PROFESSIONAL DEVELOPMENT WITH VIDEO MODELING: EFFECTS ON BEHAVIOR SPECIFIC PRAISE IN GENERAL EDUCATION CLASSROOMS

by

Colleen Barry
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Dedication

To C & L, and all of the space between.

"Education is what survives when what has been learned has been forgotten."

B. F. Skinner

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I attest my survival of the past three-and-a-half years, with absolute certitude, to the resolute kindness of friends and family. There are no words that can accurately capture the support I received when I needed it most; however, here are my best efforts:

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List of Abbreviations

Applied Behavior Analysis ..... ABA
Behavior Specific Praise Statements ..... BSPS
Individualized Education Program ..... IEP
Individuals with Disabilities Education Act ..... IDEA
Individuals with Disabilities Education Improvement Act ..... IDEIA
Interobserver Agreement ..... IOA
No Child Left Behind ..... NCLB
Percent of Data Exceeding the Mean ..... PEM
Percent of Non-Overlapping Data ..... PND

Abstract

PROFESSIONAL DEVELOPMENT WITH VIDEO MODELING: EFFECTS ON BEHAVIOR SPECIFIC PRAISE IN GENERAL EDUCATION CLASSROOMS

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Federal mandates require teachers to implement evidence-based strategies in their classrooms; however, due to gaps between research and practice, these evidence-based practices are inconsistently implemented across educational settings. Although intended to address this, teacher professional developments are most commonly delivered in a "one-shot" format, which is inconsistent with what the literature finds effective. This study sought to determine whether a functional relation exists between a professional development package incorporating video modeling with teacher rate and integrity of implementation of behavior specific praise statements (BSPS) in their classrooms. Eight general education elementary teachers participated in a six-week series of professional development on the use of BSPS in the classroom and data were collected on teacher rate of BSPS use as well as the integrity of BSPS implementation. Results indicated a functional relation between the professional development package for both rate and integrity of implementation of BSPS. Implications related to effective educator professional development and video modeling as a facilitative tool for educator skill acquisition and implementation integrity are discussed.

Chapter One

Within the walls of a classroom, educators' behaviors may serve to either bolster or undermine student successes. Among such behaviors, teacher feedback in the form of behavior-specific praise statements (BSPS) is a decisive element to the daily workings of an inclusive classroom, which houses both neurotypical children and children with various disabilities requiring accommodations and higher levels of support. These simple, yet often overlooked ingredients are universally infused across all classroom education models, albeit in vastly different ways, as teachers are now expected to provide instruction for a dynamic, diverse population of learners (Duchaine, Jolivette, & Fredrick, 2011). The purpose of this study is to examine the extent to which professional development incorporating video modeling increases the rate of elementary educator's behavior specific praise statements (BSPS) and improves the quality of such BSPS, labeled treatment integrity, with elementary educators in general education settings.

Evidence of the effectiveness of BSPS has spanned decades of literature. For example, Hall, Lund, and Jackson (1968) found that increasing praise for students' study behaviors led to marked increases in desired behaviors, while simultaneously decreasing disruptive behaviors. Further, Allday et al. (2012) found a functional relation between higher rates of BSPS and lower rates of disruptive student behaviors. Within the scope of single-subject research, demonstration of a functional relation, or experimental control, is established when the independent variable (e.g., a behavioral intervention) produces a consistent effect on the dependent variable (e.g., problem behavior; Alberto & Troutman, 2013; Cooper, Heron, & Heward, 2007). One of the

ways in which to disseminate the importance and delivery of practices such as BSPS is through teacher professional development opportunities. However, extant literature maintains that the integrity with which educators change their practices as a result of professional development is inconsistent and we are only beginning to understand the complexity of reliable and valid professional development (Desimone, 2011; Desimone, Porter, Garet, Yoon, & Birman, 2002).

Herein exists a question that begs to be answered: how do we know, and with what degree of certitude, that professional development aimed at enhancing educator practice is effectively carried out in the manner it was intended? Fidelity of implementation, sometimes referred to as treatment integrity, refers to the recipients' consistent and accurate adherence to implementing an intervention the way in which it was intended (Gresham, Gansle, Noell, Cohen, & Rosenblum, 1993; Reinke, Herman, Stormont, Newcomer, & David, 2013).

Treatment Integrity

Gresham (1989) argues that treatment integrity is critical for effectively delivering components of a strategy or plan that is intended to enhance student performances and contribute to positive outcomes in the classroom. Treatment integrity, also known as fidelity of implementation, is the educator's degree of adherence to the treatment method conveyed in a professional development program. DiGennaro-Reed, Codding, Catania, and Macguire (2010) found that "…higher integrity usually produces better intervention outcomes" (p. 291). Therefore, poor intervention outcomes may indicate lower levels of treatment integrity (i.e., poor adherence to the treatment method). Similarly, Reinke et al. (2013) examined multiple layers of treatment integrity in classrooms spanning elementary to secondary grade levels and found that exposure to additional training supports, such as modeling and coaching, were associated with better teacher implementation of such strategies (i.e., higher integrity).

Positive outcomes in the classroom are highly dependent upon two contributing factors related to integrity: first, the teachers' knowledge and working understanding of the intervention, strategy or treatment, and second, the teachers' need for support in the form of data-based performance feedback during implementation in classroom settings (Stormont & Reinke, 2013). Knowing how well the recipient of professional developments (i.e., teacher) is able to deliver a strategy, intervention, or treatment in his or her classroom predicts the success of the students who receive such interventions (DiGennaro-Reed et al., 2010). With regard to professional development, this information can be used to inform whether the professional development should keep its current content and delivery method as is, or whether either of those elements is in need of review and modification (Avalos, 2011). Professional development is considered to be more effective when teachers implement practices, such as BSPS, in the way in which they were intended (i.e., with integrity), which is determined in large part by the content and format of the professional development (Reinke et al., 2013). Consistent and accurate implementation of such practices produces favorable outcomes and directly affects the students who receive them (DiGennaro-Reed et al., 2010; Harn, Parisi, & Stoolmiller, 2013).

Those who develop and deliver professional development bear the responsibility of designing well-planned, systematic, and comprehensive trainings intended to help educators maintain consistently high levels of quality instruction for students (Nosik & Williams, 2011). Educators consuming such professional development opportunities face a herculean task: not only must they access the products of intervention research, such as BSPS, but they are also required to implement them in their classrooms with integrity to achieve the intended positive student outcomes. Although research has demonstrated effective ways in which to deliver professional development, such as continuous contact hours or opportunities to practice and

receive performance feedback, these approaches are not always translated into practice. Thus, there is a gap between what we know and what we do. It is paramount that future professional developments be delivered via modalities that are sensitive to the needs of their participants and uphold the indicators of quality put forth in the literature (Desimone, 2009; Desimone, 2011; Marsh & Mitchell, 2014).

Professional Development

Collectively, the goals of professional development are to increase and enhance educators' professional knowledge and to improve their practices in order to ultimately benefit students, both academically and socially (Borko, Jacobs, Eiteljorg, & Pittman, 2008; Fishman, Marx, Best, & Tal, 2003). Adequate, comprehensive, and ongoing professional development is central to the success of any classroom, business, organization, or residential community; yet perhaps the most visible of all of these is the 21st century American classroom, which educates the next generation of teachers, employees, and community members. Professional development for teachers is one of the most powerful avenues through which educators can access valuable information and, if applied, make changes to their pedagogy. Yet, the quality and effectiveness of professional development is challenging to measure; and therefore, what qualifies as a "good" professional development model is difficult to discern and made even further difficult to replicate.

All too often, the typical "one shot" workshops offer little-to-no cohesion linking theory, research, and practice. These types of workshops are common because they are inexpensive and are made exponentially more attractive by requiring less time, which is arguably a school's, facility's, or individual's most valuable resource (Simonsen, MacSuga, Fallon, & Sugai, 2013). Further, a pervasive attitude regarding staff training and professional development is that they

are intended to remediate a skill deficiency. A more constructive view is consistent with instructional design technologies, wherein a performance deficit, rather than a skill deficit, exists if an individual has knowledge of how to perform a skill, yet is not demonstrating it satisfactorily (Mager, 1997). Providing examples or models along with practice opportunities thereby facilitates satisfactory performance and increases the likelihood of successful outcomes.

By and large, the literature consistently agrees that professional development should be long-term in nature, delivered via modalities that extend beyond lecture, and provide participants with multiple opportunities to enhance their skill development (Borko et al., 2008; Coles, 2013; Darling-Hammond & Richardson, 2009; Desimone, 2009; Desimone, 2011; Garet, Porter, Desimone, Birman, & Suk Yoon, 2001; Showers, Joyce, & Bennett, 1987). It is also important to note that such professional development needs to be monitored for salience and social validity on an ongoing basis. Simply put, the social validity of a professional development course refers to how meaningful and relevant the content is for the participants (Cooper et al., 2007). In this way, professional development needs to be malleable and responsive to the needs of the participants. A certainty within any school is the highly variable skill levels of educators, ranging from first year novices to veteran teachers who have decades of experience (Hawkins & Heflin, 2011). More often than not, pre-packaged programs are administered without consideration of the skills and years of experience of the recipients, are not reflective of the educators' needs or wants, and consequently often do not produce expected outcomes.

With the intent of designing a cohesive professional development structure that is sensitive to the needs of its recipients, Showers and Joyce (1996) offered a peer-coaching model that emphasized the importance of using peers as coaches to enhance professional development efforts. In this way, peer coaches were encouraged to watch one another work and, rather than

provide technical feedback (as this would infer a supervisory relationship rather than a collaborative one), engage in discussion about teaching, personal pedagogy, and what they observed their peers do in their classrooms. "Rather, teachers learn from one another while planning instruction, developing support materials, watching one another work with students, and thinking together about the impact of their behavior on their students' learning" (p. 15). While there is no exhaustive and commonly accepted definition of what 'effective' professional development is, research spanning nearly 60 years suggests the most decisive measure of this is what practices and strategies a teacher is able to bring into his or her classroom. Highlights from a synthesis of research done nearly three decades ago maintains that effective professional development should include theory, demonstration or modeling of the skill or strategy, structured practice for participants, and immediate detailed feedback following practice opportunities (Showers et al., 1987).

Extending to present day, these characteristics still ring true and there is further support for powerful, active, hands-on practices. These active practices are designed to deliver content through discussion and provide opportunities to manipulate, practice, and receive feedback (Garet et al., 2001; Pelletier, McNamara, Braga-Kenyon, & Ahearn, 2010). Considering this, Desimone (2011) identified core features of educator professional development, resulting in quality indicators that provide a "framework for judging whether professional development is doing what we want it to do – increasing teacher knowledge and instruction in ways that translate into enhanced student achievement" (p. 68). From an analysis of existing empirical research, Desimone identified the following five key features of effective professional development: (a) activities focused on content specific information; (b) opportunities for active learning; (c) coherence of activity and content with other professional developments, knowledge, and school-

wide policy; (d) duration of professional development spanning approximately 20 or more hours of contact; and (e) collective participation on behalf of school-wide grade or subject teams to foster an interactive learning community.

Although these attributes exist and key indicators have been identified, there is much that remains to be known about what constitutes effective professional development. When discussed in this sense, professional development is defined as a facilitated learning process through which practitioners acquire skills and knowledge applicable to their particular field via collaboration, reflective supervision, content lessons, and/or coaching (Higginson & Chatfield, 2012). Professional development must be implemented in meaningful ways that ensure educators are able to demonstrate newly acquired skills or behaviors and, most importantly, transmit these behaviors into their classroom settings with the highest levels of treatment integrity possible. Unfortunately, an all too common failure is the disintegration of translating research into the classroom. There is not only a lackluster emphasis on providing teachers with opportunities to rehearse the implementation of the professional development strategies being taught, but the strategies are also delivered by teachers within the classroom with variable degrees of integrity and, therefore, effectiveness.

While the nature of an elementary classroom is complex, the mere act of teaching is even more intricate; van Es and Sherin's work on teacher "noticing" behavior (2002, 2005, 2006, 2008, 2010) found that teachers are only capable of attending to a small portion of stimuli at any given moment. They maintain that the process by which one learns to notice involves identifying salient aspects of a teaching situation, making connections between specific events or behaviors and established principles of learning, and using what one already knows about the environment to make judgments (van Es & Sherin, 2002). This concept of "noticing" has been a

pervasive thread woven throughout their investigations into educator professional developments. Consistent with Desimone's (2011) characteristics, teachers must be provided with opportunities to reflect upon their own learning before they are expected to impart knowledge to their students (Sherin, 2002). One of the ways in which to actively engage educators in reflection about their practice is through the use of videos. Sherin and Han (2004) engaged educators in a yearlong professional development wherein each educator watched videos of themselves and colleagues within the context of a 'video club.' Over time, educators shifted their reflective focus from their own teaching behaviors to the behaviors of their students. The content of *what* was noticed informed teachers' decisions about how they interacted with students and responded to situations in the classroom. This shift demonstrated the importance videos play in teachers' understanding of personal pedagogy and prompted future research on video-assisted professional development.

From their substantial contributions to the field, Sherin, van Es, and colleagues (2002, 2005, 2006, 2008, 2010) identified video as a valuable medium through which to enhance teachers' learning. They purport that gaps exist within the current framework of knowledge regarding the true power of video as a tool for teacher learning and how it can extend to wider scale professional development (Sherin & van Es, 2005, 2009). In order to explore this further, Sherin, Linsenmeier, and van Es (2009) emphasized three areas of importance when considering the use of videos for professional development. First, the video clips must portray authentic classrooms, lessons, or situations to which teachers can relate. Displaying the environment in this way provides familiarity to teachers while enhancing the likelihood that they will take the content seriously. Next, supplementary information may be provided via embedded text or commentary to provide sufficient context and background to the clip (Seago, Mumme, & Branca, 2004; Sherin et al., 2009). Sherin et al. (2009) noted that if background information is not

provided up front, teachers will ask for it (e.g., "What happened right before the clip began?" or "How often does Stacy call out?"). This ultimately results in the loss of valuable learning time and detracts from the objective of the professional development learning activity. Finally, the literature is divided as to whether videos should depict exemplary role-model practices or teaching challenges (Brophy, 2004; Oonk, Goffree, & Verloop, 2004; Wang & Hartley, 2003). There is mounting evidence in favor of using videos that illustrate difficulties in teaching or situations marked by some degree of uncertainty. Seago et al. (2004) maintained that videos depicting ambiguity provide more room for analysis and discourse. On the other hand, videos that concentrate on a single domain within teaching provide exemplary models, which may be necessary for developing teachers' perceptions of what the targeted skill should look like in practice (Oonk et al., 2004).

Whether the professional development utilizes ambiguous or exemplary teaching situations, the most critical component of training is the opportunity for teachers to engage in practice and receive feedback about their performances (Moore & Fisher, 2007; Pelletier et al., 2010). As mentioned previously, active methods are those that extend beyond passive transmission of information, such as watching a video modeling clip *and* being afforded an opportunity to practice a targeted skill and receive feedback. These methods have enjoyed longstanding support in the literature (Catania, Almeida, Liu-Constant, & DiGennaro-Reed, 2009; Collins, Higbee, & Salzberg, 2009; DiGennaro-Reed et al., 2010; Moore & Fisher, 2007; Pelletier et al., 2010). Such active learning provides sufficient opportunity to practice, hone skills, and sometimes unlearn techniques that are ineffective or unsubstantiated by research (Garet et al., 2001). Active learning also goes beyond simply mastering a variety of techniques; it requires modeling, problem solving, and active reflection on the part of the individual. Joyce

and Showers (2002) emphasized this very point; learning how to learn holds just as much significance as developing new knowledge from professional development. They maintain that knowledge is developed by exploring conceptual underpinnings of theory, demonstrating such practices through models, and receiving feedback (Joyce & Showers, 2002; Showers et al., 1987). There are several approaches through which professional development can incorporate active learning into its design, with one of the most promising utilizing video as a modality.

Professional development with video. One of the most inviting aspects of using video as a modality by which to learn is the mere fact that it is a permanent record that is capable of being paused, rewound, and replayed without variation (Sherin & Linsenmeier, 2011; Zhang, Lundeberg, Koehler, & Eberhardt, 2011). Embedded with both audio and visual data, videos hold incredible power by serving as a multifaceted tool with the capacity for many uses (e.g., observing oneself performing a skill, observing a colleague performing a skill, or collecting data on the behaviors observed in the video). It is in such manner that video has been referred to as a 'window into practice' by which educators can better understand their craft in the hopes of facilitating success among their students (Borko et al., 2008; Marsh & Mitchell, 2014). Together, these characteristics give video the unique ability to allow educators to watch and reflect on what they observed. As any educator is well aware, classrooms are busy operations, resonant with both actual and figurative 'noise.' Watching a video specifically focused on one targeted teacher behavior provides ample opportunities for educators to take a step back, streamline their focus, and hush the noise. As Zhang et al. (2011) succinctly stated, "…video as representation of practice has been prevalent in teacher education due to its unique capability to capture the richness and complexity of elusive classroom practice" (p. 454).

On the whole, common practice for professional development includes a lecture-style format, often accompanied by written prompts or descriptions. However, information presented in these manners is highly susceptible to misinterpretation or misunderstanding. Videos offer concrete representations of content and eliminate much of the ambiguity that may arise from other modalities of information dissemination (Marsh & Mitchell, 2014). Videos portray both the vocal and non-vocal elements that may function as decisive elements to the integrity of the practice that is lost in lectures and other similar formats.

As demonstrated most prominently throughout the literature, videos are utilized as a tool for professional development in one of two ways. Educators may either watch videos of their own practice or observe videos of others engaged in teaching (Marsh & Mitchell, 2014; Sherin & Linsenmeier, 2011; Zhang et al., 2011). These videos lend themselves to showing "real" individuals and situations, which can be used to support problem-based learning approaches in teacher education (Marsh & Mitchell, 2014).

Video modeling as a modality for professional development. Herein a distinction must be made. The intended use of video in professional development discussed thus far has been to portray student and teacher behaviors, teaching patterns, strategies, and to promote reflection, dialogue, and discussion revolving around pedagogy. A more specific and systematic use of video for instructional purposes is known as video modeling. Video modeling is an active process that provides an observer, in this case, a teacher, with the opportunity to watch a model demonstrate a specific skill multiple times. These viewings are then followed by multiple practice opportunities in which the observer imitates the skill, ideally becomes fluent with the skill, and is eventually able to effectively incorporate it into his or her repertoire (Bellini & Akullian, 2007; Catania et al., 2009). A defining discrimination between these two approaches is

the specificity in the targeted behavior that is to be taught, discussed, or modeled. For example, watching a video of a master teacher deliver a math lesson to a second grade classroom has endless points of discussion and reflection; whereas a video model is highly specified and may focus on the teacher's use of corrective feedback to a disruptive student. Videos used in professional development provide a robust base to analyze and discuss, but may not always offer such opportunities to engage in practice of a skill (Sherin & van Es, 2009; Zhang et al., 2011). In contrast, video modeling always requires the participant to engage in practice opportunities soon after watching the videos; in this way, video modeling is an active learning process (DiGennaro-Reed et al., 2010; Pelletier et al., 2010).

Research conducted by DiGennaro-Reed et al. (2010) as well as Pelletier et al. (2010) emphasize that when a feedback component is added into the video modeling process, an individual's ability to effectively learn the skill is enhanced. In this sense, feedback is defined as information that is provided via an agent such as a peer, teacher, or experience (e.g., learning to avoid touching a hot stove after receiving a burn) and is contingent on one's demonstration or performance of a skill (Hattie & Timperley, 2007). In order for feedback to be most salient, it should be delivered as closely in relation to the performer's behavior as possible, utilizing succinct, direct language, and it should provide information on both what was done correctly and what can be done to improve upon the skill (Cooper et al., 2007; Macurik, O'Kane, Malanga, & Reid, 2008).

There are many advantages of using video modeling as a professional development tool, the first of which is its cost effectiveness (Bellini & Akullian, 2007; Higginson & Chatfield, 2012). Once videos are recorded, this advantage predominates: the amount of trainer-presence time required is drastically reduced, the video format is easily transferrable, videos can function

as a stand-alone training tool, and they can be made readily available to train new oncoming staff (Macurik et al., 2008; Weldy, Rapp, & Capocasa, 2014). This is particularly helpful in settings that have high rates of turnover such as residential and special education settings (Neef, Trachtenberg, Loeb, & Sterner, 1991; Wehby, Maggin, Moore Partin, & Robertson, 2012). Additionally, with the advent of accessible, sophisticated video-editing technology, modifying videos is easy and eliminates the need for complete revision (Moore & Fisher, 2007; Nosik & Williams, 2011). Macurik et al. (2008) maintain that another potential benefit of video modeling is the option of using it to retrain individuals whose performances have deteriorated over time. These "booster sessions" can be exceptionally helpful in educational settings to promote ongoing professional development for teachers and paraprofessionals. Similarly, video modeling offers the ability to reach multiple individuals in various geographic locations, cutting down on travel costs and time expenditures when accessing professional developments.

Importantly, the literature base boasts consistently high levels of social validity on video modeling (Catania et al., 2009; DiGennaro-Reed et al., 2010; Lipschultz, Vladescu, Reeve, Reeve, & Dipsey, 2015; Macurik et al., 2008; Rosales, Gongola, & Homlitas, 2015). Cooper et al. (2007) defined social validity as the level of satisfaction, acceptability, and importance of an intervention on behalf of the participants, interventionists, and society. Social validity has been a longstanding indicator of high-quality single-subject research and emphasizes the selection of dependent variables hold high social value (Horner et al., 2005). While not innately part of a research question guiding an investigation, measures of social validity must be considered and are generally gathered by surveys or brief interviews with participants. These tools help to glean information about participant perception of the intervention and its direct or indirect outcomes. With regard to video modeling, despite its strong results for social validity with use in special

needs populations and children, there are some mixed findings regarding its use with adults, particularly teachers. For example, Nosik and Williams (2011) reported a disadvantage of this intervention where observers were dissatisfied watching videos that did not resemble their environments or populations closely enough. Another disadvantage reported by some researchers who examined treatment integrity was that at least a portion of the participants indicated that they disliked being observed or having data taken on their performance (Hawkins & Heflin, 2011; Nosik & Williams, 2011). Finally, with the case of video feedback or video self-modeling (i.e., observing videos of oneself engaging in the targeted skill), work by Hawkins and Heflin (2011) and Phaneuf and McIntyre (2007) indicated that some participants did not like watching themselves on video and thus were very averse to using video techniques in the future. Nosik and Williams (2011) resolved that much of the disapproval for the modality could be attributed to non-disabled adults' self-perceptions and self-consciousness of being observed or receiving constructive feedback regarding their teaching. However, notwithstanding the lack of consistency in reporting social validity measures associated with video modeling used with adults and teachers, the effectiveness of the intervention cannot be denied.

Behavior Specific Praise Statements (BSPS)

BSPS are defined as audible, specific, and positive verbal feedback delivered to a student that explicitly describes the behavior being praised (Allday et al., 2012; Simonsen et al., 2013); they may be provided contingent upon both academic and social behaviors (Duchaine et al., 2011; Musti-Rao & Haydon, 2011). Praise may take many forms and, accordingly, serve many functions. As most commonly seen, praise is delivered to students with the underlying intention of reinforcing behavior and maintaining the forward momentum of classroom instruction (Duchaine et al., 2011). Consequently, it is often assumed that kind words of motivation, a silent

thumbs-up, or the standard "good job!" are all intended to make children feel accomplished, intelligent, and worthy of praise; however, this is not always the case.

It is critical to note that praise should not be globally equated with reinforcement, which, simply stated, is a consequence (e.g., feedback) that follows a behavior and increases the likelihood of that behavior occurring again in the future (Cooper et al., 2007). Instead, praise as defined by Brophy (1981) is any statement commending a behavior and expressing approval. It is important to demarcate the distinction between these two terms. If praise does not increase a student's desired behavior, it does not act as a reinforcer and, thus, should not be expected to change behavior. In other words, if a student's hand raising behavior does not change in frequency following teacher-provided verbal feedback (e.g., "Thank you for raising your hand"), reinforcement has not taken place, despite the fact that praise (i.e., an approval statement) was delivered. It is critical to note that it is impossible for one to discern whether or not a specific consequence operates as a *reinforcer* after one discrete event. Establishment of a reinforcer requires multiple opportunities over time to indicate change in behavior (Brophy, 1981; Cooper et al., 2007). Thus, multiple occasions are required wherein praise is delivered following the student's hand-raising behavior to identify if, over time, patterns will arise to support a more accurate determination regarding whether or not reinforcement has occurred.

BSPS are well-established as an evidence-based practice (Allday et al., 2012; Duchaine et al., 2011; Haydon & Musti-Rao, 2011; Reinke, Lewis-Palmer, & Martin, 2007; Simonsen et al., 2013). Federal mandates and educational reform have directed schools across the country to use evidence-based practices in every classroom. Legislation and policy from the No Child Left Behind Act (NCLB, 2002) and the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) require that educators implement evidence-based interventions to provide

instruction to all learners (Stormont & Reinke, 2009; Thompson, Marchant, Anderson, Prater, & Gibb, 2012). There is a growing base of research demonstrating strong relationships between teacher behaviors and successful classrooms (Allday, Nelson, & Russel, 2011; Power et al., 2007). Extending beyond these relationships, targeted intervention research has repeatedly demonstrated that BSPS consistently improve student behavior, both academically and socially (Allday et al., 2012; Reinke, Lewis-Palmer, & Merrell, 2008; Simonsen, Myers, & DeLuca, 2010; Thompson et al., 2012).

Among the many advantages of BSPS are their portability (i.e., a teacher can deliver BSPS relatively anywhere), flexibility (i.e., a teacher may adapt a BSPS to any student), efficiency (i.e., BSPS take seconds to provide with next-to-no preparation time), and simply that their use is free (Musti-Rao & Haydon, 2011). Haydon and Musti-Rao (2011) offer the following key components of BSPS necessary for successful implementation of the strategy: (a) link the praise statement to a specific behavior; (b) provide feedback; (c) be sincere; (d) reflect student skill level; and (e) evaluate the effectiveness of the praise statements. Perhaps one of the most socially salient applications of this simple strategy is the reduction of teacher stress and frustration, which often results from ongoing disruptive behaviors in the classroom. The most commonly reported factor contributing to job dissatisfaction and emotional exhaustion is an educators' inability to address challenging behaviors (Allday et al., 2012). Further, the rate of such behaviors may be heightened within general education classrooms that also provide services to students with exceptional needs. Since BSPS have been shown to reduce the frequency is disruptive behaviors, their use in these settings is even more important for alleviating stress, job dissatisfaction, and emotional exhaustion (i.e., teacher burnout).

General Education and Inclusion

The intent of the 21st century classroom is to create an environment in which to educate children with special needs alongside their typically developing peers, while teaching all children about individual differences through a climate of acceptance (Duchaine et al., 2011). Yet, it remains difficult to extract a comprehensive definition of inclusion from the literature to depict how these classrooms operate. Inclusion should be viewed as a purposeful setting, extending beyond the mere physical placement of children with special needs in general education classrooms (Harrower & Dunlap, 2001). However, much of the extant literature relies upon the definition of physical placement due to lack of consistency among definitions (Cook, 2001; Duchaine et al., 2011). Special education law requires that students with disabilities be educated with students without disabilities in the least restrictive environment (LRE), which oftentimes equates to the general education classroom with supplementary supports (Education for All Handicapped Children Act, 1975; IDEIA, 2004). Therefore, for the purposes of this study, the term 'general education teacher' will be used in reference to educators in general education settings who service both typical and exceptional learners. Similarly, mention of the term 'inclusion' is meant only to distinguish a general education classroom that also contains both neurotypical students as well as students who receive special education services.

Spanning the last few decades, the inclusive classroom has garnered public attention and has thus been the focus of much research. Data from the National Center for Education Statistics (NCES) indicated a nearly 36% increase in the number of students with disabilities included from 1991 to 2011 (NCES, 2013). Outwardly, the appearance of an inclusion classroom looks much like a general education classroom. The fundamental distinguishing difference, however, is that an inclusion classroom is co-taught by one general educator and one special educator.

