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2022

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UNIVERSITY OF CALIFORNIA SAN DIEGO

CALIFORNIA STATE UNIVERSITY, SAN MARCOS

Ego Networks of Multi-Tiered Systems of Support Implementation Teams

A dissertation proposal submitted in partial satisfaction of the requirements for the degree of
Doctor of Education

In

Educational Leadership

by

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2022

The dissertation of Jose A. Diaz is approved, and it is acceptable in quality and form for publication on microfilm and electronically.

University of California San Diego, 2022

California State University, San Marcos 2022

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DEDICATION

I dedicate this dissertation to my mother and father and the Diaz family. I also dedicate this

dissertation to my grandmother Lola Lourdes who recently passed. Her will and desire for all her

children, grandchildren, and great-grandchildren to succeed is something that will carry on for

many generations. I am forever grateful to my parents whose forethought and sacrifices through

the years provided continuous opportunities for me and my siblings to succeed.

EPIGRAPH

"It is not beyond our power to create a world in which all children have access to a good education. Those who do not believe this have small imaginations!" ~Nelson Mandela

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ABSTRACT OF THE DISSERTATION

Ego Networks of Multi-Tiered Systems of Support Implementation Teams

by

Jose A. Diaz

Doctor of Education in Educational Leadership

University of California San Diego, 2022
California State University San Marcos, 2022

Christoforos Mamas, Chair

Achievement and opportunity gaps have continued to persist despite the best efforts of educators. "The Every Student Succeeds Act" (ESSA, 2016) legislation was written to meet the needs of all historically underserved students. To meet those needs, Local Education Agencies (LEA) have turned to a Multi-Tiered System of Support (MTSS) framework. MTSS is designed to meet students' academic, behavioral, and social-emotional needs through a tiered system of increasing support. Regional Departments of Education throughout the state are now expanding MTSS implementation. Essential to the installation of MTSS at the local level is implementation teams. However, MTSS is a complex and lengthy process requiring alignment, coordination, and support of local and regional teams. The purpose of this study was to explore the factors and

influence team members' social networks have on the MTSS implementation process. A sequential mixed-methods study design was implemented to address the two research questions: Data were collected by an electronically disseminated survey, consisting of two sections: Demographic information to allow the mapping of ego networks and open-ended questions about team members' experience with MTSS. Data from the qualitative portion of the study were collected using a semi-structured interview to provide depth and understanding of members' ego networks. 13 implementation team members representing elementary, alternative, and county local education agencies responded to the survey. Interviews were conducted with four individuals or EGOs to provide depth and understanding of teams' networks of influence. This study was driven by the theoretical frameworks of social capital, social networks, and implementation science. Key findings suggest that the local MTSS implementation team members rely on smaller networks to drive implementation. The results also show that members of the MTSS team from different backgrounds tend to have broader and diverse ego networks representing their constituencies.

Keywords: MTSS, Social Capital, Social Network Theory, Ego Networks, Implementation Science

Chapter One: Introduction

Introduction

The goal of the Every Student Succeeds Act (U.S. Department of Education, 2017) is rooted in meeting the needs of all students. The opportunity and achievement gaps for students who have historically been underserved have persisted despite previous measures designed to address those gaps. However, the ESSA (2016) has provisions designed to meet the needs of students of color, homeless students, English language learners, and low-income students. A recent report has identified four areas for educators, policymakers, and stakeholders to address. They are as follows; (1) access to learning opportunities focused on higher-order thinking skills; (2) multiple measures of equity; (3) resource equity; and (4) evidence-based interventions (Cook-Harvey et al., 2016). To meet these goals, several states have turned to a Multi-Tiered System of Support (MTSS) framework to meet the needs of all students. California has purposefully included implementation science to install MTSS with fidelity.

Background of Study

Districts and schools continue to refine how they support all students in response to local control and accountability plans (LCAP) and federal accountability measures. Local education agencies (LEAs) have used Response to Intervention and Instruction (RTII) and School-Wide Positive Behavior Interventions and Support (SWPBIS) to address and identify students' academic and behavioral needs, respectively (U.S. Department of Education, 2017b). RTII is a tiered approach addressing all students within a school by providing the appropriate intensity of

academic support necessary for continued educational progress (Batsche, 2015). SWPBIS is also a tiered approach to organizing effective social skills instruction and behavioral interventions along a continuum of increasing intensity (Sugai & Horner, 2009). The framework of MTSS emerged after several decades of research in tiered systems of support as an effort to unify these systems. Implicit in this construct of MTSS is to establish a single system of delivery. MTSS is an evolution of RTII and SWPBIS, and rather than treat them as competing alternatives, MTSS is a framework that aims to integrate the tiered intervention structure, early identification protocols, and data-based decision making into one construct (Sugai & Horner, 2009). While components of MTSS are grounded in models initially meant to address the needs of students with disabilities, the goal of MTSS is to support all students. MTSS is an integrated, comprehensive framework that focuses on state standards, core instruction, differentiated learning, student-centered learning, individualized student needs, and the alignment of systems necessary for all students' academic, behavioral, and social success (Harlacher et al., 2013).

The MTSS framework allows districts to move towards their equity goals by aligning academic, behavioral, and social-emotional learning around data-based decision-making to improve outcomes for all students (Koppich, 2020). Furthermore, the impact of Covid-19, anticipated learning loss, and lack of social interaction make the need for MTSS even more critical. The California Department of Education (CDE) has designed its MTSS framework to address the diverse needs of student learners throughout the state. MTSS implementation teams are the essential catalyst to ensure the framework is installed with fidelity to effectively meet the needs of their population of students (Fixen & Blase, 2017). The foundations come from evidence-based practices, including Response to Instruction and Intervention (RTII) and School-Wide Positive Behavior Interventions and Supports (SWPBIS) (Eagle et al., 2014). Both RTII

and SWPBS are like a public health model in its approach to prevention.

An integral component of California's MTSS framework is the purposeful use of implementation science and implementation teams to improve installation and fidelity throughout the state. Implementation science is defined broadly as the study or exploration of why specific interventions work in real-world contexts. (Bauer et al., 2015). Implementation science has become widely used over the past decade to improve human-services innovations, most prominently in the medical field. However, education and more specifically the California Department of Education has adopted implementation science to improve uptake of MTSS throughout the state (CDE, 2019).

Statement of Problem

Students can only benefit from interventions if properly implemented. Implementation of MTSS is a multi-stage complex process. The stages consist of exploration, installation, initial implementation, full implementation, innovation, and then sustainability (Eagle et al., 2014). The key to each of the stages of implementation is implementation drivers. There are three forms of drivers; competency drivers, leadership drivers, and organizational drivers (Fixsen et al., 2009). All three drivers of implementation are imperative to alter the conduct of adults who supply evidence-based practices inside schools. Effective and sustainable implementation of MTSS practices takes place via the building of personnel expertise and potential for school-wide reform (Eagle et al., 2014). Moreover, leadership is a critical component in the installation of MTSS (Richter et al., 2011).

Implementation teams and the relationships within those teams are the primary catalysts regarding the installation of MTSS and the drivers that ensure implementation. Implementation teams are the primary entity for each of the implementation stages and have a direct influence on

each of the drivers. Furthermore, although implementation science has been in use for the better part of six decades in other human service contexts, it has only recently rapidly developed in usage in education over the past decade (Fixsen, Ward, et al., 2013). Implementation teams are a necessary component of the MTSS framework but have only been identified as an active, integral implementation component in the past decade. Research in other human service fields has shown implementation teams are essential to the scaled use of effective innovations (Fixsen, Blase, et al., 2013).

Implementation has also been shown to be affected by factors external to the MTSS framework. Embedded within California's MTSS framework is implementation science which requires the purposeful use of implementation teams. Consistency or fidelity of implementation is highly dependent on implementation teams. However, a lack of proper implementation can lead to ineffective practices and less predictable outcomes for students (Long et al., 2016). Although researchers have acknowledged relationships are an important part of implementation; the development of relationships and the study of their influence is not strongly featured in the literature on implementation (Metz & Bartley, 2020). Additionally, researchers at the National Implementation Research Network (NIRN) have made recommendations to state MTSS teams to leverage local capacity by building up the interagency connections between local and regional systems (Goodman et al., 2019). There is a gap in research between implementation science and the relational aspects of implementation teams. The social aspects of implementation teams need to be explored to meet the recommendations of NIRN researchers and better meet the needs of students.

Purpose

This study aims to understand better and explore the influence of social relationships upon implementation teams and how they affect the installation of a Multi-Tiered System of Support (MTSS) within their local education agency or LEA. Researchers found that educators were not supported with adequate training and coaching in education, and high-fidelity use of the programs occurred in only 10% of the schools (Vernez et al., 2006). Training, coaching, and the use of programs begin with people and their teams. To address these issues inherent within the implementation of MTSS is the purposeful use of implementation science and implementation teams. These teams are responsible for facilitating all the elements and stages of MTSS installation. Previous research indicated that MTSS teams are dependent upon the expertise of implementation team members (Newcomer et al., 2013).

In California, the scale-up of MTSS or (SUMS) initiative aims to provide resources and funding to County education departments to ensure an effective expansion statewide (OCDE, 2016a). This study centered on one large Southern California county as one of the county departments participating in the initial scale-up. Though the initial planning began in 2016, the first cohort of pilot schools began the MTSS implementation process in the 2018-2019 school year (San Diego County Office of Education, 2018). The second cohort of schools began the initial exploration and installation phase(s) of MTSS implementation in the fall of 2019. This study presents a significant source of data because of the general diversity of the region and the various school systems involved. For this study, the second cohort of LEAs received training and coaching through their respective county education office. The second cohort of LEAs consisted of a mixture of LEAs in rural communities, charters, alternative education sites, and comprehensive districts. The general diversity of the region and the inclusion of rural,

alternative, and charter communities will provide another opportunity to expand the context and research of implementation teams not previously explored.

While some of this expertise may result from training, some of the characteristics may be inherent to team members and influenced by their social networks. More specifically, this study involved an examination of the ego networks of MTSS team members, a type of social network analysis. Unlike whole social network analysis, ego networks focus on the individual "ego," and their connections "alter."

Studies on the relational aspects of MTSS teams and how resources, information, and influence permeate throughout their social networks could prove vital to enhancing the effectiveness and efficiency of those teams. Previous research in student intervention systems has indicated "new initiatives are often introduced with little planning for how the staff will be supported to implement the initiative" (Mcintosh & Goodman, 2016, p.238). Educators often were left to figure out on their own on how to implement an initiative. MTSS implementation efforts aim to address this issue through the purposeful use of teams.

