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Evaluation of the Psychometric Properties of the Systems Coaching Survey

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Evaluation of the Psychometric Properties of the *Systems Coaching Survey*

by

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ABSTRACT

This study aimed to provide evidence for the reliability and validity of the *Systems Coaching Survey* (*SCS*). Systems coaching is an approach to building capacity among groups of educators to drive educational reform efforts by employing seven interdependent sets of skills (interpersonal communication, data-based problem solving, team facilitation, content knowledge dissemination, leadership, professional learning, evaluation). The *SCS* was designed to measure educators' skills to facilitate implementation of a multi-tiered system of supports (MTSS). The 41-item survey was piloted nationally in the spring of 2017 by 1,060 educators across 180 schools in six U.S. states who had responsibilities for facilitating MTSS practices in their schools. This study used multilevel confirmatory factor analysis to examine the construct validity and reliability of the tool at the educator and school levels. Results indicated support for seven factors at the educator level representing the seven systems coaching skill sets, and one between-level factor labeled *School Context*. Congeneric reliability estimates were in the acceptable to high ranges. Implications for future research on the *SCS* and use of the tool in practice are discussed.

CHAPTER I:

INTRODUCTION

In line with national educational policy, schools across the country have adopted multi-tiered systems of support (MTSS) to address students' academic, behavior, and social-emotional learning needs. Key provisions in the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) require the use of data-based decision making and evidence-based instructional practices. Likewise, the Every Student Succeeds Act (ESSA, 2016) requires the use of school-wide performance data to evaluate student outcomes. Both federal laws hold schools accountable for the educational success of all students, including students' academic, behavioral, and social-emotional development. Mechanisms that have facilitated adherence to these mandates involve the adoption of Response to Intervention (RTI) to address academics and Positive Behavior Interventions and Supports (PBIS) for school climate and behavior challenges across school systems.

RTI and PBIS represent multi-tiered intervention systems that prioritize the use of data and evidence-based practices (Fletcher & Vaughn, 2009; Sugai & Horner, 2009). Research on RTI and PBIS implementation has shown improved reading and math achievement, reduced office disciplinary referrals and out of school suspensions, and lower rates of referral and placement of students in exceptional student education (Burns, Appleton, & Stehouwer, 2005; Horner, Sugai, & Lewis, 2015; Hughes & Dexter, 2011). However, RTI and PBIS are often implemented as independent systems delivered in parallel, leading to inefficient service delivery (Eagle, Dowd-Eagle, Snyder, & Holtzman, 2015; Sugai & Horner, 2009). Thus, some states and

districts advocate for using MTSS as a comprehensive model of service delivery that includes academics, behavior, and social-emotional learning (Eagle et al., 2015; Freeman, Sugai, Simonsen, & Everett, 2017). Despite the push to integrate these systems of support to provide more comprehensive services, no one is quite sure how to effectively reconcile these service delivery models to facilitate positive outcomes for students (Higgins-Averill & Rinaldi, 2013; Batsche, 2014; Lane, Oakes, & Menzies, 2014; McIntosh & Goodman, 2016; Stewart, Benner, Martella, & Marchand-Martella, 2007; Sugai & Horner, 2009). One model that recently has emerged involves six core elements of MTSS implementation derived from the RTI, PBIS, and implementation literatures (Stockslager, Castillo, Brundage, Childs, & Romer, 2016). The core components include (1) leadership, (2) building capacity/infrastructure for implementation, (3) communication and collaboration, (4) data-based problem solving, (5) three-tiered instructional/intervention model, and (6) data-evaluation (Stockslager et al., 2016). Data-based problem solving, three-tiered instructional/intervention systems, and data/evaluation systems represent the critical components of any MTSS (Fletcher & Vaughn, 2009). Leadership, building capacity/infrastructure, and communication and collaboration focus on activities that facilitate higher levels of implementation (see Chapter 2 for more information).

Consistent with emerging models of MTSS implementation, researchers have proposed that data-based decision making (Lane et al., 2014) and supportive leadership (Louis, Leithwood, Wahlstrom, & Anderson, 2010; Sharratt & Fullan, 2009) are two components that may drive school reform efforts. Professional learning[1] is one way to develop data-based decision making

[1] *Professional learning* is a new term in the literature that evolved from professional development. Although often used interchangeably, the term professional learning emphasizes the ongoing process of acquiring new knowledge and skills, as opposed to stand-alone workshops. This document will use the term professional learning throughout to align with current literature and emphasize the active role of ongoing learning and growth for educators.

skills and strengthen leadership to foster school reform efforts. Learning Forward, a professional organization focused on increasing capacity for effective professional learning practices, outlines seven domains for effective professional learning, including (1) learning communities, (2) leadership, (3) resources, (4) data, (5) learning designs, (6) implementation, and (7) outcomes (Learning Forward, 2011). Although a review of each of these principles is beyond the scope of this chapter (see Chapter 2), it is important to note that effective professional learning involves ongoing and job-embedded support to be effective (Darling-Hammond, Wei, Andree, Richardson, and Orphanos, 2009; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Croft, Coggshall, Dolan, and Powers (2010) describe this type of professional learning for teachers as "social, situated, and distributed among colleagues" (p. 5). When the seven principles of professional learning are applied in a systematic and ongoing manner, researchers suggest that professional learning leads to improvements in educators' knowledge, skills, and dispositions; implementation of new practices; and student outcomes (Learning Forward, 2011).

Coaching is emerging in the literature as a recognized systematic and ongoing professional learning activity to promote the use of evidence-based practices in education. One model, change or *systems coaching* involves individuals who work in concert with district or school-based leadership to guide implementation of school reform and systems-level efforts. However, there is a lack of empirical research specifically on systems-level coaching in general or for MTSS implementation. March and Gaunt (2013) define *systems coaching* as "the application of a set of skills that provides dynamic support and facilitation to develop the capacity of school or district teams to implement multi-tiered systems of support (MTSS) aligned with the school or district improvement plans in order to enhance student outcomes" (p. 4). There are seven critical skill sets that pertain to systems coaching, including interpersonal

communication skills, data-based problem solving skills, team facilitation skills, content knowledge dissemination skills, leadership skills, professional learning skills, and evaluation skills (March & Gaunt, 2013). Importantly, these skill sets can and should be distributed across members of leadership teams with the responsibility for facilitating MTSS implementation. These interrelated domains will be further described under the Definition of Key Terms section.

To date, much of the research on professional learning, coaching, and MTSS has focused on RTI or PBIS as separate systems. Evidence exists for the relationship between ongoing professional learning, including systems coaching, and implementation of RTI practices (Castillo, Wang, Daye, Shum, & March, 2017; Hughes & Dexter, 2011). Professional learning is also related to educator beliefs and perceived skills implementing RTI (Albritton & Truscott, 2014; Bergstrom, 2008, Castillo, March, Tan, Stockslager, & Brundage, 2016; Castillo, March, Tan, Stockslager, Brundage, McCullough, et al., 2016). Furthermore, a review of PBIS implementation narratives recognized teacher training as an essential component of PBIS implementation (Horner et al., 2014). This research recognizes the relationship between training facilitated at the school-level and individual educator beliefs, knowledge, and practices that facilitate or inhibit implementation of service delivery frameworks. Further, national research has shown that school-level variables, such as population demographics and grade levels served, are related to teachers' access to professional learning, perceptions of collaboration, and involvement in school decision-making (Darling-Hammond et al., 2009). Thus, school-level constructs likely play a role in educators' individual skills. Although the evidence in support of ongoing professional learning for RTI and PBIS is promising in terms of improvements in educator and implementation outcomes, it is unclear the extent to which professional learning contributes to improved student outcomes. Furthermore, studies have tended to investigate

training and coaching together as a professional learning package rather than focusing specifically on systems coaching.

Statement of the Problem

Despite questions about the role of systems coaching in facilitating MTSS implementation, schools and districts frequently use a team-based approach to implement evidence-based practices. However, they do not have a means of evaluating the individual and combined skills of their school leadership teams due to a lack of reliable and valid tools to measure systems coaching. Although the seven critical skill sets for systems coaching introduced above were derived from theory and available literature in educational and instructional coaching, professional learning, educational reform, and other content areas (March & Gaunt, 2013), they have been minimally examined in research or practice. Thus, researchers as well as district and school teams would benefit from an instrument that adequately measures systems coaching skills that could inform professional learning regarding MTSS implementation.

The *Systems Coaching Survey* (*SCS*) was developed as a joint effort by the Problem Solving & Response to Intervention and Positive Behavior Intervention and Support Projects to address the need to measure educators' skills related to facilitating implementation of MTSS through the application of systems coaching principles. The *SCS* is intended to assess the personal skill sets of individual educators whose job responsibilities include supporting implementation of MTSS, as well as the educators' abilities to teach their skills to others. The tool was conceptualized as a research instrument that could be used to evaluate systems coaches' skills in addition to a formative assessment of educators' skills related to facilitating MTSS implementation. The *SCS* includes 41 items across the seven skill sets or domains of systems coaches described in the literature (March & Gaunt, 2013). The seven skills sets are interpersonal

communication, data-based problem solving, team facilitation, content knowledge dissemination, leadership, professional learning, and evaluation skills (described below under Definition of Key Terms). Because no educator within a school is solely responsible for school-wide reform efforts, the responses from individual educators (e.g., administrators, coaches, teachers) may be aggregated at the school level in order to evaluate the collective skill set of school teams with responsibilities related to MTSS implementation. More information on the psychometric properties of the *SCS* is needed to provide evidence for the reliability and validity of the tool with regards to the factor structure at the educator and school level.

Purpose of the Study

The purpose of this study was to examine the construct validity of the *SCS.* Elements of construct validity investigated included the factor structure of the survey and the reliability of the factor subscales. Although items were generated based on the seven domain model proposed by March and Gaunt (2013), and the seven theoretical skills of systems coaching were upheld in a single-level CFA using data from the tool (Thoman, Jenkins, Castillo, March, & Moulton, 2018), it was unclear the extent to which the items reflected these factors at both the educator and school levels. A secondary analysis was conducted using data from a national sample of educators with systems coaching roles and responsibilities. Empirical validation of the latent structure of the *SCS* was needed to provide support for its use in schools beyond the largely anecdotal evidence that exists from a limited number of schools who have piloted the tool.

Research Questions

Because a core element of the systems coaching model includes educators both employing their skills and transferring their skills to others, educators rate each item or specific

skill on the *SCS* in both of these areas. Thus, there are two sets of items embedded within the *SCS*. Preliminary analyses of the *SCS* have treated the personal skill items and those that evaluate educators' ability to teach others as separate subscales because they are thought to be highly related, but separate skill sets.

A preliminary confirmatory factor analysis (CFA) of the *SCS* revealed adequate fit of a single-level structure for both the respondent's personal skill level (CFI = .91; RMSEA = .06, SRMR = .04) and their ability to teach others (CFI = .92; RMSEA = .06; SRMR = .03; Thoman et al., 2018). All items loaded significantly on their respective factors and internal consistency reliability estimates of the factor subscales ranged from .79 to .95 for factors representing their personal skill level and from .84 to .96 for factors representing a respondent's ability to teach others. Although these analyses demonstrated adequate fit for a single-level model, there was a need to examine the *SCS* using a multi-level analysis that could account for educator as well as school-level influences.

Multilevel analysis is necessary because educators are nested within schools, presenting the need to systematically evaluate how educator and school level factors influence individual skills assessed by the tool. In other words, it is likely that both the skill sets of individual educators and the overall skill level of the schools in which educators work influence specific skills assessed by the *SCS.* The individual level factors, represented by the seven domains of systems coaching (March & Gaunt, 2013), may also be represented at the school level. That is, the theory of systems coaching supports groups of educators or school leadership teams that collectively possess skills in interpersonal communication, data-based problem solving, team facilitation, content knowledge dissemination, leadership, professional learning, and evaluation.

Alternatively, the local school capacity for systems coaching or culture of learning more generally may impact how individual educators within each school respond to items on the *SCS* (Darling-Hammond et al., 2009).

This study used an existing dataset to answer the following questions:

1. What is the factor structure of the *SCS* at the educator and school levels when:
    a. measuring the **personal skills** of educators?
    b. measuring educators' **ability to teach** their skills to others?
2. What is the internal consistency reliability of the resultant factors?

Definition of Key Terms

The following key terms guided the study:

Multi-Tiered Systems of Support (MTSS). An MTSS has been defined in the literature as an evidence-based framework for providing integrated supports for academics, behavior, and social-emotional assessment and intervention for all students within a multi-tiered system (Higgins-Averill & Rinaldi, 2013; Lane et al., 2014; USF:FLMTSS, n.d.). In this study, an MTSS refers to a multi-tiered system that addresses any one, or a combination of, these domains in the educational setting. This conceptualization was used because the separate models for academics and behavior have demonstrated similar core components (Gresham, 2002; Horner & Sugai, 2000; Sugai & Horner, 2009), despite the variability of tiered models employed in schools across the nation.

MTSS Implementation. Implementation of an MTSS has been described in the literature as the act of providing academic, behavioral, or social-emotional supports to students through assessment, instruction, intervention, and problem solving services according to student need

(Keller-Margulis, 2012). Few research-based tools are available to measure the core components of multi-tiered systems, either with isolated foci (Horner et al., 2015; Keller-Margulis, 2012), or an integrated system (Stockslager et al., 2016). For this study, MTSS implementation was defined according to the six critical components articulated by Stockslager et al. (2016). Those elements are leadership, building capacity and infrastructure, communication and collaboration, data-based problem solving, a multi-tiered model of service delivery, and data/evaluation (Stockslager et al., 2016).

School-based leaders communicate the vision and mission, plan for and model processes, and engage in professional learning related to MTSS implementation. Building capacity and infrastructure for MTSS implementation includes ongoing professional learning, scheduling, and other activities that help educators implement practices associated with the model. Communication and collaboration require involvement of key stakeholders, including parents and community agencies, as well as providing frequent feedback to implementers. Data-based problem solving represents the use of a four-step problem solving process to identify and meet student needs, or to overcome barriers to MTSS implementation. Use of a three-tiered instructional model includes academic, behavioral, and social-emotional instruction delivered to all students at Tier 1, support for students not meeting grade-level standards at Tier 2, and intensive interventions for students with significant needs at Tier 3. Finally, data/evaluation includes providing educators with access to and processes for using student learning, school-wide implementation, and intervention fidelity data to evaluate student progress.

School-Based Leadership Team (SBLT). A school-based leadership team describes a group of school personnel who have responsibilities for building staff capacity to implement an MTSS. They are tasked with facilitating systems-level change within the school. An SBLT may

focus on school-wide academic, behavioral, or social-emotional needs, as well as provide targeted support for smaller subsets of students and staff. Based on the literature, effective school-based leadership effects positive change within the school by creating a school-wide vision and expectations, building staff capacity, engaging in ongoing monitoring of implementation, and problem solving to eliminate perceived barriers (Louis, Leithwood, Wahlstrom, & Anderson, 2010; Sharratt & Fullan, 2009).

Systems Coaching. The term *systems coaching* refers to the type of support provided to facilitate and maintain large-scale reform efforts (Brown, Stroh, Fouts, & Baker, 2005; Fullan & Knight, 2011) including emphasis on leadership, resource allocation, and school-wide organization (Neufeld & Roper, 2003). In education, systems coaching describes a distributed leadership, or team-based, model for facilitating change to improve student outcomes through building capacity of a group of educators (USF:FLMTSS, n.d.). Within an MTSS, systems coaching is defined as the "application of a set of skills that provides dynamic support and facilitation to develop the capacity of school or district teams to implement MTSS aligned with the school or district improvement plans to enhance student outcomes" (March & Gaunt, 2013, p. 4). In this study, school or district leaders who completed the survey did not have to be formally labeled a "systems coach," but were identified as such if they participated on a school-based team tasked with increasing capacity for implementation of MTSS at their school.

A set of critical skills are believed to drive the work of systems coaches. In the systems coaching model, coaches are tasked with both employing their skills and transferring the skills to other educators. At present, the items of the *SCS* are divided among seven factors or constructs based on the domains of systems coaching described in the literature (March & Gaunt, 2013). The seven factors are detailed below:

Interpersonal Communication Skills. Interpersonal communication skills include developing collaborative relationships, reaching consensus, and agreeing upon responsibilities and rules for decision-making within a group. Such skills also include paraphrasing others' thoughts, asking various question types to gather information in greater detail, and facilitating active participation among all individuals within a group. Individuals with these skills should be able to facilitate discussions that recognize diverse needs and perspectives.

Data-Based Problem Solving Skills. Data-based problem solving skills include employing the four-step problem solving process, using guided questions to facilitate problem solving, and propose evidence-based hypotheses for why a problem is occurring. This domain also includes interpreting different sources of academic, behavioral, and social-emotional data to support interventions and improve student outcomes. These skills include the ability to collect data to measure the fidelity of the four-step problem solving process and the fidelity of student-level intervention implementation. Individuals with these skills should be able to organize and display data to answer problem-solving questions, monitor student performance across tiers and content areas, and use the problem-solving process to evaluate and ensure equity for all students.

Team Facilitation Skills. Team facilitation skills include developing and maintaining a clear team purpose and group norms. Team meetings should include an agenda, assigned responsibilities, and attention to activities to complete before, during, and after the meeting. Team facilitation skills also include providing opportunities for group members to develop their problem-solving skills, providing administrative support for problem-solving practices across content areas and team decisions, and fostering improvement of the teaming process through group self-assessment and ongoing feedback.

Content Knowledge Dissemination Skills. Content knowledge dissemination skills require including content knowledge experts as active participants on leadership teams as appropriate for the issue or problem, as well as accessing evidence-based strategies, resources, and tools aligned with student and educator needs, including culturally relevant resources. Individuals should also use multiple strategies to disseminate relevant resources to educators.

Leadership Skills. Leadership skills can be defined as the ability to develop a clear vision with a sense of urgency for MTSS and school improvement. Additionally, leadership skills include building and maintaining positive relationships among educators, students, families, and communities, and distributing leadership responsibilities among several individuals.

Professional Learning Skills. Professional learning skills include providing professional learning trainings, and technical assistance or coaching aligned with student and educator needs. Individuals should be able to evaluate professional learning activities and use professional learning evaluation data to plan adjustments in future professional learning activities. These skills also include using evidence-based professional learning methods, providing feedback to adult learners, and using culturally responsive techniques to promote adult learning.

Evaluation Skills. Evaluation skills include using data to evaluate the impact of professional learning and coaching practices on educator and student outcomes, using data to evaluate the fidelity of such practices, and evaluating an adult learner's application of new knowledge, skills, and/or practices.

Significance of the Study

This study investigated an instrument focused on systems coaching for MTSS implementation. Much of the literature on school-based coaching relies on theory or presents anecdotal evidence for coaching outcomes. While theory is critical for conceptualizing models of

coaching, it may not provide sufficient evidence to warrant coaching as a critical professional learning component. As a research instrument, empirical support for the *SCS* would provide evidence for the first research-based tool available to evaluate the skills and capacity of school-based leaders to implement MTSS. Second, it is widely understood that the demands of school and district leaders across the nation are heavily taxing on their time and resources. Advocating for use of another instrument in their practice, such as the *SCS*, thus requires empirical justification. Backed by sound research methodology, the survey could be used with confidence by educational leadership to inform professional learning focused on building educator and school capacity for MTSS implementation.

CHAPTER II:

LITERATURE REVIEW

This chapter will review the literature regarding systems coaching to provide background for the current study. First, national legislation is presented to provide a context for educational reform and current MTSS practices. Next, the capacity of educational systems to provide MTSS services will be addressed. Then, a review of professional learning is provided that includes detailed evidence for systems coaching as a vehicle for facilitating MTSS practices. The chapter concludes with the development of measures to evaluate MTSS and coaching efforts, including a review of standards of survey development and validation.

Educational Reform

The Accountability Movement in the United States describes the push by national lawmakers to improve and evaluate school performance using measures of student performance (Loeb & Figlio, 2011). The Every Student Succeeds Act (ESSA; 2015) and the Individuals with Disabilities Education Improvement Act (IDEIA; 2004) both require data-based decision making and evidence-based instructional practices in the nation's schools. Historically, No Child Left Behind (NCLB; 2002)–the precursor to ESSA–put pressure on educators to use school-wide performance data as evidence of school performance. Under ESSA, however, additional mandates provide support for MTSS as a mechanism to improve student outcomes. In the law, states and districts are allowed to use several funding streams for Positive Behavior Interventions and Supports (PBIS) related to improving school climate, safety, and access to comprehensive learning supports (Vaillancourt-Strobach & Cowan, 2016). Funding is also available for ongoing,

job-embedded professional learning activities (described in more detail later in this chapter) that align with school improvement efforts, data-based decision making, and increasing educator capacity for MTSS (Vaillancourt-Strobach & Cowan, 2016). According to IDEIA Part B, students with disabilities can become eligible for services through the traditional refer-test-place model, or through a process that involves districts observing how students *respond* to evidence-based interventions. The latter method gave way to what is now known as Response to Intervention (RTI), a process adopted by many districts and states across the nation (Zirkel & Thomas, 2010).

It is clear that national legislation holds schools accountable for the educational outcomes of all students. Furthermore, both ESSA (2016) and IDEIA (2004) contain provisions that call for and support multi-tiered academic and behavior service delivery systems. In order to meet these guidelines, many states, districts, and schools have decided to develop and implement large-scale multi-tiered systems such as RTI and PBIS. What follows is an overview of the history of and outcomes associated with multi-tiered systems.

History and Outcomes of MTSS

Problem Solving. Prior to the development and widespread adoption of RTI and PBIS models, researchers developed and investigated problem solving processes to address the needs of students. Problem solving models use data to inform educational decisions and have been described as a process of reducing discrepancies between an expectation or desired level of performance and the present reality (Gresham, 2007). There are four steps in the problem solving process: (1) problem identification, (2) problem analysis, (3) intervention development and implementation, and (4) evaluation (Batsche et al., 2006; Bergen & Kratochwill, 1990; Tilly, 2008).

Tilly (2008) described the four-step problem solving process in terms of four questions: "Is there a problem and what is it? Why is the problem happening? What can be done about the problem? Did the intervention work?" (p. 18). The first step requires educators to define what an individual is doing and what is expected of them in a given setting, with the discrepancy between these behaviors representing the problem. Without a quantifiable discrepancy, the behavior is not considered problematic. Second, problem analysis occurs to describe conditions under which the desired outcome will occur. Individuals engaged in problem solving conduct direct assessments and observations aligned to the perceived problem. Problems may be defined as skill or performance deficits, where specific contextual variables are targeted for intervention to facilitate the student's success to meet desired expectations. Third, interventions are developed to change the environmental conditions as determined through problem identification and analysis. Specific plans include who will implement the intervention, the context, necessary materials, and preventive and responsive actions. Finally, the problem solving process includes evaluation procedures to determine effectiveness of the intervention to reduce or eliminate the problem, and fidelity of intervention implementation.

Over the last 40 years, problem solving has been influential within behavior analysis, consultation, pre-referral education teams, curriculum-based measurement, implementation, and systems change literature (Tilly, 2008). Further, the use of evidence-based practices such as data-based decision making and evidence-based interventions within problem solving models addresses requirements included in ESSA (2016) and IDEIA (2004). More recently, models of problem solving have evolved to be the data-based decision making mechanism within multi-tiered service delivery systems such as RTI (Tilly, 2008).

Response to Intervention. One multi-tiered delivery system that incorporates problem solving is RTI. RTI originally was used to examine changes in performance based on the application of interventions for students who are struggling academically (Gresham, 2002). However, the model has evolved to include three tiers of intervention: Tier 1 focuses on core instruction provided to all students, Tier 2 includes supplemental instruction and ideally targets 10-15% of students in a classroom or school, and Tier 3 includes intensive intervention to support about 5% of the student population with intensive needs (Tilly, 2008).

Many RTI models use a process combining data and problem solving to inform intervention at each tier of educational services (Batsche et al., 2006; Pluymert, 2014), and the process helps educators coordinate resources to facilitate improvement in student outcomes (Barns & Harlacher, 2008; Batsche et al., 2006; Fletcher & Vaughn, 2009). Although the RTI model includes acquisition of both academic and behavioral data, it is most often used to meet the needs of students through academic instruction and interventions at each tier. For example, Tier 1 instruction includes universal screening procedures to identify students at risk for adverse educational outcomes. Students not meeting school or grade level benchmarks may be considered for supplemental support. At Tier 2, instruction may be delivered to small groups of students who require additional instruction for particular educational content or skills. Standard protocols of evidence-based practices may be applied at this tier to support students' needs (Gresham, 2007) and progress monitoring occurs more frequently largely through informal assessments. Frequent data collection helps educators analyze student growth and specific skill deficits in comparison to other students and grade-level benchmarks. Additional problem solving occurs for students who do not respond adequately to Tier 2 instruction (i.e., do not narrow the performance gap) to determine Tier 3 interventions. At this level, students who show the greatest

discrepancy between their present performance and that of a comparison group, and who also demonstrate a slow rate of progress despite receiving Tier 2 instruction are targeted for more intensive services. Continued problem solving occurs to understand specific skill or performance deficits and determine more individualized changes to be made to the learning environment.

RTI adoption in schools is widespread across the nation (Hauerwas, Brown, & Scott, 2013; Hughes & Dexter, 2011). In their review of state documents, Hauerwas and colleagues (2013) found that all 50 states mentioned RTI in their regulations, and 17 states indicated that RTI data were required in their process of identification of students with specific learning disabilities. However, researchers argue that eligibility for special education services should not be the primary aim of RTI models (Batsche et al., 2006). Instead, some researchers argue that providing effective instruction and interventions to increase performance among students is the primary aim of RTI.