Delivery of core content instruction is typically through the general educator, whereas the special educator is responsible for maintaining students' Individualized Education Programs (IEPs) and implementing them with integrity. This inclusive model seeks to integrate instruction for all learners in a cohesive way. In order for this to occur, ongoing communication is required between the special and general educators. To assume that the special educator in the inclusive setting will solely teach children with IEPs is erroneous. Thus, in order for the inclusive education classroom to be a successful learning environment for all students, it is crucial to keep in mind that all educators are responsible for fulfilling the educational needs of all students. The general educator must not only be well-versed in differentiating instruction among students, he or she must also have the ability to follow specific procedures, interventions, and/or behavior plans as detailed in the child's IEP. Moreover, the special educator must remain highly involved with the content being covered in class.

More often than not, teacher preparation programs do not sufficiently equip teachers with the tools required to be responsive to the vast array of learner diversity within a general education inclusion classroom (Bain, Lancaster, Zundans, & Parkes, 2009). Consequently, general education teachers may not feel confident in their abilities to serve students with exceptionalities by providing the accommodations these students require to successfully access curriculum. As Burstein, Sears, Wilcoxen, Cabello, and Spagna (2004) wrote, "Consistently, the evidence has suggested that general education teachers feel unprepared to serve students with disabilities, have little time available to collaborate, and make few accommodations for students with special needs" (p. 104).

Central to the skills necessary for a successful inclusive classroom is an in-depth knowledge of evidence-based practices. As it relates to this study, teachers must specifically

have in-depth knowledge of BSPS, as well as the skills to implement it with fidelity. Bain et al. (2009) echoed the findings of Showers and Joyce (1996) and emphasized the power of a cooperative learning approach utilizing peer-assisted learning to improve delivery of curriculum instruction within schools. In particular, there is a breadth of research backing these approaches when used in college settings with adult learners; however, the application of these practices in teacher preparation coursework is inconsistent (Bain et al., 2009). Preservice teacher education programs dedicate much of their focus on preparing future educators to have a deep understanding of content knowledge and general pedagogical knowledge; however, recent studies indicate that these programs need to put more emphasis on collaboration because it is imperative for inclusive education (Harvey, Yssel, Bauserman, & Merbler, 2010). The most successful inclusive schools embrace a unified educational system between special and general educators (Burstein et al., 2004), and this collaborative alliance should ideally begin at the preservice level (Harvey et al., 2010). Taken together, there is a growing need to provide the current cohort of educators with professional developments geared toward developing the skill sets of novice teachers to prepare them for an inclusive setting, as well as enhancing and maintaining those of veteran teachers.

Significance of the Study

Collectively, the literature regarding professional development incorporating the use of videos, along with ever advancing technology, provides a promising base of support for evidence-based interventions such as BSPS (Bellini & Akullian, 2007; Neef et al., 1991). Despite the many advantages and evidence that support the use of BSPS, many educators do not have a strong understanding of how the systematic use of BSPS in their classrooms can improve student behaviors and improve the overall classroom climate (Haydon & Musti-Rao, 2011;

Musti-Rao & Haydon, 2011; Reinke et al., 2007). Oftentimes, when high rates of disruptive behaviors are evident in a classroom, teachers tend to rely on coercive methods by delivering vocal reprimands. This is highly problematic because educators are then reinforced by the student's immediate cessation of the disruptive behavior, meaning the educator is more likely to deliver vocal reprimands in the future because they had the desired effect. Continued use of coercion in order to gain control of a classroom not only leads to alienation of some students, but may also lead to mounting frustration from both students and teachers (Haydon & Musti-Rao, 2011). This adverse cycle may be addressed through the delivery of professional development that utilizes active learning strategies such as video modeling of BSPS as a specific, targeted intervention, with opportunities for practice and feedback.

Despite evidence that video modeling is a highly effective technique for skill acquisition, mastery, and maintenance, much of the current literature base is almost exclusively geared toward its use with children and individuals with disabilities. Specifically, video modeling enjoys a large base of support with special needs populations such as autism, intellectual disability, and other developmental delays (Bellini & Akullian, 2007; DiGennaro-Reed et al., 2010). Because of its potential as a learning tool and intervention approach, especially with regard to treatment integrity, video modeling techniques may provide highly advantageous avenues for use with educators due to its versatility and social validity. Thus, the significance of the present study is to fill a gap in the literature and explore the effectiveness of professional development using video modeling that teaches BSPS to teachers who work with a population of students with and without disabilities in a general education classroom setting.

Research Questions

The following research questions guided the investigation:

1. Is there a functional relation between the professional development package incorporating video modeling* and the rate of BSPS used by general educators in general education settings with all students?

(*Professional development package includes a PowerPoint overview of key terms as well and a series of various video modeling clips demonstrating correct use of BSPS).

2. Is there a functional relation between the professional development package incorporating video modeling and increased level of educators' treatment integrity of BSPS implementation?

*Implementation with integrity refers to accuracy of steps completed from treatment integrity protocol. Integrity scores will be calculated by dividing number of correct steps by total number of steps to yield a percent correct.

In addition, the present study will address the following secondary descriptive research questions:

1. To what extent will educators rate/score the use of video modeling as an effective and efficient intervention component embedded within a professional development package for teaching classroom management skills, such as BSPS?

2. To what extent will educators rate/score the use of BSPS as an effective strategy for classroom management within a general education setting?

Hypotheses

The following hypotheses are offered for the research questions:

H_1. It is hypothesized that there will be a functional relation between the professional development package incorporating video modeling and an increase in the rate of teachers' use

of BSPS within inclusive settings. This hypothesis is consistent with the literature demonstrating the overall success of video modeling as an effective means of instruction.

$H_{2.}$ It is hypothesized that there will be a functional relation between the professional development package incorporating video modeling and higher percent correct of steps completed accurately according to treatment integrity protocol.

The following hypotheses are offered for the secondary descriptive research questions:

H_{1}. It is hypothesized that teachers will rate/score video modeling as an effective and efficient component of the professional development package by providing satisfactory ratings on the social validity questionnaire. This is based off of the evidence provided in the literature suggesting that video modeling is an

$H_{2.}$ It is hypothesized that teachers will rate/score BSPS as an effective strategy for classroom management.

Chapter Two

Review of Literature

Perhaps one of the most visible and noteworthy national issues is the state of our education system. Educators are arguably the most important element within a classroom and are forced to simultaneously uphold their highly qualified status while rapidly raising the achievement of students and preparing them for college and beyond. Policymakers, legislators, and educators have all joined forces in order to address the common mission of transforming a system sorely in need of reform (Garet et al., 2001). In order to effect change, reform is nearly completely contingent upon having strong, highly effective teachers in every classroom (Darling-Hammond, 2005; Desimone, 2011). One result is that professional development has become the focus of many reform initiatives because it has been well established as a critical means by which teachers can become better skilled, more effective, and facilitate student successes (Desimone, 2011; Garet et al., 2001; Tournaki, Lyublinskaya, & Carolan, 2011). Simply stated, professional development refers to learning opportunities presented to educators with the intent of improving students' academic, social, and/or behavioral achievements (Garet et al., 2001). The standards put forth by federal legislation such as NCLB (2002) require that highly qualified teachers instruct all students to achieve academic standards, and IDEIA (2004) mandates that educators utilize evidence-based interventions with all students (Goldschmidt & Phelps, 2010; Stormont & Reinke, 2009; Thompson et al., 2012). In response to these legal guidelines, there

are enormous pressures on the national, state, and regional levels to ensure that educator professional development intended to promote student outcomes for all students is effective and produces lasting results (Ferguson, 2006). Thus, the purpose of this study is to examine the extent to which professional development incorporating video modeling increases the rate of elementary educator's behavior specific praise statements (BSPS) and improves the quality of such BSPS, labeled treatment integrity, with elementary general educators in inclusive settings.

What is Effective Professional Development?

There has been an accumulation of literature focused on professional development for teachers that spans the past several decades (Desimone, 2011; Garet et al., 2001; Showers et al., 1987). The research base is robust and examines features of professional development such as curricula and educator pedagogical knowledge (Goldschmidt & Phelps, 2010), implementation of evidence-based strategies (Pisacreta, Tincani, Connell, & Axelrod, 2011; Simonsen et al., 2010), specific models and approaches to professional development (Desimone, 2009; Kennedy, 2014; Showers et al., 1987), and collaborative inclusion settings (Herner-Patnode, 2009; Nishimura, 2014). As such, some of the literature focuses on general components of effective professional development, whereas other individual studies examine specific professional development modalities for use with specific populations, settings, or tools (e.g., teaching children with learning disabilities, teaching in special education classrooms, or integrating technology). All too often, school districts provide professional development opportunities that are not only didactic in nature, but also do not consider the needs or the input of their teachers. These workshops are not aligned with each other and provide little-to-no continued contact or follow up to evaluate the extent to which teachers are implementing the skill or intervention with

integrity or with what degree of effectiveness within the classroom or targeted setting (Tournaki et al., 2011).

Correspondingly, it is difficult to discern a single definition or well-accepted understanding of what qualifies as *effective* professional developments. Garet et al. (2001) sought to examine the relationships among specific elements of professional development using a large national sample of math and science educators' self-reported changes in pedagogy and skills. Results from 1,027 educators indicated that professional development with an emphasis on content knowledge, opportunities to engage in active learning activities, and a clear link between theory and applied activities, were predictive of an educator's increase in knowledge and likelihood to change classroom practices. Further, regression analyses revealed that the format of the professional development activity (e.g., workshop, lecture, small group discussion), duration of activity, and opportunities for collaboration among teachers who share a subject area, grade level, or school site were likely to enhance teacher understanding of both content and pedagogy.

Similarly, Desimone (2009, 2011) conducted a synthesis of extant literature and identified that a specified content focus, active learning, coherence, duration, and collaboration are the core features of professional development. However, the mere presence of these elements does not guarantee successful outcomes; hence, Desimone (2011) proposed a model stressing that in order to address the issue of effectiveness, a conceptual framework is necessary. The proposed conceptual framework is intended to consider the relationships among effective components of professional development, changes in teacher knowledge and practice, and student outcomes. When teachers participate in professional development activities, it is expected that they will experience changes in their beliefs and/or attitudes if they develop

technical skills and an increased understanding of the content area (Desimone, 2009, 2011). Subsequent to such effective professional developments (in the sense that teachers developed their skills), it is important to assess whether teachers bring newly acquired knowledge and experiences to their classrooms and, with that, changes in instruction that are intended to improve student achievement. A second measure of effectiveness may be determined by evaluating for the presence of changes in student outcomes or achievement. Thus, effective professional development is concerned not only with teachers' acquisition of knowledge and skills, but also with student outcomes that result from these teacher skills being put into practice.

Other research has examined what constitutes effective professional development outside the scope of Desimone's framework and lends further support to the benefits of professional development models that are ongoing over a period of time, consistent with Desimone's notion of duration. Tournaki et al. (2011) examined the relationship between an ongoing curriculum workshop series and three aspects of purported teacher effectiveness: preparation and planning, classroom environment, and instruction. Rather than relying upon teacher self-report as a dependent measure, which is commonly used in this field of research, Tournaki et al. utilized classroom observations to measure the effectiveness of professional development. Roughly half of the 153 high school teachers from a large, high-need, urban school district volunteered to have their classrooms and teaching practices observed regularly, while the other half of the teachers received ongoing curriculum development workshops every two to three weeks over the course of one school year. Perhaps the most notable finding was that in order to effect change, the researchers explicitly recommended that ongoing professional development should be sustained across two to three years. This starkly contrasts with the majority of professional developments being offered nationwide which, as mentioned previously, tend to be delivered in a one-time

format due to their cost effectiveness and time efficiency. Together, the findings from Garet et al. (2001), Desimone (2009, 2011), and Tournaki et al. (2011) provide empirical support for the aforementioned core elements of content focus, active learning, duration of contact, coherence, and collaboration that make up effective professional development.

Seeking to further clarify the minimum length of ongoing professional development needed for sustained change, Goldschmidt and Phelps (2010) examined changes in teacher quality after educators were exposed to the California Professional Development Institute (CPDI), which is a large-scale teacher professional development intended to build elementary educator content knowledge mastery in mathematics and reading. Teacher quality was measured by the four domains of the CPDI, which was tailored to cover content knowledge, comprehension of knowledge and teaching, word analysis and content knowledge, and Spanish language delivered in a series of professional development sessions spanning an initial 40-hour "summer institute," 40 hours of follow up professional development over the school year, and 40 hours of collaborative team meetings. Data were collected from 1,927 California elementary educators including pre- and post-assessments. Data analyses initially revealed that the professional development model improved educator content knowledge in all but the Spanish language domain, yet these gains were not maintained at the six-month follow up. This implication echoes Tournaki et al.'s (2011) recommendation of sustaining professional development for longer than a single school year. Despite evidence pointing toward what works in education, there are corresponding challenges related to implementing such reform in ways that permit maintenance of changes in teachers' behaviors over time.

Challenges to effective professional development. There may be several issues related to how and why a professional development program does not consist of the core effective

elements. Enriching, engaging learning activities require time, materials, thoughtful planning, and of course, money (Garet et al., 2001). Extending beyond these elements are other challenges faced by the key players who have the capability of setting change into action: school and district leaders. Ferguson (2006) identified key challenges that create barriers to sustaining effective professional development. In order for even the most "effective" professional development to, in fact, be effective, it must be introduced in a way that not only sparks teacher buy-in, but also holds leaders responsible for ensuring that teachers feel supported to remain committed to the objectives of the professional development. Barlow, Frick, Barker, and Phelps (2014) also explored challenges to effective professional development; they conducted a qualitative examination of nine high school science teachers' experiences in a science curriculum professional development. Overall, the results suggested that participants fell into one of three general categories (i.e., no impact, medium impact, or high impact) based on how well the educators translated practices from the professional development into their classrooms. In other words, if a teacher translated the practices very well, the professional development was believed to have had a high impact on the teacher's translation of skills into the classroom and, thus, the teacher fell into the high impact group. Barlow et al. (2014) defined teachers in the high impact group as those who had high fidelity of implementation of practices in the classroom (i.e., treatment integrity), while those in the no impact group had weaker fidelity of implementation as evidenced by their lack of change after professional development. Several themes emerged from data gathered through interviews and classroom observation regarding the complexity of challenges teachers experienced that led to the variability in their abilities to incorporate professional development practices in their classrooms. The themes included internal and external challenges spanning teachers not fully understanding the content of the professional

development, fighting a desire to return to previous instructional methods, holding incongruent beliefs about the newly proposed ideas presented, and attributing their failure to implement changes in the classroom to student skill discrepancies. Taken together, Barlow et al. (2014) concluded that the three categories of impact (i.e., no impact, moderate impact, high impact) were related to the level of fidelity of implementation that the professional development made. Thus, the three teachers who fell into the high impact category implemented the changes related to the professional development with high fidelity of implementation, which may in turn lead to greater achievement gains among students.

Designing effective professional development. The design of an effective teacher professional development must not only take into consideration the characteristics of effective professional development, but also the challenges that may hinder teacher transmission of content and skills into the classroom. Standards put forth by Learning Forward (2015), an association dedicated solely to advancing teacher professional development, offer seven features grounded in literature that connects educator knowledge with student outcomes. Operating from the standpoint that all educators are responsible for improving their practices, Learning Forward provides an outline for designing effective professional development that supports effective teaching and leadership, while keeping student outcomes at its crux. The following seven features have been identified as characteristics of what is most effective for teacher professional development: (a) learning communities; (b) resources; (c) learning designs; (d) outcomes; (e) leadership; (f) data; and (g) implementation.

Learning communities may be seen as the foundation for educator professional development. They are defined as collaborative groups of educators that meet regularly with the goals of continuously improving practice, developing collective responsibility for the learning of

all students, and creating accountability among all members of the school team. Learning communities seek to uncover not only what is working well for students, but also what is not working well. By scrutinizing what is not working well, learning communities are driven to collectively find the strategies and practices that will work and take responsibility for learning how to implement such practices well. Underlying the implementation of professional development initiatives is the undeniable need for reliable resources. The way in which human, fiscal, material, technology, and time resources are prioritized is directly related to the quality of the professional development. Clearly, such resources are dependent on funding; however, it is of critical importance that these resources align with the goals and direction of the professional development. Similar to the way in which learning communities should meet often, it is recommended that school district leaders convene often to ensure that any changes to policies and regulations are closely examined with consideration to aligning resources.

The learning design standard places emphasis on the topography of how the professional development is delivered, including face-to-face, online, or hybrid settings with small or large groups. In order to choose a learning design most suited for the delivery of a professional development, the intended outcome derived from both students' and educators' needs must be considered at the outset. The most effective designs take educators from comprehension of a strategy or practice to being able to explicitly connect such practices to other approaches in the classroom. Central to the learning design is the presence of opportunities for educator practice and feedback, which is prevalent throughout the literature (Avalos, 2011; Brophy, 2004; Desimone et al., 2002).

In order for the design of the professional development to be effective, the educators in attendance must be held to high standards. As such, the outcomes standard focuses on aligning

professional developments with student outcomes and teacher performance. Educator professional development should focus on student learning outcomes; these outcomes should serve as a driving force behind the content of educator professional developments. This holds particular significance when considering the instruction of English as a Second Language (ESL) learners, or special education students, who require different instructional methods. These learners require a variety of teaching approaches through multiple modalities so it is important to align student outcomes with what teachers are doing in their classrooms. To carry out such effective professional development, skilled leaders are needed to facilitate opportunities for educators to attend professional developments workshops and model high expectations for students and staff alike. Together, teachers, principals, and other school leaders work collaboratively toward a shared vision of aligning educator learning and development with student outcomes and the balance of resources. Such leaders reside within all levels of a school building or district and serve many roles including principals, instructional coaches, mentors, and volunteers.

In order to inform decisions aimed at improving student outcomes, effective educator professional development relies upon data from multiple sources such as formative and summative assessment, observation, work samples, and portfolios. Additionally, data may be analyzed to see how well fiscal, human, time, and technology resources are being allocated and utilized. Finally, effective professional development flourishes through the implementation standard, which focuses on the process by which professional development affects teacher changes in the long-term. Everyone involved in such professional development must commit to change by setting explicit goals and holding high expectations for their own learning. Implementation must be viewed along a continuum, rather than as independent components

carried out by various members of the educational staff. In order for new initiatives and professional developments to work well, implementation must be specific to the needs of the participants. Additionally, those responsible for facilitating such change must understand the various ways in which participants such as teachers, principals, and other school staff involved may respond.

As stated, the content along with the design of professional development contributes to its effectiveness. However, the way in which a professional development is implemented is key, regardless of its apparent worth. Ferguson (2006) stated that implementation is one of the most critical components to transmitting effective practices into classrooms. As mentioned previously, Ferguson addressed the challenges that schools and districts may encounter when trying to maintain and sustain effective implementation of professional development. He further illustrated his argument by proposing key features intended to assist in the design of such professional developments. Ferguson analyzed professional developments and found that most programs had little effect in schools because they were never really implemented. Survey results from a total sample of 290 teachers from 36 elementary and secondary schools revealed the following missing leadership components that resulted in professional development programs not being implemented: (a) the introduction of new ideas and concepts in a way that fosters trust and genuine interest on behalf of teachers; (b) assignment of responsibilities that balance teacher autonomy with leadership control; (c) plan for monitoring of the implementation of a program with full commitment throughout the duration of the program's life; (d) support for all staff responsible for implementation in ways that encourages and motivates; and (e) the provision of recognition and reward for successes in carrying out proper implementation intended to maintain forward momentum toward positive changes. Ferguson urged leaders to correct for these

missing components by adopting his framework prior to implementing their professional development initiatives and focusing on the ways in which ideas are introduced, managed, and supported in order to deliver an effective professional development.

Due to the complexity of education reform, it is unwise to merely consider what makes professional development effective. Beyond being grounded in evidence-based standards, professional developments must also produce expected outcomes, such as changes in the teachers and/or their students. However, some professional developments contain all of the necessary ingredients to be highly effective on the surface, yet do not produce such expected outcomes. Oftentimes this gap can be explained by the improper implementation or transmission of the professional development content; in other words, the teachers who receive the professional developments are not able to or simply do not transmit the objectives into their classrooms with high levels of treatment integrity.

Treatment Integrity

Professional development is designed to have an effect on teachers' instructional practices, which is consequently intended to enhance the academic, behavioral, and social outcomes of students (Barlow et al., 2014; Darling-Hammond, 2005; Owston, Wideman, Murphy, & Lupshenyuk, 2008). However, research indicates that student improvements can vary greatly across classrooms, even when the teachers all experienced the same professional development (Barlow et al., 2014). Part of the reason this occurs is due to treatment integrity, or "the degree to which an intervention or programme is delivered as intended" (Carroll et al., 2007, p. 1), which may act as a moderator between the professional development and the expected outcomes. Generally speaking, treatment integrity may be considered in two ways; first, by seeing how well an educator is able to take content and practices from a professional

development and implement them into his or her classroom, and second, by examining whether changes in student achievement have occurred. Herein is where the effectiveness of such professional developments comes into question.

The concept of treatment integrity is not new in the literature; in 1968, Baer, Wolf, and Risley stated that the effectiveness of an intervention is strengthened by the demonstration that a change in the dependent variable may be attributed to controlled and systematic changes in the independent variable. In other words, improved student outcomes that result from a teacher's implementation of strategies learned during professional development can be attributed to the effectiveness of the professional development and the teacher's delivery of the strategies with integrity. Decades later, federal laws continue to require the field of education to provide professional developments that meet standards for the use of evidence-based interventions. In this way, treatment integrity must increasingly be viewed as something greater than just "how much" of the intervention, but also "how well" it was implemented.

Conceptual frameworks for treatment integrity. In order to facilitate the shift from research to practice, Dane and Schneider (1998) suggested that treatment integrity should be conceptualized as a multivariate construct that is essential for the effectiveness of an intervention. They identified the following five key elements comprising treatment integrity: (a) adherence; (b) exposure; (c) quality of delivery; (d) participant responsiveness; and (e) program differentiation. These five dimensions were brought forth in order to reconceptualize the traditional view of integrity and to provide a structure to allow for its assessment by future researchers.

In order to build this framework for conceptualizing and monitoring treatment integrity, Dane and Schneider (1998) suggested that the construct be broken into two distinct units: process

and content. Process, or how well the intervention was implemented, is divided into the subcategories of quality of delivery and participant responsiveness. Quality of delivery refers to overall qualitative aspects of program delivery. Interventionist-specific dimensions such as enthusiasm and preparedness are also taken into consideration when examining effectiveness. These factors contribute to a concept of a partnership-based model that ties the framework together. By sharing ownership over the intervention, researchers and the interventionists have an equal sense of authority, and with that, an increased likelihood of upholding integrity (Power et al., 2005; Wehby et al., 2012). Participant responsiveness refers to the level of participant engagement relative to the intervention. This construct is similar to social validity, or how important, effective, and socially relevant an intervention is perceived to be. If participants are not enthusiastic about a professional development program, they are less likely to implement its objectives with integrity. Further, socially valid interventions are those that satisfy both the implementer and professional development participants (Wehby et al., 2012).

The other half of the framework developed by Dane and Schneider (1998) refers to content, or how much of the intervention was implemented. This construct is divided into the adherence, exposure, and program differentiation dimensions. Adherence places a focus on the extent to which specific program objectives are implemented. It is said to be the crux of treatment integrity measurement and examines the overall content, frequency, and duration of a program or intervention. Observations and checklists are typically utilized to measure this dimension. Exposure refers to the "dosage" of the intervention, or the total number, frequency, and duration of the sessions implemented with participants. Finally, program differentiation is the identification of essential program components in order to distinguish the intervention from

others, while simultaneously including evidence-based practices and filtering out irrelevant aspects.

In 2007, Carroll et al. extended the work of Dane and Schneider (1998) by reviewing their conceptual framework and developing a revised model for understanding and measuring treatment integrity. Carroll et al. proposed a model centered on adherence and identified intervention complexity, quality of delivery, facilitation strategies, and participant responsiveness as the most likely variables that act as moderators to treatment integrity. The authors went on to implicate that researchers' and program evaluators' failure to consider and monitor these moderators are likely reasons treatment integrity is poor. To that end, they developed recommendations for researchers and program evaluators who deliver programs or interventions intended to mitigate such variables. Their suggestions included the use of a simplistic design, provision of explicit guidelines, incorporation of monitoring and feedback, less reliance on verbal instruction and more on active learning, and full commitment to the objectives of the program.

Despite the critical nature of treatment integrity, studies that rely upon this construct to provide empirical support for interventions rarely monitor and report on it (Reinke et al., 2013). If and when such integrity measures are reported, they are often done so inadequately (Dane & Schneider, 1998; Power et al., 2005). In 1997, a mere 5% of approximately 1,200 published intervention studies reported data on program implementation (Driscoll, Wang, Mashburn, & Pianta, 2011). Nearly a decade later, only 14.9% of studies directly related to school-based interventions measured levels of treatment integrity (Driscoll et al., 2011; Gresham et al., 1993). Although these numbers are not ideal, there have been recent attempts to use the

multidimensional framework offered by Dane and Schneider (1998) to evaluate this concept in research.

Acknowledging that the role of integrity within research presents ongoing challenges, Odom et al. (2010) noted that how integrity affects the implementation of evidence-based practices by teachers in classroom settings is even more complex. The researchers approached treatment integrity through both structural and procedural lenses, or through the amount of the intervention or program received by the individual and how well the intervention or program was delivered to individuals. They also created a "process" variable, which was measured on a scale from 1-5 and acknowledged elements such as the implementer being properly prepared and responsive to the needs of participants receiving the program or intervention. Odom et al. applied this model and examined the implementation of an early childhood curriculum by 51 preschool teachers; they found that different aspects of integrity were related to different variables of implementation. For example, students' literacy scores were best predicted by the process variable, or how well the teacher planned for implementation of the curriculum, whereas better math scores were predicted by a "structural" variable, or how much content students received. These findings emphasized not only the importance of monitoring integrity throughout the research process, but also that it must be done in a dynamic, multidimensional way.

Work by Stormont and Reinke (2013) further sought to bridge the gap between research and practice by providing a framework for practitioners who implement evidence-based strategies in their classrooms. The authors centered their framework on the use of performance feedback from a coach or trained professional; the feedback entailed direct observation of a teacher in his or her classroom, followed by a detailed, data driven discussion about his or her performance. They not only offered a detailed process of how to approach treatment integrity,

but also several possible methods for the delivery of performance feedback, ranging from verbal, handwritten, or emailed feedback, to the use of visual feedback via graphical data. They emphasized the importance of properly planning the delivery of performance feedback by initiating the process with rapport building between the teacher and coach/trained professional. Thus, they inferred that an intervention might not be implemented successfully if there is no mutual respect and buy-in from the teacher, which echoes the participant responsiveness dimension discussed by Dane and Schneider (1998) and Carroll et al. (2007).

Further, Stormont and Reinke (2013) concluded that teachers and coaches should decide upon a time for the coach to observe the setting that is presenting challenges to the teacher. It is important to clarify the purpose of the observation and stress that it is only evaluative in terms of identifying areas for ongoing intervention and improvement. During the observation, data collection is essential in order to determine the extent of intervention integrity. The data collection method needs to match the form and topography of the behavior. For instance, the use of BSPS would warrant a simple frequency or rate count, whereas a teacher targeting increasing time on task would warrant duration data. While sometimes used synonymously, rate and frequency may be viewed differently with respect to behavioral data collection. Consistent with behavioral literature, frequency is ideal for monitoring the use of BSPS because it allows one to consider the frequency of behavior over a period of time (Alberto & Troutman, 2013; Kalis, Vannest, & Parker, 2007). Rate is best used when observation times vary in duration, whereas frequency is used when observations are consistent. For example, if a student were to tantrum three times, the information would be determined very differently when time is considered (e.g., three tantrums in an hour versus three tantrums in a week). Further, data need not only be taken on the targeted objectives of the intervention, but may also focus on the associated outcomes.

For example, if a teacher is using reinforcement to increase time on task behaviors, data need to be recorded regarding how and what the teacher does as well as duration of student time on task behaviors.