This study examined the social networks of teams by analyzing individuals' ego networks. Rather than focus on a bounded whole network, the focus is on an individual's (ego) relational ties, including and beyond the boundary of an implementation team. The examination of the social networks of implementation teams allowed the researcher to determine how the implementation drivers presented themselves through the various educational contexts, groups, and individuals that participated in the study.

This study furthers research into the use of implementation teams and the factors they may encounter upon installing the MTSS framework. Implementation teams are the focus of the study, and this study aimed to examine what makes teams work and what barriers they face. The

study and analysis of the ego networks of implementation team members provided insights and explanations of the issues teams encounter from a relational perspective. This study may also benefit the construction of future implementation teams addressing intervention systems. Students can only benefit from academic and behavioral innovations accessible through MTSS if implemented successfully.

The following two research questions guided this study.

     1. What factors influence teams while implementing the MTSS framework?

     2. How do team members' ego networks influence implementation?

Theoretical Framework

Central to the diffusion and implementation of interventions in health and human service contexts, social relationships are researched throughout various models, frameworks, and theories (Ward et al., 2012). All forms of network theory examine relationships. Prior research has indicated that innovations spread through social relationships (Rogers, 2003). Social network analysis (SNA) is an approach to examining social relationships. SNA is particularly appropriate for looking at dissemination and implementation research, especially in analyzing the social structure of administration settings, social connections, and the explanation of outcomes (Bunger & Nooraie, 2020). The parameters of this study were informed through social network and social capital theory and the frameworks of implementation science. Social capital and network homogeneity are commonly explored in social network analysis (Borgatti et al., 2018). The goal of social capital measurement research is to demonstrate how an individual's status and access to resources may influence their network.

Research in many other human service fields has led to a greater understanding of

effective implementation. Previous strategies have indicated that educators were the catalyst for meaningful change. While still valid, implementation teams are purposely constructed to provide support in training, coaching, and the use of data. Social networks may provide support for network members but may also be a source of influence and information (Hlebec & Kogovšek, 2012). Social capital theory can be explored in this context and determine how team members' relationships affect and influence or are, in turn, influenced by implementation teams.

Methodology

To address the research questions, a mixed-methods sequential explanatory study design was implemented (Creswell & Plano-Clark, 2018). Through the lens of implementation teams and social capital theory, I mapped the ego networks of MTSS team members participating in this study. Once mapped, voluntary members of LEAs' implementation teams were interviewed to explore further their ego-nets and identify barriers, facilitators, and impact on implementation. This provided descriptive data that could inform the practice, policy, and composition of future implementation teams. Data was first collected through an electronically disseminated ego-net survey. Following the analysis of that data, network members who were interviewed had their responses analyzed to provide further context. The analysis of both the ego networks and semi-structured interviews provided insights into the research questions. Studying the process of implementation through this context provides meaningful information and demonstrates value for other LEAs pursuing implementation.

Key Terminology

Actor: An actor is a member of a network that can have a connection of other actors within a network. (Borgatti et al., 2018).

Human Services: The term human services refer to the full spectrum of services in which one human being interacts with another to be helpful. Examples of providers include teachers, medical services, therapists, and community organizers. Examples of recipients of this service include students, patients, clients, and communities (Fixsen & Blase, 2020).

School-Wide Positive Behavior Intervention and Supports: School-wide Positive Behavioral Interventions and Supports (PBIS) is a framework for delivering both the whole school social culture and additional tiers of behavior support intensity needed to improve educational and social outcomes for all students (Horner & Sugai, 2015).

***Response to Instruction and Intervention*:** Both a preventive early intervening approach and an alternative route to learning disability identification, RTII has impacted whether and how special education is provided in schools. RTII has evolved into a general education system of support to identify students struggling academically (Berkeley et al., 2020).

<center>**Chapter Two: Review of Literature**</center>

This literature review describes and discusses the elements of the California Multi-Tiered System of Supports (MTSS) initiative through the framework of implementation science, with a focus on implementation teams and through the lens of social networks. Included is an examination of the foundations and primary components of MTSS, an overview of implementation science within education, and the social networks of implementation teams. Additionally, this literature review covers the process of implementation as intended and constructed by the State of California MTSS implementation team.

Process of implementation

The scale-up of MTSS statewide or SUMS initiative is California's mechanism to grant resources to local education agencies or LEAs to expand the implementation of MTSS throughout the state (OCDE, 2016a). The Orange County Office of Education is acting as the California Department of Education's implementation arm. The initial SUMS grant has been awarded to expand MTSS statewide. According to the California Department of Education, local education authorities or LEAs must apply for grant money to receive funding support for MTSS implementation through the Orange County Department of Education (OCDE, 2016a). In this context, it is important to note that MTSS is a new initiative in California. The SUMS initiative has only recently awarded grant monies to counties and districts to implement MTSS in LEAs (OCDE, 2016a). All LEAs in this study are somewhere along the initial stages of the implementation process.

This county in Southern California is one of the first counties to receive a grant award for MTSS implementation from the State. When this study was initiated, teams were in the process of evaluating their current local programs and systems that serve their respective student

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populations. The second cohort of six LEAs was in the exploration and initial stages of implementation. MTSS is a framework merged from previous tiered systems of intervention such as RTII, SWPBIS, and socio-emotional initiatives. These intervention systems share a commonality in having both focused on prevention with the common foundational concepts of assessing response and a tiered approach for delivery of interventions (McIntosh et al., 2009). MTSS provides the opportunity for LEAs to be efficient and strategic about resource allocation to serve students' needs. Although MTSS provides a framework for the adoption of successful evidence-based practices (EBPs), many schools have trouble implementing and sustaining practices.

Implementation Science and MTSS

There are a few studies that measure the impact of implementation science as a method of bridging the research to practice gap within education. California has adopted MTSS to address the diverse behavioral and academic needs of students across the state (OCDE, 2018). Rather than mandating a specific intervention for school leaders to adopt, the state of California has allowed school districts and individual school systems to choose interventions by providing guidelines through the SUMS initiative (OCDE, 2016b). Through this initiative, school systems construct implementation teams and conduct self-evaluations of their LEAs and choose a school(s) to pilot either academic or behavioral interventions specific to their context. Although MTSS has been used as a framework for many States to address their specific students' needs, implementation science has not necessarily been a part of that framework. Only within the last five to ten years has implementation science been used in education, specifically as a method to improve evidence-based practices uptake (Fixsen et al., 2013).

California's use of implementation science aims to address the inconsistencies found in

the adoption of evidence-based practices throughout the state. This is the first statewide

educational initiative to use implementation science as a framework for installing EPBs.

Implementation science has been shown to improve the uptake of innovations in other human

services (Fixsen, Ward, et al., 2013). However, it is unclear if implementation science provides

an effective set of parameters and guidelines for implementation teams to significantly improve

the adoption of MTSS systems and improve student academic and behavioral outcomes. As

such, it is beneficial to explore the factors, barriers, and facilitators that may influence the

installation of the framework by implementation teams. There is research to support that

implementation teams can be an effective tool for meaningful change rather than just a data

collecting or decision-making entity (Higgins et al., 2012).

Implementation Teams

Forming a district leadership team is a crucial step in MTSS (Newcomer et al., 2013).

According to continuing research by the National Implementation Research Network (NIRN),

the role of the implementation team is to leverage the principles of implementation science in

conjunction with systems change best practices. Implementation teams play an active role in

supporting implementation. Implementation teams provide a support structure to facilitate the

process of installation of a given innovation, in this case, MTSS (NIRN, 2013). Regarding the

characteristics implementation teams possess, research can be expanded on how teams acquire

knowledge and resources regarding MTSS that is external to the framework.

Although the framework provides an internal structure, external influences may also

affect implementation outcomes. Additionally, the features of a network could affect knowledge

sharing and transfer (Tortoriello et al., 2012). In other human services contexts, innovations, or

interventions, without the use of implementation science and implementation teams, resulted in

up to only a 14% success rate and up to 17 years for the adoption of evidence-based practices (Balas & Boren, 2000). In contrast, implementation teams, in conjunction with the other active frameworks, resulted in an 80% success rate in a three-year period (Fixsen et al., 2007).

Foundations of MTSS

Response to Intervention, now known as Response to Instruction and Intervention (RTII), is an approach that focuses on individual students struggling academically and pulls together resources from local education agencies, schools, and communities to promote students' success before they fall behind. Characteristics of RTII include a data-driven systems approach with tiered levels of Intervention (CDE, 2019). Prior to RTII, students with learning disabilities were identified using an IQ achievement discrepancy model. There were significant disparities within the discrepancy model, and students not meeting the criteria did not receive any form of educational assistance (Blackburn & Witzel, 2018a). RTII was criticized for its arbitrary designations of learning disabilities, and many described it as a wait-to-fail model; students would have to fall dramatically behind in their studies to be designated with a learning disability (Fuchs & Fuchs, 2006). This is antithetical to the preventative nature of RTII and other tiered systems of support. RTII was born from the reauthorization of the 2004 Individuals with Disabilities Education Act (IDEA), which allowed RTII to be used to identify learners with disabilities (Sugai & Horner, 2009). Further research into RTII resulted in developing protocols within the system, such as universal screening, evidence-based instructional curricula, progress monitoring, and support for struggling students (Jimerson et al., 2015).

RTII practices comprise the core foundational aspects of the California MTSS framework. MTSS and RTII are often used interchangeably because they both employ a system of tiered support. As MTSS has been scaled up as a nationally used system to identify students

with learning disabilities, some still regard it as an evolution of RTII. When RTII was first implemented in the 1980s, three percent of the student population was identified as having a learning disability. From 2010 to 2011, the number of students diagnosed with a learning disability has risen to over 13% (Jimerson et al., 2015). Since early 2009, it has been suggested that RTII expanded from a focus on screening for students with learning disabilities to an approach for improving instruction for all (Sugai & Horner, 2009).

A key aspect of RTII in relation to the California MTSS framework is its multi-tiered approach. Versions of RTII have anywhere from two to four tiers. The tiers are designed to intensify instruction, provide small-group instruction, increase the duration and/or frequency of instruction, and rely on instructors with greater levels of expertise with each tier (Fuchs & Fuchs, 2006). Following the reauthorization of the IDEA (2004), a study revealed several issues with the effectiveness of nationwide RTII (Hoover et al., 2015). Although 44 states have reported implementing RTII, the percentage of districts using RTII, as well as the degree of implementation, varied drastically. Several state departments reported significant barriers to implementation, including information dissemination, data collection, and a lack of culturally responsive instruction (Hoover et al., 2015).

