

***INCLUDE ME: THE IMPACT OF CONSULTATION DOSAGE AND STRATEGIES ON  
THE IMPLEMENTATION OF BEST PRACTICES IN INCLUSIVE CLASSROOMS***

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Students with disabilities are increasingly being educated in inclusive settings (McLeskey, Landers, Williamson, & Hoppey, 2012). A hallmark of successful inclusion is the use of best practices by teachers in these settings (e.g., Jorgensen, McSheehan, Schuh, & Sonnenmeier, 2012). Implementing inclusive practices can be conceptualized as a process of adult behavior change (e.g., Long & Maynard, 2014). Collaborative consultation is frequently used to support teachers in inclusive classrooms (e.g., Idol, Nevin, & Paolucci-Whitcomb, 1995), and can effectively facilitate inclusive placements (e.g., Shapiro, et al., 1999). However, the mechanisms by which consultation may help teachers implement inclusive practices are not yet well understood. This dissertation used a Study 1 – Study 2 format to investigate aspects of consultation that may promote changes in teachers’ use of inclusive practices. Study 1 examined relations between consultation dosage and teachers’ implementation of inclusive practices. Results increase understanding of these relations, and suggest methodological implications for future research in this area. Study 2 examined relations between specific consultation strategies and teachers’ implementation of inclusive practices. The efficacy of commonly used strategies was examined here in a larger sample of teachers than has been previously studied. Findings

also extend an implementation framework to a specific application of consultation (namely, to support inclusion). Taken together, these two studies contribute to an understanding of how consultants vary their services across teachers, and how these services may promote positive changes in teachers' use of inclusive practices. Results of these studies also have important practical implications. By providing initial insights as to the aspects of consultation that promote teachers' implementation of best practices in inclusion, these findings offer useful guidance to consultants in applied practice. Specifically, findings suggest that increased dosage of consultation may be particularly beneficial in helping teachers to implement concrete instructional practices and support strategies that characterize best practices in inclusion. Consultation strategies most likely to impact teachers' overall use of best practices in inclusion include demonstration/modeling and observation + verbal feedback.

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## **PREFACE**

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## 1.0 INTRODUCTION

Inclusion occurs when students with disabilities are educated in the same classrooms as non-disabled students, instructed by a general education teacher (Mastropieri & Scruggs, 2000). Advocates argue that an inclusive education promotes academic, behavioral, and social growth, and that access to an inclusive education represents a matter of civil rights or educational equity for students with disabilities (e.g., Lipsky & Gartner, 1987; Polat, 2011). Educational policy has steadily evolved to reflect this position, with federal law in the United States now requiring that students with disabilities be educated, to the greatest extent possible, in the least restrictive environment (IDEA, 2004). Accordingly, national data indicates that increasing numbers of students with disabilities are being educated in inclusive settings for all or part of the school day (McLeskey, Landers, Williamson, & Hoppey, 2012).

It is important to remember the complexity of inclusion, reflected in the oft-repeated mantra that special education is a process and not a place (e.g., Kauffman, 1993). That is to say, placing students with disabilities in general education classrooms is not sufficient; successful inclusion also necessitates the provision of evidence-based support services, adaptations, and accommodations to the general education curriculum in order to support the specialized needs of students with disabilities in this setting (Wolfe & Hall, 2003). The provision of such supports and accommodations is considered a best practice in inclusive education (Jorgensen, McSheehan, Schuh, & Sonnenmeier, 2012). Yet research has found that evidence-based

strategies for students with disabilities are often not implemented in inclusive classrooms, calling into question the efficacy of the educational services being provided (Zigmond, Kloo, & Volonino, 2009). Effective delivery of such services involves complex processes (Lindsay, 2007), and any critique of inclusion must recognize the complexity inherent in achieving this goal. Numerous calls for research investigating these processes and addressing questions of *how* inclusion may be successfully achieved have been issued (e.g., Urton et al, 2014; Lohrman & Bambara, 2006; Monsen et al, 2014; Grieve, 2009; McLeskey et al, 2012; Kilanowski-Press et al, 2010). Thankfully, this work has begun (e.g., Odom, Buysse, & Soukakou, 2011) and a foundation laid for the many questions that are yet to be answered.

This dissertation addresses such gaps by investigating ways that consultation (a frequently-used support for teachers attempting to use evidence-based strategies) may help teachers' implementation of inclusive practices. Using data from the *Include Me* initiative (Bagnato, Fevola, & Whitaker, 2014), this research will examine mechanisms by which school-based consultation services may promote changes in teachers' usage of specific inclusive practices. Chapter 1 provides an overview of the topic including a history of the inclusive education movement, a review of relevant theoretical foundations, a brief summary of existing research, and an identification of gaps in the literature. A more detailed review of the literature, specific research questions, and methods, is presented in Chapters 2 and 3. Results are presented in Chapter 4, with Chapter 5 providing discussion and conclusion. Results of this research are expected to contribute to understanding how to support successful implementation of inclusive practices, with implications for practice, policy, and future research.

## **1.1 INCLUSION IN THE UNITED STATES**

### **1.1.1 A brief history**

Historically, students with disabilities (particularly moderate to severe disabilities) were educated via special programs that were separate and distinct from general education (Kavale & Forness, 2000). This often meant that students with disabilities attended different schools than their non-disabled peers; within the same schools, students with disabilities were typically funneled into special classrooms and educated separately from non-disabled students. Within these special programs, instructional methods and curricula significantly differed from those used in general education classrooms (Zigmond, Kloo, & Volonino, 2009). Such differences included smaller class sizes, instruction provided by special education teachers, and increased emphasis on social, vocational, or functional skills (Kavale & Forness, 2000). Additionally, academic content was often delivered at a much lower level than in general education settings in efforts to individualize instruction so as to meet the needs of students with disabilities (Zigmond, et al., 2009).

In the context of the civil rights movement of the 1960s, debate arose in the field of special education regarding what was increasingly viewed as the segregation of students with disabilities into these separate settings (e.g., Dunn, 1968). This debate was reflected in the passage of the Education for All Handicapped Children Act (1975), or Public Law 94-142 (PL 94-142). This law provided the foundation for current practices in special education in the United States. In establishing legal rights and protections for students with disabilities, PL 94-142 introduced the requirement that students with disabilities be educated “to the maximum extent appropriate” with non-disabled students in the least restrictive environment, or LRE.



Initially, the LRE mandate resulted in a shift from a purely separate model of service delivery for special education students to a resource, or “pull out,” model (e.g., Zigmond et al., 2009). In this model, students with disabilities were educated in the general education classroom for a portion of the school day, but also received academic instruction from a special education teacher in a designated “resource” classroom (Kavale & Forness, 2000). However, debate within the field regarding the optimal setting in which to educate students with disabilities continued. Many argued that resource models continued to unnecessarily segregate students with disabilities from their non-disabled peers, with social and academic implications (e.g., Lipsky & Gartner, 1987). In combination with school reform movements calling for increased focus on differentiated instruction in general education classrooms (e.g., Reynolds, Wang, & Walberg, 1987), the education of students with disabilities has steadily progressed towards a model of inclusion (e.g., Zigmond, et al., 2009).

This move towards full or increased inclusion has been both reflected in and strengthened by educational policy. The most recent reauthorization of the Individuals with Disabilities Education Act (IDEA) in 2004 extended the LRE mandate by requiring that students with disabilities not only be educated with non-disabled peers but also have access to the general education curriculum (McLeskey, Landers, Williamson, & Hoppey, 2012). The No Child Left Behind Act of 2001 (NCLB) introduced accountability standards for the academic achievement of students with disabilities. Such accountability has drawn increased attention to the historic gaps in academic achievement between students with disabilities and their non-disabled peers, a gap that many have attributed to the decreased expectations and less rigorous curriculum that often accompany resource placements (e.g., Koenig & Bachman, 2004). This emphasis on

accountability for all students has been continued in the recently passed Every Student Succeeds Act (ESSA, 2015).

In addition to accountability for student achievement, local education agencies are also increasingly held accountable for compliance with the LRE mandate. The Individualized Education Program (IEP) for each student with a disability must, by law, specify the extent to which the student will or will not participate in the general education program. This information is reported to state departments of education and utilized in compliance reviews. Additionally, the U.S. Department of Education's Office of Special Education Programs (OSEP) annually collects state-level data on student placement to monitor each state's degree of compliance with the LRE mandate. A recent examination of national trends in the educational placement of students with disabilities utilized this annual OSEP data for the period between 1990 and 2008, and found a steady and consistent increase in general education placements for students across all categories of disability (McLeskey, et al., 2012).

The state of Pennsylvania has demonstrated an especially strong commitment to the adoption of a full inclusion model (Zigmond, et al., 2009), largely as a result of the Gaskin decision (*Gaskin v. Pennsylvania*, 2005) which found that the state was failing to adequately comply with the LRE mandate. Thus, the past decade has seen significant numbers of students with disabilities in Pennsylvania transitioned from pull out to full inclusion models of special education service delivery. Given these trends at both the national and state level, increasing numbers of general and special education teachers are adapting the manner in which they educate students with disabilities. This has made the identification of best practices in inclusive education particularly important.

Unfortunately, scientific knowledge has often lagged behind educational policy. Mandates such as IDEA (2004) and NCLB (2001) instructed schools to use practices backed by research evidence. However, at the time of their passage there was no consensus as to what constituted an evidence-based practice (Cook, Tankersly, & Landrum, 2009). Only recently have clearly defined standards been established for identifying evidence-based practices (e.g., Cook, et al., 2009; What Works Clearinghouse, 2008). Even when evidence-based practices are successfully identified, the implementation of these practices in real-world settings has proven challenging (e.g., Forman, Olin, Hoagwood, Crowe & Saka, 2009). Growing awareness of this research to practice gap has led to increased focus on process of implementation (e.g., Forman, et al., 2013). Much has been learned as a result of this focus, but many important questions remain.

## **1.2 THEORETICAL FOUNDATIONS**

In addition to the social impetus generated by the civil rights movement, proponents of inclusion have applied numerous theoretical models to support their position. Theoretical foundations underlying the current research address the rationale behind and expected outcomes of inclusive education, and potential mechanisms by which such outcomes may occur. Major topics to be addressed in this section are as follows: social learning theory, ecological systems theory, the theory of planned behavior, and an implementation science framework.

### **1.2.1 Social learning theory**

Much of the theoretical support for the general practice of inclusion is drawn from social learning theory (Bandura, 1977). Applied to inclusion, social learning theory suggests that students with disabilities are likely to exhibit behavioral and academic improvements when exposed to positive peer models. Through the processes of observational and interactional learning, students with disabilities will begin to emulate the academic and behavioral functioning of their peers; when included in general classroom settings (as opposed to pull-out programs composed entirely of other students with disabilities), the peer group is more likely to be composed of typically-developing age-mates. Thus, students with disabilities would be expected to exhibit more age-appropriate social and academic behaviors when included in the general classroom (e.g., Guralnick, 1999).

### **1.2.2 Ecological systems theory**

Ecological systems theory (Bronfenbrenner & Morris, 2006) has also been applied to inclusion. From an ecological systems perspective, the primary mechanisms of development are bidirectional, proximal processes within the child's environment. In inclusive settings, students with disabilities are more likely to engage in proximal processes that support age-appropriate performance than may be the case in specialized settings. These include interactions with typically-developing peers as well as with educators and materials. In general education settings, academic and behavioral expectations reflect age-appropriate standards. In contrast, educators in special education settings may expect performance that falls below age- or grade-level norms. Similarly, classroom materials (e.g., books, displays) in general education classrooms are likely

to be at a higher level than those typically found in resource settings. By virtue of inclusive placements, an ecological systems perspective posits that such higher-level proximal processes promote the development of academic, social, and behavioral skills for included students with disabilities that more closely approximate those of typically-developing peers (e.g., Odom & Wolery, 2003).

Moreover, ecological systems theory maintains that development is a function of reciprocal relations between multiple levels of influence (Bronfenbrenner & Morris, 2006). When students with disabilities are educated in general education settings, many of the specialized services they require are delivered indirectly. For example, related service providers such as special education teachers, occupational therapists, or school psychologists may indirectly provide services through consultation with the regular classroom teacher as opposed to removing the child from the classroom to provide services directly.

Ecological systems theory provides a useful framework for mapping the ways in which such interactions between multiple levels of the child's ecosystem may impact his/her development of important skills (e.g., Jackson, Ryndak, & Wehmeyer, 2009). In the above example, interactions between the general education teacher and a consultant influence development. The consultant may influence development without any direct involvement with the child. The general education teacher, conversely, is a key figure in the school microsystem. Within this microsystem, the behavior of the general education teacher is a major factor in the achievement of student outcomes.

### **1.2.3 Theory of planned behavior**

The theory of planned behavior (TPB; Ajzen, 1991) offers a basis from which to consider the behavior of adults in inclusive settings. To meet the needs of included students, general education teachers must exhibit specific behaviors or practices. Doing so often requires that these teachers change existing behaviors, and/or adopt new behaviors. Behavior change is a challenging process, and warrants separate consideration.

The TPB maintains that the most immediate determinant of any behavior is the existence of behavioral intention, or willingness to engage in the behavior. The intention to engage in a behavior informs the effort that an individual is likely to exert. Behavioral intention, in turn, is determined by attitudes, subjective norms, and perceived behavioral control. Attitudes are an individual's evaluation of a behavior (positive or negative), and include both thoughts and feelings. Subjective norms are perceived social expectations regarding a behavior. Perceived behavioral control is an individual's assessment of how easy or difficult it will be to perform a behavior. Perceived behavioral control is influenced by past experiences, and by current factors that may help or hinder performance of the behavior (Ajzen, 1991). In educational settings, perceived behavioral control has been conceptualized as a teacher's sense of efficacy (e.g., Ajzen, 1991; Fishbein & Capella, 2006).

From this perspective, general education teachers' use of inclusive practices represents the specific behavior(s) of interest. Whether, or to what degree, teachers engage in these behaviors will be determined by attitudes, subjective norms, and sense of efficacy. Teachers who hold positive attitudes towards inclusion, believe that others in their school support inclusion, and perceive themselves as capable of including students with disabilities are more likely to successfully engage in inclusive behaviors. Consistent with ecological systems theory,

multiple levels of influence can impact each of these factors (e.g., Urton, Wilbert, & Hennemann, 2014).

#### **1.2.4 Implementation science framework**

Finally, implementation science offers a useful framework from which to consider this topic. This framework incorporates each of the theoretical foundations outlined above, and provides a basis for understanding how inclusion may be achieved.

Implementation science is defined as the study of factors that impact change (Fixsen, Naoom, & Wallace, 2009). Interest in implementation science has increased in recent years with growing recognition of gaps between research and practice. Despite a proliferation of research documenting the efficacy of evidence-based practices, findings also indicate that such practices are often not implemented with fidelity in applied settings (e.g., Capella, Reinke, & Hoagwood, 2011). Treatment fidelity, or integrity, refers to the degree to which an intervention is implemented as designed, and has been shown to mediate the relations between intervention and outcome (e.g., Durlak & DuPre, 2008).

Treatment integrity in educational settings has been conceptualized as a process of adult behavior change; the behavior of adults must change in a manner consistent with the intervention or practice to be implemented (Long & Maynard, 2014). Applied to the topic of inclusion, the behavior of general education teachers must change as needed to become more consistent with established best practices in inclusion, or to implement inclusive practices with integrity. It is through this process that the benefits associated with inclusion may be achieved.

In their review of inclusion in early childhood education, Odom, Buysse, & Soukakou (2011) advocated for the application of an implementation science framework to understanding

and promoting widespread dissemination of inclusive practices. Although the amount of implementation research in the educational literature has been steadily increasing, systematic application of this framework to the topic of inclusion is just beginning.

### **1.2.5 Summary and conceptual model**

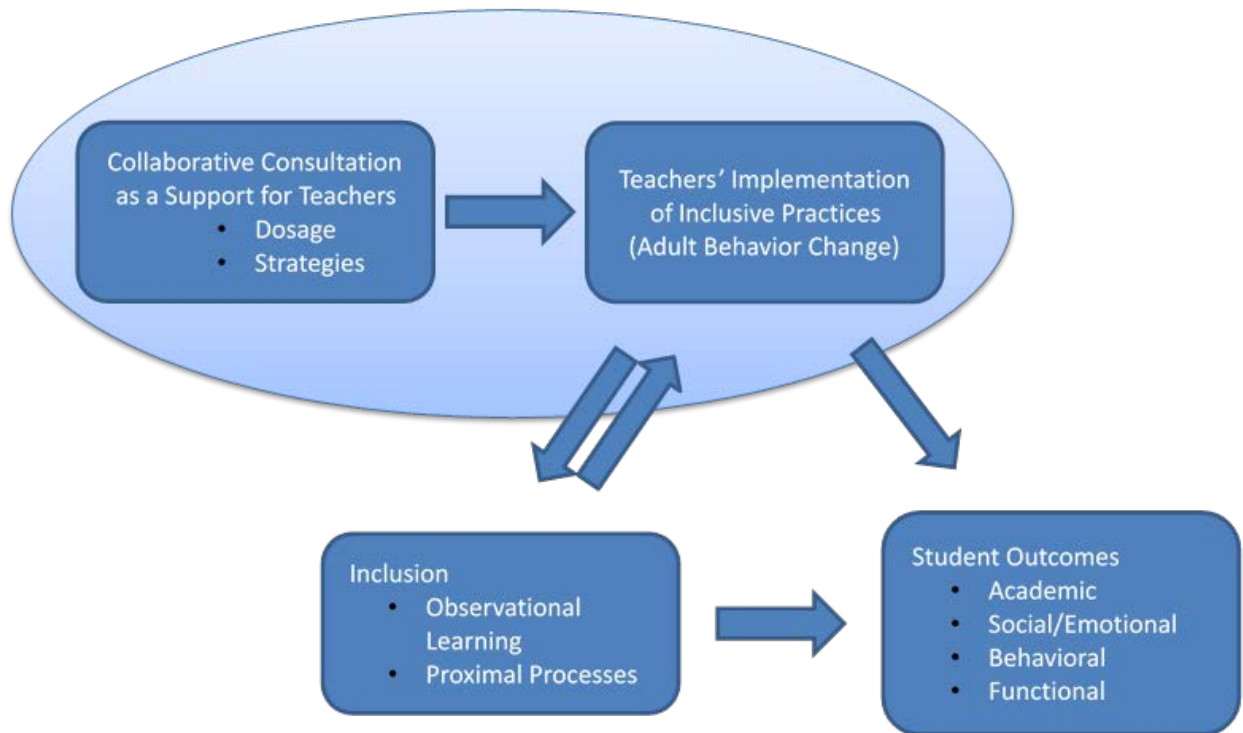
Integrating each of the theoretical foundations summarized above allows for the following conceptualization of inclusion within the school microsystem: By virtue of inclusion, students with disabilities are exposed to proximal processes and observational learning opportunities that are likely to promote more positive and developmentally appropriate academic, social, and behavioral outcomes than would be expected in the absence of inclusive placements. These outcomes may be mediated by teachers' implementation of specific practices conducive to inclusion; that is, student outcomes are thought to be dependent on the degree to which inclusive practices are actually utilized in the general education setting.

The implementation of inclusive practices requires behavior change on the part of adults in the general education classroom. The types and amounts of supports provided to these adults likely impacts the degree to which the desired behaviors (implementation of inclusive practices) occur. Effective supports may promote adult behavior change by influencing attitudes towards inclusion, subjective norms about inclusion, and perceived efficacy to implement inclusive practices. Provision of these supports thus indirectly impacts student outcomes. Such supports are also likely to impact whether inclusion occurs at all, as teachers who receive adequate supports are likely more willing and able to include students with disabilities in their classrooms.

This “big picture” conceptual model is summarized in Figure 1. As noted, this model conceptualizes inclusion within the school microsystem. Consistent with ecological systems



theory, multiple levels of influence will impact this microsystem, including but certainly not limited to student, teacher, and parent characteristics, family systems, environmental factors, social factors, and so on. However, for the sake of concision and given the focus of this research, school processes are of primary interest. This focus of course is not meant to minimize the importance of the various other sources of influence impacting children’s development.



**Figure 1.** *Conceptual model of inclusion in the school microsystem (highlighted area indicates that to be addressed in this dissertation)*

The current research will contribute to existing literature by examining components of this conceptual model for which empirical support is notably lacking. In the following sections, current knowledge in the field will be briefly reviewed. Empirical work that has examined aspects of this “big picture” model and accepted best practices in inclusion will be summarized, followed by a discussion of gaps in the literature to be addressed by the current research.

## **1.3 EMPIRICAL SUPPORT**

### **1.3.1 Student outcomes**

Relations between inclusion and student outcomes have been more firmly established in the early childhood education literature than for school-aged children. A seminal review of this work was undertaken by Odom and colleagues (2004), who adopted an ecological systems perspective. This comprehensive review concluded that young children with disabilities educated in inclusive preschool settings demonstrate positive behavioral, developmental, social, and academic outcomes. Consistent with the ecological model, these outcomes were linked with interactions within and between various levels of influence, from child, teacher, and classroom characteristics through social and cultural systems across time (Odom, et al., 2004). At the microsystem level, specific strategies, practices, and interactions within early childhood inclusive classrooms were identified as important factors in achieving these outcomes. Collaboration between practitioners was identified as an “essential feature of inclusion at the preschool level” (Odom et al., 2004, pg. 33). These authors note, however, that despite the importance of collaboration in supporting student outcomes, the research on collaboration between professionals in inclusive settings is relatively limited. For a detailed review of the literature on preschool inclusion, the reader is referred to Odom and colleagues (2004).

Of course, early childhood and school-aged educational programs are very different entities. Prominent differences between the two settings include class size and characteristics, curricular focus (developmental vs. academic), standards and accountability, and degree of discrepancy between children with disabilities and non-disabled peers (Odom et al., 2004).

Thus, while the literature on preschool inclusion may inform the study of school-aged inclusion, work specific to school-aged populations is necessary.

A review of the literature identified several comprehensive reviews of research on inclusion for school-aged students, with mixed and at times seemingly contradictory conclusions. Based on their 2000 review, Kavale and Forness determined that evidence for the effectiveness of inclusion in improving student outcomes (academic and social/behavioral) was “mixed at best” (pg. 287). These authors concluded that caution was warranted when moving towards inclusive models, and that the implementation of inclusive practices mattered (Kavale & Forness, 2000). Lindsay (2007) reviewed the literature specific to inclusion in U.S. and U.K. contexts. He concluded that evidence was “marginally positive” (pg. 16) in terms of both academic and social outcomes for included students with disabilities.

These two large-scale reviews integrated the results of studies that included students receiving special education services under all categories of disability, with varying degrees of severity. Such significant intra-individual variation may partially account for the tepid findings regarding outcomes associated with inclusion; impacts on such a wide range of individuals may be difficult to capture on a large scale. This possibility was addressed in the Kavale and Forness review (2000), which noted that the majority of research in support of inclusion was qualitative in nature, including case studies and testimonials. In the early childhood inclusion literature, there has also been relatively little work that has attempted to disaggregate effects by disability category. What work does exist, however, indicates that positive outcomes associated with preschool inclusion are observed across disability type (Odom, et al., 2004).

Comparing findings of student outcomes associated with inclusion at the preschool and school-aged levels necessitates a consideration of differences between the two settings. These

differences include developmental levels, standards, and expectations. In preschool settings, all children are working towards achievement in basic developmental domains such as social skills or motor coordination. As children progress to school-aged services, goals and expectations become increasingly complex. In light of this key difference, the consideration of functional outcomes for school-aged students with disabilities becomes especially important.

The development of functional skills (those skills necessary for independent living) has been recognized as a primary goal of special education for students with more severe disabilities. The accepted view has long been that such skills could be developed only in specialized educational placements, such as self-contained classrooms (Jackson, Ryndak, & Wehmeyer, 2009). However, a 2009 review of the empirical literature found that functional skill instruction could effectively be provided in inclusive settings. Moreover, the authors of this review argued better outcomes were achieved by students with severe disabilities and complex needs educated in inclusive settings than by those educated in self-contained special education classrooms (Jackson, et al., 2009).

Given widespread policy mandates emphasizing inclusive placements for students with disabilities, the body of research examining student outcomes associated with school-aged inclusion seems surprisingly small. Scholars have attributed the relative dearth of research to several factors. Prominent among these explanations are the strongly-held views of inclusion as a matter of social justice or civil rights (Kavale & Forness, 2000), or as providing access to intellectual and social capital (Zigmond et al., 2009). Such views, it has been argued, may discourage rigorous scientific examinations of the practice, as inclusion is accepted by many educators as being “inherently correct” (Lindsay, 2007, pg. 2).

Additionally, empirical examination of the impact of inclusion on student outcomes has likely been hampered by a slew of methodological challenges. Chief among these are the aforementioned policy mandates (Lindsay, 2007). Such mandates essentially rule out the possibility of randomized control trials, the “gold standard” of scientific evidence. Any local education agency willing to agree to random assignment of students with disabilities to less inclusive settings would be in direct violation of the LRE provision (IDEA, 2004) and thus subject to a host of undesirable consequences including loss of funding and due process proceedings.

Finally, the sheer complexity of the processes involved in inclusion represents another area of methodological challenge. Vast differences in student-, teacher-, and setting-level factors, and complex interactions between these levels, have posed significant challenges to the systematic investigation of student outcomes. Failure to adequately consider these complex interactions, and their likely causal role in relations between inclusion and student outcomes, has been implicated in the apparent lack of consensus in this body of research (Jackson, et al., 2009).

Given these methodological challenges, and following a comprehensive review of the extant literature, Lindsay (2007) issued a call for research that considers inclusion from an ecological perspective, recognizing and examining these complex processes rather than oversimplifying the topic. Jackson and colleagues (2009) reached a similar conclusion based upon their nuanced consideration of inclusion that integrated empirical findings with historical records. Drawing heavily upon ecological systems theory, these authors argued for more research addressing questions of complexity rather than viewing inclusion in mechanical, input-output terms. Specifically, this review called for research investigating how schools could make

the changes necessary to support students with severe disabilities in inclusive classrooms (Jackson, et al., 2009). To date, however, research addressing these calls remains sparse.