For example, the Florida Center for Reading Research surveyed 10 high performing schools from the 2004-2005 school year that participated in the *Reading First* program to increase the effectiveness of academic interventions for struggling readers in Florida (Crawford & Torgesen, 2007). These schools were identified using an "Effectiveness of Intervention" (EI) index, which considers how many students were reading at some level of risk at the beginning of the school year, but made gains enough to meet grade level expectations at the end of the year, meaning that they responded to the instruction that they were given (Crawford & Torgesen, 2007, p. 1). Surveyors identified seven characteristics among schools implementing effective interventions that were less apparent at less successful schools. One such characteristic was "data utilization and analysis," (p. 5) which included regular meetings focused on using academic data to match materials to student needs, the inclusion of educators who could make school-level

decisions and enact those changes immediately, and had strategic forms or systems of using the data to inform problem solving conversations (Crawford & Torgesen, 2007). Likewise, the use of "scientifically based intervention programs" (p. 12) was another distinction among high performing schools. Both data utilization and analysis and scientifically-based interventions are critical components of RTI. Thus, this research provides evidence that employing practices related to the RTI model of service delivery is related to better academic outcomes. Studies that have looked more specifically at problem-solving and RTI models have provided additional evidence.

Burns, Appleton, and Stehouwer (2005) conducted a meta-analysis of problem solving outcomes for four large-scale field-based problem-solving and RTI models and compared these models to university-driven research models. They found large effects for field-based and research-initiated models, with the effects for the four field models being larger than for models used for research (Burns et al., 2005). However, both field- and university-based sites demonstrated increases in both systemic and student outcomes, with mean and median effect sizes between 0.72 and 1.53. Systemic outcomes addressed in the study included "referrals to and/or placements in special education, student time in special education services, and number of students retained in a grade" (Burns et al., 2005, p. 385). Student outcomes focused on academic assessments and growth estimates of academic skills, time on task, and task completion. Further, fewer students were identified as having a learning disability (LD), which contradicted concerns about rates of LD eligibility based on non-responsiveness to intervention (Burns et al., 2005). Thus, results of this meta-analysis support the use of the RTI model for promoting student success.

Hughes and Dexter (2011) also conducted a research review on RTI. In their review of 13 field studies, seven used a problem solving model of RTI, whereas five studies used a standard protocol of preselected, research-based interventions for non-responsiveness, and one study used a combined approach (Hughes & Dexter, 2011). Although a causal relationship cannot be determined because of the lack of experimental control in the designs used in the studies, all of the included studies that focused on academic outcomes demonstrated an improvement in student achievement or performance (e.g., curriculum-based measures, statewide assessments). Further, intensive and ongoing professional learning, support from administration, teacher buy-in, and adequate meeting time were cited across the studies as facilitators of RTI implementation (Hughes & Dexter, 2011). Thus, this synthesis demonstrated that RTI programs may be related to improved student outcomes, although systemic variables may mediate the effectiveness of RTI models.

Positive Behavior Interventions and Supports. PBIS is another, often co-existing with RTI, multi-tiered service delivery system that focuses more distinctly on behavioral concerns in the educational setting. PBIS includes the use of evidence-based interventions for modifying student behavior in schools and targets individual students in addition to class or school-wide behavioral outcomes (Horner et al., 2014; Sugai & Horner, 2008; Sugai, Horner, & Lewis, 2009). Like RTI, PBIS employs data-based decision making across multiple levels (tiers) of intervention implementation, and was derived from a functional behavioral approach (Sugai & Horner, 2006; Sugai & Horner, 2008). The three core tenants of PBIS as described by Sugai and Horner (2006) include prevention, practice informed by evidence and theory, and systemic implementation.

At the universal level, practices are directed toward prevention of problem behaviors across school settings (Sugai & Horner, 2006). Applications of school wide, or universal, methods for eliminating behavior problems are advantageous because they may increase school safety and decrease the amount of time teachers spend correcting problem behaviors in comparison to teaching academic content (Sugai & Horner, 2008). School-wide Positive Behavior Supports (SWPBS) include explicit teaching of behavioral expectations, positive reinforcement for appropriate behavior, and collecting data to use to measure implementation integrity and outcomes (Sugai & Horner, 2008). At Tier 2, function-based approaches are targeted toward a smaller group of students with at-risk behaviors (Sugai & Horner, 2008). Support is provided across various settings, including classroom, non-classroom, and individualized student procedures (Sugai & Simonson, 2012). Tier 3 strategies are employed for individual students whose behavioral needs are not met by group interventions (Sugai & Horner, 2006; Sugai & Horner, 2008). At the tertiary level, practices are based on assessment and tend to require more resources to meet the intensity of student need (Sugai & Horner, 2008).

Adoption of a PBIS framework is related to overall decreases in problem behaviors in schools. Office disciplinary referrals are often used as outcome data to represent the behavioral effectiveness of school-wide PBIS implementation. Studies have shown that PBIS implementation can reduce rates of office disciplinary referrals (ODRs; Barclay, 2015; Barrett, Bradshaw, & Lewis-Palmer, 2008; Bradshaw, Koth, Thornton, & Leaf, 2009; Bradshaw, Mitchell, & Leaf, 2010; Childs, Kincaid, George, & Gage, 2016; Horner et al., 2009; Nelson, Martella, & Marchand-Martella, 2002; Safran & Osald, 2003; Sandomierski, 2011; Taylor-Greene & Kartub, 2000). Likewise, applications of the PBIS framework in schools have shown reductions in suspensions (Childs, Kincaid, George, & Gage, 2016; Horner et al., 2009;

Sandomierski, 2011; Scott, 2001). Other studies have cited increases in perceptions of school safety (Horner et al., 2009; Sugai & Horner, 2008) and more positive behavior in non-classroom settings (Leedy, Bates & Saffron, 2004; Lewis, Colvin & Sugai, 2000; Putnam, Handler, Ramirez-Platt, & Luiselli, 2003; Sugai & Horner, 2008).

Additionally, research has shown relationships between academic achievement and behavior, such that implementation of PBIS relates to increases in academic engaged time and academic outcomes (Algozzine & Algozzine, 2007; Horner et al., 2009; Lassen, Steele, & Sailor, 2006; Sugai & Horner, 2008). Conversely, high quality academic instruction has been shown to reduce problem behaviors in the classroom (Filter & Horner, 2009; Preciado, Horner, Scott, & Baker, 2009; Sugai & Horner, 2008). Algozzine, Wang, and Violette (2011) emphasized the importance of teaching both academic and behavioral skills in the classroom: "viewed as outcomes, achievement and behavior are related; viewed as causes of the other, achievement and behavior are unrelated," (p. 16).

Despite the evidence in support of RTI and PBIS models and clear relations between academic and behavioral performance of students, challenges to providing effective school services for all students as part of multi-tiered systems exist. RTI and PBIS are often implemented in parallel fashion, instead of addressing the intersections of academics and behavior in schools (Eagle et al., 2015; McIntosh & Goodman, 2016; Sugai & Horner, 2009). The implementation of RTI and PBIS models has resulted in separate systems being implemented that can lead to disjointed and inefficient services for students. However, some states and districts have adopted the term Multi-tiered Systems of Support (MTSS) to encompass a comprehensive tiered model for academics, behavior, and social-emotional learning (Eagle et al., 2015; Freeman et al., 2017). Moving forward, the term MTSS is used to refer to this

collective approach to systemic implementation of interventions. A review of what is known about integrated MTSS follows.

Integrated Multi-Tiered Systems of Support. Despite research demonstrating outcomes associated with using multi-tiered, evidence-based approaches to both academic and behavioral intervention, efforts to efficiently integrate a system of comprehensive services have not been adequately documented or achieved (McIntosh & Goodman, 2016; Batsche, 2014). Stewart and colleagues (2007) reviewed seventeen studies of three tiered models of reading (n = 5), behavior (n = 7), and integrated models of reading and behavior (n = 5) to determine the effects of each model on reading and behavioral performance. Moderate and large effect sizes were found for behavioral and reading outcomes of the integrated models, respectively (Stewart et al., 2007). The effects of the integrated models were larger for each outcome than comparing the effects of reading-only or behavior-only tiered models (Stewart et al., 2007). Although there is some research describing outcomes of integrated academic and behavioral models, design and implementation of an integrated MTSS has not been clearly demonstrated.

Despite the lack of clear guidance regarding how to implement integrated MTSS, some researchers focus on examining academic, behavioral, and social-emotional data together to facilitate integration. For instance, Lane and colleagues (2014) suggested a focus on data-based decision making across tiers of instruction and support. They recommended collection and analysis of various school-wide indicators, such as attendance, behavioral outcomes, and academic performance measures to inform intervention (Lane et al., 2014). Importantly, the authors argue that these data sources should be examined together to determine the relationship between the interrelated outcomes and to plan for whatever combination of instruction and intervention is needed to address the presenting problem(s). Similarly, Eagle and colleagues

(2015) described systems-level MTSS implementation as "guided by both a problem-solving framework, and an implementation science framework," (p. 173). The use of implementation science to facilitate integrated MTSS is intended to help educators identify the critical elements and to systematically work towards implementing them with fidelity.

Implementing MTSS with Fidelity

Systems change, such as implementing an MTSS, is inherently complex because it involves all aspects of the targeted system, as well as elements outside the system that may influence individuals or groups within. Systems change is thus ecological in nature and also an abstract concept (Sullivan, Artiles, & Hernandez-Saca, 2015). According to Thompson (1994),

> It is important to keep in mind that systemic reform is not so much a detailed prescription for improving education as a philosophy advocating reflecting, rethinking, and restructuring. Unlike reform efforts that are more limited in scope, systemic reform pervades almost every aspect of schooling. It calls for education to be reconceptualized from the ground up, beginning with the nature of teaching and learning, educational relationships, and school–community relationships. (p. 2)

As Thompson (1994) indicated, there is no single treatment plan for school reform. Instead, districts and schools must comb the literature for evidence-based approaches, while considering their local objectives, stakeholders, and context. However, research does emphasize a number of important components and practices for promoting systems change in schools. Although there are several ways that researchers address educational reform and implementation science (Eagle, Dowd-Eagle, Snyder, & Holtzman, 2015; Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005), this review will organize the literature on reform or change around the six critical components of MTSS implementation articulated by Stockslager and colleagues (2016).

The review is organized in this manner to be consistent with systems coaching and implementation models utilized by the developers of instruments utilized in the proposed study. The six components are (a) a multi-tiered model of service delivery, (b) data-based problem solving, (c) data evaluation systems, (d) capacity and infrastructure, (e) communication and collaboration, and (f) leadership.

Multi-Tiered Model of Service Delivery. One element of MTSS implementation is a multi-tiered model of service delivery. The core components of multi-tiered instruction and intervention were described above. However, the implementation of these components is an ongoing process that is driven by the remaining five critical components that follow.

Data-Based Problem Solving. A second critical element of MTSS implementation is data-based problem solving. Data-based decision making reflects the necessity of using data during screening, progress monitoring, and evaluating outcomes of an MTSS to support organizational change (Curtis & Stollar, 2002; Forman & Crystal, 2015). The selection of interventions should be made according to evidence, as well as the unique context of the school. Leithwood (2010) presented seven claims regarding how underperforming school districts can "turn themselves around," (p. 3) based on empirical evidence, as well as research on school and organizational turnaround processes and leadership. The first finding was that expert problem solving among school leaders builds capacity for district changes. According to Leithwood (2010),

> A *problem* is defined as the gap between a current state (the underperforming system in this case) and a goal state (a high performing system). Problem *solving* entails 'transforming' the current state into the goal state or transforming the low performing school system into a high performing system. (p. 3)

Leithwood (2010) argued that individuals within the school or district who are experts regarding the content knowledge surrounding the presenting problem is a necessary component of problem solving. Another claim acknowledged that there may be several causes of underperformance, and the causes within each school should be carefully assessed. In essence, it is important to "identify the right problem to solve," by isolating relevant and workable problems (Leithwood, 2010, p. 9).

Consistent with Leithwood's (2010) emphasis on effective problem solving, the MTSS framework includes a problem-solving component (Eagle et al., 2015; Stockslager et al., 2016; Sugai, 2009). The four-step problem solving process described previously is applied at and across each tier, which also provides continuous improvement of instruction and intervention for all students (Gresham, 2007; Stockslager et al., 2016). This includes universal screening, assessment, intervention, and progress monitoring to inform fidelity of interventions and outcomes of individual students (Gresham, 2007), as well as MTSS implementation and aggregated student responses across a system (Florida Positive Behavior Supports Project, & Florida Problem Solving/Response to Intervention Project, 2011). Thus, ongoing evaluation at the individual and systems levels through usage of an MTSS framework facilitates systems change through the application of the critical element of problem solving.

Data Evaluation Systems. Data and evaluation is a critical component of MTSS implementation research and practice (Eagle et al., 2015; Florida Positive Behavior Supports Project, & Florida Problem Solving/Response to Intervention Project, 2011; Horner et al., 2014; Stockslager et al., 2016; Sugai & Horner, 2009). Data systems play an integral role in building the context for change (Fixsen et al., 2005). First, data can be a tool used to build consensus around the need for change (Steinbacher-Reed & Powers, 2013), such as when presenting

aggregated results of staff member surveys about organizational practices or student assessment outcomes. However, data are used across all stages of change to answer critical questions about the organization, including evaluating areas of strength within a given system, as well as areas where growth may be necessary to increase effectiveness or efficiency (Crawford & Torgesen, 2007; Florida Positive Behavior Supports Project, & Florida Problem Solving/Response to Intervention Project, 2011). In essence, data provide support for what works and what changes are needed to tailor procedures or interventions associated with desired outcomes. Maintaining strong data systems can facilitate ongoing evaluations of progress.

Anderson, Leithwood, and Strauss (2010) suggested that districts should allow educators to practice data interpretation, model effective data use, and support data management systems that are easily accessible to schools. Based on interviews and documentary data from ten school districts, the following conditions have been identified as influencers of data use in schools: (a) accessibility and timeliness of data, (b) perceived validity of data, (c) staff capacity and support for considering data, (d) time available to interpret and act on the evidence, (e) partnerships with external organizations in analyzing and interpreting data, and (f) procedures and instruments for data collection and interpretation (Anderson, Leithwood, & Strauss, 2010; Ikemoto & Marsh, 2007). Thus, districts should consider these elements when developing their own data evaluation systems.

Specific to MTSS, this domain often includes an integrated data system to collect academic and behavioral measures that can be used to inform decisions across tiers. Examples may include the School-Wide Information System, AIMSweb®, and STAR® (Eagle et al., 2015). Data systems must allow for universal screening, progress monitoring, and other critical problem-solving functions to occur. Fidelity of implementation and effectiveness of

interventions should also be monitored using valid and reliable assessment procedures (Horner et al., 2014; Stockslager et al., 2016). Teacher practices and student learning should undergo ongoing evaluation in order to monitor progress and make adjustments as needed (Stockslager et al., 2016).

In addition to data systems, facilitators of MTSS implementation should consider developing protocols for decision-making using data. For example, Sugai and Horner (2009) developed a self-assessment protocol that school-based leaders can use to improve their implementation of a spectrum of school-wide interventions for behavior. Included in their self-assessment are guidelines for data-based action planning (e.g., regular self-assessment, universal screening procedures, efficient system of data input, storage, and summarization) and evaluation of implementation integrity and progress toward desired outcomes (e.g., relevant and measurable outcome indicators, regular data review, benchmarks and data decision rules; Sugai & Horner, 2009). Taken together, it is evident that data evaluation systems that are comprehensive, supported by district leadership, and made accessible to school staff through procedures and practice opportunities may be best suited to facilitate MTSS implementation.

Capacity and Infrastructure. Schools need to have adequate infrastructure to initiate change, implement and sustain interventions, and facilitate necessary changes over time (Fixsen & Blasé, 2008; Stockslager et al., 2016). Cook and Odom (2013) stated that the benefits of using evidence-based practices, as described above, are not realized if the quality, accessibility, and sustainability of implementation are low. Based on the dearth of experimental research on implementation, Fixsen and colleagues (2005) determined that implementation requires more than providing steps, policies, content knowledge, and training. It should also include a

longitudinal approach and several layers of practices, as well as systematic approaches to building capacity (Cook & Odom, 2013; Fixsen et al., 2005).

One way to develop capacity for change is to focus on the competencies of stakeholders within an organization (Fixsen & Blasé, 2008; Fixsen et al., 2005). For example, leadership might focus on defining the vision and core components of the organization or system they intend to implement. Training, including disseminating the purpose, content, and responsibilities to all staff and providing opportunities for feedback enhance capacity for implementation of new practices (Fullan & Knight, 2011). Ongoing supports are emphasized in the literature to shape practices toward desirable outcomes beyond initial information dissemination (Fixsen et al., 2005; Stockslager et al., 2016; Yoon et al., 2007).

Another method of developing capacity is to build the organizational infrastructure, or the systemic environments that facilitate change (Fixsen & Blasé, 2008; Fixsen et al., 2005). This may include scheduling, personnel, and material resources to support ongoing training efforts, data collection, and feedback processes. If schools do not have the time, personnel, or other resources allocated to implement the practices, the likelihood such practices will be implemented with fidelity is reduced. Additionally, procedures and decision criteria should be established to facilitate some consistency in implementation and evaluation of key practices. Clear guidance regarding steps and criteria to be used can be used to build a common way of work that facilitates individual and organizational progress toward effective change (Stockslager et al., 2016).

Specific to MTSS, districts and schools without basic MTSS capacity and infrastructure components will fail to implement system-wide MTSS with fidelity (Florida Positive Behavior Supports Project, & Florida Problem Solving/Response to Intervention Project, 2011).

Researchers have identified competency and organizational drivers for MTSS implementation (Eagle et al., 2015). Redesigning staff trainings to include coaching supports and professional learning may strengthen competencies (Forman & Crystal, 2015; Showers & Joyce, 1996). Training is necessary to drive service delivery (e.g., instruction, assessment, intervention) matched to student need. Consistent policies and collaborative partnerships among stakeholders also enhance organizational practices for MTSS implementation (Forman & Crystal, 2015), including providing services to students across tiers of support. Further, use of the problem-solving process to address implementation issues, data systems to support decision making, and scheduling that provide time for assessment, interventions, and problem-solving, and accountability and celebration of successful outcomes support the core components of MTSS (Florida Positive Behavior Supports Project, & Florida Problem Solving/Response to Intervention Project, 2011).

For example, Horner and colleagues (2014) reviewed implementation narratives of seven states that adopted a school-wide Positive Behavioral Interventions and Supports (SWPBIS) among at least 500 schools (approximately one third of the schools within each state). Essential components for implementation included advocacy, funding, and training capacity at the state or district level to initiate demonstration schools, adapting training to a more localized level, state level administrative support, local technical capacity for behavioral training and coaching, between 100 and 200 demonstrations, and evaluation systems to validate the utility and benefits of a SWPBIS (Horner et al., 2014). Specifically related to capacity, the authors shared that costs and resources to initially implement SWPBIS were higher because support came from state-level initiatives (Horner et al., 2014). Importantly, as greater number of schools established practices and demonstrated effectiveness, schools could rely on localized trainers, evaluative systems,

district-level funding and professional learning, and state-level supports could be withdrawn. Thus, as implementation grew, states modified their efforts to match the need.

Similarly, the Florida PS/RtI Project used a three-stage process for implementing MTSS practices in schools statewide, including (1) developing consensus, (2) infrastructure support, and (3) implementation of the model (Batsche et al., 2007). Using a statewide approach to MTSS implementation is uncommon (Batsche et al., 2007), but important implementation strategies were gleaned from this process. Specifically, infrastructure support was first developed by investigating what was already in place statewide. Then, project staff initiated ongoing support, such as annual statewide conferences and technical assistance papers (Batsche et al., 2007). Organizing and utilizing resources already available within a system should be a priority when developing capacity and fostering sustainability of a new initiative.

Communication and Collaboration. A collaborative school culture is frequently cited in the literature as a necessary element to support systems change in schools (Hall & Hord, 2015; Showers & Joyce, 1996). Relatedly, buy-in and consensus regarding a new system or approach in education is a prerequisite to system-wide implementation, and thus an important component of systems change. Fixsen and colleagues (2005) stated plainly that, "there are virtually no data to support any given approach to achieving buy-in" (p. 8). However, some suggestions in educational contexts include acquiring an understanding of the current efforts already in place, involving key stakeholders and identifying champions who can take ownership in the initiative, providing professional learning opportunities and support from administration, and engaging in strategic planning to determine how changes can be accomplished and maintained (Adelman & Taylor, 2003; Denton, Vaughn, & Fletcher, 2003; Fixsen et al., 2005).

Buy-in is important when implementing any new initiative because experiencing initial success can facilitate a broader culture of collaboration and growth (Fullan & Knight, 2011). At a school level, sharing materials and teaching strategies creates conversations that may enhance practices across classrooms because teachers can see what works (Steinbacher-Reed & Powers, 2011/12). Large-scale MTSS implementation efforts have also utilized similar strategies through use of demonstration sites or model schools (Batsche et al., 2007; Horner et al., 2014). However, when initiatives in education lack buy-in, they do not succeed because stakeholders are not active contributors toward a common goal. Communicating shared vision and responsibility is essential to drive any organization in a new direction (The University of Florida Lastinger Center for Learning, Learning Forward, & Public Impact, 2016).

Additionally, communication and collaboration facilitate more effective implementation of new initiatives by providing rationale for and stakeholder benefits of the initiative, proactively addressing facilitators and barriers of implementation, and providing ongoing support for those responsible for implementation and ensuring sustainability. Fixsen and colleagues (2005) discussed the importance of a "communication link" between those driving the systemic change and the educators or other individuals responsible for implementing new practices (p. 28). In addition to sharing reasons for changing current practices, conversations can also include developing expectations, roles, and responsibilities of all those involved. Without these in place, individuals within the system operate in isolation, instead of promoting a shared and sustainable vision.

Communication links must involve key stakeholders across the system. Stakeholder involvement includes targeting all of the individuals involved in the change process from beginning to end (Curtis & Stollar, 2002; Forman & Crystal, 2015). Stakeholders may include

school-based leaders such as principals and specialized staff, as well as general and special education teachers and other support staff. Likewise, leaders or change agents of an effective system should have knowledge about the impact of internal and external factors that impact the goals of the system and be involved in the process (Curtis & Stollar, 2002). Communication and collaboration with external systemic supports, such as community groups, agencies, or universities may be used to provide resources, training, or additional support personnel (Curtis & Stollar, 2002; Forman & Crystal, 2015).

In addition to involvement, implementation research on MTSS has highlighted the importance of educator and stakeholder beliefs (Batsche et al., 2007; Cook et al., 2015; Erchul, 2015; Forman & Crystal, 2015). In one study by Cook and colleagues (2015), reports from 16 coaches within five school districts showed that a supportive beliefs intervention helped reduce resistance to change among educators, and improved implementation fidelity and the school context in favor of evidence-based practices for their schools with MTSS for behavior. Erchul (2015) also asserted that teacher beliefs are an important component of assessing treatment validity, or the extent to which interventions are implemented as intended. Likewise, evaluation of treatment acceptability, or the extent to which the treatment is reasonable and appropriate, may align with national policy regarding the use of evidence-based practices (Erchul, 2015). Overall, these results showed an important link between beliefs and implementation behaviors among educators.

Leadership. The last critical component of systemic change is effective leadership. Leadership is highly cited in the literature as a mandatory component and facilitator of effective systems change, which serves to drive the other elements discussed above (Fixsen et al., 2015; Forman & Crystal, 2015; Freeman et al., 2015; Fullan, 2010; Fullan & Knight, 2011). Several

components of effective leadership include promoting common understanding of the aims and expected outcomes of change, distributing responsibilities for implementation, and managing the organizational needs to ensure time and resources for professional learning (Florida Positive Behavior Supports Project, & Florida Problem Solving/Response to Intervention Project, 2011; Louis et al., 2010; Sharratt & Fullan, 2009). Importantly, leaders do not work in isolation, but emphasize teamwork and collaborative culture within the organization and across community resources (Fullan & Knight, 2011; Hall & Hord, 2015).

School-based leaders charged with implementing an MTSS are sometimes referred to as change agents (Forman & Crystal, 2015; Fullan & Knight, 2011). These individuals should be provided with skills-based training and technical assistance, often in the forms of coaching and consultation (Forman & Crystal, 2015). Elements of effective school-based leadership include active involvement of the principal, development of a strategic MTSS implementation plan, a school-based leadership team (SBLT) with implementation responsibilities, and ongoing professional learning and coaching supports (McIntosh & Goodman, 2016). Leadership teams responsible for implementing MTSS must rely on collaboration among school-based professionals, such as administrators, special and general education teachers, and behavior specialists, and coordinate services across academic, behavioral, and social-emotional realms. Integrated school teams that address both academics and behavior may be more equipped to support student needs (McIntosh & Goodman, 2016). A leadership team focuses on building competencies among their staff by engaging in professional learning as a team, and transferring those learning opportunities to their staff. Leadership teams also coordinate and assess systemic initiatives focusing on data at Tier 1, or the school level (McIntosh & Goodman, 2016). Recommendations for school and district leaders facilitating MTSS implementation include

promoting practices such as common planning time (George & Kincaid, 2008), as well as supporting educator knowledge of and skills related to systems work (Eagle et al., 2015). However, empirical studies are needed to determine the knowledge, skills, and practices required of leaders to facilitate effective MTSS implementation.