School-Wide Positive Behavior Interventions and Supports

School-Wide Positive Behavior Interventions and Supports, an approach that focuses on students' emotional and behavioral learning, has demonstrated an increase in engagement and a decrease in problematic behavior over time. The goal of SWPBIS is to have school systems adopt and organize preventative, evidence-based behavioral interventions to serve all students (Sugai & Horner, 2002). Despite being a tiered intervention system similar to RTII, SWPBIS is focused on broader behavioral outcomes for all students rather than just on their academic issues.

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As a result of the reactive zero-tolerance policies of the 1990s, suspension, and expulsion rates in some schools reached up to 92% of the student body. Additionally, higher suspension rates correlated to lower academic outcomes in schools (Skiba & Sprague, 2008). In the absence of other alternatives, school suspensions and expulsions are the tools of administrators who do not know what else to do for disciplinary measures. Several studies have shown that reactive and short-term exclusionary practices reinforce antisocial behavior in students. Additionally, these practices result in unintended consequences of reduced time for teaching and learning opportunities and reinforce an authoritarian environment (Sugai & Horner, 2002).

SWPBIS was introduced as an alternative to short-term exclusionary practices in favor of longer-term preventive practices. Much like RTII, SWPBIS is directed towards fixing the system itself to deal with behavioral issues on school campuses. Characteristics of SWPBIS include building on school culture, customizing practices to the context of each individual school, and using data to inform decision-making (McIntosh et al., 2009). SWPBIS identifies the entire school population as the target population. Schools are being asked to organize their resources, activities, and initiatives in support of continuous improvement while focusing on positive outcomes for students and teachers (Sugai & Horner, 2002).

SWPBIS also relies on a continuum of support based on a three-tier system. The intensity of support ideally rises with the increased behavioral needs of the student. At each tier, a student should receive an intervention appropriate to the behavior exhibited (Algozzine et al., 2012). In the first tier of prevention, the goal is to emphasize teaching, focus on academics, and encourage desired social behaviors. The second tier focuses on increasing support by reducing the impact of risk factors and employing small group interventions. The third tier requires full wraparound services and outside services, as necessary.

Blending of Tiered Support Systems

SWPBIS and RTII's preventative approach to behavior and academics adopted their three-tiered intervention strategy from the healthcare industry. This multi-tiered approach divides intervention levels into three distinct areas, often depicted by a triangle. Tier one is the level of prevention where most common remedies will work for the majority of the population. Tier two includes a smaller percentage of people for whom Tier one prevention strategies did not work. Tier three strategies are applied to individuals unresponsive to Tier one and two interventions (McIntosh & Goodman, 2016). Although this model is primarily borrowed from the medical industry, adaptations have been made to apply it to an educational context. Rather than treating medical conditions, each level can be thought of as varying levels of increased support for students as needed. This is one of the primary areas in which RTII and SWPBIS coincide and upon which the foundation of MTSS is built. It is important to note that each layer supports the other to work collectively rather than existing as an independent system or tier. Some educational institutions have attempted using more than three tiers, but the three-tiered model is the most prevalent nationwide for both academic and behavioral interventions (Dulaney, 2012). Furthermore, a student does not have to pass through all tiers to receive Tier 3. Students are not to be labeled as Tier 1, 2, or 3; rather, the tier refers to the level of support a student currently requires, and it is not reflective of a student's character or overall ability (McIntosh & Goodman, 2016).

In addition to the multi-tiered structure, RTII and SWPBIS share other commonalities, such as scientifically based interventions, instruction as prevention, use of problem-solving models, and data-based decision rules. However, there are also clear distinctions between RTII and SWPBIS, especially as it relates to implementation. RTII may initially be used to identify

students in need of special education support, whereas SWPBIS may focus on tier 1 supports in its initial implementation (McIntosh & Goodman, 2016). These distinctions are important, especially during implementation, because staff and financial resources are finite. Simultaneous implementation of interventions can be ineffective and even counterproductive due to competition for resource allocation (McIntosh & Goodman, 2016).

Several studies have indicated that behavioral and academic outcomes are unavoidably linked (McIntosh et al, 2009). One research article outlining three studies on low self-esteem found students with low self-esteem presented more instances of antisocial, aggressive, and delinquent behavior. Factors identified in this study that may contribute to low self-esteem include peer relationships, achievement test scores, and IQ measurements (Donnellan et al., 2005). Another study measuring the results of students in the 8th and 9th grades revealed students with problem behaviors were almost four times as likely to have academic and behavioral problems compared to students with academic problems alone (McIntosh et al., 2009). A study of seven elementary schools with large "at-risk" populations measured behavioral and literacy interventions applied within a tiered framework, showed significant student improvements in academic benchmarks and reductions in disciplinary referrals (Algozzine et al., 2012).

Integrating Systems Using Evidence-Based Practices

The use of evidence-based practices (EBPs) is a key structural element of MTSS. EBPs have a strong empirical basis and can demonstrate positive outcomes in multiple well-designed studies (Forman et al., 2013). SWPBIS and RTII are examples of EBPs in Education. Moreover, SWPBIS and RTII are both multi-tiered programs that have shown a record of success in schools. Additionally, the goal of the education researchers is not to integrate for integration's

sake but to facilitate the creation of a system that is both effective and efficient. With limited

budgets, staff resources, and time, it is in the best interest of most schools to integrate

comprehensive systems when possible (McIntosh et al., 2009).

In line with the positive outcomes for EBP systems, increasing evidence has

demonstrated support for the integration of both models. Additionally, legislation passed in 2000

prompted the Office of Special Education Programs to request projects focusing on both K–3

behavior and reading intervention programs (McIntosh & Goodman, 2016). Several states and

follow-on grants provided the research base for MTSS as well as evidence that the approach

to integration is both sustainable and possible once implemented (Freeman et al., 2016). A

significant issue is the successful implementation of EBPs. There is a research gap in guiding the

implementers of EBP, which may lead to the overall failure of any system integration (McIntosh

et al., 2010). Insights into closing the research-to-practice gap of EBPs are explored below.

Implementation Science

Implementation science is a new area of study within education. Research has taken

place within this area of study over the past six decades, in other social services, but primarily

within the health and medical domains. The first journal to address implementation science,

aptly named Implementation Science, was published in 2006. Implementation science has been

applied in several fields, including medicine, psychology, public health, communication,

anthropology, and, most recently, Education (Forman et al., 2013). Implementation science is

defined broadly as the study or exploration of why certain interventions work in real-world

contexts (Kelly & Perkins, 2012). Theories and frameworks of implementation science have

foundations in diffusion theory. Diffusion theory discusses the issues of "innovation, attitudes,

beliefs, and relationships of social system members, and the nature of and structure of the social

system influence the diffusion process and the adoption, implementation, and sustainability of new programs" (Forman et al., 2013, p. 83). The most commonly held paradigm within diffusion theory related to Education is Everett Rogers's diffusion of innovation theory. Rogers's theory formally involves technology innovations within education and often uses the terms technology and innovation interchangeably (Rogers, 1995). For context, innovation is described "as an idea, practice or project that is perceived as new by an individual or another unit of adoption" (Rogers, 2003, p. 12). The primary goal of implementation science is to bridge an idea to usage or (research-to-practice gap). The reasons for implementation science are significant. In fact, implementation science exists because of failed innovations and programs. Traditional approaches to disseminating and implementing evidence-based and informed practices have not been successful in closing this gap (Metz & Bartley, 2020). A study regarding innovations within the public health field found that it took an average of 17 years to institute 14% of the original research within EBPs. The same study concluded; that organizations that utilized implementation science reached 80% success within three years. (Fixsen et al., 2009). A multi-year study on implementation science within human services derived a formula of success depicted as follows:

Effective Interventions * Effective Implementation = IMPROVED OUTCOMES The formula is presented as a multiplication problem. If either aspect of Intervention or implementation is 0, then the overall outcome will be 0 (Fixsen et al., 2013). Implementation is not to be thought of as an event, but as a process that organizations undergo, following a series of informed-based adjustments that unfold throughout a two to four-year period (Bertram et al., 2014).

Implementation Drivers

Using the results from over 500 successfully implemented programs, concepts, and tools of implementation science, researchers from the National Implementation Research Network (NIRN) identified the core components (Fixsen et al., 2009). These studies encompassed an array of fields within human services. The components emerged as characteristics of successful implementation and are encapsulated by three primary drivers: leadership, competency, and organization.

Leadership drivers

Leadership drivers include the components of technical and adaptive strategies that leaders must adopt to achieve change within the system (Fixsen et al., 2013). Technical leadership stems from a managerial situation where outcomes or challenges are agreed upon. For example, if there are specific, identifiable challenges or deficits that present themselves during implementation, developing a path forward presents more of a technical challenge. Adaptive strategies are required when the outcomes, challenges, and solutions are more ambiguous. Adaptive challenges emerge when there is resistance to implementation efforts, requiring leaders to pursue nontraditional methods and approach resistant members in finding a path forward (Harn et al., 2015). Leaders are required to congregate groups and reach a consensus on how to address the underlying issues (Bertram et al., 2014). Within the context of MTSS, leadership drivers are found at the district level and require a district implementation team to successfully install programs.

Competency drivers

Competency drivers are the activities and resources that teachers, administrators, and implementers need to ensure the quality implementation of MTSS. The four competency drivers are selection, training, coaching, and performance assessment. Team selection is a vital part of the MTSS process. Different skills will be required, and though some skills can be trained, experts dealing primarily with academics, behavior, and literacy, among others, would be ideal for capturing various perspectives to ensure fidelity. Studies have indicated that in order to achieve fidelity, an organization must serve at least 60% of those intended to receive benefits (Durlak & DuPre, 2008). Considerations of expertise will also have to be weighed against team dynamics, as well as attrition (Harn et al., 2015).

Training is another component of the competency driver. Ongoing training is required to support the implementation efforts of staff and administrators. Knowledge of data-based decision-making and the implementation of data-based practices is essential to building capacity for all implementers. Additionally, training also helps facilitate any gaps the team may not be able to fill with its own personnel.

Coaching can help improve understanding and fill the knowledge gap. Coaches may be internal to the implementation team or external from sources able to provide skill acquisition or retention. Coaching is ongoing throughout the process, and not only ensures fidelity but also continuous improvement within the system (Fixsen et al., 2009; Harn et al., 2015).

Performance assessment throughout the process is essential to ensure fidelity and quality implementation. Various tools to assess the quality of the system can be utilized; these include self-assessment, walkthroughs, observations, and performance evaluations. External and internal tools relevant to the context of the school environment can help inform future action plans and ongoing interventions (Harn et al., 2015).