This dissertation represents a step towards building a better understanding of the complex processes involved in inclusion. Of primary interest here are the processes involved in teacher behavior change, specifically the adoption of inclusive practices. Research within the field has advanced to the point that many accepted best practices in inclusive education have been identified. In the following section of this paper, these best practices will be reviewed. Barriers and challenges impacting implementation of these practices will also be discussed.

### **1.3.2 Best practices in inclusive education**

Based on a comprehensive synthesis of research and applied experience, the Institute on Disability at the University of New Hampshire (with funding from the U.S. Department of Education, Office of Special Programs) has developed a set of Essential Best Practices in Inclusive Schools (Jorgensen, McSheehan, Schuh, & Sonnenmeier, 2012). Practices identified in these guidelines are those with documented efficacy in promoting positive outcomes for students with significant disabilities educated in inclusive settings. Significant disabilities are defined as those resulting in a need for intensive support services in order to participate in general education classrooms (Jorgensen, et al., 2012). This document identifies 14 categories of best practices in inclusion, and is intended to be used by schools as a program evaluation tool (Jorgensen, et al., 2012). These categories of best practice in inclusion are summarized in Table 1.

**Table 1.** *Categories of best practices in inclusive education*

Category	Description
High Expectations and Least Dangerous Assumption	High expectations are maintained for all students. Students with disabilities work towards the same educational goals as students without disabilities to the greatest extent appropriate; when students with disabilities do not currently demonstrate age- or grade-level knowledge or skills, the “least dangerous assumption” of presumed competence is applied.
General Education Class Membership and Full Participation	Students with disabilities have equitable access to all environments and experiences in the school setting, and are welcomed as fully participating members of the general education classroom.
Quality Augmentative and Alternative Communication	When necessary, reliable and appropriate assistive technology is provided to allow students with disabilities to communicate with peers and adults in academic and social situations.
Curriculum, Instruction, and Supports	Curriculum and instruction are based on universal design principles. Students with disabilities are provided individualized supports as necessary to allow full participation and progress in the general education program. Functional or life skills instruction is embedded in daily routines in inclusive settings.
Ongoing Assessment and Evaluation of Learning	Authentic, performance-based assessments are conducted in natural contexts to identify strengths as well as needs, with individualized supports provided as necessary to allow students with disabilities to demonstrate their “best work.” Progress monitoring and formative assessments are used as a basis for decisions about instruction and interventions.
Family-School Partnerships	Families and schools work together as equals to provide high-quality inclusive education programs and promote student and family strengths.
Community Partnerships	Schools and community agencies work collaboratively to provide a comprehensive support network. School staff work to create and maintain positive community relations.
Team Collaboration	All individuals involved work collaboratively to design, implement, and evaluate the IEP and educational program for included students with disabilities.
Friendships and Social Relationships	Students with disabilities are afforded opportunities to foster meaningful friendships and social relationships with peers. This includes general education class membership, sharing meals in the school cafeteria, and participating actively in recess and extracurricular activities.
Futures Planning, Graduation, and Transition to Adult Life	Students with disabilities are actively engaged in planning for the transition to adult life, and are provided the same opportunities as their non-disabled peers to explore career and post-secondary options.

**Table 1. Continued**

Self-Determination	Students with disabilities are instructed in and encouraged to practice the elements of self-determination, including the opportunity to take an active (or lead) role in their own IEP meetings, participate in extracurricular activities or organizations of their choosing, and design their own post-graduation plan.
School Improvement	School improvement efforts are collaboratively undertaken, emphasize equity and inclusion, strive to reduce bias, and address individual and societal barriers to learning.
Resources	School staff identify and obtain necessary resources to optimize teaching and learning. School administrators provide support as necessary to ensure adequate resources for students and teachers.
Professional Development	Professional development is highly valued and designed to maximize transfer to daily practice. Ongoing professional development opportunities are provided that include the opportunity for feedback, reflection, and observation; combine training and coaching; are collaborative in nature; and link directly to improved student outcomes.

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*Note:* Adapted from *Essential Best Practices in Inclusive Schools* by Jorgensen, C.M., McSheehan, M., Schuh, M., & Sonnenmeier, R.M., 2012, Durham, NH: National Center on Inclusive Education Institute on Disability/UCEDD, University of New Hampshire.

### **1.3.3 Barriers and challenges**

Despite legal mandates, identified best practices, and widespread acceptance of inclusion as a fundamental matter of educational equity, barriers and challenges to successful inclusion for students with disabilities remain. This problem is certainly not unique to inclusion; the translation of research to practice poses challenges in all fields (e.g., Fixsen, et al., 2009). An implementation science framework offers a useful lens through which to consider the problem. By examining and addressing barriers and challenges to the successful implementation of evidence-based inclusive practices, more effective dissemination of such practices may be promoted.



The chief challenges in implementing inclusive practices pertain to issues of rhetoric vs. reality (e.g., Lindsay, 2007; Kavale & Forness, 2000). A substantial body of research has documented discord between teachers' general attitudes towards inclusion and the challenges they face in actually implementing inclusive practices. Although teachers overwhelmingly report positive attitudes about the concept of including students with disabilities, they also report substantial concerns about the realities of implementing full inclusion in their own classrooms (e.g., MacFarlane & Woolfson, 2013). Such concerns include teachers' feelings of self-efficacy or confidence about their ability to successfully meet the needs of included students with disabilities (e.g., Cook, Cameron, & Tankersly, 2007) and to manage the added responsibilities that accompany inclusion (e.g., Kavale & Forness, 2000).

Teachers' perceptions about these challenges take on added importance in light of research demonstrating links between such concerns and classroom practices. Teachers' feelings of self-efficacy about their ability to meet the needs of included students predict both general attitude towards inclusion and willingness to include a student with a disability in their own classroom (Urton, Wilbert, & Hennemann, 2014). Additionally, teachers' attitudes towards inclusion influence the classroom learning environment, as rated by both teachers and students. Teachers who hold more positive attitudes towards inclusion had classrooms with a higher quality learning environment (Monson, Ewing, & Kwoka, 2014).

How, then, can such challenges be addressed? A major finding that has emerged in this regard is the importance of providing adequate supports for teachers. The supports available to facilitate the inclusion of students with disabilities in general education classrooms impact teachers' attitudes towards inclusion as well as specific classroom practices. A lack of available supports and resources can undermine inclusion efforts (Lindsay, 2007), while a greater

perceived adequacy of supports has been associated with more positive attitudes towards inclusion (Monson et al., 2014). In a rigorous qualitative study investigating factors contributing to successful experiences with inclusion among general education teachers, the provision of both school-level and individualized supports emerged as crucial features. (Lohrmann & Bambara, 2006) Moreover, individual experiences with inclusion contribute to teachers' feelings of self-efficacy regarding their ability to successfully include students with disabilities in the future (Urton, et al., 2014), suggesting the importance of adequate supports for teachers in the perpetuation of inclusive classrooms. Such findings are reflected in the best practices identified by Jorgensen and colleagues (2012), which include the provision of supports through appropriate professional development opportunities as well as adequate resources for staff involved in the inclusion of students with disabilities.

Beyond the literature specific to inclusion, a growing body of research addresses the implementation of evidence-based practices in schools more generally. A number of additional barriers and challenges to implementation have been identified in this work. These include available resources such as funding and time (e.g., Forman, Olin, Hoagwood, Crowe, & Saka, 2009), principal support (e.g., Wanless, Patton, Rimm-Kaufman, & Deutsch, 2013), school climate (e.g., Langley, Nadeem, Kataoka, Stein, & Jaycox, 2010), and teachers' readiness to implement (e.g., Bliss & Wanless, 2016). Attempts to implement inclusion are likely to be impacted by these and related factors as well.

## 1.4 SUMMARY AND GAPS IN THE LITERATURE

The movement towards inclusion for students with disabilities, rooted in social learning and ecological systems theories, emerged on the heels of the civil rights movement. Since that time, inclusion has increasingly been recognized as a marker of quality education, a legal right, and a matter of educational equity for students with disabilities (e.g., Jorgensen, et al., 2012). Existing research, particularly in the early childhood education literature, supports theorized relations between inclusion and student outcomes. Preschool children with disabilities educated in inclusive classrooms demonstrate positive behavioral, developmental, social, and academic outcomes (Odom, et al., 2004). Findings linking inclusion to outcomes for school-aged students are somewhat more equivocal, likely owing at least in part to the increasing complexities and methodological challenges that accompany the transition to school-aged services (e.g., Lindsay, 2007).

As illustrated in the preceding sections, successful inclusion for school-aged students requires the use of evidence-based practices on the part of teachers in inclusive classrooms. When conceptualized within an implementation science framework, best practices in inclusion must be implemented with integrity if expected outcomes are to be realized. By their own report, teachers require adequate supports to successfully implement these practices. Thus, supporting teachers' implementation of inclusive practices represents a critical component in the process of inclusion. An understanding of the precise mechanisms by which teachers can be supported in this process, however, has not yet been established.

## 1.5 DISSERTATION OVERVIEW

This dissertation aims to address this gap in the literature by examining how teachers' implementation of inclusive practices may be effectively facilitated. Using a Study 1 – Study 2 format, this research will apply an implementation science framework to the topic of inclusion. Data for each study was drawn from the *Include Me* program, an initiative of the Arc of Pennsylvania (with funding provided by the Pennsylvania Department of Education) whose purpose is to support and promote the inclusion of school-aged students with significant disabilities in general education classrooms. With guidance from the Pennsylvania Department of Education, Bureau of Special Education, and Pennsylvania Training and Technical Assistance Network, this program provides trained consultants to school districts throughout the state of Pennsylvania.

Consultation is frequently used to support teachers in inclusive classrooms (e.g., Idol, Nevin, & Paolucci-Whitcomb, 1995), and is an effective method of facilitating inclusive placements (e.g., Shapiro, et al., 1999). However, the mechanisms by which consultation supports changes in teachers' practices are not yet well understood. Existing research suggests that several aspects of consultation impact teachers' implementation of evidence-based practices. These include dosage, or amount, of consultation (e.g., Pas, et al., 2015) and specific strategies used by consultants (Noell & Gansle, 2014a and 2014b). However, these topics have not yet been investigated in the context of inclusion, and more research is needed to better understand such relations (Noell & Gansle, 2014a). The *Include Me* program offers a unique opportunity to examine these questions. In their work with teachers, *Include Me* consultants emphasized the use of best practices in inclusion as identified by Jorgensen and colleagues (2012). Detailed logs

allow for in-depth analysis of consultants' activities, while observational measures provide information about teachers' use of these practices.

Program evaluation findings have demonstrated significant effects of *Include Me* on functional, academic, and social outcomes for included students (Bagnato, Fevola, & Whitaker, 2014). The aim of the current research is to more thoroughly understand how these outcomes were achieved. In Study 1, the impact of consultation dosage on changes in teachers' use of inclusive practices will be examined. In Study 2, the use of specific strategies during consultation and relations between these strategies and teachers' inclusive practices will be further explored. Taken together, these two studies will contribute to the knowledge base regarding how general education teachers may be effectively supported in implementing inclusive practices.

## **2.0 STUDY 1 LITERATURE REVIEW AND METHODS (CONSULTATION TO SUPPORT INCLUSION: HOW MUCH IS ENOUGH?)**

The field of education is steadily progressing towards a model of full inclusion for students with disabilities (Zigmond, Kloo, & Volonino, 2009). Inclusion occurs when students with disabilities are educated in general education settings, with the general education teacher assuming primary responsibility for instruction (Mastropieri & Scruggs, 2000). Local education agencies are increasingly mandated to provide students with disabilities such access to the regular education program (e.g., IDEA, 2004). Accordingly, an examination of national trends in the educational placement of students with disabilities from 1990-2008 found a steady increase in general education placements across all categories of disability (McLeskey, Landers, Williamson, & Hoppey, 2012). With increases in inclusive placements, responsibility for daily classroom instruction has shifted from special educators to general education teachers.

Research has consistently found that most general education teachers report positive attitudes about the concept of inclusion. However, they express significant concerns about the realities of implementing inclusion in their own classrooms. Teachers' concerns include increases to their responsibilities, and doubts about their abilities to successfully meet the needs of included students (e.g., Kavale & Forness, 2000; Lindsay, 2007). Teachers' attitudes towards, and concerns about, inclusion have important implications for classroom practice. Positive attitudes towards inclusion have been linked to higher quality classroom learning environments

(Monsen, Ewing, & Kwoka, 2014). Concerns about implementing inclusion, conversely, predict both attitude towards inclusion and teachers' willingness to include a student with a disability in their own classroom (Urton, Wilbert, & Hennemann, 2014). Supports for general education teachers can help alleviate these concerns, and are an important component of successful inclusive programs (e.g., Lohrmann & Bambara, 2006; Downing & Peckham-Hardin, 2007).

Such support is frequently provided through consultation between general education teachers and special educators or other professionals with relevant expertise. The collaborative consultation model (Idol, Nevin, & Paolucci-Whitcomb, 1995) was developed for the express purpose of supporting the inclusion of students with disabilities. Through collaborative consultation, special educators and related service providers indirectly support included students by helping general education teachers to select and implement appropriate practices. When these practices are implemented with integrity (or in the manner intended), students are more likely to achieve desired outcomes (Noell & Gansle, 2014a). Existing literature has demonstrated the efficacy of consultation in facilitating inclusive placements for students with disabilities (e.g., Shapiro, et al., 1999). Remaining unclear are questions not of if, but *how* consultation may effectively support teachers in implementing inclusive practices.

Implementation science offers a useful perspective from which to consider such questions. Research in this area has primarily examined the implementation of universal, evidence-based programs in schools. Important findings emerging from this work include relations between dosage, or amount, of support received by a teacher and the integrity with which that teacher implements target practices (e.g., Pianta, et al., 2014; Blazar & Kraft, 2015).

The present study applies these findings to the topic of inclusion. Adopting an implementation science framework, relations between consultation dosage and teachers'

implementation of inclusive practices are explored. Both variable- and person-centered analyses will be employed in order to understand this relationship on a broad scale, while also recognizing that individuals within a larger sample may exhibit variable patterns of change.

## **2.1 LITERATURE REVIEW**

The current research was informed by thorough review of the relevant literature, which is summarized in the following sections of this paper. Following this review, specific research questions and analytic strategies are outlined.

### **2.1.1 Shifting responsibilities**

As is evident in the definition of inclusion (Mastropieri & Scruggs, 2000), the move towards more inclusive models has shifted primary responsibility for daily instruction of students with disabilities from special educators to general education teachers. A large body of research has examined teachers' attitudes towards this shift in responsibilities; in fact, this represents the most thoroughly researched topic pertaining to inclusion (e.g., Lindsay, 2007). A consistent finding is that teachers report generally positive attitudes towards the concept of inclusion, but express concern about the realities of implementing full inclusion in the context of the general education classroom (e.g., MacFarlane & Woolfson, 2013; Cook, Cameron, & Tankersly, 2007). These findings are particularly noteworthy in light of research demonstrating that teachers' attitudes towards inclusion influence the quality of the classroom learning environment (Monsen, et al., 2014) and willingness to implement inclusive practices (Urton, et al., 2014).



Teachers consistently cite two major concerns about implementing inclusion in their own classrooms: sense of self-efficacy and perceived availability of supports. In terms of self-efficacy, general education teachers often report feeling ill-equipped to meet the needs of students with disabilities (e.g., Urton, Wilbert, & Hennemann, 2014). Even among teachers who feel very positively about the concept of inclusion, many lack confidence in their own ability to successfully implement inclusion in their classroom (Cook et al., 2007). Reviewing the literature in this area, Kavale and Forness (2000) found that teachers' feelings of self-efficacy are influenced by concerns about the severity of disability as well as the added responsibilities associated with inclusion. Urton and colleagues (2014) found that individual experiences with inclusion can effectively build teachers' feelings of self-efficacy. Increased self-efficacy, in turn, contributes to more positive attitudes towards inclusion and increased willingness to include students with disabilities (Urton, et al., 2014). Such findings emphasize the importance of supporting teachers to help promote positive experiences with inclusion.

Existing research demonstrates that supports available to facilitate inclusion influence both attitudes and practices among general education teachers. Based on his review of the literature, Lindsay (2007) concluded that teachers' sense of a lack of available supports may undermine both attitudes and practices regarding inclusion. Conversely, greater perceived adequacy of supports has been associated with more positive attitudes towards inclusion, and higher quality environments in inclusive classrooms (Monsen, et al., 2014). Adequate support for teachers was also identified as a necessary component of a high-quality inclusive education program by key stakeholders, including parents and teachers (Downing & Peckham-Hardin, 2007).

In a rigorous qualitative study, Lohrmann and Bambara (2006) explored the types of supports that teachers require. Teachers with positive experiences including students with developmental and behavioral disabilities were asked to describe the supports they believed were essential to their success. Results indicated that both school-level and individual supports for teachers were crucial; recommended individualized supports included a combination of tailored coaching and technical assistance (Lohrmann & Bambara, 2006).

Such findings make clear that as responsibility for educating students with disabilities shifts to general education teachers, these teachers require supports in order to successfully implement best practices in inclusion. Models of special education service delivery have evolved accordingly.

### **2.1.2 Shifting models of service delivery**

Under the resource model, services such as special education instruction, speech/language therapy, or occupational therapy were provided to students directly. However, this necessitated the separation of students with disabilities from the general education environment (e.g., Zigmond, et al., 2009). The advent of inclusion has resulted in a shift to indirect models of service delivery, wherein specialized service providers engage in a high degree of collaboration with general education teachers to support the needs of students with disabilities in general education settings (e.g., McLaughlin, 2002). Effective collaboration between professionals has been identified as a key factor in successful inclusion (e.g., Jorgensen et al., 2012; Odom, Buysse, & Soukakou, 2011), and may be particularly vital to supporting the inclusion of students with moderate to severe disabilities (Wolfe & Hall, 2003). In inclusive models, consultation is

frequently used to both support general education teachers and indirectly provide specialized services to included students with disabilities.

**2.1.2.1 Consultation** The collaborative consultation model (Idol, Nevin, & Paolucci-Whitcomb, 1995) was developed to support the needs of special education students in inclusive classrooms. While collaborative consultation has been operationally defined in various ways, the key features of this model, common to all definitions, have been summarized as follows: “The consultant and consultee work together in some way in one or more phases of consultative problem solving (i.e. problem identification, plan development, and plan implementation)” (Schulte & Osborne, 2003, pg. 110). The use of collaborative, problem-solving models of consultation is a frequently employed method of supporting teachers in addressing the learning and behavioral needs of students (Kampwirth & Powers, 2012). In this model, specialized service providers assume the role of consultant and general education teachers the role of consultee.

Research shows that problem-solving consultation can effectively facilitate the inclusion of students with disabilities. Given the individualized focus of both consultation and inclusion, it is not surprising that many studies of this topic have employed single-subject and/or case study methodology. In an example of such research, Wilkinson (2005a & 2005b) demonstrated the efficacy of collaborative, problem-solving consultation in supporting continued inclusive placements for students with disabilities whose behavioral difficulties placed them in danger of being moved to more restrictive educational placements.

A review of the literature identified one example of a larger scale, quantitative study examining the use of consultation to facilitate inclusion. Shapiro and colleagues (1999) found that consultation effectively helped school teams transition students to more inclusive settings, or maintain students in inclusive settings. Results were observed in both the short-term and at 4-

and 6-month follow-up (Shapiro, et al., 1999). Such findings are consistent with the school-based consultation literature more broadly. Work in this area has extensively documented relations between school-based consultation and positive academic and behavioral student outcomes (e.g., MacLeod, et. al. 2001).

Remaining questions are not whether, but how consultation can effectively facilitate inclusion. Investigating the mechanisms involved in this process represents a next important step in this body of research. Implementation science offers useful guidance in addressing these questions.

### **2.1.3 Implementation science**

Implementation science, the study of variables that impact change (Fixsen, Blasé, Metz, & Naoom, 2014), is a burgeoning area of educational research. Research in this area seeks to identify and understand key aspects in the process of implementation, or translating research to practice. A major finding that has emerged from this work is the importance of treatment integrity. Treatment integrity (or fidelity) is the degree to which an evidence-based practice is implemented as intended (e.g., Sanetti & Kratochwill, 2014). Treatment integrity has been shown to mediate relations between training in the use of an evidence-based practice and observed outcomes (e.g., Durlak & DuPre, 2008).

**2.1.3.1 Treatment integrity in consultation** When conceptualizing the relationship between school-based consultation and student outcomes, indirect effects are assumed (Noell & Witt, 1999). Here, consultation is considered the intervention. Treatment integrity is the degree to which teachers (the consultees) implement the practices identified through the consultation

process. In the context of the consultation relationship, this has been termed intervention plan implementation (Noell & Gansle, 2014a). Analogous to research linking treatment integrity to student outcomes, intervention plan implementation has been hypothesized to mediate relations between school-based consultation and student outcomes, and scholars have called for research investigating this connection (Noell & Gansle, 2014a).

Given the nature of the consultative relationship, the specific intervention plan agreed upon will in some ways be unique to each consultant/consultee dyad. However, when applied to a specific topic such as inclusion, certain commonalities across intervention plans can be expected. Best practice guidelines for inclusion have been developed (Jorgensen, McSheehan, Schuh, & Sonnenmeier, 2012); increasing teachers' use of these practices thus seems a likely focus of many consultation intervention plans.

Although research examining this topic is limited, existing findings support this premise. In the sole example identified of a large-scale, quantitative study investigating consultation to facilitate inclusion, consultation effectively supported the implementation of inclusive practices in general education K-12 settings (Shapiro, et al., 1999). Employing a longitudinal design with random assignment to conditions, these authors investigated the effectiveness of three intervention conditions. In each condition, the goal was to support the inclusion of students with emotional and behavioral disabilities in general education settings. Students who were the target of these efforts were either transitioned from more restrictive educational placements to inclusive settings during the course of the study, or were already placed in inclusive classrooms but were in danger of being moved to more restrictive settings. School staff were assigned to one of three conditions: training in inclusive strategies alone, training followed by school-based consultation services (provided by external consultants), or a control condition in which neither training nor

consultation was provided. The training-only condition did not result in the implementation of inclusive strategies. Only when consultation support was provided following training were the inclusive strategies successfully implemented. Moreover, in the training plus consultation condition, the target students were successfully maintained in inclusive settings at 4-6 month follow-up (Shapiro et al., 1999). This is particularly noteworthy, as sustained implementation has proven difficult; in one study, even high levels of implementation began to decrease as soon as 2-4 days after initial training (Witt, et al., 1997).

Similar findings have been reported in early childhood education settings. In a randomized trial, Strain and Bovey (2011) investigated an evidence-based model of inclusion for children with Autism Spectrum Disorders. They found that this model was implemented with significantly higher levels of fidelity in classrooms that received a combination of training and coaching as compared to classrooms that received training alone (Strain & Bovey, 2011). The use of the term coaching as opposed to consultation in this study reflects a growing trend, and an important overlap between the general and special education literatures.

***Coaching vs. consultation: A comment on terminology*** As multi-tiered systems of support/Response-to-Intervention frameworks have been widely adopted, general education researchers have increasingly investigated how to support high-fidelity implementation of universal, evidence-based programs (Schultz, Arora, & Mautone, 2015). A major finding that has emerged is the importance of coaching in ensuring that practices or skills learned during training translate to changes in teachers' classroom behavior (e.g., Joyce & Showers, 2002). Coaches are defined as professionals who support teachers in developing newly learned skills, and using these skills in their daily classroom practice (Fixsen, et al., 2014). Support strategies used by coaches include on-the-job supervision, demonstration, evaluation, performance

feedback, and general support (Fixsen, et al., 2014). A large body of research demonstrates that training is necessary but insufficient in helping teachers implement evidence-based programs (e.g., Strain & Bovey, 2011). Coaching support in addition to training is a key factor in the implementation process (e.g., Fixsen, et al., 2014).

Although the role of “coach” in school settings is relatively new, there is considerable overlap between the role of “coach” and that of “consultant” (e.g., Schultz et al, 2015). A recent comparison concluded that school-based coaching and consultation share many similarities (Erchul, 2015). Thus, work examining school-based consultation may be informed by findings in the coaching research. In fact, Schultz and colleagues (2015) have asserted that school-based consultants “increasingly fulfill the role of coach,” (pp. 1).

**2.1.3.2 Dosage** A topic that has received considerable attention in the coaching literature is that of dosage effects, or the dose-response relationship. In terms of educational and mental health interventions, dosage refers to the time and/or frequency with which an intervention is delivered (e.g., Bumbarger, 2014). Applied to questions of treatment integrity, as previously discussed, teachers’ implementation of specific practices is considered the outcome. Strategies meant to increase or support this implementation, such as coaching or consultation, are conceptualized as the intervention and thus the focus of dosage investigations.

Coaching research demonstrates relations between dosage and teachers’ implementation of target practices. Reinke, Stormont, Herman, and Newcomer (2014) found a significant dose-response relationship between coaching and teachers’ use of proactive classroom management strategies. Teachers who received higher dosages of coaching (defined as amount of coaching time) showed greater increases in use of these strategies over time (Reinke, et al., 2014). Using data from a randomized trial of the MyTeaching Partner coaching model in early education

settings, Pianta and colleagues (2014) found a significant correlation between coaching dosage (defined as number of coaching sessions received) and improvements in teachers' classroom interactions (Pianta, et al., 2014). Pas and colleagues (2015) found significant relations between coaching dosage and teachers' implementation of the Good Behavior Game. While unable to establish causality, Blazar and Kraft (2015) found that a reduction in coaching dosage across cohorts of a randomized trial was accompanied by a loss of program effectiveness.

Coaching research has also demonstrated that effective coaches often individualize, or attune, their approach to best meet the needs of the teachers with whom they work (e.g., Wanless, Patton, Rimm-Kaufman, & Deutsch, 2013; Pieri & Wanless, 2015). Again, the overlap between the role of coach and that of consultant is evident here. Collaborative, problem-solving consultation models inherently involve individualization of services based upon the consultee's needs. It stands to reason that such tailoring of services would extend to the dosage of consultation provided, with consultants using professional judgment to determine which teachers require higher or lower dosages. Some evidence of this is found in Blazar and Kraft (2015), who note that coaches likely made decisions about how to allocate their time based on the needs of each teacher. However, such decisions were not formally analyzed in relation to coaching dosage (Blazar & Kraft, 2015). While consistent dosage may be desirable in establishing the efficacy of a coaching intervention, decisions such as those described by Blazar and Kraft (2015) likely reflect those made by coaches in applied settings on a regular basis. Whether or how dosage may vary based on individual teacher needs, however, is a topic that remains largely unexplored.