With regard to how professional development is intended to be translated within the confines of a classroom, recent research points to the use of video as a modality that holds much promise in not only effectively delivering content and strategies, but also doing so with good treatment integrity (Pelletier et al., 2010). Blending effective elements of professional development with the benefits of video has led to highly effective transmission of evidence-based practices in classrooms (DiGennaro-Reed et al., 2010). Sherin (2004) argued that despite its presence in the field of teacher education since the 1960's, the use of videos has been a highly underutilized tool for teacher development. In one of its earliest forms, videos played an integral role in the microteaching movement, wherein teachers watched videos of themselves teaching a lesson and then replayed the video to analyze their execution of minute instructional aspects (Allen & Eve, 1968). In this form, videos were used as a tool intended to simplify the highly complex process of teaching into discrete behaviors.

Bandura (1977) illustrated that individuals are capable of acquiring a wide array of skills by observing others perform such skills. This was the start of a paradigm shift from behaviorism to cognitive psychology, which was mirrored in the education field. Bruner (1986) stressed that the ways in which teachers *think,* rather than *behave,* implies that novice teachers could learn much from watching master teachers at work. The idea of using videos of experts in this way paralleled Bandura's research on social learning theory in the 1970s and 1980s (1977, 1989). The premise of social learning theory affirms modeling as a powerful form of instruction. As such, modeling is well supported throughout the literature and has demonstrated lasting changes

in behavior over time (Bandura, 1977; Cooper et al., 2007; Gelbar, Anderson, McCarthy, & Buggey, 2012; Tereshko, MacDonald, & Ahearn, 2010). Despite the many paradigms used to examine the field of education, these early forms of video served as a gateway into modern advances of incorporating videos into teacher education and teacher development (Sherin, 2004).

Professional Development with Video

Research exploring the use of video as a modality to deliver professional development shows promise with regard to its effectiveness as a strategy that both transmits evidence-based practices and results in high treatment integrity. A large portion of this literature has focused on the use of video clubs, or a small group of teachers who consistently meet and engage in active inquiry about teaching practices, as models for professional development. To gather content for the group inquiry, a facilitator films a participating teacher's classroom and then the teacher selects short clips to use for discussion. Sherin and Han (2004) examined the use of a video club professional development with four middle school math teachers. Two main conclusions were drawn from the video club that spanned the course of one school year. First, there was a shift in the content of what was discussed in the club meetings. Initially, teachers focused on pedagogical issues; over time, they focused increasingly on students' ideas and thoughts. Second, there was an observed change in how the teachers approached discussion topics facilitated through the video clips. At the beginning of the school year, teachers focused on suggestions for teaching strategies and areas in which to improve regarding pedagogical approaches. As the year progressed, they began to engage in analytical dialogue, examining the reasons that a particular teaching strategy was used. Sherin and Han concluded that over the course of the video club, teachers began to connect deeper analyses of complex pedagogical issues with students' thoughts and ideas. Overall, the authors suggested that using video as part

of educator professional development is a promising initiative that allows teachers to reflect on their teaching and learn through active discussion with peers.

In order to examine changes in teachers' thinking regarding noticing and supporting students' mathematical reasoning, van Es and Sherin (2010) utilized a yearlong video club professional development model. Using data gathered from transcripts of video clubs as well as entrance and exit interviews with all seven elementary teachers, results indicated that teachers' noticing behaviors regarding students' math reasoning shifted over the course of the school year and fell into one of three paths: direct, cyclical, or incremental. Three teachers developed along the direct path, which was characterized by a shift in thinking from broad perspectives on teaching pedagogy (e.g., comments regarding overall classroom climate) to more specific and focused attention on students' mathematical reasoning skills (e.g., comments regarding how students solved questions). Two teachers on the cyclical path adopted a pattern similar to the direct path; however, unlike those on the direct path who maintained narrow perspectives, teachers who followed the cyclical path tended to cycle between broad and narrow perspectives over time. Finally, the remaining two teachers on the incremental path developed gradually, moving in small increments from broad perspectives to specific ones. While conclusions cannot be applied to how teachers' processes of learning to notice behavior affected student outcomes, participation in the video club allowed teachers to look beyond what they were doing and attend to their students' math reasoning.

Preceding van Es and Sherin's 2010 work, Sherin and van Es (2005) emphasized that teachers' attention to students' mathematical thinking can bolster both teacher and student learning, which in turn may lead to positive gains in student achievement. As teachers learn to notice certain elements in how students approach mathematical concepts, they are better suited to

deliver a lesson that will be meaningful and centered on students' strengths. To further examine teachers' experiences in professional development, van Es (2009) studied teacher learning from the perspectives of seven elementary teachers who participated in a yearlong video club. Primarily, the goal of the study was to document shifts in the roles teachers play within the video club context. An auxiliary goal of the video club was to foster a collaborative community in which teachers could reflect on their teaching, receive peer feedback, and engage in critical dialogue about teaching. The monthly group meetings entailed watching clips of two of the participating teachers' lessons and analyzing student and teacher interactions during structured math lessons. van Es instructed the participating teachers to take on different roles within the video club analysis. The four main roles consisted of 'prompter,' or one who engages the group in discussion about student thinking, 'proposers,' or those responsible for encouraging interaction and offering explanations, 'builders,' or those who develop ideas with evidence, and finally, 'critics,' or those who offer alternative explanations for observed events. Throughout the course of the video club, teachers had the opportunity to serve in various roles, thereby taking onus over different portions of analysis and developing new skills in noticing how students portray their thinking in the classroom. The video club allowed teachers to engage in continuous dialogue over time, an important element of effective professional development (Garet et al., 2001). Further, van Es provided groundwork for how to evaluate video club discussions related to the various roles teachers served; this foundation may function as a guide for designing such professional development based on both the content of what teachers need to learn as well as how they can actively participate in such learning.

Shifting toward providing an experimental approach to the examination of teachers' thinking, Seidel, Stürmer, Blomberg, Kobarg, and Schwindt (2011) sought to determine whether

there was a difference in knowledge activation and professional vision when teachers analyzed videos of their own teaching versus the teaching of others. Knowledge activation was assessed by immersion, or the extent to which teachers felt "inside the lesson," resonance, which was defined as the extent to which teachers felt the videos watched were pertinent to their practice, and overall motivation. The authors defined professional vision as a teacher's ability to notice what is happening in the classroom and their use of knowledge-based reasoning. Sixty-seven science teachers were divided into one of three groups: Group 1 consisted of teachers who had experience with using video to facilitate teacher learning and who watched videos of their own teaching; Group 2 also consisted of teachers who were familiar with the use of videos, but they were shown videos of teachers who were unknown to them providing a lesson; and Group 3 included teachers who were inexperienced with the use of video and who also watched videos of teachers who were unknown to them. All three groups participated in an 8-hour workshop regarding the use of video as a modality to facilitate teacher reflection. After watching their respective videos, teachers were instructed to make written comments on the content as well as fill out a short questionnaire rating their degree of immersion and resonance. Two weeks later, another questionnaire was sent out to assess sustained motivation from the workshop. Consistent with their hypothesis, Seidel et al. found that teachers who watched videos of their own teaching showed higher levels of knowledge activation in all areas (i.e., immersion, resonance, and motivation). However, the results regarding teacher noticing (i.e., professional vision) were inconsistent with the hypothesis that teachers watching their own videos would have more detailed reflections on their practices and notice more components of teaching and learning than the other conditions. This discrepancy may be due to what Seidel et al. identified as "self-defense" mechanisms such as increased self-criticism and self-consciousness, which likely

functioned as barriers to teacher reflection. Despite the brevity of the study, the researchers demonstrated that shifts in teachers' thinking could be made and sustained over short periods of time. They highlighted the need for future research that extends the use of video-based teacher learning with different populations and across disciplines. Further, there is a need to examine specifics, such as workshop duration, related to the use of video and teacher reflection to better understand the effectiveness of video as a teaching tool.

Baecher and Kung (2014) demonstrated that video-based professional development not only has a place with inservice teachers, but also with teacher educators working in a university setting as well, referred to as faculty. Through the use of collaborative video inquiry, which involves video based discussions that focus on a particular teaching approach or solutions to typically encountered problems in the classroom, the authors sought to determine what aspects of teaching faculty attended to in their analyses of videos, the content of conversations around videos of teaching, and how viewed this collaborative learning process. Faculty were divided into three trans-disciplinary focus groups based upon programs offered at the university: (a) Master in Teaching English to Speakers of Other Languages (TESOL); (b) Elementary Education and Literacy; and (c) Secondary Social Studies, English, Special Education, and TESOL. The videos used for analyses were archived videos of teacher candidates from the teacher education college during their supervised internship semesters at local elementary schools. The videos varied in content and were organized into one of six categories including grouping of students, phase of lesson, classroom setting, planning, engaging students in the lesson, and assessment of student knowledge. Each of the focus groups met for approximately two hours, watched one 15-minute segment of a video, and took notes on what they noticed. Following the viewing, faculty engaged in an open discussion about the videos, noting particular

aspects of teaching that were defined as 'best practices' within their particular disciplines. Finally, faculty were asked to independently respond to written exit questions that focused on the use of video-based inquiry as a means of professional development and collaboration. Data from faculty notes, collaborative discussions, and exit questions were analyzed using some of the components regarding participant roles within video-based professional development developed by van Es (2009). Initial findings indicated that the more experienced faculty took on a discussion facilitator role and benefitted from collaboration with members from other disciplines. Those with less experience reported gains related to how other faculty members analyzed the classroom videos. Faculty were also more likely to attend to specific teacher behaviors related to their own disciplines. For example, special educators were more attuned to teacher knowledge of student disability and behavior, whereas literacy educators focused on how texts were being utilized in a lesson. Overall, the faculty openly received the use of video-based inquiry. The authors concluded that teacher educator professional development should be consistent with teacher preparation. Authentic conversations and the use of video artifacts focused on instruction could serve as a means to enhance teacher education by creating stronger connections across disciplines. This connection may provide insight into how course preparation aligns with field performances for teacher candidates.

In an effort to extend the literature on video clubs and the elements responsible for contributing to changes in teachers' thinking, van Es and Sherin (2006) examined the results from two different video clubs and the effects on teachers' "learning to notice." One of the video clubs consisted of seven novice and veteran urban fourth- and fifth-grade teachers and had the goal of focusing on teachers' attention to students' mathematical reasoning. Each monthly meeting over the course of one school year was facilitated by a researcher and entailed teachers

analyzing two video clips of math lessons from two different teachers' classrooms. The goal of the other video club, which consisted of six educators from different grade levels and disciplines (i.e., physical education, music, Spanish), centered around a principal-initiated school mentoring program designed for novice teachers to receive guidance on teaching issues from veteran teachers. This video club met for half of a school year (February to May), yet followed a similar format of a teacher filming a lesson and approaching the club with a particular issue or topic, but without researcher facilitation. The primary research design differences between the video clubs consisted of the choice in video clips selected for discussion (i.e., math or varied subjects) and presence or absence of researcher facilitation. Data from pre-post interviews from each teacher yielded differences in how teachers learned to notice aspects of pedagogy. For those in the first video club, teacher analysis centered on students' mathematical thinking only, whereas the second video club involved discussions across a wider range of teacher perspectives and issues. Overall, van Es and Sherin found that teachers' discussions resulted from the different designs of the video club. It was noted that these results could be used to inform the design of meaningful professional development for teachers that mirror both school-wide and individual teacher's goals.

Video modeling. Introduced over 40 years ago, the concept of learning through observation was transformed into the intervention technique that is known as video modeling. The premise of video modeling is grounded in Bandura's (1977) research on social learning theory, which, as mentioned above, posits that modeling is a powerful form of instruction. A video modeling intervention involves an individual watching a video presentation of a person correctly performing a specific skill, followed by opportunities to practice the targeted skill in similar settings (Bellini & Akullian, 2007; Collins et al., 2009).

Video modeling can be applied to any observable skill, thus making it a valuable resource for bridging the gap between research-based interventions and practice. Dieker et al. (2009) sought to develop a process to create video models of evidence-based strategies in reading, math, and science for preservice and inservice teachers. They broke the process down into distinct, well-described segments, the first of which involved using the literature to select an evidence-based strategy and identify all of its essential components. Next, scripts aligned to those characteristics were developed, scenarios were videotaped, and the videos were edited. The videos were then field tested by dividing preservice and inservice teachers into video and no-video groups. Both groups completed written pre-assessments evaluating their prior knowledge of the evidence-based strategy. Participants in the video group were able to access unlimited viewings of the video modeled strategy, whereas participants in the no-video group only received a written description and verbatim text transcript of the video. Across both groups, the inservice teachers were observed implementing the strategy in their classrooms, whereas preservice teachers' knowledge was evaluated with a written assessment. Preliminary findings showed promise for the use of video models for both pre- and inservice teachers; however, these conclusions need to be taken with caution. Despite the observations of inservice teachers' implementation, there were no application activities such as rehearsal opportunities or feedback provided for either the video or no-video groups. Further, preservice teachers were never observed, meaning a less definitive conclusion can be drawn regarding the effect of video on their knowledge. Regardless, the intent of the research was to develop a process by which to produce reliable and replicable video models. Dieker et al. successfully outlined this process and provided the necessary literature on the steps required before implementing a video modeling intervention.

Video modeling interventions have an impressive breadth of applications with many populations. Boyer, Miltenberger, Batsche, & Fogel, (2009) effectively used video models of expert gymnasts to enhance the physical skills of young female competitive gymnasts. When compared against other forms of instruction such as text descriptions, video modeling produced rapid and sustained improvements among undergraduates who were learning how to graph single subject data (Tyner & Fienup, 2015). Loughrey, Marshall, Bellizzi, and Wilder (2013) extended the use of video modeling into the field of organizational and behavior management, where video modeling was found to successfully increase retail credit card promotions. Video modeling has also been used among nursing and hospital staff for behavioral safety interventions aimed at preventing back injuries resulting from unsafe patient lifts and transfers (Nielsen, Sigurdsson, & Austin, 2009). Particularly, video modeling has also picked up momentum in education as evidenced by Vladescu, Carroll, Paden, and Kodak (2012), who taught educators how to implement discrete trial instruction through video models and voiceover instructions.

There are many facets within the continuum of education settings and services that lend themselves to the use of video modeling. One area in which video modeling research has been conducted is with staff and educators working with individuals with moderate to profound cognitive impairments. A preliminary skill for individuals working with this population is the systematic use of preference assessments to determine potential sources of reinforcement that can be used during instruction (Cooper et al., 2007). Educators must be versed in all components of a preference assessment and be able to implement it fluently. Weldy et al. (2014) sought to evaluate the effects of video modeling with embedded instructions on nine special education staff's ability to give a brief preference assessment. The training included a brief overview of preference assessments followed by video models carefully documenting each step. Teachers

watched the videos two or fewer times and were then assessed on how many steps they could complete correctly. In just over 60 minutes of total training time, all teachers increased the number of steps completed fluently and maintained these gains over several weeks. These findings lend support to the time and cost effectiveness of video modeling.

In an effort to replicate the work of Weldy et al. (2014), Rosales et al. (2015) used video modeling with embedded text instructions in order to teach three special educators how to implement various types of preference assessments. Teachers were permitted to view the video models with text instructions as many times as needed in order to reach mastery criteria. Further, they were also allowed to rewind and replay, as well as take notes. While the results mirrored the positive outcomes of Weldy et al., Rosales et al. noted that repetition of video watching to reach mastery criteria could have served as a form of performance feedback, which made it difficult to discern which elements of the intervention (i.e., repetition of video, note-taking) led to the positive outcomes. They recommended more work be dedicated to isolating the variable responsible for the success of a video modeling intervention, specifically, feedback.

Approaching preference assessment training for staff in a similar way, Lavie and Sturmey (2002) combined video modeling with opportunities for practice and feedback. Three teaching assistants in an autism center were shown videos of model demonstrations of a preference assessment protocol and were provided multiple opportunities to practice the skill until 85% of the steps were performed correctly. Impressive gains were made in the number of correctly performed steps between baseline and intervention. The most dramatic increase, from 16% to 98% correct in approximately eight sessions, emphasized the efficiency of video modeling.

Despite its breadth across the literature, there are relatively few applications of video modeling interventions used with the highly lauded evidence-based strategy of behavior specific

praise. Through the use of video self-modeling, a variation of video modeling wherein a teacher observes (edited) videos of himself or herself engaging in the targeted skill as opposed to observing an expert model, Hawkins and Heflin (2011) investigated its effects on teachers' frequency of BSPS in high school special education classrooms. In addition to the video self-modeling intervention, teachers were also provided with graphical feedback of their own performances. Through the use of an embedded withdrawal design, the researchers ultimately wanted to examine the sustainability of behavior specific praise after direct support from researchers was removed. While rates of behavior specific praise increased across all three teachers during the intervention phase, only one teacher maintained increased levels of behavior specific praise during and after the withdrawal phase. This depreciation may be contributed to issues related to the social validity of the video self-modeling intervention; although behavior specific praise was accepted as a valuable intervention, two teachers had strong negative reactions to watching themselves in the videos. Hawkins and Heflin deduced that because the teachers had limited familiarity with video modeling and self-modeling techniques, they might have experienced discomfort watching their own teaching on video. For this reason, the authors proposed using guided self-monitoring (i.e., teachers taking data on the rate of their use of behavior specific praise) in addition to video self-modeling in an effort to support teachers in the use of videos to enhance their practice delivering evidence-based strategies.

Summary of Video Modeling

Video modeling is grounded in research on observational learning and maintains strong standing as a highly versatile tool capable of teaching a variety of skills and skill- sets to beginning and practicing teachers in a relatively short amount of time. There have been repeated demonstrations of the effectiveness of video modeling as a teaching modality for a wide range of

individuals and across many fields including medicine, education, recreation, and vocational training. From its earliest days as microteaching in the 1960s to the current transmission of evidence-based strategies in the classroom, the use of video has progressed remarkably and has been shown to uphold high levels of treatment integrity (Allen & Eve, 1968; Pelletier et al., 2010). In this way, video modeling may serve as a feasible way for practitioners to embed necessary evidence-based practices into classrooms, delivering those practices as they were intended, and narrowing the gap between research and practice (DiGennaro-Reed et al., 2010). Importantly, when used as a means for staff training and development, feedback to the participant is included in the video modeling process, which is congruent with the literature on effective professional development. As results from Stormont and Reinke (2013) suggested, while teachers respond differently to various modalities of feedback (i.e., verbal, handwritten, emailed, visual/graphical), such feedback is necessary to transmit content and skills related to evidence-based practices from a training package or professional development.

Behavior Specific Praise Statements

Known early in the literature as teacher attention or praise, BSPS has enjoyed consistent support as an effective means to increase desired student behaviors such as task completion and on-task behavior, while reducing disruptive behaviors such as calling out and noncompliance (Brophy, 1981). Praise is a widely recommended technique for use by educators (Allday et al., 2012; Brophy, 1981). Not only is it free, easy to use, and often occurs as a natural response to interactions between teachers and students, praise can also encourage positive relationships between students and teachers (Musti-Rao & Haydon, 2011; Sutherland, Wehby, & Copeland, 2000). Though it is a widely recommended practice, evidence that spans decades of literature indicates that the frequency with which educators use praise is relatively low (Brophy, 1981;

Cook, 2001; Marchant & Anderson, 2012). Flanders (1970) devised the Flanders Interaction Analysis Categories system, which sought to quantify teachers' interactive behaviors such as praise. In a review of 10 studies that utilized the Flanders Interaction Analysis Categories system, Dunkin and Biddle (1974) concluded that a mere 6% of teacher communication within the classroom was comprised of "praise and encouragement." Recent literature continues to uphold that the frequency of teacher praise remains low (Allday et al., 2012; Cook, 2001; Duchaine et al., 2011; Sutherland et al., 2000). Cook (2001) examined teacher reports and concluded that behavioral issues in the classroom redirect teacher focus away from praise and toward correction, redirection, and punishment. Further substantiating this claim, Duchaine et al. (2011) found that the tendency toward correction may stem from a rise in the inclusion of students with academic, behavioral, and social difficulties within the general education classroom. In order to improve social and academic outcomes for all learners by establishing and nurturing teacher-to-student relationships, a ratio of four praise statements to one corrective or negative statement is desired (Marchant & Anderson, 2012). Thus, the most effective classroom managers are those who criticize less frequently and praise more frequently, which is often accomplished as a result of their ability to minimize disruptions quickly and efficiently, leading to more time-on-task behaviors and therefore more opportunities to deliver praise (Cook, 2001; Marchant & Anderson, 2012). The following sections will review literature pertaining to the characteristics of BSPS, the importance of BSPS, the evidence-base behind it, studies on practical implementation in the classroom, and its place within the scope of the inclusive classroom.

Treatment integrity of BSPS. BSPS are audible, specific, and positive verbal feedback statements delivered by an educator to a student that explicitly describes the behavior being

praised (Cavanaugh, 2013; Duchaine et al., 2011). BSPS are versatile and, as such, are capable of targeting a wide range of student behaviors both academically and socially. As previously stated, the use of BSPS is well documented throughout the literature, with many studies validating its effectiveness student behaviors while decreasing disruptive behaviors across grade levels and classroom settings (Allday et al., 2012; Cook, 2001; Musti-Rao & Haydon, 2011). However, in order for BSPS to function effectively, they must be delivered consistently with three primary elements: contingency, specificity, and credibility (Brophy, 1981; Cooper et al., 2007; Duchaine et al., 2011; O'Leary & O'Leary, 1972). These elements must be taken into careful consideration when supporting teachers in the use of BSPS, as they are essential to monitoring the treatment integrity with which they are implemented.

Contingency refers to the relationship between two events or stimuli. From a behavioral perspective, all behaviors are seen as a response to an antecedent, or stimuli that evoke a response, or behavior. Thus, antecedent-behavior chains are formed to which consequences are the immediate events that follow. Individuals encounter innumerable antecedent-behavior-consequence chains per day; for example, a headache (i.e., antecedent) signals an individual to search for and take an analgesic (i.e., behavior) resulting in pain relief (i.e., consequence). The linkage between these stimuli is known as contingency; the more immediate the contingency, the greater the likelihood that an individual will make an association between the behavior and the consequence. For BSPS to be implemented with integrity, teachers' statements must be delivered to a student or group of students immediately following the observed target behavior (i.e., immediacy of the contingency) in order to increase the likelihood that students will pair the receipt of BSPS with the desired behavior in which they engaged. Throughout the literature related to contingency pairings, there is consensus that there

should be no longer than a five consecutive second gap between antecedents, in this case student behavior, and the teacher's response of a BSPS (Alberto & Troutman, 2013; Cooper et al., 2007; Simonsen et al., 2010). If too much time elapses between the behavior and the BSPS, the student or group of students will be less likely to learn the connectedness between the teachers' affirmation and the preceding actions (Cooper et al., 2007). Equally important, the praise statement delivered must specify the behavior that is being targeted. Clearly communicating the specific behavior for which the student is being praised lets the student know which behavior is acceptable and worthwhile to repeat again in the future. Brophy (1981) emphasized that the way in which teachers deliver praise holds significant weight in the classroom. Praise should look and sound sincere and credible. The words emitted must be congruent with the teachers' non-verbal behavior, lest it will come across as phony. Similarly, with respect to specificity, the praise should be varied and contextually appropriate. This variety of praise statements bolsters teachers' credibility in its delivery.

The importance of BSPS. Teachers are ultimately responsible for their students' academic, social, and behavioral well-being. The presence of challenging behaviors directly affects a teacher's ability to fulfill this responsibility. According to Allday et al. (2012), educators overwhelmingly identify disruptive, maladaptive student behaviors as their greatest challenge in day-to-day teaching. Maladaptive behaviors disrupt the flow of instruction, which detracts from overall student achievement (Musti-Rao & Haydon, 2011). Accordingly, our education system has witnessed a rise in referrals for behavioral supports in classrooms that has resulted in teachers bearing the responsibility of implementing behavioral interventions and contributes to elevated teacher stress levels and high levels of teacher burnout. With the requirements of NCLB (2002) and IDEIA (2004), more and more of these referrals are coming

from general education settings, in which students with disabilities are educated in the least restrictive environment alongside their typically developing peers (Allday et al., 2012; Duchaine et al., 2011; Musti-Rao & Haydon, 2011). Unfortunately, many of these general educators report feeling underprepared to effectively carry out behavior plans designed to reduce problem behaviors (Allday et al., 2012). Further, there is a shortage of professional developments intended to not only help educators effectively implement specific strategies within these behavior plans, but also to utilize evidence-based interventions geared toward maintaining behavioral improvements over time. Consequently, there is a need for professional developments on the use of evidence-based interventions that are not only effective, but are also easy to implement and are both time and cost efficient. BSPS are an evidence-based intervention that satisfies these characteristics.

BSPS as an evidence-based practice. Evidence-based practices date back to the mid-1800's within the field of medicine; however, education did not embrace it until it was written into federal law approximately 30 years later (NCLB, 2002; Odom et al., 2005). Despite its ubiquitous nature within education, it is difficult to garner a precise definition of evidence-based practice (Spencer, Detrich, & Slocum, 2012). Per Mesibov and Shea (2011), an evidence-based practice is any instructional strategy, intervention, or teaching program that has resulted in repeated and consistent positive results when experimentally tested. Since federal law requires educators to implement such practices (NCLB, 2002), educators must be able to access knowledge about these practices. The What Works Clearinghouse, headed by the National Center for Education Statistics (NCES), was developed and is currently the most prominent database of education research from which educators can learn about such evidence-based practices. The mission of this database seeks to review research on programs, strategies, and

practices in education in order to guide educators toward evidence-based decisions regarding what is effective (U.S. Department of Education, Institute of Education Sciences, 2014). BSPS enjoys a large literature base that demonstrates its effectiveness with multiple populations across many settings within the field of education. As such, this literature continues to grow and gain strength, further establishing BSPS as an evidence-based practice.

As mentioned, prior to being labeled as such, BSPS were commonly known in the literature as teacher attention or praise. In one of the earliest demonstrations of teacher attention on student behavior, Hall et al. (1968) successfully utilized a simple reversal design in which a researcher cued teachers to provide positive attention contingent upon student study behaviors, while ignoring non-study behaviors. In the reversal phase of the study, the researchers no longer provided cues; as a result, teachers resumed their prior patterns of attention, which typically consisted of corrective statements. Upon reinstatement of the teacher attention condition, findings indicated that as the rate of teacher-provided positive attention rose, rates of study behaviors increased while rates of non-study behaviors decreased. Results supported contingent use of teacher attention to improve student behaviors. Notably, this study was carried out in the most economically disadvantaged school districts in the state of Kansas, with class sizes up to 41 pupils and teachers with no prior experience with the principles of reinforcement or praise, further accentuating the strength of the findings.

Allday et al. (2012) acknowledged BSPS as portable and always accessible to an educator, making them one of the most powerful evidence-based interventions available. Allday et al. examined the effectiveness of this intervention by delivering a professional development that described BSPS and provided multiple examples of their use to four elementary inclusion teachers. Teachers were never explicitly told to increase their use of BSPS; however, results

indicated an overall increase in the rate of BSPS delivered by all participants. This was directly reflected in a marked increase in available instructional time, which opened up the opportunity for student engagement and, likely, achievement. Additionally, there was a subsequent decrease in teachers' use of corrective statements, which research has shown are ineffective for creating long lasting behavior change (Nelson & Roberts, 2000).

Perhaps one of the most powerful rationales for the use of BSPS in the classroom is not only the effect it has on reducing disruptive behaviors, but also the reductive effect it has been shown to have on teacher stress and burnout. Research on the negative effects associated with challenging student behaviors are often focused on the 'student level' in terms of instructional opportunities lost and social stigmas; however, Närhi, Kiiski, Peitso, and Savolainen (2015) emphasized the importance of research on teachers' stress levels resulting from disruptive student behaviors. In their pilot study, a class-wide intervention focused on teachers providing clearly defined expectations to students, utilizing BSPS, and responding to misbehavior with various approaches. Although the study utilized a pre-post design lacking a control group, the results demonstrated a large reduction in disruptive classroom behaviors and, as a result, a significant reduction in teachers' reported stress levels. These reduced levels of stress allowed teachers to concentrate on their teaching while maintaining a positive classroom climate. Moreover, lower reported stress may have contributed to the very high levels of satisfaction teachers reported with the overall intervention, further bolstering the social validity of the use of BSPS in the classroom.