Organization drivers

Organization drivers are crucial components of the information systems designed to maintain MTSS. Data-based decision-making can only take place if there are tools that allow the implementers and providers to store, maintain, and analyze data. Data systems that can track and monitor academic and behavior data are a major component of a school's ability to apply interventions.

A facilitative administration allows organizations to adequately allocate resources, and personnel and eliminate barriers to implementation. Furthermore, decisions by administrators involving, for instance, infrastructure changes and developments to facilitate the interventions for the benefit of all students are key aspects of organization drivers. The administration will include the principal but may also include other members from the implementation team who are allowed to make decisions based on the data management systems in place (Harn et al., 2015). These are the primary drivers providing the underlying infrastructure of the implementation science framework. The organization drivers have the components of facilitative administration, decision support data systems, and system interventions. Each of the implementation drivers possesses the key components that drive installation. (Blase et al., 2015; Fixsen et al., 2009).

Implementation Stages

From reviewing existing studies on implementation science, researchers within the NIRN initially developed six stages to describe the implementation process for any program or organization: (a) exploration, (b) installation, (c) initial implementation, (d) final implementation, (e) innovation, and (f) sustainability. NIRN has recently refined these stages, where innovation and sustainability have been absorbed into the other four stages. Within each of the stages are sub categorical tasks required of the implementers. Proper implementation of

any innovation has been shown to take anywhere from two to four years (Bertram et al., 2015).

Exploration Stage

In the exploration stage, implementers consider interventions to assess their fit within the organization, assess the needs of the organization, and consider implementation drivers within their organization. Organizations at this stage should also come to a decision regarding their resources and key implementers. To determine the most effective EBPs, organizations need to complete a thorough examination of their strengths and weaknesses (Fixsen et al., 2013).

Installation Stage

Following the exploration stage is installation; implementers gather resources, prepare the staff and organization, and consider infrastructure changes to accommodate implementation. Organizations may need to reassign or rename job descriptions and roles to achieve implementation and form cohesive teams. An organization may have to continually adjust and make practice-informed decisions until fidelity and program outcomes are achieved (Bertram et al., 2015). Additionally, if the tools for data collection, dissemination, and analysis are not already in place, organizations need to facilitate this key requirement (Fixsen et al., 2013).

Initial Implementation

The next stage is the initial implementation, in which a key factor includes implementers adjusting implementation drivers and data systems and initiating improvement cycles. Staff during this stage are trying on their new work roles and skills. Unexpected issues, changes in roles and responsibilities, and natural resistance to change should be anticipated. Researchers recommend leaders meet these challenges by providing necessary coaching and support for practitioners. This stage is the most fragile point for implementers and organizations and is the

stage for an organization to devolve back to its old ways. External support is key to aiding organizations through this stage (Fixsen et al., 2013).

Full Implementation

At this stage, implementation drivers should be monitored and managed as necessary by implementation teams. Additionally, outcomes and fidelity measures should be considered as the organization moves to achieve a state of continuous improvement. Organizations that have achieved this stage rely on teachers and staff who are able to provide high-quality services to students on a consistent basis (Blase, et al., 2015); (Harn et al., 2015). It is important to note that while these stages are described and often depicted in a linear fashion, they are dependent on internal as well as external factors, i.e., attrition, demographics, funding. An organization may need to revert to earlier stages at any point depending on the context and organizational needs (Bertram et al., 2015; Blase et al., 2015; Fixsen et al., 2009).

There are a growing number of studies that have measured the outcomes and use of implementation science, specifically in human services. A meta-analysis on education interventions for aggressive behavior on campus determined that implementation was the second most important factor regarding positive outcomes for students (Durlak & DuPre, 2008). In another study concerning the implementation of the Lifestyle for Education Program (LEAP), implementation aspects of fidelity and dosage were measured in relation to positive student outcomes (Saunders et al., 2006). A comprehensive human-services meta-analysis consisting of over 500 studies indicated that the mean effect is two to three times greater when the tools of implementation science are used compared to non-use of those factors (Durlak & DuPre, 2008).

Implementation Team Structure

The teaming approach is one of the core components of the MTSS framework. In this context, a team is defined as more than a group of individuals coming together on occasion. A team is a group that forms for a common purpose by working together. The goal of teams is to support one another to achieve better student outcomes (McIntosh & Goodman, 2016).

The National Implementation Research Network (NIRN) has constructed guidelines for building implementation teams. At the highest levels, the state implementation team informs the regional implementation team down to the district implementation team and then the building implementation team.
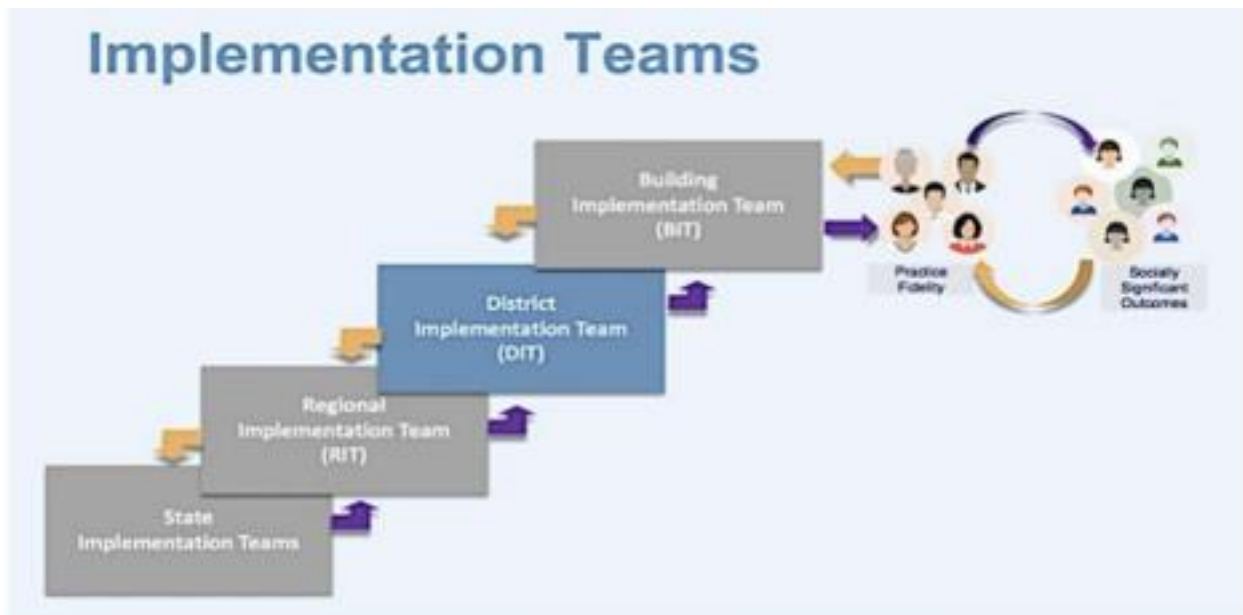
Figure 1. Implementation Teaming Structure (NIRN, 2013)

Implementation teams are part of the six active frameworks that ensure fidelity and quality of implementation. They are, in fact, "the who" of implementation science. For some schools, this may be the building or site implementation team. The district implementation team is responsible for the following areas for informing the building or site implementation team.

Assures fit and feasibility for establishing a team in each school; Facilitate the bi-directional flow of communication to establish and strengthen enabling contexts in schools (e.g., policy, funding, resources); Reviews current strengths, needs, and initiatives at the district/school level; Guides selection of effective innovations and their application as effective usable innovations; Uses a stage-based approach to develop infrastructure (training, coaching, data use) needed to support educators' use of effective innovations with fidelity; Assures timely assessments of implementation capacity and functions and uses the data for action planning; Designs or adopts an existing model for what and how data will be used and monitors data regularly to inform scale-up in additional schools. (NIRN, 2013).

(NIRN) has identified implementation teams as one of the four domains of rapid school improvement (Jackson, et al., 2013). The impact of MTSS depends on teams' ability to implement practices correctly and with fidelity. NIRN also identified five other elements that are part of the active implementation frameworks (AIF's); they are usable intervention criteria, stages of implementation, implementation drivers, implementation cycles, along with implementation teams (NIRN, 2013). Furthermore, the teaming approach is also practical and has two fundamental functions; one to distribute the workload among many individuals; two to create opportunities for collaboration.

Failures of Integration and Implementation

California has a history of beginning programs and having the implementation of initiatives fail. This is phenomenon is not isolated to California; however, implementation has failed in part due to the inability of practitioners to adjust to changes in context (McIntosh & Goodman, 2016). Previous research in RTII and PBIS implementation has also indicated common barriers to implementation. In the case of PBIS, for example, educators have felt that dealing with behavior is out of their training. Some view the concepts of a specific subject as outside the realm of the educational concepts they usually teach (Mcintosh & Goodman, 2016).

There is also the underlying resistance to change that is common not just in education but

a common feeling when new initiatives are proposed. Additionally, there is evidence to suggest in the literature that educators feel they are not fully supported in the implementation of a new initiative or its sustainment (Nese et al., 2016). Some of these issues can be addressed by refreshing various team members and when intentional bringing new staff can bring new ideas, enhance capacity, and prevent burnout (Andreou et al., 2014).

Social Networks and Implementation Teams

Highly effective teams are needed to ensure fidelity of implementation. New understandings about institutions suggest establishing a fundamental change in schools requires the design of new systems and social networks that allow more personalized and equitable opportunities to learn for a wide diversity of students (Ogawa, 2015). Therefore, driving meaningful change in schools requires a profound comprehension of both learning and the context wherein learning happens (Ogawa et al., 2008). Within the previous two decades, researchers contemplated the connections among leadership, seeing instructional authority as shared work that depends on the collaborations of educators and administrators across the school, locale, and state levels (Leithwood et al., 2010). Looking from this point of view, leadership that promotes change in schools moves beyond the actions of a solitary person to include social and professional connections (Cook & Odom, 2013). Furthermore, collaborations with others and the moves they make improve guidance and inform decisions (Knapp et al., 2014). Social relationships between educational practitioners are increasingly viewed as a crucial resource in educational research and practice (Moolenaar & Sleegers,2010). The parameters of these studies include connections internal and external to their respective organizational units.