The findings summarized in the preceding paragraphs are promising, but they represent only initial steps in understanding relations between dosage of coaching or consultation and



teachers' implementation of target practices. Existing research suggests that higher dosage of coaching increases the likelihood that teachers will implement target practices. Remaining questions include whether coaches provide differing dosages based on the needs of individual teachers, and how varying dosages relate to differing patterns of implementation (e.g., Pas, et al., 2015). This is true of the coaching literature generally which, as previously stated, has largely examined coaching in the context of universal or widespread programs.

In terms of consultation for the express purpose of facilitating inclusion (or, more specifically, teachers' implementation of inclusive practices), a review of the literature identified no studies to date that have examined the dose-response relationship. In some ways, this is not unexpected and reflects the individualized nature and focus of consultation. However, given that consultation is employed on a wide scale to support compliance with inclusion mandates (e.g., Jorgensen, et al., 2012), an examination of dosage effects specific to this topic seems timely. A better understanding of these effects may provide valuable guidance to practitioners, stakeholders, and policymakers as they determine how best to allocate time and resources.

Research that contributes to this understanding should take into account the inherent complexities of the topic. Just as consultants may tailor dosage based on teacher needs, individual teachers may respond differently to the same dosage. However, such differences are not likely to be reflected in research that identifies only overall trends. Person-centered approaches to research allow for consideration of such differences. The use of these methods may enhance understanding of dosage effects.

#### **2.1.4 Person-centered vs. variable-centered approaches**

Person-centered approaches to research have emerged as an alternative to more traditional variable-centered approaches. Person-centered approaches identify subgroups of participants within a larger sample who share similar attributes or patterns (e.g., Magnusson, 2003). Variable-centered approaches assume homogeneity within a population in the relations between predictors and outcomes (Laursen & Hoff, 2006). Person-centered approaches may allow for an understanding of outcomes that is both more holistic and more individualized (Denham, et al., 2012). Given the individualized nature of both consultation and special education, research using person-centered approaches in addition to more traditional variable-centered methods seems appropriate.

This research employed both variable-centered and person-centered analyses to investigate how consultation impacts teachers' implementation of inclusive practices. Variable-centered analyses will contribute to a broad understanding of the dose-response relationship in the full sample of teachers, while person-centered analyses will allow for a more nuanced understanding of subgroups within this full sample.

## **2.2 PURPOSE**

This study utilized data from the *Include Me* initiative to investigate relations between consultation dosage and teachers' implementation of inclusive practices. *Include Me* is a statewide initiative that provides specially trained consultants to school districts throughout Pennsylvania. The overarching goal of these services is to facilitate the inclusion of students

with moderate to severe disabilities in general education classrooms. Program evaluation has demonstrated positive outcomes for included students, and increased use of inclusive practices by teachers associated with this initiative (Bagnato, Fevola, and Whittaker, 2014). The *Include Me* program is described in more detail in subsequent sections of this paper. The current study will undertake a secondary analysis of data from the *Include Me* initiative. The purpose of this research is to better understand how consultation dosage related to teachers' implementation of inclusive practices in this sample. The following research questions will be addressed:

RQ1: Did teachers' implementation of inclusive practices at baseline relate to total dosage of consultation received? Consultation dosage is expected to significantly relate to implementation of inclusive practices at baseline. Consistent with the individualized nature of collaborative consultation, it is hypothesized that consultants tailored consultation dosage based on teachers' implementation of inclusive practices at baseline. Specifically, teachers with lower baseline levels of implementation are expected to have received higher dosages of consultation.

RQ2: Did total dosage of consultation received across one school year relate to teachers' implementation of inclusive practices at the end of that school year? Consultation dosage is expected to significantly relate to teachers' implementation of inclusive practices at the end of the school year. Specifically, higher dosages of consultation are expected to relate to higher levels of implementation at exit.

RQ3: Did teachers in this sample show distinct patterns of change in their implementation of inclusive practices across one school year? The hypothesis here is that subgroups based on distinct patterns of change will be identified within the overall sample.

RQ4: Does consultation dosage relate to membership in subgroups based on distinct patterns of change in implementation of inclusive practices? Consultation dosage is expected to

significantly relate to membership in subgroups based on distinct patterns of change in implementation of inclusive practices. Specifically, higher dosage of consultation is expected to relate to membership in subgroups with greater change in inclusive practices.

## 2.3 METHODS

### 2.3.1 *Include Me* overview

Data for this study were drawn from the *Include Me* program during the 2013-2014 school year. *Include Me* is an initiative of the Arc of Pennsylvania, with funding provided by the Pennsylvania Department of Education. This program provides specially-trained consultants to school districts across the state of Pennsylvania. Consultants' primary aim is to facilitate inclusion for students with moderate to severe disabilities.

*Include Me* was established during the 2010-2011 school year as the result of a legal settlement, *Gaskin v. Pennsylvania* (2005). This class action lawsuit claimed that school districts in the state were failing to educate students with disabilities in the least restrictive environment. As part of the settlement agreement, the state Department of Education increased the training and technical assistance provided to support inclusion in local school districts (*Gaskin v. Pennsylvania*, 2005). The *Include Me* initiative was a part of this settlement agreement.

*Include Me* (then known as *Include Me from the Start*, or IMFS) initially focused on inclusion at the early elementary level. During the pilot phase (2010-2013), IMFS consultants worked with 30 school districts to facilitate the inclusion of 150 students with significant disabilities in grades K-1. Consultants were assigned to districts with the lowest rates of

inclusion. Program evaluation indicated significant positive gains in teachers' inclusive practices, and functional outcomes for the included students (see Bagnato, Fevola, & Whitaker, 2014 for further information). Due to these positive impacts and the receptiveness of school personnel to these services, the IMFS program was expanded during the 2013-2014 school year. Renamed *Include Me*, the program now provides services to districts on a volunteer basis and supports inclusion from grades K-12. This study utilizes data collected during the 2013-2014 school year.

Evaluation of the expanded *Include Me* program demonstrated continued positive impacts. Between Fall 2013 and Spring 2014, teachers increased their implementation of inclusive practices, and students showed positive functional and learning gains (Bagnato, et al., 2014). The current study undertakes a secondary analysis of this data to better understand how these gains were achieved, specifically focusing on relations between consultation dosage and teachers' implementation of inclusive practices.

## **2.3.2 Participants**

**2.3.2.1 Teachers** Participants for this study included 82 general education teachers from school districts across the state of Pennsylvania. Participating schools and districts self-selected by independently approaching and expressing interest in the *Include Me* initiative. There was no cost to participating schools.

Demographic information was voluntarily obtained for 31 of the 82 teachers included in the full sample. All teachers for whom demographic information is available identified their race as White. This reflects demographics of the teaching profession in general (U.S. Department of Education, 2016). Most teachers in this sample (40%) were between 42 and 51 years of age.

The highest level of education completed by the majority (81%) of these teachers was a Master's degree, with Elementary Education being the most common area in which the highest degree was earned (71%). The average years of teaching experience among this group was 15.9, with the largest percentage of teachers (26%) having 23 or more years of experience.

Approximately 71% of teachers reported some training in working with children with disabilities via undergraduate, graduate, or professional development education. Notably, however, 26% of these teachers reported no training in working with children with disabilities. Sixteen of these teachers (52%) reported that their current school offered some type of professional development (trainings, workshops, conferences, or coursework) focusing on the inclusion of students with disabilities. Four of these teachers (13%) reported having a co-teacher in the general education classroom.

Available demographic information for teachers in this sample is summarized in Table 2.

**Table 2.** *Teacher demographic information (N=31/82 total participants)*

	<i>N</i>	Percent
Educational level completed		
Bachelor's degree	4	13
Some graduate	2	6
Master's degree	25	81
Education major for highest degree*		
Elementary Education	23	74
Special Education	2	6
Other	7	23
Age range (in years)		
22-31	4	13
32-41	11	35
42-51	12	39
52-61	4	13
Years of teaching experience		
7 or fewer	6	19
8-12	5	16
13-17	6	19
18-22	6	19
23 or more	8	26
Prior training in working with children with disabilities		
Undergraduate	9	29
Graduate	5	16
Professional development	9	29
None	8	26

Percents rounded to nearest whole number

\*One teacher reported dual majors in elementary and special education

**2.3.2.2 Consultants.** Additional participants for this study were 16 specially trained *Include Me* consultants. Fifteen consultants (93.7%) were female. One consultant was African American; the remainder were White. The average age of consultants was 43.2 years. Years of experience working in a related role ranged from a minimum of 3 to a maximum of 53 ( $M = 15.4$ ). Eleven of the 16 consultants (68.8%) were parents or relatives of children with special needs. Consultants' educational background, previous occupation, and undergraduate major are summarized in Table 3.

**Table 3.** *Include Me* consultants' educational levels, undergraduate majors, and previous occupations as a percentage of the sample ( $N=16$ )

	<i>N</i>	Percent
Educational level completed		
Bachelor's degree	6	38
Some graduate	5	31
Master's degree	5	31
Undergraduate major		
Anthropology	1	6
Business	2	13
Education	9	56
Engineering	1	6
Marketing	1	6
Psychology	1	6
Social Work	1	6
Previous occupation		
Advocate	4	25
Inclusion coordinator	2	13
Mental health	1	6
Manager	1	6
Teacher	5	31
TSS	3	19



### 2.3.3 Measures

**2.3.3.1 Teachers' implementation of inclusive practices** Teachers' implementation of inclusive practices was assessed using the Classroom Effective Practices Inventory (CEPI; McKeating & Bagnato, 2013). The CEPI is an observational measure that was adapted from Jorgensen et al.'s (2012) Essential Best Practices for Inclusive Schools, with permission from the first author. This measure uses a 4-point Likert scale ranging from 0 (very little or no evidence that the practice is being used in the classroom) to 3 (clear evidence; the practice needs no improvement). The CEPI is comprised of 40 items that assess 6 domains of inclusive practices: Expectations, Membership and Participation, Instruction and Supports, Social Relationships, Communication, and Self Determination and Futures Planning.

The CEPI was completed for each participating teacher in Fall 2013 (entry) and Spring 2014 (exit) by *Include Me* consultants. The mean time between collection of entry and exit data was 131 school days, or about 6 months (Bagnato, et al., 2014). Domain and total scores were created by calculating the sum of item ratings. Mean scores for CEPI entry and exit data were summarized in Table 4. The Self Determination and Futures Planning domain was excluded from all calculations, as this domain pertained to only a very few students in the sample ( $N = 5/82$ ) who were of transition planning age. The current study uses the CEPI total score as an overall measure of each teachers' implementation of inclusive practices at entry and exit.

**Table 4.** *CEPI entry and exit mean scores (N=82)*

CEPI Domain	Entry (Fall) Mean	Exit (Spring) Mean
Expectations	15.15	15.66
Membership and Participation	13.63	14.40
Instruction and Supports	15.79	17.09
Social Relationships	11.80	14.40
Communication	9.09	8.06
CEPI Total Score	65.46	69.61

**2.3.3.2 Dosage** Dosage was measured using the SPECS Mentoring Monitor (McKeating & Bagnato, 2012). Using this tool, consultants maintained detailed logs of the frequency and duration of their interactions with consultees. During the 2013-2014 school year, *Include Me* consultants worked with general education teachers, special education teachers, parents and guardians, and related services professionals. For the purposes of this study, consultant logs detailing interactions with general education teachers were used.

In their work with general education teachers, consultants used the following strategies: observation with feedback, direct training, demonstration and modeling, and problem-solving sessions. Problem-solving sessions addressed behavioral, social, and instructional supports as well as physical or environmental adaptations and modifications. Consultants communicated with teachers via face-to-face meetings, telephone calls, emails, texts, and written notes. Consultants logged each contact with teachers; duration, mode of contact, and strategies employed were recorded. For the purposes of this study, dosage is defined as the total amount of interaction time (in hours) *Include Me* consultants logged for each general education teacher.

Teachers in this sample received a mean of 26.13 hours of consultation over the course of the 2013-2014 school year.

**2.3.3.3 Student functional impairment** In addition to teacher and consultant data (CEPI and SPECS) previously described, the *Include Me* program also collected student data during the 2013-2014 school year. The Functional Outcomes Classifications of Assets for Learners (FOCAL; Bagnato & McKeating, 2013) was used as a measure of student learning and functional skills. The FOCAL is based upon the framework provided by the US Department of Education's Office of Special Education Programs (OSEP) for documenting and reporting students' functional status. This measure consists of 21 items that are rated using a 7-point Likert scale ranging from "not yet" (1) to "completely" (7). Ratings are assigned based on the extent to which the child displays age-appropriate skills across a variety of settings and situations in each of 5 domains: Social-Emotional, Knowledge, Effective Actions, Self-Regulation, and Academics. FOCAL ratings for each included student were completed collaboratively by teachers, parents, and *Include Me* consultants at entry (fall) and exit (spring), with a progress measure completed during the school year. Follow-up analyses (described in subsequent sections of this paper) employed the FOCAL score at entry as a measure of functional impairment for each student. FOCAL entry scores were available for 81/82 students who were the focus of consultation services with general education teachers in this sample. A total score was created by summing the ratings for each item ( $M = 87.63$ ,  $SD = 26.27$ ), with higher scores indicating more age-appropriate functioning.

## **2.3.4 Analyses**

**2.3.4.1 Preliminary/descriptive analyses** Descriptive statistics (mean, standard deviation) were calculated for CEPI entry and exit scores and for total consultation dosage (in hours) received by each teacher (see Table 4 and the preceding sections of this paper). Scatterplots were generated to provide a visual depiction of the score distributions. This output was examined to determine the degree of variability in dosage of consultation received across the sample. Additional preliminary/descriptive analyses, including those used to check relevant assumptions, are described in subsequent sections pertaining to each research question.

**2.3.4.2 Research question 1** This research question was addressed using regression analysis procedures. Data screening was conducted to check for violations of assumptions prior to regression analysis. A scatterplot of teachers' baseline implementation of inclusive practices (CEPI total entry score) and consultation dosage (total dosage, in hours) was generated and examined to check for linearity. A scatterplot of standardized residuals against standardized predicted Y values was also generated and examined to check for linearity and homoscedasticity. A histogram, normal probability plot, and Q-Q plot of standardized residuals was generated and examined for evidence of normality, skewness, or kurtosis. The Shapiro-Wilk test was conducted to check the assumption of normality, and the Durbin-Watson statistic calculated to examine independence of errors. Finally, data was checked for outliers by generating and examining histograms for both leverage and studentized deleted residuals. Outlier statistics tables, and a scatterplot of leverage values for the CEPI entry score and studentized deleted residuals for the dosage value, were each be generated and examined. Cook's distance was calculated. Cases with the 10 highest values of Cook's distance were identified and compared to

the “rule of thumb” cut-off score of 1.0 to determine the existence of any outlying cases that may be influential on the overall regression model.

Linear regression was conducted to investigate how well teachers’ implementation of inclusive practices at baseline predicted total consultation dosage. The model used in this analysis is summarized in the following equation:

$$Y_i = b_0 + b_1X_i + e_i$$

In the above,  $Y_i$  represents the dosage value of the  $i$ th participant,  $X_i$  represents the CEPI entry value of the  $i$ th participant,  $b_0$  denotes the y-intercept of the best-fitting line,  $b_1$  the slope, and  $e_i$  the error term. The following hypothesis was tested:

$$H_0: \beta_1 = 0 \quad H_1: \beta_1 \neq 0$$

The hypothesis was that the null hypothesis, which holds that no linear relationship exists between baseline implementation and total consultation dosage, would be rejected. Rejection of the null hypothesis would indicate that a relationship between baseline implementation (CEPI entry) and total dosage does exist, suggesting that consultants tailored the dosage provided based on teachers’ implementation of inclusive practices at baseline. The direction of the hypothesized relationship was expected to be negative, such that lower levels of inclusive practices at baseline predict higher dosage of consultation meant to support these practices. This hypothesis was tested using the  $F$  test. Follow-up analyses used similar procedures to examine the relations between student functional impairment and consultation dosage. When  $F$  testing indicated a significant relationship,  $R^2$  and adjusted  $R^2$  were also calculated in order to determine the proportion of variability in the dependent variable accounted for by the predictor variable. The  $R^2$  value indicated the proportion of variance accounted for in this sample, while the adjusted  $R^2$

value provided an estimate of proportion of variability in the dependent variable explained by the independent variable in the population.

A power analysis was conducted using G\*Power (Faul, Erdfelder, Buchner, & Lang, 2009) to determine the number of participants necessary to detect a statistically significant difference given a false null hypothesis using linear regression analyses. The sample size to detect a medium effect size ( $r = .30$ ) using a two-tailed test, with  $\alpha = .05$  and  $1 - \beta = .80$ , is  $N = 82$ . The size of the sample to be analyzed in this research ( $N = 82$ ) meets this requirement.

**2.3.4.3 Research question 2** This research question was addressed using regression analysis procedures. All relevant assumptions (normal distribution of the error term, independence of Y-values, homoscedasticity, and linearity) were checked prior to analysis using procedures outlined above. In this analysis, total dosage for each teacher (in hours) was entered as the independent variable. Teachers' implementation of inclusive practices at the conclusion of the school year (represented by CEPI total exit score) was the dependent variable. The null hypothesis tested held that no linear relationship existed between total dosage and teachers' implementation of inclusive practices at exit. Rejection of the null hypothesis would indicate that dosage did relate to CEPI total exit scores. The direction of the hypothesized relationship was positive, with higher consultation dosage expected to predict higher CEPI exit scores. Again, follow-up analyses were undertaken using the FOCAL entry score as the independent variable in similar analyses, for reasons outlined in the Results section of this paper.

A power analysis conducted using G\*Power (Faul, et al., 2009) indicated that the size of the sample to be analyzed in this research ( $N = 82$ ) satisfies the criteria necessary to detect a medium effect size ( $r = .30$ ).

**2.3.4.4 Research question 3** Procedures used to address this research question were exploratory in nature. Change scores were calculated for each participant by subtracting CEPI total entry from CEPI total exit scores. Descriptive analyses (mean, standard deviation, range) of the change scores were conducted and analyzed, and scatterplots of change scores generated and examined.

Additionally, scatterplots of CEPI entry and CEPI exit scores were generated for each participant. These scatterplots were examined to identify specific patterns of change that may not be readily apparent in the change scores. For example, a teacher whose CEPI entry and exit scores were both low would have a minimal change score; the same can be said of a teacher whose CEPI entry and exit scores were both high. However, despite similar change scores, the patterns suggested by these examples may be distinctly different and thus merit separate consideration.

Based on examination of the information summarized above, a determination was made as to whether and how participants may be grouped based on observed pattern of change. Consideration included whether natural breaks in the data were evident, as well as whether additional procedures may have been useful in identifying existing subgroups within the overall sample. Given that the number of variables under consideration was less than 3, the use of scatterplots and visual inspection was determined to be sufficient in identifying clusters or subgroups within the data (Bartholomew, Steele, Moustaki, & Galbraith, 2008). Similar procedures were followed to create subgroups based on pattern of change for each of the 5 domains assessed by the CEPI.

**2.3.4.5 Research question 4** This research question was addressed using multinomial logistic regression. Subgroups created in RQ3, based on observed pattern of change in implementation

of inclusive practices, were used here as the dependent variable. Total consultation dosage (in hours) was the independent variable. Logistic regression analysis was most appropriate here due to the categorical nature of the dependent variable.

Prior to conducting this analysis, data screening was conducted to check for violations of relevant assumptions. A logit of the dependent variable (group membership) was computed. A scatterplot and Box-Cox transformation were generated and visually analyzed to check for a linear relationship between the logit and the continuous independent variable (dosage). Histograms and Q-Q plots were generated and used to check for outliers among the errors.

The logistic regression model tested in this analysis was as follows:

$$\text{logit}_i = b_0 + b_1X_i + e_i$$

This model is essentially the same as the linear regression model described in RQ1 and RQ2. The difference here is that the equation is now predicting  $\text{logit}_i$  rather than  $Y_i$ . In the above,  $\text{logit}_i$  is defined as:

$$\text{logit}_i = \log\left(\frac{p_i}{1-p_i}\right)$$

Where  $p_i$  represents the probability of a certain outcome (in this case, group membership) for each case and  $\left(\frac{p_i}{1-p_i}\right)$  represents the odds ratio, or the probability that an outcome will occur divided by the probability that the same outcome will not occur. The logarithmic function linearizes the relationship between the dependent variable (which is categorical) and the independent variable (which is continuous). The hypothesis tested was again:

$$H_0: \beta_1 = 0 \quad H_1: \beta_1 \neq 0$$



Here,  $H_0$  held that the odds of membership in a subgroup (based on pattern of change in inclusive practices) was not related to dosage of consultation received. The overall fit of this model was assessed using likelihood ratio testing. The determination as to whether to reject  $H_0$  was based upon the statistical significance of the likelihood ratio  $\chi^2$  (defined as  $\alpha = .05$ ). One subgroup was used as a reference in these analyses, with odds of membership in other groups calculated in comparison to this reference group. Comparison of coefficients for each outcome (group) allowed for a more detailed understanding of identified relations. These procedures were first followed using membership in subgroups based on pattern of change in overall implementation of inclusive practices (CEPI total scores). Following this analysis, the same procedures were used to examine relations between consultation dosage and membership in subgroups based on pattern of change in each of the five domains of inclusive practice assessed by the CEPI.

Power analysis for multinomial logistic regression is less straightforward than that for linear regression as described in RQ1 and RQ2, making a determination as to the power offered by this procedure more difficult. Statistical software packages offering power analysis for multinomial logistic regression models have only recently been made available and remain rare. When such analyses are available, guidelines are often provided only for post-hoc power analyses (e.g., Faul, et al., 2009). Complicating this procedure is the necessity of providing an estimated effect size in calculating power; for regression analyses, as illustrated in RQ1 and RQ2, Cohen's (1988) "rule of thumb" estimates of effect size are often employed for this purpose. In logistic regression, the strength of an effect is represented by the odds ratio value. However, while some methods of converting odds ratios to effect sizes for the purpose of meta-analyses have been proposed (e.g., Lipsey & Wilson, 2001) there is as yet no consensus

regarding descriptors of the strength of odds ratio values (Chen, Cohen, & Chen, 2010). Determination of the strength of an odds ratio is dependent upon knowledge of the rate of occurrence of the outcome of interest in the population (Chen, et al., 2010). Given the unique outcome of interest to be examined in this study (group membership based on pattern of change in teachers' implementation of inclusive practices), an estimate of population parameters for this value is unavailable. Any attempt to input such a value would be based solely on conjecture, and results of such an analysis would not provide valid or useful estimates. The power of the procedures proposed for RQ4, therefore, cannot be determined with any degree of certainty. General consensus holds that logistic regression procedures require fairly large sample sizes. Thus, a drawback of this procedure is the potential risk of committing a Type II error, or failing to reject a false null hypothesis.

However, the benefits of the procedures outlined here were believed to outweigh this risk. With a categorical dependent variable, the alternative analytic procedure would be  $\chi^2$  analysis. The use of multinomial logistic regression allowed for statistical modeling of the relationship between predictors and outcomes, rather than simply testing for associations. Because previous research allows for the generation of a specific hypothesis, modeling of the hypothesized relationship was appropriate and strengthened the conclusions that could be drawn from the results (Shadish, et al., 2002).

### **3.0 STUDY 1 RESULTS AND DISCUSSION**

Results of all analyses outlined in Chapter 2 of this dissertation are presented here, followed by a discussion of these findings. Results are organized by research question.

#### **3.1 RESULTS**

##### **3.1.1 Research Question 1**

*Did teachers' implementation of inclusive practices at baseline relate to total dosage of consultation received?*

Data screening was conducted in order to check for violations of assumptions prior to analysis. Examination of the scatterplot of inclusive practices at baseline (CEPI total entry score) and total consultation dosage (hours) supported a reasonable assumption of linearity.

A scatterplot of standardized residuals against predicted Y values offered further support that the assumption of linearity was satisfied, as the points scattered randomly around the horizontal line of zero and no curvilinear pattern was evident. Examination of this scatterplot also indicated that the assumption of homoscedasticity was satisfied, as the scatter cloud exhibited similar variability across predicted scores.

A histogram, normal probability plot, and Q-Q plot of standardized residuals were produced and examined. Examination suggested positive skewness and excess peakedness of the distribution. The Shapiro-Wilk test indicated that the assumption of normality was violated,  $W = .89$ ,  $p < .01$ , with the dependent variable having skewness of 1.36 ( $SE = .27$ ) and kurtosis of 2.43 ( $SE = .53$ ). The Durbin-Watson statistic was calculated to examine the independence of errors, and was 1.67. This indicates that the assumption of independence of errors was satisfied. Finally, data was checked for outliers. Histograms were generated and examined for both leverage and studentized deleted residuals. Each histogram suggested the existence of outliers. Outlier statistics tables were generated and examined. One case had studentized deleted residuals above the magnitude of 3. Ten cases had leverage values above the critical leverage value of .02. Because 5% of cases (with  $N = 82$ ,  $5\% = 4.1$ ) can be expected to have leverage values above the critical value, approximately 6 of these cases can be considered true outliers. Each case was examined, and there was no evidence that any resulted from an error or malfunction.

A scatterplot of leverage values for the CEPI total entry scores and studentized deleted residuals for the total consultation dosage scores was generated. Examination of this scatterplot did not indicate any cases with both high leverages and high studentized deleted residuals, suggesting that the cases with outlying values on either variable may not be influential data points. Finally, Cook's distance was calculated and the cases with the 10 highest values of Cook's distance were identified. Each of the 10 highest values of Cook's distance was less than the "rule of thumb" cut-off score of 1.0, indicating that there were no influential cases on the overall regression model. All potential outliers were included in the final analysis.

The assumption of normality, or normal distribution of errors, was violated. All other assumptions of regression were met. Given that regression is robust to violations of the normality assumption when all other assumptions are satisfied (e.g., Osborne & Waters, 2002), analyses proceeded as planned.