In another powerful demonstration of the effectiveness of BSPS, Sutherland et al. (2000) sought to extend the literature beyond the use of praise in the general education environment and compared the effects of specific versus non-specific praise statements delivered to students with

emotional and behavioral disabilities in self-contained special education classrooms. Through the use of observations and detailed feedback regarding teachers' use of either specific or non-specific praise, findings showed a functional relation between increased rates of teacher-delivered BSPS and increased rates of students' on-task behaviors. However, some of these improvements declined when the observations and feedback were removed after a few sessions of implementation, implicating a need for consistent, ongoing support, especially at the beginning of intervention. The authors concluded overall that despite its power, BSPS comprise a very small amount of feedback received by students. Feedback to students, in the form of praise, correction, or clarifications, has been looked at widely with respect to academic achievement. In his synthesis of over 800 meta analyses related to student achievement, Hattie (2009) found that feedback had a powerful effect on students ($d = 0.73$); however, this very broad topic is outside of the scope of this study.

BSPS in the general education setting. In addition to the obstacles surrounding rigorous standards and pacing requirements for delivery of academic content within classrooms, teaching in an inclusive setting presents its own specific set of challenges. As previously stated, the inclusive classroom may serve as the least restrictive environment (LRE) for students with disabilities to be educated alongside their neurotypical peers. Students from disability areas ranging from mild intellectual disabilities and learning disabilities, to autism and emotional and behavioral disorders are increasingly included in these settings (Cook, 2001). Consequently, a natural byproduct of having a heterogeneous mix of learners in one classroom is the potential for higher rates of disruptive behaviors displayed by students with disabilities (Scott, Park, Swain-Bradway, & Landers, 2007).

Students who engage in high rates of prosocial behavior, such as cooperation, helping, and consoling, are more likely to experience high levels of academic achievement and social adjustment (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000). In contrast, students who exhibit challenging or disruptive behavior are at risk for poor academic achievement, social difficulties, and potential for school failure (Cavanaugh, 2013). As mentioned previously, the current climate of educational policy dictates the requirement that educators embed evidence-based practices into their teaching (IDEIA, 2004; NCLB, 2001). The need for this is even more paramount within the walls of an inclusive classroom due to the presence of students with disabilities. These students are more likely than their neurotypical peers to have gaps in their academic, social, and/or behavioral repertoires that lead to a greater probability for them to demonstrate challenging behaviors, which may negatively affect teachers' abilities to deliver effective instruction. However, the general educators who lead such inclusive classrooms do not have the same levels of training or preparation than special education teachers to manage challenging student behaviors (Duchaine et al., 2011). As an evidence-based strategy, BSPS have been identified as one of the most powerful practices from which students can benefit when teachers increase or maintain high rates of their use, thereby positively affecting students' behaviors and, consequently, achievement. The following section will further explore the versatility BSPS offers, as well as the importance of how it can be individually tailored to a variety of learners in the inclusive setting.

Herein, it is important to consider the definition of what constitutes disruptive or maladaptive behavior. The definitions of these and other like terms are highly individualized and dependent upon a teacher's breadth of knowledge about disabilities. As such, teachers may view various challenging behaviors very differently due to inherently different beliefs and

tolerance levels. Orsati and Causton-Theoharis (2013) identified these different teacher perspectives and sought to understand teachers' beliefs about students who are labeled as 'challenging' or 'defiant.' The authors posited that, despite the fact that such descriptors are not specifically tied to a disability area, they are often used to describe students with disabilities in inclusive settings. Additionally, the authors suggested that the stigma attached to students with disabilities and behavior problems might affect the ways in which teachers view their own abilities to effectively handle these issues in their classrooms. Through analysis of interview transcripts from 11 staff from inclusive classrooms (i.e., special education teachers, general education teachers, teaching assistants), Orsati and Causton-Theoharis found embedded themes from the language staff used when discussing children with challenging behaviors. First, there was an overall labeling of students as 'challenging' individuals rather than the students' *behaviors* being considered challenging. In turn, these challenging behaviors were addressed inadequately by teachers in the form of students being removed from the classroom or excluded from the activities they were disrupting. The removal or exclusion of these students was believed to be the only viable option staff felt capable of implementing in order to regain control of the classroom. Similar to the use of verbal reprimands as opposed to BSPS, these are not effective strategies because they are forms of punishment that use coercion to control the behavior of others and do not teach new skills (Alberto & Troutman, 2013; Cooper et al., 2007). In order to address these issues, the authors provided suggestions to support students with disabilities in inclusive classrooms. They proposed that support be offered through staff commitment to building a trusting relationship with all students and providing genuine, affirmative language, especially in moments of student distress, will foster a relationship that

does not view differences as deficits and will separate disruptive behaviors from the students themselves.

In addition to teachers viewing student behavior as challenging, research has shown general education teachers are not well-equipped to utilize evidence-based behavior management strategies in their classrooms (Duchaine et al., 2011; Grossman, 2005; Nelson & Roberts, 2000). Grossman (2005) specifically noted that teachers are not prepared to deal with the myriad ways in which disabilities might manifest into maladaptive behavioral patterns. All too often, teachers approach behavior issues through a prescriptive lens and cursorily apply strategies from a book, prior experience, or previously attended professional development without regard for balancing students' individual needs with the climate of the classroom. Grossman provided an analysis of relevant literature on how characteristics of gender, disability area, and culture influence the ways in which students respond to teachers' attempts at classroom management. In general, gender differences indicated that girls are more inclined to seek approval from teachers than are boys. Additionally, Grossman noted that girls are more likely to use more vocal means of self-expression, whereas boys tend to express themselves through more outward, physical ways (e.g., tearing up a worksheet to communicate frustration with or inability to understand the task). Similarly, cultural backgrounds were found to underlie both students' behaviors and teachers' expectations of students, though in different ways. "Middle-class white teachers tend to expect that all students will behave like middle-class white students" (p. 27). However, students from various cultural backgrounds learn to navigate their social worlds in different ways. For example, students from Asian decent are taught to avoid eye contact with adults as a means of communicating respect, which may be misinterpreted by a teacher from an Anglo background as

rude or disrespectful. This mismatch between culture and perceptions fuels such misunderstanding and can result in unnecessary behavioral challenges in the classroom.

Upon examination of disability areas, Grossman (2005) reported many misperceptions regarding behavior problems that were tied with disability areas. As mentioned previously, the definition of 'challenging behavior' spans widely and may be perceived by teachers in very different ways. The presence or absence of a disability does not connote whether or not a student will experience behavior problems. Along those lines, 'challenging behavior' should not be seen as synonymous with 'acting out' and may manifest more internally among students in the form of withdrawal, anxiety, or depression. On the other hand, students who are identified as emotionally and behaviorally disordered often display disproportionate emotional reactions to commonly encountered stimuli (e.g., having a tantrum in response to a math quiz). Together, Grossman emphasized that teachers must be cognizant of students' gender, disability/ability, and cultural differences and approach class-wide behavior management through the use of consequences, particularly in the form of praise or affirmations of students' behaviors. All too often, teachers' vocal reprimands and redirections are ineffective to student success. Therefore, in order for teachers to nurture healthy relationships with their students, they must select and implement specific language that is sensitive to their students' aforementioned characteristics in order to have the greatest success.

In a review of literature, Cavanaugh (2013) analyzed 25 studies focused on how to increase teachers' use of praise statements in conjunction with students' opportunities to respond (i.e., teacher delivered verbal prompt intended to evoke a student response). The review yielded promising results for the use of performance feedback delivered by peers or coaches to teachers through professional development initiatives in order to increase teachers' use of praise in the

classroom. The studies included students with and without disabilities, spanned preschool through high school settings, and reported that rates of disruptive behaviors were reduced after teachers systematically applied higher rates of praise contingent with students' opportunities to respond. This demonstrated not only the powerful effect that high rates of praise have on students' behaviors, but also how teachers can learn to reinforce prosocial behaviors by individualizing praise for both students who have behavioral difficulties as well as those who function as behavioral role models.

Students with emotional and behavioral disorders are increasingly being placed in inclusive settings; these students make up roughly one to five percent of the school-aged population, yet account for nearly half of school discipline referrals (Dufrene, Lestremau, & Zoder-Martell, 2014; Sugai, Sprague, Horner, & Walker, 2000). In response to these challenging behaviors, teachers commonly rely upon consequences such as reprimands, redirections, and forms of punishment to gain order within their classrooms; however, these consequences are ineffective and may also lead to higher rates of teacher burn-out (Scott et al., 2007; Sugai et al., 2000). While these consequences sometimes have an almost immediate ameliorating effect on disruptive behavior, they do not teach students the desired alternative to their disruption and the effects may not persist over time (Daniels, 1998). This can create an undesirable relationship dynamic between teachers and students based on coercion and control rather than on supportive, nurturing language.

Nelson and Roberts (2000) studied the rates of teachers' reprimands versus praise statements to students with and without disruptive behaviors. They found that students who presented behavioral challenges in inclusive classrooms received significantly more reprimands and fewer praise statements than their counterparts who were not identified as demonstrating

behavioral challenges. Nelson and Roberts concluded that teachers' rates of BSPS not only need to increase overall, but must also be balanced across all learners (i.e., students with and without disabilities) within inclusive classrooms.

In summary, BSPS are free, portable, and simple to implement; evidence in support of their use spans decades of research and examines many populations in a variety of settings. Implementation of BSPS in the classroom takes only a matter of seconds and, thus, allows teachers' time to be spent attending to the social, behavioral, and academic demands of the classroom. Still, this does require teachers to change their own behavior, which not only takes willingness, but also practice over time. To be implemented with integrity, BSPS must follow the aforementioned principles of contingency, specificity, and credibility. These characteristics not only facilitate a positive effect of BSPS on classroom behaviors, but also allow teachers the flexibility to individualize these statements to meet the needs of all learners in inclusive settings (Grossman, 2005). When implemented systematically and with integrity, BSPS can decrease disruptive behaviors, while simultaneously increasing desirable ones, consequently reducing the stress teachers experience from highly disruptive teaching environments. As the model (Figure 1) below depicts, there is a cyclical relationship wherein increased rates of BSPS lead to positive outcomes for both students and teachers, which in turn increases the likelihood that teachers will continue to utilize BSPS as a classroom management strategy.

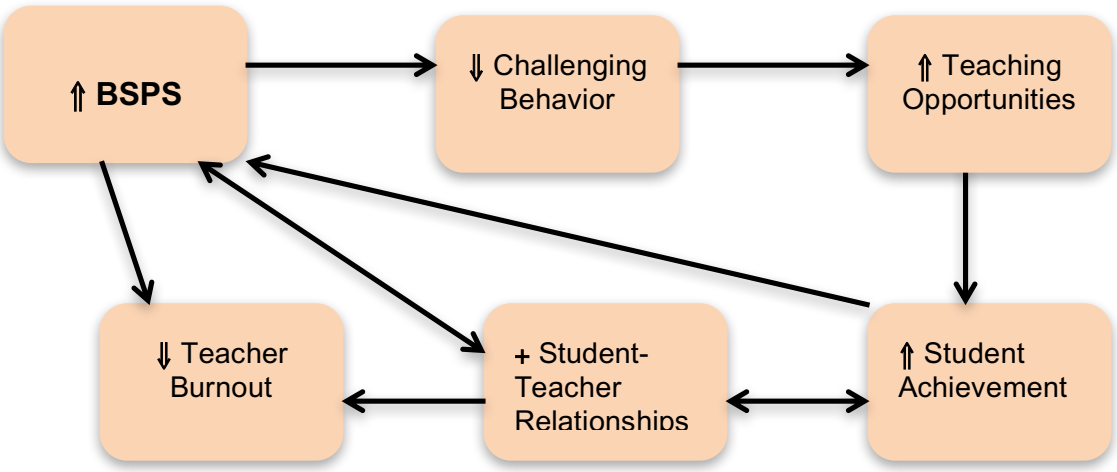

Figure 1. Relationship among BSPS and classroom factors

Despite this, the frequency with which BSPS are used in classrooms is still strikingly low compared to teacher delivered corrections or reprimands (Allday et al., 2012; Cook, 2001; Nelson & Roberts, 2000; Sutherland et al., 2000). It appears that educators may lack knowledge regarding both the benefits of their use and how to implement this highly effective classroom management strategy. Praise fosters good teacher-student relationships, which have the power to facilitate student engagement and promote fewer challenging behaviors within the classroom (Hattie, 2009). As such, the development of positive relationships requires teachers' dedication to hone skills such as BSPS, and therefore, the development of positive relationships requires teachers' dedication to utilizing strategies such as BSPS. Teachers must learn these strategies and hone their skills in its delivery or usage in order to nurture these positive relationships and experience secondary benefits such as decreased burnout (Wehby et al., 2012).

Teacher implementation of BSPS. As stated previously, classroom management strategies are essential skills for all educators in any classroom setting to possess. However, Simonsen et al. (2010) noted that empirical research on teacher development of such skills is

severely lacking. In order to address this gap in the literature, Simonsen et al. developed a protocol consisting of two components, explicit training and feedback, that was designed to provide three alternative-school teachers with training on classroom management skills. The explicit training portion of the protocol consisted of a basic overview of the dependent variables (i.e., prompts, opportunities to respond, and the use of BSPS), followed by activities for practicing each skill and an opportunity for teachers to identify a self-monitoring strategy intended to facilitate their implementation in the classroom. Although data did not indicate a functional relation after teachers were exposed to the explicit training portion, there was a small shift in the consistency and frequency with which teachers used the skills when the feedback component was added. Despite the weak findings related to the protocol and teacher behavior, the daily feedback given to teachers was functionally related to small improvements in their use of classroom management strategies, demonstrating the importance of incorporating feedback into a training package.

As discussed, BSPS are one classroom management strategy that may be delivered contingent upon any observable student academic or social behavior. In their study examining the implementation of BSPS in inclusive settings, Musti-Rao and Haydon (2011) categorized praise as either specific (i.e., BSPS such as "Well done raising your hand, Nancy") or non-specific (i.e., NBSPS such as "Good job!"). They also noted that despite its simplicity and effectiveness as a strategy, teachers do not utilize BSPS at a rate suitable for changing students' behaviors. Thus, the authors subsequently provided a series of practitioner strategies intended to increase teachers' use of BSPS in inclusive settings. Musti-Rao and Haydon suggested the use of a data-recording system to monitor the frequency of teacher-delivered BSPS. Within this

suggestion was the strong recommendation that educators utilize an external cueing system and/or recruit peer coaches to record these frequency data.

The strategy of using peer coaches, sometimes referred to as teacher coaches, has facilitated teachers' use of BSPS in many education settings. Duchaine et al. (2011) extended the literature on coaches by examining the effect of written performance feedback on rates of teacher-delivered BSPS and the effect of BSPS on students' on-task engagement across three high school mathematics inclusion classrooms. After receiving a brief professional development regarding the importance and use of BSPS, teachers were observed by coaches, debriefed quickly following the observation, and provided with written feedback regarding their rates of BSPS. Overall, not only did BSPS rates increase across all participants, but students' time-on-task also increased. Results from a social validity inventory indicated that the coaches' observations and written performance feedback were easy to understand and provided meaningful information to teachers, further bolstering the findings of their study.

In a similar study examining the effectiveness of performance feedback, Reinke et al. (2007) explored the effects of group consultation workshops to the provision of visual feedback on three elementary general education teachers' use of BSPS. Consistent with the literature on passive group workshops, BSPS rates did not change as a result of the teachers' participation in the group consultation workshop. An increase in teachers' use of BSPS only occurred after the introduction of visual feedback, which was presented via individualized graphical data of the teachers' daily frequency of praise statements. Rates of teacher-delivered BSPS reached a plateau after a few weeks. The authors noted that although the participants reported high levels of satisfaction with the intervention and found BSPS to be extremely valuable (i.e., high levels of social validity), the reason for the plateau might be attributable to the too frequent provisions of

visual feedback, thus decreasing the novelty of the approach. They recommended more research in the areas of ideal frequency of feedback and the use of various feedback modalities, such as email, written, verbal, or a combination.

Rathel, Drasgow, Brown, and Marshall (2014) explored the use of emailed performance feedback on four first-year special educators' use of BSPS related to student task-engagement. Teachers received an email containing graphs of their frequency of BSPS along with both praise for correct implementation of BSPS and corrective feedback. Notably throughout the intervention, 35% of all BSPS targeted academically related behaviors, whereas 20% were specific to social behaviors. The remaining 45% of data recorded consisted of non-specific praise and non-verbal gestures signaling approval. Although the total amount of BSPS made up just over half of all praise statements delivered, there was an overall increase of teacher-delivered BSPS. Of equal importance, the data indicated that teacher praise was distributed evenly across student disability status (i.e., learning disability, emotional and behavioral disorders, mild intellectual disability, and developmental disabilities). Within general education classrooms, it is important for teachers to deliver BSPS evenly across all students, regardless of each student's ability/disability status.

Thompson et al. (2012) investigated the effects of tiered professional development methods for BSPS use among three elementary general education teachers across three different schools. The authors utilized a response to intervention (RtI) approach, which is a multi-tiered framework typically used with students; however, this framework may be applied to structure and guide professional developments for teachers. The study employed three tiers of support, wherein Tier 1 involved a typical school-wide didactic professional development focused on BSPS use, Tier 2 utilized video self-modeling, and Tier 3 utilized peer coaching. After teachers

were exposed to Tier 1, very little change in their rates of BSPS was evident, which is consistent with existing literature on the ineffectiveness of one-shot workshops for creating teacher change (Desimone, 2009; Garet et al., 2001). However, after the addition of Tier 2, wherein teachers monitored their use of BSPS by watching video clips of themselves delivering a lesson, all teachers' rates of BSPS increased dramatically. Peer support in Tier 3 also increased the frequency of teacher-delivered BSPS for two of the three teachers. Notably, the third teacher missed several peer coaching sessions and was instead given emailed feedback from a coach. In contrast to the results regarding emailed feedback reported by Rathel et al. (2014) that led to an initial increase in BSPS, the frequency of this third teacher's BSPS dropped on days where performance feedback was emailed, indicating the need for more formalized feedback for some teachers.

Summary of BSPS

Taken together, BSPS holds power for use by teachers as evidenced by its ability to reduce disruptive behaviors and increase desirable ones. However, these positive effects only come following proper implementation within the classroom context, which may be difficult for teachers to execute without effective professional development training and ongoing performance feedback. If the use of BSPS is unfamiliar to a teacher, his or her difficulty implementing the approach may be due to the inherent difficulty that accompanies the path to changing one's own behavior and, in this case, his or her teaching practices (Musti-Rao & Haydon, 2011). Research shows that teachers may not be trained in the use of BSPS, may utilize BSPS improperly, or may not implement BSPS at the rates required for student behavior changes to occur (Allday et al., 2012; Cook, 2001; Duchaine et al., 2011; Sutherland et al., 2000). In order to remedy these problematic inconsistencies across classrooms, educator professional

developments are needed and should ideally incorporate elements of written, verbal, or visual performance feedback to best develop teachers' knowledge of and skills implementing BSPS (Rathel et al., 2014; Reinke et al., 2007). The use of feedback along with an ongoing format that spans across time and offers opportunities for practice comprises the characteristics established by the literature for effective professional development. Since teachers are required to utilize evidence-based strategies, yet report feeling underprepared to do so, the challenge is to design a professional development that aligns with the standards put forth in the literature and supports teachers' skill development using effective, socially valid strategies.

Herein lies the challenge to design a professional development aligned with effective practices with the intention of increasing teacher use of BSPS with integrity to support teacher practice and skill development. By increasing the use of BSPS, teachers may reduce the time spent on challenging behaviors and consequently increase opportunities for student engagement and achievement. The following research questions guided this study's investigation:

1. Is there a functional relation between the professional development package incorporating video modeling* and the rate (i.e., frequency of BSPS) of BSPS used by general education teachers in general education settings with all students?
(*Professional development package includes an overview of key terms via PowerPoint as well and a series of various video modeling clips demonstrating correct use of BSPS).
2. Is there a functional relation between the professional development package incorporating video modeling and increased level of teachers' treatment integrity of BSPS implementation?

*Implementation with integrity refers to accuracy of steps completed from treatment integrity protocol. Integrity scores will be calculated by dividing number of correct steps by total number of steps to yield a percent correct.

In addition, the research addressed the following secondary descriptive research questions:

1. To what extent will educators rate/score the use of video modeling as an effective and efficient intervention component embedded within a professional development package for teaching classroom management skills, such as BSPS?

2. To what extent will educators rate/score the use of BSPS as an effective strategy for classroom management within a general education setting?

Chapter Three

Methods

This chapter presents the methods for the intervention study intended to determine if a functional relation exists between a professional development package incorporating video modeling of behavior specific praise statements (BSPS) and teacher rate of BSPS. This chapter also presents the methods used to determine if a functional relation exists between the professional development package and the extent to which BSPS are delivered by teachers with integrity. Integrity refers to number of accurate steps completed from the treatment integrity portion of the direct observation data sheet as described below (see Appendix B). Procedures related to the secondary descriptive research questions regarding the social validity of video modeling and the use of BSPS as a classroom management strategy are described below. Details regarding the research design, participants, settings, materials, dependent variables, independent variables, procedures, data collection, interobserver agreement, treatment integrity, social validity, and data analyses are included.

Participants and Settings

Eight teachers from the same school site, located in a large mid-Atlantic school district, participated in the study. Inclusion Criteria for participation required that the teachers be elementary level educators of any grade from Kindergarten through 6th grade. Additionally, the teachers must teach in a general education classroom that also provides services to one or more

students with Individualized Education Programs (IEPs). There were no restrictions based upon years of teaching experience. Demographic data related to teacher gender, age, ethnicity, current teaching grade level, years of experience, total number of students per classroom by gender, and number of students with IEPs per classroom were gathered via a brief questionnaire at the outset of the study (Appendix C), after informed consent was obtained and are presented in Table 1.

Table 1

Participant Demographics

	Sarah	Whitney	Tracy	Heather	Donna	Stacey	Cynthia	Karen
Age	48	56	39	37	51	28	55	61
Gender	F	F	F	F	F	F	F	F
Ethnicity	White	White	White	White	White	White	White	White
Experience	18	26	13	15	27	5	21	24
Current Grade	4th	4th	3rd	K	1st	1st	2nd	K
Degree	MA	BS	BA; MS	BS; MA	BS	BS; MA	BS	BA; BS
Class (boy/girl)	16/12	21/5	13/12	15/9	11/12	11/12	16/7	20/8
No. IEPs	2	1	6	3	1	6	2	3

Prior to the data collection, the researcher obtained information from participants on factors such as common planning times and willingness and/or ability to meet during planning times, before school, and/or after school. This information was then used to group teachers into

the following four pairs of two teachers: Pair 1, Sarah and Whitney; Pair 2, Tracy and Heather; Pair 3, Donna and Stacey; and Pair 4, Cynthia and Karen. These pairings were based solely on each individual teacher's availability to meet for the professional development series. The use of these pairs allowed teachers to receive the intervention along with a peer, in a more natural setting, mirroring small-group professional development.

Sarah. Sarah was a 48-year-old Caucasian female teaching 4th grade. At the time of her participation, Sarah held a master degree in educational psychology with a specialty in gifted education. Of her 18 years of classroom experience, she spent eight years in a center-based advanced academics, the school district's name for its gifted and talented, program and six years in a school-based advanced academics classroom. Sarah's classroom for the 2015-16 school year was comprised of 28 students (16 boys and 12 girls) in a school-based advanced academics program. Along with Sarah, one advanced academic resource teacher provided regularly scheduled enrichment and differentiated lessons to all students in the classroom. Additionally, one special education teacher and two special education instructional assistants provided intermittent special education services to two students with IEPs.

Sarah's classroom, measuring roughly 20 by 25 feet, was located on the second floor of the school building. An interactive white board (i.e., SmartBoard) was centrally mounted on the wall shared by the main classroom entrance and student seating was arranged into four large "L" shaped groupings of six to seven desks each. One teacher desk was positioned in front of a window at the rear of the classroom, which was adjacent to a wall-mounted counter with four laptop computers, each equipped with one external mouse. Three independent student work stations were located next to the teacher desk. Each station was equipped with one student desk,

one chair, a collapsible cardboard study carrel, one 8- by 10-inch white board, and one dry erase marker.

Whitney. Whitney was a 56-year-old Caucasian female 4th grade teacher with 26 years of classroom experience. She held a bachelor of science degree in elementary education and had also completed some graduate courses. Whitney's experience included teaching in 2nd, 3rd, 4th, and 6th grade general education classrooms. Her classroom at the time of the study was comprised of 26 students (21 boys and 5 girls), one of whom had an IEP. One special education teacher and one special education instructional assistant provided intermittent services in Whitney's classroom.

Whitney's classroom was located on the second floor of the school building and measured approximately 20 by 25 feet. A wall-mounted counter with five laptop computers, each equipped with one external mouse, was positioned adjacent to the main classroom door. One small window, facing out to the parking lot, was located across from the main classroom entrance and had two clusters of student desks (five desks each) located directly in front of it. A mounted SmartBoard was centered on the wall opposite the main entrance and had two additional clusters of student desks (one with six desks and one with five desks), in front of it.

Tracy. Tracy was a 39-year-old Caucasian female 3rd grade teacher. In her 12 years of teaching experience, Tracy primarily taught in general education settings within public schools. She also taught English in China for four and a half years within the higher education system (i.e., undergraduate, graduate, and professional studies). Tracy held a bachelor of arts in psychology and elementary education as well as a master of science degree in reading education and an additional endorsement in reading. Her classroom was comprised of 25 students (13 boys

and 12 girls), six of whom had IEPs. Two special education teachers provided both push-in and pull-out special education services for the students with IEPs.

Tracy's classroom was located on the first floor of the school building. Her 24- by 20-foot space had one small angled window, which faced a wooded area and parking lot, situated diagonally across from the main classroom entrance. A SmartBoard was mounted on the wall adjacent to the window and had one kidney shaped table used for small group work to the left of it. Student seating was organized into four groupings, two groups with eight, one group with five, and one group with four desks. All of the walls in Tracy's classroom were covered with instructional material and one wall was dedicated solely to student work. A wall-mounted counter with five laptop computers, each with one external mouse and one set of headphones, was located on the same wall as the main classroom entrance. Small cubbies for storing student belongings were scattered throughout the classroom, one on each wall.

Heather. Heather was a 37-year-old Caucasian female kindergarten teacher. Her degrees included a bachelor of science in elementary education and special education as well as a master of arts degree in curriculum and instruction. Nine of her fifteen years of teaching experience were in the kindergarten general education setting, while the remaining six years were spent in special education in both elementary and secondary settings. Heather had a total of 24 students in her classroom (15 boys and 9 girls), of whom three had IEPs.

Heather's classroom measured roughly 24 by 24 feet and was located on the first floor of the school building. The classroom opened up into a large space with four kidney shaped tables for student seating. One teacher desk was located on the back wall of the classroom. Each table was labeled with a color (i.e., blue, red, green, yellow) for the purposes of facilitating transitions to and from the workspaces and organizing student materials. An additional kidney table, used

for small group instruction, was equipped with math manipulatives and student-specific reading materials. This small group instructional area was located in the far corner of the room, diagonally across from the main classroom door. A SmartBoard was mounted on the wall to the left of the small group instructional area. Each student was assigned a number (1 through 24) and small adhesive cutouts with corresponding numbers were placed on the carpet in front of the SmartBoard; these cutouts provided a visual prompt for where they were to be seated while on the floor for instruction. Additionally, a wall mounted counter with four laptop computers, each with its own external mouse, was located behind the carpeted space.

Donna. Donna was a 51-year-old Caucasian female 1st grade teacher. Donna held a bachelor of science in elementary education and completed over 36 hours of graduate education for other endorsements. Throughout her 27 years of teaching experience, Donna taught kindergarten, 1st, 2nd, 3rd, 4th, and 5th grades, as well as served as an instructional coach for 1st grade curriculum. Of her 23 students (11 boys and 12 girls), one student had an IEP and received services in the general education setting from both a special education teacher and special education instructional assistant.