Social Network Analysis (SNA) has emerged to understand and help improve

educational outcomes for students, teachers, and leaders (Daly, 2010). SNA has been used as a set of tools and theoretical orientations to examine the dissemination of information throughout several studies in various human service industries that benefit people. A network is defined as a "group of actors who are connected to one another through a set of different relations of ties (Daly, 2010). From a network perspective, the relationships between actors are the central focus (Daly, 2010, p. 18). Network analysis entails two broad classes of hypotheses: those that seek to understand what influences the formation of relational ties in a given population (e.g., having the same major, having relational partners in common), and those that consider the influence that the structure of ties has on shaping outcomes, at either the individual or group level (Borgatti et al., 2018). The analysis of social networks has a great capacity to inform researchers and educators about attitudes towards the implementation of policy and Intervention (Frank et al., 2010). Any number of resources, as stated previously, can flow between ties, and this may include opinions, views, and beliefs about social justice and equity. These ties are also not treated in isolation; rather, these paths and channels of information can influence the entirety of the network.

Active Frameworks in Implementation Science

Implementation teams are part of the five active frameworks found within implementation science. The active frameworks evolved over six decades of research and currently consist of (1) usable innovations, (2) implementation teams, (3) implementation stages, (4) implementation drivers (5) improvement cycles (Fixsen & Blase, 2020). Research indicates that highly effective teams are required to ensure fidelity of implementation. Past or traditional implementation efforts have been described as "letting it happen" or "helping it happen." Implementation teams are in the category of "making it happen." These teams take an active role in supporting the installation of a program or innovation. (Metz & Bartley, 2020). Furthermore,

implementation teams are the "who" and ensure the training, coaching, dissemination, and use of the other active frameworks within implementation science.

Implementation teams are part of the AIFs that have emerged from six decades of study. NIRN has identified implementation teams to be one of the four domains of rapid school improvement (Fixsen & Blase, 2020). Implementation teams are effectively "the who" within implementation science. Daly (2010) posited, "the intuitive sense that relationships are central raises important questions related to the association between relations, network structure, and efforts at change" (p. 1). In keeping with Daly's position, the purpose of this mixed-methods study is to examine the relationships of implementation teams within and their respective teams. Most implementation teams consist primarily of teachers along with administrators and other staff support as each LEA constructs its own team. Previous strategies have indicated teachers are the catalyst for meaningful change, and while still true, implementation teams are purposely constructed to provide support in the form of training, coaching, and use of data. Students can only benefit from academic and behavioral innovations accessible through MTSS if they are properly implemented.

The study was conducted through the lens of determinant frameworks by utilizing ego network analysis. A synthesized study of the literature on implementation science was conducted by the (NIRN) in 2005. The active frameworks are a type of determinant framework because they specify types of barriers and enablers. Additionally, some determinant frameworks also seek to define specific relationships between the determinants of individual actors. The past few decades have resulted in a wide range of studies within the five active frameworks and merit such consideration. While there is bound to be overlap between the AIFs, this study primarily focused on implementation teams. Early uses of the term "multi-tiered systems of support" were

part of an effort by the State of Kansas to reduce confusion about a state initiative to shift from standard RTII to school wide RTII (Sailor et al., 2018). The meaning of the term has evolved as more LEAs seek to implement the framework. MTSS models typically involve multiple systems to deliver individualized academic interventions (i.e., what would be considered Response to Instruction) and systems for addressing individual behavior needs (such as Positive Behavioral Interventions and Supports [PBIS]).

MTSS implementation teams in California have an enormous task in installing a framework designed to meet the needs of all students. The MTSS framework provides a set of guidelines for implementation and attempts to unify disparate systems. Social dynamics and implementation team networks can be one of the most influential factors in the installation of MTSS.

Chapter Three: Methodology

This chapter provides a methodological account of the study utilizing a mixed-method explanatory sequential study design (Creswell & Plano Clark, 2018). This study aimed to understand better the context, factors, enablers, and barriers for implementation teams installing MTSS, through the lens of their social networks. A growing body of research suggests that organizational contexts play a significant role in installing evidence-based practices in education (Lyon et al., 2018). Furthermore, studies in schools where interventions have successfully been implemented and sustained indicate "effective leadership" may hold as much significance as any other external or internal factor (McIntosh et al., 2016), with implementation teams being the primary vehicle for leadership. Leadership in this context centers around the expertise of implementation team members. While many studies provide statistically significant measures regarding the effectiveness of implementation factors and student outcomes, few explore the relationship between school implementation teams and factors influencing the "effective implementation" of interventions in educational settings. To understand the issues implementation teams may experience, the following research questions have been addressed:

Research Questions

1. What are the factors influencing implementation teams while installing the MTSS framework?

2. How do team members' ego networks influence implementation?

Research Design

The research questions have been addressed utilizing an explanatory sequential mixed-methods study design (Creswell & Plano Clark, 2018). This study design was selected due to the

context in how implementation teams receive training from the same county office. All LEAs received the same training, although their specific contexts were different and addressed a diverse demographic of students. This situation creates a bounded network of individuals receiving the same "treatment" or training. The rationale for this design is due to the specific nature and use of implementation teams as the primary driver for installing the MTSS framework. This mixed-methods approach allows for collecting quantitative and qualitative data, providing a more nuanced examination tool. The sequential aspect of the design allows the researcher first to capture an overview of the network scope and participants. After analyzing the initial data, the researcher can then use the second phase to expand on the quantitative data by adding a qualitative context through interviews that elaborate on the experience of participants.

The rationale for using both methods lies in examining the ego networks of implementation team members. Relying on a singular method cannot provide a complete picture of how the social networks of implementation teams influence the implementation of MTSS. Quantitative data allowed for the mapping of team members' ego networks (1st phase of data collection). However, this data was limited in capturing who and why people seek specific people or resources related to MTSS. Qualitative data was then collected and analyzed to examine how those networks affect implementation (2nd phase of data collection). The qualitative phase provided insight into whom teams consult regarding dynamics, factors, and barriers to implementation. A mixed-methods study intended to develop an enhanced description of the teams using both data methods (Creswell & Plano Clark, 2018). The context of several types and sizes of LEAs in the same implementation process is the main reason for this study design. A comparison of whether LEAs face similar issues could provide information significant to implementing the MTSS framework. The diagram below illustrates the research design

process (Creswell & Plano Clark, 2018). Furthermore, the study design allowed the researcher to explore the dynamics of an inter-organizational structure between the county department of education and their respective LEAs.

Quant.: quantitative
Qual.: qualitative
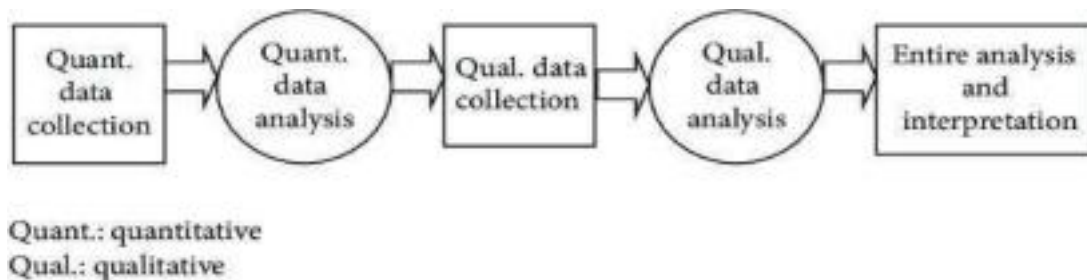
Figure 2. Explanatory Sequential Study Design Stages

Context of Study

This study involved three implementation teams, although six teams were invited participate, from the same county office of education undergoing training and implementation of the MTSS framework. Implementation teams within this study have been installing MTSS as a framework to improve student outcomes. Teams in this study were a part of the second cohort of schools participating in this process. Although training protocols recommend a minimum of three to five members, teams varied in size and personnel depended on context. Team members included site staff, administrators, and district personnel as appropriate. Training recommendations included members that possessed specific skill sets that were associated with each team. For example, a counselor, school psychologist, and administrator. The members assigned to each team were at the discretion of each respective LEA. Though all LEAs participated in the same training, each of the implementation teams' contexts provided a unique perspective not previously explored in both ego network research and MTSS studies. Complete

MTSS implementation may take anywhere from three to five years. With guidance from the local county office of education, schools conducted an initial self-evaluation followed by the initial installation phase. After undergoing the initial self-evaluation, LEAs selected a specific tier one intervention focused on improving academics or behavior outcomes for students. In the context of MTSS in California, this is either RTII or Response to Intervention or SWPBIS or School-Wide Positive Behavior Intervention and Support. Through an examination of the ego networks of implementation team members, this study explored the factors, barriers, and facilitators teams encounter during the implementation process.

Social Capital Theory

This study is partially driven by and conducted through the lens of social capital theory. Social capital is described as "a collective asset in the form of shared norms, values, beliefs, trust, networks, social relations, and institutions that facilitate cooperation and collective action for mutual benefit" (Burgess et al., 2020, p. 3). Theorists define social capital as "the sum of the actual and potential resources embedded within, available through, and derived from the network" (Mooelenar & Seegers, 2010, p.99). This social network theory perspective accounts for the relationships that either facilitate or constrain the flow of resources, usually in the form of knowledge, information, best practices, and influence (Finnigan & Daly, 2014). Hean et al. (2012) and Dennick (2012) suggest that theories that describe and explain social interactions are beneficial (Hean, et al., 2012). Social capital theory also has descriptive and explanatory power and is a summation of several concepts and can be applied in this study as follows: Network characteristics; External resources within the network; Team working skills among members; Internal resources among network members.

Although MTSS implementation teams are purposely constructed to leverage team

members' strengths, the reality may show that team members rely on external sources of information and knowledge. This study's results may better inform the construction of MTSS implementation teams or other targeted interventions for students. Social capital consists of both the resources available to and potentially generated by the network. Social capital has the power to describe and explain how professional groups bring knowledge, resources, and character regarding their profession (Hean et al., 2012).

Social Network Theory

Social network analysis research shows effective reforms are often found in professional relationships and developed interactions. Exploring the networks of implementation team members may reveal relational factors that influence MTSS implementation teams (Daly, 2010). Before and during implementation, social network data can be examined to reveal connections and gaps in groups and design implementation strategies responsive to the local school context. As social network theory suggests, network ties have the potential to shape attitudes and behavior. Network metrics for individuals, teams, or whole networks can be used to test hypotheses about whether and how social ties explain implementation outcomes. Social networks, specifically "educator networks," can affect diffusion, adoption, knowledge transfer, and problem-solving within a school (Borgatti et al., 2018). Teachers, administrators, and other staff members holding significant roles in implementation teams are all included in this study.

Furthermore, an examination of social network structures can help researchers understand the exchange of information, resources, enablers, and barriers among implementation team members (Woodland et al., 2014). Specifically, network data can be used to identify influential actors, or those who should be targeted for implementation or engagement efforts and explore the general social structure within a network (Yousefi Nooraie et al., 2017). The social

network constructs, both formal and informal, may impact the effective implementation of the MTSS framework.