Linear regression was conducted to investigate how well teachers' implementation of inclusive practices at baseline predicted total consultation dosage. Results of this analysis indicate that teachers' implementation at baseline (CEPI total entry score) did not significantly predict total consultation dosage,  $F(1,80) = 1.58, p = .21$ . Therefore the null hypothesis of  $H_0: \beta_1 = 0$ , which holds that no linear relationship exists between implementation at entry and total consultation dosage, can be accepted.

Follow-up analyses were undertaken in an attempt to better understand how consultants in this sample allocated their time. Given that collaborative consultation focuses on addressing student needs, perhaps the level of need exhibited by students (rather than teachers) impacted the amount of consultation provided to teachers. This possibility was investigated using the FOCAL total score at entry to represent the degree of impairment exhibited by each included student at the start of the school year.

Assumptions were checked using procedures outlined above, with results indicating suitability of data for regression analysis. Linear regression analysis indicated that students' level of functional impairment significantly related to teachers' use of inclusive practices at entry,  $F(1,79) = 7.73, p = .007$ . The unstandardized regression coefficient of .18 indicates that for each 1-point increase in FOCAL score, teachers' CEPI score increased by .18. The  $R^2$  value of .09 indicates that 9% of the variance in CEPI total entry score in this sample can be explained by FOCAL total entry score. However, level of student functioning (FOCAL total) at entry was

not significantly related to total consultation dosage received by general education teachers,  $F(1,79) = 2.71, p = .10$ .

Finally, the possibility that teachers' implementation of inclusive practices at baseline (CEPI total entry) interacted with student functioning (FOCAL total entry) to impact consultation dosage was explored. FOCAL and CEPI total entry scores were centered prior to analysis in order to avoid multicollinearity (Aiken & West, 1991). The full model (containing centered FOCAL, centered CEPI, and the interaction term) did not significantly relate to total dosage of consultation received,  $F(3,77) = 1.80, p = .16$ . As previously reported, main effects for both CEPI ( $t(77) = -.78, p = .44$ ) and FOCAL ( $t(77) = -1.65, p = .10$ ) entry scores were non-significant. The interaction term also was not significant,  $t(77) = 1.30, p = .30$ .

### **3.1.2 Research Question 2**

*Did total dosage of consultation received across one school year relate to teachers' implementation of inclusive practices at the end of that school year?*

Data screening was conducted following the procedures outlined above in order to check for violations of assumptions prior to regression analysis. A scatterplot of total consultation dosage (hours) and inclusive practices at the end of the school year (CEPI total exit score) was generated and examined. Examination of this scatterplot did not strongly suggest linearity but did not indicate a clear violation of this assumption, as points appeared to be randomly scattered with no evidence of curvilinearity. The scatterplot of standardized residuals against predicted Y values did not suggest that the assumptions of linearity or homoscedasticity had been violated.

Examination of a histogram, normal probability plot, and Q-Q plot of standardized residuals suggested positive skewness and excess peakedness. The Shapiro-Wilk test indicated

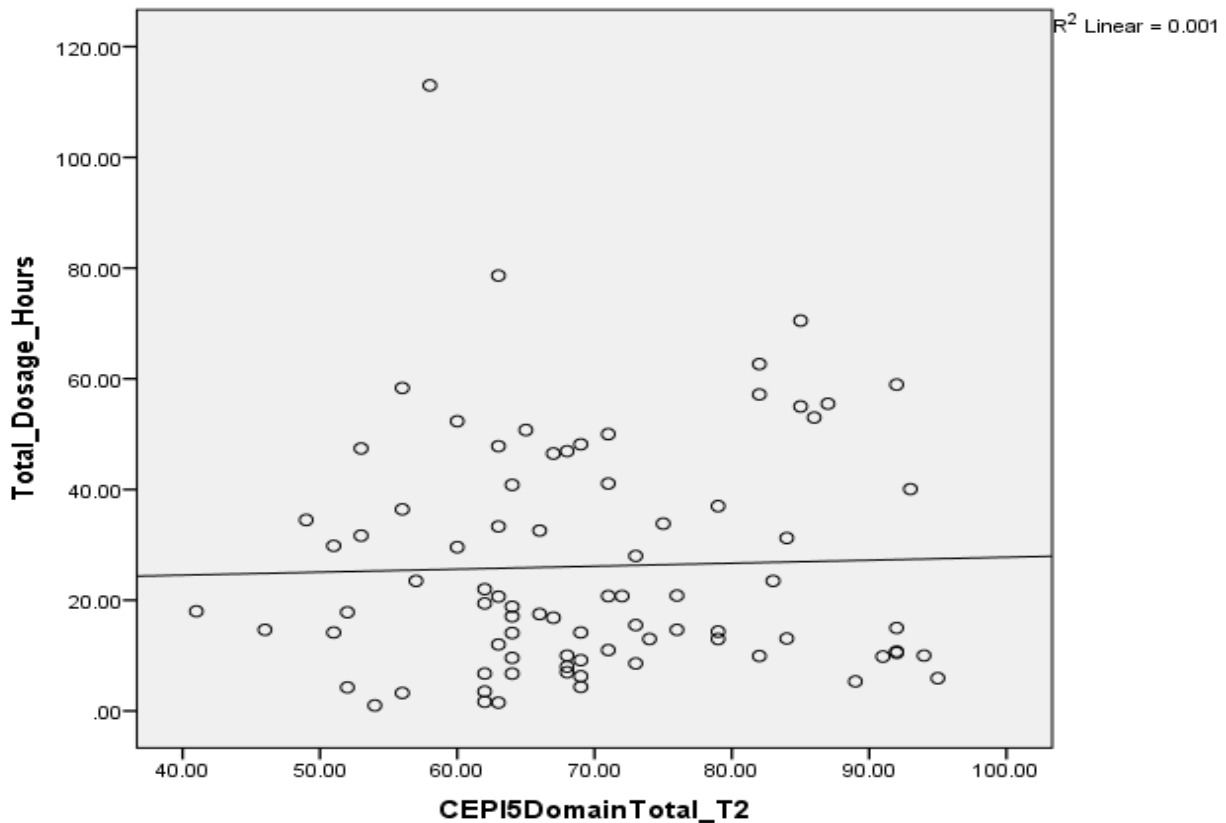
that the assumption of normality was violated,  $W = .89$ ,  $p < .01$ . The dependent variable had skewness of  $.25$  ( $SE = .27$ ) and kurtosis of  $-.54$  ( $SE = .53$ ), indicating that deviations from normality existed in the independent variable (dosage). The Durbin-Watson value of  $1.32$  indicated that the assumption of independence of errors was satisfied.

Histograms for leverage and studentized deleted residuals suggested the existence of outliers. Outlier statistics tables were generated and examined. No cases had studentized deleted residuals above the magnitude of  $3$ . Nine cases had leverage values above the critical value of  $.02$ . Because  $5\%$  of cases (with  $N = 82$ ,  $5\% = 4.1$ ) can be expected to have leverage values above the critical value, approximately  $5$  of these cases can be considered true outliers. Each case was examined, and there was no evidence that any resulted from an error or malfunction.

A scatterplot of leverage values for total dosage (hours) and studentized deleted residuals for the CEPI total exit scores was generated. Examination of this scatterplot did not indicate any cases with both high leverages and high studentized deleted residuals, suggesting that the cases with outlying values on either variable may not be influential data points. Finally, Cook's distance was calculated and the cases with the  $10$  highest values of Cook's distance were identified. Each of the  $10$  highest values of Cook's distance was less than the cut-off score of  $1.0$ , indicating that there were no influential cases on the overall regression model. All potential outliers were included in the final analysis.

Again, because normality was the only assumption violated and regression is robust in this situation (e.g., Osborne & Waters, 2002), regression analysis proceeded as planned. Results of linear regression analysis indicate that total dosage of consultation did not significantly predict teachers' use of inclusive practices at the conclusion of the school year,  $F(1,80) = .08$ ,  $p = .77$ .

The standardized beta value (equal to correlation,  $r$ ) of .03 shows no association between these two variables ( $p = .77$ ; see Figure 2).



**Figure 2:** Scatterplot of Consultation Dosage and End-of-Year Implementation of Inclusive Practices

Follow-up analyses were again undertaken using the FOCAL total score as a measure of students' functional impairment. Student functional impairment at entry significantly predicted teachers' implementation of inclusive practices at the conclusion of the school year,  $F(1,79) = 5.18$ ,  $p = .03$ . The unstandardized regression coefficient of .12 indicates that each 1-point increase in FOCAL total score was associated with .12 increase in CEPI total exit score. The  $R^2$  value of .06 indicates that 6% of the variance in CEPI exit score was accounted for by FOCAL total score in this sample.

Finally, the interaction of dosage with student functional impairment was investigated in relation to teachers' implementation of inclusive practices at the conclusion of the school year.

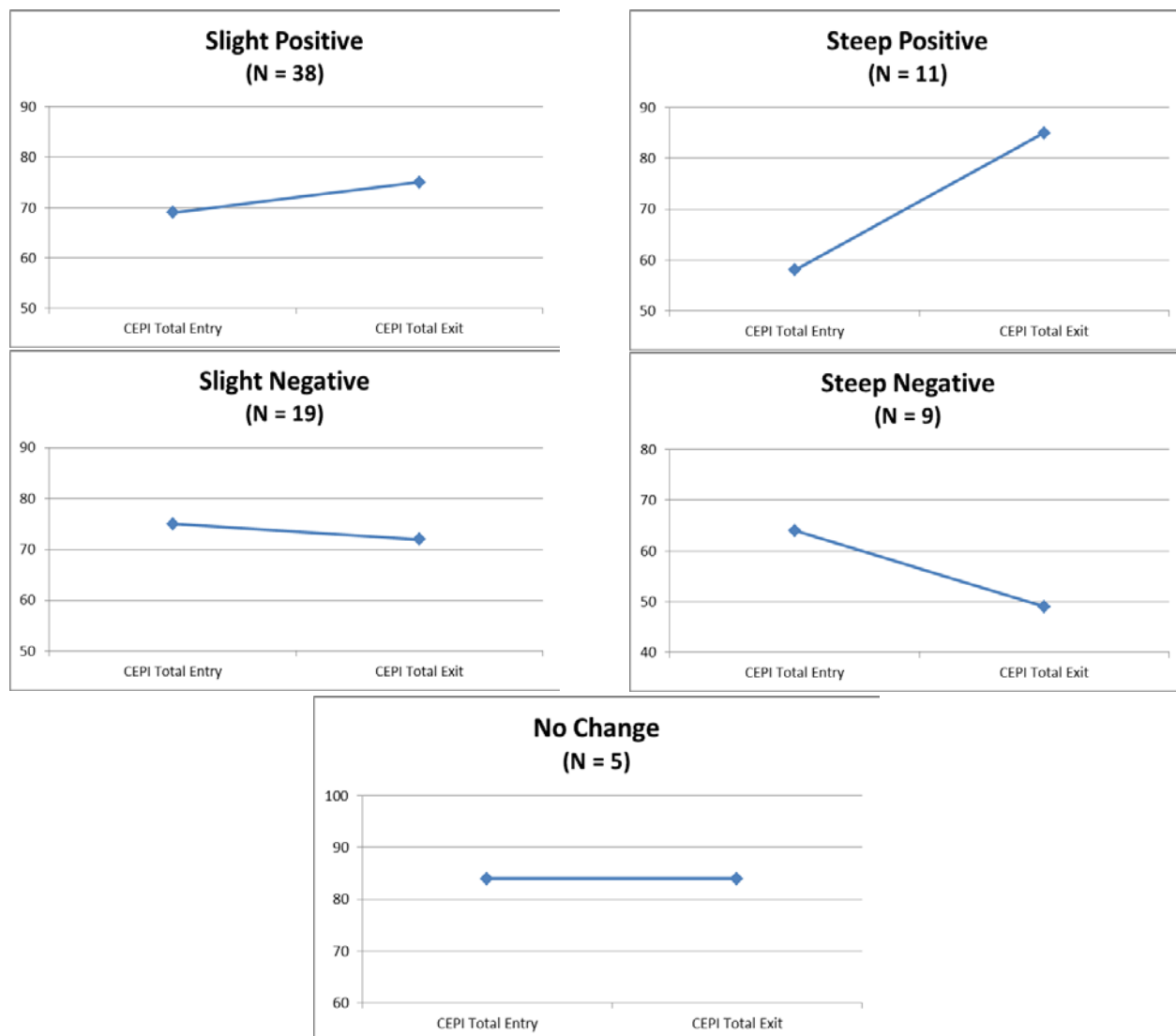


All predictor variables were centered prior to analysis in order to avoid multicollinearity. The full model (containing centered dosage, centered FOCAL, and centered interaction term) did not significantly relate to CEPI exit score,  $F(3,77) = 2.41, p = .07$ . The interaction term was not significant,  $t(77) = 1.31, p = .20$ .

### **3.1.3 Research Question 3**

*Did teachers in this sample show distinct patterns of change in their implementation of inclusive practices across one school year?*

Change scores for each participant were calculated by subtracting CEPI total entry from CEPI total exit score ( $M = 4.15, SD = 12.26$ ), and scatterplots of CEPI total entry and exit scores for each participant were generated. Visual examination of the scatterplots suggested 5 distinct subgroups within the overall sample. These subgroups were categorized as follows: No Change, Slight Positive, Steep Positive, Slight Negative, and Steep Negative. These patterns are illustrated in Figure 3.



**Figure 3:** *Patterns of Change in Teachers' Implementation of Inclusive Practices*

Change score values were used to assign participants to subgroups (see Table 5). Participants with a change score of 0 were assigned to the No Change subgroup. Those participants with positive change scores that fell within 1 *SD* of the overall mean were assigned to the Slight Positive subgroup. Positive change scores in excess of 1 *SD* of the mean were assigned to the Steep Positive subgroup. Similarly, change scores with negative values that fell within 1 *SD* of the mean were categorized as Slight Negative. Negative change scores in excess of 1 *SD* of the overall mean were assigned to the Steep Negative subgroup.

**Table 5.** *Descriptive statistics for subgroups based on observed pattern of change in CEPI total score*

(*N*=82)

Subgroup	<i>N</i>	Mean Change Score	<i>SD</i>
No Change	5	0.00	0.00
Slight Positive	38	8.21	4.13
Steep Positive	11	24.18	5.27
Slight Negative	19	-4.68	2.29
Steep Negative	9	-15.56	9.44

Creation of these subgroups was checked using independent samples t-tests. Results supported the conclusion that participants in these subgroups exhibited significantly different patterns of change in implementation of inclusive practices (see Table 6).

**Table 6.** Independent samples *t*-tests comparing means between subgroups based on observed pattern of change in CEPI total score (*N*=82)

	No Change	Slight Positive	Steep Positive	Slight Negative	Steep Negative
No Change	--	-4.40*	-10.07*	4.51*	-3.85*
Slight Positive	--	--	-10.61*	-12.65*	-12.23*
Steep Positive	--	--	--	-20.91*	-12.22*
Slight Negative	--	--	--	--	-5.27*
Steep Negative	--	--	--	--	--

\**p* < .01

Similar procedures were followed to create subgroups based pattern of change for each of the 5 domains of inclusive practice identified by the CEPI. Descriptive statistics for change scores in each domain are summarized in Table 7.

**Table 7.** Descriptive statistics for exit-entry change score in each CEPI domain

Domain	<i>M</i>	<i>SD</i>
Expectations	.51	3.32
Membership and Participation	.77	3.27
Instruction and Supports	1.29	3.76
Social Relationships	2.60	3.85
Communication	-1.02	2.07

Visual analysis of scatterplots and examination of change scores indicated that the 5 change subgroups created for the total score applied to domain scores as well. Participants were

categorized into change subgroups for each domain using procedures outlined above (see Table 8).

**Table 8.** *Number of participants assigned to subgroups based on pattern of change in CEPI domain scores*

*(total N = 82)*

Subgroup	Expectations	Membership and Participation	Instruction and Supports	Social Relationships	Communication
No Change	7	13	13	10	24
Slight Positive	31	40	33	51	5
Steep Positive	15	7	11	10	8
Slight Negative	13	10	16	2	32
Steep Negative	16	12	9	9	13

### 3.1.4 Research Question 4

*Does consultation dosage relate to membership in subgroups based on distinct patterns of change in implementation of inclusive practices?*

Data screening was conducted prior to analysis to check the suitability of data for multinomial logistic regression. A logit of the dependent variable (subgroup membership) was computed. Visual analyses of scatterplots and a Box-Cox transformation indicated that the assumption of linearity between the continuous independent variable (total dosage) and the categorical dependent variable (subgroup membership) was satisfied. Examination of

histograms and Q-Q plots did not indicate any outliers among the errors, and no highly influential data points were identified.

Multinomial logistic regression was conducted to determine whether total dosage of consultation related to membership in subgroups based on pattern of change in CEPI total score. Likelihood ratio testing indicates that the full model fits the data well,  $\chi^2(4, N = 82) = 10.94, p = .03$ . That is, the model using consultation dosage significantly predicts the odds of subgroup membership. Odds ratio values,  $Exp(\beta)$ , for each subgroup were examined in comparison to all other subgroups (see Table 9) in order to better understand the identified relation between total dosage and pattern of change in inclusive practices. Teachers who received a higher dosage of consultation were significantly more likely to be members of the Steep Positive change subgroup than the No Change or Slight Negative subgroups. For each one unit (hour) increase in dosage, the odds of membership in the Steep Positive subgroup increased by 9.1% in comparison to the No Change subgroup, and by 5.5% in comparison to the Slight Negative subgroup.

**Table 9.** Odds ratios,  $Exp(B)$ , for total change subgroup membership predicted by consultation dosage

Reference Group	No Change	Slight Positive	Steep Positive	Slight Negative	Steep Negative
No Change	--	1.06	1.09*	1.03	1.06
Slight Positive	.94	--	1.03	.98	1.00
Steep Positive	.92*	.97	--	.95**	.97
Slight Negative	.97	1.03	1.06**	--	1.03
Steep Negative	.94	1.00	1.03	.97	--

\* $p \leq .05$

\*\*  $p \leq .01$

In order to more thoroughly investigate the impact of consultation dosage on changes in teachers' use of inclusive practices, follow-up analyses were conducted. A series of multinomial

logistic regressions were carried out, following the procedures outlined above. Membership in subgroups reflecting pattern of change in each of the 5 domains of inclusive practice assessed by the CEPI were used as the dependent variables in these analyses. The model using consultation dosage to predict subgroup membership was not a good fit for the data in the Expectations ( $\chi^2(4, N = 82) = 1.47, p = .83$ ), Membership and Participation ( $\chi^2(4, N = 82) = 4.69, p = .32$ ), Social Relationships ( $\chi^2(4, N = 82) = 8.94, p = .06$ ), or Communication ( $\chi^2(4, N = 82) = 4.43, p = .35$ ) domains.

The odds of subgroup membership in the Instruction and Supports domain was significantly predicted by consultation dosage,  $\chi^2(4, N = 82) = 10.63, p = .03$ . Comparison of odds ratio values indicated that teachers who received higher dosages of consultation were significantly more likely to be members of the Steep Positive change subgroup than any other subgroup (Table 10).

**Table 10.** Odds ratios,  $Exp(B)$ , for subgroup membership predicted by consultation dosage in the Inclusion and Supports domain

Reference Group	No Change	Slight Positive	Steep Positive	Slight Negative	Steep Negative
No Change	--	1.01	1.05*	1.01	.98
Slight Positive	.99	--	1.04*	1.00	.96
Steep Positive	.95*	.97*	--	.96*	.93*
Slight Negative	.99	1.00	1.04*	--	.97
Steep Negative	1.03	1.04	1.08*	1.04	--

\* $p \leq .05$

## 3.2 DISCUSSION

The purpose of Study 1 was to investigate relations between consultation dosage and teachers' implementation of inclusive practices. These relations were first examined broadly in the full sample of general education teachers. Results of regression analysis found no significant relation between teachers' implementation of inclusive practices at baseline and the dosage of consultation received across the school year. This finding was somewhat unexpected in light of previous work demonstrating that school-based coaches often tailor their services based on individual needs of teachers with whom they work (Wanless, et al., 2013). It seems logical that such tailoring would extend to decisions about dosage; indeed, there was notable variation in the dosage of consultation received by teachers in this sample. This variation reflects the realities of applied practice, in which consultants regularly use professional judgment to make decisions about how to allocate their time (e.g., Blazar & Kraft, 2015). The current findings indicate that baseline observations of teachers' use of target practices may not factor into these decisions.

It is possible that practicing consultants have not yet adopted an implementation oriented framework. In the traditional model of collaborative consultation (Idol, et al., 1995), the needs of included students are the primary focus. In an attempt to better understand how consultants in this sample allocated their time, follow-up analyses examined relations between the degree of functional impairment displayed by included students and dosage of consultation received by each participating teacher. Neither level of student functioning nor the interaction of student functioning with baseline implementation was significantly related to consultation dosage.

Though inconclusive, these findings represent an important first step in understanding how consultants in practice make decisions about how and where to focus their time and energy. The variation in dosage received by teachers in this sample is not well explained by teachers'



baseline implementation, student functional impairment, or the interaction of the two. Yet notable variation in dosage was evident; thus, some other factor(s) must be at play in determining how consultants allocate their time. This will represent an important area of inquiry for future research, as consultant time represents a valuable but often finite resource.

The amount, or dosage, of consultation received by teachers across the school year was also not significantly related to teachers' implementation of inclusive practices at the conclusion of that year. In fact, there seemed to be no discernible relation between the two at all. This finding is somewhat more surprising, as a substantial and growing body of work in the coaching literature has established relations between dosage and implementation (e.g., Pianta, et al., 2014; Reinke, et al., 2014; Pas, et al., 2015). This finding suggests that, despite many similarities between coaching and consultation (e.g., Erchul, 2015), the two processes may in fact differ in important ways. This has important implications for practitioners who look to the research literature for guidance. It will behoove practitioners to remain cognizant of the idea that, while they may find useful and informative information in the school-based coaching literature, these findings may not always be directly applicable to the practice of consultation (and specifically consultation to support inclusion).

The majority of research in school-based coaching has investigated the implementation of universal, or school-wide, programs (Schultz, et al., 2015). Consultation, conversely, focuses by definition on addressing individual needs (Kampwirth & Powers, 2012). Although consultants in this sample worked broadly to promote implementation of a common intervention plan (the use of best practices in inclusion), effective implementation of this plan is far from uniform. Rather, it requires that teachers adapt best practices appropriately to address the varied and highly specific needs of included students with moderate to severe disabilities. It stands to reason that

the substantial differences in the needs of these students may make it difficult to capture the effects of consultation on such a broad scale. Follow-up analyses lend some support to this possibility, as the degree of student functional impairment did significantly relate to teachers' implementation of inclusive practices at the conclusion of the school year. The amount of variance in implementation accounted for, however, was quite small, and the interaction of student functioning with dosage was not significant.

Importantly, teachers in this sample did show an overall increase in implementation of inclusive practices from entry to exit. As illustrated above, this increase is not easily explained by the net amount of time consultants spent with each teacher. Thus, a more in-depth examination of this process seems warranted. Study 2 of this dissertation expands upon these findings by examining the strategies used by consultants to better understand how the process itself may have contributed to implementation. The remaining analyses in Study 1 employed alternate approaches that allowed for consideration of individual differences within the overall sample.

Descriptive, visual, and confirmatory analyses resulted in the identification of 5 subgroups within the overall sample: No Change, Slight Positive, Steep Positive, Slight Negative, and Steep Negative. These subgroups represented participants who displayed distinct patterns of change in the implementation of inclusive practices from entry to exit. This categorization of participants into subgroups applied to overall use of inclusive practices (represented by the CEPI total score) as well individual domains of practice assessed by the CEPI. As reflected in overall trends, the majority of teachers in this sample exhibited Slight or Steep Positive patterns of change in implementation of overall (total) inclusive practices as well

as in the Expectations, Membership and Participation, Instruction and Support, and Social Relationships domains.

The most improvement, in terms of both number of teachers showing positive change and overall growth in CEPI scores, was in the Social Relationships domain. Much of the theoretical support for inclusion emphasizes opportunities for meaningful social relationships between students with disabilities and non-disabled peers (e.g., Bandura, 1977; Bronfenbrenner & Morris, 2006). However, this aspect of inclusion has proven challenging. Even when successfully included in general education classrooms, many students with disabilities continue to report feelings of loneliness or low sense of belonging (Lindsay, 2007). That teachers in this sample successfully improved their use of best practices in this area is particularly noteworthy.

Finally, relations between consultation dosage and membership in these subgroups were examined. Results of logistic regression analysis indicated that consultation dosage was useful in understanding the likelihood of subgroup membership. Teachers who received higher dosages of consultation across the school year were significantly more likely to exhibit a Steep Positive pattern of change in their implementation of overall (total) inclusive practices than to show No Change or a Slight Negative pattern. In the specific domains of inclusive practice assessed by the CEPI, participants who received higher dosages of consultation were more likely to exhibit a Steep Positive pattern of change than any other pattern in Instruction and Supports practices. This finding is encouraging, as research has suggested that evidence-based instructional strategies for students with disabilities are often not used in inclusive classrooms (Zigmond, et al., 2009). These results suggest that increased consultation time may effectively support teachers in improving their use of such strategies.

More broadly, these findings suggest that person-centered methods of analysis may be more appropriate in understanding the mechanisms by which consultation supports change on a large scale (e.g., Blazar & Kraft, 2015). The use of small-*n* or case study methodology has long been accepted as appropriate in consultation research (e.g., Gutkin, 1993), as consultation by its nature is an individualized process. However, as inclusive placements for students with disabilities steadily increase (McLeskey, et al., 2012), consultation is being used widely as a means of indirectly providing specialized services (Kampwirth & Powers, 2012). Understanding how consultation may support teachers' use of inclusive practices on a broad scale thus becomes a worthwhile endeavor. However, traditional variable-centered approaches to such questions, which assume homogenous responses across participants (Laursen & Hoff, 2006), may not provide the most valuable information in this regard. Given the widely varying needs of included students, as well as the differing needs and experiences of teachers in inclusive classrooms, such homogeneity may not be a reasonable expectation. The apparent lack of relations between consultation dosage and teachers' implementation of inclusive practices observed across the full sample here may reflect this possibility.