In summary, researchers have demonstrated consistency regarding key components and best practices of MTSS implementation. However, several questions remain in spite of the existing research on systems change and on how to apply change principles to facilitate MTSS implementation. First, how do schools arrive at a full-scale implementation of MTSS? Next, who are the leaders or primary stakeholders responsible for facilitating this change within the educational context, and how do they develop the skills required for their roles? It is clear that there are many factors that affect successful systems change initiatives among schools and districts, but a single prescription for school innovation does not exist. This is true for MTSS implementation as well. However, one consistent recommendation in the literature suggests increasing school *capacity* for implementation through professional learning and coaching. Given the focus of the proposed study, the literature on professional learning and coaching as *capacity* building mechanisms is explored in more detail below.

Professional Learning

States, districts, and schools are responsible for providing professional learning to their employees (Russo, 2004). Historically, local and regional agencies have commissioned brief, single-event workshops to provide training for teachers. However, research has shown that this method of professional learning is not effective (Deussen, Coskie, Robinson & Autio, 2007; Dole & Donaldson, 2006; Knight, 2009; Russo, 2009).

The Mirage, published by The New Teacher Project (TNTP), reports the investments in professional learning for teachers and the challenges of helping teachers improve their practices (Jacob & McGovern, 2015). Researchers tracked teacher performance data across several years using several measures and surveyed over 10,000 teachers to learn about what might differentiate those teachers who increased their performance over time. Based on analysis of data from three large public school districts and one charter school network, researchers estimated that almost $18,000 are spent annually, per teacher, on professional learning. Further, the teachers included in the study reported spending 19 school days, or 150 hours, participating in activities related to professional learning each year. However, growth most often occurred during the first few years of teaching, and more than two-thirds of teachers did not show improvement in their evaluation ratings over two or three years of the study.

Other research has demonstrated the types of professional learning that do contribute to improved practices. One meta-analysis analyzed 1,300 studies on professional learning (Yoon et al., 2007). The researchers found only long and intensive programs were found to impact student achievement. Further, professional learning programs less than fourteen hours did not change teaching practice nor showed any effects on student achievement (Yoon et al., 2007). Longer professional learning programs may have more opportunities for staff to practice and apply skills. Consistent with Yoon and colleagues, Darling-Hammond, Wei, Andree, Richardson, and Orphanos (2009) found that professional learning programs of greater lengths were associated with changes in teaching practices and increases in student achievement. This finding was consistent across the nine experimental studies reviewed in their analysis (Darling-Hammond et al., 2009).

The term *ongoing, job-embedded professional learning* has already been used to describe the type of professional learning that is considered most effective in schools. Croft and colleagues (2010) define this term as "teacher learning that is grounded in day-to-day teaching practice and is designed to enhance teachers' content-specific instructional practices with the intent of improving student learning" (p. 2). This occurs within the school, at or near the time of actual implementation, and focuses on the real practices of educators, rather than hypothetical skills or scenarios. Further, this type of educator learning occurs across school social systems including state, district, and school levels, and emphasizes long-term planning and learning, a school culture of continuous development, identifying effective facilitators of learning, and identifying times, policies, and data to inform opportunities for development (Croft et al., 2018). Thus, this type of learning builds the local capacity of educators to identify and address difficulties they face in school systems through direct, on-the-job support. While job-embedded professional learning describes the nature of capacity building across systems, there are also specific strategies to increase individual educators' knowledge and skills.

The critical components of ongoing professional learning include theory, modeling, and practice and collaborative reflection (Joyce & Showers, 2002). According to Joyce and Showers (2002) training should enable teachers to learn new knowledge and skills, transfer skills into their practice, and help teachers understand how to be more effective learners. Educating teachers on theory aligns with having the content knowledge required to implement a desired skill or strategy. Having a shared understanding builds consensus and helps instill beliefs that a new practice can be useful and effective. Modeling skills involves one individual, often a coach or leader, who demonstrates a skill while one or more learners observe. Then, learners should be given adequate opportunities to practice new strategies in low-stakes environments with

conditions similar to the classroom, such as in front of peers or among a small group of students. Finally, the feedback utilized in professional learning should be focused more on appropriate contexts for the teacher to use the new strategies in order to meet specific goals, and less on the fidelity of the skill (Joyce & Showers, 1981).

Although designing professional learning to include Joyce and Showers' (1981, 2002) model is important, it is not sufficient without a comprehensive approach to professional learning. Learning Forward is one national professional association that works with states and districts to develop capacity for increasingly effective professional learning practices. Learning Forward (2011) compiled information on research and practice of professional learning into seven standards for effective professional learning. The seven domains of Professional Learning standards are: *learning communities, leadership, resources, data, learning designs, implementation,* and *outcomes* (Learning Forward, 2011). These domains provided by Learning Forward overlap with the core components of MTSS implementation and coaching practices. The *learning communities* standard refers to professional learning opportunities designed to increase collaboration and collective responsibility among stakeholders, while the *leadership* standard emphasizes building collective capacity for change at a systems level (Learning Forward, 2011). The *resources* and *data* standards reflect professional learning opportunities that optimize available resources and use a variety of data sources and evaluation methods (Learning Forward, 2011). The *implementation* standard emphasizes that the application of systems change research and sustained implementation support increases educator effectiveness and student outcomes (Learning Forward, 2011). Finally, standards of *learning design* and *outcomes* demonstrate the need for educators to integrate theory and research, and align teacher practices with student curriculum standards to increase student learning (Learning Forward, 2011).

However, research shows that teachers have differential access to ongoing, job-embedded professional learning based on their school setting. A report by Darling-Hammond and colleagues (2009) showed teachers' perceptions of collaboration and influence in school decision-making varied across elementary and secondary contexts. Teachers in urban schools and those with high rates of racially diverse, limited English proficiency (LEP), and low-income students generally reported more collaboration, observation, coaching, and mentoring experiences than their counterparts in suburban and rural schools. They more often agreed that cooperation and coordination of academic content occurred in their schools, albeit low rates of agreement with these practices across the nation. Teachers in rural area schools and with the lowest rates of students receiving free or reduced lunch price indicated higher levels of perceived influence in school decisions than teachers in urban and high-poverty schools. Results of national survey data suggest that school-level factors are related to individual educator perceptions of their professional learning opportunities.

In summary, the primary goal of professional learning is to take teaching knowledge and skills from trainings and apply it in teaching practices in the classroom to support student learning. Research has shown that this transfer of skills is not reliable among more traditional forms of professional learning. More time spent providing ongoing, job-embedded professional learning is needed and job-embedded professional learning must be part of a comprehensive approach to increasing the capacity of staff across all types of school contexts. Coaching is one method of providing job-embedded support to promote the application and generalization of new knowledge and skills in the classroom that is getting more attention in the literature.

Coaching. Coaching has become a central activity in professional learning to facilitate transfer of knowledge and skills into classroom practices (Erchul, 2015; Neufeld & Roper,

2003). There is great enthusiasm for the use of coaches to improve teacher learning and student outcomes, but empirical research demonstrating the effectiveness of coaching practices is lacking (Cornett & Knight, 2009; Killion & Harrison, 2017; Poglinco et al., 2003). Further, there are several variations of coaching practices, and an agreed upon formal definition of *coaching* has not been established to effectively describe such school-based activities.

Hargreaves and Dawe (1990) described coaching as a transfer of skills and knowledge from a more experienced practitioner to one with less experience by means of a strong relationship between the coach and learner. Aligning closely with the national context of school reform, coaching helps to close gaps between training and implementation of a new skill, supports data-based decision making and implementation, and ensures practices acquired during training develop as sustainable and high fidelity implementation efforts (Freeman et al., 2017). Coaching also addresses the need for ongoing, job-embedded teacher support and can be the mechanism for employing several critical elements of professional learning, including observation, feedback, and problem solving (Erchul, 2015; Joyce & Showers, 1981; Joyce & Showers, 2002).

Joyce and Showers (1980) first suggested a form of technical coaching, called peer coaching, as a form of staff development (Joyce & Showers, 1980; Showers & Joyce, 1996). At the time of publication, studies revealed that only around 10% of staff implemented what they had learned at trainings focused on teaching strategies and curriculum, even if staff volunteered for the professional learning opportunity (Showers & Joyce, 1996). However, they found that implementation rose among teachers who engaged in weekly "coaching sessions" that provided opportunities for staff to work together to develop teaching skills (Showers & Joyce, 1996, p.

12). Thus, peer coaching appears to facilitate the transfer of training and the development of organizational norms and a culture of experimentation (Joyce & Showers, 2002).

Today, there are several types or models of coaching employed in the school setting. The definition of a school-based coach does not adequately fit all coaching models (Rush & Shelden, 2005). For example, content or instructional coaches are individuals who work primarily with teachers to increase instructional capacity in a specific content area, such as reading or mathematics (Neufeld & Roper, 2003). They may work with individual teachers or in small groups to address the instructional needs within the school. Content coaches may model teaching practices, observe teachers and provide feedback, and act as leaders in a particular domain of teaching (Dole & Donaldson, 2006).

In addition to peer and instructional coaching, other common coaching models include literacy coaching and Cognitive Coaching. Literacy coaching is a form of instructional coaching that focuses on the teaching and learning of literacy. Literacy coaches, for example, supported the national initiative, Reading First (Crawford & Torgesen, 2007). The roles of such coaches range from stand-in supervisors and professional developers to more classroom-embedded supports to strengthen teacher practices (Toll, 2009). In contrast, Cognitive Coaching focuses on changing teachers' thoughts to become more reflective and engage in self-directed practice (Ellison & Hayes, 2009). However, all of these models suggest an individual, the coach, is supporting one or several teachers within a school to focus on some combination of content, instruction, and self-reflective practice.

The availability of different coaching models suggests that the role of coaches varies widely across schools and districts, and emphasizes the lack of a common definition of coaching. To overcome role confusion and diffusion in the school setting, Dole and Donaldson (2006)

advised that coaches hone in on a primary goal, frequently spend time in classrooms to collaborate with teachers, and help teachers see the value of the coach's role and the support they can provide. In fact, three purposes of coaching have emerged in the coaching literature regarding practices among teachers. These are (1) building communities of teachers who engage in an ongoing study of teaching, (2) facilitate new knowledge and skills through shared language and understanding, and (3) provide a supportive structure for teachers to develop new teaching practices (Hargreaves & Dawe, 1990; Joyce & Showers, 1985).

Although coaching can build a positive climate among school staff and has been shown to increase implementation of teaching practices, the central goal of coaching is to enhance student outcomes. Killion (2009) emphasized that the goal of coaching is to "improve student learning" (p. 22) Effective coaching has great potential to affect teacher and student learning. For example, coaching focused on high quality teaching, collaborative teaching practices, addressing obstacles collectively, and engaging in frequent and ongoing data analysis to inform decisions may enhance student success (Killion, 2009). However, even content coaches, such as a reading or literacy coach, work exclusively with teachers, not students (Dole & Donaldson, 2006). The relationship between coaching and student outcomes is not a direct relationship, but mediated by teacher practices. Thus, evidence to support school-based coaching practices is not well established (Cornett & Knight, 2009; Killion & Harrison, 2017; Neumerski, 2012; Poglinco et al., 2003).

Cornett and Knight (2009) conducted a review of the foundational research in coaching, including 254 documents related to coaching and school-based professional learning. In general, they found that teachers who received peer coaching demonstrated higher implementation rates of teacher practices and students demonstrated greater achievement. Regarding specific types of

coaching models, evidence for Cognitive Coaching was weak, largely due to the dearth of empirically sound research at the time of their review (Cornett & Knight, 2009). Likewise, evidence for literacy coaching was limited because the construct describes the goal of such coaches (to support teachers in teaching literacy skills to students), but does not describe by what process, or how, this takes place. Finally, Jim Knight at the University of Kansas Center for Learning developed a framework for instructional coaching, but research is still in the early stages. Although there is limited generalizability due to the exploratory nature of the research, the authors asserted that coaching impacts teacher attitudes, practices, and efficacy (Cornett & Knight, 2009).

Neufeld and Roper (2003) noted that "while not yet proven to increase student achievement, coaching does increase the instructional capacity of schools and teachers, a known prerequisite for increasing learning," (p. v). Outcomes of coaching described in the literature include (1) more targeted professional learning that addresses teacher and principal needs, (2) teacher learning that transfers into classroom practice because the coach is embedded on site, (3) increased collaboration among teachers to share their practices and assume collective responsibility for student learning, (4) high-quality principal leadership regarding instructional improvement, (5) and school cultures that use teacher and principal discussion, reflection, and use of data to support instructional change (Neufeld & Roper, 2003, p. 27).

Neufeld and Roper (2003) suggest that the barriers to coaching are similar to most other professional learning plans among districts and schools, and require considerable effort to overcome. Common limitations include lack of time and personnel to engage in coaching activities. One way to overcome the perceived limited time for coaching is to have a clear definition of the coach's roles and responsibilities within the school and encourage coaches to

work with small groups of teachers. Changing teaching practices can be difficult, especially among veteran teachers who have used the same strategies over many years. Neufeld and Roper (2003) suggest setting annual goals with more frequent benchmarks to monitor coaching and teaching progress. Additionally, holding principals responsible for instruction can also help reinforce the value of coaching. Third, they suggest evaluating the impact of coaches, starting with standards developed at the district level, as well as a tool that evaluates coaches' strengths and areas for improvement. Finally, there is not an established way to distribute coaches among schools, but Neufeld and Roper (2003) advocated for coaching that occurs among small groups of teachers, as well as school leadership who expect their teachers to participate in coaching, rather than relying on volunteers. In other words, some coaching experts have begun advocating for coaching responsibilities to be distributed among formal and informal leaders in schools and districts rather than relying on one individual with the title of Coach.

Distributed Leadership. So far, the research has described coaching largely as the efforts of one designated coach to support learning among teachers within a school. Based on current economic climate, schools and districts may be unable to hire individuals to fill the needs of coaches to support MTSS (Steinbacher-Reed & Powers, 2011/12; Steinbacher-Reed & Powers, 2013). However, using a distributed leadership model to maintain shared responsibility for data collection and analysis, instead of relying on a single coach, can increase collaborative culture and accountability among educators in the wake of eliminating roles due to funding shortages (Steinbacher-Reed & Powers, 2013). The need for distributed leadership was also recommended by Fullan and Knight (2011) who argued,

> School improvement will fail if the work of coaches remains at the one-to-one level. Coaches are systems leaders. They need development as change agents at both the

> instructional level and the level of organizational and system change. It's time to recast their role as integral to whole-system reform. (p. 53)

This statement reflects the pressure of schools and districts to engage in systemic change using a team of leaders, or coaches, in order to improve student outcomes. This approach is being referred to as *change* or *systems coaching*.

Systems Coaching

Although coaching practices are widely used in schools across the nation to enhance teaching practices and support student outcomes, the clarity regarding coaching activities and evidence for such practices is largely descriptive and anecdotal in nature. Further, the national context in education limits the capacity of schools to hire individuals for formal coaching roles. However, growing interest in distributed leadership and change coaching indicate new avenues of research and opportunities for system-wide reform and implementation.

Neufeld and Roper (2003) first differentiated content coaching from what they called *change coaching*. They described change coaches as those individuals who "address whole-school organizational improvement" by examining resources and allocating those resources in more effective ways (p. 4). Where instructional coaches work primarily with teachers, change, or systems coaches may also work with principals and other members of school leadership to improve instruction and student outcomes, with a focus on leadership skills among school staff. Neufeld and Roper (2003) argued that change coaches must be adaptable and learn to "customize" their work to the needs of the school (p. 6). For example, change coaches should value working with teachers as one element of larger system-wide practices, but prioritize their roles working with principals and other specialized leadership staff, such as those with MTSS implementation responsibilities.

The term *systems coaching* is emerging in the literature to describe the method by which coaches in education support the implementation of evidence-based practices (Fixsen et al., 2005) and facilitate change for systems-level improvements (Brown et al., 2005; Fullan & Knight, 2011). Much like the previous literature on coaching, research regarding the characteristics of systems coaching and its effectiveness is primarily exploratory. However, researchers such as March and Gaunt (2013) have developed a theoretical model of systems coaching with a focus on implementation practices in education.

The definition articulated by March and Gaunt (2013) describes Systems Coaching as the "application of a set of skills that provides dynamic support and facilitation to develop the capacity of school or district teams to implement MTSS aligned with the school or district improvement plans in order to enhance student outcomes," (p. 2). This definition is consistent with the intended purposes of other coaching models (Killion, 2009) to improve student outcomes. However, there are a number of principles that guide the definition of systems coaching (March & Gaunt, 2013). Further, systems coaching is designed for any school improvement effort or initiative, but its consistency across initiatives has not been empirically tested.

Effectiveness of Systems Coaches. Empirical evidence for the roles and activities that make systems coaches effective is even less than that of other forms of coaching (March & Gaunt, 2013). However, several characteristics of systems coaching emerge in the literature through theory, anecdotal evidence, and case studies (March & Gaunt, 2013). First, researchers suggest that a combination of knowledge, skills, and abilities contribute to the effectiveness of coaches (March & Gaunt, 2013; Marsh et al., 2008). Specifically, pedagogical knowledge, or understanding of how students and teachers learn, and relevant instructional strategies must be

part of coaches' toolkits (King et al., 2004; March & Gaunt, 2013; Neufeld & Roper, 2003; Poglinco et al., 2003). Coaches should also possess content expertise in particular academic subjects, as well as the variations in academic domains across grade levels and instructional levels (March & Gaunt, 2013). Third, systems coaches should be experts regarding educational reform efforts within their schools (March & Gaunt, 2013; Neufeld & Roper, 2003; Poglinco et al., 2003). Finally, interpersonal skills are critical for systems coaches, including flexibility, relationship building and communication skills, as well as leadership (March & Gaunt, 2013). Thus, pedagogical expertise, content knowledge, and interpersonal abilities are three essential characteristics of school-based coaches (King et al., 2004; Kowal & Steiner, 2007; March & Gaunt, 2013).

The School Context as a Facilitator of Systems Coaching. Though the above skills and activities are considered fundamental to school-based coaching efforts, the context of a coach's work can facilitate or bar the effectiveness of their efforts. Much like implementation research, districts and schools that believe in the theory of coaching, namely that improving teaching quality will improve student learning, are more likely to have effective coaches (Neufeld & Roper, 2003). According to March and Gaunt (2013), schools must consider coaches second in line to the principal as essential to the educational reform process. In light of the definition of systems coaching as a "dynamic" process, it seems likely that several factors of a school or system influence the application of systems coaching skills, just as effective leadership, capacity building, and other constructs of systems change are affected by systemic variables. Further, the authors suggest that with fluctuations in the socio-political climate and economy, school systems must consider how the myriad roles of coaches can be assumed (March & Gaunt, 2013). Broad school assumptions about the relationship between coaching and student learning, the complexity

of school reform, and changing socio-political factors offer compelling arguments to further investigate the school-level constructs that influence systems coaching.

Based on what has been implied throughout this literature review, the success of systems coaching is hypothesized to depend on support from the school environment and team of leaders within the school. For example, coaching that is ongoing and meshed with the social environment of the school may drive systems coaching efforts (Croft et al., 2010; Learning Forward, 2011). Educational systems factors that promote or inhibit educators' access to professional learning (one aspect of capacity building), such as student and community demographics, funding, educators' perceived involvement in school decisions, and other material and nontangible (e.g., time) resources may be related to systems coaching initiatives (Darling-Hammond et al., 2009). Use of collaboration, data-based problem solving, and integration of these practices by a school-based leadership team across the school are hypothesized to also impact the extent to which a systems coaching model is employed (Louis, Leithwood, Wahlstrom, & Anderson, 2010; Sharratt & Fullan, 2009). While there are no studies investigating the relationship between school-level factors and systems coaching, the current literature suggests characteristics of the school context influence the skills of educators doing this work.

Coaching for MTSS. Systems coaching has been identified as a method for providing educators with job-embedded support to implement MTSS (March, Castillo, Batsche, & Kincaid, 2016; March & Gaunt, 2013). The goal of coaching for MTSS implementation is to "build capacity of all individuals within the education system" (March & Gaunt, 2013, p. 2). According to the Florida MTSS Project, coaching supports are a critical element of district and school infrastructures required to implement and sustain MTSS (Florida Positive Behavior Supports

Project, & Florida Problem Solving/Response to Intervention Project, 2011, p. 10). In schools, March and Gaunt (2013) posit that systems coaches may assume responsibilities for implementation efforts that include assisting with rules and procedures, using data to inform decision making and facilitating team-based problem solving, helping schools establish a variety of interventions to support diverse populations, and providing ongoing professional learning related to the change initiative. These activities mirror the critical components of MTSS implementation.

As part of a state-level professional learning initiative, systems coaches were part of an ongoing professional learning plan in 34 schools in seven districts over three years who had responsibilities for implementing a problem-solving process for RTI (Castillo, March, Tan, Stockslager, & Brundage, 2016; Castillo, March, Tan, Stockslager, Brundage, McCullough & Sabnis, 2016; Castillo, Wang, Daye, Shum, & March, 2017; March, Castillo, Batsche, & Kincaid, 2016). Ongoing trainings were provided by state-level trainers. One full-time RTI coach was employed for every three pilot schools involved in the implementation of RTI. Researchers examined coaching quality and continuity, changes in educator beliefs & perceived skills, and problem solving implementation fidelity using multi-level modeling (MLM) procedures (March, Castillo, Batsche, & Kincaid, 2016).

Regarding coaching infrastructure for 31 schools implementing RTI focused on reading, researchers found that coaching continuity (i.e., having the same coach over three years) was positively related to RTI implementation fidelity; however, the effect of coaching quality and the interaction of coaching quality and time did not predict RTI implementation (March et al., 2016). The researchers suggested that schools may have seen an initial increase in implementation fidelity at the outset of the initiative, and that consistent coaching supports may have maintained

that increase over time, as opposed to a gradual increase in fidelity (March et al., 2016). Regarding a lack of relationship among coaching quality and problem solving fidelity, the researchers posited that the quality of coaches in the study were rated fairly high and there was little variability in the ratings (March et al., 2016).

With regards to educator beliefs regarding RTI within the state-level initiative, researchers found that SBLT members among 34 pilot schools reported higher beliefs than pilot school staff and educators in 27 comparison schools, with educators at comparison schools reporting the lowest levels of beliefs about RTI throughout the three-year study (Castillo, March, Tan, Stockslager, & Brundage, 2016). SBLT membership at pilot schools predicted increases in educators' beliefs regarding data-based decision making, a fundamental skill within MTSS. Other measured beliefs (functions of Tier 1 and Tier 2 instruction, and academic abilities and performance of students with disabilities) within the study did not show significant increases over time, likely due to statistical limitations and the less pervasive emphasis on these beliefs throughout the SBLT trainings (Castillo, March, Tan, Stockslager, & Brundage, 2016). Despite increases in beliefs about data-based decision making being associated with professional learning, it is not clear the extent to which systems coaching contributed.

Regarding educators' perceived skills, researchers found that membership on an SBLT among 34 pilot schools was associated with increases in educators' perceived RTI skills as they relate to academic content and perceived data display skills (Castillo, March, Tan, Stockslager, Brundage, McCullough & Sabnis, 2016). This relationship was significant when compared to other instructional staff at the pilot schools, as well as educators at 27 comparison schools. Further, educators working in a pilot school that received systems coaching supports reported greater perceived RTI skills applied to academic content when compared to working in a

comparison school (Castillo, March, Tan, Stockslager, Brundage, McCullough & Sabnis, 2016). Again, however, it was unclear the extent to which systems coaching contributed to these relations.

Finally, Castillo, Wang, Daye, Shum, and March (2017) used growth curve modeling to determine relationships between professional learning, educator beliefs and perceived skills, and RTI implementation. Problem-solving implementation was found to increase more quickly among pilot schools that received coaching supports within a broader professional learning plan when compared to schools that did not receive these supports. Educators' beliefs about data-based decision making and their perceived problem-solving skills related to academic issues were also related to levels of implementation. The authors concluded that schools that participated in professional learning and coaching supports demonstrated higher educator beliefs and skills, and RTI implementation, but the specific contribution of systems coaching remained unclear.

Despite the positive outcomes, there were several limitations to the study design that necessitate caution. The study was a quasi-experimental design, meaning that although some schools received coaching and professional learning support, the participating schools were not randomly assigned to the intervention and comparison conditions. Likewise, systems coaching was not an isolated independent variable because of the complexity of educators and schools embedded within systems, so effects of coaching on the outcome variables cannot be interpreted with causality. Finally, a pervasive theme demonstrated in this research is the challenge to better define systems coaching from a research perspective and support it in practice. To address this gap, some researchers have utilized the available literature to propose essential skills of systems coaches.

Skills of Systems Coaches. The activities of systems coaches are best understood as a set of skills employed by those with coaching responsibilities. Further, these skills may best be distributed over several individuals within a school, instead of assumed by a single coach. March and Gaunt (2013) detailed seven skill sets of systems coaches that facilitate implementation and sustainability of MTSS based on their review of the literature on coaching and consultation. They distilled this information into the following seven skill sets that are described in isolation, but are intended to work interdependently (March & Gaunt, 2013).