Donna's 24- by 20-foot classroom was located on the first floor of the school building. Across from the main classroom entrance was a large window, which faced a large wooded area. In front of the window was a small, carpeted circle area with one teacher chair, a wall-mounted SmartBoard, a reading easel, and a variety of materials for calendar math and literacy activities. Student seating in the circle area was arranged into four "movie theatre rows," demarcated by yellow electrical tape on the carpet. Student seating for the main classroom area was divided into four tables with six chairs per table, with each chair-back holding a cloth 'seat-sack' used for student notebooks, papers, and other materials. Each table was labeled with a number, 1

through 4, which Donna used as a way to systematically organize students during transitions (e.g., "All table two students should gather their folders and walk to their seats."). A kidney shaped table was situated toward the rear of the classroom, away from the window. Adjacent to the kidney table was a wall-mounted counter with four laptop computers, each equipped with one external mouse and one set of headphones.

Stacey. Stacey was a 28-year-old Caucasian female 1st grade teacher who held a bachelor of science in elementary education as well as a master of arts degree in early childhood special education. Stacey had five years of teaching experience, with her first year spent as a self-contained preschool autism teacher and the following four years spent teaching general education 1st grade. Of her 23 students (11 boys and 12 girls), five had IEPs and three were going through the special education eligibility process at the time of the study.

Stacey was housed in a rectangular classroom, measuring approximately 28 by 30 feet on the first floor of the school building. The main classroom door was flanked by cubbies for student storage as well as the teacher desk on the left. Across from the main entrance was a window, which faced out onto the playground. A small, carpeted circle area with a mounted SmartBoard, a reading easel, and a teacher rocking chair were set up in front of the window. A colorful 8- by 10-foot rug served as student seating for the circle area. Four clusters of student tables were scattered throughout the main classroom space, each with their own color (i.e., red, blue, green, orange) that Stacey used to organize student belongings and facilitate transitions (e.g., "All red table kids should put their journals in the red bin and line up at the door."). A long wall-mounted counter was positioned on the wall adjacent to the window and had four laptop computers, each outfitted with an external mouse and a set of headphones.

Cynthia. Cynthia was a 55-year-old Caucasian female 2nd grade teacher with 21 years of teaching experience and she held a bachelor of science degree in elementary education curriculum. Cynthia's experience spanned kindergarten, 1st, and 2nd grade classrooms, most of which included students who received special education or English as a second language services. Her classroom had a total of 23 students (16 boys and 7 girls), two of whom had IEPs. Additionally, there was one student going through the special education eligibility process at the time of the study. Along with Cynthia, one special education teacher and two special education instructional assistants provided intermittent special education support, both in the general education classroom as well as in the special education classroom setting.

Cynthia's classroom space spanned approximately 24 by 24 feet. A large set of windows facing a wooded area was located on the wall across from the main classroom entrance. Student seating was divided into three sets of student desks, which were positioned behind a colorful carpet (8 by 10 feet) and faced the SmartBoard. A large teacher chair was placed in between the SmartBoard and a reading easel with a large bin of materials (e.g., books, markers, pointers, calendar shapes, pattern blocks, etc.) was positioned just behind it. One kidney shaped table for small group work was located in the far left corner of the classroom next to a wall-mounted counter equipped with four laptop computers, each with one external mouse and one set of headphones. Lastly, two free-standing coat cubbies were placed catty corner to the kidney shaped table.

Karen. Karen was a 61-year-old Caucasian female kindergarten teacher. All 24 years of her classroom teaching experience was in kindergarten in the same county. She held a bachelor of science in political science, a bachelor of arts in elementary curriculum and instruction, and a master of education in elementary education and literacy. Karen's classroom consisted of 27

students (19 boys and 8 girls), three of whom were receiving special education services through an IEP. Along with Karen, one general education instructional assistant supported the classroom and was present for the duration of the study. Additionally, one special education teacher was assigned to the classroom to provide intermittent special education support to students as dictated by their IEPs.

Karen's rectangular classroom measured approximately 20 by 28 feet and was located on the first floor of the school building. A large pair of windows that looked out into the playground was across from the main classroom entrance and a SmartBoard hung on the wall adjacent to the main classroom entrance. A large wooden rocking chair along with books, calendar materials, counting blocks, and a reading easel was positioned in front of the SmartBoard. A wall-mounted counter with five laptop computers, each equipped with one external mouse and set of headphones, was also adjacent to the main entrance. One kidney shaped table, which was set up as an audio listening center with four sets of headphones, four cassette players, and four stools, was located next to the laptop computers. Four kidney shaped tables were located in the center of the classroom and served as the children's seated desk space. 'Seat-sacks' hung on every child's seat-back. Karen had a small teacher desk in the far left corner of the room with one filing cabinet beside it. Additionally, a small restroom and external sink were located in the far right corner of the classroom.

Informed Consent

All procedures in this research study underwent review by the Institutional Review Board (IRB) at George Mason University, as well through the research approval process via the school district's Office of Program Evaluation. Informed consent (see Appendix D) was obtained from

all participating teachers prior to the initiation of the study to ensure their rights and wellbeing throughout the course of the study.

Single-Subject Research Designs

Single-subject research designs employ a small number of heterogeneous participants. These designs, widely used in applied settings such as education and human behavior, demonstrate a functional relation between the independent and dependent variables by recruiting each participant to serve as his or her own control. Simply put, the participant is exposed to non-treatment (i.e., baseline) and treatment (i.e., intervention) conditions, during which times his or her performance is continuously measured throughout each phase. Performance data are graphed and frequently referenced over the course of the intervention to determine if the intended behavior change is occurring. This differs distinctly from group design studies wherein participants are placed into conditions (i.e., treatment, comparison, or control) and are compared within and/or between groups, rather than comparing across other participants, settings, or materials as is customary in single-subject designs (Cooper et al., 2007). In group studies, comparisons are made within and/or between groups to establish the presence of a relationship between the independent and dependent variable(s), also known as experimental control. Such experimental control is evident in single-subject research when distinct change occurs from baseline to intervention. Single-subject designs are sensitive to individual differences rather than averages of groups, meaning that single-subject designs do not inherently permit for the same degree of generalizability to the broader population. Instead, these designs allow for a detailed examination on how an intervention effected individual behavior (Gast, 2010).

In order to provide support for the use of single-subject research designs, Horner and colleagues (2005) developed a set of conventions to determine if a specific study demonstrates a

"credible example of single-subject research and if a specific practice or procedure has been validated as 'evidence-based' via single subject research" (p. 165). Their intent was to clarify the importance of this research methodology and how experimental control through single-subject design provides a comparable rigor to studies that rely on randomized control-group designs. Kratochwill et al. (2013) recently published an overview of their recommended single-subject design standards and adopted them into the What Works Clearinghouse's evidence database. These standards, consistent with Horner et al. (2005), provide structure for determining to what extent a single-subject study has met nationally recognized standards for evidence-based practice.

With regard to single-subject designs, experimental control is said to exist when the study establishes functional relations among variables, thereby validating the effectiveness of a particular intervention within the context of the study (Cooper et al., 2007). General conventions suggest that experimental control is present if there are at least three documented demonstrations of an effect over at least three different points in time within or across participants (Horner et al., 2005; Kratochwill et al., 2013).

Multiple baseline design. This study employed a multiple baseline across teacher pairs to determine whether there is a functional relation between the professional development package incorporating video modeling and teacher rate of BSPS. Further, this design allowed for a determination of whether a functional relation exists between the professional development package with video modeling and increased levels of educators' treatment integrity of BSPS implementation. Multiple baseline designs are used to establish functional relations between independent and dependent variables and are characterized by a staggered introduction of the

independent variable across participants, conditions, behaviors, or settings, for at least three different points in time.

The present study utilized such a staggered design, wherein all teacher pairs began baseline at the point in time, but received the intervention at different points in time. After a stable baseline of five data points was established, the first teacher pair began receiving the professional development package (i.e., independent variable), while the other teacher pairs remained in baseline. A stable baseline provides a benchmark comparison to determine whether the intervention is creating the intended change and is defined as a set of data points with low variability and a steady trend (Kratochwill et al., 2013). Each successive teacher pair received the professional development package in a staggered fashion across the duration of the study (i.e., four-to-six total consecutive weeks), meaning that some teachers and/or pairs received the professional development package for several weeks longer than others. This procedure was intended to identify whether a functional relation exists between the professional development package and each dependent variable (i.e., teacher rate of BSPS and treatment integrity of BSPS implementation). In this way, functional relations are established through verification and replication of the data. Verification is marked by a distinct change in the path of the data from baseline to intervention (i.e., phase change), and replication is evident when there are similar changes in the data path following the introduction of the independent variable with each teacher and/or pair (Cooper et al., 2007). Since the present study involves multiple points of intervention, it is expected that a similar change will be observed after each dosage, referring to teacher/pairs' receipt of a professional development session.

Direct Observation

All data for dependent variables were collected by the primary researcher via direct observation, which occurred three to five times per week, with each lasting 10 minutes in duration. To the best of the primary researcher's ability, these observations were conducted at the same time of day for each teacher. All data were gathered during an instructional block (i.e., language arts, math, science/social studies); however, the structure of the lesson (e.g., small or large group instruction) was variable, depending on the schedule for the day. The schedule of data collection observations was determined independently with each Teacher/pair at the outset of the study and included at least two data recording sessions per week on different days. The primary researcher and Teacher/pair agreed upon a mutual time for all sessions, and the primary researcher sent an emailed reminder 24 hours in advance of each session.

Continuous data were collected via direct observation on teacher rate and implementation integrity of BSPS in the same manner for all phases of the study. Each occurrence of BSPS was recorded via a direct observation data sheet (see Appendix B), which indicated number of BSPS occurrences (i.e., rate), type of BSPS (i.e., social, behavioral, or academic), and in what setting the BSPS was delivered (i.e., one to one, small groups of 2-9 students, or large groups of 10 or more students). This information was recorded on the left side of the data sheet. Upon conclusion of each data collection observation, all frequencies were totaled and recorded on a master data spreadsheet.

Treatment integrity data were collected during observations immediately after each occurrence of teacher delivered BSPS via the treatment integrity portion of the direct observation data sheet (see Appendix B). The protocol, located on the right hand side of the direct observation data sheet, consisted of the following six essential components required for correct

implementation of BSPS: (a) the teacher delivered BSPS within 5 seconds of the observed behavior; (b) the teacher delivered BSPS contingent upon observable behavior; (c) the BSPS was positive/affirming; (d) the teacher's torso and/or head/eyes were oriented toward the target student when delivering BSPS; (e) BSPS were stated audibly; and (f) BSPS were received by target student. The treatment integrity protocol is described with greater detail below in the dependent variables section.

Interobserver agreement (IOA). IOA is the most common indicator of reliable data collection (Kazdin, 2010). IOA requires two trained data collectors to conduct independent observations of the dependent variable(s) using the same data-collection method (Cooper et al., 2007). IOA is a critical element to single-subject research and is incorporated into single-subject research in order to prevent researcher drift and bias (Horner et al., 2005). For the present study, a second trained observer was present for the collection of IOA data, as this is the ideal percentage to capture accurate agreement between or among independent observers (Kazdin, 2010). IOA was collected for 33% of randomly selected data collection sessions per teacher and/or pair for each condition of the study (i.e., baseline, intervention, and follow-up). This second trained observer also completed fidelity checks on the primary researcher for all phases of the study to ensure that the intervention was implemented with integrity (see Appendices E-H).

The second observer was trained prior to data collection. Training consisted of introducing the second observer to all dependent variable definitions, examples of BSPS, non-examples of BSPS, and the direct observation data sheet, which made up the data recording system (see Appendix B). Three practice data collection observations were conducted using video examples of classroom lessons taken from the internet (i.e., www.teachingchannel.org).

During practice observations, the primary investigator and second trained observer sat in separate rooms and independently scored teacher rate and integrity of BSPS from the videos. The mastery criteria expectation required at least 85% agreement between the second trained observer and primary investigator. Performance exceeded criteria, with agreement at 90%, 100% and 100% across the three training sessions, respectively.

In order to randomize data collection sessions, the primary researcher shared her weekly data collection schedule with the second trained observer. The second trained observer would then reference her schedule and alert the primary researcher within 24-hours that she would join the data collection session. This was done so that the primary researcher could uphold the county-wide visitation policy by informing the school staff (i.e., front office administration) that there would be two non-school based individuals entering the building. IOA was calculated using an interval agreement formula for teacher rate of BSPS, type of BSPS, setting in which BSPS occurred, and the treatment integrity of BSPS. Each calculation divided the total number of agreements of BSPS by the total number of agreements plus disagreements, multiplied by 100%.

Dependent Variables

The rate of teacher delivered BSPS along with the integrity of BSPS implementation were used as dependent measures in the present study. These two measures are both consistent with extant literature on BSPS (Allday et al., 2012; Cavanaugh, 2013; Duchaine et al., 2011) and professional development (Dieker et al., 2009; DiGennaro-Reed et al., 2010) and were measured via direct observation throughout each condition of the study.

Rate of BSPS

The rate of BSPS used by teachers served as the dependent variable for the first research question. During data collection, frequency data were gathered for each occurrence of teacher delivered BSPS. Previous research that utilized BSPS as a dependent variable defined them as statements of approval provided to a student that described the behavior being reinforced (Duchaine et al., 2011); a teacher specifying the behavior for which praise is delivered (Musti-Rao & Haydon, 2011); or specific praise statements delivered immediately after a desired behavior (Simonsen et al., 2010). For the present study, BSPS were defined as any audible and positive verbal feedback delivered by an educator to a student within five seconds of the student's behavior (social, behavioral, or academic) that explicitly described the behavior being praised (e.g., "Good job raising your hand, Matthew!"). See Appendix B for direct observation data sheet.

Treatment Integrity

The extent to which teachers implement BSPS with integrity (i.e., the way in which it was intended) was evaluated through direct observation data, which was collected on the number of correctly completed components of BSPS via a treatment integrity protocol. The following six components of BSPS were examined by the integrity protocol according to a binary system (i.e., yes = implemented correctly; no = not implemented/not implemented correctly): (a) the teacher delivered BSPS within five seconds of the observed behavior; (b) the teacher delivered BSPS contingent upon observable behavior; (c) the BSPS was positive/affirming; (d) the teacher's shoulders and eyes were oriented toward the target student when delivering BSPS; (e) BSPS were stated audibly; and (f) BSPS were received by target student. Receipt of BSPS by the target student was determined by the presence or absence of student behavior that would

indicate he/she heard the statement (i.e., making eye contact, orienting his/her body/face toward the teacher, nodding, or engaging in another affirming behavior). See Appendix B for the direct observation data sheet.

Independent Variable

The primary researcher designed a professional development package incorporating video modeling to serve as the independent variable. Elements of effective professional development as identified throughout the literature, namely an ongoing format with opportunity for practice and feedback, were included and delivered to teachers over the course of the study.

Professional Development Package

The professional development package incorporating video modeling served as the independent variable. The package included four components: (a) an initial overview of BSPS and video modeling provided in person by the primary investigator; (b) presentation of 10 to 15 video modeling clips portraying accurate use of BSPS with three to five clips being shown per intervention session (number of clips shown was based off of total time the primary investigator and teacher/pair had available); (c) practice opportunities for teachers; and (d) individualized feedback from the primary investigator regarding each teacher's practice performances delivered immediately after practice opportunities. While there were no formal criteria for mastery, teachers were asked to practice BSPS until they were able to deliver them fluently two or more consecutive times. The professional development package was delivered to teachers at a predetermined agreed upon time every week for four-to-six consecutive weeks. Delivery of the package was staggered in accordance with the multiple baseline design; therefore, the number of sessions in which each teacher participated depended on which pair the teacher was assigned. The initial overview session lasted approximately 20-to-30 minutes, whereas the successive

weekly sessions lasted roughly 10-to-15 minutes. Average total participation time for each teacher was roughly 90 to 110 minutes, which accounts for the time each teacher spent engaged in the professional development portion of the study but not the time the primary researcher spent engaged in data collection observations in each classroom.

Materials

The materials used for this study included a PowerPoint presentation for the overview portion of the professional development package and video modeling clips. The video modeling clips were filmed with a MacBook Air and edited with the iMovie software program for Mac. Recordings were edited such that only discrete occurrences of BSPS were displayed and content irrelevant to BSPS delivery were deleted. Video modeling clips were shown to teachers via QuickTime Media player on a MacBook Air. Both the PowerPoint overview and all video modeling clips were projected onto a SmartBoard for all professional development sessions. No materials were not available to participants outside of the professional development sessions.

Video modeling clips. A total of 22 video clips were recorded for use during the intervention portion of the study. Fourteen of these clips featured two Caucasian females (including the primary researcher) between the ages of 30 and 32 who served as the video models. These clips were utilized in a pilot study conducted by the primary researcher in the Fall of 2015 for the purpose of validation. Two elementary general education teachers participated in the four-week pilot study, which sought to determine if a functional relation existed between the professional development with video modeling package and teacher use of BSPS. Results indicated a functional relation between the professional development package and an increase in teacher rate of BSPS, as well as a functional relation between the professional development package and treatment integrity of BSPS implementation.

After participant recruitment was completed for the present study, eight additional video model clips were created to more accurately reflect the demographics of the teachers participating in the current study. A total of three video models, including the primary researcher, were used to portray the role of general education teacher in the clips; all were Caucasian females who ranged in age from 30 to 54 years. Two of the video models were teachers with general and special education experience and a combined 39 years of classroom teaching experience. The third video model was a trained pediatric clinical psychologist with five years of experience working with students in clinical and educational settings. These individuals were purposefully sought out for use as video models in order to be consistent with the literature on video modeling as an intervention technique. Individuals watching a model are more likely to attend to that which is being modeled if they perceive the model as competent and similar to them by way of age, physical characteristics, ethnicity, etc. (Bellini & Akullian, 2007).

The video clips varied in length between 21 and 47 seconds and captured a variety of scenarios (i.e., math review game, language arts activities, content-relevant class discussions, and craft activities) in which BSPS were delivered to varying numbers of students, from one on one instruction to large group instruction. Participants did not have access to video modeling clips outside of the professional development.

Procedure

This intervention study consisted of the following phases: (a) baseline data collection observations; (b) professional development package (i.e., initial overview and video modeling session, video modeling sessions with practice opportunities and feedback) and intervention data collection observations; and (c) follow-up data collection observations and social validity, measured via an 11-item questionnaire.

Baseline. Baseline data for all teachers were collected under 'business as usual,' or typically occurring classroom conditions. Teachers were notified at least 24-hours in advance of each data collection observation and encouraged to teach as they normally would. Baseline data were collected prior to the introduction of the professional development package until a stable baseline of five data points for Pair 1 was obtained. In other words, teachers did not know that the intended target of their upcoming professional development workshop package was the use of BSPS. Direct observations of teacher rates of BSPS were recorded; no feedback was given during baseline. When any occurrence of BSPS was recorded during baseline, the data collector also gathered integrity data related to the occurrence as per the treatment integrity portion of the direct observation data sheet (see Appendix B). Baseline data was gathered across both structured settings (e.g., during direct instruction/mini lessons) and less structured settings (e.g., independent work centers) for the same amount of time per observation (i.e., approximately 10 minutes per probe). A stable baseline of at least five data points was required before the introduction of the professional development package for the first teacher pair.

Professional development package and intervention data collection. The initial, one-time overview was presented to each teacher/pair via a 10-slide PowerPoint presentation projected on an interactive white board (i.e., SmartBoard) and included the following: (a) definitions of BSPS and video modeling (one slide); (b) research on the effectiveness of BSPS and video modeling (one slide); (c) rationales for the use of BSPS and video modeling (two slides); (d) examples and non-examples of BSPS (two slides); and (e) the six necessary components to deliver BSPS with integrity (two slides). One slide was dedicated to research-indicated aspects of effective professional development, such as the benefits of ongoing professional development and opportunities for practice and feedback. Finally, one slide

provided a description of what video modeling entails. Following the overview, time was allotted for discussion, questions and answers, and application exercises wherein teachers discussed sample BSPS and wrote them down, if needed. Next, the teachers watched three to five video modeling clips of BSPS, had opportunities to practice implementing BSPS, and received targeted feedback from the primary researcher on their performances.

The video modeling viewing sessions of the professional development package lasted approximately 10 to 15 minutes, depending on whether teachers were able to meet as a pair. Each video modeling clip was between 21 to 47 seconds in length and portrayed a teacher (i.e., video model) delivering various BSPS to students. A variety of scenarios that are representative of a general education classroom were presented in the clips such as delivery of BSPS to one student, small groups of two to nine students, and large groups/whole classrooms of students (more than 10 students). The video modeling clips also showed BSPS delivery across settings such as structured lessons, independent student work time, unstructured time, course subjects, and locations within a school building (e.g., library, hallway, classrooms, etc.). Additionally, multiple examples of BSPS were illustrated to include social behaviors (e.g., sharing materials, helping a classmate), academic behaviors (e.g., task completion), and general classroom management behaviors (e.g., cleaning up work location, raising hand to answer a question). Teachers participated in another structured practice session following presentation of the video clips, during which they implemented BSPS within the context of role-played scenarios reflecting the various contexts described above. Teachers were permitted to view the video modeling clips as many times as they preferred and the primary investigator provided immediate and contingent verbal feedback regarding each teacher's performance during the BSPS role-play. Table 2 displays the sequence in which video modeling clips were presented to each teacher pair

throughout the intervention wherein each letter corresponds to the type of clip shown: (a) A – individual academic; (b) B – individual behavior; (c) C – individual social; (d) D – small group academic; (e) E – small group behavior; (f) F – small group social; (g) large group academic; (h) H – large group behavior; (i) I – large group social.

Table 2

Sequence of Video Modeling Clips Presented in Intervention Condition

	Overview	Session 2	Session 3
Pair 1	A, D, G	E, B, H	C, B, E, I, F
Pair 2	A, D, G	F, B, H	I, H, E,
Pair 3	A, D, G	E, B, H, I	D, F, A, H
Pair 4	A, D, G	C, E, G, I, H	G, B, A, H

Note. Letters correspond to type of video modeling clip shown: A – individual academic; B – individual behavior; C – individual social; D – small group academic; E – small group behavior; F – small group social; G – large group academic; H – large group behavior; I – large group social.

The primary investigator provided at least one point of positive feedback per role-play scenario regarding what was done well, as well as constructive feedback on specifics that could be improved, when applicable (e.g., "You did very well providing the BSPS statement directly related to the hand-raising behavior. This time, practice providing the statement within five seconds from the time you observed it."). In many cases, the verbal feedback provided to teachers served as a catalyst for general comments, discussion, and questions. For example, after role play and feedback, Donna articulated how she was more cognizant of labeling a child's

outward academic behavior (e.g., worksheet completion) rather than something covert (e.g., "You are so smart!" "I like you're thinking"). In addition to the verbal feedback provided, the primary investigator also provided a written copy of the feedback, which was sent via email to each teacher within 24 hours of the session for a permanent record and is consistent with suggestions put forth by Stormont and Reinke (2013) regarding the delivery of performance feedback.

When applicable, video clips were purposefully selected and shown to teachers not only according to physical attributes and characteristics but also based upon data gathered in the baseline phase. For example, if a teacher provided most of her praise in a small group setting during baseline, that teacher was shown additional large group and one to one scenarios in an effort to generalize her use of BSPS across settings. Further, if a teacher requested assistance with a particular element of BSPS, such as providing academic BSPS statements in a small group setting, corresponding video clips were shown during intervention.

Intervention data refer to the data points simultaneously collected on teachers' rates of BSPS and treatment integrity of BSPS during observations within the intervention phase (i.e., implementation of the professional development package). These data were collected within two hours of each video modeling intervention session, depending on each classroom's individual schedule and the whereabouts of the students. Additional data points were collected on at least two to three subsequent days per week for the duration of the study. Intervention data were collected in the same manner as they were for baseline data collection (i.e., at the same time of day for each teacher, for the same duration each observation, and during core content lessons). Similarly, teachers were given at least 24-hour notice prior to a scheduled data collection observation.

Follow-up. Follow-up data on rate of BSPS and treatment integrity were collected two weeks after the final intervention data point. These data were recorded in the same fashion as the baseline and intervention phases. These data were intended to check for sustainability of the intervention effects over time on teachers' rates of BSPS and/or treatment integrity of BSPS implementation. Each teacher was observed two times. The procedure for data collection in this phase was identical to those of the baseline and treatment conditions. Upon completion of data collection for the study, teachers were asked to complete an 11-item questionnaire intended to measure the social validity (see Appendix I) of the intervention. Teachers received requests to complete the questionnaire via email with an embedded link to an online survey tool (i.e., GoogleForms), which ensured anonymity of responses.

Fidelity of treatment. In the present study, the fidelity with which the primary researcher conducted baseline data collection observations, the initial overview session of the professional development package, intervention data collection observations, and follow-up data collection observations were measured via corresponding checklists (see Appendices E-H). These fidelity checklists intended to serve as measures of reliability to ensure that all aspects of the study were implemented as intended across settings, people, and materials. The second trained observer, who was present for the purposes of IOA, randomly completed the fidelity checklists for each phase of the study, unbeknownst to the primary researcher. All fidelity checklists required the primary researcher to provide teachers with 24-hour notification prior to any interactions (i.e., data collection observations and the professional development overview session). As such, copies of email correspondences were provided to the second observer to permit assessment of this component. For baseline, intervention, and follow-up conditions, as well as the overview condition, the second trained observer scored the fidelity protocol in real

time alongside the primary investigator. Fidelity of treatment was scored for 50% of the overview session and 33% of all data collection observations across all phases, which is consistent with the design standards for single-subject research (Kratochwill et al., 2013).

Social validity. An 11-item social validity questionnaire to determine the acceptability and levels of satisfaction regarding the intervention and procedures was administered to all teachers after all phases of data collection were complete. The survey was administered anonymously via an online survey system (i.e., Google Forms). The questionnaire targeted teachers' perceptions of the importance of BSPS use, how useful the intervention sessions with practice and feedback were, and the overall feasibility of the intervention. Ten of the eleven items on the questionnaire items were rated along a 5-point Likert-type scale (i.e., 1 = strongly disagree, 5 = strongly agree). One item prompted an open-ended, short answer response. A copy of the social validity questionnaire is located in Appendix I.

Chapter Four

Results

Direct observation data were gathered on teacher rate of behavior specific praise statements (BSPS) and integrity of BSPS implementation for baseline, intervention, and follow-up conditions. These data are presented in stacked line graphs on Figure 2 and Figure 3, respective to rate and integrity. Social validity ratings related to how teachers perceived the use of video modeling as an efficient component of professional development as well as how teachers rated the use of BSPS as effective strategies for classroom management are also reported. Specifics related to each research question, components of visual analysis, single-subject effect size metrics, and standards for single-subject designs are described below. Additionally, results from interobserver agreement (IOA), researcher fidelity of implementation, and social validity are reported.