Ego-net Analysis

The ego-net analysis is an approach to social network analysis; in social science research, it is also described as "actor-centered" or "personal network" analysis (Mamas et al., 2019). Analysis of ego networks allows researchers to analyze the size, composition, and structure of a person's social network (Borgatti & Halgin, 2011). Egocentric data is from the perspective of a singular actor's set of connections (De Lima, 2010). Within this context, personal network research design allows researchers to determine if team members of successful teams tend to have a substantial number of connections with others, diverse networks, or personal attributes related to their success (Borgatti & Halgin, 2011).

Individuals know the resources they have access to, and their social capital influences their access and perspective of those resources. In the Baker-Doyle (2010) study of urban high school teachers' advice networks in a science professional-development program, they found that the informal networks impact their access to practitioner-based social capital (PBSC). PBSC refers to the resources, knowledge, and support available through the informal network of professionals (Baker-Doyle, 2010). The researchers identified three ways to develop expertise transparency. 1) present the background and expert knowledge of the teachers to a group, 2) give teachers strategies and opportunities to collaborate and learn about each other's expertise, and 3) discuss PBSC and explicitly encourage collaboration with individuals who have diverse backgrounds or experiences (Baker-Doyle, 2010). Baker-Doyle and Yoon (2010) suggested that conversations explicitly about the power of PBSC, sharing of expertise, and time to collaborate with others may help support the development of PBSC in a meaningful way that impacts

educational reform. The practitioners in this study are all members of their respective

implementation teams and are experts within their relative area of practice. The implementation

team members serve as the subject matter experts for their respective teams and LEAs.

Participants

Members from six implementation teams were invited to participate as they began

implementing the MTSS framework for their respective local education agencies. All teams in

this study participated in the same training cohort through their county office. Teams consisted

of three to five members per team. At the time of the study, these teams were in the initial phases

of implementation. Implementation is a multiyear process and is estimated to take three to five

years depending on size and context of the organization. Due to the worldwide pandemic, full

training and implementation were delayed. As a result, this study's data collection began in the

spring of 2021 and concluded in the summer of 2021. The potential pool of participants was an

estimated 30 team members, based on information from their respective team members. 27

respondents completed part of the survey and of those, 13 members answered enough of the

survey to be included within the study for a 48% completion rate. The teams that participated in

the study represented three teams with members from a large comprehensive district, a team

representing an alternative school system, and a team representing a small elementary rural

district. Though six teams were part of the second cohort, some LEAs were contextually similar,

so the focus was on three teams that differ in context and student populations they serve. Each of

the LEAs involved in the implementation of MTSS in cohort two differed in terms of context

and population of students they serve. The LEAs selected their personnel based on guidance

from the county office of education. However, team members selected were also contextually

dependent. The examination of the teams and their networks provided data consequential to the

communities they serve.

Data Collection and Analysis

The explanatory sequential design consisted of four steps that can briefly be summarized as follows, 1) quantitative strand to define the qualitative parameters, 2) analysis of the quantitative data to define those parameters, 3) initiation of the qualitative strand with semi-structured interviews (Appendix B), based on the analysis of the quantitative results, 4) concluding with an interpretation of the qualitative results (Creswell & Plano Clark, 2018).

The initial part of this study began with an electronically disseminated survey (Appendix A) of implementation team members participating as part of a cohort of schools within their county office of education. The survey was constructed using the Qualtrics survey tool which is freely available to all graduate students at UCSD. The initial portion of the survey asked for consent from the participants, in accordance with IRB requirements.

There are several methods for gathering ego-net data. For this study's purposes, the name generator method was utilized to capture a team member's ego network (Hlebec & Kogovšek, 2012). The name generator method allows individuals to identify significant members of their network, regardless of their position on the implementation team. Part of this study was to determine the influences of individual networks upon implementation teams, and some of those sources of influence may exist both internal and external to the implementation team. The name generator method typically involves three elements; alters, network structure, and alter attributes. Alters in this study may have some connection regarding the MTSS framework, PBIS, RTII, and knowledge of equity issues in Education (Agneessens et al., 2006). Anonymity was preserved by using pseudonyms to protect the identities of participants and school sites. Egos were randomly assigned a numeric identifier.

Network ties between team members create pathways for the flow of a variety of network content, between members, alters and potentially throughout the LEA (Daly, 2010). During this phase, ego-network measures including tie central tendency or "degree," tie dispersion, and alter central tendency were calculated to gain an understanding of internal and external dynamics and connectedness (Mamas et al., 2019). Degree or tie central tendency is the number of alters in the network. Tie dispersion examines how ties are spread in the network, which evaluates the composition of the network and only requires information on ego-alter ties. For binary data, tie dispersion refers to measuring the extent to which a team member's ties are equally distributed across distinct types of relationships, such as friendships, professional ties, family ties, and so on (Mamas et al., 2019). A third measure is alter central tendency, which is analogous to tie central tendency with alter attributes instead of ties. The survey also included demographic information and questions regarding informal and formal structures within their LEA. Members were asked to identify team members, colleagues, or resources from which they seek advice or advice on MTSS issues, including PBIS and RTII interventions. As already noted, Implementation teams included large districts, rural districts, and charter organizations. Formal and informal structures, as well as roles, may vary depending on the context of the LEA.

Once ego-network data was collected, a visual or graphical representation of each network was created. The visual depiction of each network allows the researcher to look for patterns within the structure of the network (Borgatti & Ofem, 2010). Analysis of that data was used to outline and determine the ego networks of MTSS implementation team members. The network dataset from implementation teams could provide consequential network data to include dissemination patterns, informal and formal structures, and influential sources beyond implementation teams.

The quantitative phase of this study informed the qualitative phase. Following the survey results, ego networks were examined to determine information dissemination patterns and other actors of influence. Then, key members and alters were invited to participate in a follow-up semi-structured interview (Appendix B). This second phase of the study utilized semi-structured interviews to understand key team members' networks better and explore facilitators and challenges towards implementation. Four team members agreed to participate in the interview and were asked to name the network members they seek in MTSS implementation matters as well as contextual questions about their connections. The semi-structured interview allowed flexibility and for the interviewee to personalize their data and experiences. Central actors were interviewed, and interview transcripts were analyzed to determine patterns of influence and information dissemination. The semi-structured interview also allowed the participants to remap their ego networks with the use of a concentric circle design that allowed the interviewee to indicate a degree of importance for each network actor they identified.

The main analysis method involved coding themes derived from the initial survey, implementation science frameworks, and a thorough review of the interviews (Maxwell, 2013). The analysis of thematic elements provided deeper context as to factors affecting implementation. An analysis and comparison of themes, and the in-depth analysis of the participants' ego networks, gave insight into how information, procedures, and practices are disseminated in a way that enabled or inhibited the MTSS implementation process.

Interviews were conducted in a secluded setting at the discretion of the participant. Due to current COVID-19 restrictions, all the interviews with one sole exception were conducted and recorded through a video conference platform. Participants were notified of interview procedures in advance of the interview and informed of their ability opt-out at any point before, during, or

after the interview. Additionally, these interviews were coded to provide participants with anonymity and protection. All data is password protected in the case of digital media. If hard copy transcripts were generated, all copies were kept in a secured cabinet. Once the responses were thoroughly examined and cleaned, the data were systematically analyzed. Participants were also invited to review their transcripts to provide validity and accuracy.

County representatives agreed to share any data or survey questions distributed to implementation teams as part of the MTSS training. Due to the varied nature of how each LEA is adapting to the Covid-19 pandemic, some teams were not able to fulfill the training requirements and, therefore, were not able to participate in the study.

Ethical Considerations and Positionality

The study was conducted in line with the IRB requirements from UCSD and Cal State San Marcos. A letter of support has been obtained and the county office providing training expressed its willingness to support this study. A significant consideration is the willingness and ability of schools to participate. To ensure participants were involved in the consent process, a consent letter (Appendix C) was sent prior to receiving a link to the online survey. Additionally, the beginning of the survey had an active consent form (Appendix C). All participants were assured that all data collected would be treated with the utmost confidentiality. Pseudonyms were used for individual participants and organizations. Permission was obtained for any audio recordings prior to the initiation of an interview. Participants had the opportunity to withdraw from the study at any time.

The MTSS process includes a self-evaluation of the systems within schools that may produce inequity among students. This can be a highly controversial and sensitive topic for some schools. Students were not involved in the study, nor were they surveyed directly. However,

teachers, administrators, and other educational partners were interviewed depending on the results of the ego network survey and the construction of their implementation team. As a result, internal relationships could have been a factor. For implementation teams, where the dynamics of someone being in a subordinate role professionally warranted some consideration. Additionally, for schools with closer ties, IE charter schools where all members of the implementation team may be from a singular school site, relationship dynamics could emerge and cause unintended friction because of an individual's self-examination of their ego network in contrast to their professional roles.

With regards to my positionality, my school was a member of the first cohort participating in the MTSS process through the local County office of education. I am one of the primary implementers within my school as the Assistant Principal, and as a result, my school was not included in this study. I have had familiarity with the implementation process as our team has already participated in the initial training as described within parameters the county has set. The MTSS cohort is composed of several school districts, throughout the County. School district leaders were asked to form implementation teams consisting of school site members as well as district-level representatives. For charter schools, implementation team members were formed primarily from staff members of their respective schools.

Chapter Four: Findings

This study sought to examine the ego networks of 13 MTSS implementation for team members representing six MTSS teams in Southern California. The goal was to provide a better understanding of the context, factors, enablers, and barriers for teams to implement MTSS. This research was guided by the following questions:

1. What factors influence teams while implementing the MTSS framework?

2. How do team members' ego networks influence implementation?

To answer these questions, a sequential mixed methods design was employed (Creswell et al., 2018). Data collection for this had occurred in two phases. In the first phase, 13 implementation team members completed the survey and both quantitative and qualitative data were collected. The full survey can be found in Appendix A. This survey tool was constructed using the Qualtrics platform and disseminated during a regionally led MTSS training session. The results of the first phase of this study provided both quantitative data in the form of demographics and ego network data and some qualitative data in the form of short answers. The examination of ego networks provides a theoretical lens and evidentiary basis through which the human and systemic aspects driving MTSS implementation could be evaluated.