First, *interpersonal communication skills* are required for effective coaching. Specifically related to systems coaching practices, interpersonal communication may include seven specific skills including active and attentive listening, summarizing, questioning, paraphrasing, delivering, integrating, and empathizing (March & Gaunt, 2013). These skills were derived from the literature on effective consultation (Gutkin & Curtis, 2009), a service delivery model with many similarities to coaching. This skill is required for working with individuals as well as groups of people, and may facilitate participation among key stakeholders in an MTSS (March & Gaunt, 2013). Interpersonal communication skills help facilitate the problem solving process and strengthen relationships among stakeholders, which are critical for effective MTSS implementation (March & Gaunt, 2013).

Second, *data-based problem solving skills* include using a various data sources to appropriately inform high-stakes decisions (March & Gaunt, 2013). This skill set includes accurate and appropriate use of data to guide solutions to individual or organizational level problems. Problem-solving models employed within an MTSS framework rely on data to plan and evaluate effective interventions to address a variety of needs within schools and districts. Coaches should be able to plan for and gather relevant data for decision-making, analyze and

disseminate results of the data, and draw conclusions about how to address student or organizational concerns (March & Gaunt, 2013). This includes knowledge of the facilitators and barriers to problem solving, and the ability to apply a problem solving process (e.g. the four-step problem solving model) to address needs within the school or district.

Third, *team facilitation skills* include the ability to "lead a group toward a solution to a given problem and include job-embedded opportunities for staff to learn and build skills at effectively solving problems together" (March & Gaunt, 2013, p. 13). Team facilitation involves attention to the context of the concern, as well as the processes of problem solving and interpersonal relationships. Someone with team facilitation skills may be responsible for delegating roles and responsibilities within groups, expertly guide the team through the stages of problem solving, and providing post-meeting follow-up to ensure action steps are taken based on consensus from the group conversation (March & Gaunt, 2013). Other relevant roles of team facilitators include using a systems change lens to involve all stakeholders; guiding teams using a clear mission, decision making, and consensus building; articulating clear team processes and procedures including maintaining a meeting agenda; defining roles and responsibilities for all team members related to problem solving and data-based decision making; developing efficient teams with member involvement relative to the team objectives; helping all team members develop individual capacities for problem solving and data-based decision making; ensuring administrator support; and maintaining the team vision through ongoing self-reflection and assessment (March & Gaunt, 2013; Nellis, 2012).

Fourth, *content knowledge dissemination skills* within systems coaching may include expert knowledge regarding instruction and teaching practices, as well as systems level issues throughout the educational organization (March & Gaunt, 2013). Systems coaches should also

have specific knowledge regarding resources and strategies in the school or district and expertise in how to access and disseminate this information to key stakeholders (March & Gaunt, 2013). Though all skills of systems coaches may be demonstrated by several members, it may be particularly advantageous to recognize multiple leaders within a school or district who can provide their unique expertise as specific issues arise (March & Gaunt, 2013). In particular, this skill set may depend on multiple individuals to provide their expertise in a multidisciplinary team setting. Thus, leadership teams may be comprised of a core group of members, with additional experts included as is relevant to the context (March & Gaunt, 2013).

Next, *leadership skills* in the systems coaching model include reinforcing a clear vision, working with a sense of urgency, and focusing on implementation of MTSS within schools (March & Gaunt, 2013). Developing relationships with key participants is another aspect of leadership skills. Further, employing the problem solving process and investing in ongoing professional learning are hallmarks of effective leadership skills (March & Gaunt, 2013). Because all educators are responsible for student outcomes, all staff members within an organization carry responsibility to improve their organization through their unique contributions. Leadership involves flexibility and integration of individual roles to contribute to collective goals and outcomes (March & Gaunt, 2013).

Systems coaches should also possess *professional learning skills*. This includes facilitating ongoing, job-embedded professional learning related to the unique needs of a school and results in changes in beliefs as well as practices (March & Gaunt, 2013). Professional learning opportunities should be of high quality, target educators' "knowledge, skills, attitudes, practices, and beliefs," and be available for teachers, support service personnel, leadership, and others across the school and district (March & Gaunt, 2013, p. 16). March and Gaunt (2013)

recommend that systems coaches have the ability to employ Learning Forward's (2011) *Standards for Professional Learning* (i.e., Learning Communities, Leadership, Resources, Data, Learning Designs, Implementation, Outcomes) in their development of localized professional learning practices.

Finally, *evaluation skills* in the systems coaching model include coaches' capacity to evaluate their own work to provide evidence for the effectiveness of local coaching efforts. It is suggested that various forms of data be included from coaches, as well as those who receive coaching supports (March & Gaunt, 2013). March & Gaunt (2013) suggest that organizations review best practices of professional learning evaluation because "systems coaching for capacity can be considered a professional learning strategy in itself" (p. 18). Though evaluation skills have been identified as a critical coaching skill set, current research does not describe best practices for evaluating systems coaching specifically, and many organizations initiate coaching practices without developing evaluation procedures (March & Gaunt, 2013).

The seven skills of systems coaching are distinctly named and described, but are intersectional in practice (March & Gaunt, 2013). A team of leaders or coaches must possess these seven skill sets, or the domains of systems coaching, to implement MTSS with fidelity. Yet, the skills should be applied according to their need within the local school context and MTSS reform initiative.

Measurement of Systems Coaching

Based on the evidence supporting the roles of coaches as change agents in school settings and the importance of data-based decision making and accountability, it is important to have empirical measures to evaluate coaches' work. Several researchers emphasize the importance of measuring the impact of coaching efforts, despite the challenges of doing so (Killion & Harrison,

2017; Kowal & Steiner, 2007; Neufeld & Roper, 2003; Steinbacher-Reed & Powers, 2013). Several barriers to assessment of coaching include a lack of established benchmarks of coaching quality, as well as the mediating relationships between coaching, teaching quality, and student achievement (Neufeld & Roper, 2003). Experts in coaching have recommended several areas for the measurement of coaching based on coaching theory. Neufeld and Roper (2003) suggested developing a tool to measure coaching quality that is "formative as well as summative" in nature (p. 25). Such a tool might provide an overview of the knowledge and skills of coaches, while also showing areas where individuals or coaching teams would benefit from additional professional growth.

Therefore, there is a need for an evaluation of systems coaching that would indicate the human resources already available in a school or district to support MTSS implementation, including the summative skills of individual educators and school-based leadership teams. These data can be used to identify individuals who already possess the skills to be systems leaders and designate leadership team experts within the organization. Skill data should also be used formatively to indicate the optimal roles for such educators within their district or school-based leadership teams. Schools and districts frequently use a team-based approach to implementing evidence-based practices and educators would benefit from a psychometrically sound measure of coaching skills that could inform professional learning for implementing MTSS with fidelity. Using data to identify gaps in collective skillsets and inform professional learning can increase the individual and collective capacity of educators and schools respectively. Currently, there are no validated tools that are consistent with the systems coaching and MTSS implementation literature that evaluate the skills of systems coaches. However, the *SCS* was derived to address

the perceived need to evaluate MTSS implementation efforts and integrate both academic and behavioral education initiatives in the state of Florida.

The *Systems Coaching Survey* Development Process. The *SCS* was created as part of the Problem Solving & Response to Intervention and Positive Behavior Intervention and Support Projects. It was developed to address the need to measure educators' skills related to MTSS implementation to inform research and practice. Development of the *SCS* followed a multi-step process consistent with "gold standard" survey development procedures (DeVellis, 2012). Two studies were conducted previously to evaluate the content validity of the *SCS*. Draft items were generated based on the literature on coaching and MTSS implementation and evaluated by a panel of content and practitioner experts. Cognitive interviews (DeVellis, 2012; Willis et al., 2005) were also conducted with seven prospective users. Revisions were made to the survey following each of these procedures. This information is covered in more depth in the Method section. Four questions were later added to the survey to reflect cultural responsiveness within an MTSS, a growing area of education research and practice. This resulted in the 41-item survey that was used for the current study. Each of the seven critical skill sets of systems coaching defined by March and Gaunt (2013)—interpersonal communication, data-based problem solving, team facilitation, content knowledge dissemination, leadership, professional learning, and evaluation skills—are represented by three to 11 survey items. Each item on the survey has two parts, meaning that educators are asked to respond according to *their skill level* and their *ability to teach the skill*, ranking each item from 1 (*Not Skilled*) to 5 (*Very Highly Skilled*). The seven domains of systems coaching were upheld in a preliminary single-level confirmatory factor analysis for each response type: educators' *personal skills* and their *ability to teach the skill* to

others (Thoman et al., 2018). However, the survey developers hypothesized that school-level factors (described previously) would influence how individual educators responded to the items.

The next step in the survey validation procedures included empirical validation of the internal consistency of the *SCS* at the educator and school levels. If found psychometrically sound, such a survey could provide empirical evidence for the effectiveness of systems coaches, especially when paired with school-level demographic and student outcome data.

Survey Validation and Measurement Standards

When discussing validation of the *SCS*, measurement standards published by the American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (2014) should be considered. Validity refers to "the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests" (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014, p. 11) Validation of an instrument, such as the *SCS*, may involve review of content, processes of responding, the latent structure of the tool, and relationships to other measures. The *SCS* has undergone content review and response processes. Thus, this study sought to expand the validity of the *SCS* by exploring the factor structure and reliability of scores on the tool.

Conclusion

The *SCS* was derived from a perceived need to evaluate the skills of school-based coaches targeting MTSS implementation. This necessity stems from the national context of educational accountability, school reform focused on data-based decision making and evidence-based instruction, and professional learning literature. Systems coaching addresses the need for ongoing, job-embedded, professional learning for teachers and facilitates the use of an MTSS

model of student service delivery. This study took the next step in providing empirical support for the *SCS*. The factor structure and internal consistency reliability of the *SCS* were evaluated to provide support for an instrument that has utility in practice among educational leaders and is aligned with national policy.

CHAPTER III:

METHOD

This study assessed the factor structure of the *SCS* based on the theoretical model of Systems Coaching (March & Gaunt, 2013). Preexisting data collected through the national pilot of the *SCS* were analyzed. Quantitative data collected by purposive convenience and snowball sampling were used. This chapter details the participants and procedures of the study, describes the questionnaire, and articulates the plan used for analysis of data. Ethical considerations and potential study limitations were considered as well.

Participants

Participants were recruited by purposive convenience and snowball sampling using an email invitation to participate. Additionally, Florida PS/RtI Project and PBIS Project staff reached out to district contacts and regional professional learning communities within Florida and an invitation to participate was distributed statewide in Florida via the Project's contact list (see the Invitation in Appendix B). National recruitment occurred through national contacts of the PS/RtI Project staff, distribution of the invitation letter on listserves focused on MTSS issues (e.g., RTI listserve), Project social media sites (i.e., Twitter, Facebook), the Project website homepage, and via networking at professional conferences (i.e., Innovations Conference and National Association of School Psychologists Annual Conference). District administrators or agency directors who were interested in having educators they work with participate in the study were encouraged to contact the Principal Investigator (PI) by email.

Survey respondents may or may not have been formally labeled “coach” by their district or agency. Participants included anyone whose responsibilities included building capacity for MTSS or anyone who was a member of an individual coaching cadre within a school or at the district level. Participants were required to have prior knowledge of MTSS, but familiarity with systems coaching was not required. Only coaches associated with a school were included in the study.

Relative to the current study, the survey was completed by 1,060 educators across 180 schools from 26 districts located in 6 U.S. states involved in implementing MTSS (see Table 1). The number of respondents per school ranged from 1 to 28 (M = 5.89; SD = 5.85), with between 1 and 279 (M = 40.77; SD = 68.48) educators participating from each district. The largest proportions of respondents indicated their current positions as general educator (43%), school-based administrator (16%), special educator (7%), and teacher mentor (7%). Seventy-one percent of respondents held a master’s degree or higher, and 54% of respondents had at least 15 years of experience in education. Over half (54%) of the participants had been serving in their current position for less than 5 years. Nearly three-quarters (73%) of participants reported having responsibilities for leading, coaching, or otherwise facilitating capacity for MTSS for less than five years. Table 2 provides additional educator demographic information. The sample size was above the researchers’ goal of 500 participants, an adequate sample size to conduct confirmatory factor analyses (Snijders, 2005; Wang & Wang, 2012).

Table 1

Descriptive Statistics for the Distribution of Participants

State	District	District *n*	School *n*	Educator *n*
Florida		**7**	**46**	**323**
	A		7	11
	B		3	5
	C		6	69
	D		23	220
	E		2	2
	F		1	8
	G		4	8
Georgia		**4**	**42**	**384**
	H		15	279
	I		10	50
	J		11	39
	K		6	16
Michigan		**1**	**5**	**12**
	L		5	12
North Carolina		**1**	**17**	**112**
	M		17	112
Utah		**1**	**42**	**93**
	N		42	93
Wisconsin		**12**	**28**	**136**
	O		7	48
	P		9	27
	Q		1	6
	R		1	9
	S		1	1
	T		1	6
	U		2	3
	V		1	14
	W		2	11
	X		1	1
	Y		1	4
	Z		1	6
TOTAL		26	180	1060

Table 2

Demographic Characteristics of Survey Respondents

	n (%)
Position	
Behavior Analyst	3 (0.28)
Behavior Specialist/Coach	18 (1.70)
District Based Administrator	14 (1.32)
General Educator	455 (42.92)
Intervention Specialist	51 (4.81)
MTSS Specialist/Coach	54 (5.09)
School Based Administrator	174 (16.42)
School Counselor	66 (6.23)
School Psychologist	22 (2.08)
School Social Worker	7 (0.66)
Special Educator	71 (6.70)
Speech Pathologist	14 (1.32)
Teacher Mentor	79 (7.45)
Paraprofessional	18 (1.70)
Other	180 (16.98)
Highest Degree Earned	
High School Diploma	4 (0.38)
Some College	5 (0.47)
Associate's	7 (0.66)
Bachelor's	295 (27.83)
Master's	535 (50.47)
Specialist	168 (15.85)
Doctorate	46 (4.34)
Years of Experience in Education	
<5	102 (9.62)
5-9	152 (14.34)
10-14	235 (22.17)
15-19	221 (20.85)
20-24	175 (16.51)
25-29	106 (10.00)
≥ 30	69 (6.51)
Years in Current Position	
<5	574 (54.15)
5-9	201 (18.96)
10-14	141 (13.30)
15-19	80 (7.55)
20-24	36 (3.40)
25-29	22 (2.08)
≥30	6 (0.57)
Years with MTSS Responsibilities	
<5	769 (72.55)
5-9	291 (18.02)
10-14	75 (7.08)
15-19	21 (1.98)
20-24	3 (0.28)
25-29	1 (0.09)
≥30	0 (0.00)

Note. MTSS = Multi-Tiered System of Supports; Position was *select all that apply*.

Instrumentation

Demographic Information. Districts and leadership team names were preloaded into the survey based on information provided by the district contacts. Within the survey, participants selected their affiliated school district, as well as their leadership team(s). School affiliations were coded later for each participant by comparing district and leadership team names with school-level outcome data provided by the district contacts. Participants indicated their gender, highest level of education earned, field of training or certification, years of experience in education, and years responsible for leading, coaching, and/or otherwise facilitating capacity for MTSS. Additionally, they provided their grade levels served, setting (i.e., urban, suburban, rural), current title or position, and years in their current position within their school or district.

District contacts also provided school-level demographic information for the schools that had employees participating in the study, by filling out an Excel template developed by the researchers for this study. This information included the school names, grade levels served, number of students enrolled, setting (i.e., urban, suburban, rural), number of years implementing MTSS, and MTSS Leadership Team size as indicated by number of members. Student information included the percent of students eligible for free- or reduced-priced lunch, students with disabilities (SWD), English speakers of other languages (ESOL)/English language learners (ELL), and White, Black, Hispanic, American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, and Multiracial students.

The *Systems Coaching Survey*. The *SCS* was created as a joint effort by the Problem Solving & Response to Intervention and Positive Behavior Intervention and Support Projects (see Appendix A). The *SCS* was developed using procedures consistent with the "Gold Standard" of survey development recommended by DeVellis (2012). Items were developed based on the

seven domains of the Systems Coaching Model derived from the literature (March & Gaunt, 2013). First, the Systems Coaching Model developed by the survey authors underwent an expert panel review process. In the spring of 2012, an expert panel first provided feedback on the Systems Coaching Model, including its definition and skill sets. Given the Systems Coaching Model was developed based on existing theory and prior coaching-related research, a direct approach to content analysis was used to determine content validity (Hsieh & Shannon, 2005).

According to Rubio, Berg-Weger, Tebb, Lee, and Rauch (2003), the panel of experts selected for a content validity study should include at least three participants with content expertise (i.e., researchers) as well as at least three participants with whom the topic is most salient (i.e., practitioners). Therefore, the panel included four national coaching content experts such as researchers, trainers, and theorists, as well as seven practitioner experts such as coaching supervisors, coaches, and district- and school-level leaders. They provided feedback on the content, quality, clarity, relevance, applicability, and acceptability of the model through an online survey comprised of both open-ended and closed-ended items. Closed-ended items asked participants if they agreed with the statement by selecting either "yes" or "no." Percent agreement on closed-ended items was calculated by the number of "yes" responses divided by the total number of "yes" and "no" responses, with 90% total agreement emerging among participants. All open-ended feedback statements from participants were coded as either "agreement" or "disagreement" with the various elements of the model for which feedback was sought. Percent agreement reflected in the qualitative statements was calculated by the number of agreements divided by the total number of feedback statements. Overall, 94% of the total feedback statements reflected agreement. In general, the experts supported the model, including

its definition and skill sets and minor changes were made based on constructive feedback from the panel.

Once the survey was developed, expert panel and cognitive interviewing processes were used to evaluate the content validity of the *SCS*. In the spring of 2015, researchers generated items for the *SCS* and an expert panel of reviewers provided feedback on clarity, relevance, acceptability, and comprehensiveness of individual items and the seven groups of items (divided by skill set). Feedback and minor changes were made to the survey after receiving individual feedback from six expert reviewers from the Florida Problem-Solving/Response to Intervention (PS/RtI) Project and the Florida Positive Behavior Intervention and Supports (PBIS) Project. Then, seven district- and school-based professionals with responsibility for implementing a systems coaching model and its related activities participated in a cognitive interviewing process (DeVellis, 2012; Willis et al., 2005). The cognitive interview procedure included a combination of "think-aloud" interviewing and "verbal probing" techniques, whereby a standard protocol was used to guide the seven participants individually through the process (Willis et al., 2005). Feedback elicited from these participants informed additional minor changes to survey item language to improve clarity and acceptability. The survey included 37 two-part items after these revisions. In working with other educational agencies, conversations regarding the inclusion of skills related to educators' cultural competency resulted in the survey developers including four items related to skills in facilitating culturally competent practices.

The aforementioned processes resulted in a 41-item survey that was used for the current study. The items were designed to measure the seven domains of systems coaching (i.e., interpersonal communication, data-based decision making, team facilitation, content knowledge dissemination, leadership, professional learning, and evaluation skills) including the skills to

facilitate culturally responsive practices. Each item on the survey had two parts, meaning that educators were asked to respond according to their skill level and their ability to teach the skill. For example, under Interpersonal Communication Skills, participants were asked to evaluate "The skill to: Develop consensus among a group of individuals (a) **Your** skill level, (b) Your ability to **teach** this skill." Two-part items were deemed necessary based on the systems coaching model that emphasizes educators own coaching skills, as well as their ability to transfer content knowledge and problem solving skills to others. Participants ranked each item from *1* (*Not Skilled*) to *5* (*Very Highly Skilled*) for both parts. See *Appendix A* for a copy of the survey.

The results of a preliminary 7-factor single-level confirmatory factor analysis (CFA) using educators as the unit of analysis indicated reasonable fit for educators' personal skill level (CFI = .91, RMSEA = .06, SRMR = .04). Standardized factor loadings ranged from .69 to .90 across the 41 items, and the internal consistency reliability ranged from .79 to .95 across the seven factors. Additionally, a 7-factor single-level CFA also indicated reasonable fit for educators' ability to teach systems coaching skills to others (CFI = .92, RMSEA = .06, SRMR = .03). Standardized factor loadings ranged from .76 to .95 across the 41 items, and the internal consistency reliability ranged from .84 to .96 across the seven factors.

Data Collection Procedures

Training. Each participating district identified a contact person to facilitate the training, administration, and data collection procedures. During initial phone or email contact to express interest in study participation, the PI clarified the study procedures with district contacts, answered preliminary inquiries, and a formal training was scheduled. School and district personnel responsible for coordinating the *SCS* administration were trained prior to administration, including an overview of the systems coaching model, a review of the *SCS* and

its individual items, specific information regarding the administration procedures of the *SCS,* as well as conversations about teaming structures that district contacts wanted to target for participation within their organization. Approximately 21 formal training sessions were conducted and lasted one hour on average, with some districts completing the training session together. All trainings were conducted using a web-based meeting software, Adobe Connect, and took place between January and April 2017. An option to record formal presentations was available if a district expressed a need for school-level leaders to watch at a later time.

Survey Administration. The *SCS* was administered from April through June 2017. District and agency contacts received the survey link via email from the researchers. District contacts were responsible for indicating the window of time between April and June 2017 that the PI would make the survey available to participants at each site (e.g., two weeks, two months). The district contact was responsible for sharing the link to identified personnel at their district by email so that researchers had no way to identify participants. Each participant completed the *SCS* independently and submitted their demographic information, survey responses, and acceptability and feasibility feedback using SurveyMonkey.

Reminder emails including completion rates were sent to district contacts to increase the return rate, according to the timeline indicated by district contacts for survey completion. District contacts could choose to extend the window of response time if their local response data were not fully completed based on anticipated participation. Approximately one to five reminder emails were sent to each district contract to increase the response rate.

Ethical Considerations

This study did not pose more than minimal risk to human subjects. Each participant viewed an electronic version of the consent letter that included a description of the study, what

the participants would be asked to do, assurance that their responses would remain anonymous, and by continuing the survey they were consenting to participation. Researchers did not have direct contact with individuals completing the *SCS* and did not have access to any identifying data. Additionally, a diverse sample was preferred, but all schools that agreed to the regulations of the study were included. Finally, the Institutional Review Board at the University of South Florida reviewed the research protocol and determined that the study did not constitute Human Subjects Research.

Analyses

Preliminary Analyses. This study utilized descriptive and inferential statistics to evaluate the assumptions underlying the factor analyses using IBM SPSS Statistics (Version 24.0). The ranges for each variable were examined for accuracy to ensure that values fell within the expected ranges. Means, standard deviations, and descriptive statistics were calculated for all variables of interest from the sample. Skewness and kurtosis of each response item were assessed to determine whether responses were normally distributed. Observation of the frequency of responses was also used to indicate whether educators demonstrated a pattern of responses or nonresponses among the survey items.

The developers of the tool state that the skills evaluated by the *SCS* are inter-related (March & Gaunt, 2013). Thus, the researcher anticipated that items for both sets of item responses (i.e., their skills and their ability to teach others) would be highly correlated, resulting in greater correlated error within the models. However, one matrix of Pearson product-moment correlation coefficients (PPMCCs; available upon request) that includes both educators' *personal skill level* and *ability to teach* the skill was used to determine the extent to which individual items were related to one another within and between the proposed factors for each 41-item set. This

correlation matrix of the PPMCCs was also used to determine the extent to which the educators' *personal skill level* and *ability to teach* the skill were correlated for each item to address redundancy in the data.

Multilevel Confirmatory Factor Analysis. Construct validity was examined by evaluating the internal structure of the instrument using multi-level confirmatory factor analysis (MCFA). In a recent review, Kim, Dedrick, Cao, and Ferron (2016) found that 82% of applications of multilevel factor analysis (MFA) were used to address questions of measurement validity. Further, MFA are increasingly being applied to evaluate measurement tools because software programs such as *Mplus* (Muthén & Muthén, 1998-2017) are available to run such analyses, and this type of statistical model accounts for organizational influences (Kim et al., 2016).

MCFA was used because the *SCS* was developed based on the literature, using theory to inform the individual items and the factors of the instrument and to account for nested data. There were seven constructs or latent variables that were evaluated through MCFA: Interpersonal Communication Skills (Items 1-7), Data-based Decision Making Skills (8-18), Team Facilitation Skills (19-24), Content Knowledge Dissemination Skills (25-28), Leadership Skills (29-31), Professional Learning Skills (32-38), and Evaluation Skills (39-41). This pattern of responses was upheld in the preliminary single-level CFA model evaluated by Thoman et al. (2018); however, the survey developers hypothesized that school-level factors would influence how individual educators responded to the items (i.e., educators were nested within schools). Further, MFA are generally conducted on large sample sizes (Kim et al., 2016), as was obtained through the *SCS* pilot study. Thus, MCFA was used to account for the complex effects of

systems-level (i.e., schools) variables on the educators nested within them (Dedrick & Greenbaum, 2011).

Two sets of models were investigated. One set investigated the 41 items that asked respondents to evaluate their skill level. The other set investigated the 41 items that asked respondents to evaluate their ability to teach others. Moving forward, each item set will be referred to as a subscale. MCFA (Muthén, 1994) for both subscales was conducted using *Mplus* Version 8 (Muthén & Muthén, 1998-2017). Initially, intraclass correlations (ICC) were examined to determine the extent to which variation in participant responses could be attributed to the school level to determine if MCFA was warranted (Dedrick & Greenbaum, 2008; Dyer, Hanges, & Hall, 2005). Then, two models were examined for each subscale. One model included the seven-factor structure described above at both the educator- and school-level. A second model was examined for each subscale which included the seven-factor structure at the educator level and a single factor at the school level, as guided by the literature on school-based professional learning.