When analyzed using methods that are more sensitive to individual differences in response to consultation, however, relations between dosage and implementation are observed. The existence of subgroups of participants who exhibited similar patterns of change suggests that the consideration of growth or change, rather than status at a single time point, may be a more useful means of understanding these relations. When examined in this manner, relations between consultation dosage and implementation of inclusive practices are more consistent with prior research. As suggested by work in the coaching literature (e.g., Pianta, et al., 2014), higher dosage is related to increased implementation. However, unlike findings pertaining to school-

based coaching, this relation is not broadly applicable. This suggests important similarities as well as differences between school-based coaching and consultation meant to support inclusion. Future research should consider these differences. Understanding characteristics of teachers that may be related to differing patterns of change in response to consultation will be an important area of future investigation.

Finally, an important practical implication of these findings is that simply providing increased consultation time to a given teacher should not necessarily be expected to result in improvements to that teachers' use of inclusive practices. However, for some teachers and in some domains of practice, more time (or dosage) may be beneficial. Findings here provide some initial insights as to when this may be the case. Specifically, increased dosage of consultation may be particularly effective in helping teachers to improve their use of best practices in the Instruction and Supports domain. However, future research is certainly warranted in order to better understand how individual teachers may respond differently to increased dosages of consultation.

### **3.3 STRENGTHS AND LIMITATIONS**

The ultimate goal of this research is to determine whether there is a causal relationship between consultation dosage and teachers' implementation of inclusive practices. As identified by Shadish, Cook, and Campbell (2002), the necessary conditions for causal inference are temporal precedence (cause precedes effect), constant conjunction (covariation of cause and effect), and nonspuriousness (a lack of plausible alternative explanations for the relationship).

A major strength of this research is the longitudinal nature of data collection. This allows for the establishment of temporal precedence between hypothesized predictors (causes) and dependent variables (effects). The analytic procedures also allow for establishment of constant conjunction by determining whether and to what degree hypothesized causes and effects covaried. The size of the sample ( $N = 82$ ) offered sufficient power to detect existing effects with the procedures used in RQ1 and RQ2. Power could not be definitively determined for RQ3, as the analyses employed were exploratory. The identification of distinct subgroups within the overall sample indicates that this was not of concern. The potential risk of unknown power for RQ4 was the possibility of a Type II error, or failing to reject a false null hypothesis. This risk was believed to be outweighed by the strengths associated with this analysis. Again, the findings indicate that this was not of concern, as the null hypothesis was rejected. By statistically modeling the hypothesized relationship, as opposed to simply testing for association between variables, the degree to which causal inference may be drawn from these findings was strengthened (Shadish, et al., 2002).

A limitation is the inability of this research design to address the third necessary condition for causal inference, nonspuriousness. The lack of a control group limits counterfactual inference, or knowledge of the outcomes that would have been observed in the absence of treatment (here, the provision of consultation). The restricted demographic information available about teachers in this sample also impacts any determination regarding the nonspuriousness of results, as the ability to identify and rule out (via statistical control) demographic variables that may be producing or contributing to spurious effects are limited. Finally, the non-random selection of participating teachers in this study raises the possibility that those teachers whose schools/districts elected to utilize *Include Me* consultants may

fundamentally differ from those who did not. Again, the absence of a control group limits the ability to examine whether such differences exist. Thus, the degree to which causal inference can be drawn from the findings of this research is accordingly limited (Shadish, et al., 2002).

Additional strengths of this research are the applied nature of the *Include Me* project and the use of both variable-centered and person-centered analytic procedures. Many empirical studies of consultation require standard dosage across samples. Although this increases the internal validity of a given study, it does not reflect the realities of applied practice. In real world settings, consultants use professional judgment in determining how best to allocate their time. Because this project was open to such natural variation, an examination of dosage effects was possible.

#### **4.0 STUDY 2 LITERATURE REVIEW AND METHODS (RELATIONS BETWEEN CONSULTATION STRATEGIES AND TEACHERS' IMPLEMENTATION OF INCLUSIVE PRACTICES)**

Students with disabilities are increasingly being educated in inclusive settings (McLeskey, Landers, Williamson, & Hoppey, 2012), with general education teachers assuming responsibility for daily instruction. These teachers require support in order to effectively meet the needs of included students (e.g., Downing & Peckham-Hardin, 2007). Collaborative consultation is frequently used to facilitate inclusion (e.g., Idol, Nevin, & Paolucci-Whitcomb, 2000). The supportive relationships and shared responsibilities fostered by the collaborative consultation model are considered essential to successful inclusion (e.g., Jorgensen, et al., 2012; Odom, Buysse, & Soukakou, 2011). Research has shown relations between school-based consultation generally, and collaborative consultation specifically, and positive student-level outcomes (e.g., MacLeod, et al., 2001; Denton, Hasbrouck, & Sekaquaptewa, 2003). Although much more limited in scope, studies have also indicated that consultation can effectively support inclusive placements (e.g., Shapiro, et al., 1999), and positive outcomes for included students (e.g., Ruble, Dalrymple, & McGrew, 2010). However, the mechanisms underlying these relations are not yet well understood.

Relations between consultation and student outcomes may be mediated by teachers' implementation of the intervention plans developed in and supported by consultation (Noell &



Gansle, 2014a). Research examining this hypothesis is limited, but offers preliminary support (e.g., Strain & Bovey, 2011). Initial steps have been taken towards identifying specific consultation strategies that promote intervention plan implementation (Noell & Gansle, 2014b). Continued research that builds upon these findings is necessary to further establish this pathway, and to better understand how consultation may promote implementation.

To date, no known studies have applied this framework to the topic of inclusion. Given the widespread use of collaborative consultation to support inclusion (e.g., Idol, et al., 2000), such research is certainly warranted. In the current study, these scientific advances in the study of school-based consultation will be applied to the topic of inclusion. Relations between consultation strategies and teachers' implementation of inclusive practices will be investigated. This work will add to existing consultation literature by examining strategies that may promote intervention plan implementation in a larger sample of teachers than has previously been studied. Additionally, the current study will contribute to understanding how collaborative consultation may support teachers in implementing more inclusive practices.

## **4.1 LITERATURE REVIEW**

### **4.1.1 Collaborative consultation**

Collaborative consultation emerged in response to a changing educational landscape. Previously prominent, the “resource room” model of special education came under criticism as an unnecessarily restrictive setting for many students with disabilities (e.g., Lipsky & Gartner, 1987). The general education classroom is now considered the least restrictive environment, and

educational policy mandates that students with disabilities be educated in this setting to the greatest extent possible (e.g., IDEA 2004). Successful inclusion requires a high degree of collaboration between professionals, and support for general education teachers as they adopt inclusive practices (e.g., Jorgensen, et al., 2012). The collaborative consultation model offers a structured means of providing this support.

**4.1.1.1 Model** Collaborative consultation is a model of service delivery for students with disabilities in inclusive settings, in which a consultant provides support to general education classroom teachers (Idol, Paolucci-Whitcomb, & Nevin, 1986). Collaborative relationships between individuals with varying areas of expertise and knowledge are a key feature of this model (Idol, Nevin, & Paolucci-Whitcomb, 2000). Within these collaborative relationships, problems are identified and creative solutions mutually sought (Idol, et al., 2000). Consultants and consultees work in an “egalitarian, non-hierarchical relationship” (Kampwirth, 2003, pp. 3), with consultants providing support and assistance to consultees in best meeting the needs of included students.

A collaborative approach developed in direct contrast to expert-driven consultation (e.g., Bergan, 1977). As the name implies, consultants using expert-driven models assume the role of expert, essentially prescribing and monitoring the use of evidence-based strategies. Limitations of expert-driven approaches include lack of buy-in from consultees, and the potential for poor fit between prescribed strategies and consultees’ beliefs or values (e.g., Schulte & Osborne, 2003).

Each collaborative relationship is in some ways unique, differing with characteristics and needs of both consultants and consultees. However, the collaborative consultation model outlines several key stages considered essential to the process. These stages include problem identification, plan development, and plan implementation (Schulte & Osborne, 2003). Problem

solving is the overarching goal of collaborative consultation (Kampwirth & Powers, 2012); as such, mutually agreeing upon a clear definition of the problem is vital to the process. Consultant and consultee then work together to analyze the problem, creatively identify potential solutions, select strategies, and develop a plan for implementation (Idol, et al., 2000; Kampwirth & Powers, 2012). During implementation, consultant and consultee continue working together to monitor implementation and effectiveness, modifying the plan as needed. In any consultative relationship, these stages are cycled through regularly as changes occur or new problems arise (Kampwirth & Powers, 2012).

In the following sections, research examining application of the collaborative consultation model is reviewed.

**4.1.1.2 Efficacy** The collaborative consultation model has been used in schools for decades (e.g., Idol, et al., 1986). Empirical examination of its use initially lagged (e.g., Kampwirth, 2003), but a body of research has since accumulated. Initial research investigated student outcomes. Over time, increasingly complex models have developed in attempts to better map the pathways between consultation and student outcomes. Intervention plan implementation has been identified as an important component of this process, and a more direct outcome of consultation (Noell & Gansle, 2014a). Research examining each topic (student outcomes and intervention plan implementation) is briefly reviewed in the following sections.

*Student outcomes* Many studies of consultation employ case study or small group methodologies. Given the individualized nature of consultation, these research methods have long been accepted as appropriate (e.g., Gutkin, 1993). Such studies have demonstrated that collaborative consultation can effectively support behavioral and academic outcomes for students (e.g., Ray, Skinner, & Watson, 1999; Denton, Hasbrouck, & Sekaquaptewa, 2003).

Early reviews of the literature concluded that consultation could positively impact student outcomes (e.g., Sheridan, Welch, & Orme, 1996; Busse, Kratochwill, & Elliott, 1995). However, these reviews incorporated results from studies investigating various models of consultation. More recently, studies focusing specifically on collaborative consultation models have confirmed and extended these early findings.

To illustrate, the efficacy of a collaborative consultation model was examined using random assignment to condition for teachers and young children with autism (ages 3-8 years). For child/teacher dyads assigned to the intervention (collaborative consultation) condition, significant improvement on IEP goals was found as compared to dyads assigned to the control (no consultation) condition. In addition to statistical significance, the effect size in this study ( $d = 1.51$ ) was large (Ruble, Dalrymple, & McGrew, 2010).

With links between collaborative consultation and student outcomes established, some research attention has shifted to understanding how such outcomes are achieved. A major focus of this work is the importance of intervention plan implementation.

***Intervention plan implementation*** The importance of implementation is increasingly recognized in both research and practice. Simply put, an intervention that is not implemented cannot be effective. Likewise, the degree to which an intervention is implemented as intended (with integrity, or fidelity) is an important component in the change process. A major meta-analysis found that implementation fidelity mediates relations between intervention programs and observed outcomes (e.g., Durlak & DuPre, 2008). Implementing with fidelity does not suggest mechanical or impersonal service delivery. Tailoring interventions to address individual characteristics is an important component of human service work. Fidelity requires that key features of an intervention are implemented as intended, and can be maintained when other

aspects are tailored as appropriate (King & Bosworth, 2014). The study and practice of school-based consultation have been influenced by this body of work. Noell and Gansle (2014a) use the term intervention plan implementation to describe the degree to which an intervention plan developed through the consultation process is implemented with fidelity.

In an effort to better understand how consultation may promote student outcomes, some have advocated for a shift in the focus of consultation research. Noell and Witt (1999) argued that adult behavior change, in the form of intervention plan implementation, should be considered the most direct goal of consultation and an outcome that should be more thoroughly measured and studied. This conceptualization is consistent with consultation as a means of indirect service delivery to students. Intervention plan implementation is hypothesized to mediate relations between consultation and student outcomes in much the same way that treatment integrity mediates relations between intervention program and child outcomes (Noell & Gansle, 2014a; Durlak & DuPre, 2008; see Figure 1). However, Noell and Gansle (2014a) caution that numerous and varied moderating influences are also at play. Given these complexities, researchers are advised to consider the two processes (consultation → intervention plan implementation, and implementation → student outcomes) as related but distinct in initial efforts to build this body of research (Noell & Gansle, 2014a).

Despite development of, and advocacy for, such conceptual models, measurement of intervention plan implementation has remained elusive in the consultation literature (Noell & Gansle, 2014a). This has been attributed to the nature of consultation itself. The numerous individuals, transactions, and contexts involved all complicate attempts to isolate and assess individual components of the process such as implementation (Wesley, et al., 2010). However, a

small but growing body of research has begun to emerge in which intervention plan implementation is systematically assessed and considered as an outcome variable.

Consistent with the broader implementation literature, findings indicate great variability in teachers' intervention plan implementation following consultation (e.g., DiGennaro, Martens, & McIntyre, 2005). During the planning phase, consultants may provide training in the use of new practices or interventions (e.g., Kampwirth & Powers, 2012). The reasoning is that a teacher must know how to implement an intervention in order to do so. Training in the selected intervention alone, however, appears insufficient in ensuring intervention plan implementation (Noell, et al., 2005). Ongoing consultation support during implementation appears to be one means of effectively promoting intervention plan implementation. After training school teams in the use of inclusive practices, only those who received consultation following training successfully implemented the target practices (Shapiro, et al., 1999). Similarly, early childhood educators randomized to a training plus coaching condition implemented an inclusive model with significantly higher fidelity than those who received training alone (Strain & Bovey, 2011).

In the only known direct comparison of collaborative vs expert-driven consultation, a collaborative approach resulted in the selected interventions being implemented with greater integrity (Kelleher, Riley-Tillman, & Power, 2008). This finding suggests that intervention plans that are more acceptable to the consultee, such as those developed collaboratively, are more likely to be implemented. However, other research has found that treatment acceptability does not lead to higher levels of implementation (Noell, et al., 2005).

Available literature thus offers preliminary support for the hypothesized relations between consultation and intervention plan implementation. However, additional research that contributes to this emerging body of work is both necessary and warranted (Noell & Gansle,

2014a). Understanding the consultation strategies that promote intervention plan implementation is an important area of inquiry.

#### **4.1.2 What strategies promote intervention plan implementation?**

The collaborative consultation model provides a general framework within which individual consultant-consultee relationships emerge. These relationships are egalitarian in nature, but consultants are also specially trained professionals with knowledge and expertise of the process itself (Kampwirth & Powers, 2012). As such, within the context of the collaborative relationship, consultants employ a variety of strategies to support consultees in generating and implementing appropriate intervention plans. Research support for these strategies varies. Some have been studied in relation to intervention plan implementation; others remain within the “black box” of consultation as an intervention. In the following sections, research that has examined specific consultation strategies is reviewed.

**4.1.2.1 Performance feedback** Performance feedback has the strongest empirical support of any consultation strategy, with demonstrated efficacy in promoting intervention plan implementation. In performance feedback, consultees are provided “verbal, written, or graphical feedback about their implementation of an intervention...in an effort to improve their implementation” (Casey & McWilliam, 2011, pp. 68).

In one of the earliest studies to consider intervention plan implementation as an outcome of consultation, Witt and colleagues (1997) used a staggered multiple baseline experimental design to investigate the impact of performance feedback on the integrity with which 4 general education teachers implemented an intervention plan developed through consultation. Results

indicated that provision of verbal and graphical performance feedback by consultants resulted in markedly improved implementation for all 4 teachers (Witt, Noell, LaFleur, & Mortensen, 1997). These findings were replicated by Noell and colleagues (1997) using a similar multiple baseline design. Again, the use of performance feedback effectively increased and maintained the integrity with which teachers implemented intervention plans developed through consultation (Noell, Witt, Gilbertson, Ranier, & Freeland, 1997).

Subsequent research has confirmed and extended these early findings. Expanding upon the permanent product outcome measures used in previous research (Witt, et al., 1997; Noell, et al., 1997), DiGennaro and colleagues (2005) used observational measures to assess the integrity with which 4 teachers implemented intervention plans developed through consultation. All 4 participating teachers demonstrated notable increases in treatment integrity after receiving performance feedback from consultants (DiGennaro, Martens, & McIntyre, 2005).

Moving beyond these small n studies, Noell and colleagues (2005) examined the efficacy of several consultation strategies in promoting intervention plan implementation. Following development of an intervention plan through a collaborative, problem-solving consultation process, 45 teachers were randomly assigned to one of three follow-up conditions. As compared to weekly follow-up interviews and a social influence procedure, teachers who received explicit performance feedback showed the highest levels of implementation integrity. The effect size for performance feedback in this study was large (Noell, et al., 2005).

A 2012 meta-analysis of the single-case consultation literature found that performance feedback had moderate effects on increasing teachers' implementation integrity (Solomon, Klein, & Politylo, 2012). In a comprehensive review, Noell and Gansle (2014b) concluded that



performance feedback has demonstrated efficacy in facilitating adult behavior change (i.e., intervention plan implementation) in the context of school-based consultation.

Among the various methods of providing performance feedback, verbal feedback seems to be used most commonly (Casey & McWilliam, 2011). However, the impacts of verbal feedback alone may be time-limited. The provision of written feedback, which provides a more lasting record, appears more effective in promoting long-term intervention plan implementation (e.g., Casey & McWilliam, 2011; DiGennaro, et al., 2007; Noell, et al., 2005). Written performance feedback that includes a graphic representation of intervention plan implementation was found to be the most effective form of data review in a recent review of the research (Noell & Gansle, 2014b).

**4.1.2.2 Training, demonstration, and modeling** If intervention plan implementation requires adult behavior change, learning the new behaviors seems a logical step in the process. Collaborative consultants may use any or all of the following strategies to help teachers learn new skills: direct (didactic) instruction, demonstration or modeling, and opportunities to practice the skill (Collier-Meek, Sanetti, & Boyle, 2016). Teachers who receive this type of support show greater increases in intervention plan implementation than those who receive verbal or written instructions alone (Gilbertson, Witt, Singletary, & VanDerHeyden, 2007).

Links between consultant-provided training and immediate increases in teachers' implementation are well established (e.g., Sterling-Turner, et al., 2001; Noell, et al., 2005). However, these initial increases in intervention plan implementation are not sustained over time (e.g., Noell, et al., 2005). Even when initial levels of implementation are very high following training, they decrease rapidly without the provision of ongoing support strategies (Noell & Gansle, 2014b). Witt and colleagues (1997) observed significant decreases in intervention plan

implementation within just 2-4 days following initial training. Only when consultants use follow-up procedures is implementation successfully sustained (e.g., Gilbertson, et al., 2007).

Again, performance feedback is the follow-up strategy with the strongest evidence of efficacy in maintaining teachers' intervention plan implementation over time. In a direct comparison of training procedures, the combination of modeling, skill rehearsal, and performance feedback led to higher levels implementation than didactic training strategies alone (Sterling-Turner, Watson, Wildmon, & Watkins, 2001). In Noell and colleagues' 2005 study, consultants trained all 45 participating teachers in intervention plan implementation procedures. Observations conducted immediately after training and at 3-week follow-up showed declines in implementation integrity across participants. Teachers randomly assigned to a performance feedback follow-up condition, however, maintained significantly higher levels of implementation (Noell, et al., 2005).

A recent randomized case study investigated consultants' use of direct training with demonstration and modeling. Observations indicated increased implementation integrity immediately and at 1- and 2-month follow-up. However, consultation procedures included ongoing meetings with performance feedback for the duration of the study (Collier-Meek, et al., 2016). This makes it impossible to disentangle the effects of training from those of performance feedback.

Training (including demonstration and modeling) thus seems to be a necessary component of effective consultation. Use of these strategies promotes immediate improvements in intervention plan implementation (e.g., Sterling-Turner, et al., 2001). Alone, however, these strategies are insufficient to support sustained intervention plan implementation (Noell & Gansle,

2014b). Ongoing performance feedback following training appears effective in helping teachers maintain implementation over time (e.g., Noell, et al., 2005).

**4.1.2.3 Other consultation strategies** School-based consultants regularly employ a variety of other strategies in their work with teachers. Examples include gathering and sharing relevant materials, or engaging teachers in goal planning and monitoring. Such strategies have rarely been considered directly in relation to intervention plan implementation. When addressed, they have generally been considered components of the broader consultation process. What evidence does exist suggests that, akin to training, these strategies may support initial implementation. However, they may not be effective in promoting sustained intervention plan implementation.

Gathering all materials necessary for implementation was a standard component of consultation provided to all participants in Noell and colleagues' 2005 study. Consultants shared these materials with teachers prior to, or in conjunction with, direct training in implementation procedures. As previously described, initial gains in intervention plan implementation decreased over time (Noell, et al., 2005). Other researchers have also considered consultants' gathering and sharing materials with teachers as a component of training (Witt, et al., 1997; DiGennaro, et al., 2007).

Engaging consultees in jointly setting goals, and selecting and monitoring interventions, are key strategies in collaborative consultation. An underlying assumption here is that teachers may be more likely to buy in to implementing intervention plans that they helped develop. Existing research lends some support to this assumption. In a direct comparison of collaborative vs. expert-driven models of consultation, teachers who participated in a collaborative process exhibited higher levels of treatment integrity (Kelleher, et al., 2008). However, other research has found that treatment acceptability, reached through a collaborative process, is insufficient in

ensuring long-term intervention plan implementation (e.g., Gilbertson, et al., 2007; Noell, et al., 2005). Again, engaging teachers in collaborative planning as a specific consultation strategy may promote initial implementation, but be insufficient in sustaining implementation over time.

### **4.1.3 Summary**

Collaborative consultation can effectively support students with disabilities in inclusive placements (e.g., Ruble, et al., 2010; Denton, et al., 2003). Relations between consultation and student outcomes, however, are indirect. A more direct outcome of consultation is adult behavior change in the form of intervention plan implementation (Noell & Witt, 1999; Noell & Gansle, 2014a).

Existing research offers preliminary support to the hypothesized pathway from consultation generally (e.g., Noell, et al., 2005), and collaborative consultation specifically (e.g., Strain & Bovey, 2011; DiGennaro, et al., 2007), to intervention plan implementation. Some strategies used in collaborative consultation seem to promote initial implementation, but are insufficient in sustaining implementation over time. These include providing implementation materials and directly training, demonstrating, or modeling the intervention (e.g., Noell, et al., 2005; Sterling-Turner, et al., 2001). Performance feedback is the only consultation strategy with proven efficacy in supporting teachers' intervention plan implementation over time (Noell & Gansle, 2014b). Verbal feedback is used most commonly (Casey & McWilliam, 2011). However, written feedback, particularly with a graphic component, appears most effective (Casey & McWilliam, 2011; Noell & Gansle, 2014b).

These findings are promising, and offer valuable guidance to practicing consultants. However, with one exception (Noell, et al., 2005), all research investigating relations between

specific consultation strategies and intervention plan implementation has utilized single case study or small-*n* methodologies. Given the widespread use of school-based consultation, examining strategies that promote intervention plan implementation in a larger sample of teachers may provide useful insights.

Additionally, no studies to date have applied this framework to the topic of inclusion. Specific strategies that promote teachers' implementation of inclusive practices are not well understood. It seems likely that consultation strategies found to support implementation generally (e.g., Sterling-Turner, et al., 2001; Noell, et al., 2005) may also apply to inclusion. Yet it is also possible that consultation conducted for a specific purpose (namely, to facilitate inclusion) may fundamentally differ from other forms of consultation in at least some ways. The common usage of collaborative consultation to support inclusion (e.g., Kampwirth & Powers, 2012) highlights the importance of understanding this process. The current study represents a unique opportunity to investigate relations between specific consultation strategies and implementation of inclusive practices in a large sample of general education teachers.

## 4.2 PURPOSE

The purpose of this study is to investigate relations between consultation strategies and teachers' implementation of inclusive practices. This study uses data from the *Include Me* initiative collected during the 2013-2014 school year. *Include Me* is a statewide program that provides consultants to school districts throughout Pennsylvania, with the overall mission of facilitating inclusion for students with moderate to severe disabilities. Consultants employ a collaborative model. During the 2013-2014 school year, *Include Me* consultants worked with 82 general

education teachers in school districts throughout the state of Pennsylvania. Consistent with the collaborative model, consultation addressed individual needs of teachers and students as appropriate. Additionally, across all teachers, consultants aimed to increase implementation of best practices in inclusion (Jorgensen, et al., 2012). It is the implementation of this common intervention plan (e.g., inclusive practices) that is of interest in the current study.

Program evaluation found that participating teachers did increase their implementation of inclusive practices over the course of the school year (Bagnato, et al., 2014). The current study will extend these findings by investigating how various strategies used by *Include Me* consultants may have contributed to this increase. For a detailed description of the *Include Me* initiative, the reader is referred to the program evaluation report (Bagnato, et al., 2014) or to Study 1 of this paper.

This study will address the following research questions:

RQ1: Did the frequency with which consultants used different strategies vary across the sample of teachers? The frequency with which consultants used different strategies is expected to vary across teachers. For each strategy, a normal distribution of frequency scores is anticipated.

RQ2: Did any consultation strategies tend to co-occur? The expectation is that some strategies will co-occur. Based on previous literature, observation is expected to co-occur with performance feedback (written or verbal). Direct training is expected to co-occur with demonstration or modeling.

RQ3: Do specific consultation strategies relate to teachers' implementation of inclusive practices? Some consultation strategies are expected to relate to teachers' implementation of

inclusive practices. Strategies expected to account for significant amounts of variance in implementation are written and verbal performance feedback.

RQ4: Do variations in consultation strategies across teachers relate to different patterns of change in teachers' implementation of inclusive practices? Variations in frequency of consultation strategies are expected to relate to membership in subgroups based on distinct patterns of change in teachers' implementation of inclusive practices.

## 4.3 METHODS

### 4.3.1 Participants

**4.3.1.1 Teachers** Participants included 82 general education teachers from school districts throughout Pennsylvania. All teachers for whom demographic information is available were of the White race. The majority (81%) held a Master's degree, and had an average of 15.9 years of teaching experience. For a description of sampling procedures and a complete summary of demographic information, the reader is referred to the corresponding section of Study 1. Available demographic information for this sample of teachers is reported in Table 2.

**4.3.1.2 Consultants** Additional participants were 16 consultants from the *Include Me* initiative. The majority of consultants (93.7%) were female and of White ethnicity. Consultants in this sample had an average of 15.4 years of experience. Complete demographic information for participating consultants is summarized in Table 3, and the corresponding section of Study 1.