The second phase in data collection began after an initial analysis of the survey data. Subsequently, four interviews were conducted to provide depth and context to the data collected in the first phase and to add relevant context to the MTSS implementation process. Qualitative data from the interview was coded using deductive coding derived from the initial survey and was also guided by implementation frameworks of organization and competency. Qualitative data was then examined with the assistance of data analysis software "Delve." For this study, participants were recruited from a cohort of schools undergoing MTSS implementation through

their county's local education agency. Six MTSS teams were part of this cohort. The individual teams varied in terms of size, context, and location but represented traditional, alternative, and county team members.

As discussed in Chapter Two, this research was also guided by and examined through the lens of implementation science. The use of implementation science is critical within education for the successful implementation of innovations benefitting schools. The national implementation research network (NIRN) has studied implementation in a variety of settings and has pooled its knowledge for the benefit of all implementation science practitioners. NIRN has identified key implementation drivers required for any innovation to be successfully implemented. Implementation drivers are crucial components, which promote the usage of the program or practice and its subsequent influence on students. Implementation drivers ensure that essential competencies are developed and that necessary organizational support and engaged leadership are provided (SISEP, 2013). Implementation drivers facilitate and ensure the success of initiatives. They are based on common features existing among many successfully implemented programs and practices (NIRN, 2018). Part of this study was aimed at determining how these drivers, specifically the competency and organizational drivers, present themselves while examining the team members' networks.

The following table describes the data collection sources for this study and how they address each research question.

Table 1. Research Questions and Data Collection Methods

Research Question	Data Collection
What factors influence teams while implementing the MTSS framework?	MTSS member network survey MTSS member interviews Team member demographics
How do team members' ego networks affect implementation?	Name generator method Ego Network measures Ego Network maps

Demographic Results

MTSS team members were recruited during a county-wide training session. County implementation team members participated in the study along with the local MTSS team. Six MTSS teams were involved in the implementation process at the time of the study. The potential participants who were not in attendance at the training were sent the initial survey to be filled out later. 13 team members responded to the survey. The sample of respondents was drawn from one alternative school, one traditional secondary school, and the county implementation team. The respondents identified the roles within their MTSS team: Administration (n=4), Staff member (n=3), School Psychologist (n=2), Teacher (n=2), County team member (n=2). The respondents were anonymized and informed that participation was completely voluntary and that they had the option to opt-out of the survey at any point. The survey included a follow-up question asking whether the participants would like to take part in a follow-up interview. Of the sixteen participants, three were not included in the ego network maps due to a lack of data in mapping their networks and /or because they provided partial answers to the survey questions. One respondent was interviewed even though they did not initially participate in the survey.

The preparation of the dataset involved two steps: the creation of ego-net data maps and the transcription of interviews. The survey responses were then analyzed to create the ego net data maps. All the survey respondents were either members of an MTSS implementation team at their respective LEA or members of the MTSS county implementation team that guided the implementation. The survey respondents were asked the questions: "Who do you seek advice from or consider your primary resource(s) regarding MTSS *(Consider people internal and external to your team to include personal and professional contacts)*. Please identify their name and role. If more than one, list them in order of importance." The table below depicts demographic information as well as workplace settings according to the participants' responses. The table below provides some context for the composition of implementation teams.

Table 2. Respondent demographics

Gender	Percentage	Number
Female	76%	10
Male	15%	2
Self-Describe	7%	1
Racial Identity	**Percentage**	**Number**
African American	15%	2
Caucasian	61%	8
Latinx	23%	3
Education Setting	**Percentage**	**Number**
Elementary	23%	3
Secondary	18%	4
District	23%	3
Other	23%	3
LEA Type	**Percentage**	**Number**
Traditional	18%	4
Alternative	18%	4
District	7%	1
County	18%	4
LEA Role	**Percentage**	**Number**
Administration	18%	4
Staff	23%	3
School Psychologist	15%	2
Teacher	15%	2
County Member	15%	2

The MTSS participants were also asked to rate their overall experience levels. The

following question was also posed: "Have you worked with MTSS, RTII, or PBIS before?"

Respondents were asked to rate their overall experience with MTSS, RTII, and PBIS using a

Likert scale. The tables below are constructed to help understand the survey respondents'

attributes about their experience with MTSS. Table 3 displays the respondents' self-assessment

of their experience levels and Table 4 displays how they overall rated their team members. 13

responses were recorded for the following question.

Table 3. Ego Self-rated level of Experience with MTSS, RTII, PBIS

Level	None	Number	Some	Number	Moderate	Number	Extensive	Number
MTSS	7%	1	23%	3	46%	6	23%	3
RTII	15%	2	7%	1	61%	8	15%	2
PBIS	0%	0	7%	1	38%	5	53%	7

Team members were also asked the question: "Considering the entirety of your MTSS team, how

would you rate the teams' level of experience with MTSS, RTII, and PBIS?"

Table 4. Ego Rated MTSS Team Member's Level of Experience

Level	None	Number	Some	Number	Moderate	Number	Extensive	Number
MTSS	0%	0	62%	8	23%	3	15%	2
RTII	7%	1	62%	8	31%	4	0	0
PBIS	0%	0	38%	5	31%	4	31%	4

The table below (Table 5) depicts each ego and how they self-rated and rated their

respective MTSS team related to their level of experience. The expertise of each ego could be a

factor that may influence the implementation process. The table provides insight into each ego,

where (S) indicates a self-rating and (T) indicate how the corresponding ego rated their team.

Some of the egos did not rate themselves or their team and, therefore, were not included in the table below. However, the data below provides context as to the expertise of each ego. One respondent did indicate that they had no experience with RTII. Ego ten indicated their team had no experience with RTII and one respondent ego12 indicated no experience with MTSS while ego 6 indicated no experience with RTII. All respondents did indicate at least some expertise or experience with one of the systems of support.

Table 5. Ego Likert Matrix Level of Experience Self and Team Experience

EGO ID	MTSS (S)	PBIS (S)	RTII (S)	MTSS (T)	PBIS (T)	RTII (T)
1	some	moderate	extensive	some	some	some
2	extensive	extensive	moderate	moderate	some	moderate
3	some	some	moderate	some	some	some
4	moderate	extensive	moderate	some	extensive	moderate
5	moderate	extensive	moderate	some	extensive	moderate
6	some	moderate	*none*	some	some	moderate
7	extensive	extensive	extensive	some	moderate	some
8	moderate	extensive	extensive	some	some	some
9	moderate	extensive	moderate	moderate	extensive	some
10	moderate	moderate	some	extensive	extensive	*none*
11	extensive	extensive	moderate	extensive	extensive	some
12	none	moderate	some	moderate	moderate	moderate
13	DNA	DNA	DNA	DNA	DNA	DNA

Network Data

In addition to the team expertise of each ego, I sought to capture who each ego sought for information within their network. Since I was interested in exploring the social capital of MTSS team members, this was an important measure to utilize in this study. Social capital is partly characterized by the size of an ego's network (Lin, 2000). By asking each ego a series of questions related to their network, I was able to determine the size of each ego's network by calculating the degree, which is the number of alters in the network. The s*ize of the ego network* is the number of nodes they identify, in addition to the ego. For this study, we utilized the name

generator method to elicit a list of names for establishing each ego's network. From the list of names, I established the network map for each ego. The table below depicts the size of each ego's network along with the egos' demographic information as it relates to MTSS. Each of the respondents in the survey was asked the question, "Who do you seek advice from or consider your primary resource(s) regarding PBIS or MTSS? You could consider people who are either internal or external to your team, including your personal and professional contacts.

Table 6. Ego Demographic Data

ID	Gender	Size	Years of Ed Experience	LEA Role	Race	LEA Type
1	Female	3	18+	School Psychologist	Caucasian	Traditional
2	Male	3	18+	Teacher	Caucasian	Alternative
3	Female	3	18+	Administration	Caucasian	Traditional
4	Female	2	18+	Ed Specialist	Caucasian	Traditional
5	Female	3	18+	School Psychologist	Caucasian	Traditional
6	Male	2	18+	County Member	Latinx	County
7	Female	4	18+	Administration	Caucasian	County
8	Female	2	18+	County Coach	Caucasian	Traditional
9	Female	2	14-17	District Member	Caucasian	Alternative
10	Female	6	18+	District Member	Latinx	Alternative
11	Female	4	18+	Administration	African American	Alternative
12	Female	4	18+	District Member	Latinx	Alternative
13	Female	9	18+	County	African American	County

As a follow-up to this question, the respondents were questioned, "How often do you confer or interact with the person(s) every week?". The table below indicates an aggregate of the respondents' answers. This information is included as it provides further context as to how often egos interact with their network members. The data would indicate that 66% of respondents meet at least once a week.

Table 7. Frequency of Interaction between MTSS members

0-1 / week	2-3/week	4-5/week	preplanned meetings	other
25%	16%	25%	25%	8%

The table below indicates the naming conventions for egos and alters, for the subsequent ego network maps. The number assigned to each network member is not an indication of importance; rather, it was simply the order in which the ego or alter was named in the survey. The information procured from this data set allowed for mapping of the ego networks to include actor attributes.

Table 8. Naming conventions for EGO network maps

MTSS Role	Identifier
Administrator	A
School Psychologist	P
Ed Specialist	S
Teacher	T
County Team Member	C
District	D
Director	DR

Using the name generator method, the network map (Figure. 3) below was generated to depict the egos and their named alters. Egos are the focal point of this study and the alters are the direct connections the egos have identified with either during the survey or the subsequent interviews. The following network maps provide the size of each network and depict certain attributes of each ego and alter, providing further context for each network member. To protect respondent identities, the egos and alters have been anonymized. Many respondents hold high-level positions within their implementation team because of the responsibilities of their roles within their specific site. The survey was completed by all the identified egos and three of the

respondents completed both the surveys and volunteered to participate in the interview. One respondent did not complete the survey but agreed to an interview because of their high-level role in the installation of the MTSS and was a named alter by some of the egos.