Goodness of fit for each model was determined by examining the comparative fit index (CFI), standardized root mean square residual (SRMR) at the within and between levels, and root mean square error of approximation (RMSEA) indices. Although originally suggested for single-level CFA, the researcher utilized Hu and Bentler's (1999) criteria for model fit (CFI > .95; SRMR < .08; RMSEA < .08). Model modification indices produced by *Mplus* were used to make decisions about making adjustments to each model. The aforementioned fit indices as well as comparative fit indices (i.e., AIC and BIC) were used in conjunction with theory on professional learning and coaching to determine the best fitting model to the data. The robust maximum likelihood (MLR) estimator was used for parameter estimation and was selected based on the

results of skewness and kurtosis values. Full information maximum likelihood (FIML) was used to account for missing data in the models.

Reliability. CFA models typically rely on Cronbach's alpha to investigate the reliability of resultant factors. However, using Cronbach's alpha to examine reliability at the single-level for nested data violates the assumption of independent residuals. Further, it can confound within-group and between-group variance, thus biasing the reliability estimates. MCFA allows for estimates of reliability to be developed at both the school- and educator-levels (Dedrick & Greenbaum, 2011; Kim et al., 2016). Thus, McDonald's (1999) omega (ω) is superior to Cronbach's alpha for the purposes of this study because alpha assumes a tau-equivalent model in which all factor loadings are equal or nearly equal whereas omega accounts for variation in factor loadings. Thus, composite reliabilities were calculated from standardized factor loadings (Geldhof, Preacher, & Zyphur, 2014) using a Microsoft Excel file. The equation for McDonald's (1999) omega is:

$$\omega = \frac{(\Sigma\lambda)^2}{(\Sigma\lambda)^2 + \Sigma\theta},$$

where λ represents standardized factor loadings and θ represents the variance of each item.

CHAPTER IV:

RESULTS

Preliminary Analyses

Descriptive Data. The sample included 1,060 educators nested within 180 schools (*M* = 5.89 educators per school). Item means on the *Personal Skills* subscale ranged from 3.15 (*SD* = 1.00) to 4.33 (*SD* = 0.67). Item means on the *Ability to Teach* subscale ranged from 2.91 (*SD* = 1.00) to 3.77 (*SD* = 0.86). Complete descriptive data for both subscales are displayed in Tables 3 and 4.

Assumptions. Skewness and kurtosis values were used to evaluate the normality assumption. Skewness values on the *Personal Skills* subscale ranged from -0.72 (*SD* = 0.08) to -0.08 (*SD* = 0.08). Kurtosis on the *Personal Skills* subscale ranged from -0.31 (*SD* = 0.16) to 0.89 (*SD* = 0.15). Skewness values on the *Ability to Teach* subscale ranged from -0.54 (*SD* = 0.08) to 0.03 (*SD* = 0.08). Kurtosis on the *Ability to Teach* subscale ranged from -0.41 (*SD* = 0.15) to 0.28 (*SD* = 0.15). Regarding missing data and response patterns, 1,060 (100%) participants completed the first seven items of each response type: *Personal Skills* and *Ability to Teach*. A total of 1,026 (96.8%) participants completed 18 items for each response type; 1,008 (95.1%) completed 24 items; 996 (94.0%) completed 28 items; 994 (93.8%) completed 31 items; 979 (92.4%) completed 38 items; and 973 (91.8%) completed all 41 items for each response type. While the skewness and kurtosis values showed approximate normality of the data, the robust maximum likelihood (MLR) estimator was used for parameter estimation because MLR adjusts for even small deviations from normality. ICCs on the *Personal Skills* subscale ranged from .05

to .14. ICCs on the *Ability to Teach* subscale ranged from .05 to .15. The ICCs demonstrated adequate variability between schools to proceed with multilevel modeling (Dedrick & Greenbaum, 2008; Dyer, Hanges, & Hall, 2005).

Multi-Level Confirmatory Factor Analysis

The following sections will discuss the multilevel analyses for each subscale. Two models were examined for the *Personal Skills* subscale, and two models were assessed for the *Ability to Teach* subscale. Model 1 for both subscales examined seven factors at the educator and school levels, as this structure was consistent with the theoretical conceptualization of systems coaching. Model 2 for each subscale examined seven factors at the educator level and one factor at the school level. This structure is consistent with education reform literature that indicates school-level characteristics that influence educator skills, described in Chapter 2, as well as literature on MCFA that indicates that fewer factors tend to exist at level 2 (Kim et al., 2016). First, I explain the overall fit of the MCFA models, then I provide information on the adjustments to model fit and specific data that led to the decisions that were made. After the models for both subscales are described, I explain the reliability for the *SCS*.

Research Question 1a: Personal Skills. First, a model with seven factors at the within (educator) level and seven factors at the between (school) level was examined (Model 1; see Figure 1). The theoretical model of systems coaching was used to determine the items representing each factor. To reach convergence of Model 1, the number of iterations was increased to 5,000 and the item residual variances were constrained to zero. Results of the MCFA for Model 1 indicated only acceptable fit across most indices (CFI = .91, RMSEA = .05, SRMR within = .04, SRMR between = .18), except for the SRMR between value which was above the specified criterion.

A model with seven factors at the educator level and a single factor at the school level (Model 2; see Figure 2), representing an overall school context factor, was also examined. In Model 2, the number of iterations was increased to 5,000 to allow the models to converge.

Table 3

Descriptive Data for Personal Skills (Level-1 n = 1,060; Level-2 n = 180)

Item	Mean	SD	Skewness	Kurtosis	ICC	% Missing
1	4.33	0.45	-.70	.16	.06	0.0
2	3.93	0.54	-.55	.88	.09	0.0
3	3.92	0.60	-.49	.36	.10	0.0
4	4.00	0.58	-.48	.15	.12	0.0
5	3.91	0.60	-.30	-.27	.09	0.0
6	3.83	0.61	-.37	.20	.10	0.0
7	3.67	0.70	-.27	.10	.13	0.0
8	3.50	0.82	-.32	.12	.13	3.2
9	3.64	0.69	-.38	.33	.13	3.2
10	3.39	0.78	-.25	.21	.11	3.2
11	3.62	0.83	-.42	.06	.11	3.2
12	3.44	0.79	-.17	-.05	.09	3.2
13	3.25	0.92	-.08	-.23	.09	3.2
14	3.34	0.90	-.29	-.03	.11	3.2
15	3.44	0.87	-.35	.00	.12	3.2
16	3.52	0.95	-.38	-.13	.10	3.2
17	3.60	0.83	-.56	.36	.10	3.2
18	3.49	0.82	-.40	.20	.12	3.2
19	3.89	0.60	-.55	.60	.10	4.9
20	3.80	0.74	-.62	.55	.10	4.9
21	3.87	0.73	-.61	.42	.12	4.9
22	3.47	0.82	-.42	.14	.10	4.9
23	3.54	0.87	-.48	.19	.15	4.9
24	3.47	0.83	-.39	.10	.11	4.9
25	3.60	0.93	-.58	.15	.11	6.0
26	3.60	0.79	-.38	.10	.11	6.0
27	3.51	0.88	-.39	.03	.10	6.0
28	3.32	0.85	-.21	-.08	.09	6.0
29	3.41	1.01	-.26	-.31	.11	6.2
30	4.12	0.58	-.72	.78	.08	6.2
31	3.77	0.77	-.60	.47	.05	6.2
32	3.49	1.05	-.42	-.22	.12	7.6
33	3.41	0.96	-.27	-.22	.11	7.6
34	3.47	0.89	-.38	.14	.14	7.6
35	3.41	0.95	-.30	-.07	.13	7.6
36	3.38	0.91	-.36	.08	.13	7.6
37	3.33	1.02	-.31	-.25	.12	7.6
38	3.15	1.00	-.18	-.21	.10	7.6
39	3.38	0.89	-.30	-.02	.12	8.2
40	3.29	0.94	-.27	-.10	.13	8.2
41	3.21	1.02	-.28	-.15	.11	8.2

Note. SD = standard deviation; ICC = intraclass correlation.

Table 4

Descriptive Data for Ability to Teach Skills (Level-1 n = 1,060; Level-2 n = 180)

Item	Mean	SD	Skewness	Kurtosis	ICC	% Missing
1	3.77	0.75	-.40	.06	.05	0.0
2	3.52	0.74	-.35	.28	.07	0.0
3	3.58	0.76	-.32	.15	.10	0.0
4	3.60	0.77	-.35	.19	.11	0.0
5	3.50	0.76	-.18	-.03	.07	0.0
6	3.49	0.75	-.20	.14	.10	0.0
7	3.33	0.83	-.14	-.04	.13	0.0
8	3.11	0.96	-.12	-.22	.14	3.2
9	3.27	0.84	-.19	.00	.11	3.2
10	3.04	0.89	-.07	-.08	.12	3.2
11	3.23	0.99	-.25	-.18	.11	3.2
12	3.09	0.94	-.06	-.12	.09	3.2
13	2.91	0.99	.03	-.24	.11	3.2
14	3.00	0.97	-.14	-.23	.12	3.2
15	3.10	1.01	-.20	-.23	.13	3.2
16	3.20	1.06	-.21	-.42	.09	3.2
17	3.25	0.97	-.28	-.19	.12	3.2
18	3.15	0.90	-.17	-.04	.12	3.2
19	3.54	0.79	-.34	.10	.09	4.9
20	3.50	0.88	-.40	.13	.12	4.9
21	3.56	0.89	-.42	.05	.10	4.9
22	3.19	0.90	-.21	-.08	.12	4.9
23	3.22	1.03	-.27	-.18	.12	4.9
24	3.18	0.97	-.18	-.16	.11	4.9
25	3.30	1.95	-.36	-.25	.13	6.0
26	3.27	0.93	-.27	-.05	.10	6.0
27	3.22	1.00	-.21	-.18	.09	6.0
28	3.05	0.96	-.13	-.15	.10	6.0
29	3.09	1.10	-.12	-.36	.11	6.2
30	3.74	0.85	-.54	.24	.08	6.2
31	3.49	0.94	-.40	.05	.06	6.2
32	3.24	1.10	-.26	-.33	.12	7.6
33	3.13	1.03	-.10	-.27	.12	7.6
34	3.19	0.98	-.19	-.12	.15	7.6
35	3.13	1.03	-.13	-.17	.13	7.6
36	3.10	1.01	-.15	-.15	.14	7.6
37	3.06	1.08	-.16	-.32	.10	7.6
38	2.92	1.03	-.06	-.24	.11	7.6
39	3.08	0.97	-.15	-.10	.13	8.2
40	3.00	0.99	-.06	-.15	.14	8.2
41	2.94	1.04	-.12	-.25	.12	8.2

Note. SD = standard deviation; ICC = intraclass correlation.

Results of the MCFA for Model 2 indicated only acceptable fit across most indices (CFI = .91, RMSEA = .05, SRMR within = .05, SRMR between = .39), except for the SRMR between value which above the specified criterion. The results of these models are shown in Table 5. Differences among model fit were more difficult to detect, so both models were explored further (described below).

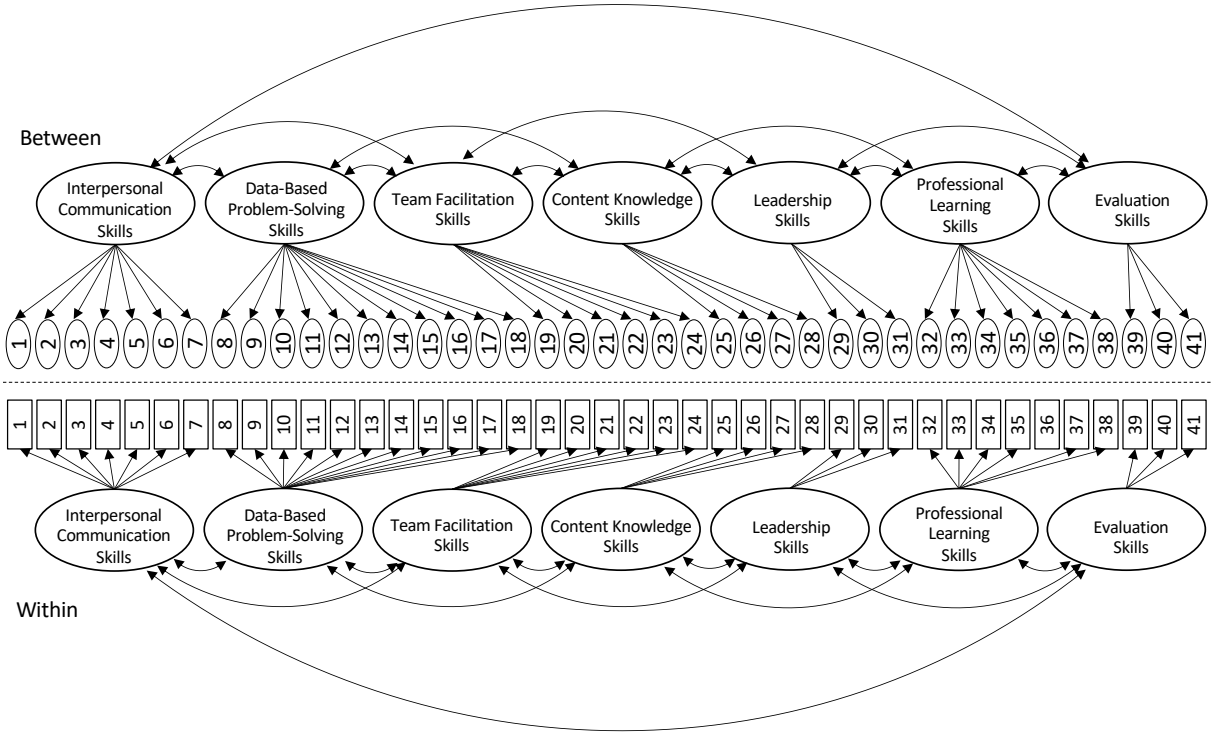

Figure 1. Personal Skills Model 1.

The fit for each of the *Personal Skills* models did not meet the pre-determined criteria for good model fit, particularly with regard to the CFI, TLI, and SRMR between fit indices. A review of model modification indices indicated that some error terms were highly correlated, necessitating modifications to improve overall model fit. Item content of highly statistically correlated error terms was reviewed to determine appropriateness of theoretical relationships

prior to adding into the measurement model. For example, Item 12, *Interpret different sources and types of behavior data to support intervention design and improve student outcomes,* and Item 13, *Interpret different sources and types of social/emotional data to support intervention design and improve student outcomes,* involve making sense of various types of data for the purpose of intervention planning. Thus, one would expect these two items to be related. In addition to statistical correlations, item content was examined and items that were theoretically related were identified to account for each relationship in the model (see *Appendix A* for items). Correlated errors were added to the models one at a time to improve model fit and the correlation coefficients between these error terms are displayed in Table 6. In Model 1, 15 correlated error terms were added, while 16 correlated error terms were added to Model 2. In each case, the process of adding individual error terms with the highest, statistically significant correlations as well as theoretical relationships was repeated until the CFI and TLI reached the pre-determined criteria for good fit.

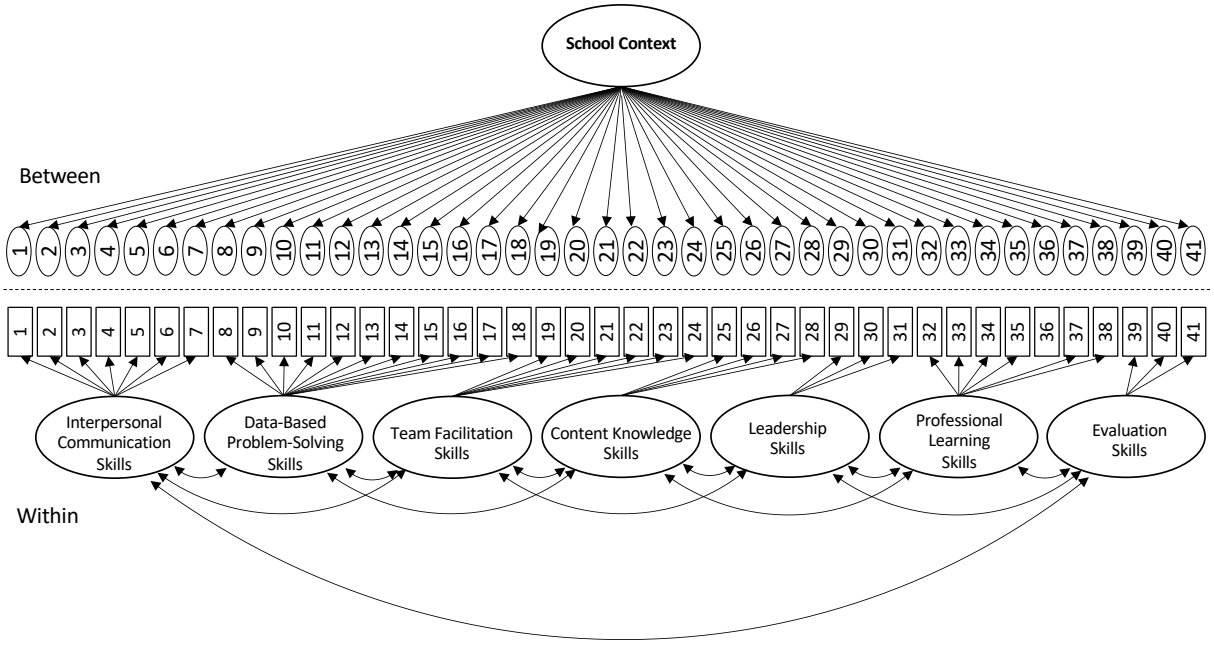

Figure 2. Personal Skills Model 2.

Table 5

Multilevel Confirmatory Factor Analysis Fit Indices: Personal Skills

Model	RMSEA (<.08)	CFI (.90/.95)	TLI	SRMR W (<.08)	SRMR B (<.08)	# of Parameters	-2 Log Likelihood	AIC	BIC	Chi square	*df*	*p* value
1: Seven factors at Levels 1 & 2; Item residual variances constrained to zero	.05	.91	.90	.04	.18	172	-36442.13	73228.25	74082.41	5758.97	1591	<.001
2: Seven factors at Level 1 & one factor at Level 2	.05	.91	.90	.05	.39	226	-36355.76	73163.51	74285.83	5629.93	1537	<.001

Note. Level-1 *n* = 1,060; Level-2 *n* = 180.

Table 6

Correlated Error Terms for Personal Skills Models 1 and 2.

Model	Item 1	Item 2	*r*
1	12	13	.60**
	8	9	.32**
	38	28	.21**
	37	38	.34**
	19	20	.33**
	14	15	.31**
	30	1	.29**
	11	12	.22**
	4	5	.27**
	30	31	.29**
	6	7	.26**
	17	18	.23**
	39	40	.39**
	32	33	.23**
	9	10	.21**
2	12	13	.60**
	8	9	.41**
	37	38	.35**
	38	28	.37**
	19	20	.33**
	14	15	.29**
	30	1	.30**
	11	12	.22**
	4	5	.28**
	30	31	.29**
	6	7	.26**
	17	18	.22**
	32	33	.23**
	9	10	.33**
	8	10	.31**
	39	40	.40**

Note. * $p < .05$, ** $p < .01$

After adding correlated error terms to Model 1, the results showed good model fit (CFI = .95, TLI = .95) based on our criteria of .95. Model 2 also indicated good fit with regards to the CFI (.95) and TLI (.95). However, neither Model 1 nor Model 2 met the criterion for the SRMR between fit index. Although neither of the *Personal Skills* models met the desired model fit criteria of less than .08 for the SRMR between index, Model 2 (see Table 7) was the final selected model representing the best fit to the data for the *Systems Coaching Survey: Personal*

Skills subscale. Model 2 (7 factors within level, 1 factor between level) was chosen because it demonstrated the lowest SRMR between (.15) as well as the smallest AIC (71,629.20) compared to Model 1 (SRMR between = .18, AIC = 71,735.64). An SRMR between value of .15 was considered acceptable based on Asparouhov and Muthén's (2018) report that Level-2 values of SRMR tend to be higher than .08.

Correlations between the within-level factor scores for the *Personal Skills* subscale are shown in Table 8. Correlations ranged from small to moderately high, and all were statistically significant. Correlations ranged from r = .21 ($p < .001$) between *Interpersonal Communication* and *Data-based Problem Solving* and r = .61 ($p < .001$) between *Professional Learning* and *Evaluation* factors.

Standardized and unstandardized factor loadings for the final *Personal Skills* model are displayed in Table 8. Standardized factor loadings at the educator level exceeded .66 for all factors. The highest factor loading was .91 on the Professional Learning factor (see Table 9 for individual factor loadings on each factor). Standardized loadings on the school level factor ranged from .79 to 1.00.

Table 7

Fit indices after model modifications of the Personal Skills Models 1 and 2.

Model	RMSEA (<.08)	CFI (.90/.95)	TLI	SRMR W (<.08)	SRMR B (<.08)	# of Parameters	-2 Log Likelihood	AIC	BIC	Chi square	*df*	*p* value
1: Seven factors at Levels 1 & 2; Item residual variances constrained to zero	.04	.95	.95	.04	.18	187	-35680.82	71735.64	72664.29	3904.77	1576	<.001
2: Seven factors at Level 1 & one factor at Level 2	.04	.95	.95	.04	.15	242	-35572.60	71629.20	72830.98	3733.27	1521	<.001

Note. Level-1 n = 1,060; Level-2 n = 180.

Table 8

Correlations between Factor Scores for the Personal Skills Subscale

Factor	1	2	3	4	5	6
1. Interpersonal Communication	—					
2. Data-Based Problem Solving	.21**	—				
3. Team Facilitation	.22**	.30**	—			
4. Content Knowledge Dissemination	.24**	.39**	.39**	—		
5. Leadership	.28**	.39**	.43**	.51**	—	
6. Professional Learning	.26**	.39**	.40**	.54**	.55**	—
7. Evaluation	.24**	.39**	.37**	.51**	.51**	.61**

Note. ** $p < .01$

Table 9

Factor Loadings for the Personal Skills Survey

	Level 1		Level 2	
Item	Standardized	Unstandardized	Standardized	Unstandardized
Interpersonal Communication				
1	.71	1.00	.79	1.00
2	.76	1.18	.90	1.43
3	.79	1.28	.96	1.85
4	.70	1.11	.94	1.71
5	.69	1.13	.99	1.45
6	.73	1.19	.98	1.89
7	.68	1.15	.99	2.85
Data-Based Problem Solving				
8	.73	1.00	.99	2.14
9	.75	0.95	.96	1.98
10	.76	1.02	.99	2.21
11	.80	1.14	.89	1.28
12	.72	0.97	.99	2.16
13	.66	0.96	1.00	2.70
14	.81	1.17	.99	2.16
15	.82	1.18	.92	1.79
16	.78	1.17	.91	1.87
17	.80	1.13	.92	1.36
18	.81	1.12	.98	2.36
Team Facilitation				
19	.80	1.00	1.00	1.61
20	.82	1.14	.96	2.11
21	.82	1.13	.97	1.77
22	.85	1.23	1.00	2.45
23	.83	1.23	.94	2.43
24	.83	1.21	1.00	2.53
Content Knowledge Dissemination				
25	.80	1.00	.84	1.40
26	.85	0.98	.94	1.07
27	.85	1.04	.95	1.55
28	.82	0.95	.98	2.49
Leadership				
29	.79	1.00	.94	2.27
30	.68	0.67	.99	1.21
31	.73	0.83	.98	1.34
Professional Learning				
32	.83	1.00	.93	1.93
33	.80	0.92	.92	1.62
34	.89	0.97	.94	1.84
35	.91	1.04	.95	1.85
36	.90	0.99	.98	2.26
37	.85	0.99	.91	2.37
38	.78	0.90	1.00	2.81
Evaluation				
39	.89	1.00	.96	1.81
40	.90	1.03	1.00	2.39
41	.89	1.06	1.00	2.55

Note. Factor loadings in the Level-2 column represent the single school-level factor.

Research Question 1b: Ability to Teach. I followed a similar procedure to construct a multilevel model for educators' ability to teach others. First, a model with seven factors at the within (educator) level and seven factors at the between (school) level was conducted (Model 1; see Figure 3). The theoretical model of systems coaching was used to determine the items representing each factor. To reach convergence of the model, the number of iterations was increased to 5,000 and the item residual variances were constrained to be zero. Results of the MCFA for Model 1 indicated only acceptable fit across most indices (CFI = .92, RMSEA = .05, SRMR within = .04, SRMR between = .19), except for the SRMR between value which was above the specified criterion (see Table 10).

A model with seven factors at the educator level and a single factor at the school level, representing an overall school context factor, was also examined (Model 2; see Figure 4). To reach convergence of this model, the number of iterations was also increased to 5,000. Results of the MCFA for Model 2 also indicated acceptable fit across most indices (CFI = .92, RMSEA = .05, SRMR within = .04, SRMR between = .13), except for the SRMR between value which was above the specified criterion. The model with a single factor at level 2 (see Table 10) was chosen based on overall comparisons of the fit indices, including a better fit at the between level (SRMR between = .13). Adjustments were made to Model 2 based on model modification indices.

Error terms that were highly correlated were added to the model to improve overall model fit. Consistent with the *Personal Skills* subscale, correlated error terms were added one at a time to improve model fit. Each set of items was examined to justify adding each parameter to the model based on theory and the magnitude of the correlated error. In the final *Ability to Teach* model, eight correlated error terms were added and the results showed good model fit (CFI = .95, TLI = .95) based on the criterion of .95. See Table 11 for correlated error terms added to the

selected *Ability to Teach* model and Table 12 for the model fit indices. The model in Table 12 was the final selected model representing the factor analytic structure of the *Systems Coaching Survey: Ability to Teach* subscale.