## 4.3.2 Measures

**4.3.2.1 Inclusive practices** The Classroom Effective Practices Inventory (CEPI; McKeating & Bagnato, 2013) was used to measure teachers' implementation of inclusive practices. As described in Study 1, the CEPI is an observational measure adapted with permission from Jorgensen and colleague's (2012) Essential Best Practices in Inclusive Schools. Observers evaluate teachers' implementation of inclusive practices using a 4-point Likert scale (0 = very little or no evidence; 3 = clear evidence, no improvement needed). The CEPI consists of 40 items reflecting 6 domains of inclusive practices: Expectations, Membership and Participation, Instruction and Supports, Social Relationships, Communication, and Self Determination and Futures Planning. Each domain is briefly described in the following paragraphs.

The Expectations domain assesses teachers' expectations for students with disabilities. Items address the language teachers use in communicating with or about students (e.g., "People First" language, age-appropriate vocabulary and inflection, speaking directly to students rather than through a paraprofessional or another person), and the degree to which goals and expectations for students with disabilities align with content standards and expectations for non-disabled students.

The Membership and Participation domain assesses the degree to which students with disabilities are welcomed as fully participating members of the general education classroom. Items address classroom accessibility, accommodations, and equitable access to instructional materials and school activities.

The Instruction and Supports domain assesses the responsiveness of classroom instruction to student needs. Items address variety and appropriateness of instructional materials and activities,



teacher preparation, individualization of strategies and supports, and use of data-based decision making.

The Social Relationships domain assesses how well the classroom environment facilitates friendships and social relationships between students with disabilities and non-disabled classmates. Items address opportunity and support for social interactions during academic and nonacademic activities.

The Communication domain assesses the degree to which appropriate means of communication are used and encouraged. Items address the following: availability and use of assistive technology or other alternative communication systems; facilitation of appropriate communication between students with disabilities and others in the classroom; respectful communication; and teacher intervention when bullying or teasing occurs.

The Self Determination and Futures Planning domain assesses the degree to which students with disabilities are provided active opportunities to contribute to and participate in their own educational planning as well as planning for the future. Items address students' active participation in IEP meeting and graduation planning, use of person-centered principles in educational and graduation planning, and inclusion of students with disabilities in graduation ceremonies.

Items are summed within and across domains to produce scores. The total score reflects overall implementation of inclusive practices. The CEPI was completed by *Include Me* consultants at two time points for each participating teacher: Fall 2013 (entry) and Spring 2014 (exit). The mean time between entry and exit data collection was 131 days, or approximately 6 months (Bagnato, et al., 2014). Mean scores for this data were calculated and are reported in

Table 4. The Self Determination and Futures Planning domain was excluded from all calculations, as only a small number of included students ( $N = 5/82$ ) were of transition age.

The current study utilizes CEPI entry and exit data for each participating teacher. Total and domain scores will each be used in analyses.

**4.3.2.2 Consultation strategies** The SPECS Mentoring Monitor (McKeating & Bagnato, 2012) was used to measure consultation strategies. Using this tool, *Include Me* consultants maintained detailed records of their interactions with each participating teacher. In addition to general education teachers, *Include Me* consultants also provided services to special education teachers, related services professionals, and parents or guardians during the 2013-2014 school year. This study uses only those records pertaining to consultation with general education teachers.

For each teacher contact, consultants recorded the topic(s) addressed, duration of the interaction, and consultation strategies used. Topics of consultation were categorized as follows: health/behavioral/social supports, instructional supports, environmental/physical adaptations, or collaborative supports. Total duration of each contact was recorded in minutes. Consultation strategies were logged using the following categories: observation, verbal feedback, written feedback, demonstration or modeling, formal/direct training, collecting and sharing resources, and engaging in inclusion goal planning. Use of each strategy was dichotomously coded in yes/no format.

### **4.3.3 Analyses**

**4.3.3.1 Research question 1** This research question was addressed using descriptive analyses. Frequency counts were created for each consultation strategy by summing the number of

sessions in which each strategy was used. Descriptive statistics (mean, standard deviation, range) were calculated for frequency of each consultation strategy across teachers. Scatterplots were generated to allow for a visual inspection of score distributions. This information was examined to determine whether, and/or to what degree, strategies used by consultants varied across teachers.

The distribution of frequency scores for each strategy were also assessed for normality. A histogram, normal probability plot, and Q-Q plot of standardized residuals were produced and examined for evidence of normality. The Shapiro-Wilk statistic was calculated and used to test for normality. The null hypothesis of this test was that the data were not normally distributed. Thus, rejection of the null hypothesis (with  $\alpha = .05$ ) would indicate a normal distribution.

**4.3.3.2 Research question 2** This research question was addressed using correlation analysis. Cross-tabulation tables and bar charts were produced for each of the 7 consultation strategies recorded. These products were examined to assess for frequently co-occurring strategies. Additionally, correlation coefficients were calculated to assess the strength of relations between all strategies. Because occurrence of each strategy was recorded in a binary fashion (1 = strategy occurred; 0 = strategy did not occur), the phi coefficient,  $\phi$ , was the appropriate measure of association. The significance of each correlation was assessed using the  $\chi^2$  test. The null hypothesis tested in each case was that no significant association exists between strategies. Co-occurrence was determined by considering both the strength and significance of association between each of the consultation strategies. For any strategies found to co-occur, new variables were created and used in subsequent analyses, as described in the following sections of this paper.

**4.3.3.3 Research question 3** This question was addressed using multiple regression analysis. Data screening was conducted prior to analysis to check for violations of assumptions. Standardized residuals were plotted against predicted values and against each independent variable (consultation strategies). Each scatterplot was examined to check for linearity and homoscedasticity. The Breusch-Pagan test was also used to check the assumption of homoscedasticity. The assumption of normality was checked by producing and examining a histogram of the residuals, normal probability (P-P) plot, and Q-Q plot, and by conducting the Shapiro-Wilk test. The Durbin-Watson statistic was calculated to check independence of errors. Data was checked for univariate outliers by generating and examining histograms, boxplots, and detrended Q-Q plots. Data was checked for multivariate outliers by generating and examining outlier statistics tables that included centered leverage values and studentized deleted residuals. A scatterplot of leverage values and studentized deleted residuals was also generated and examined. Cook's distance was calculated. The 10 cases with the highest value were identified and compared to the cut-off value of 1.0 to determine the existence of influential data points. Finally, data was checked for multicollinearity by generating and inspecting the variance inflation factor (VIF) statistic for each independent variable and comparing these values to the cut-off value of 10.

The model used in this analysis is summarized below:

$$Y_i = b_0 + b_1X_1 + b_2X_2 + \dots + b_kX_k + e_i$$

Here,  $Y_i$  represents implementation of inclusive practices at the end of the school year (CEPI total exit score) for the  $i$ th participant,  $b_0$  denotes the y-intercept of the best-fitting line, and  $e_i$  the error term. In the above equation,  $b_1$  represents the partial regression coefficient for  $Y_i$  on  $X_1$ , with  $X_1$  representing the first independent variable (consultation strategy) in the model.

The partial regression coefficient for  $X_1$  represents the expected change in  $Y_1$  for each unit increase in  $X_1$  when the value each of the other independent variables is held constant. The model included  $k$  independent variables, with the value of  $k$  determined by the findings of RQ2 (above). Consultants in this sample logged 7 consultation strategies using the SPECS Mentoring Monitor. Any of these 7 strategies found to co-occur were combined to form a single variable. Any combined variables were used in the regression analysis described here. Use of these combined variables, as appropriate, also helps to protect against multicollinearity.

The overall fit of the model was determined by testing the following hypothesis:

$$H_0: \beta_1 = \beta_2 = \dots = \beta_k = 0 \quad H_1: \beta_k \neq 0 \text{ for at least one } k$$

The  $F$  test was used to test this overall hypothesis. Rejection of the null would indicate that the model containing all independent variables (consultation strategies) significantly predicts implementation of inclusive practices (CEPI total exit score). When  $F$  testing indicated a good fit for the data, the  $R^2$  value was also calculated. This value indicated the proportion of variance in the dependent variable accounted for by the model containing all  $k$  predictor variables in this sample. The adjusted  $R^2$  value was also calculated. This value provided an estimate of the proportion of variance in the dependent variable explained by the set of independent variables in the population.

The unstandardized regression coefficients for each independent variable in the model were also determined. These values indicated the amount of change in the dependent variable accounted for by each independent variable with all other independent variables held constant. The significance of each individual regression coefficient was checked using  $t$  tests. Each  $t$  test assessed the partial contribution of the independent variable with all other variables also in the

model. In other words, they provided a test of whether each independent variable significantly improved the prediction of  $Y_i$ .

This model was first tested using the CEPI total exit score as the dependent variable, as described in the preceding paragraphs. Following this, a series of multiple regression analyses were conducted using the procedures outlined above. In these analyses, each CEPI domain score, in turn, served as the dependent variable. These analyses determined the contribution of various consultation strategies (individually and together) to the prediction of specific domains of teachers' inclusive practices.

A power analysis was conducted using G\*Power (Faul, et al., 2009) to determine the necessary sample size with 6 predictors (based on results of RQ2) in the model. The sample size necessary to detect a medium effect size ( $f^2 = .15$ ) in the overall model, with  $\alpha = .05$  and  $1 - \beta = .80$ , is  $N = 98$ . The sample size to be used here ( $N = 82$ ) falls below this requirement, but exceeds the criteria necessary ( $N = 53$ ) to detect a large effect ( $f^2 = .30$ ).

**4.3.3.4 Research question 4** Because existing literature does not support the generation of specific hypotheses here, analyses conducted to address this research question were exploratory in nature. This question was addressed using the  $\chi^2$  test for association. Subgroups created in Study 1, based on distinct patterns of change in teachers' implementation of inclusive practices, were used here (see Study 1, RQ3 for more information). For each consultation strategy, the mean frequency score in the overall sample was calculated. Each participating teacher was categorized as "high" or "low" based on the frequency with which each strategy was used during their consultation sessions. A "high" categorization indicated frequency above the mean score for the overall sample, and "low" indicated frequency below the mean. The  $\chi^2$  test was used to determine whether a significant association exists between frequency of use for each consultation

strategy and pattern of change in teachers' inclusive practices from entry to exit. In each analysis, the null hypothesis tested was that the two variables (high vs. low frequency of consultation strategy, and membership in subgroup) were independent. With  $\alpha = .05$ , rejection of the null hypothesis indicated that a significant association does exist between variables. Any significant associations identified were interpreted accordingly.

A priori power analysis for this procedure was precluded, as it required knowledge of the number of categories for each variable (Faul, et al., 2009). This information was not available until Study 1 analyses were completed. However, a post hoc power analysis was conducted using G\*Power (Faul, et al., 2009). This analysis indicated that the sample size ( $N = 82$ ) and number of subgroup categories used was sufficient to detect a medium effect size ( $w = .30$ ) with  $\alpha = .05$  and  $1 - \beta = .80$ .

## 5.0 STUDY 2 RESULTS AND DISCUSSION

Results of all analyses described in the preceding chapter are presented here, followed by discussion of these findings. Again, results are organized by research question.

### 5.1 RESULTS

#### 5.1.1 Research Question 1

*Did the frequency with which consultants used different strategies vary across the sample of teachers?*

Frequency scores were created for each of the 7 consultation strategies logged using the SPECS. These scores represent the sum total of sessions in which each strategy was used. The most frequently used strategy was verbal feedback ( $M = 13.98$ ,  $SD = 8.81$ ), while the least frequently used was formal or direct training ( $M = .59$ ,  $SD = 1.50$ ). Descriptive statistics for these scores (Table 11) show notable variability in the frequency with which different strategies were used across teachers.



**Table 11.** *Descriptive statistics for frequency (number of sessions) of consultation strategies across teachers (N = 82)*

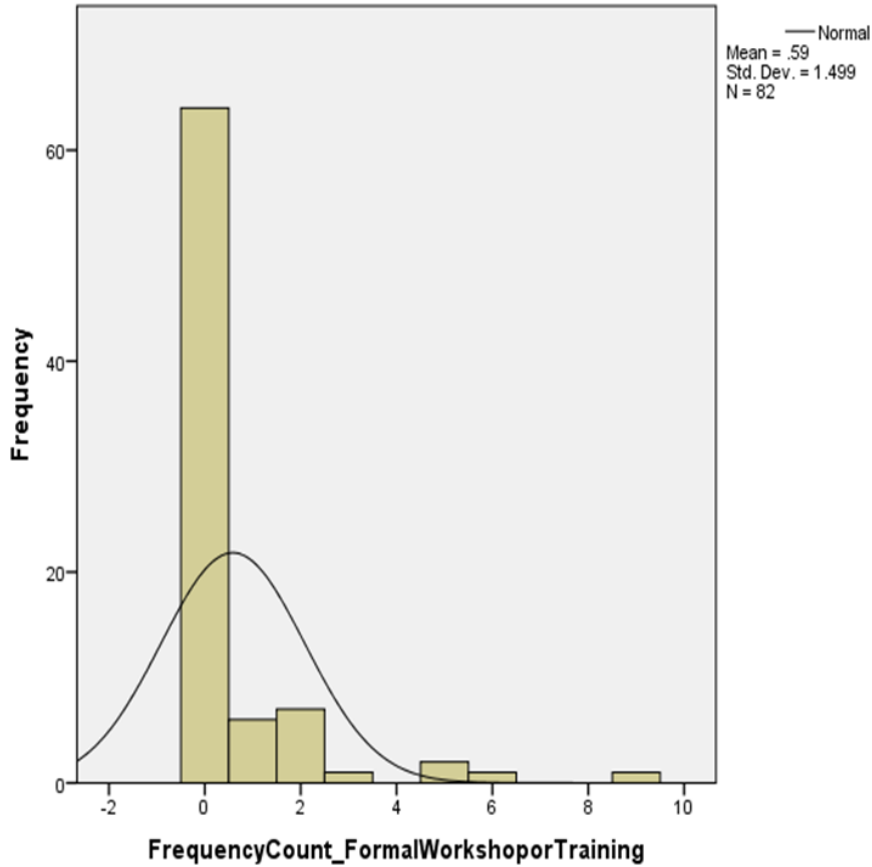
Strategy	Mean	SD	Median	Range (Min. – Max.)
Observation	13.13	7.93	12.00	1 – 39
Verbal Feedback	13.98	8.81	12.00	0 – 31
Written Feedback	6.50	8.55	3.00	0 – 33
Demonstration/Modeling	6.34	7.91	3.00	0 – 31
Formal/Direct Training	.59	1.50	.00	0 – 9
Collecting and Sharing Resources	7.76	7.23	5.50	0 – 30
Inclusion Goal Planning	8.52	8.02	5.50	0 – 33
Observation + Verbal Feedback	11.28	7.47	9.00	0-31

The Shapiro-Wilk test was used to assess normality of each distribution. Frequency scores for all strategies were non-normal (see Table 12). Histograms, normal probability plots, and Q-Q plots of standardized residuals were produced and examined to better understand deviations from normality. Visual inspection suggested that the distributions for all 7 frequency scores were positively skewed, with scores clustering towards lower values. Skewness values for each frequency score were calculated; values for each were greater than zero, confirming positive skew for all scores. The degree of positive skew varied, with formal workshop or training exhibiting the highest skewness value (3.57) and verbal feedback the lowest (.56).

**Table 12.** *Normality testing for frequency score distributions*

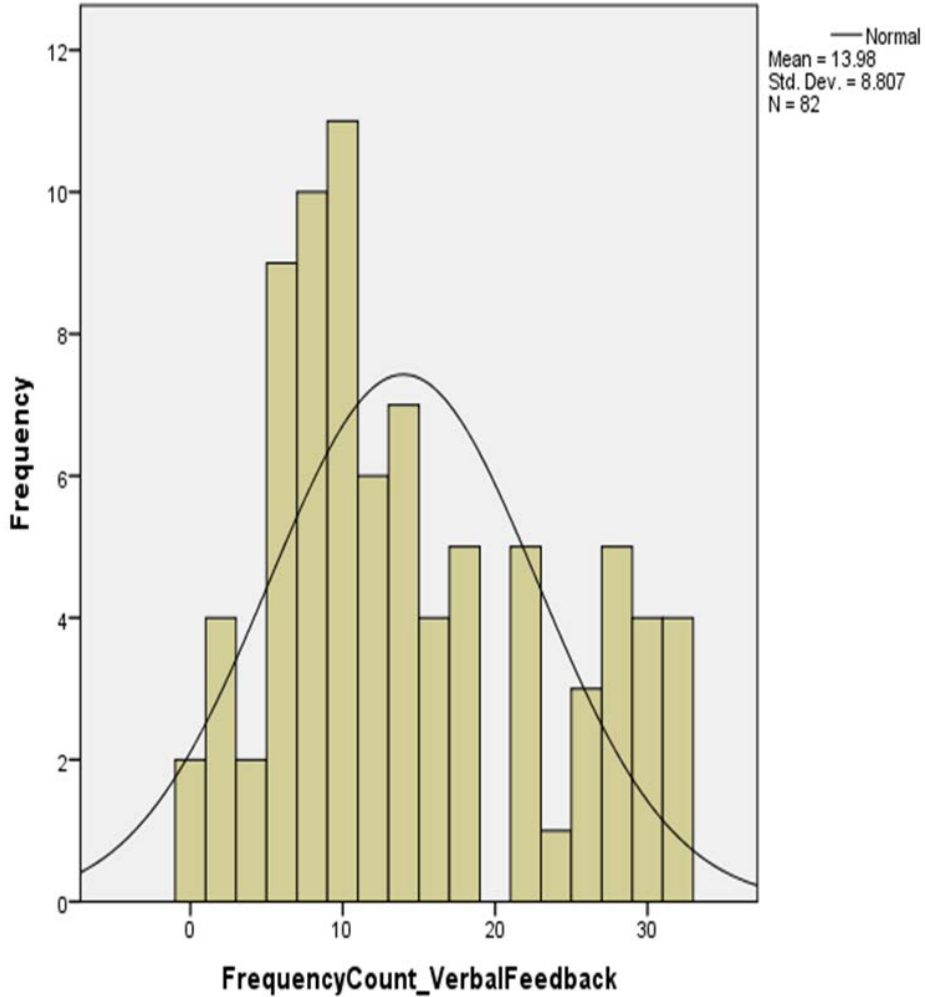
Strategy	<i>W</i>	<i>p</i>
Observation	.95	<.01
Verbal Feedback	.93	<.001
Written Feedback	.76	<.001
Demonstration/Modeling	.79	<.001
Formal/Direct Training	.46	<.001
Collecting and Sharing Resources	.88	<.001
Inclusion Goal Planning	.86	<.001

Visual inspection also suggested kurtosis, or excess peakedness, to many distributions. Kurtosis values were calculated. These values were positive for all frequency scores except verbal feedback, confirming excess peakedness of these distributions. The strategy with the highest kurtosis value (14.56) was again formal workshop or training (Figure 4).



**Figure 4.** Histogram of frequency distribution for use of formal workshop/training (N = 82)

Verbal feedback exhibited a negative kurtosis value (-.81), suggesting a flatter distribution. Visual analysis of the histogram for this strategy indicated some clustering towards the left with a wider distribution of frequency scores (Figure 5).



**Figure 5.** Histogram of frequency distribution for use of verbal feedback (N = 82)

### 5.1.2 Research Question 2

*Did any consultation strategies tend to co-occur?*

Correlation coefficients,  $\phi$ , were calculated to assess the strength of association between all consultation strategies, and interpreted using Cohen's rules. The  $\chi^2$  test was used to determine the significance of each correlation (Table 13). Correlation between four pairs of strategies was both statistically significant ( $p < .01$ ) and moderate in strength ( $\phi > .30$ ):

observation + verbal feedback ( $\phi = .47, p < .001$ ), verbal feedback + demonstration/modeling ( $\phi = .33, p < .001$ ), written feedback + inclusion goal planning ( $\phi = .40, p < .001$ ), and written feedback + collecting and sharing resources ( $\phi = .37, p < .001$ ).

**Table 13.** Correlation coefficients ( $\phi$ ) for co-occurrence of consultation strategies

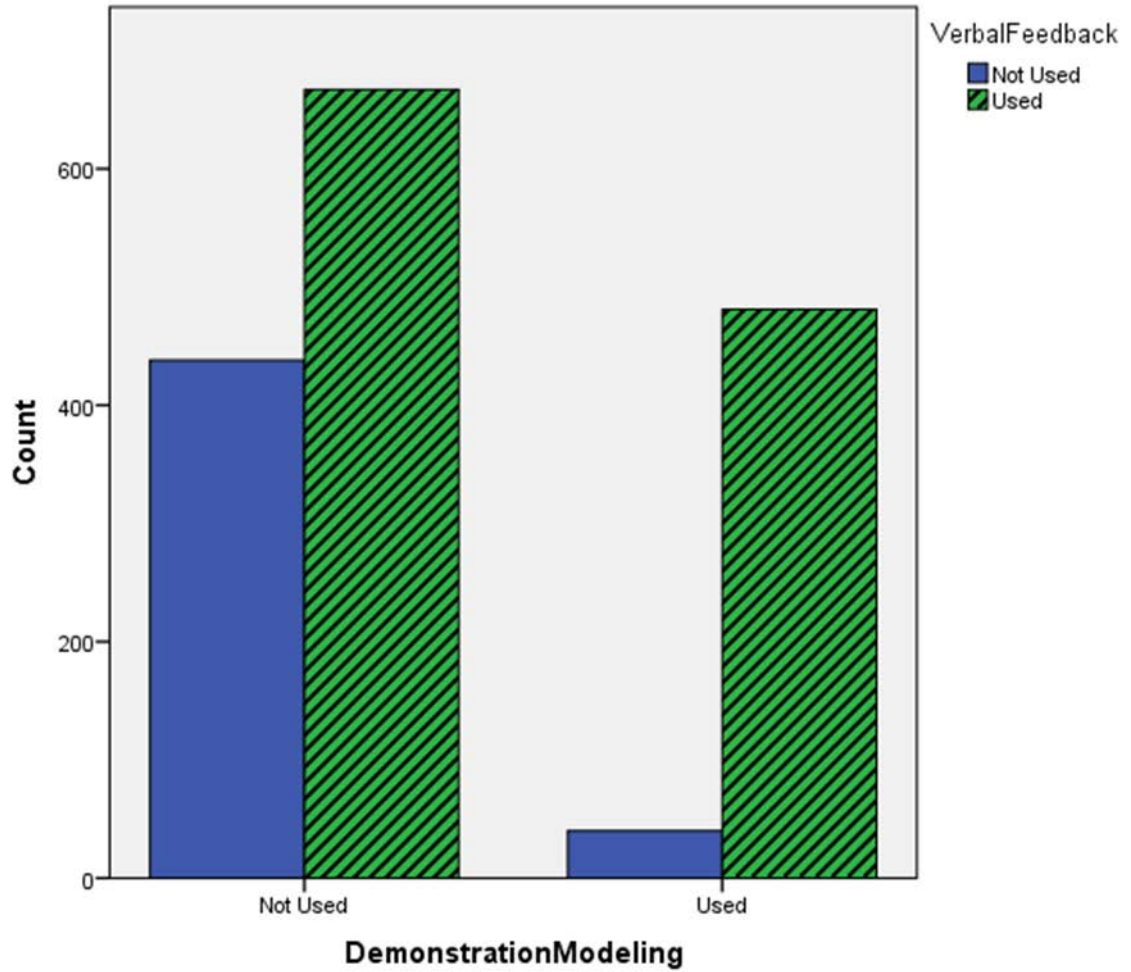
Strategy	Observation	Verbal Feedback	Written Feedback	Demo/ Modeling	Formal/ Direct Training	Collecting and Sharing Resources	Inclusion Goal Planning
Observation	--	.47**	-.12**	.28**	-.11**	-.02	-.08*
Verbal Feedback	--	--	-.08**	.33**	.03	.03	.10**
Written Feedback	--	--	--	-.16**	.15**	.37**	.40**
Demo/ Modeling	--	--	--	--	-.01	-.14**	-.20**
Formal/ Direct Training	--	--	--	--	--	.08**	.14**
Collecting and Sharing Resources	--	--	--	--	--	--	.28**
Inclusion Goal Planning	--	--	--	--	--	--	--

\* $p < .01$

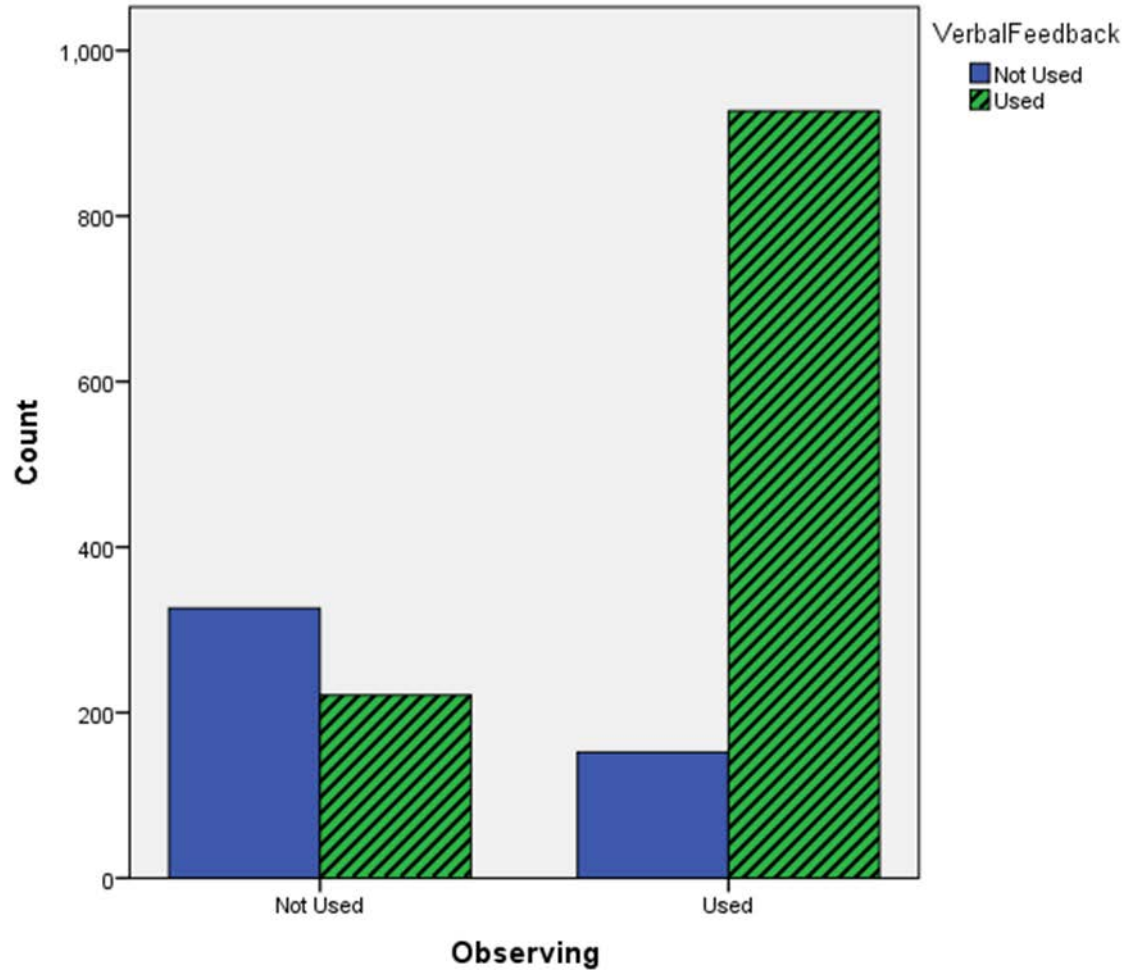
\*\* $p \leq .001$

Examination of cross-tabulation tables and bar charts indicated that the association between written feedback + inclusion goal planning and written feedback + collecting resources was not in the direction of interest. That is, these strategies frequently did not occur together. Although demonstration/modeling and verbal feedback frequently co-occurred, examination of bar charts demonstrated that they were much more frequently not used together (Figure 6).