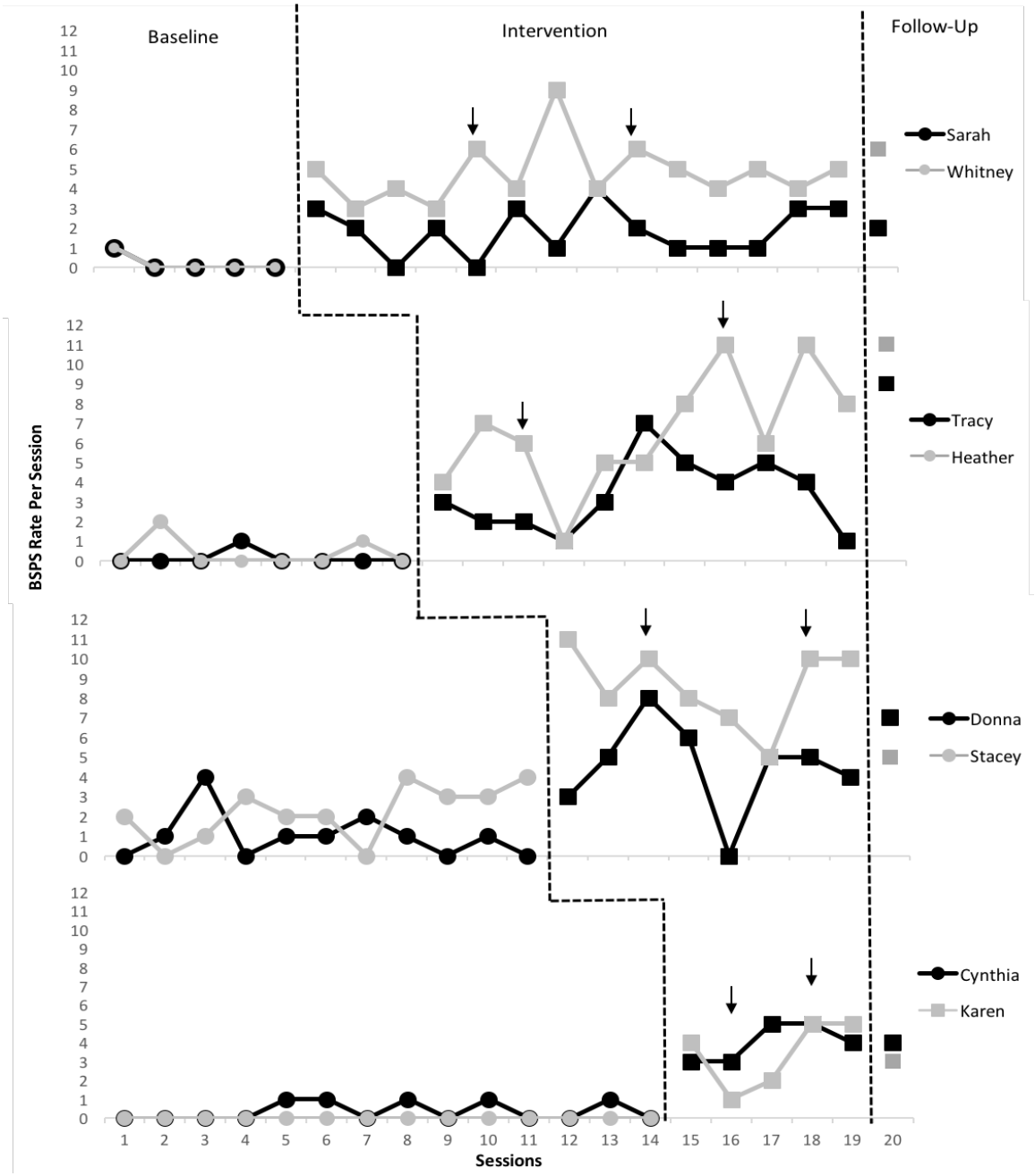

Figure 2. Rate of BSPS by teacher pair. Video modeling professional development sessions are indicated by dosage arrows.

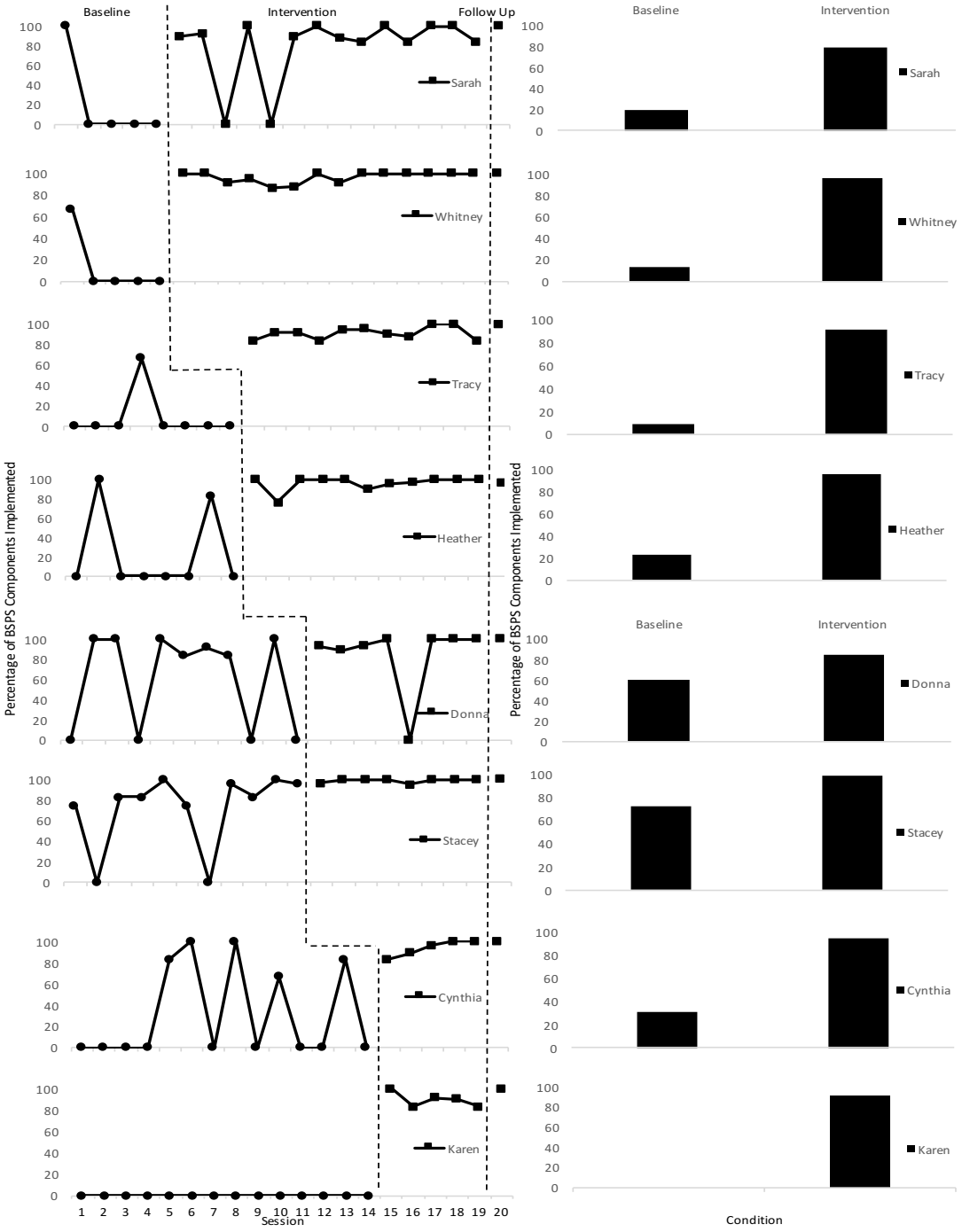

Figure 3. Percentage of BSPS integrity components implemented. Integrity score average by session displayed on the left and overall integrity score average by condition on right.

As mentioned in Chapter 3, Kratochwill et al. (2013) revised the standards by which the design of single-subject studies may be reviewed and assigned one of the following categories: meets standards, meets standards with reservations, or does not meet standards. These standards, consistent with Horner et al. (2005), are specific to single-subject methodology and provide structure for determining the extent to which a study has met nationally recognized standards for evidence-based practice. With regard to single-subject designs, experimental control is said to exist when the study establishes functional relations among variables, thereby validating the effectiveness of a particular intervention within the context of the study (Cooper et al., 2007). General conventions suggest that experimental control is present if there are at least three documented demonstrations of an effect over at least three different points in time within or across participants (Horner et al., 2005; Kratochwill et al., 2013). In the present study, a functional relation exists between the rate of teacher delivered BSPS and the professional development package. There is also evidence of a functional relation between the professional development package and the integrity with which teachers implemented BSPS.

Visual Analysis

Conventions hold that single-subject data are visually analyzed, which considers the level, trend, variability, latency of change, overlap, and overall patterns assessed within and between baseline and intervention conditions (Cooper, et al., 2007; Kratochwill et al., 2013). Data collected on teacher rate of BSPS throughout baseline, intervention, and follow-up phases are displayed in a series of stacked line graphs (Figure 2), with rate of BSPS delivered by teachers displayed on the y-axis and number of sessions across the x-axis. Similarly, BSPS integrity data for each teacher from all phases are displayed in Figure 3, with the percentage of BSPS components implemented correctly on the y-axis and number of sessions represented

along the x-axis. Similarly, mean BSPS integrity data are presented on a cluster column graph, with condition along the x-axis and the percentage of BSPS components implemented on the y-axis. Using these graphs, the levels, otherwise known as the mean or median, were assessed across the general plane of the data. Visual comparison between the levels of baseline and intervention permits tentative conclusions to be drawn regarding the presence of a functional relation and therefore the effectiveness of the intervention (Ross, 2012).

Visual analysis also provides information regarding the tendency of a data set to show systematic increases or decreases over time, or what is known as trend (Kazdin, 2010). By examining the trend, one may make preliminary judgments regarding whether or not the data are moving in the expected direction. Variability within the data set refers to the variation in consistency, or spread of the data points, and is generally reported as a high-to-low range of scores. If data are highly variable within the intervention condition, it is difficult to ascertain whether or not the intervention is having an effect; it also allows one to assess whether or not patters exist among the data and can infer that the intervention does not have any control over behavior (Cooper et al., 2007; Riley-Tillman & Burns, 2009).

Visual analysis also requires one to analyze the latency of change as well as the proportion of data points that overlap across adjacent phases. Latency of change refers to how quickly behavior change is noted from one condition to another, namely between baseline and intervention conditions. The more rapid/abrupt the change, the more likely the change is due to the new condition and the more confident one can be that the behavior is being affected by the intervention (Riley-Tillman & Burns, 2009). Overlapping data points across conditions may indicate inconsistent participant performance, thus, diminishing confidence regarding the existence of functional relations among variables.

Together, these characteristics were all considered when visually examining the data in the present study in order to determine if there were global patterns among them. Despite the usefulness of visual analysis, there are arguments against its sole use for determining an intervention's overall effectiveness. Morgan and Morgan (2009) posited that visual analysis is susceptible to inconsistent interpretations due to individual differences among researchers (Kazdin, 2010; Wendt, 2007). One way in which to address such inconsistencies and potential inaccuracies of data interpretation is through synthesizing single-subject data by calculating effect size metrics (Wendt, 2007).

Single-subject effect size metrics. There are numerous methods for calculating effect sizes of single-subject research; however, there is a lack of consensus regarding the best approach (Parker, Vannest, Davis, & Sauber, 2011). Thus, it is recommended that several metrics be employed to evaluate the effectiveness of an intervention (Wendt, 2007). Perhaps most commonly used to synthesize this research are non-regression based approaches such as percentage of non-overlapping data (PND) and percentage of data exceeding the mean (PEM), known as part of a family of "non-overlap" metrics (Wendt, 2007). The purpose of the PND procedure is to produce a common metric that provides information regarding the effectiveness of an intervention from studies that employ a single-subject design (Scruggs & Mastropieri, 1998). While it does not yield a conventional effect size because it must be interpreted according to specific guidelines, PND is easy to compute and interpret, may be calculated with relatively few data points, and is still one of the most widely used non-parametric statistic (Parker, Vannest, & Davis, 2011).

In order to calculate PND, the first step is to identify the highest baseline data point. It is important to note that baseline points should be stable and predictable because a single extreme

score may skew the results. From the highest data point, a horizontal line is drawn through the intervention phase of the graph. If the intervention is intended to decrease a targeted behavior, all intervention data points that fall *below* the horizontal line are counted and placed into a fraction, with the denominator representing total intervention data points. Alternatively, if the intention of the intervention is to increase a particular behavior, all points that lie *above* the horizontal line are counted and put into a fraction in a similar manner. The calculation of these fractions, multiplied by 100%, is the PND.

PND ranges from 0-100% and the interpretation of PND strength in the present study was evaluated based upon the following conventions put forth by Scruggs & Mastropieri (1998): scores of 90% and above are interpreted as very effective, scores between 70% and 90% are considered to be effective, scores between 50% and 70% are questionable, and any PND score below 50% suggests that the treatment is ineffective or unreliable. Some notable limitations of the PND procedure include the fact that it ignores all but one baseline point, which in some cases may be unreliable (e.g., if this point is an outlier), and lacks sensitivity to data trends, especially as the PND score approaches 100%. In the present study, PND scores were calculated for each teacher and/or pair for rate of BSPS.

Similar to PND, PEM is a nonparametric calculation of percentage of data points that exceed the median of the baseline phase (Ma, 2006). Contrary to PND's insensitivity to outlier baseline points, PEM consistently reflects the effect size, even in the presence of floor or ceiling data. For this reason, it is often used in conjunction with PND. The first step in calculating PEM requires locating the median data point in the baseline phase and then drawing a horizontal line through the treatment phase. Next, the percentage of treatment phase data points that fall above

(if behavior increase is expected) or below (if behavior decrease is expected) the line is computed.

PEM scores fall between 0 and 1, with 0.9-1.0 reflecting a highly effective treatment, 0.7-0.9 reflecting a moderately effective treatment, and anything less than 0.7 reflecting a questionable or non-effective treatment (Ma, 2006). Just as with any other metric, PEM is not without limitations. Primarily, PEM cannot discriminate the magnitude of data points above or below the median. Similar to PND, PEM also does not take data trend or the variability among data in the treatment phase into account. In the present study, PEM scores were calculated for each teacher and/or pair for rate of BSPS.

Tau-U, one of the newer single-subject effect size metrics, was developed by Parker, Vannest, Davis, and Sauber (2011) from the Kendall's Rank Correlation and the Mann-Whitney U-Test between groups. Most importantly, it addresses the aforementioned limitations of PND and PEM. By including an analysis of trend in the intervention phase, Parker and colleagues were able to derive conservative results as compared to traditional non-overlap methods such as PND and PEM. Parker, Vannest, Davis, and Sauber (2011) suggest the use of Tau-U as an alternative to both non-overlap and regression models of analysis. This nonparametric technique does not rely upon a normal distribution of data and "when data are non-conforming (common in single-case research), then the power of Tau-U can exceed the parametric techniques to 115%" (p. 291). Tau-U is an index that combines non-overlap between baseline and treatment phases with the trend from within the intervention phase. It is represented as a family of four indices as follows: (a) non-overlap of phase A (i.e., baseline) and phase B (i.e., treatment); (b) non-overlap and phase B trend combined; (c) non-overlap with baseline trend controlled; and (d) non-overlap and phase B trend with baseline trend controlled (Parker, Vannest, Davis, & Sauber, 2011).

Since Tau-U is such a new metric for calculating effect sizes in single-subject research, some of its application has yet to be well established in the literature. Additionally, Tau-U's application to more complex designs as well as more sophisticated baseline and trend control considerations have seen only limited field testing due to its recent innovation (Parker, Vannest, Davis, & Sauber 2011). Importantly, however, use of Tau-U in the present study enhances the findings by remaining consistent with the literature recommendations to employ several metric when calculating single-subject effect sizes. In order to calculate Tau-U, raw scores for individual data points are required. Raw data points were input into an online calculator developed by Parker Vannest, Davis, and Sauber (2011), which yielded the Tau-U scores for each teacher.

In summary, the present study employed three different metrics by which to aggregate an effect size: PND, PEM, and Tau-U. Of note, these single-subject effect size metrics presented in Table 2 were only applied to the results from the first research question, teacher rate of BSPS.

Table 3

Single-Subject Effect Sizes by Participant for Rate of BSPS

Metric	Sarah	Whitney	Tracy	Heather	Donna	Stacey	Cynthia	Karen
PND	57.14%	100%	81.81%	90.90%	37.50%	100%	100%	100%
PEM	0.86	1.00	1.0	1.0	0.88	1.00	1.00	1.00
Tau-U	0.73	1.00	0.98	0.97	0.75	1.00	1.00	1.00

Single-subject effect size metrics were not applied to the second research question regarding BSPS integrity scores due to highly variable integrity data in baseline conditions across seven of the eight participants. This variability resulted in considerable overlap for these individuals in the adjacent intervention condition, which does not lend itself to analysis via non-overlap effect size calculations. The nature of the non-overlap effect size calculations discussed above would have produced either very low or zero effect sizes for teachers, greatly skewing the results. Results regarding BSPS implementation integrity are, instead, discussed from the visual analysis perspective, which more accurately depicts the changes in level, trend, patterns, variability, overlap, and latency of change from baseline to intervention. In addition, a column chart was utilized to display mean percentage of BSPS components implemented with integrity for each participant during baseline and intervention conditions (see Figure 3). Although column charts are not often used to display single-subject results, this format provided a clearer depiction of implementation integrity capturing only instances in which BSPS were actually delivered.

Unequal Variances *t*-test

In order to document whether or not a teacher's average percentage of integrity components implemented between baseline and intervention differed significantly, as displayed in the column chart, an unequal variances *t*-test, or Welch's *t*-test, was run. A Welch's *t*-test is a statistical test used to test for significant differences between two means when two samples have unequal variance and unequal sample sizes (Warner, 2013). In the present study, participants received different numbers of baseline and intervention sessions (e.g., Sarah's data spanned five baseline sessions and fourteen intervention sessions, whereas Donna had eleven baseline sessions and eight intervention sessions). No participants had an equal number of baseline and intervention sessions.

Table 4

Welch's t-test for Average Percentage of BSPS Integrity Components Implemented

Participant	Condition	*M*	*SD*	*t*-value	df	*p*-value
Sarah	Baseline	20.00	44.72	2.78	5	.04*
	Intervention	80.46	33.36			
Whitney	Baseline	13.33	29.81	6.23	4	00**
	Intervention	96.76	5.08			
Tracy	Baseline	8.33	23.27	9.77	7	.00**
	Intervention	91.71	6.45			
Heather	Baseline	22.92	42.67	4.82	7	.00**
	Intervention	96.21	6.99			
Donna	Baseline	59.85	47.84	1.46	17	.16
	Intervention	86.22	32.59			
Stacey	Baseline	71.97	36.71	2.45	10	.03*
	Intervention	99.13	1.78			
Cynthia	Baseline	30.95	43.78	5.30	14	.00**
	Intervention	94.82	7.09			
Karen	Baseline	0.00	0.00	29.90	5	.00**
	Intervention	91.39	7.49			

Note. * significant at $p < .05$; ** significant at $p < .001$.

Rate of BSPS

Direct observation data were graphed across teacher pairs for the rate of BSPS, displayed in Figure 1. Baseline rates were low across all teacher pairs, with an immediate change in level upon introduction of the professional development package. All dosages of the professional

development sessions, at the specific times they were delivered to each teacher pair, are indicated on the graphs. Details related to each teacher's results are described below. Additionally, a rate breakdown according to type of BSPS (i.e., academic, behavioral, or social) and setting (i.e., one to one, small group, or large group) for baseline and intervention conditions are presented in Table 4.

Table 5

Rate of BSPS by Type and Setting for Baseline, Intervention, and Follow-Up Conditions

Baseline	Sarah	Whitney	Tracy	Heather	Donna	Stacey	Cynthia	Karen
Behavioral								
Individual	1	0	0	1	8	8	1	0
Small Group	0	1	0	1	2	7	0	0
Large Group	0	0	0	0	0	7	2	0
Academic								
Individual	0	0	0	1	0	0	2	0
Small Group	0	0	0	0	0	0	0	0
Large Group	0	0	0	0	0	0	0	0
Social								
Individual	0	0	0	0	1	0	0	0
Small Group	0	0	0	0	0	0	0	0
Large Group	0	0	1	0	0	0	0	0
Total	1	1	1	3	11	24	5	0
Intervention								
Behavioral								
Individual	3	34	5	31	25	14	4	7
Small Group	4	6	6	3	0	3	0	0
Large Group	4	6	11	5	2	27	0	3
Academic								
Individual	10	19	12	32	4	21	16	6
Small Group	3	1	1	1	0	0	0	0
Large Group	1	0	2	0	1	3	0	0
Social								

Individual	1	0	0	0	0	0	0	0
Small Group	0	0	0	0	3	1	0	1
Large Group	0	1	0	0	0	0	0	0
Total	26	67	37	72	35	69	20	17
Follow-up								
Behavioral								
Individual	1	4	2	9	3	4	0	0
Small Group	0	0	0	0	0	1	0	0
Large Group	0	0	1	0	0	0	0	0
Academic								
Individual	1	1	3	2	4	0	4	2
Small Group	0	1	1	0	0	0	0	0
Large Group	0	0	0	0	0	0	0	0
Social								
Individual	0	0	0	0	0	0	0	0
Small Group	0	0	1	0	0	0	0	1
Large Group	0	0	1	0	0	0	0	0
Total	2	6	9	11	7	5	4	3

Pair 1 (Sarah and Whitney). Baseline data for Sarah and Whitney were identical and stable, with both teachers utilizing only one BSPS over the course of five observation sessions (M = 0.20 BSPS per baseline session). Following a stable baseline, the first dosage of professional development was delivered, which produced an immediate change in the rate of BSPS for both teachers. However, data were highly variable for both teachers throughout the intervention condition. For Sarah, a slight change in level was evident (M = 1.86 BSPS per intervention session), but her rates dipped back to baseline levels on five occasions throughout the intervention condition, causing overlap between conditions and resulting in a highly variable trend. Sarah utilized BSPS in 20% of baseline sessions (i.e., one out of five), whereas she utilized BSPS during 85.71% of intervention sessions (i.e., 12 out of 14), reflecting a marked overall increase in BSPS usage. Overall, Sarah's rates of BSPS delivery improved both within (i.e., average number used per session) and between sessions (i.e., presence of at least one BSPS per session).

For Whitney, despite the variability in her rate of BSPS throughout the intervention condition, there was a definitive change in level (M = 4.79 BSPS per intervention session), with no overlap between conditions. Her data remained above baseline levels and resulted in a fairly predictable trend. Overall, Whitney utilized BSPS in 20% of baseline sessions (i.e., one out of five), whereas she utilized BSPS during 100% of intervention sessions (i.e., 14 out of 14), reflecting a marked overall increase in BSPS usage. Overall, Whitney's rates of BSPS delivery improved both within (i.e., average number used per session) and between sessions (i.e., presence of BSPS per session). Single-subject effect size metrics yielded a PND of 57.14%, a

PEM of 0.86, and Tau-U of 0.73 for Sarah. Whitney's data generated a PND of 100%, a PEM of 1.0, and a Tau- U of 1.00. Both teachers' performances also improved in the follow-up condition, with Sarah utilizing two BSPS and Whitney delivering six BSPS during single observation sessions of the same duration as baseline and intervention; these follow-up rates exceeded their respective mean rates from intervention.

Pair 2 (Tracy and Heather). Baseline data for Tracy and Heather were fairly stable and relatively low (Tracy, $M = 0.13$; Heather, $M = 0.38$ BSPS per baseline session), with some initial variability from both teachers. Despite variability in the intervention condition, an immediate change in level was evident for both teachers upon the introduction of the first professional development session. An upward trend was observed in Tracy's rate of BSPS at the outset of the intervention condition ($M = 3.36$ BSPS per intervention session), yet dropped back to baseline levels at the last intervention session, with three points of overlap evident. Tracy utilized BSPS in 12.5% of baseline sessions (i.e., one out of eight), whereas she utilized BSPS during 100% of intervention sessions (i.e., 11 out of 11), reflecting a marked overall increase in BSPS usage. In all, Tracy's rate of BSPS improved both within sessions, as indicated by overall means, and between sessions, indicated by her delivery of at least one BSPS per session.

Heather's immediate change in BSPS level at the first dosage of the professional development was maintained throughout the intervention condition ($M = 6.54$ BSPS per intervention session). Her data trended upward in the intervention condition, with only two points of overlap noted between conditions. Heather utilized BSPS in 25% of baseline sessions (i.e., two out of eight), whereas she utilized BSPS during 100% of intervention sessions (i.e., 11 out of 11), reflecting a marked overall increase in BSPS usage. Heather's overall rate of BSPS improved within and between sessions. Single-subject effect size metrics for Tracy yielded a

PND of 81.81%, a PEM of 1.0, and a Tau-U of 0.98. Effect sizes for Heather were as follows: PND = 90.90%, PEM = 1.0, and Tau-U = 0.97. Rate of BSPS improved in the follow-up condition for both teachers, with Tracy utilizing nine BSPS and Heather delivering eleven BSPS, which markedly exceeded their respective mean rates from intervention.

Pair 3 (Donna and Stacey). Baseline data for Donna and Stacey were fairly variable throughout the 11 sessions. Donna's baseline data was marked with one high outlier in the third data observation session, but became somewhat stabilized roughly halfway through the condition (M =1.00 BSPS per baseline session). Stacey had the highest baseline rates of any participant (M = 2.18 BSPS per baseline session). Her baseline was, however, somewhat variable throughout the condition, ending in a slightly increasing trend up to four BSPS during the final session. This is not ideal, because the variability does not reflect a stable baseline, and it is unknown if the rate would have continued to rise regardless of the introduction of the professional development package. Normally, additional baseline data would be gathered to counter this concern; however, limitations put forth in the IRB criteria provided to the primary researcher at the outset of the study restricted the number of permissible sessions. Despite the variability observed during baseline for both teachers, an immediate change in BSPS rate and level (Donna, M = 4.38; Stacey, M =8.63 BSPS per intervention session) was evident after the first dosage of the professional development package and both teachers' data produced a relatively flat trend across the condition.

Donna's intervention condition was also marked by one low outlier (i.e., zero BSPS) during session 16, which was likely due to a student exhibiting tantrum behaviors (i.e., kicking, screaming, rolling around on floor, throwing/ripping books) throughout the entire data observation session. These behaviors appeared to pull Donna's attention to the student, while an

instructional assistant took over the class lesson. Together, the outlier points from Donna's baseline and intervention sessions resulted in an overlap of four data points between conditions. In contrast, there was no overlap present between phases for Stacey. Despite variability during the intervention condition, both teachers' data stabilized in the last two intervention sessions.

Overall, Donna and Stacey utilized BSPS in 63.64% and 81.82% of baseline sessions (i.e., seven and nine out of eleven), respectively. During intervention, Donna's usage increased to 87.50%, while Stacey's usage increased to 100% (i.e., seven and eight out of eight intervention sessions, respectively), reflecting an overall increase in BSPS usage. Overall, both teachers demonstrated within and between session improvement in their rate of BSPS. Single-subject effect size metrics for Donna yielded a PND of 37.50% (this score was affected by the outlier point at session 16), a PEM of 0.88, and a Tau-U of 0.75. Stacey's data yielded a PND of 100%, a PEM of 1.0, and a Tau-U of 1.00. During the follow-up condition, Donna delivered seven BSPS, indicating an overall improvement from her previous means. However, Stacey utilized only five BSPS during follow-up, likely as a result of a highly disruptive student for the duration of the observation, which is a diminishment relative to her average performance during the intervention condition.

Pair 4 (Cynthia and Karen). Baseline data for Cynthia and Karen were stable, predictable, and remained at low levels throughout the condition. Cynthia engaged in minimal rates of BSPS (M = 0.36 BSPS per baseline session), while Karen did not deliver any BSPS throughout the condition (M = 0.00). There was an immediate change in level following the first professional development session for both teachers (Cynthia, M = 4.00*;* Karen, M = 3.40 BSPS per intervention session). Intervention data for Cynthia were somewhat variable, with an initial upward trend, but a small dip at the last intervention session. Karen saw an initial and immediate

change in rate and, following a decline in the second intervention session, had an increasing trend throughout the rest of the condition. Cynthia and Karen utilized BSPS in 35.71% and 0.00% of fourteen baseline sessions, respectively. However, during intervention, both Cynthia and Karen's usage increased to 100% of the five intervention sessions, reflecting a striking increase in BSPS usage. Additionally, both teachers had zero overlap between conditions. Overall, Cynthia and Karen maintained their rate of BSPS within sessions and improved between sessions. Single subject effect size metrics for Cynthia yielded a PND of 100%, a PEM of 1.0, and a Tau-U of 1.00. Likewise, data for Karen generated a PND of 100%, a PEM of 1.0, and a Tau-U of 1.00. During follow-up, Cynthia delivered four BSPS, while Karen delivered three BSPS, indicating that they both maintained their performance after the intervention condition.