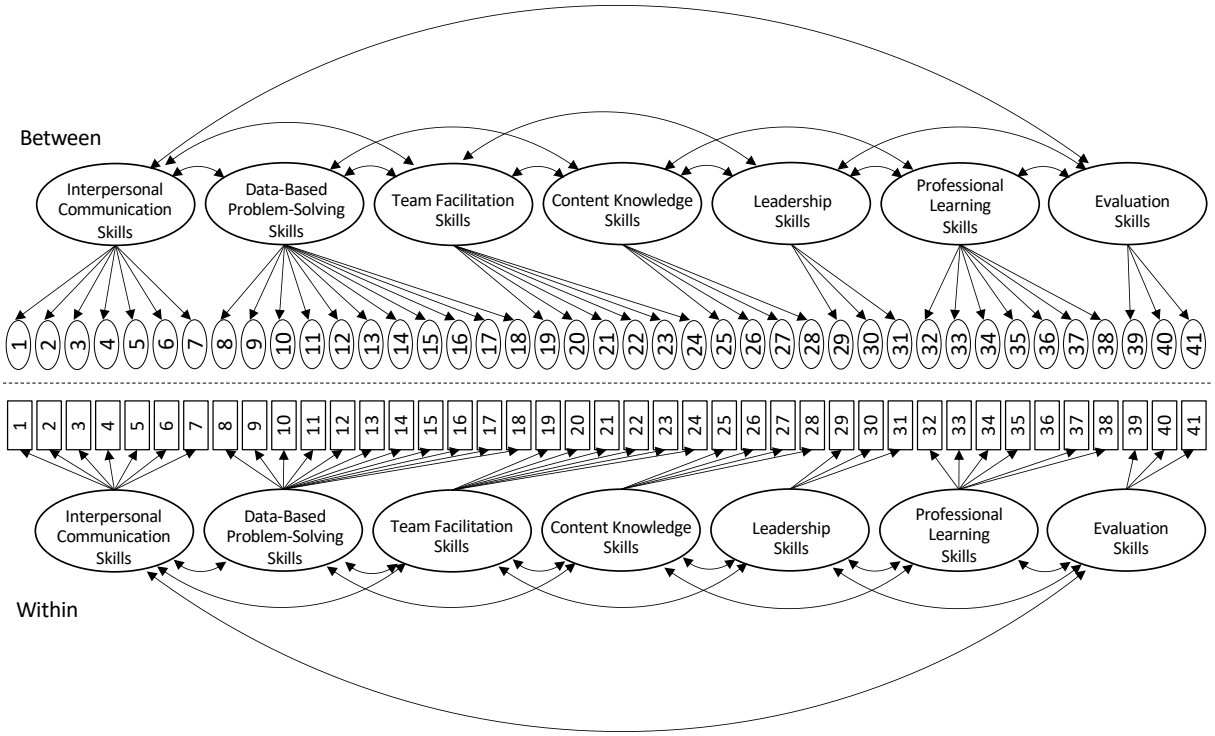

Figure 3. Ability to Teach Model 1.

Correlations between the within-level factor scores for the *Ability to Teach* subscale are shown in Table 13. Correlations ranged from small to moderately high and all were statistically significant. Correlations ranged from r = .38 ($p < .001$) between *Interpersonal Communication* and *Data-based Problem Solving* and r = .74 ($p < .001$) between *Professional Learning* and *Evaluation* factors.

Standardized and unstandardized factor loadings for the *Ability to Teach* model are displayed in Table 14. Standardized factor loadings at the educator level exceeded .66 for all factors. The highest factor loading was .91 on the Professional Learning factor (see Table 14 for

individual factor loadings on each factor). Standardized loadings on the school level factor ranged from .79 to 1.00.

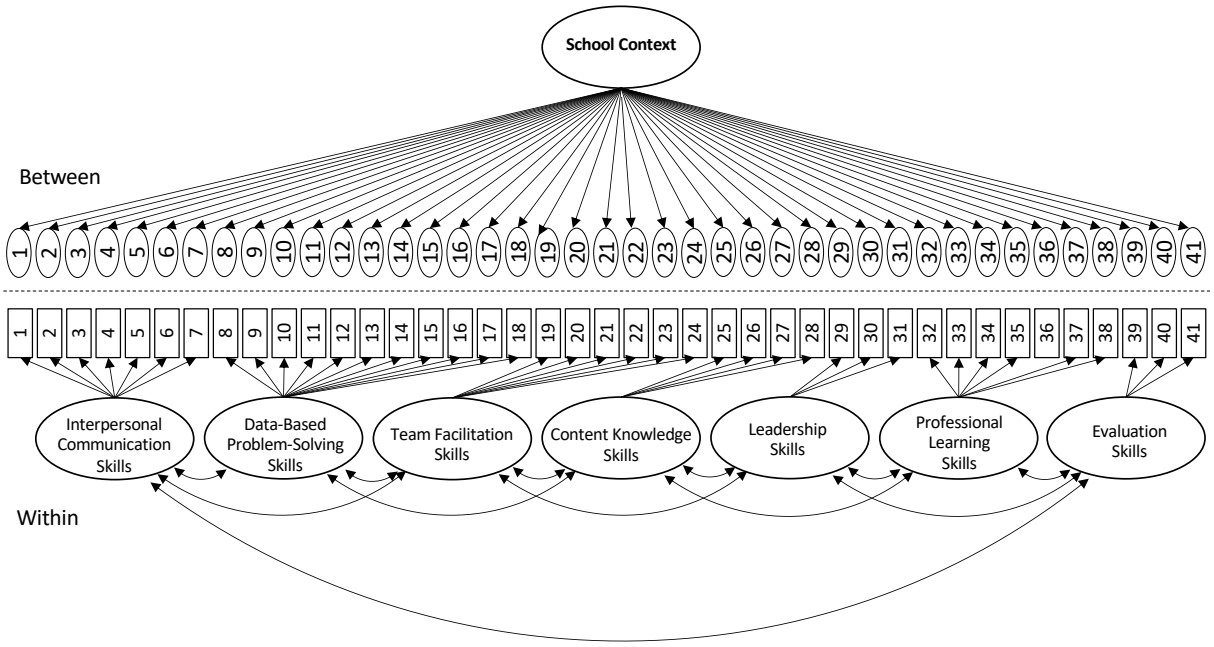

Figure 4. Ability to Teach Model 2.

Table 10

Multilevel Confirmatory Factor Analysis Fit Indices: Ability to Teach Skills

Level 2 School Factors	RMSEA (<.08)	CFI (.90/.95)	TLI	SRMR W (<.08)	SRMR B (<.08)	# of Parameters	-2 Log Likelihood	AIC	BIC	Chi square	*df*	*p* value
1: Seven factors at Levels 1& 2; Item residual variances constrained to zero	.05	.92	.92	.04	.19	172	-35530.17	71404.33	72258.49	5897.75	1591	<.001
2: Seven factors at Level 1 & one factor at Level 2	.05	.92	.91	.04	.13	226	-35404.16	71260.32	72382.65	5838.9	1537	<.001

Note. Level-1 n = 1,060, Level-2 n = 180.

Table 11

Correlated Error Terms for the selected Ability to Teach model

Item 1	Item 2	*r*
12	13	.60**
8	9	.44**
19	20	.41**
37	38	.38**
1	2	.33**
30	31	.36**
38	7	.31**
14	15	.32**

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

Table 12

Fit indices after model modifications of the Ability to Teach Skills Model 2

Model	RMSEA (<.08)	CFI (.90/.95)	TLI	SRMR W (<.08)	SRMR B (<.08)	# of Parameters	-2 Log Likelihood	AIC	BIC	Chi square	*df*	*p* value
2: Seven factors at Level 1 & one factor at Level 2	.04	.95	.95	.04	.14	234	-34778.53	70025.07	71187.11	4217.64	1529	<.001

Note. Level-1 n = 1,060; Level-2 n = 180.

Table 13

Correlations between Factor Scores for the Ability to Teach Subscale

Factor	1	2	3	4	5	6
1. Interpersonal Communication	—					
2. Data-Based Problem Solving	.38**	—				
3. Team Facilitation	.40**	.49**	—			
4. Content Knowledge Dissemination	.41**	.58**	.58**	—		
5. Leadership	.44**	.56**	.61**	.69**	—	
6. Professional Learning	.41**	.55**	.57**	.69**	.68**	—
7. Evaluation	.39**	.55**	.54**	.66**	.66**	.74**

Note. ** $p < .01$

Table 14

Factor Loadings for the Ability to Teach Survey

	Level 1		Level 2	
Item	Standardized	Unstandardized	Standardized	Unstandardized
Interpersonal Communication				
1	.75	1.00	.85	1.00
2	.81	1.07	1.00	1.23
3	.82	1.09	.99	1.32
4	.81	1.09	.91	1.17
5	.82	1.10	1.00	1.22
6	.84	1.11	.95	1.24
7	.80	1.08	.96	2.18
Data-Based Problem Solving				
8	.79	1.00	.92	1.05
9	.81	0.95	.89	1.10
10	.84	1.01	.88	1.38
11	.85	1.09	.90	0.57
12	.80	0.98	.99	1.60
13	.76	0.94	1.00	2.63
14	.84	1.06	.97	1.61
15	.86	1.11	.83	1.10
16	.81	1.08	.96	0.82
17	.86	1.09	.79	0.92
18	.86	1.04	1.00	1.41
Team Facilitation				
19	.85	1.00	.99	1.16
20	.86	1.05	.88	1.27
21	.86	1.08	.98	0.73
22	.89	1.09	1.00	1.91
23	.88	1.16	.90	1.61
24	.89	1.13	1.00	2.05
Content Knowledge Dissemination				
25	.86	1.00	.79	0.69
26	.89	0.98	.99	0.76
27	.87	0.99	.90	0.88
28	.87	0.95	1.00	2.24
Leadership				
29	.83	1.00	.96	1.51
30	.76	0.81	.99	1.07
31	.78	0.87	.97	1.17
Professional Learning				
32	.86	1.00	.86	1.05
33	.84	0.96	.90	0.87
34	.92	1.01	.92	0.99
35	.93	1.04	.92	1.03
36	.93	1.03	.94	1.20
37	.88	1.01	.85	1.20
38	.82	0.90	1.00	2.18
Evaluation				
39	.94	1.00	.94	1.46
40	.96	1.03	.99	1.73
41	.90	0.99	1.00	1.69

Note. Factor loadings in the Level-2 column represent the single school-level factor.

Research Question 2: Internal Consistency Reliability. The reliability estimate omega (McDonald, 1999), derived from standardized factor loadings, was used to examine reliability at level 1 (i.e., educator) and level 2 (i.e., school) of the *Systems Coaching Survey.* For the *Personal Skills* survey, omega reliability estimates for factors at the educator level ranged from .78 (Leadership Skills) to .95 (Professional Learning Skills). The school level reliability estimate for the *Personal Skills* survey was .998. For the *Ability to Teach* survey, omega reliability estimates for factors at the educator level ranged from .83 (Leadership Skills) to .96 (Professional Learning Skills). The school level reliability estimate for the *Ability to Teach* survey was .997. All omega reliability estimates of the *SCS* were at least in the acceptable range (with $\geq$ .70 used as a general rule for Cronbach's alpha), and some estimates were considered to have high internal consistency reliability (Geldhof, Preacher, & Zyphur, 2014). A complete list of reliability estimates can be found in Table 15.

Table 15

Omega Reliability Coefficients for Factors of the SCS

Factor	Personal Skills	Ability to Teach
Level 1: Educator		
Interpersonal Communication	.88	.93
Data-Based Problem Solving	.94	.96
Team Facilitation	.93	.95
Content Knowledge Dissemination	.90	.93
Leadership	.78	.83
Professional Learning	.95	.96
Evaluation	.92	.95
Level 2: School		
School Context	.998	.997

CHAPTER V:

DISCUSSION

The purpose of this study was to examine the reliability and validity evidence for the *Systems Coaching Survey* used to measure educators' coaching skills relative to implementing a systems-level initiative such as MTSS. An MCFA was conducted to account for nested data (i.e., educators within schools) and to extend the preliminary findings beyond a single-level CFA examined by Thoman and colleagues (2018). This chapter includes a discussion of the findings, limitations of the current study, and implications for research and practice.

Review of Findings

The Systems Coaching Survey was designed to measure the perceived skills of educators to employ seven interrelated skills sets, as well as their ability to transfer these skills to others. Preliminary analyses demonstrated the seven-factor structure of the *SCS* at the educator level for both the *Personal Skills* and *Ability to Teach* subscales (Thoman et al., 2018). The results of this study provided evidence to support the theoretical factor structure of the *SCS* using a multilevel confirmatory factor analysis to account for the nested nature of the data (i.e., educators nested within schools). Identical factor structures were identified for both subscales: *Personal Skills* and *Ability to Teach*. At the educator level, seven factors were identified and labeled based on the interrelated systems coaching skills sets (i.e., interpersonal communication, data-based problem solving, team facilitation, content knowledge dissemination, leadership, professional learning, evaluation skills) consistent with Thoman and colleagues (2018). At the school level, a single "school context" factor was identified.

The seven-factor structure at the educator level of both the *Personal Skills* and *Ability to Teach* item sets is consistent with the literature on systems coaching (March & Gaunt, 2013). Furthermore, the distribution of items loading onto the seven factors across the *Personal Skills* and *Ability to Teach* subscales were identical to the Thoman and colleagues' (2018) study. The results from the current study indicate items from both subscales of the *SCS* measure individual educators' skills within each of the seven inter-related domains. Items on both subscales demonstrated high standardized loadings on each factor. Moreover, consistent with the literature (March and Gaunt, 2013; Thoman et al., 2018), high correlations between factor scores indicated that educators' skill sets across the domains appear to be interrelated. Finally, congeneric reliability estimates for each factor were adequate to high, as the estimates were above the criterion considered acceptable (Geldhof, Preacher, & Zyphur, 2014) and indicated that the items loaded onto each factor measure similar constructs.

According to March and Gaunt (2013), the skill sets measured by the *SCS* at the educator level are expected to be distributed among the members of school-based teams, rather than assumed by one individual, in order to implement MTSS across the school system. As a result, I explored whether the seven-factor conceptualization would hold up at the school level. Although findings at the educator level were consistent with the theoretical model proposed by March and Gaunt (2013), a single factor at the school level, labeled *School Context,* better explained the data. Potential explanations for these findings across the two subscales can be found in the systems change and professional learning literature.

The overall capacity for coaching at the school level likely influences individual coaches' skills sets, such that an overall higher level of coaching skills may promote social learning of the seven skill sets at the educator level. The literature on educational reform indicates that the

school as a complex system is related to changes in individual beliefs and skills (Sharratt & Fullan, 2009). Focusing on the competencies of individuals within the organization is one method to develop capacity, or increase knowledge, beliefs, or skills (Fixsen & Blasé, 2008; Fixsen et al., 2005). Building a school of leaders who share collective responsibility for improving educators' skills and putting structures in place to train staff may influence individual coaches' skill sets (Fullan & Knight, 2011). Croft and colleagues (2010) discussed professional learning that is "social, situated, and distributed among colleagues" (p. 5). This type of professional learning occurs within the school where educators can observe, practice, reflect, and receive feedback directly related to their practices designed to increase student learning. This iterative process of theory, modeling, practice, and collaborative reflection facilitates adult learning (Joyce & Showers, 2002). Moreover, this type of ongoing communication is possible within unique social systems that focus on collective capacity (Sharrat & Fullan, 2009).

An application of this theory is demonstrated through Learning Forward's (2011) professional learning model which indicates that standards-based professional learning leads to changes in educators' knowledge, beliefs, and skills. This type of professional learning "occurs within learning communities," emphasizes "collective responsibility," (Learning Forward, 2011, p. 24) and requires leadership to "develop capacity, advocate, and create support systems for professional learning" (Learning Forward, 2011, p. 28). Such professional learning communities are designed to promote learning between educators within the school by creating the time, policies, practices, and procedures that make continuous, on-the-job learning designs a reality. Within this process is the need to establish consensus among staff regarding a rationale for altering teacher practices in order to impact student success. Effective school leadership teams may be needed to create a culture of change by exhibiting school-wide vision and expectations,

increasing the capacity of staff, consistently monitoring implementation efforts, and problem solving barriers to change (Louis et al., 2010; Sharratt & Fullan, 2009), which also may influence educators' skills. Schools that demonstrate overall higher coaching skills and the ability to teach others on the *SCS* may reflect environments that embrace ongoing, job-embedded professional learning of the individual systems coaching skill sets. Educators across the system may have greater opportunities to communicate with one another and share expertise to foster school-wide and individual improvement. In short, professional learning requires that educational leaders make changes in the context of learning (from individually to collectively driven) to affect deep and lasting change for teachers.

Finally, the results of this study also demonstrated acceptable to high congeneric reliability for educator- and school-level factors for both subscales of the *SCS*. Reliability is used in measurement research (Dedrick & Greenbaum, 2011; Kim et al., 2016) to indicate measurement error in evaluating a construct of interest. In this case, educators responded in similar ways to the items within each systems coaching domain, indicating a high likelihood that the items loading onto each factor measured the identified latent constructs, or systems coaching skills, at the educator level. At the school level, relationships among item responses again indicate the items measure a similar construct, which was labeled *School Context*. The reliability of scores on this instrument indicates that it could be used to measure systems coaching skills among educators charged with implementing MTSS in their school and survey data could be used to provide a snapshot of collective capacity for systems coaching at the school level, and to make decisions about educators' professional learning related to each of the systems coaching skill sets.

Although more research is needed, the results of the current study support the notion that seven inter-related factors best explain systems coaching skills at the educator-level and that one global factor best explains school-level coaching skills. Furthermore, the high reliability across factors of the *SCS* provides additional evidence for the technical adequacy of the tool.

Limitations and Future Research

One limitation of this study was the convenience sampling method. This method could contribute to sampling bias and may have resulted in a low number of educators within each school. While more than enough participants and schools participated in the study to warrant a multi-level approach, the variability within schools may have been limited by the distribution of participants (i.e., the number of coaches ranged from 1 to 28 across the schools). A related limitation involved the fact that it was unknown how many individuals actually functioned as systems coaches at each site. The researchers did not have contact with the individual participants, and it was unknown whether all participants were members of an established SBLT within their school. Further, individual participants could have been members of several leadership teams within the school. For these reasons, an accurate survey response rate could not be calculated. Furthermore, the researchers did not have information about participants' previous coaching history or the pattern of MTSS implementation, limiting the generalizability of this sample.

Because the researchers worked with a district contact and had no contact with the individual educators who were tasked with completing the survey, the response rate may have been lower than what was anticipated by the researchers, another potential limitation of the current study. Some district contacts provided the total number of educators who would receive the survey link to the researchers during the training phase of the study. However, not all

organizations provided anticipated numbers of participants, meaning that an accurate response rate could not be calculated. While district contacts were asked to prompt participants to complete the survey during the administration window, the researchers had limited control of these follow-up procedures. Additionally, although the researchers made an effort to only permit district or school-based leadership teams who were reported to include two or more members, response rates among smaller teams sometimes resulted in a team of one educator.

Another potential limitation involves the fact that respondents were informed that their district would receive aggregated feedback from their responses in a report as compensation for participating in the study. Thus, social desirability may have impacted the responses of some individuals to rate their skills higher than their true abilities. This may have impacted the distribution of the responses on individual survey items. Similarly, the survey contained 41 item stems, but each item required two responses (i.e., *personal skill level* and *ability to teach the skill*) which were separated as subscales in the analyses. This resulted in a fairly long survey of 82 item responses, in addition to demographic and acceptability data. Given that many of the respondents were members of school-based leadership teams and likely had high demands placed on them to serve various roles within their school, they may have been less likely to respond thoughtfully to each item because of the survey length and the high demands on their time. This may be the case despite having a school or district leader who demonstrated support for the project through their election to participate.

At the educator level, future research should explore who is a "systems coach" and how participants respond to the *SCS* according to their job titles (e.g., classroom teacher, school psychologist, administrator), school-based team membership (e.g., SBLT, individual student problem-solving team), and previous experiences with MTSS implementation. In this study,

systems coaches included any individual within the school who had responsibilities for building capacity for MTSS implementation or was a member of a coaching cadre. These individuals did not need the formal label of a "coach" and participants in this study held various titles within the school from which they employed the skills of systems coaches. Thus, the systems coaches in this study likely received variable levels of training related to their roles as well as MTSS implementation, but the actual content, format, and duration of training and application of MTSS that participants experienced is unknown to the researchers. Thus, the relationship between these variables and educators' responses to the *SCS* should be explored in future research.

However, participants' individual experiences with coaching and MTSS implementation is likely not the only influence on their skills. It is possible that school-level MTSS implementation levels and may be related to educators' systems coaching skill sets as well. Because there is variation in MTSS implementation across schools, districts, and states (Fletcher & Vaughn, 2009), future research could investigate the consistency in *SCS* responses using these organization levels as the unit of analysis in order to promote the generalizability of the *SCS* to local adaptions of MTSS. Similar to individual educator experiences, the history and current practices within each school with regards to professional learning, MTSS training designs, and implementation levels may also influence responses on the *SCS*. Future research should explore how MTSS and its implementation components are represented across schools and districts to address the relationship between school-level implementation and systems coaching skills.

Additionally, evidence for criterion and convergent validity as outlined by the American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (2014) would strengthen the statistical measurement support for the *SCS* and its application to inform professional learning and resource allocation. First, the *SCS*

might be compared to more direct measures of coaching. The literature suggests that common methods of coaching evaluation may include direct observation or examination of permanent products such as coaching logs (Killion, 2009; Killion & Harrison, 2017; Neufeld & Roper, 2003). Further, researchers should explore relationships between the *SCS* and widely used educational outcome measures to provide additional support for the validity of the *SCS*. For example, responses on the *SCS* should be compared to measures of MTSS implementation (e.g., Self-Assessment of MTSS; Stockslager et al., 2016), as well as student academic (e.g., statewide assessment scores) and behavioral (e.g., suspension rates) indicators. Moreover, research might explore growth in school or student outcomes over time as a predictor of systems coaching skills rather than a single time point measure because systems coaching skills focus on increasing the capacity of the system to implement MTSS with fidelity.

Regarding Research Question 2, it is important to recognize that some reliability estimates for multilevel confirmatory factor analysis take the correlated errors into account, but omega (McDonald, 1999), which does not account for correlated errors, was used in this study. This decision was made based on the quantity of correlated error terms in the final models and how those terms correlated both within and across level 1 factors. Future psychometric studies of the *SCS* should consider using the coefficient rho (Raykov, 2009) because it takes correlated errors into consideration when examining the proportion of observed variance to true variance in a set of scores. There is a need for further exploration of the correlated error terms in the final models of this study and how they affect the estimates of reliability.

More research is needed on the school-level construct that influences educator perceived skills. In this study, final models for both subscales of the *SCS* (i.e., *Personal Skills* and *Ability to Teach*) included a single school context factor at level 2, rather than measuring each of the seven

systems coaching skills at the school level. While the literature suggests that school characteristics such as populations and grade levels served are related to educator access to professional learning (Darling-Hammond et al., 2009), there is limited research defining how the overall school context influences educator perceptions of their systems coaching skill sets. Even if educators have access to ongoing, job-embedded professional learning, more support may be necessary. While aspects of the school environment (e.g., access, shared beliefs, ongoing learning opportunities) are prevalent across the professional learning, coaching, and MTSS implementation literature, more research is needed to identify what specifically about the school context is related to variability in educators' skill sets relative to the systems coaching model.

Future studies should also examine *SCS* data to develop a cut score for the *School Context* score for each survey subscale. Further development of the *SCS* at the school level could help guide interpretations for schools looking to improve their overall capacity for MTSS implementation. At the district level, a cut score could help determine which schools may require additional support and further exploration of the survey data. Further, school leaders could compare their overall *Personal Skills* and *Ability to Teach* scores to a cut score chosen based on the desired goal of the local school or developed from a normative sample of schools who have taken the *SCS* to better interpret their school context for systems coaching. Researchers should also explore school-level cut scores for each subscale of the *SCS* to determine the predictive validity of school-level systems coaching skills for MTSS implementation and student academic and behavioral outcomes. These indicators could inform decisions regarding the need to disaggregate the school level *SCS* data for systems-level problem solving with respect to systems coaching skill development.

Future research also should explore the acceptability, feasibility, and utility of the *SCS* in decision-making to inform school and district professional learning plans. Research on professional learning and systems change shows that increasing buy-in, collaborative culture, and educator beliefs in the value of and rationale for a new practice at the school level are necessary for uptake of any practice (Fixsen et al., 2005; Fullan & Knight, 2011; Steinbacher-Reed & Powers, 2011/12). This survey is the first of its kind to measure the current capacity of educators to employ systems coaching skills and transfer those abilities to others, building the internal capacity of the school for MTSS implementation. As the core components of MTSS cannot be isolated, a facilitator of capacity building includes an environmental shift that empowers and enables educators to work together to teach, transfer, and co-develop their skills (Fixsen & Blasé, 2008; Fixsen et al., 2005). However, across the country the demand on educators' time and resources is strained. Therefore, educators are less likely to provide data through an assessment such as the *SCS* if it is difficult to complete, takes a significant amount of time, or if it does not seem beneficial to the educator or their students. Beyond the rationale that the *SCS* can inform ongoing professional learning efforts, data to demonstrate that the *SCS* is acceptable and feasible for educators may enhance the uptake of the survey. In-depth study to examine how SBLTs use the *SCS* in practice to make decisions around coaching and professional learning practices at the school level, and how this information guides professional learning plans, would also enhance the support for the *SCS*. Strong evidence that completing the *SCS* is beneficial and a viable option to inform professional learning efforts is required in order to justify its use in schools and districts across the country.