Cross-tabulation tables and bar charts confirmed that observation + verbal feedback frequently co-occurred (Figure 7). Therefore, a new variable reflecting these co-occurring strategies was created and used in all subsequent analyses.



**Figure 6.** Frequency of co-occurrence, demonstration/modeling with verbal feedback



**Figure 7.** Frequency of co-occurrence, observation with verbal feedback

### 5.1.3 Research Question 3

*Do specific consultation strategies relate to teachers' implementation of inclusive practices?*

All relevant assumptions were checked prior to analysis. The scatterplot of standardized residuals against standardized predicted values supported the assumptions of linearity and homoscedasticity, with the scatter cloud exhibiting approximately constant variability around the horizontal line of zero. VIF statistics were all less than the rule-of-thumb cutoff score of 10, indicating that multicollinearity is not of concern. The Shapiro-Wilk statistic indicated that the

assumption of normality was violated. Nine cases fell above the critical leverage value of .15; as approximately 5% ( $N = 4$ ) cases can be expected to have leverage values above the critical value, 5 of these cases may be of concern. No cases had studentized deleted residuals above the magnitude of 3, which would indicate concern. Histograms and scatterplots of leverage values and studentized deleted residuals did not suggest any cases with high values of each. Each of the 10 highest values of Cook's distance fell below the cut-off score of 10, indicating that none were influential on the overall model.

Multiple regression analysis was used to determine whether specific consultation strategies related to teachers' implementation of inclusive practices at the conclusion of the school year. The full model contained 6 independent variables, including the created variable reflecting observation + verbal feedback. The model containing all 6 independent variables significantly related to implementation of inclusive practices (CEPI total exit score),  $F(6, 75) = 7.16, p < .001$ . The  $R^2$  value of .36 indicates that 36.4% of the variance in CEPI total exit score can be explained by the model containing all 6 consultation strategies. The adjusted  $R^2$  value of .31 indicates that approximately 31.3% of the variance in inclusive practices can be accounted for by consultation strategies in the population. Strategies that contributed significantly to the prediction of end-of-year inclusive practices were demonstration/modeling ( $B = .44, p = .04$ ) and observation + verbal feedback ( $B = .57, p = .02$ ). Interpreted differently, each one-unit (session) increase in demonstration/modeling was associated with a .44 increase in CEPI total exit score. Similarly, each one-unit (session) increase in observation + verbal feedback was associated with a .57 increase in CEPI total exit score. Interestingly, the unstandardized coefficient for collecting and sharing resources was significantly related to CEPI total exit score in a negative



direction ( $B = -.74, p = .006$ ), indicating that for each session in which consultants devoted time to this activity teachers' end-of-year implementation scores decreased.

Following the above analyses, in which the CEPI total exit score served as the dependent variable, a series of similar multiple regression analyses were conducted using each CEPI domain score at exit as the dependent variable. The full model significantly related to implementation of all 5 domains of inclusive practice assessed by the CEPI: Expectations,  $F(6, 75) = 2.55, p = .03, R^2 = .17$ , adjusted  $R^2 = .10$ ; Membership and Participation,  $F(6, 75) = 3.70, p = .003, R^2 = .23$ , adjusted  $R^2 = .17$ ; Instruction and Supports,  $F(6, 75) = 7.98, p < .001, R^2 = .39$ , adjusted  $R^2 = .34$ ; Social Relationships,  $F(6, 75) = 5.87, p < .001, R^2 = .32$ , adjusted  $R^2 = .27$ ; and Communication,  $F(6, 75) = 4.39, p = .001, R^2 = .26$ , adjusted  $R^2 = .20$ . With all other variables (strategies) in the model, observation + verbal feedback significantly improved prediction of end-of-year scores in the Membership and Participation ( $B = .16, p = .02$ ), Instruction and Supports ( $B = .14, p = .05$ ), and Communication ( $B = .09, p = .05$ ) domains. Inclusion goal planning contributed significantly to the Instruction and Supports score ( $B = .17, p = .02$ ). Demonstration/modeling ( $B = .19, p = .008$ ) and formal workshop or training ( $B = .55, p = .05$ ) also improved prediction of the Social Relationships domain score.

#### **5.1.4 Research Question 4**

*Do variations in consultation strategies across teachers relate to different patterns of change in teachers' implementation of inclusive practices?*

Mean frequency scores for each consultation strategy in the overall sample (Table 11) were used to assign participants to categories. For each strategy, participants with frequency scores at or above the mean were categorized as "high". Those with frequency scores below the

mean were categorized as “low.” The  $\chi^2$  test was used to determine whether a significant association existed between high vs. low frequency of each consultation strategy and membership in subgroups created in Study 1 based on observed pattern of change in CEPI total score.

The association between demonstration/modeling and subgroup membership was statistically significant,  $\chi^2 (4, N = 82) = 16.57, p = .002$ . All members of the Steep Negative change subgroup ( $N = 9$ ) and most members of the Slight Negative change subgroup ( $N = 16/19$ ) received a low frequency of demonstration/modeling during consultation. Associations between all other consultation strategies and subgroup membership were non-significant (see Table 14).

**Table 14.** Association between high vs. low frequency of consultation strategies and membership in subgroups based on observed pattern of change in CEPI total score

Strategy	$\chi^2$	<i>p</i>
Observation + Verbal Feedback	3.69	.45
Written Feedback	5.71	.22
Demonstration/Modeling	16.57	.002
Formal/Direct Training	4.42	.35
Collecting and Sharing Resources	6.70	.15
Inclusion Goal Planning	4.37	.36

Similar procedures were used to test for association between high vs. low frequency of consultation strategies and membership in subgroups based on pattern of change in each domain of inclusive practice assessed by the CEPI (Table 15).

**Table 15.** Results of  $\chi^2$  (4,  $N = 82$ ) tests for association between high vs. low frequency of consultation strategies and membership in subgroups based on pattern of change in CEPI domain scores

Strategy	Expectations	Membership and Participation	Instruction and Supports	Social Relationships	Communication
Observation + Verbal Feedback	6.32	6.92	2.52	1.84	3.15
Written Feedback	2.13	4.27	5.99	6.12	5.98
Demonstration/ Modeling	9.77*	2.47	14.16**	7.24	1.33
Formal/Direct Training	3.43	2.35	3.36	5.03	3.84
Collecting and Sharing Resources	6.72	9.89*	2.80	2.07	2.64
Inclusion Goal Planning	1.90	4.96	9.55*	2.07	.28

\* $p \leq .05$

\*\* $p < .01$

In the Instruction and Supports domain, the majority of teachers who exhibited Steep Negative ( $N = 8/9$ ), Slight Negative ( $N = 11/16$ ), and No Change ( $N = 10/13$ ) patterns received a low frequency of inclusion goal planning during consultation. Low frequency of demonstration/modeling also characterized most members of the Steep Negative ( $N = 8/9$ ) and Slight Negative ( $N = 11/16$ ) subgroups in this domain.

In the Expectations domain, the majority of teachers in the Steep Negative ( $N = 15/16$ ) and Slight Negative ( $N = 10/13$ ) subgroups received a low frequency of demonstration/modeling during consultation. In the Membership and Participation domain, collecting and sharing

resources was used less frequently with the majority of teachers who exhibited No Change ( $N = 11/13$ ), and with higher frequency with most teachers who exhibited Steep Positive change ( $N = 6/7$ ).

## 5.2 DISCUSSION

The aim of Study 2 was to better understand the mechanisms by which collaborative consultation may support general education teachers in implementing best practices in inclusion. Specifically, relations between strategies used by consultants and teachers' implementation of inclusive practices were examined. The frequency with which *Include Me* consultants used each of 7 common strategies varied across teachers in this sample. Consistent with prior research (Casey & McWilliam, 2011), verbal feedback was the most commonly used strategy. Formal or direct training was the least frequently used strategy. Frequency scores for this strategy also demonstrated the most negative skew, with the majority of teachers receiving only one to two sessions at most. This suggests that consultants here may have been influenced by the well-established finding that training alone is insufficient in supporting teachers' implementation of new or changed practices (e.g., Noell & Gansle, 2014b). That other strategies were used more frequently, and varied more widely across teachers, indicates that the provision of ongoing support was the primary focus of consultants in this sample.

Examination of correlation strength, significance, and direction indicated that observation and verbal feedback were frequently used together. Again, this suggests that the practices of *Include Me* consultants were likely informed by the substantial body of research demonstrating the efficacy of performance feedback (feedback based explicitly on a teachers' observed

implementation of target practices) in promoting implementation (e.g., Noell, et al., 2005; Solomon, et al., 2012). Given this, a new variable reflecting the co-occurrence of these strategies (observation + verbal feedback) was created and used to investigate relations between consultation strategies and implementation of inclusive practices.

Results of multiple regression analysis indicated that consultants' use of specific strategies did significantly relate to teachers' implementation of inclusive practices at exit. Overall implementation of inclusive practices was higher when demonstration/modeling and observation + verbal feedback were used more frequently during consultation. The effectiveness of these strategies is unsurprising, and aligns with previous findings. Demonstrating or modeling the practices to be implemented has been shown to improve teachers' use of target practices in the short term (e.g., Sterling-Turner, et al., 2001). Performance feedback has repeatedly been found effective in helping teachers to sustain implementation over time (e.g., Noell, et al., 2005). Though assessments of implementation immediately following demonstration/modeling were not used here, it seems likely that end-of-year implementation can be attributed to a similar pattern.

Unexpectedly, written feedback did not significantly contribute to understanding end-of-year implementation in this sample. This is a break from previous research, in which written feedback has proven more effective than verbal feedback in promoting sustained implementation (e.g., Casey & McWilliam, 2011; DeGennaro, et al., 2007). In the current study, written feedback was used by consultants approximately half as often, on average, as verbal feedback. The lack of impact of this strategy may therefore be attributable to the simple fact that it was not being used as frequently. Preparing a written and/or graphical record of feedback is certainly a more time- and labor-intensive endeavor. Limited time and full caseloads, then, may have contributed to the less frequent provision of written feedback. Given the evidence of its

effectiveness, future work exploring reasons why consultants in applied practice may not make frequent use of this strategy may be worthwhile.

A second surprising finding to emerge from this analysis involved consultants' collecting and sharing resources with teachers. This strategy actually exhibited a negative relation to overall implementation of inclusive practices; teachers' overall implementation scores decreased when consultants spent more time engaged in this activity. This strategy has not previously been examined in isolation. While it is commonly used by consultants, it is generally considered a component of training or the consultation process itself (e.g., Witt, et al., 1997; DiGennaro, et al., 2007). Training, in turn, may promote initial implementation, but these initial gains rapidly fade without the provision of ongoing support (Noell, et al., 2005). Considered in this context, the current findings may suggest that a key component of effective ongoing support is direct interaction between consultant and teacher. This possibility is consistent with the collaborative consultation model, in which teacher and consultant actively work together to select and implement strategies (e.g., Schulte & Osborne, 2003; Kampwirth & Powers, 2012). When consultants spend more time collecting and sharing resources with teachers, they may instead assume the role of expert. Expert-driven consultation, in which consultants prescribe strategies to be implemented, has been found in direct comparison to be less effective than collaborative models in promoting implementation (Kelleher, et al., 2008).

These findings extend upon previous work in that use of each strategy was examined in relation to, and in conjunction with, all other consultation strategies. In previous research, impacts of consultation strategies have generally been considered in isolation, or in direct comparison to one another (e.g., Noell, et al., 2005; Collier-Meek, et al., 2016). In applied

practice, however, consultation frequently involves the simultaneous application of numerous strategies, giving these findings direct relevance to practitioners in the field.

In addition to considering the impact of each consultation strategy on overall implementation, relations between the various strategies and specific domains of inclusive practice were examined. Observation + verbal feedback contributed significantly to teachers' scores in the Instruction and Supports, Membership and Participation, and Communication domains. Given the effects of this strategy on overall implementation, these findings are not unexpected but contribute to a more in-depth understanding of the specific aspects of classroom practice most impacted by its use.

In addition to observation + verbal feedback, inclusion goal planning also contributed significantly to teachers' practices in the Instruction and Supports domain. This domain assesses teachers' use of appropriate, individualized instructional practices and data-based decision making. Effectively implementing these practices requires that teachers effectively provide and monitor the specially designed instruction and goals outlined in the IEP of each included student. As such, explicitly engaging teachers in goal planning for inclusion logically relates to implementation in this area. Engaging teachers in a collaborative process of goal setting and monitoring is a central component of collaborative consultation (e.g., Idol, et al., 2000). An explicit focus on inclusion goal planning, however, has not received prior research attention as a specific strategy that may be used during the consultation process. Future research seeking to confirm or extend the current findings in this regard will therefore be important.

Demonstration/modeling, also significantly related to overall implementation of inclusive practices, contributed significantly to understanding improvements in the Social Relationships domain. The use of formal workshops or trainings also significantly improved the prediction of

end-of-year practices in the Social Relationships domain. Practices that facilitate the formation of meaningful social relationships between included students and non-disabled peers are central to inclusive education. This aspect of inclusion, however, has proven particularly challenging in practice (e.g., Lindsay, 2007). Findings here suggest that teachers may benefit from direct training in strategies that promote social interaction, and the opportunity to see these strategies effectively used. This information offers important guidance to practitioners seeking to bolster this facet of inclusion.

Finally, associations between the frequency with which each consultation strategy was used and membership in subgroups reflecting teachers' pattern of change in implementation of inclusive practices across the school year were examined. These analyses were exploratory in nature, as associations between consultation strategies and trajectory of change in teachers' practices has not previously been considered in the research.

When frequency of each consultation strategy was categorized simply as high vs. low, only demonstration/modeling was significantly associated with membership in subgroups based on trajectory of change in overall implementation of inclusive practices. The majority of teachers who exhibited negative change (that is, overall inclusive practices decreased from entry to exit) received low frequency of demonstration/modeling across the school year. Low frequency of demonstration/modeling was also associated with negative patterns of change in the Instruction and Supports and Expectations domains. Most teachers who received low frequency of inclusion goal planning also demonstrated negative patterns of change or no change in the Instruction and Supports domain.

These results complement those of the broad analyses previously summarized, and supplement the understanding of how various strategies may impact teachers' implementation of



inclusive practices. Regression analyses showed that increases in the use of demonstration/modeling and inclusion goal planning related to increased implementation scores overall and/or in the Instruction and Supports domain. These exploratory analyses confirm and extend these findings by suggesting that the reverse may also be true; that is, when these strategies are used infrequently during consultation, teachers' implementation may actually decrease. It is important to remember, however, that these analyses are exploratory; therefore the conclusions that may be drawn from these findings are limited.

When collecting and sharing resources was examined in this exploratory manner, findings were not as straightforward. A significant association existed between the frequency with which this strategy was used (high vs. low) and teachers' trajectory of change in the Membership and Participation domain. Most teachers who exhibited no change in this domain received low frequency of this strategy, while most teachers who exhibited a dramatic positive change received a high frequency. This finding is seemingly at odds with the results of RQ3, in which a negative relation between collecting and sharing resources and overall inclusive practices was identified. The relation between collecting and sharing resources and end-of-year score in the Membership and Participation domain in RQ3 was not significant. Results of RQ4, however, suggest that in this narrow domain of inclusive practice a small subset of teachers may benefit from more frequent use of this strategy.

Practices assessed by the Membership and Participation domain pertain to increasing classroom accessibility, and making accommodations to materials and strategies that allow for equitable access. Findings here suggest that the concrete strategy of collecting and sharing such resources may lend itself to directly supporting some teachers' practices in this regard. Again, because prior research has not examined relations between specific consultation strategies and

teachers' pattern of change in inclusive practices, the analyses used in RQ4 were exploratory in nature. As such, they should be interpreted with appropriate caution. Future research that builds upon these findings using more sensitive statistical procedures to test this hypothesis will be important. A more detailed understanding of the characteristics of teachers who are likely to show this pattern of response will also be beneficial. Should the preliminary association identified here be confirmed, these findings may offer guidance to consultants in applied settings in selecting strategies most likely to support desired change.

Given the applied nature of the *Include Me* program, the findings of this study have a number of practical implications. The use of numerous consultation strategies in conjunction with one another and with varying frequencies is very reflective of real-world practice. As such, these findings offer useful information to practitioners about how their services may impact teachers' use of best practices in inclusion. Specific information as to consultation strategies that are effective when used together (such as observation + verbal feedback), and the aspects of teachers' practices that may be most impacted by given strategies, will be useful in developing clear and concrete guidance for practitioners. Such guidance will help consultants in applied practice to make the most efficient and effective use of their time. Though more research will be needed to develop such guidance, findings here suggest that the use of demonstration/modeling and observation + verbal feedback are likely to have positive impacts on teachers' overall implementation of best practices in inclusion.

### 5.3 STRENGTHS AND LIMITATIONS

A major strength of this research is the applied nature of the *Include Me* program. This allowed for a realistic examination of the strategies used by consultants in practice, and contributes to an understanding of how consultants allocate their time and effort. Consultants in this sample worked broadly to promote teachers' use of best practices in inclusion. As such, the application of an implementation framework to the topic of inclusion was possible. This research also contributes to the broader school-based consultation literature by examining relations between strategies and implementation in a larger sample of teachers than has been previously studied.

Multiple regression analysis procedures used to address RQ3 represent a methodological strength of this study design. These procedures are appropriate because previous literature and theory allows for modeling of hypothesized relations. Using statistical modeling procedures, rather than simply testing for associations, strengthens the conclusions that can be drawn from results of these analyses. The significance of the full model (containing all 6 consultation strategies) in this analysis establishes constant conjunction between predictors (strategies) and outcomes (implementation). The longitudinal nature of data collection ensures that hypothesized predictors preceded hypothesized outcomes in time. Thus, two of the three conditions necessary for causal inference are satisfied by these procedures (Shadish, Cook, & Campbell, 2002). Additionally, these procedures allowed for the relative contribution of each strategy to be determined. This raises the external validity of these findings, as consultation in applied settings often involves the simultaneous use of a variety of strategies.

Although the sample size used here exceeds that used in previous research examining the impact of consultation strategies on implementation, the power afforded by procedures in RQ3 was sufficient to identify only a large effect size. This raises the possibility that additional

effects may exist that were not detected here. In addition, the third condition necessary for causal inference, nonspuriousness (Shadish, et al., 2002), cannot be sufficiently addressed by this study. This therefore represents a major weakness of this research. The absence of a control group, limited demographic information, and non-random selection of participants preclude a full consideration of plausible alternative explanations for any identified relations.

Other analytic procedures used in this study, such as those in RQ4, are exploratory in nature. Although this aspect of the study design does not allow for causal inference, these analyses are most suitable given the research questions addressed. Because existing literature has not considered such questions, the generation or testing of specific hypotheses is inappropriate. Exploratory analyses such as those employed here are a necessary initial step in developing a more advanced understanding of these relations.

## 6.0 SUMMARY AND CONCLUSIONS

With both social and policy impetus, schools in Pennsylvania and throughout the nation are increasingly moving towards models of inclusive education for students with disabilities (e.g., Zigmond, et al., 2009). Empirical evidence supporting the theoretical benefits of inclusion has begun to accumulate (e.g., Odom, et al., 2004), further strengthening the inclusive movement. The crucial questions facing the field have thus shifted from whether inclusion should occur to how it may be best achieved (e.g., Jackson, et al., 2009).

This question has proven challenging, and adequate answers have lagged behind advances in both policy and practice. Far from a straightforward matter of student placement, successful inclusion is a multifaceted process (e.g., Lindsay, 2007). The student outcomes associated with inclusion result from numerous, complex interactions within and between various systems (e.g., Odom, et al., 2004). Understanding these interactions, and their impact on student functioning, is a necessary step in the field's adjustment to this shifting educational landscape. Fortunately, educational researchers have undertaken this important work.

Within the school microsystem, the move towards inclusion has had far-reaching effects. The roles and responsibilities of many professionals have undergone substantial change as educators adjust to this new reality. Among those most significantly affected are general education teachers who, in inclusive models, assume primary responsibility for daily classroom instruction of both students with disabilities and their non-disabled peers (e.g., Mastropieri &

Scruggs, 2000). The roles of special educators and related service providers, in turn, have evolved accordingly. In addition to direct intervention, these practitioners also devote substantial effort to assisting and supporting general education teachers in providing appropriate services to included students with disabilities (e.g., Kampwirth & Powers, 2012). The collaborative consultation model is frequently employed by a variety of professionals for this purpose (e.g., Idol, et al., 1995; Kampwirth & Powers, 2012).

Research has established consultation as an effective means of facilitating inclusion (e.g., Shapiro, 1999) and supporting positive academic, social, and behavioral outcomes for students (e.g., MacLeod, et al., 2001). The path between consultation and student outcomes is indirect, with teachers (the consultees) linking the two (see Figure 1). In this conceptualization, the most direct outcome of consultation is teachers' implementation of the practices consultants work to support (Noell & Gansle, 2014a). However, the mechanisms by which consultation helps teachers to implement inclusive practices are not well understood. Moving towards this understanding will help practitioners to more efficiently and effectively use consultation to support inclusion, thereby complying with policy mandates and promoting positive outcomes for included students.

The research summarized in this dissertation represents a step in developing this knowledge. In a Study 1- Study 2 format, an implementation framework was applied to the topic of consultation to support inclusion. Though this framework has gained acceptance in the literature, findings here suggest that it may not yet have permeated the consciousness of practicing consultants as they make daily decisions about the allocation of their time. This apparent disconnect between consultation research and practice is reflective of the widespread research-to-practice gaps seen in many disciplines (e.g., Fixsen, et al., 2009). Applied research,

such as that summarized here, represents an important avenue for identifying and addressing such gaps. Future projects exploring whether, or to what degree, practicing consultants consider teachers' implementation as central to their work may offer useful guidance to those involved in training school-based practitioners. Adopting a more implementation-oriented perspective may offer consultants in applied practice a different or expanded way to reflect upon their own allocation of time and effort.

In Study 1, advances in the coaching literature were applied to the topic of consultation meant to support inclusion. Results of this study indicated areas of both similarity and difference between the role of coach and that of consultant in school settings. These findings have important implications for practitioners who look to the research literature for guidance. Given the many areas of overlap between coaching and consultation (e.g., Erchul, 2015), research pertaining to school-based coaching may prove interesting and informative to professionals using collaborative consultation. However, it will behoove practitioners to remain cognizant of the ways in which these two processes are distinct. These differences suggest that findings pertaining to coaching may not always be directly applicable to consultation (specifically when the purpose of consultation is to support inclusion). This awareness will allow practitioners of both coaching and consultation to more critically review the professional literature pertaining to their work.

These findings also suggest methodological implications and areas of interest for future research investigating consultation to support inclusion. The use of analytic procedures that allow for consideration of individual differences may offer an alternative to the small-n and case study methods typically employed in consultation research. Given the widespread usage of collaborative consultation to support inclusion (e.g., Kampwirth & Powers, 2012), the

opportunity to study this process on a larger scale than has been previously considered is both timely and appropriate.

Consistent with the individualized nature of consultation, overall relations between dosage and implementation are far from straightforward. Based on the findings presented here, practitioners certainly should not expect that simply spending more time in consultation with an individual teacher will lead to improvements in that teachers' implementation of inclusive practices. However, results do suggest that for some teachers, in some circumstances, increased dosage of consultation may impact their use of inclusive practices. It is likely that a variety of factors at many levels influence which teachers respond more positively to increased consultation time. Further research will certainly be necessary to better understand the personal and school-level characteristics that may account for this variation. In the short term, an increased awareness that different teachers are likely to respond differently to consultation may itself have useful implications. By considering this information in conjunction with personal knowledge of teachers and schools, and professional knowledge of other factors likely to influence teachers' classroom practices, practitioners may develop more informed opinions as to which teachers may benefit from an increased investment of consultation time.

Finally, results of Study 1 offer some preliminary guidance to practitioners as to which teachers may be more likely to show positive change in their implementation of inclusive practices following consultation. Specifically, increased dosage of consultation may be particularly beneficial in helping teachers to implement the concrete instructional practices and support strategies that characterize best practices in inclusion. This suggests that, in determining where to focus their time and effort, it may be useful for practitioners to consider the areas of inclusive practice where teachers show the most need for improvement.



Of course, it is not only the amount of time that consultants and teachers spend together that promotes the positive outcomes associated with consultation. The interactions that occur during that time are also of substantial interest. In Study 2 of this dissertation, the content of consultation sessions was examined in greater detail. The *Include Me* program provided a unique opportunity to study consultants' use of common strategies in real-world settings. Results of this study provide a realistic picture of the frequency and variation in consultants' use of several common strategies in school-based practice. Future research that considers how consultants determine which strategies to use in various situations will be both interesting and informative.