Integrity of BSPS Implementation

The integrity with teachers delivered each BSPS was concurrently measured with rates of BSPS during each phase of the study. Since teachers were not aware of what specific data were being gathered during baseline, the BSPS implementation integrity data (i.e., percentage of BSPS components implemented correctly) during this condition had a great deal of variability across all teacher pairs, with no clear trend or consistent pattern. If teachers were observed engaging in zero rates of BSPS during a session, the integrity data reflected zero components implemented correctly and were not factored into the average integrity score for that condition. Average integrity scores for each teacher per observation session are presented below in Table 5. A clear change in level was evident for all teacher pairs after the introduction of the professional development package, with less variability and consistent trends in the intervention condition. Details related to each teacher's data are discussed below.

Table 6

Average Integrity Score Per Session

Session	Sarah	Whitney	Tracy	Heather	Donna	Stacey	Cynthia	Karen
1	100	66.66	n/o	n/o	n/o	75.00	n/o	n/o
2	n/o	n/o	n/o	100	100	n/o	n/o	n/o
3	n/o	n/o	n/o	n/o	100	83.33	n/o	n/o
4	n/o	n/o	66.66	n/o	n/o	83.33	n/o	n/o
5	n/o	n/o	n/o	n/o	100	100	83.33	n/o
6	88.89	100	n/o	n/o	83.33	75.00	100	n/o
7	91.67	100	n/o	83.33	91.67	n/o	n/o	n/o
8	n/o	91.76	n/o	n/o	83.33	95.83	100	n/o
9	100	94.44	83.33	100	n/o	83.33	n/o	n/o
10	n/o	86.11	91.67	76.28	100	100	66.66	n/o
11	88.78	87.50	91.67	100	n/o	95.83	n/o	n/o
12	100	100	83.33	100	93.33	96.96	n/o	n/o
13	87.49	91.67	94.44	100	88.89	100	83.33	n/o
14	83.33	100	95.24	90.00	93.75	100	n/o	n/o
15	100	100	90.00	95.83	100	100	83.33	100
16	83.33	100	87.50	96.96	n/o	95.22	88.89	83.33
17	100	100	100	100	100	100	96.67	91.65
18	100	100	100	100	100	100	100	90.00
19	83.31	100	83.33	100	100	100	100	83.33
20	100	100	100	95.45	100	100	100	100

Note. n/o = not observed; all numbers are percentages of the six integrity components completed correctly by each teacher; dashed lines indicate condition change from baseline to treatment.

Sarah. At baseline, Sarah delivered one BSPS with 100% integrity. During intervention, Sarah delivered 26 BSPS, with integrity ranging from 83.31% to 100% for each individual BSPS. At follow-up, two BSPS were delivered with 100% implementation integrity. On average, she delivered BSPS with 92.84% integrity during intervention and follow-up.

Whitney. At baseline, Whitney delivered one BSPS with 66.66% integrity. Following intervention, Whitney delivered 67 BSPS, with integrity ranging from 86.11% to 100% for each individual BSPS, reflecting an average of 96.53%. At follow-up, six BSPS were implemented

with 100% integrity. Across intervention and follow-up conditions, Whitney averaged 96.76% implementation integrity.

Tracy. Tracy delivered one BSPS with 66.66% integrity at baseline. During intervention, Tracy delivered a total of 37 BSPS, with integrity ranging from 83.33% to 100%. At follow-up, nine BSPS were implemented with 100% integrity. Tracy delivered BSPS with 91.71% integrity, on average, throughout intervention and follow-up.

Heather. Heather delivered three BSPS during baseline, with an average of integrity score of 91.67%, with scores ranging from 83.33% to 100%. After intervention, Heather provided 72 BSPS, with integrity ranging from 76.28% to 100%. Follow-up data indicated a 100% integrity score for 11 BSPS. On average, Heather implemented BSPS with 95.87% integrity for intervention and follow-up conditions.

Donna. At baseline, Donna provided 11 BSPS with an average integrity score of 94.05%, with scores ranging from 83.33% to 100%. During intervention, Donna delivered 35 BSPS, ranging from 88.89% and 100% integrity; at follow-up, her delivery was 100% for seven BSPS. Donna averaged an integrity score of 97.00% across intervention and follow-up conditions.

Stacey. At baseline, Stacey delivered 24 BSPS with an average integrity score of 87.96%, ranging from 75% to 100%. During intervention, Stacey provided 69 BSPS, with integrity scores ranging between 96.22% and 100%. At follow-up, Stacey delivered five BSPS with 100% integrity, yielding an overall average of 99.13% across intervention and follow-up conditions.

Cynthia. At baseline, Cynthia delivered five BSPS with an average of 86.67% integrity, with scores ranging from 66.66% to 100%. During intervention, Cynthia delivered 20 BSPS,

with integrity ranging from 83.33% to 100%. Four BSPS were delivered in follow-up with 100% integrity. On average, BSPS were delivered with 94.82% integrity during intervention and follow-up.

Karen. Karen delivered zero BSPS during the baseline condition. Following intervention, Karen delivered 17 BSPS, with integrity ranging from 83.33% to 100%. During follow-up data collection, Karen delivered three BSPS with 100% integrity. On average, Karen delivered BSPS with 91.39% integrity for intervention and follow-up conditions.

Interobserver Agreement

As mentioned previously, IOA data were collected for 33% of randomly selected data collection sessions per teacher and/or pair for each condition of the study (i.e., baseline, intervention, and follow-up). IOA was calculated using an interval agreement formula wherein each calculation divided the total number of agreements of BSPS by the total number of agreements plus disagreements, multiplied by 100%. IOA was calculated for teacher rate of BSPS (98.89%), type of BSPS (i.e., behavioral, academic, or social; 92.91%), setting in which BSPS occurred (i.e., one to one, small, or large group; 91.49%), and the integrity of BSPS delivery (97.20%). For a breakdown of IOA results by participant and dependent variable, please see Table 6.

Table 7

IOA by Participant and Dependent Variable

	Sarah	Whitney	Tracy	Heather	Donna	Stacey	Cynthia	Karen
Rate	100%	100%	100%	95.45%	100%	100%	100%	100%
Integrity	100%	100%	97.14%	97.73%	100%	88.64%	100%	100%
Average	100%	100%	98.57%	96.59%	100%	94.32%	100%	100%

Fidelity of Treatment

Checklists covering each element of the study from baseline through follow-up conditions measured the primary researcher's fidelity of implementation. This was done to ensure that the intervention was implemented as intended across settings, people, and materials. The second trained observer engaged in random observations of the primary researcher and completed the corresponding condition's checklist. Fidelity of treatment checklists were scored for 33% of all sessions across all phases in order to be consistent with single-subject research design standards (Kratochwill et al., 2013). Based on the data from these checklists, the primary researcher adhered to implementing all elements of the study with 100% fidelity.

Social Validity

Participant responses to the social validity questionnaire are summarized by means and medians in Table 7. Medians are reported because they are a more accurately reflect central tendency with ordinal data. The survey was distributed to participants after all data collection was completed via an email with an embedded link sent by the primary researcher. Participants were informed that responses would remain anonymous. All eight participants used a Likert Scale to rate their agreement with each of the 10 items (1 = strongly disagree to 5 = strongly agree). Additionally, one short-answer item was included; however, only one participant provided a response.

The highest level of agreement among participants was the importance of using BSPS in their classroom ($M = 4.38$), ease of BSPS use ($M = 4.38$), and preference for an ongoing, active format for the professional development ($M = 4.25$). Participants rated video modeling as a valuable tool for educators ($M = 4.00$) as well as indicated the practice and feedback portion of the intervention as helpful ($M = 4.00$). Items with low ratings were related to observed student behavior; positive changes observed in student behavior while using BSPS ($M = 3.88$) and noticed a decrease in disruptive student behavior while using BSPS ($M = 3.63$). With regard to the video modeling intervention, participants provided low ratings, on average, for video modeling assisting in the implementation of BSPS ($M = 3.63$) and being more likely to use BSPS in the classroom after receiving video modeling ($M = 3.75$).

One participant provided a response to the open-ended item asking about other thoughts related to use of BSPS in the classroom. Her response is as follows: "The video modeling as well as the active format of the intervention allowed me to be more aware of using BSPS in my classroom on a daily basis. I am now more aware of using BSPS in my classroom and have seen a change in my teaching and delivery. As a result, I have observed a positive change in my students [*sic*] behaviors and actions."

Table 8

Participant Responses to Social Validity Questionnaire Items

Item	*M*	Median	Range
1. Using BSPS in my classroom is important.	4.38	5	1 – 5
2. After the video modeling intervention, I was more likely to use BSPS in my classroom.	3.75	4	1 – 5

3. The video modeling intervention assisted me in implementing BSPS.	3.63	4	2 – 5
4. The practice and feedback portion of the intervention was helpful.	4.00	5	1 – 5
5. I prefer the ongoing, active format of this intervention.	4.25	5	1 – 5
6. BSPS is easy to use.	4.38	5	1 – 5
7. While using BSPS, I saw a decrease in disruptive student behavior.	3.63	3.5	2 – 5
8. While using BSPS, I saw a positive change in student behavior.	3.88	4	2 – 5
9. Video modeling is a useful tool for teachers to learn skills.	4.00	4	2 – 5
10. I would recommend the use of video modeling as part of a professional development package to others.	4.00	4	2 - 5

Note. Likert Scale responses for teachers (n = 8). Responses ranged from 1 = Strongly Disagree to 5 = Strongly Agree. Does not include one open ended item.

Together, the present study employed the evidence standards for single-subject design put forth by Kratochwill et al. (2013) as well as provided evidence for a functional relation between the implementation of the professional development package and an overall increase in teacher rate of BSPS for all participants. Further, the data provide support for a functional relation between the professional development package and treatment integrity of BSPS implementation.

Chapter Five

Conclusions, Discussion, and Implications

The implementation of evidence-based strategies such as behavior-specific praise statements (BSPS) in classrooms is of critical importance, not only to satisfy federal mandates that require their use, but also to bolster students' academic, behavioral, and social successes, and support teachers in effective classroom management strategies. As more and more students with disabilities are integrated into the least restrictive environment, namely general education classrooms, the need for teachers to incorporate such evidence-based practices is even more urgent. Educator professional development has been identified as the vehicle by which the transmission of evidence-based practices into classrooms is facilitated (Borko et al., 2008; Darling-Hammond & Richardson, 2009; Desimone, 2011; Higginson & Chatfield, 2012). However, what we know to be true of effective professional developments, namely their delivery over time rather than via one-shot workshops as well as participant opportunities for feedback and practice, are not what is being applied across the country (Desimone, 2011; Garet et al., 2001; Simonsen et al., 2013). Rather, these proven effective components are delivered in isolation or omitted entirely.

In this chapter, the researcher states the conclusions derived from the data, discuss how they fit into the literature, and then draws implications for practice and additional needed research. Limitations and future directions for research are also discussed.

Conclusions

The present study sought to create a professional development series that was delivered in an ongoing format, incorporated the evidence-based strategy of video modeling to support teachers in the implementation of yet another evidence-based strategy, BSPS, and provided participants with several opportunities for feedback and practice. Two primary research questions guided the investigation. First, did a functional relation exist between the professional development package incorporating video modeling and the rate of BSPS used by general education educators? Results from the current study revealed that each of the eight participants increased her rate of BSPS delivery from baseline to intervention conditions, with seven of the eight teachers more than tripling their rates. Further, teachers not only delivered more BSPS on average per observation session, but also varied the type of BSPS (i.e., academic, behavioral, social) and setting (i.e., one to one, small group, large group) in which they were given. These changes, which were immediately evident after the intervention was implemented, provide evidence to support a functional relation between the professional development package and teacher rate of BSPS. Next, the study examined whether a functional relation existed between the professional development package incorporating video modeling and increased level of educators' treatment integrity of BSPS implementation. Findings from the study suggest that a functional relation, while not as strong as the one between the intervention and rate of BSPS, was evident. Integrity data gathered via a six-item integrity checklist indicated improvement among all teachers, with six teachers' integrity scores improving by at least 50 percentage points (e.g., on average, Heather delivered BSPS with 22.92% integrity during baseline and with 96.28% integrity during intervention). Moreover, at follow-up, all teachers delivered BSPS with over 95% integrity, on average. In addition to the primary research questions, social validity ratings

were gathered regarding teachers' perceptions of video modeling as a component within a professional development package as well as how teachers rated BSPS as an effective strategy for classroom management. Teachers provided satisfactory ratings of video modeling as a tool to facilitate skill acquisition and would recommend video modeling as an acceptable medium for professional development delivery. To a lesser degree, teachers also indicated the video modeling component assisted in their implementation of BSPS in the classroom.

Together, the findings from the two primary research questions indicate that there was a meaningful and lasting change in participants' performances from baseline to intervention conditions for the duration of this study, wherein all participants increased their overall rates of BSPS and delivered BSPS with improved integrity. In single-subject research designs such as the present study, the presence or absence of a functional relation implies a causal interaction between the independent and dependent variables, and thus provides evidence about the effectiveness of the intervention. Unlike statistical significance in group studies, functional relations do not rely upon large sample sizes. Rather, single-subject research examines observed changes in participant behavior prior to, during, and following a particular intervention. The presence or absence of functional relations is determined by visually analyzing the data for level, trend, variability, consistency or pattern, latency of change, and overlap (Alberto & Troutman, 2013; Cooper et al., 2007).

Rate of BSPS. In the present study, there was not only an immediate increase in teacher rate of BSPS following the introduction of the professional development package, but also a marked improvement in the integrity of BSPS implementation, which continued throughout the study. Thus, the data indicated a functional relation between receipt of the professional development package and an increase in all teachers' rates of BSPS. Seven out of eight teachers

demonstrated over three times more BSPS per intervention observation session after initial delivery of the professional development package relative to their baseline BSPS rates, with two teachers' intervention BSPS rates over six times greater than their baseline rates.

Treatment integrity. Educator professional development must not only focus on well-established evidence-based practices, but must also provide equal weight to the integrity with which such practices are implemented in the classroom. The present study sought to create a professional development intervention for classroom teachers that not only increased their use of BSPS, but also improved the quality with which BSPS were delivered. In essence, this study aimed to examine treatment integrity in two ways. First, it was assessed within the scope of the research question about whether the professional development improved teacher BSPS implementation integrity. Second, it was done by determining the extent to which the professional development was delivered in accordance with the standards for evidence-based interventions stated in the literature.

The data provided moderate support for a functional relation between the professional development package and improved treatment integrity of BSPS delivery. This suggests that one can assume, with reasonable confidence, that the observed changes in the participants' behavior related to BSPS implementation were a result of the professional development package to which they were exposed. In order to capture the integrity performance of each participant, direct observation data were averaged together across sessions. However, if a direct observation session yielded a zero rate of BSPS, that is, if there were no occurrences of BSPS for the duration of the observation, the integrity score for that session reflected zero percent integrity implementation, and was not factored into that teacher's overall average performance. As expected, zero rates of BSPS occurred quite commonly throughout the baseline condition;

specifically, 50 out of the 76 total baseline observation sessions yielded a zero rate, compared to just three out of the 76 observation sessions in the intervention condition. It is important to keep this consideration in mind when visually analyzing these data, because zero rates affect the analyses and, subsequently, the interpretations that can be made.

First, because the current study was conducted via a multiple baseline across participants design, one must consider the number of opportunities (i.e., observation sessions) each teacher/teacher pair had in which to engage in BSPS during each condition. Some teachers had as few as five baseline or intervention observation sessions, whereas others had as many as fourteen. Together, varying numbers of observed opportunities to engage in BSPS along with very low overall baseline rates of BSPS for all teachers produced highly variable, inconsistent data, which does not accurately portray performance across conditions. For example, out of five total baseline sessions, Sarah utilized just one BSPS, which was delivered with 100% integrity. During intervention, she increased her overall rate to 26 BSPS over 14 sessions, with an average integrity score of 92.24%. At first glance, it appears that Sarah's integrity score declined over time; however, this interpretation would be erroneous. Sarah not only became more consistent in her delivery of BSPS, providing at least one BSPS 85% of the time (i.e., 12 out of 14 sessions), but she also consistently provided BSPS with integrity scores ranging from 83.31% all the way up to a perfect score of 100% across five different observation sessions. It is also important to mention that the variability evident in the beginning of Sarah's intervention phase may be a sign of her skills coming under proper stimulus control. That is, Sarah was able to perform the skill; however, her performance of the skill was not yet operating under specific conditions that make it more likely for her to use praise (e.g., a student sitting with a hand raised).

Next, the highly variable BSPS rate data during baseline resulted in a great deal of overlap between conditions when examining treatment integrity. As stated previously, the analysis of single-subject data must consider multiple aspects in addition to overlap, such as level, trend, immediacy of change, as well as variability and consistency among the data. Upon analyses of the treatment integrity data, it is clear that despite the highly volatile baseline, all participants had positive gains during the intervention and follow-up conditions. While integrity scores in baseline ranged from 0% to 100%, with an average of 67.45% for all participants, integrity scores during the intervention condition were vastly different with an average of 94.34% integrity across all participants (range 87.08% to 99.32%). A very clear demarcation was also evident for all teacher pairs upon the introduction of the intervention, thereby suggesting that the professional development package contributed to the teacher pairs' improved integrity with which BSPS were implemented. This is further supported by the level, or mean performance of participants, particularly, Whitney, Erin, Stacey, and Cynthia, who respectively had five, eight, eleven, and fourteen baseline sessions. These teachers demonstrated not only consistent patterns in their data, but also either stable or upward trends in their integrity scores during intervention. Karen and Tracy, with fourteen and eight baseline sessions, demonstrated improved overall integrity scores, but had BSPS integrity scores of 83.33% during the final intervention observation relative to previous scores up to 100% integrity. In the case of Donna, who demonstrated marked variability in BSPS implementation integrity over the course of eleven baseline sessions, received 100% integrity scores during four of eight intervention sessions. However, her intervention data were marked by the presence of one outlier (i.e., zero rate of BSPS, hence zero integrity score during one intervention session). Positively, Donna's performance leveled off and was consistent throughout the remaining three intervention sessions.

Sarah utilized just one BSPS with 100% integrity over the course of five baseline sessions; during intervention, her BSPS implantation integrity was highly variable, with two zero rate outliers, yet her performance became more predictable toward the end of intervention. Taken together, the duration of baseline versus intervention sessions did not appear to factor into performance on BSPS implementation integrity during intervention.

Broadly speaking, during baseline, integrity scores for observed BSPS were highly variable and ranged from 66.66% to 100%; however, during intervention, integrity scores improved overall, ranging from 76.28% to 100%. Additionally, stability in these data among all participants was evident toward the end of the intervention condition. Notably, four participants delivered BSPS during intervention with an average of greater than 95% integrity. Thus, within the scope of the research question about whether or not the professional development improved teacher BSPS implementation integrity, the data lend support for the presence of a functional relation. Additionally, factors such as the ongoing nature of the intervention and the use of fidelity checklists to monitor the primary researcher's consistency were critical components for delivering an intervention with integrity. The integrity with which the researcher applied the intervention in accordance with the standards for evidence-based interventions stated in the literature may have contributed to these positive BSPS implementation integrity results.

Social validity. In addition to the positive findings related to rate and integrity, the participants also rated the professional development package as acceptable and meaningful to their classroom teaching experiences via an anonymous social validity questionnaire. The intent of collecting social validity data is to gauge participant satisfaction with an intervention (Cooper et al., 2007). By anonymously soliciting the opinions of individuals intimately involved with the intervention, one may draw conclusions about how meaningful it was to the participants. Those

in the present study overwhelmingly acknowledged BSPS as an important strategy to implement in their classrooms, and, equally, that they were more likely to use BSPS because they are simple and may be delivered quickly (i.e., does not slow down instructional time). On the other hand, participants gave the lowest ratings with respect to observed student behavior change, namely a decrease in disruptive student behavior and/or a positive change in student behavior while implementing BSPS.

Discussion

It is well documented throughout the literature that educators benefit from professional development delivered in an ongoing fashion (Desimone, 2009, 2011; Tournaki et al., 2011), yet such a format demands a prolonged time commitment from educators, for whom time is arguably the most valuable resource. In order to integrate the need for ongoing professional development opportunities with reduced stress on resources, the present study employed video modeling due to its proven utility as a time and cost efficient means of facilitating learning (Rosales et al., 2015; Weldy et al., 2014). Additionally, the selection of BSPS as the dependent variable was purposeful due to its simplicity and portability as a strategy that may be delivered to students immediately, while utilizing just seconds of instructional time. The combination of video modeling with BSPS in the present study intended to capitalize on teacher time, both during the professional development sessions and within the classroom. On average, teachers spent 90 to 110 minutes actively engaged in various components of the study. While "one-shot" workshops may vary in length, the common factor among them is the delivery of information without follow-up or feedback regarding participants' acquisition of the skill(s) or information (Desimone, 2011; Sherin & Han, 2004). Despite the relative overall brevity of the present study with regard to average participation time, the ongoing nature of its delivery allowed teachers to

receive feedback related to their performances and develop skill delivering BSPS at increased rates and with improved integrity.

Rate of BSPS. In the present study, all teachers' rates of BSPS increased between baseline and intervention conditions, with all teachers maintaining increased levels of performance at follow-up. Notably, Stacey and Heather had the largest increases in BSPS rates between baseline and intervention: Stacey's rate increased by 6.44 BSPS per session and Heather's rate increased by 6.17 BSPS per session. Stacey and Heather were also the only participants who reported completing special education coursework during their academic training. While all educators are prepared to be knowledgeable in content, pedagogy, and general classroom management, special educators receive specialized coursework and field placements specific to implementing various behavioral interventions (Morewood & Condo, 2012). Prior experience in special education could have contributed to these impressive gains because evidence-based strategies such as BSPS are more prominent in special education settings and special educators are generally more versed in attending to desirable behaviors they hope to see increase. As such, these tailored experiences with behavioral interventions may account, in part, for the overall higher rates and largest gains observed from baseline to intervention by Heather and Stacey, relative to their strictly general educator counterparts.

Regardless of one's positions as a special or general educator, research has indicated the teaching profession is a high-stress career, with main sources of stress stemming from the need to maintain behavior management in the classroom as well as factors related to high workloads mixed with time constraints (Klassen & Chiu, 2010; Kyriacou, 2001). Although the literature is saturated with evidence about the positive effects BSPS can impart on a classroom, specifically with regard to its usefulness for maintaining behavior management, it has been documented that

it remains a widely underutilized strategy (Allday et al., 2012; Brophy, 1981; Cook, 2001; Marchant & Anderson, 2012; Sutherland et al., 2000). BSPS not only provide students with immediate feedback regarding their behavior, but can also improve the overall climate of a classroom by reducing disruptive behaviors, while increasing desirable ones (Hawkins & Heflin, 2011). Reduction of disruptive or maladaptive behaviors allows for teachers to spend more time on instruction and provides more opportunities for student responses, thus fostering healthy relationships between teachers and students. Further, Närhi and colleagues (2015) concluded that by utilizing BSPS to reduce the frequency of maladaptive classroom behaviors, teacher stress was subsequently lowered, allowing teachers to focus on instruction while maintaining a positive classroom environment.

Teachers' levels of stress are linked to their degrees of self-efficacy with an inverted U relationship, wherein stress is highest and self-efficacy is lowest during the first years of teaching (Klassen & Chiu, 2010). Klassen and Chiu found that as years of experience increase up to approximately 23 years, stress steadily decreases and self-efficacy steadily increases. When years of experience exceeds the 23-year mark, the relationship becomes inverted, wherein stress begins to steadily increase while self-efficacy steadily decreases. The teachers in the present study ranged from having five to twenty-seven years of experience and therefore varying levels of stress and self-efficacy. As such, one may conclude that the teachers with the fewest years of experience and, thus, highest stress levels, would benefit most from utilizing a strategy such as BSPS in an effort to combat stress. However, those same teachers with the highest stress levels are not expected to perform well based upon longstanding research related to the Yerkes-Dodson law (Lens & de Jesus, 1999; Yerkes & Dodson, 1908), wherein there is an inverted U relationship between level of stress and an individual's performance on a task.

According to Yerkes-Dodson (1908), very low and very high levels of stress result in the poorest performances, whereas moderate levels of stress result in the best performances on a task. Taken together, teachers in the present study with very few years of teaching experience (i.e., Stacey with five years of experience) and between 21 and 27 years of experience should theoretically have the highest and lowest stress levels, respectively, and thus the poorest performances delivering BSPS. In contrast, the teachers with between five and eighteen years of experience hypothetically have moderate, or optimal, levels of stress, which has been shown to stimulate and enhance performance on a task (Palethorpe & Wilson, 2011; Yerkes & Dodson, 1908). Therefore, those teachers would be expected to demonstrate the highest rates of BSPS.

Four teachers in the present study performed consistently with these expectations. Karen, with 24 years of experience, was expected to have the lowest stress and therefore not demonstrate high performance when learning a new skill. She only delivered 3.40 BSPS per intervention session, on average, which was the third lowest rate overall. Whitney and Donna with 26 and 27 years of experience, respectively, as well as Heather with 15 years of experience, were expected to have moderate stress levels (Palethorpe & Wilson, 2011; Yerkes & Dodson, 1908) and therefore demonstrate optimal performance delivering BSPS. In fact, they ranked second, third, and fourth overall with regard to average number of BSPS per intervention session, with Heather at 6.54, Whitney at 4.79, and Donna at 4.38 BSPS. It is also important to note that Donna's average performance could have been higher, but was pulled down by the occurrence of an intense student tantrum throughout the entirety of one observation session, during which time zero BSPS were delivered. Notably, BSPS delivery could have been most beneficial to counter the disruptive behavior (Sutherland et al., 2000). With that data point

removed, Donna's average rate of BSPS across intervention sessions increased to 5.14, which would have ranked her at the third highest in rate, overall.

The remaining four teachers did not perform consistently with expectations per the Yerkes-Dodson law. For example, Stacey had, by far, the fewest years of teaching experience at 5 years and was expected to have the highest level of stress and therefore the worst performance. However, her performance exceeded that of all her teacher counterparts, with an average of 8.63 BSPS per intervention session. Likewise, Tracy and Sarah with 13 and 18 years of teaching experience, respectively, were expected to perform optimally, but delivered 3.36 and 1.86 BSPS per intervention session, on average. These were the two lowest rates observed. Finally, Cynthia was expected to deliver some of the lowest rates of BSPS due to her 21 years of teaching experience and therefore low stress levels, but demonstrated 4.00 BSPS per intervention session, on average, which was the fourth lowest rate overall.

In addition to the relationship between teacher stress and years of teaching experience, teacher stress is also directly related to the presence of disruptive or problem behaviors (Kyriacou, 2001). While no classroom is immune from behavior problems, there is research to support that earlier elementary grade levels are wrought with more frequent emotional and behavioral outbursts, as these classrooms are composed of less experienced students just beginning to build language and emotional self-regulating skills (Caldarella, Williams, Hansen, & Wills, 2015; Egger & Angold, 2006). Likewise, there is research that indicates BSPS positively affect younger students' behaviors (Hawkins & Heflin, 2011; Van Acker & Grant, 1996). Therefore, it is expected that because Kindergarten, 1st and 2nd grade teachers may experience higher rates of disruptive behaviors in their classrooms, they would engage in higher rates of BSPS than teachers from upper grades. As mentioned, younger students tend to have

less developed self-regulation and, thus, are likely to exhibit higher rates of disruptive behaviors than their older counterparts.

Consistent with this notion, 3rd and 4th grade teachers, Tracy and Sarah, respectively, utilized lower rates of BSPS overall, while Kindergarten and 1st grade teachers, Heather and Stacey, respectively, engaged in the highest rates of BSPS. However, Whitney, who taught 4th grade, engaged in the third highest rate of BSPS out of the eight teachers and increased her rate by over four BSPS per observation session between baseline and intervention, which was unexpected because students in her classroom should theoretically exhibit fewer disruptive behaviors and require fewer BSPS to maintain a positive classroom environment. Further, Karen, who taught Kindergarten, delivered the lowest rates of BSPS in the present study, despite the expectation that her classroom would require higher rates of BSPS due to the presence of higher rates of disruptive behaviors associated with young students' less well-developed self-regulatory and language skills. What is more, Karen had an extremely high percentage of males in her classroom (71.43%), who, according to Fagot and Leve (1998), are generally more likely to display higher levels of disruptive externalizing behaviors such as noncompliance and aggression. Together with the expectations put forth by Caldarella et al. (2015) and Egger and Angold (2006) regarding younger students engaging in more frequent disruptions, Karen was expected to deliver some of the highest rates of BSPS observed, yet she did not.