Implications for Practice

This study extends the literature on MTSS and systems initiatives in education to include

a tool measuring collective coaching capacity. While this was not an intervention study and there are limitations of using an applied research design as described previously, the public availability of the *SCS* as a free and validated tool may still have implications for MTSS implementation, professional learning, and school-based leadership teams. Even with some limitations, the results of this study may also influence MTSS implementation and the application of coaching models in schools given the prevalence of both of these models in current education reform initiatives.

First, the data from the *SCS* may be used by individual school-based leaders to evaluate their current systems coaching practices and inform their individual learning goals. Part of MTSS implementation includes problem solving around individual barriers to learning (Gresham, 2007; Eagle et al., 2015; Stockslager et al., 2016; Sugai, 2009) and this framework can be generalized to both students and educators within a school. For example, school or district-level leaders could collect data from the *SCS* to assess current skill levels of educators who engage in systems coaching and screen for those individuals who may need additional support in one or more skill domains of the survey. Then, leaders could supervise and consult individually with those school-based systems coaches to provide feedback and ongoing support in targeted areas using the evidence-based professional learning model described by Joyce and Showers (2002) to build capacity of the individual to support organizational change. Application of Joyce and Showers' (2002) model to systems coaching skill development would be advantageous because this learning cycle has been shown to help transfer content learned into practice, produces the greatest adult learning outcomes, and aligns with Learning Forward's (2011) standards for professional learning that emphasize ongoing supports, direct communication and collaboration, and shared responsibility.

While the results of this study demonstrate evidence that the *SCS* can provide individual educator information (i.e., one educator's skills), the survey data may be best utilized in practice to inform systems coaching supports and professional learning efforts across the school system. It is not surprising that the seven skill sets described in the systems coaching model were aggregated at the school level because while some of the skills may be taught independently, they are often applied synchronously (March & Gaunt, 2013), such as in SBLT problem solving meetings where nearly all of the skills sets may be demonstrated collectively by the team. For similar reasons, it was also not surprising that the seven skill sets were highly correlated at the educator level since they have been described as theoretically interrelated (March & Gaunt, 2013). From a psychometric perspective, this study suggests that schools should consider several aspects of the *SCS* data when making decisions about professional learning. For example, the survey could be completed annually to inform the school context for coaching and professional learning goals for the school year. In the fall, schools might first examine the overall school-level *Personal Skills* and *Ability to Teach* subscale scores measured by the *School Context* factor as an indication of school capacity for coaching and use these data to encourage consensus among school leadership team members regarding the need for systemic change. Next, the school team may disaggregate the scores for each factor to discuss the variability of current skills of individuals on the SBLT across each systems coaching domain. Use of data beginning with a global perspective of school functioning relative to the systems coaching skills and then narrowing in on a team-based approach aligns with practices to identify systemic barriers and problem solve for school-level change (Steinbacher-Reed & Powers, 2013; Stockslager et al., 2016). Finally, results of the *SCS* can be used at the educator level to provide individualized coaching support for a specific survey item or skill domain as described above, while keeping in

mind that targeting one skill for development is also likely to impact the other skill sets based on the theoretical and statistical relationships between them.

The *SCS* was designed to inform school-based professional learning and use of the tool is aligned with several critical components of MTSS implementation including data-based problem solving and access to data evaluation systems (Stockslager et al., 2016). However, the *SCS* only provides two data points (overall scores for each subscale) to indicate school-level capacity for systems coaching. Thus, it would be beneficial to use the *SCS* in combination with other assessment methods of coaching practices, as well as measures of MTSS implementation fidelity to increase the availability of data for school-level decision making and problem solving. Examples of possible tools to use in concert with the *SCS* include coaching logs or fidelity checklists, the *Self-Assessment of MTSS* (*SAM*; Stockslager et al., 2016) to measure school-level MTSS implementation, or the *Benchmarks of Quality* (BoQ; Kincaid, Childs, & George, 2010) to examine fidelity of a multi-tiered system for behavior. As MTSS emphasizes multi-method and multi-informant approaches to data collection and interpretation through a problem solving process (Gresham, 2007; Stockslager et al., 2016), the *SCS* should be supported with other data to inform professional learning needs for school teams and systems.

Finally, this is the first validated measure to inform the type of ongoing, job-embedded professional learning efforts that facilitate meaningful adult learning and implementation of new school-based practices. While this study was not an intervention study to demonstrate the application of the *SCS* to inform such efforts and caution should be used in survey interpretation, the development of the *SCS* followed the "Gold Standard" of survey development (DeVellis, 2012) and was informed by the literature in areas such as educational reform and coaching, leadership, professional learning, and school consultation (March & Gaunt, 2013). Early

development procedures included expert panels and cognitive interviewing procedures to review the systems coaching model and survey content. Thus, research and practitioner experts have guided the development of the *SCS* to suggest its application to educational decision making. Professional learning communities and SBLTs might consider using the *SCS* to identify educators' current personal skill levels and ability to transfer skills relative to the systems coaching model for local initiatives such as MTSS implementation. For example, teams might use the results of this survey as one of several data sources to engage in problem solving to identify and analyze barriers and provide intervention focused on building capacity among leadership teams and across the school. In this way, the *SCS* might be integrated into the preexisting procedures to inform MTSS implementation and coaching already occurring in schools nationwide. Nonetheless, practitioners should use caution when interpreting the scores on the factors of the *SCS* and should not rely on this survey as the only data source to inform professional learning efforts for school reform.

Conclusion

The *Systems Coaching Survey* was developed to evaluate the systems coaching skills of educators within schools related to implementation of MTSS. This study provided evidence for the reliability and validity of the tool using multilevel confirmatory factor analyses to account for nested data from educators within schools. Results of the current study indicated that the seven theoretical skill sets of systems coaching were upheld at the educator level, and a single school context factor was observed at the school level. Reliability estimates demonstrated good evidence of reliability of scores for both subscales. This evidence supports the *SCS* as a tool for educators to evaluate their systems coaching skills and inform school-based professional learning efforts for MTSS implementation.

REFERENCES

Adelman, H. S., & Taylor, L. (2003). On sustainability of project innovations as systemic change. *Journal of Educational and Psychological Consultation*, *14*(1), 1-25.

Albritton, K., & Truscott, S. (2014). Professional development to increase problem-solving skills in a response to intervention framework. *Contemporary School Psychology*, *18*, 44–58. doi:10.1007/s40688-013-0008-0

Algozzine, K., & Algozzine, B. (2007). Classroom instructional ecology and school-wide positive behavior support. *Journal of Applied School Psychology*, *24*(1), 29-47.

Algozzine, B., Barrett, S., Eber, L., George, H., Horner, R., Lewis, T., Putnam, B., Swain-Bradway, J., McIntosh, K., & Sugai, G (2014). *School-wide PBIS Tiered Fidelity Inventory.* OSEP Technical Assistance Center on Positive Behavioral Interventions and Supports. www.pbis.org.

Algozzine, B., Wang, C., & Violette, A. S. (2011). Reexamining the relationship between academic achievement and social behavior. *Journal of Positive Behavior Interventions*, *13*(1), 3-16.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education (2014). *Standards for Educational and Psychological Testing*. Washington, DC: American Educational Research Association.

Anderson, S. E., Leithwood, K., & Strauss, T. (2010). Leading data use in schools: Organizational conditions and practices at the school and district levels, *Leadership and Policy in Schools, 9(3)*, 292-327. doi: 10.1080/15700761003731492

Asparouhov, T. & Muthén, B. (2018). SRMR in Mplus. Retrieved from: http://www.statmodel.com/download/SRMR2.pdf.

Barns, A. C., & Harlacher, J. E. (2008). Clearing the confusion: Response-to-intervention as a set of principles. *Education and Treatment of Children*, *31*(3), 417–431.

Barrett, S. B., Bradshaw, C. P., & Lewis-Palmer, T. (2008). Maryland Statewide PBIS Initiative Systems, Evaluation, and Next Steps. *Journal of Positive Behavior Interventions, 10*(2), 105-114.

Batsche, G. (2014). Multi-tiered systems of supports. In J. McLeskey, N. Waldron, F. Spooner, & B. Algozzine (Eds.), *Handbook of Research and Practice for Effective Inclusive Schools* (pp. 183-196). NY: Routledge Publishers.

Batsche, G. M., Curtis, M. J., Dorman, C., Castillo, J. M., & Porter, L. J. (2007). The Florida Problem Solving/Response to Intervention Model: Implementing a Statewide Initiative. In S. R. Jimerson, M. K. Burns, & A. M. VanDerHeyden (Eds.), *Handbook of Response To Intervention: The science and practice of assessment and intervention* (pp. 378-395). New York: Springer.

Batsche, G. M., Elliott, J., Graden, J. L., Grimes, J., Kovaleski, J. F., Prasse, D., Reschly, D. J., Schrag, J., & Tilly, W. D. (2006). *Response to intervention: Policy considerations and implementation.* Alexandria, VA: National Association of State Directors of Special Education, Inc.

Bergan, J. R., & Kratochwill, T. R. (1990). *Behavioral consultation and therapy*. Plenum Press.

Bergstrom, M. K. (2008). Professional development in response to intervention: Implementation of a model in a rural region. *Rural Special Education Quarterly, 27*, 27–36.

Bradshaw, C. P., Koth, C. W., Thornton, L. A., & Leaf, P. J. (2009). Altering school climate through school-wide Positive Behavioral Interventions and Supports: Findings from a group-randomized effectiveness trial. *Prevention Science, 10*(2), 100-115.

Bradshaw, C. P., Mitchell, M. M., & Leaf, P. J. (2010). Examining the effects of schoolwide positive behavioral interventions and supports on student outcomes results from a randomized controlled effectiveness trial in elementary schools. *Journal of Positive Behavior Interventions, 12*(3), 133-148.

Brown, C. J., Stroh, H. R., Fouts, J. T., & Baker, D. B. (2005). *Learning to change: School coaching for systemic reform* (Report prepared for the Bill & Melinda Gates Foundation). Mill Creek, WA: Fouts & Associates, L.L.C.

Burns, M. K., Appleton, J. J., & Stehouwer, J. D. (2005). Meta-analytic review of responsiveness-to-intervention research: Examining field-based and research-implemented models. *Journal of Psychoeducational Assessment*, *23*, 381–394.

Castillo, J. M., Dedrick, R. F., March, A. L., Stockslager, K. M., Hines, C. V., & Tan, S. Y. (2015). Development and initial validation of a scale measuring educators' beliefs regarding Response to Intervention. *Journal of Applied School Psychology*, *31*, 1–30. doi:10.1080/15377903.2014.938282.

Castillo, J. M., March, A. L., Stocklager, K., & Hines, C. V. (2016). Measuring educators' perceptions of their skills relative to response to intervention: A psychometric study of a survey tool. *Assessment for Effective Intervention*, *41*(2), 94–108.

Castillo, J. M., March, A. L., Tan, S. Y., Stockslager, K., & Brundage, A. (2016). Relationships between ongoing professional development and educators' beliefs relative to Response to Intervention. *Journal of Applied School Psychology, 32*(4), 287-312. doi:

10.1080/15377903.2016.1207736

Castillo, J. M., March, A. L., Tan, S. Y., Stockslager, K., Brundage, A., McCullough, M., & Sabnis, S. (2016). Relationships between ongoing professional development and educators' perceived skills relative to Response to Intervention. *Psychology in the Schools, 53*(9), 893-910. doi: 10.1002/pits

Castillo, J. M., Wang, J. H., Daye, J. G., Shum, K. Z., & March, A. L. (2017). A Longitudinal Analysis of the Relations Among Professional Development, Educators' Beliefs and Perceived Skills, and Response-to-Intervention Implementation. *Journal of Educational and Psychological Consultation*, doi: 10.1080/10474412.2017.1394864

Childs, K. E., Kincaid, D., George, H. P., & Gage, N. A. (2016). The relationship between school-wide implementation of positive behavior intervention and supports and student discipline outcomes. *Journal of Positive Behavior Interventions*, *18*(2), 89-99.

Cohen, R., Kincaid, D., & Childs, K.E. (2007). Measuring School-wide Positive Behavior Support Implementation: Development and validation of the Benchmarks of Quality. *Journal of Positive Behavior Interventions, 9*, 203-213.

Cook, C.R., Lyon, A.R., Kubergovic, D., Browning Wright, D., & Zhang, Y. (2015). A Supportive Beliefs Intervention to Facilitate the implementation of Evidence-Based Practices in a Multi-Tiered System of Supports. *School Mental Health, 7*, 49-60.

Cook, B.G. & Odem, S.L. (2013). Evidence-based practices and implementation science in special education. *Exceptional Children, 79*(2)*,* 135-144.

Cornett, J., & Knight, J. (2009). Research on coaching. In J. Knight (Ed.), *Coaching: Approaches & Perspectives* (pp. 192-216). Thousand Oaks, CA: Corwin Press.

Crawford, E. C., & Torgesen, J. K. (2007). *Teaching All Students to Read: Practices from Reading First Schools with Strong Intervention Outcomes*. Tallahassee, FL: Florida Center for Reading Research.

Croft, A., Coggshall, J. G., Dolan, M., & Powers, E. (2010). Job-Embedded Professional Development: What It Is, Who Is Responsible, and How to Get It Done Well. Issue Brief. *National Comprehensive Center for Teacher Quality*.

Curtis, M. J. & Stollar, S. A. (2002). Best practices in system-level change. In A. Thomas & J. Grimes (Eds.), *Best Practices in School Psychology IV* (Vol. 1, pp. 223–234). Bethesda, MD: National Association of School Psychologists Publications.

Darling-Hammond, L., Wei, R.C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. Dallas, TX: National Staff Development Council.

Dedrick, R. F., & Greenbaum, P. E. (2011). Multilevel confirmatory factor analysis of a scale measuring interagency collaboration of children's mental health agencies. *Journal of Emotional and Behavioral Disorders*, *19*(1), 27-40.

Denton, C. A., Vaughn, S., & Fletcher, J. M. (2003). Bringing research-based practice in reading intervention to scale. *Learning Disabilities Research & Practice*, *18*(3), 201-211.

DeVellis, R. F. (2012). *Scale development: Theory and applications*. Thousand Oaks, CA: Sage Publications, Inc.

Dole, J. A. & Donaldson, R. (2006). "What am I supposed to do all day?": Three big ideas for the reading coach. *International Reading Association*, 496-488. doi:10.1598/RT.59.5.9

Deussen, T., Coskie, T., Robinson, L., & Autio, E. (2007). "Coach" Can Mean Many Things: Five Categories of Literacy Coaches in Reading First. Issues & Answers. REL 2007-No. 005. *Regional Educational Laboratory Northwest*.

Dyer, N. G., Hanges, P. J., & Hall, R. J. (2005). Applying multilevel confirmatory factor analysis techniques to the study of leadership. *The Leadership Quarterly*, *16*(1), 149-167.

Eagle, J. W., Dowd-Eagle, S. E., Snyder, A., & Holtzman, E. G. (2015). Implementing a Multi-Tiered System of Support (MTSS): Collaboration between school psychologists and administrators to promote systems-level change. *Journal of Educational and Psychological Consultation, 25(2-3)*, 160-177.

Eccles, M. P., & Mittman, B. S. (2006). Welcome to *Implementation Science*. *Implementation Science, 1*(1), 1–3. Retrieved from http://www.implementation science.com/content/1/1/1

Ellison, J. & Hayes, C. (2009). Cognitive Coaching. In J. Knight (Ed.), Coaching: Approaches & Perspectives (pp. 192-216). Thousand Oaks, CA: Corwin Press.

Erchul, W. P. (2015). Put Me In, Coach: Observations on selected studies implementing supportive interventions to teachers. *School Mental Health, 7*, 74-79. doi: 10.1007/s12310-015-9144-1

Every Student Succeeds Act (ESSA), S. 1177 § 1000 *et seq.*

Filter, K. J., & Horner, R. H. (2009). Function-based academic interventions for problem behavior. *Education and Treatment of Children*, *32*(1), 1-19.

Fixsen, D. L., & Blase, K. A. (2008). Drivers framework. *Chapel Hill: National Implementation Research Network, Frank Porter Graham Child Development Institute, The University of North Carolina*.

Fixen, D. L., Blase, K. A., Naoom, S. F., & Duda, M. A. (2015). Implementation Drivers: Assessing Best Practices. *The National Implementation Research Network*. Retrieved from http://implementation.fpg.unc.edu/sites/implementation.fpg.unc.edu/files/NIRN-ImplementationDriversAssessingBestPractices.pdf

Fixen, D. L., Blase, K. A., Naoom, S. F., & Wallace, F. (2009). Core implementation components. *Research on Social Work Practice, 19*(5)*,* 531-540.

Fixsen, D. L., Naoom, S. F., Blase, K., Friedman, R. M., & Wallace, F. (2005). Implementation research: A synthesis of literature. *National Implementation Network, University of South Florida, Louis de la Parte Florida Mental Health Institute*. Retrieved from http://nirn.fpg.unc.edu/sites/nirn.fpg.unc.edu/ les/resources/NIRN-MonographFull-01-2005.pdf

Fletcher, J. M., & Vaughn, S. (2009). Response to intervention: Preventing and remediating academic difficulties. *Child Development Perspectives*, *3*(1), 30–37.

Florida Department of Education (2016). *Bureau of K-12 student assessment 2016-17 FSA ELA and mathematics fact sheet Oct. 2016.* Retrieved from http://www.fldoe.org/core/fileparse.php/5663/urlt/ELA-MathFSAFS1617.pdf

Florida Department of Education (2017). *2017-2018 FSA ELA and Mathematics Fact Sheet*. Retrieved from http://www.fldoe.org/core/fileparse.php/5663/urlt/FSAELA-MathFS1718.pdf

Florida Department of Education (2015). *Florida standards assessments: Evidence of reliability and validity*. Retrieved from http://www.fldoe.org/core/fileparse.php/5663/urlt/1415TechV4FSA.pdf

Florida Positive Behavior Supports Project, & Florida Problem Solving/Response to Intervention Project. (2011). *MTSS Implementation Components: Ensuring common language and understanding*. Retrieved from http://www.floridarti.usf.edu/resources/format/pdf/mtss_q_and_a.pdf

Forman, S. G., & Crystal, C. D. (2015). Systems consultation for multitiered systems of supports (MTSS): Implementation issues. *Journal of Educational and Psychological Consultation*, *25*(2-3), 276-285.

Freeman, R., Miller, D., & Newcomer, L. (2015). Integration of academic and behavioral MTSS at the district level using implementation science. *Learning Disabilities: A Contemporary Journal, 13*(1), 59-72.

Freeman, J., Sugai, G., Simonsen, B., & Everett, S. (2017). MTSS Coaching: Bridging Knowing to Doing. *Theory Into Practice*, *56*(1), 29-37, doi: 10.1080/00405841.2016.1241946

Fullan, M. (1985). Change Processes and Strategies at the Local Level. *The Elementary School Journal, 85*(3), 390-421.

Fullan, M. (2010). *All Systems Go*. Thousand Oaks: CA, Corwin.

Fullan, M., & Knight, J. (2011). Coaches as system leaders. *Educational Leadership, 69,* 50–53.

Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological methods*, *19*(1), 72.

George, H. P. & Kincaid, D. (2008). Building District-Level Capacity for Positive Behavior Support. *Journal of Positive Behavior Interventions, 10*(1), 20-32.

George, H. P. & Childs, K. E. (2012). Evaluating Implementation of Schoolwide Behavior Support: Are We Doing It Well?. *Preventing School Failure: Alternative Education for Children and Youth, 56*(4), 197-206.

Gresham, F. M. (2002). Responsiveness to intervention: an alternative approach to the identification of learning disabilities. In R. Bradley, L. Danielson, D. P. Hallahan, R. Bradley, L. Danielson, D. P. Hallahan (Eds.), *Identification of learning disabilities: Research to practice* (pp. 467-519). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Gresham (2007). Evolution of the Response-to-Intervention Concept: Empirical Foundations and Recent Developments. In J. R. Jimerson, M. K. Burns, & A. M. VanDerHeyden (Eds.), *Handbook of Response To Intervention: The Science and Practice of Assessment and Intervention* (pp.10-24). New York, NY: Springer.

Hall, G. E., & Hord, S. M. (2015). *Implementing change: Patterns, principles and potholes* (4th ed.). Boston, MA: Pearson.

Hargreaves, A. & Dawe, R. (1990). Paths of Professional Development: Contrived collegiality, collaborative culture, and the case of peer coaching. *Teaching & Teacher Education, 6*(3), 227-241.

Hauerwas, L. B., Brown, R., & Scott, A. N. (2013). Specific learning disability and response to intervention: State-level guidance. *Exceptional Children*, *80*(1), 101–120.

Higgins-Averill, O., & Rinaldi, C. (October 2013). Research Brief: Multi-tier System of Supports (MTSS). Urban Special Education Leadership Collaborative: From RTI and PBIS to MTSS. Retrieved from https://www.urbancollaborative.org/files/mtss_brief_final.modified_0.pdf

Horner, R. H., Kincaid, D., Sugai, G., Lewis, T., Eber, L., Barrett, S., Rossetto Dickey, C., Richter, M., Sullivan, E., Boezio, C., & Algozzine, B., Reynolds, H., & Johnson, N. (2014). Scaling Up School-Wide Positive Behavioral Interventions and Supports:

Experiences of seven states with documented success. *Journal of Positive Behavior Interventions, 16*(4), 197-208.

Horner, R. H., & Sugai, G. (2000). School-wide behavior support: An emerging initiative. *Journal of Positive Behavior Interventions, 2*, 231.

Horner, R. H., Sugai, G., Smolkowski, K., Eber, L., Nakasato, J., Todd, A. W., & Esperanza, J. (2009). A randomized, wait-list controlled effectiveness trial assessing school-wide positive behavior support in elementary schools. *Journal of Positive Behavior Interventions, 11*(3), 133-144.

Horner, R.H., Todd, A.W., Lewis-Palmer, T., Irvin, L. K., Sugai, G., & Boland, J. B. (2004). The school-wide evaluation tool (SET): A research instrument for assessing school-wide positive behavior support. *Journal of Positive Behavior Interventions, 6*, 3–12.

Horner, R. H., Sugai, G., & Lewis, T. (2015). *Is school-wide positive behavior support an evidence-based practice?* Retrieved from https://www.pbis.org/research

Hsieh, H. & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1–55.

Hughes, C. A., & Dexter, D. D. (2011). Response to intervention: A research-based summary. *Theory into Practice*, *50*, 4–11.

Individuals with Disabilities Education Improvement Act [IDEA/IDEIA], 1997, 2004

Jacob, A., & McGovern, K. (2015). The Mirage: Confronting the hard truth about our quest for teacher development. TNTP.

Jimerson, S. R., Burns, M. K., & VanDerHeyden, A. M. (2016). *Handbook of response to intervention: The science and practice of multi-tiered systems of support, 2nd Edition*. Springer.

Joyce, B. R., & B. Showers. (1980). "Improving Inservice Training: The Messages of Research." *Educational Leadership,* 37(5), 379-385.

Joyce, B. R., & Showers, B. (1981). Transfer of Training: The contribution of "coaching". *Journal of Education*, *163*(2), 163-172.

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

Keller-Margulis, M. A. (2012). Fidelity of implementation framework: A critical need for response to intervention models. *Psychology in the Schools*, *49*(4), 2012.

Killion, J. (2009). Coaches' Roles, Responsibilities, and Reach. In J. Knight (Ed.), *Coaching: Approaches & Perspectives* (pp. 192-216). Thousand Oaks, CA: Corwin Press.

Killion, J., & Harrison, C. (2017). *Taking the lead: New roles for teachers and school-based coaches (2nd ed)*. Oxford, OH: Learning Forward.

Killion, J., Harrison, C., Bryan, C., & Clifton, H. (2012). *Coaching matters*. Oxford, OH: Learning forward.

Kim, E. S., Dedrick, R. F., Cao, C., & Ferron, J. M. (2016). Multilevel Factor Analysis: Reporting Guidelines and a Review of Reporting Practices. *Multivariate Behavioral Research, 51*(6), 881-898. doi: 10.1080/00273171.2016.1228042

Kincaid, D., Childs, K., & George, H. P. (2010). School-wide Benchmarks of Quality (BoQ). Unpublished instrument. Department of Child and Family Studies, University of South Florida, Tampa. Available from http://flPBIS.fmhi.usf.edu

King, D., Neuman, M., Pelchat, J., Potochnik, T., Rao, S., & Thompson, J. (2004). *Instructional coaching: Professional development strategies that improve instruction.* Providence, RI: Annenberg Institute for School Reform.

Kowal, J., & Steiner, L. (September 2007). Issue Brief — Instructional Coaching. Washington, DC: The Center for Comprehensive School Reform and Improvement.

Kratochwill, T. R., & Bergan, J. R. (1990). *Behavioral consultation in applied settings: An individual guide*. Springer Science & Business Media.

Kratochwill, T. R., Volpiansky, P., Clements, M., & Ball, C. (2007). Professional development in implementing and sustaining multitier prevention models: Implications for response to intervention. *School Psychology Review*, *36*, 618–631.