Study 2 also considered relations between these commonly used consultation strategies and teachers' implementation of inclusive practices. Results provide further insight regarding the mechanisms by which consultation may impact implementation, and build upon previous work in this regard. Importantly, the applied nature of this research allowed for the impact of each consultation strategy to be considered in relation to all other strategies. In this way, results contribute to a fuller understanding of how consultation may most effectively promote implementation of inclusive practices in applied settings.

These findings may also offer useful guidance to practitioners. Results suggest consultation strategies that may be most useful in supporting teachers' overall implementation of inclusive practices, as well as strategies that may effectively target specific domains of inclusive practice. By considering implementation in several ways (e.g., at a single time point and in terms of change), Study 2 also moves towards a more nuanced understanding of these relations. Moving forward, work that builds upon these findings may help consultants to select strategies targeted to the needs of consultees.

Taken together, the two studies presented here contribute to developing knowledge of how consultation may impact teachers' use of best practices in inclusion. This work also suggests important areas of future inquiry that will be necessary to more fully understand this process. Continued efforts to move towards this understanding will be important in helping school-based practitioners to maximize their impact.

In building upon the findings presented here, future research in this area should consider supplementing observational assessments of teachers' implementation of inclusive practices with other information. The addition of qualitative measures may be beneficial in more thoroughly understanding observational data. A recent example of such procedures can be found in the work of Hemmeter and colleagues (2016), in which formal observational measures of implementation were followed by qualitative interviews with the teachers observed. Applied to the topic of inclusion, such interviews may expand upon the reasons teachers did or did not display specific practices during a given observation and thus contribute to a more comprehensive understanding. Additionally, the collection of demographic data from all teachers, including background and training in the use of inclusive practices, will be useful in better understanding differences in individual teachers' responses to consultation. Similarly, school-level data pertaining to attitudes towards inclusion and/or school climate will be useful in investigating how such factors may impact individual teachers' implementation of inclusive practices. Finally, the development of increasingly sensitive measures of implementation that take into account teachers' appropriate and flexible adaptations of best practices in response to individual student needs will be important in further developing this line of research.

Local education agencies are increasingly held accountable for providing appropriate, inclusive educational opportunities for students with disabilities (e.g., IDEA, 2004; ESSA,

2015). The time and expertise of professionals with specialized knowledge is a valuable resource in achieving successful inclusion. A comprehensive understanding of the process through which consultation may contribute is thus a worthwhile goal.

More broadly, the process of consultation represents a piece in the much larger and infinitely more complex puzzle of inclusion as a whole. With inclusion widely accepted as a matter of educational equity for students with disabilities, efforts to understand how it may be successfully achieved are vital (e.g., Lindsay, 2007). Understanding of this intricate and important process will best be built in a piecemeal fashion (e.g., Jackson, et al., 2009). As reflected in Figure 1, the research presented in this dissertation addresses a small but important component of this process within the school microsystem. The aggregation of results from many such studies and programs of research will, over time, contribute to comprehensive knowledge of how best to achieve successful inclusion that promotes positive outcomes for students with disabilities.

## BIBLIOGRAPHY

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Bagnato, S.J., Fevola, A., & Whitaker, C. (2014). *SPECS for Include Me from the Start: Program Evaluation Report*. Pittsburgh, PA: Early Childhood Partnerships.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bartholomew, D.J., Steele, F., Moustaki, I., & Galbraith, J.I. (2008). *Analysis of multivariate social science data* (2nd ed.). Boca Raton, FL: Chapman & Hall.
- Barton, E.E., & Smith, B.J. (2015). Advancing high-quality preschool inclusion: A discussion and recommendations for the field. *Topics in Early Childhood Special Education*, 35(2), 69-78.
- Bergan, J.R. (1977). *Behavioral consultation*. Columbus, OH: Charles E. Merrill Publishing Company.
- Blazar, D., & Kraft, M.K. (2015). Exploring mechanisms of effective teacher coaching: A tale of two cohorts from a randomized experiment. *Educational Evaluation and Policy Analysis*, 37(4), 542-566.
- Bliss, C.M., & Wanless, S.B. (2016). Defining readiness to implement in educational settings: A pilot study. Manuscript submitted for publication.
- Bronfenbrenner, U., & Morris, P.A. (2006). The bioecological model of human development. In W. Damon & R.M. Lerner (Series Eds.) and R.M. Lerner (Vol. Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (6th ed., pp. 793-828). New York, NY: Wiley.
- Bumbarger, B.K. (2014). Understanding and promoting treatment integrity in prevention. In L.M.H. Sanetti & T.R. Kratochwill (Eds.), *Treatment integrity: A foundation for evidence-based practices in applied psychology* (pp. 35-54). Washington, DC: American Psychological Association.

- Busse, R.T., Kratochwill, T.R., & Elliott, S.N. (1995). Meta-analysis for single-case consultation outcomes: Applications to research and practice. *Journal of School Psychology, 33*(4), 269-285.
- Cappella, E., Hamre, B., Kim, H.A., Henry, D.B., Frazier, S.L., Atkins, M.S., & Schoenwald, S.J. (2012). Teacher consultation and coaching within mental health practice: Classroom and child effects in urban elementary schools. *Journal of Consulting and Clinical Psychology, 80*(4), 597-610.
- Cappella, E., Reinke, W.M., & Hoagwood, K.E. (2011). Advancing intervention research in school psychology: Finding the balance between process and outcome for social and behavioral interventions. *School Psychology Review, 40*(4), 455-464.
- Casey, A.M., & McWilliam, R.A. (2011). The characteristics and effectiveness of feedback interventions applied in early childhood settings. *Topics in Early Childhood Special Education, 31*(2), 68-77.
- Chen, H., Cohen, P., & Chen, S. (2010). How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Communications in statistics – Simulation and computation, 39*, 860-864.
- Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
- Coles, E.K., Owens, J.S., Serrano, V.J., Slavec, J., & Evans, S.W. (2015). From consultation to student outcomes: The role of teacher knowledge, skills, and beliefs in increasing integrity in classroom management strategies. *School Mental Health, 7*, 34-48.
- Cook, B.G., Cameron, D.L., & Tankersley, M. (2007). Inclusive teachers' attitudinal ratings of their students with disabilities. *The Journal of Special Education, 40*(4), 230-238.
- Cook, B.G., & Cook, S.C. (2011). Unraveling evidence-based practices in special education. *The Journal of Special Education, 47*(2), 71-82.
- Cook, B.G., Tankersley, M., Cook, L., & Landrum, T.J. (2000). Teachers' attitudes toward their included students with disabilities. *Exceptional Children, 67*(1), 115-135.
- Cook, B.G., Tankersley, M., & Landrum, T.J. (2009). Determining evidence-based practices in special education. *Exceptional Children, 75*(3), 3365-383.
- Denham, S.A., Bassett, H., Mincic, M., Kalb, S., Way, E., Wyatt, T., & Segal, Y. (2012). Social-emotional learning profiles of preschoolers' early school success: A person-centered approach. *Learning and Individual Differences, 22*, 178-189.

- Denton, C.A., & Hasbrouck, J. (2009). A description of instructional coaching and its relationship to consultation. *Journal of Educational and Psychological Consultation*, 19, 150-175.
- Denton, C.A., Hasbrouck, J., & Sekaquaptewa, S. (2003). The consulting teacher: A descriptive case study in responsive systems consultation. *Journal of Educational and Psychological Consultation*, 14(1), 41-73.
- DiGennaro, F.D., Martens, B.K., & Kleinman, A.E. (2007). A comparison of performance feedback procedures on teachers' treatment implementation integrity and students' inappropriate behavior in special education classrooms. *Journal of Applied Behavior Analysis*, 40(3), 447-461.
- DiGennaro, F.D., Martens, B.K., & McIntyre, L.L. (2005). Increasing treatment integrity through negative reinforcement: Effects on teacher and student behavior. *School Psychology Review*, 34(2), 220-231.
- Downing, J.E., & Peckham-Hardin, K.D. (2007). Inclusive education: What makes it a good education for students with moderate to severe disabilities? *Research and Practice for Persons with Severe Disabilities*, 32(1), 16-30.
- Dunn, L.M. (1968). Special education for the mildly retarded – Is much of it justifiable? *Exceptional Children*, 35, 5-22.
- Durlak, J.A., & DuPre, E.P. (2008). Implementation matters: A review of the research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41, 327-350. doi: 10.1007/s10464-008-9165-0
- Education of All Handicapped Children Act of 1975, Public L. No. 94-142 (1975). Retrieved from <https://www.gpo.gov/fdsys/pkg/STATUTE-89/pdf/STATUTE-89-Pg773.pdf>
- Erchul, W.P. (2015). Put me in, coach: Observations on selective studies implementing supportive interventions to teachers. *School Mental Health*, 7, 74-79.
- Every Student Succeeds Act of 2015, Public L. No. 114-95 (2015). Retrieved from <https://www.congress.gov/bill/114th-congress/senate-bill/1177/text>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.G. (2009). Statistical power analysis using G\*Power 3.1: Tests for correlation and regression analysis. *Behavior Research Methods*, 41, 1149-1160.
- Fishbein, M., & Cappella, J.N. (2006). The role of theory in developing effective health communications. *Journal of Communication*, 56, 1-17.

- Fixsen, D.L., Blase, K.A., Metz, A.J., & Naoom, S.F. (2014). Producing high levels of treatment integrity in practice: A focus on preparing practitioners. In L.M.H. Sanetti & T.R. Kratochwill (Eds.), *Treatment integrity: A foundation for evidence-based practices in applied psychology* (pp. 185-201). Washington, DC: American Psychological Association.
- Fixsen, D.L., I, K.A., Naoom, S.F., & Wallace, F. (2009). Core implementation components. *Research on Social Work Practice*, 19(5), 531-540.
- Forman, S.G., Olin, S.S., Hoagwood, K.E., Crowe, M., & Saka, N. (2009). Evidence-based interventions in schools: Developers' views of implementation barriers and facilitators. *School Mental Health*, 1, 26-36. doi: 10.1007/s12310-008-9002-5
- Forman, S.G., Shapiro, E.S., Coddling, R.S., Gonzales, J.E., Reddy, L.A., Rosenfield, S.A., Sanetti, L.M., & Stoiber, K.C. (2013). Implementation science and school psychology. *School Psychology Quarterly*, 28(2), 77-100.
- Gaskin v. Pennsylvania, 389 F. Supp. 2d 628 (E.D. Pa. 2005).
- Gilbertson, D., Witt, J.C., Singletary, L.L., & VanDerHeyden, A. (2007). Supporting teacher use of interventions: Effects of response dependent performance feedback on teacher implementation of a math intervention. *J Behav Educ*, 16, 311-326.
- Grieve, A.M. (2009). Teachers' beliefs about inappropriate behavior: challenging attitudes? *Journal of Research in Special Education Needs*, 9(3), 173-179.
- Guralnick, M.J. (1999). The nature and meaning of social integration for young children with mild developmental delays in inclusive settings. *Journal of Early Intervention*, 22(1), 70-86.
- Gutkin, T.B. (1993). Conducting consultation research. In J.E. Zins, T.R. Kratochwill, & S.B. Elliott (Eds.), *Handbook of consultation services for children* (pp. 227-248). San Francisco, CA: Jossey-Bass.
- Hemmeter, M.L., Snyder, P.A., Fox, L., & Algina, J. (2016). Evaluating the implementation of the Pyramid Model for Promoting Social-Emotional Competence in early childhood classrooms. *Topics in Early Childhood Special Education*, 1-14.
- Idol, L., Nevin, N., & Paolucci-Whitcomb, P. (2000). *Collaborative consultation* (3rd ed.). Austin, TX: Pro-Ed.
- Idol, L., Nevin, N., & Paolucci-Whitcomb, P. (1995). The collaborative consultation model. *Journal of Educational and Psychological Consultation*, 6(4), 347-361.
- Idol, L., Paolucci-Whitcomb, P., & Nevin, N. (1986). *Collaborative consultation*. Austin, TX: Pro-Ed.

Individuals With Disabilities Education Improvement Act, Pub. L. No. 108-446, 118 Stat. 2647 (2004). Retrieved from <http://idea.ed.gov/>

Jackson, L.B., Ryndak, D.L., & Wehmeyer, M.L. (2009). The dynamic relationship between context, curriculum, and student learning: A case for inclusive education as a research-based practice. *Research & Practice for Persons with Severe Disabilities*, 33-4(4-1), 175-195.

Jordan, A., Schwartz, E., & McGhie-Richmond, D. (2009). Preparing teachers for inclusive classrooms. *Teaching and Teacher Education*, 25, 535-542.

Jorgensen, C.M., McSheehan, M., Schuh, M., & Sonnenmeier, R.M. (2012). Essential best practices in inclusive schools. Durham, NH: National Center on Inclusive Education Institute on Disability/UCEDD, University of New Hampshire.

Joyce, B.R., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Kampwirth, T.J. (2003). *Collaborative consultation in the schools* (2nd ed.). Upper Saddle River, NJ: Pearson.

Kampwirth, T.J., & Powers, K.M. (2012). *Collaborative consultation in the schools* (4th ed.). Upper Saddle River, NJ: Pearson.

Kauffman, J.M. (1993). How we might achieve the radical reform of special education. *Exceptional Children*, 60, 6-16.

Kavale, K.A., & Forness, S.R. (2000). History, rhetoric, and reality: Analysis of the inclusion debate. *Remedial and Special Education*, 21(5), 279-296.

Kelleher, C., Riley-Tillman, T.C., & Power, T.J. (2008). An initial comparison of collaborative and expert-driven consultation on treatment integrity. *Journal of Educational and Psychological Consultation*, 18, 294-324.

King, H.A., & Bosworth, H. (2014). Treatment fidelity in health services research. In L.M.H. Sanetti & T.R. Kratochwill (Eds.), *Treatment integrity: A foundation for evidence-based practices in applied psychology* (pp. 35-54). Washington, DC: American Psychological Association.

Kilanowski-Press, L., Foote, C.J., & Rinaldo, V.J. (2010). Inclusion classrooms and teachers: A survey of current practices. *International Journal of Special Education*, 25(3), 43-56.

Koenig, J.A., & Bachman, L.F. (Eds.) (2004). *Keeping score for all: The effects of inclusion and accommodation policies on large-scale educational assessments*. Washington, D.C.: National Academies Press.



- Langley, A.K., Nadeem, E., Kataoka, S.H., Stein, B.D., & Jaycox, L.H. (2010). Evidence-based mental health programs in schools: Barriers and facilitators of successful implementation. *School Mental Health, 2*, 105-113. doi: 10.1007/s12310-010-9038-1
- Laursen, B.P., & Hoff, E. (2006). Person-centered and variable-centered approaches to longitudinal data. *Merrill-Palmer Quarterly, 52*(3), 377-389. doi: 10.1353/mpq.2006.0029
- Lindsay, G. (2007). Educational psychology and the effectiveness of inclusive education/mainstreaming. *British Journal of Educational Psychology, 77*, 1-24.
- Lipsey, M.W. & Wilson, D.B. (2001). *Practical Meta-Analysis (Applied Social Research Methods Series)*. Thousand Oaks, CA: SAGE Publications.
- Lipsky, D.K., & Gartner, A. (1987). Capable of achievement and worthy of respect: Education for handicapped students as if they were full-fledged human beings. *Exceptional Children, 54*, 69-73.
- Lohrmann, S., & Bambara, L.M. (2006). Elementary education teachers' beliefs about essential supports needed to successfully include students with developmental disabilities who engage in challenging behaviors. *Research and Practice for Persons with Severe Disabilities, 31*(2), 157-173.
- Long, A.C., & Maynard, B. (2014). Treatment integrity as adult behavior change: A review of theoretical models. In L.M.H. Sanetti & T.R. Kratochwill (Eds.), *Treatment integrity: A foundation for evidence-based practices in applied psychology* (pp. 35-54). Washington, DC: American Psychological Association.
- MacFarlane, K., & Woolfson, L.M. (2013). Teacher attitudes and behavior toward the inclusion of children with social, emotional, and behavioral difficulties in mainstream schools: An application of the theory of planned behavior. *Teaching and Teacher Education, 29*, 46-52.
- Magnusson, D. (2003). The person approach: Concepts, measurement models, and research strategy. *New Directions for Child and Adolescent Development, 2003* (101), 3-23. doi: 10.1002/cd.79
- Male, D.B. (2011). The impact of a professional development programme on teachers' attitudes towards inclusion. *Support for Learning, 26*(4), 182-186.
- Martens, B.K., DiGennaro Reed, F.D., & Magnuson, J.D. (2014). Behavioral consultation: Contemporary research and emerging challenges. In W.P. Erchul & S.M. Sheridan (Eds.), *Handbook of research in school consultation* (2nd ed., pp. 180-209). New York, NY: Routledge.

- McKeating, E., & Bagnato, S.J. (2013). Classroom Effective Practices Inventory.
- McLaughlin, M.J. (2002). Examining special and general education collaborative practices in exemplary schools. *Journal of Educational and Psychological Consultation*, 13(4), 279-283.
- McLeskey, J., Landers, E., Williamson, P., & Hoppey, D. (2012). Are we moving toward educating students with disabilities in less restrictive settings? *The Journal of Special Education*, 46(3), 131-140.
- Monsen, J.J., Ewing, D.L., & Kwoka, M. (2014). Teachers' attitudes towards inclusion, perceived adequacy of support and classroom learning environment. *Learning Environ Research*, 17, 113-126.
- No Child Left Behind Act, Pub. L. No. 107-110 (2001). Retrieved from <http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf>
- Noell, G.H., & Gansle, , K.A. (2014a). Research examining the relationships between consultation procedures, treatment integrity, and outcomes. In W.P. Erchul & S.M. Sheridan (Eds.), *Handbook of research in school consultation* (2nd ed., pp. 386-408). New York, NY: Routledge.
- Noell, G.H. & Gansle, K.A. (2014b). The use of performance feedback to improve intervention implementation in schools. In L.M.H. Sanetti & T.R. Kratochwill (Eds.), *Treatment integrity: A foundation for evidence-based practices in applied psychology* (pp. 161-183). Washington, DC: American Psychological Association.
- Noell, G.H., & Witt, J.C. (1999). When does consultation lead to intervention implementation? Critical issues for research and practice. *The Journal of Special Education*, 33(1), 29-35.
- Noell, G.H., Witt, J.C., Gilbertson, D.N., Ranier, D.D., & Freeland, J.T. (1997). Increasing teacher intervention implementation in general education settings through consultation and performance feedback. *School Psychology Quarterly*, 12, 77-88.
- Noell, G.H., Witt, J.C., Slider, N.J., Connell, J.E., Gatti, S.L., Williams, K.L., Koenig, J.L., Resetar, J.L., & Duhon, G.J. (2005). Treatment implementation following behavioral consultation in schools: A comparison of three follow-up strategies. *School Psychology Review*, 34(1), 87-106.
- Odom, S.L., Buysse, V., & Soukakou, E. (2011). Inclusion for young children with disabilities: A quarter century of research perspectives. *Journal of Early Intervention*, 33(4), 344-356.
- Odom, S.L. (2001). Learning about the barriers to and facilitators of inclusion for young children with disabilities. In S. Odom (Ed.), *Widening the circle: Including children with disabilities in preschool programs* (pp. 1-9). New York: Teachers College Press.

- Odom, S.L., Vitztum, J., Wolery, R., Lieber, J., Sandall, S., Hanson, M.J., Beckman, P., Schwartz, I., & Horn, E. (2004). Preschool inclusion in the United States: a review of research from an ecological systems perspective. *Journal of Research in Special Educational Needs*, 4(1), 17-49.
- Odom, S.L., & Wolery, R. (2003). A unified theory of practice in early intervention/early Childhood special education: Evidence-based practices. *The Journal of Special Education*, 37(3), 164-173.
- Osborne, J.W., & Waters, E. (2002). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research, and Evaluation*, 8(2), 1-5.
- Pas, E.T., Bradshaw, C.P., Becker, K.D., Domitrovich, C., Berg, J., Musci, R., & Ialongo, N. (2015). Identifying patterns of coaching to support the implementation of the Good Behavior Game: The role of teacher characteristics. *School Mental Health*, 7, 61-73.
- Pianta, R.C., DeCoster, J., Cabell, S., Burchinal, M., Hamre, B.K., Downer, J., LoCasale-Crouch, J., Williford, A., & Howes, C. (2014). Dose-response relations between preschool teachers' exposure to components of professional development and increases in quality of their interactions with children. *Early Childhood Research Quarterly*, 29, 499-508.
- Pieri, J.W., & Wanless, S.B. (2015). Attuning program coaching. Manuscript in preparation.
- Polat, F. (2011). Inclusion in education: A step towards social justice. *International Journal of Educational Development*, 31, 50-58.
- Ray, K.P., Skinner, C.H., & Watson, T.S. (1999). Transferring stimulus control via momentum to increase compliance in a student with autism: A demonstration of collaborative consultation. *School Psychology Review*, 28, 622-628.
- Rea, P.J., McLaughlin, V.L., & Walther-Thomas, C. (2002). Outcomes for students with learning disabilities in inclusive and pullout programs. *Exceptional Children*, 68(2), 203-222.
- Reinke, W.M., Stormont, M., Herman, K.C., & Newcomer, L. (2014). Using coaching to support teacher implementation of classroom-based interventions. *J Behav Educ*, 23, 150-167.
- Reynolds, M.C., Wang, M.C., & Walberg, H.J. (1987). The necessary restructuring of special and general education. *Exceptional Children*, 53, 391-398.
- Ruble, L.A., Dalrymple, N.J., & McGrew, J.H. (2010). The effects of consultation on individualized education program outcomes for young children with autism: The collaborative model for promoting competence and success. *Journal of Early Intervention*, 32(4), 286-301.

- Sanetti, L.M.H., & Kratochwill, T.R. (2014). Introduction: Treatment integrity in psychological research and practice. In L.M.H. Sanetti & T.R. Kratochwill (Eds.), *Treatment integrity: A foundation for evidence-based practices in applied psychology* (pp. 3-11). Washington, DC: American Psychological Association.
- Schultz, B.K., Arora, P., & Mautone, J.A. (2015). Consultation and coaching to increase the uptake of evidence-based practices: Introduction to the special issue. *School Mental Health, 7*, 1-5.
- Shadish, W.R., Cook, T.D., & Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York, NY: Houghton Mifflin Company.
- Shapiro, E.S., Miller, D.N., Sawka, K., Gardill, M.C., & Handler, M.W. (1999). Facilitating the inclusion of students with EBD into general education classrooms. *Journal of Emotional and Behavioral Disorders, 7*(2), 83-93.
- Sheridan, S.M., Clarke, B.L., & Ransom, K.A. (2014). The past, present, and future of conjoint behavioral consultation research. In W.P. Erchul & S.M. Sheridan (Eds.), *Handbook of research in school consultation* (2nd ed., pp. 210-247). New York, NY: Routledge.
- Sheridan, S.M., Welch, M., & Orme, S.F. (1996). Is consultation effective? A review of outcome research. *Remedial and Special Education, 17*(6), 341-354.
- Shernoff, E.S., Lakind, D., Frazier, S.L., & Jacobsons, L. (2015). Coaching early career teachers in urban elementary schools: A mixed-method study. *School Mental Health, 7*(1), 6-20.
- Showers, B., Joyce, B., & Bennett, B. (1987). Synthesis of research on staff development: A framework for future study and state-of-the-art analysis. *Educational Leadership, 45*(3), 77-87.
- Solomon, B.G., Klein, S.A., & Politylo, B.C. (2012). The effect of performance feedback on teachers' treatment integrity: A meta-analysis of the single-case literature. *School Psychology Review, 41*(2), 160-175.
- Strain, P.S., & Bovey, E.H. (2011). Randomized, controlled trial of the LEAP model of early intervention for young children with autism spectrum disorders. *Topics in Early Childhood Special Education, 31*(3), 133-154.
- U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service (2016). *The State of Racial Diversity in the Educator Workforce*. Washington, DC.
- Urton, K., Wilbert, J., & Hennemann, T. (2014). Attitudes towards inclusion and self-efficacy of principals and teachers. *Learning Disabilities: A Contemporary Journal, 12*(2), 151-168.

- Von der Embse, N., Brown, A., & Fortain, J. (2011). Facilitating inclusion by reducing problem behaviors for students with autism spectrum disorders. *Intervention in School and Clinic*, 47(1), 22-30.
- Wanless, S.B., Patton, C.S., Rimm-Kaufman, S.E., & Deutsch, N.L. (2013). Teachers' accounts of the process of teacher change: Examining fidelity of implementation. *Prevention Science*, 14, 41-50.
- Wesley, P.W., Bryant, D., Fenson, C., Hughes-Belding, K., Tout, K., & Susman-Stillman, A. (2010). Treatment fidelity challenges in a five-state consultation study. *Journal of Educational and Psychological Consultation*, 20, 209-227.
- What Works Clearinghouse (2008). What Works Clearinghouse evidence standards for reviewing studies. Retrieved from [http://ies.ed.gov/ncee/wwc/pdf/study\\_standards\\_final.pdf](http://ies.ed.gov/ncee/wwc/pdf/study_standards_final.pdf).
- Wilkinson, L.A. (2005a). Bridging the research-to-practice gap in school-based consultation: An example using case studies. *Journal of Educational and Psychological Consultation*, 16(3), 175-200.
- Wilkinson, L.A. (2005b). Supporting the inclusion of students with emotional and behavioural disorders: Examples using conjoint behavioural consultation and self-management. *International Journal of Special Education*, 20(2), 73-84.
- Witt, J.C., Noell, G.H., LaFleur, L.H., & Mortensen, B. P. (1997). Teacher use of interventions in general education settings: Measurement and analysis of the independent variable. *Journal of Applied Behavior Analysis*, 30(4), 693-696.
- Wolfe, P.S., & Hall, T.E. (2003). Making inclusion a reality for students with severe disabilities. *Teaching Exceptional Children*, 35(4), 56-61.
- Zigmond, N., Kloo, A., & Volonino, V. (2009). What, where, and how? Special education in the climate of full inclusion. *Exceptionality*, 17(4), 189-204.