In sum, a functional relation between rate of BSPS and the professional development package is supported by the data from the current study. However, while average rates of BSPS increased over the course of the study, some observations are worth nothing. Having received special education coursework may have better prepared Heather and Stacey to implement BSPS at higher rates than the participants without such preparation. Additionally, the overall increase

in BSPS rates may not be attributed to a clear pattern between years of experience and rates of BSPS, as predicted by the Yerkes-Dodson law (1908). Similarly, there were no consistent pattern related to the notion that younger grade level teachers would employ BSPS more often than teachers of older students due to the expectation for higher rates of disruptive behaviors in younger grade levels.

Treatment integrity. In order to discuss the integrity with which the current professional development was implemented, it is helpful to consider the ways in which it fits into the conceptual framework of integrity presented by Dane and Schneider (1998). Tracing back to their conceptual framework for treatment integrity, the process, or how well an intervention is implemented, may be examined via categories known as quality of delivery and participant responsiveness. Within the quality of delivery dimension of the present study, interventionist-specific factors such as the relationships fostered among the teacher participants, school-based administrator, and the interventionist, all contributed to a partnership-based model for the delivery of the professional development. These relationships encourage equal ownership over the intervention, thus leading to an increased likelihood that those involved would maintain the integrity of the intervention (Power et al., 2005; Wehby et al., 2012). Because the nature of the study's participant recruitment was voluntary, with participants stating their genuine intent to pursue additional professional development, it may be reasonably concluded that participant responsiveness was rather high. In the case of participant responsiveness, participants are more willing to implement an intervention as intended (Dane & Schneider, 1998). Results from the present study bolster this suggestion as indicated by extremely high integrity scores after receiving the professional development, averaging 92.09% across all participants, with such high scores maintained at follow up.

Specifically related to the content portion of the conceptual framework, adherence is the critical element responsible for how well the objectives of the professional development are implemented (Dane & Schneider, 1998). The present study utilized fidelity checklists corresponding to each condition in order to ensure that this element was fulfilled satisfactorily. Further, the exposure, or dosage of the intervention, was considered when examining the overall results. For an educator professional development to work well, it must be ongoing in nature (Desimone, 2009, 2011); thus, teachers must be exposed to multiple opportunities wherein content is presented and time is offered for practice and feedback. The professional development offered in the present study was originally intended to last at least an additional two or three weeks, which would have allowed for more frequent participant exposure; however, institutional review board (IRB) limitations restricted the duration of the study. Yet, despite its brevity, the robust findings indicate that the professional development package was effective with regard to both dependent variables. Suitably, this outcome corresponds to the final dimension of the integrity framework, program differentiation, wherein the most effective program components are identified and irrelevant aspects are filtered out. Thus resulting in a professional development that contains only requisite elements suited to the needs of the participants. The incorporation of video modeling may have bolstered the efficiency of the professional development, which is consistent with the results from Lavie and Sturmey (2002) and Weldy et al. (2014). These researchers provided professional development using video modeling aimed at helping teachers correctly implement preference assessments, or systematic inventories used to identify potential reinforcers for use with an individual's behavior program, in 60 and 80 minutes, respectively. Likewise, the present study utilized video modeling and produced favorable results across participants after receiving between 90 and 110 minutes of professional

development. Since the present study produced such promising results in a rather short period of time, less stress was placed on teacher resources, thus allowing teachers more time in the classroom with students. This outcome likely contributed in part to positive ratings related to teachers' self-reported acceptance of the professional development package.

Social validity. Lowest social validity ratings were related to teachers' observed changes in student behaviors, namely a decrease in disruptive student behavior and/or a positive change in student behaviors while implementing BSPS. This may be attributed to the abbreviated length of the professional development package, as mentioned above. Although the teachers' behaviors changed during intervention, marked by increased rates of BSPS and improved integrity scores, these changes spanned different durations for each participant because the intervention was introduced at different times (i.e., some participants were observed for five intervention sessions, whereas others had up to fourteen sessions). Had more time been permitted for the professional development series, teachers may have begun to more fluently deliver BSPS. Behavior change is rarely immediate and often quite difficult; thus, teachers with more years of teaching experience and prescribed teaching methods may require more time to acquire and begin implementing new skills. Subsequently, additional time would have permitted the potential to observe changes in student behavior. Future studies that seek to increase teachers' use of BSPS should consider this issue as some individuals may simply take longer to acquire such skills and move into fluent mastery.

Practical Implications

The present study extended the literature across video modeling, professional development, and treatment integrity of BSPS, three domains of great import to the field of education. Specifically, it expanded upon the use of video modeling with neurotypical adults in

professional development settings and added to the already rich literature base on the use of video in professional development (Sherin 2002, 2004; Sherin & van Es, 2005). The study's findings also lend support to the extant literature on elements of effective professional development, namely an ongoing format (Desimone, 2009, 2011; Goldschmidt & Phelps, 2010; Tournaki et al., 2011), which includes repeated practice opportunities (Borko et al., 2008; Coles, 2013; Darling-Hammond & Richardson, 2009) and performance feedback (Garet et al., 2001; Pelletier et al., 2010). Further, by monitoring the integrity with which BSPS were delivered and providing teachers with such specific feedback, teachers became more aware of how well they were able to deliver BSPS while recognizing their improvement throughout the course of the study. It is hoped that this study provides insights about the implementation of the evidence-based practice of BSPS in general education settings, with particular consideration for personnel servicing students with and without disabilities, and demonstrates the inherent value of these applied approaches to teachers.

Applied research involves the pragmatic application of scientific methodology to real world settings. When this dimension falls within behavior analytic research, it stresses the importance of addressing problems that hold social significance; that is, it asks whether or not an intervention produces a measurable change in an individual's behavior that is meaningful and enhances quality of life. In the present study, the aim was to develop a professional development that would embody the functionality of applied research and thus translate readily to real world settings such as general education classrooms nationwide. The extent to which the primary researcher interacted directly with the participants in the professional development was purposefully minimized (i.e., limited to the delivery of the overview session and facilitation of the video modeling sessions) because minimally invasive interventions more closely resemble

the types of professional developments that can be delivered and maintained within schools outside of the strict control of a research study. As intended, the goal was to produce a portable intervention, such that any trainee would be able to function in the same role as the primary researcher and yield the same results. Such a decreased reliance on the primary researcher would offer time and cost-saving benefits to schools if this professional development package were implemented on a larger scale, real-life setting. Further, one of the objectives of the professional development package was to improve the integrity with which teachers implement strategies like BSPS. Delivering evidence-based practices such as BSPS with high levels of integrity benefits teachers by reducing rates of student disruptions and increasing rates of expected behaviors. BSPS secondarily benefit students by providing clear expectations for expected behaviors, while benefiting teachers by decreasing rates of stress and burnout. Further, BSPS may provide prosocial ways by which students access teacher attention. Such benefits to teachers and students are best achieved when BSPS are delivered frequently and with integrity.

Future Research

Results from the present study as well as extant literature on educator professional development, video modeling, and BSPS all lend fodder to areas for future research. In general, additional research is needed on the use of video modeling with neurotypical populations, especially within general education settings. At the present time, there are few studies utilizing video modeling as a professional development tool for educators (DiGennaro-Reed, 2010; Hawkins & Heflin, 2011; Lipschultz et al., 2015; Vladescu et al., 2012). Further, these studies have employed mostly special educators or trained staff working in clinical settings. The present study broadens the research to include general educators who teach in classrooms that serve students with and without disabilities. This is of critical importance because the numbers of

students with disabilities being placed in the least restrictive environment steadily increases (NCES, 2013). However, educator professional development will need to continue to evolve and focus on how to narrow the research-to-practice gap between teacher implementation of strategies and enhanced student achievements. Future research should consider analyses on student behavior within the classroom and the ways in which evidence-based strategies influence them.

Future research should also investigate students' responses to BSPS in general education settings. Using student behavior as a dependent measure will add dimensions not only to the research on BSPS, but also on how general education students respond to an evidence-based strategy implemented with integrity. The results from the present study indicated teachers improved their rate and integrity of BSPS implementation; however, without gathering information related to student performance, these data alone do not capture the likely potential longevity of the intervention. That is, a behavioral contingency, wherein a behavior is temporally dependent on a stimulus that precedes it, may be fostered if the reduction of disruptive student behaviors served to reinforce teacher's BSPS delivery. Simply, if teachers were reinforced by a reduction of students' disruptive behaviors and/or an increase in desirable student behaviors resulting from BSPS, they may be more likely to implement BSPS in the future, thus bolstering the utility of BSPS in these settings. Therefore, if teachers saw positive improvement in their students' behaviors, social validity scores related to the student behavior and BSPS rate and implementation dimension may improve.

Of course, measurement of any participant behavior, particularly that of students, may be highly subject to reactivity; therefore, future research should explore the use of capturing data in such settings with unobtrusive measures, such as video technology. The use of unobtrusive

technology to capture participant data would mitigate observer-expectancy effects that were introduced in the current study. This would also facilitate more rigorous collection of IOA data since individuals are not bound by real-time observation sessions and factors that may compromise such data collection (e.g., environmental distractions, inability to see/hear participant clearly) could be paused, rewound, and/or slowed down with videos of observation sessions. Further, this would allow for the primary researcher to remove himself or herself from the implementation of the intervention and associated data collection, which was a source of bias in the present study.

It has been established in the professional development literature that continuous contact hours result in positive outcomes for teachers' acquisition and implementation of targeted skills (Desimone, 2011). As research in the area of video modeling as a vehicle for professional development grows, it would be of great value to conduct parametric analyses on the ideal number of video modeling clips required to achieve maximally positive results. Parametric analyses are experiments designed to investigate the differential effects of a range of independent variable values (Alberto & Troutman, 2013; Cooper et al., 2007); in this case, future research may examine dosage frequency and/or duration of video modeling clips. Since the time effectiveness of video modeling is widely accepted (Rosales et al., 2015; Weldy et al., 2014), information garnered from parametric analyses may lend additional support for the utility of video modeling. Further, this would contribute to the body of research on how to create effective and time efficient professional development.

Additionally, future research may be geared toward examining factors surrounding BSPS use from veteran teachers with greater classroom management experience versus more novice teachers. Since workloads, expectations, and levels of stress differ among years of experience,

research may seek to expand upon each of these factors. In particular, measures of teacher stress could be examined relative to BSPS use to determine if functional relations exist between the two variables. Further, the data may be considered in accordance with the Yerkes-Dodson (1908) law in order to explore for the possibility of relationships between teacher stress and other factors such as yeas of experience.

Limitations

As with all research, the present study is not without limitations. Foremost, the intervention was designed, implemented, and measured by the primary researcher, which inherently poses the risk for expectancy bias. While fidelity checks were conducted, IRB guidelines did not allow another trained individual to implement the intervention, which would have countered such effects. Additionally, the number of professional development sessions granted, which was set by the school county's IRB, was five fewer than the eight-sessions requested by the primary researcher. Further, the primary researcher and the principal of the school site agreed that all data collection and teacher participation would be completed before the state-wide standardized testing review began in early spring 2016, leaving a window of just six weeks. Taken together, had more sessions been permitted over a longer period of time, the professional development may have more closely resembled the suggested duration of at least 20 contact hours for ongoing professional development put forth in the literature (Desimone, 2011). Additionally, a longer timeline would permit more robust data collection, including an opportunity to extend baseline conditions if needed. This would have held particular significance for Stacey because her baseline condition ended on an upward trend. As stated previously, ending on an upward trend may be problematic as it is unknown whether or not her rate of BSPS would have continued to climb or stabilize prior to the introduction of the

professional development. With respect to the social validity findings, more professional development sessions over a longer period of time may have allowed teachers to become more fluent in their delivery of BSPS and possibly see or become more aware of positive changes in student behavior. However, such a relationship between the duration for which teachers received the intervention (e.g., five vs. fourteen intervention sessions) and teachers' social validity ratings is not possible due to the anonymity of the questionnaire. Further, participant time limitations (i.e., before and after school) as well as competing professional development responsibilities did not allow for randomization of participant pairings, which were organized by convenience based upon teacher availability. If randomization were possible, it would have enhanced internal validity by offsetting any concern regarding selection biases.

Multiple baseline designs inherently require participants to enter into the intervention condition at different points in time, and consequently, there is concern for diffusion of treatment. This was of particular concern in the present study because all participants were recruited from the same school site. Moreover, the school site had a small staff population and all of the teachers were familiar with one another. Therefore, regardless of the primary researcher asking participants to maintain discretion regarding study elements and procedures at the outset of their participation, there is no certainty that participants did not discuss any portions of the study amongst themselves.

Further, single-subject designs such as a multiple baseline designs are flexible in the sense that they allow researches to be responsive to participants' behaviors through continuous measurement of the dependent variable. Data gathered throughout a study is used to guide the intervention; if a participant is not responsive to the independent variable, this signals to the researcher that an adjustment may need to be made. This is beneficial to both the researcher, by

providing immediate feedback regarding specific aspects of the intervention that may be more or less effective, as well as to the participant, by providing targeted instruction or training in areas of apparent need based upon observed performances (Howard, Best, & Nickels, 2015). Throughout the present study, data collected after each session were graphed and specific attention was paid toward the type of BSPS delivered (i.e., academic, behavioral, or social) as well as the group to whom the BSPS were delivered (i.e., one-to-one, small group, or large group). For example, if a teacher was lagging in a certain area (e.g., not delivering any social BSPS), the primary researcher planned for the next video modeling session to include examples of social BSPS. While this practice upholds the flexibility allowed within single-subject research, it also poses limitations in that participants across different teacher pairs were exposed to different video modeling clips.

Direct observation of participant behavior, as commonly occurs in single-subject research, is a defining feature of applied behavior research (Cooper et al., 2007). Notably, there is a known limitation associated with direct observation referred to as participant reactivity, wherein individuals alter their behavior in response to the awareness of being observed (Kazdin, 1979; Liang, 2015). The primary researcher made efforts to reduce the degree of participant reactivity by being as minimally invasive as possible within the physical context of the classroom. In an effort to reduce anxiety and/or general discomfort about being observed in their classrooms, the primary investigator assured all teachers that no data would be shared with the principal or any other individual not directly related to the study. However, observer-expectancy effects remained a prominent limitation because the primary researcher gathered the data herself. Such observer-expectancy effects may bias results wherein a researcher may consciously or unconsciously communicate his or her expectation of the study outcome to participants

(Rosenthal, 1966). The primary investigator may have served as a discriminative stimulus to signal participants to change their behaviors during the intervention condition in response to her presence thereby potentially inflating rates of BSPS and/or improved integrity of BSPS implementation. This influence is nearly impossible to avoid unless an unbiased individual (e.g., not the primary researcher) collected data, which was not possible in the present study due to time constraints and IRB parameters.

At the outset of the study, Tracy indicated to the primary researcher that she felt nervous about having her teaching observed. This inherently could have affected data collected on her performance, particularly in the beginning of the study when she was more unfamiliar with the primary researcher. As always, participant reactivity is a legitimate concern (Liang, 2015), despite the fact that the researcher and trained observer limited their presence (with respect to location and duration), in the classrooms. As a result of the limited timeline afforded for the study, the researcher and trained observer did not have extended time to spend in the classrooms to familiarize themselves with the teachers and students. As previously mentioned, the most evident concern when the primary researcher went in to collect data was that she may have inadvertently prompted the teacher to display the desired target behaviors (i.e., increased rate/treatment integrity of BSPS). It is recommended that, whenever possible, video be used to capture participant data because it is an unobtrusive measure that ameliorates effects resulting from reactivity. Unfortunately, IRB approval was not obtained for the use of recording devices in the classroom due to the likelihood for concerns regarding student confidentiality.

Teachers' prior teaching histories and years of experience may have also affected the ways in which they implemented BSPS in the classroom. The most novice teacher (Stacey, with five years of experience), demonstrated the highest rates of BSPS, both at baseline and

intervention, as well as the highest levels of integrity, likely due to a lower level of stress evident for most newer teachers (Närhi et al., 2015). Further, Närhi and colleagues noted that lower levels of stress and burnout may motivate individuals to enhance their skills. On the other hand, veteran teachers have greater experience with classroom management and may be more skilled in balancing the vast amount of responsibilities placed upon them as educators. Finally, and perhaps most importantly, the study only focuses on teachers' behaviors and ignores students' behaviors. A subsequent examination of students' responsive behaviors to BSPS delivered with integrity may provide more robust understanding about the role BSPS play in student achievement and extend knowledge about the benefits of this evidence-based strategy to both students and teachers. It is important to keep in mind that single-subject design of the present study was intended to examine a small group of individuals in a small scale manner in order to make informed judgments about video modeling professional development as an intervention. As such, the nature of this single-subject design is not intended to generalize to the larger population. Rather, external validity may be accomplished via study replication.

Appendix A

IRB Approval

Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 6D5, Fairfax, Virginia 22030 Phone: 703-993-5445; Fax: 703-993-9590

DATE: November 18, 2015

TO: Gary Galluzzo

FROM: George Mason University IRB

Project Title: [813011-3] Professional Development with Video Modeling: Effects on Behavior Specific Praise in Inclusive Classrooms

Reference:

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED

APPROVAL DATE: November 18, 2015

EXPIRATION DATE: October 20, 2016

REVIEW TYPE: Expedited Review

Thank you for your submission of Amendment/Modification materials for this project. The George Mason University IRB has APPROVED your submission. This submission has received Expedited Review based on applicable federal regulations.

Please remember that all research must be conducted as described in the submitted materials.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by the IRB prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to the Office of Research Integrity & Assurance (ORIA). Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed (if applicable).

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the ORIA.

The anniversary date of this study is October 20, 2016. This project requires continuing review by this committee on an annual basis. You may not collect date beyond this date without prior IRB approval. A continuing review form must be completed and submitted to the ORIA at least 30 days prior to the anniversary date or upon completion of this project. Prior to the anniversary date, the ORIA will send you a reminder regarding continuing review procedures.

Please note that all research records must be retained for a minimum of five years, or as described in your submission, after the completion of the project.

If you have any questions, please contact Karen Motsinger at 703-993-4208 or kmotsing@gmu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.

Appendix B

Direct Observation Data Sheet for Rate and Integrity

Teacher ID:												**Date:**
Observer:												**Time (range):**
Behavior Specific Praise Statements: any audible, specific verbal feedback delivered by a teacher to student(s) w/in 5 seconds of student behavior (**S**ocial/ **B**ehavioral/ **A**cademic) that explicitly describes the behavior being praised. -Mark ***S/B/A*** for social/behavioral/academic, respectively, for each occurrence of BSPS delivered in the corresponding column. Mark + or - for each integrity element corresponding												
Frequency	**1 to 1**	**Small Grp (2-9 students)**	**Large Grp (>10 students)**		**(1) BSPS delivered w/in 5s of target bx(s)**	**(2)BSPS contingent upon observable bx(s)**	**(3) BSPS positive/affirming**	**(4) Teacher torso/head oriented toward target student for BSPS delivery**	**(5) BSPS stated audibly**	**(6) BSPS 'received*' by target student**	**% accuracy**	
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
Totals/Time					***'Received' indicated by student making eye contact, orienting body/face toward the teacher, nodding, or engaging in any other affirming behavior.**							
S	**/**											
B	**/**											
A	**/**											

Appendix C

Demographic Questionnaire

Please provide the following information:

1. Teacher Name: _____

2. Gender: F / M

3. Age: ____

4. Ethnicity: _____

5. Degrees completed:

_____

6. Years of teaching experience: _____

7. Please describe your previous teaching experience (e.g., general education, special education, private school, etc.)

_____

_____

_____

8. In what kind of classroom do you currently teach? General Ed / Special Ed / Inclusion

9. What grade level do you currently teach? ____

Appendix D

Informed Consent

Professional Development with Video Modeling: Effects on Behavior Specific Praise in General Education Classrooms

INFORMED CONSENT FORM

RESEARCH PROCEDURES
This research is being conducted to examine how professional development utilizing video modeling affects the rate at which educators deliver behavior specific praise statements (e.g., "Good job raising your hand before speaking!") in their general education classrooms. If you agree to participate, baseline data points on rate of BSPS and how well it is implemented will be taken via scheduled observations in your classroom. You will be asked to participate in a series of 3-5 very brief (15-minutes) professional development workshops, actively engage in role-play practice, and receive specific feedback about your performance. A researcher or trained observer will follow up with you in your classroom 2-3 times per week for 3-5 weeks to collect data on your rate of BSPS during and post the professional development intervention. Demographic data will be collected from you via a questionnaire at the outset of the study. Information regarding your overall opinion of the professional development will be gathered via a questionnaire at the end of the study. Total duration of your participation in the professional development is anticipated to be roughly 90 minutes.

RISKS
There are no foreseeable risks for participating in this research.

BENEFITS
There are no direct benefits to the researcher; however, this project will expose you to professional development and strategies with strong evidence-based support. You will be given opportunities to actively engage in professional development activities and receive specific feedback regarding your performance. In addition, the benefits will extend to your classroom practice with the intent of increasing your use of BSPS, which has been shown to have a positive impact on improving student behaviors and decreases rates of disruptive behaviors.

CONFIDENTIALITY
The data in this study will be confidential. Data collected on teacher performance will not be reported to any other person or agency. Identifying teacher information will not be included in any written product that results from participating in this study and pseudonyms will be used. Participant pseudonym identity will only be known to the researcher and not be shared with

anyone or agency at any point before, during, or after the study. School names and locations will not be reported; however, teacher grade level, years of experience, gender, and degrees earned may be reported.

PARTICIPATION

Your participation is voluntary, and you may withdraw from the study at any time and for any reason. If you decide not to participate or if you withdraw from the study, there is no penalty or loss of benefits to which you are otherwise entitled. There are no costs to you or any other party.

CONTACT

This research is being conducted by **Colleen Barry**, doctoral candidate in the College of Education and Human Development at George Mason University. She may be reached at **xxx-xxx-xxxx, xxxxxxxx@gmu.edu** for questions or to report a research-related problem. **Dr. Gary Galluzzo** is the faculty advisor for this study and he can be reached at **xxx-xxx-xxxx, xxxxxxxx@gmu.edu.** You may contact the George Mason University Office of Research Integrity & Assurance at 703-993-4121 if you have questions or comments regarding your rights as a participant in the research.

This research has been reviewed according to George Mason University procedures governing your participation in this research.

CONSENT

I have read this form, all of my questions have been answered by the research staff, and I agree to participate in this study.

_____

Name

_____

Date of Signature

Appendix E

Fidelity of Treatment Checklist: Baseline

Observer: _____ Condition: _____ Teacher ID: _____ Date: ___/___/___

Directions: Mark each step completed or not completed by the primary investigator. Fidelity of treatment score is calculated by dividing the number of steps completed (i.e., "Yes") by the total number of planned steps.

Baseline

1. Evidence of email correspondence setting up baseline data observation session with least 24 hours advance notice

Yes ☐ No ☐

2. Primary investigator sits in silence in inconspicuous location in classroom

Yes ☐ No ☐

3. Primary investigator records all occurrences of BSPS use by teacher on rate data sheet within 5 seconds of BSPS delivery

Yes ☐ No ☐

4. Treatment integrity checklist completed within 15 seconds of BSPS delivery by teacher for each BSPS occurrence

Yes ☐ No ☐

5. No feedback regarding any aspect of data collection given by primary investigator to anyone present (e.g., teacher, students, paraprofessional, etc.)

Yes ☐ No ☐

Appendix F

Fidelity of Treatment Checklist: Overview

Observer: _____ Condition: _____
Teacher ID: _____ Date: ___/___/___

Directions: Mark each step completed or not completed by the primary investigator. Fidelity of treatment score is calculated by dividing the number of steps completed (i.e., "Yes") by the total number of planned steps

Overview

1. Evidence of email correspondence setting up overview session with least 24 hours advance notice

Yes ☐ No ☐

2. Ensures all overview PowerPoint slides are reviewed

Yes ☐ No ☐

3. Ensures examples and non-examples of BSPS reviewed

Yes ☐ No ☐

4. Ensures video modeling clips are viewed in entirety

Yes ☐ No ☐

5. Ensures role-play opportunity provided

Yes ☐ No ☐

6. Primary investigator provides feedback on teacher's role-play of BSPS

Yes ☐ No ☐

Appendix G

Fidelity of Treatment Checklist: Intervention

Observer: _____ Condition: _____
Teacher ID: _____ Date: ___/___/___

Directions: Mark each step completed or not completed by the primary investigator. Fidelity of treatment score is calculated by dividing the number of steps completed (i.e., "Yes") by the total number of planned steps

Intervention

1. Evidence of email correspondence setting up intervention data observation session with least 24 hours advance notice
Yes ☐ No ☐

2. Ensures all video modeling clips are shown in entirety
Yes ☐ No ☐

3. Ensures role-play opportunity provided
Yes ☐ No ☐

4. Primary investigator provides feedback on teacher's role-play of BSPS
Yes ☐ No ☐

5. Primary investigator sits in silence in inconspicuous location in classroom
Yes ☐ No ☐

6. Primary investigator records all occurrences of BSPS use by teacher on rate data sheet within 5 seconds of BSPS delivery
Yes ☐ No ☐

7. Treatment integrity checklist completed within 15 seconds of BSPS delivery by teacher for each BSPS occurrence
Yes ☐ No ☐

8. No feedback regarding any aspect of data collection given by primary investigator
Yes ☐ No ☐

Appendix H

Fidelity of Treatment Checklist: Follow-Up

Observer: _____ Condition: _____
Teacher ID: _____ Date: ___/___/___

Directions: Mark each step completed or not completed by the primary investigator. Fidelity of treatment score is calculated by dividing the number of steps completed (i.e., "Yes") by the total number of planned steps

Follow-Up

1. Evidence of email correspondence setting up follow-up data observation session with least 24 hours advance notice

Yes ☐ No ☐

2. Primary investigator sits in silence in inconspicuous location in classroom

Yes ☐ No ☐

3. Primary investigator records all occurrences of BSPS use by teacher on rate data sheet within 5 seconds of BSPS delivery

Yes ☐ No ☐

4. Treatment integrity checklist completed within 15 seconds of BSPS delivery by teacher for each BSPS occurrence

Yes ☐ No ☐

5. No feedback regarding any aspect of data collection given by primary investigator to anyone present (e.g., teacher, students, paraprofessional, etc.

Yes ☐ No ☐

Appendix I

Social Validity Questionnaire

This questionnaire consists of 11 items regarding the professional development intervention package in which you participated. Please indicate your responses below.

1. Using BSPS in my classroom is important

Strongly Agree Agree Neutral Disagree Strongly Disagree

2. After the video modeling intervention, I was more likely to use BSPS in my classroom

Strongly Agree Agree Neutral Disagree Strongly Disagree

3. The video modeling intervention assisted me in implementing BSPS

Strongly Agree Agree Neutral Disagree Strongly Disagree

4. The practice and feedback portion of the intervention was helpful

Strongly Agree Agree Neutral Disagree Strongly Disagree

5. I prefer the ongoing, active format of this intervention

Strongly Agree Agree Neutral Disagree Strongly Disagree

6. BSPS is easy to use

Strongly Agree Agree Neutral Disagree Strongly Disagree

7. While using BSPS, I saw a decrease in disruptive student behavior

Strongly Agree Agree Neutral Disagree Strongly Disagree

8. While using BSPS, I saw a positive change in student behavior

Strongly Agree Agree Neutral Disagree Strongly Disagree

9. Video modeling is a useful tool for teachers to learn skills

Strongly Agree Agree Neutral Disagree Strongly Disagree

10. I would recommend the use of video modeling as part of a professional development package to others

Strongly Agree Agree Neutral Disagree Strongly Disagree

11. Is there anything else about your use of BSPS that I should know?

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Biography

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