LaFrance, J. A. (2011). Examination of the fidelity of school-wide positive behavior support implementation and its relationship to academic and behavioral outcomes in Florida. *Journal of Research in Education, 21,* 52–64.

Lane, K. L., Oakes, W. P., & Menzies, H. M. (2014). Comprehensive, Integrated, Three-Tiered Models of Prevention: Why Does My School—and District—Need an Integrated Approach to Meet Students' Academic, Behavioral, and Social Needs?, *Preventing School Failure, 58*(3), 121-128, doi: 10.1080/1045988X.2014.893977

Lassen, S. R., Steele, M. M., & Sailor, W. (2006). The relationship of school-wide positive behavior support to academic achievement in an urban middle school. *Psychology in the Schools*, *43*(6), 701-712.

Learning Forward (2011). *Standards for professional learning.* Oxford, OH: Author.

Leedy, A., Bates, P., & Safran, S. P. (2004). Bridging the research-to-practice gap: Improving hallway behavior using positive behavior supports. *Behavioral Disorders, 19*, 130–139.

Leithwood, K. (2010). *Turning around underperforming school systems: Guidelines for district leaders.* Edmonton, AB: Report prepared for the College of Alberta School Superintendents. Retrieved from http://o.b5z.net/i/u/10063916/h/Pre-Conference/ CASS_Research_Paper_3_Leithwood_Turning_Around_School_Systems.pdf

Lewis, T. J., Colvin, G., & Sugai, G. (2000). The effects of pre-correction and active supervision on the recess behavior of elementary school students. *Education and Treatment of Children, 23*, 109–121.

Loeb, S., & Figlio, D. (2011). School accountability. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the Economics of Education, Vol. 3* (pp. 383-423). San Diego, CA: North Holland.

Louis, K.S., Leithwood, K., Wahlstrom, K., Anderson, S., Michlin, M., Mascall, B., et al. (2010). *Learning from leadership: Investigating the links to improved student learning. Final report of research.* St. Paul, MN: Center for Applied Research and Educational Improvement, University of Minnesota & Toronto: Ontario Institute for Studies in Education at The University of Toronto.

March, A.L., Castillo, J.M., Batsche, G.M., & Kincaid, D. (2016). Relationship between systems coaching and problem-solving implementation fidelity in a Response to Intervention model. *Journal of Applied School Psychology, 32*(2), 147-177. doi: 10.1080/15377903.2016.1165326

March, A. L., & Gaunt, B. T. (2013). *Systems coaching: A model for building capacity.* Tampa, FL: University of South Florida, Florida's Multitiered System of Supports Project. Retrieved from http://www.floridarti.usf.edu/resources/format/pdf/ SystemsCoaching.pdf

Marsh, J.A., McCombs, J.S., Lockwood, J.R., Martorell, F., Gershwin, D., Naftel, S., Le, V., Shea, M., Barney, H., & Crego, A. (2008). *Supporting literacy across the sunshine state: A study of Florida middle school reading coaches.* Arlington, VA: RAND Corporation.

McDonald, R.P. (1999). *Test theory: A unified treatment*. Mahwah, NJ: Lawrence Erlbaum.

McIntosh, K., & Goodman, S. (2016). *Integrated multi-tiered systems of support: Blending RTI and PBIS*. New York, NY: Guilford Press.

Muthén, B. O. (1994). Multilevel covariance structure analysis. *Sociological Methods and Research, 22*, 376–398.

Muthén, L.K., & Muthén, B.O. (1998-2017). *Mplus User's Guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.

Nellis, L. M. (2012). Maximizing the effectiveness of building teams in response to intervention implementation. *Psychology in the Schools*, *49*(3), 245-256.

Nelson, J. R., Martella, R. M., & Marchand-Martella, N. (2002). Maximizing student learning: The effects of a comprehensive school-based program for preventing problem behaviors. *Journal of Emotional and Behavioral Disorders*, *10*(3), 136.

Neufeld, B. & Roper, D. (2003). *Coaching: A strategy for developing instructional capacity – Promises and practicalities.* Washington, DC: Aspen Institute Program on Education and Providence, RI: Annenberg Institute for School Reform. Retrieved from http://annenberginstitute.org/pdf/Coaching.pdf

Neumerski, C. M. (2012). *Leading the improvement of instruction: Instructional leadership in high-poverty, urban schools* (Doctoral dissertation, University of Michigan).

O'Connor, E.P., & Freeman, E.W. (2012). District-level considerations in supporting and sustaining RtI implementation. *Psychology in the Schools, 49*(3), 297-310. doi:10.1002/pits.21598

Owens, J.S., Lyon, A.R., Brant, N.E., Warner, C.M., Nadeem, E., Spiel, C., & Wagner, M. (2013, December). Implementation science in school mental health: Key constructs in a developing research agenda. *School Mental Health.* Advance online publication. doi:10.1007/s12310-013-9115-3

Pas, E. T., & Bradshaw, C. P. (2012). Examining the association between implementation and outcomes. *The Journal of Behavioral Health Services & Research*, *39*(4), 417-433.

Pas, E. T., Bradshaw, C. P., & Mitchell, M. M. (2011). Examining the validity of office discipline referrals as an indicator of student behavior problems. *Psychology in the Schools*, *48*(6), 541-555.

Pluymert, K. (2014). Problem-solving foundations for school psychological services. In P. L. Harrison & A. Thomas (Eds.), *Best practices in school psychology: Data-based and collaborative decision making*. Bethesda, MD: National Association of School Psychologists.

Poglinco, S.M., Bach, A.J., Hovde, K., Rosenblum, S., Saunders, M., & Supovitz, J.A. (2003). *The heart of the matter: The coaching model in America's Choice schools.* Philadelphia: Consortium for Policy Research in Education.

Preciado, J. A., Horner, R. H., & Baker, S. K. (2009). Using a function-based approach to decrease problem behaviors and increase academic engagement for Latino English language learners. *The Journal of Special Education*, *42*(4), 227-240.

Putnam, R. F., Handler, M. W., Ramirez-Platt, C. M., & Luiselli, J. K. (2003). Improving student bus-riding behavior through a whole-school intervention. *Journal of Applied Behavior Analysis, 36*, 583–589.

Raykov, T. (2009). Evaluation of scale reliability for unidimensional measures using latent variable modeling. *Measurement and Evaluation in Counseling and Development*, *42*(3), 223-232.

Rubio, D. M., Berg-Weger, M, Tebb, S.S., Lee, E. S., & Rauch, S. (2003). Objectifying content validity: Conducting a content validity study in social work research. *Social Work Research, 27*(2), 94-104.

Rush, D. D., & Shelden, M. L. (2005). Evidence-Based Definition of Coaching Practices. *CASEmakers, 1*(6), 1-6.

Russo, A. (2004, July/August). School-based coaching: A revolution in professional development or just the latest fad? *Harvard Education Letter, 20*(4), 1-3.

Safran, S. P., & Oswald, K. (2003). Positive behavior supports: Can schools reshape disciplinary practices?. *Exceptional children, 69*(3), 361-373.

Sandomierski, T. (2011). *Disciplinary outcomes by race and gender in schools implementing positive behavior support: Does fidelity of implementation reduce disproportionality?* (Doctoral dissertation, University of South Florida).

Scott, T. M. (2001). A school-wide example of positive behavior support. *Journal of Positive Behavior Interventions, 3,* 88–94.

Sharratt, L. and Fullan, M. (2009). *Realization: The Change Imperative for Deepening District Wide Reform*. Thousand Oaks, CA: Corwin Press.

Showers, B. (1982). *Transfer of Training: the Contribution of Coaching*. Eugene, OR: Center for Educational Policy and Management.

Showers, B. (1984). *Peer Coaching: A Strategy for Facilitating Transfer of Training*. Eugene, OR: Center for Educational Policy and Management.

Showers, B. & Joyce, B. (1996). The Evolution of Peer Coaching. *Educational Leadership*, *53*(6), 12-16.

Snijders, T. A. B . (2005). Power and sample size in multilevel linear models. In B. S. Everitt & D. C. Howell (Eds.), *Encyclopedia of statistics in behavioral science* (Vol. 3, pp.1570-1573). Hoboken: NJ: Wiley.

Steinbacher-Reed, C. & Powers, E. (2011/12). Coaching Without A Coach: How can cash-strapped schools empower educators at all levels to engage in coaching? *Educational Leadership*, 68-72.

Steinbacher-Reed, C. & Powers, E. (2013). Don't Bench Coaching: How can schools plan personalized professional learning when funds for a coach are cut? *Educational Leadership*, 54-57.

Stewart, R. M., Benner, G. J., Martella, R. C., and Marchand-Martella, N. E. (2007). Three-tier models of reading and behavior: A research review. *Journal of Positive Interventions, 9*, 239-252.

Stockslager, K., Castillo, J., Brundage, A., Childs, K., & Romer, N. (2016). *Self-Assessment of MTSS (SAM).* Florida's Problem Solving/Response to Intervention Project and Florida's Positive Behavior Intervention and Support Project, University of South Florida.

Sugai, G., & Horner, R. H. (2006). A promising approach for expanding and sustaining school-wide positive behavior support. *School Psychology Review, 35*, 245– 259.

Sugai, G., & Horner, R. H. (2008). What we know and need to know about preventing problem behavior in schools. *Exceptionality, 16*, 67–77.

Sugai, G., & Horner, R. H. (2009). Responsiveness-to-intervention and school-wide positive behavior supports: Integration of multi-tiered system approaches. *Exceptionality*, *17*(4), 223-237.

Sugai, G., Horner, R. H., & Lewis, T. (2009). *School-wide positive behavior support: Implementers' blueprint and self-assessment*. Eugene: University of Oregon, OSEP Technical Assistance Center on Positive Behavioral Interventions and Supports.

Sugai, G., & Simonsen, B. (2012). *Positive behavioral interventions and supports: History, defining features, and misconceptions.* Center for PBIS & Center for Positive Behavioral Interventions and Supports, University of Connecticut.

Sullivan, A. L., Artiles, A. J., & Hernandez-Saca, D. I. (2015). Addressing special education inequity through systemic change: Contributions of ecologically based organizational consultation. *Journal of Educational and Psychological Consultation*, *25*(2-3), 129-147.

Taylor-Greene, S. J., & Kartub, D. T. (2000). Durable Implementation of School-Wide Behavior Support The High Five Program. *Journal of Positive Behavior Interventions, 2*(4), 233-235.

The New Teacher Project (2015). *The mirage: Confronting the hard truth about our quest for teacher development.* Retrieved from https://tntp.org/assets/documents/TNTP-Mirage_2015.pdf

Thoman. S., Jenkins, A., Castillo, J., March, A., & Moulton, S. (2018, February 14). *Systems Coaching: Introducing a Tool to Measure MTSS Implementation Support*. Paper

presentation at the 2018 Annual Conference of the National Association of School Psychologists, Chicago, IL.

Thompson, J. (1994). Systemic education reform. ERIC Digest, 90. Retrieved from www.eric.ed.gov

Tilly, W. D. (2008). The evolution of school psychology to science-based practice: Problem solving and the three-tiered model. *Best practices in school psychology V*, *1*, 17-36.

Toll, C. A. (2009). Literacy Coaching. In J. Knight (Ed.), Coaching: Approaches & Perspectives (pp. 192-216). Thousand Oaks, CA: Corwin Press.

The University of Florida Lastinger Center for Learning, Learning Forward, & Public Impact. (2016). *Coaching for impact: Six pillars to create coaching roles that achieve their potential to improve teaching and learning.* Gainesville: University of Florida Lastinger Center; Oxford, OH: Learning Forward; and Chapel Hill, NC: Public Impact. Retrieved from www.learningforward.org/coaching-for-impact/

University of South Florida, Florida's Multitiered Systems of Support Project (n.d.). *Systems Coaching and Leadership: Fact sheet*. Retrieved from http://www.floridarti.usf.edu/resources/factsheets/coaching.pdf

Vaillancourt-Strobach, K., & Cowan, K. C. (2016). The Every Student Succeeds Act: Opportunities for School Psychology. *Communique*, *44*(6).

Wang, J., & Wang, X. (2012). *Structural equation modeling: Applications using Mplus*. John Wiley & Sons.

Willis, G., Lawrence, D., Thompson, F., Kudela, M., Levin, K., & Miller, K. (2005, November). The use of cognitive interviewing to evaluate translated survey questions: Lessons

learned. In *Proceedings of the Federal Committee on Statistical Methodology Research Conference*.

Yoon, K. S., Duncan, T., Lee, S. W. Y., Scarloss, B., & Shapley, K. L. (2007). *Reviewing the evidence on how teacher professional development affects student achievement. Issues & answers.* REL 2007-No. 033. Regional Educational Laboratory Southwest (NJ1).

Zirkel, P. A., & Thomas, L. B. (2010). State laws and guidelines for implementing RTI. *Teaching Exceptional Children*, *43*, 60–73.

APPENDIX A:

SYSTEMS COACHING SURVEY

Developed by the Florida PS/RtI Statewide Project (http://floridarti.usf.edu) and the Florida PBIS Project (http://flpbs.fmhi.usf.edu)

Systems Coaching Survey - R

Systems Coaching Survey

Demographic Information

District: _____

School: _____

Please indicate your field of training/certification (check all that apply):

- ☐ General Education
- ☐ Special Education/Exceptional Student Education
- ☐ Educational Leadership
- ☐ School Psychology
- ☐ School Counseling
- ☐ School Social Work
- ☐ Behavior Analysis
- ☐ Intervention Specialist
- ☐ Speech/Language Pathology

Other, please specify: _____

Please indicate your current title/position (check all that apply):

- ☐ General Educator
- ☐ Special Educator
- ☐ School Based Administrator
- ☐ District Based Administrator
- ☐ School Psychologist
- ☐ School Counselor
- ☐ School Social Worker
- ☐ Intervention Specialist
- ☐ Teacher Mentor
- ☐ Behavior Specialist/Coach
- ☐ Behavior Analyst
- ☐ MTSS Specialist/Coach
- ☐ Speech Pathologist

Other, please specify: _____

Directions: *Please read each statement below. Rate* ***your skill level*** *within the context of your current role and then rate your* ***ability to teach*** *this skill to others. Depending upon whether the question is about your personal skill level or your ability to teach that skill, please use the following response scale:*

	Personal Skill Level	Ability to Teach Skill
□ = Not Skilled (NS)	I do not have this skill.	I cannot teach this skill.
□ = Minimally Skilled (MnS)	I have minimal skills in this area; need substantial support to use it.	I need substantial support to teach this skill.
□ = Somewhat Skilled (SS)	I have this skill, but still need some support to use it.	I need some support to teach this skill.
□ = Highly Skilled (HS)	I can use this skill with little support.	I can teach this skill with little support.
□ = Very Highly Skilled (VHS)	I am very highly skilled in this area and can use it independently.	I can teach this skill independently.

Interpersonal Communication Skills

The skill to:	NS	MnS	SS	HS	VHS
1. Develop and maintain a collaborative relationship when working with others					
a. **Your** skill level	□	□	□	□	□
b. Your ability to **teach** this skill	□	□	□	□	□
2. Develop consensus among a group of individuals					
a. **Your** skill level	□	□	□	□	□
b. Your ability to **teach** this skill	□	□	□	□	□
3. Ensure roles, responsibilities, and rules for decision-making (e.g., conflict, logistics, norms, etc.) are understood and agreed upon among a group of individuals working together					
a. **Your** skill level	□	□	□	□	□
b. Your ability to **teach** this skill	□	□	□	□	□
4. Summarize and paraphrase others' thoughts and statements for clarification and to confirm accuracy					
a. **Your** skill level	□	□	□	□	□
b. Your ability to **teach** this skill	□	□	□	□	□

5. Ask various types of questions (e.g., open-ended, closed, clarifying, information-gathering) to elicit more detailed information from others					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
6. Facilitate active participation among all individuals involved in a discussion or meeting					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
7. Facilitate discussions that recognize and support diverse cultural perspectives and needs					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

Data-Based Problem-Solving Skills

The skill to:	NS	MnS	SS	HS	VHS
8. Employ a four-step problem solving process that involves the following basic steps: 1) Problem Identification, 2) Problem Analysis, 3) Plan Development and Implementation, and 4) Plan Evaluation.					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
9. Use guiding questions to facilitate the problem-solving process					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
10. Facilitate the development and validation of evidence-based hypotheses as to why the problem is occurring					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
11. Interpret different sources and types of *academic* data to support intervention design and improve student outcomes					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

The skill to:	NS	MnS	SS	HS	VHS
12. Interpret different sources and types of *behavior* data to support intervention design and improve student outcomes					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
13. Interpret different sources and types of *social/emotional* data to support intervention design and improve student outcomes					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
14. Collect data to measure the fidelity of the four step problem-solving process					
a. Your skill level	☐	☐	☐	☐	☐
b. Your ability to teach this skill	☐	☐	☐	☐	☐
15. Collect data to measure the fidelity with which student interventions are implemented					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
16. Organize and display data (i.e., graphs, charts, data walls) to answer specific problem-solving questions					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
17. Monitor student performance across tiers and content areas					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
18. Use the problem-solving process to evaluate and ensure equity for all students					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

Team Facilitation Skills

The skill to:	NS	MnS	SS	HS	VHS
19. Develop and maintain a clear team purpose and focus for the group's work					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
20. Facilitate development and adherence to clearly defined team norms/guidelines					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
21. Ensure efficient meetings involving the use of agendas, assigned responsibilities, and a focus on activities to complete prior to, during, and following the meeting					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
22. Ensure opportunities for team members to develop and refine their problem-solving skills					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
23. Ensure administrative support for problem-solving practices across content areas and decisions made by the team					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
24. Facilitate continuous improvement of the teaming process through group self-assessment and ongoing feedback					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

Content Knowledge Dissemination Skills

The skill to:	NS	MnS	SS	HS	VHS
25. Ensure content knowledge (e.g., reading, behavior, math, systems change, problem solving) experts are active participants on Leadership Teams when appropriate for the issue/problem being addressed					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
26. Access evidence-based strategies, resources, and tools aligned with student and educator needs					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
27. Use multiple strategies to disseminate relevant resources and tools to educators (e.g., newsletters, presentations, research summaries, training sessions)					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
28. Access culturally responsive strategies, resources, and tools aligned with student and educator needs					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

Leadership Skills

The skill to:	NS	MnS	SS	HS	VHS
29. Develop and articulate a clear vision with a sense of urgency for Multi-tiered Systems of Support (MTSS) and school improvement					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
30. Build and maintain positive relationships among all educators, students, family, and community members					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

The skill to:	NS	MnS	SS	HS	VHS
31. Distribute leadership responsibilities among a number of individuals					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

Professional Learning Skills

The skill to:	NS	MnS	SS	HS	VHS
32. Deliver professional learning trainings aligned with student and educator needs					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
33. Provide technical assistance/coaching aligned with student and educator needs					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
34. Evaluate professional learning activities based on student and educator outcomes					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
35. Use the professional learning evaluation data gathered to plan necessary adjustments and modifications in subsequent professional learning activities					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
36. Utilize evidence-based professional learning methods/techniques to increase participant awareness, skills, and/or knowledge					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
37. Provide instructional feedback to adult learners based on their unique learning needs					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

The skill to:	NS	MnS	SS	HS	VHS
38. Use culturally responsive techniques to promote adult learning					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

Evaluation Skills

The skill to:	NS	MnS	SS	HS	VHS
39. Use data to evaluate the impact of professional learning and coaching practices on educator and student outcomes					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
40. Use data to evaluate the fidelity of professional learning and coaching practices					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐
41. Evaluate an adult learner's application of new knowledge, skills, and/or practices					
a. **Your** skill level	☐	☐	☐	☐	☐
b. Your ability to **teach** this skill	☐	☐	☐	☐	☐

Thank you!

APPENDIX B:

PILOT OF SYSTEMS COACHING SURVEY INVITATION TO PARTICIPATE

Pilot of Systems Coaching Survey Invitation to Participate

http://floridarti.usf.edu/scs/invitation.html

The Florida MTSS Project, a collaborative effort between Florida's Positive Behavioral Interventions & Support and Florida's Problem Solving/Response to Intervention Projects, has developed a tool designed to measure the skills of those leading, training, and/or coaching others to build capacity for MTSS implementation. The instrument has undergone an extensive development process and we are currently initiating a national validation study. We are recruiting state or local education agencies (districts) that will commit school and/or district personnel with responsibilities that include systems coaching activities (i.e., activities designed to help schools implement MTSS) to participate by completing the instrument and submitting the results to the Project. Results will be graphed and returned to inform ongoing professional development and coaching supports for MTSS implementation at the participating sites.

About the Instrument

The Systems Coaching Survey (SCS) was designed to measure the seven domains of systems coaching: interpersonal communication, data-based problem solving, team facilitation, content knowledge dissemination, leadership, professional learning, and evaluation. Both the present skill level of coaches and their ability to teach the skill to others are measured. The self-report survey contains 37 items that are rated on a 5-point scale (*1 = Not Skilled; 2 = Minimally Skilled; 3 = Somewhat Skilled; 4 = Highly Skilled; and 5 = Very Highly Skilled*).

Participants

The SCS is designed to be completed by district and school personnel who have the responsibility for facilitating MTSS implementation (i.e., personnel who have systems coaching responsibilities). Participants may or may not be identified within their district, school, or agency as a formally labeled "coach." In other words, eligible participants will include ANYONE whose responsibilities involve "systems coaching" or building capacity for MTSS (for example, school or district leadership team members, implementation team members, content area specialists, support personnel such as school psychologists, behavior specialists, counselors, etc.) and/or anyone who is a member of an individual coaching cadre. Familiarity with "systems coaching" is not required, but participants must have some prior knowledge of MTSS/RtI.

Administration Procedures

District and agency contacts will receive the survey link from study personnel. Contacts will be responsible for disseminating the link to their identified personnel. Each participant will complete the SCS independently using SurveyMonkey. The SCS will require approximately 20 minutes to complete in SurveyMonkey. Participants will have 2 months to complete the survey. Project staff will send reminder emails to district and agency contacts with updates regarding the number of respondents.

Training and Technical Assistance

Project staff will coordinate with the designated educational agency contact to identify personnel who will be responsible for facilitating completion of the SCS. Identified personnel will participate in a 20-30 minute web-based training focused on the content of the instrument, administration procedures, and requirements for the pilot study. The training will be provided remotely via Adobe Connect by Project staff. Project staff will also be available to provide ongoing content and technical support regarding items and administration procedures on an as needed basis.

Data Graphing & Return

Within one month of the close of the administration window, identified educational agency contacts will be provided graphs and an excel file with aggregated SCS data from their participating school and/or district personnel. These data can be used to inform ongoing professional development and coaching supports for MTSS implementation at the district and school levels.

Other Data Elements

Participating educational agencies will be asked to provide supplementary data for participating schools. School demographic (e.g., student demographics, school size) and outcome (e.g., percent proficient on statewide assessments, office discipline referral rates, out-of-school suspension rates) data will be *required*. We also will ask participating agencies to provide any available data on MTSS implementation (e.g., Self-Assessment of MTSS, Benchmarks of Quality, School-Wide Evaluation Tool, Tiered Fidelity Inventory). More information regarding required and optional data elements will be shared during initial calls with agency contacts.

Timelines for Participation

Notification of interest to participate – by March 2017
Planning for contacts to be trained on administration procedures – March 2017
Training for contacts – March 2017
SCS completion and data entry – April to May 2017
School-level demographic data collection - April 2017 to August of 2017

Contact Information for Interested Educational Agencies

Educational agency representatives interested in participating or who would like additional information should contact XXXX.

APPENDIX C:

INSTITUTIONAL REVIEW BOARD ACTIVITY FORM

Activity Details (Study that has never been approved is Closed)

Author:	Various Menzel (Research Integrity & Compliance)
Logged For (Study):	Systems Coaching Survey Validation Study
Activity Date:	1/13/2017 8:41 AM

Activity Form | Property Changes | Documents | Notifications

Close Study - Never Approved Activity

- This activity will close the IRB Study and change the state to **Closed - Never Approved**.
- Any comments and/or documents entered below will show in the History Log.

Comments:
The Vice Chair, Dr. Kristen Salomon has reviewed this study and has determined: "The activities described in the application consist of quality improvement. The study information would appear to be descriptive and would not appear to contribute to generalizable knowledge. This is not to say that the activities do not have value, just that these activities do not appear to meet the definition of research under USF HRPP policy and are therefore not under USF IRB oversight. It would be accurate to state that 'this study has been reviewed by the USF IRB' albeit not formally approved; because it is not research subject to our approval."

Add Documents:

Name	Description

There are no items to display

<< Return to Workspace

APPENDIX D:

PERMISSION TO INCLUDE *SYSTEMS COACHING SURVEY*

Sarah Thoman <sthoman@mail.usf.edu>

Another thesis ETD question

Castillo, Jose <jmcastil@usf.edu> Tue, Aug 20, 2019 at 7:24 AM
To: "Thoman, Sarah" <sthoman@mail.usf.edu>
Cc: "March, Amanda" <amarch@usf.edu>

Hi Sarah,

This email is to indicate that you have the permission of the Florida Problem Solving/Response to Intervention Project to use the Systems Coaching Survey in your Ed.S. Thesis. Please let me know if you require any additional information.

Jose

Jose Castillo, Ph.D.

Associate Professor and Program Coordinator, School Psychology Program

Director, Institute for School Reform

Department of Educational and Psychological Studies

University of South Florida

4202 E. Fowler Avenue, EDU 105

Tampa, FL 33620

Phone: 813-974-5507

Email: jmcastil@usf.edu

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