The egos are represented by ovals and the alters each ego identifies which are indicated by a rounded square. A 1.0-level series of ego networks is pictured in the diagram above, which means that no ties between alters are depicted, and only the connections between ego and alter are shown (Mamas et al., 2019). The connections are shown with a straight line and the assumption here is that these connections are two-way, meaning that information and resources are shared between connections. The network map below also indicates each network's male/female ratio. The green nodes are males, and the yellow nodes are females. The gray nodes did not wish to be identified or did not identify with a particular gender. 11 of the 13 egos identified as females. The two male egos had a single female in their network who could be identified. Within their network, the remaining 11 egos had mostly female alters. Six of the ego networks were entirely females. Ego 13, who also happened to be the MTSS director, had the largest and the most diverse network. This is potentially significant as it shows that the ego networks of team members consist primarily of female members. In the network map below, EGO IDs are assigned a number followed by a letter that indicates their respective role within their MTSS team. The alters are designated by a number.
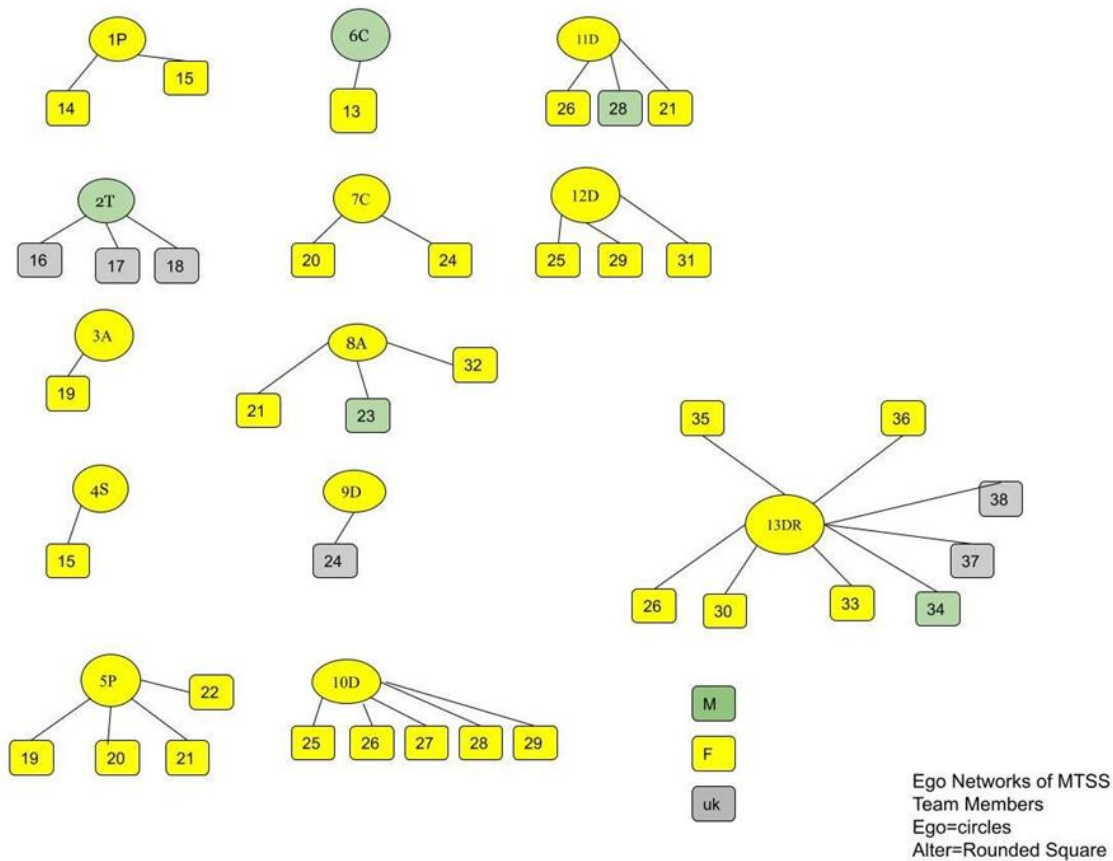
Figure 3. Ego network map by gender and MTSS Role.

The next network map below (Figure 4) depicts the egos' context regarding their LEA setting. Furthermore, each ego's identified alter is classified as an internal or external connection. Colored circles define the egos in context with the colors identifying their distinct LEA type. Squares represent alters as identified by each ego. As illustrated in the legend, distinct color schemes indicate whether the ego identifies an internal or external alter. An internal alter is a team member within the ego's local school site or the MTSS team. An external connection is someone identified outside of the team members' LEA or who is external to the MTSS team.

This provides some context for the homogeneity of their networks and network size

(Borgatti et al., 2018). The average network size of all survey respondents was found to be 3.6.

While accounting for the educational context of the egos, the average size of those in a

traditional school setting was noted as 2.6, those in the alternative setting as 4, and those at the

county level as 5. This, potentially, could indicate that the networks at the county level have

more connections and subsequently more access to resources and information. This leads to the

potential impact for facilitating information and influencing within implementation teams.
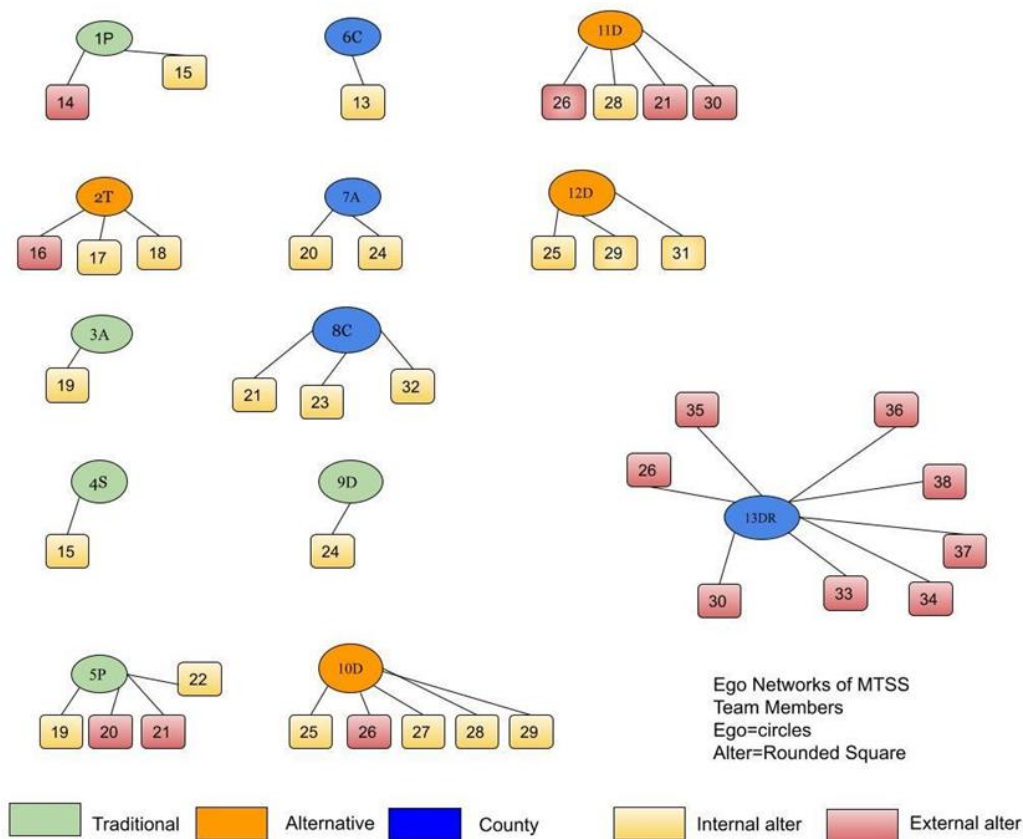
Figure 4. Ego network map by LEA context; internal and external connections

The map above provides some context regarding how ego networks may affect

implementation teams. The network map, although still a level 1.0, shows which alters are

connected to the ego and whether they are internal or external to the MTSS team. Furthermore, a larger network would imply that those teams and members have access to more resources. Based on the egonet maps below, county-level members have access to more resources than a school team member would have. The ego networks with more diverse networks when it comes to internal or external alters may have a more diverse range of source and social capital. Social capital is the idea that social relationships provide access to resources that can be exchanged, borrowed, and leveraged to achieve goals (Moolenaar et al., 2012). While all egos indicated at least one internal alter, seven egos named at least one external alter as a resource.

The network maps provide the ability to visualize the size and attributes of each ego network. The networks below are homogeneous as it relates to gender. All the egos below are females and the majority of the alters are also females. Only two of the alters identified as male, which were alters 23 and 33. Two alters, 36 and 37, were identified as organizational resources for ego 13. Ego 13 has the largest and the most diverse network, however, all the identified alters were external to their team. All the egos who elected to participate in the interview had more than 18+ years of experience in education and had at least one previous iteration with MTSS in some other context.

Table 9. Demographics of interview respondents

ID	Degree	Role	Years of experience
5P	5	School Psychologist	18+
8C	4	County MTSS Coach	18+
11D	5	Alternative School Director	18+
13DR	9	MTSS Director	18+

Data Mapping Concentric Circles

To provide additional context to the connections between egos and alters of the interview participants, a participatory visual map was employed while collecting their ego net data. The interview respondents were not only asked to name their alters, but also to rank them as a primary, secondary, or tertiary source, using the concentric circle map as a visual aid. In the following diagram, all the egos are represented in the middle of the circle. Three survey respondents consented to the interview portion of the study. The MTSS director also completed the interview and the visual map. The alters identified were inclusive of the county, state, and national resources.

The respondents were asked to complete their circle and the map below represents an aggregation of all the interview respondents. Due to the pandemic restrictions, all but one of the interview respondents constructed their circle virtually. Ego 13 had the opportunity to construct their concentric circle in a live interview setting. For the remaining participants a digital image of the concentric circles was displayed on the screen. The respondents placed themselves at the center of the circle and named alters on the radiating arcs based on the degree of importance they assigned to each. The stronger or more important connections are placed closer to the center of the circle. The concentric circle shape is beneficial because it allows respondents to identify the strength and importance of relationships between the ego and alter(s) (Mamas et al., 2019). The interview participants' ego networks are depicted on the concentric circle map below along with their named alters. Placing all the egos on the same circle map helps in demonstrating how other egos may rank the alters they share, and the strength and quality of their ties as compared to their peers.

Although the egos participating in the interviews serve their teams in different contexts, the network map indicates some sharing of resources across ego networks between shared alters. The interview respondents did not name other egos as alters but all the interview respondents have a shared alter with at least one other ego. This could indicate a path of shared resources and influence among different teams. The map also provides more depth than the initial interview questions utilized to generate the previous network maps. It is important to note that the ego networks of individuals interviewed were larger than those that only answered the survey. Ego 7, for example, only named one other person as an alter in the survey, but after a subsequent interview identified three additional alters that they would seek for information or as a resource.

This could be due to several reasons, one of which is that the use of a visual aid could be a catalyst to refresh the memory of the interview participants. The use of a concentric circle map allowed the respondents to think about their network in more detail. Moreover, the use of this technique during an interview allows the respondent to talk about their network while thinking about who may be in their network. The limitation of the survey format to collect data is a known limitation of name generator methods due to recall issues (Bell, et al., 2007; Matzat & Snijders 2010). Additionally, the map below utilizes the same color scheme as Figure. 4 to indicate context as well as internal or external alters.
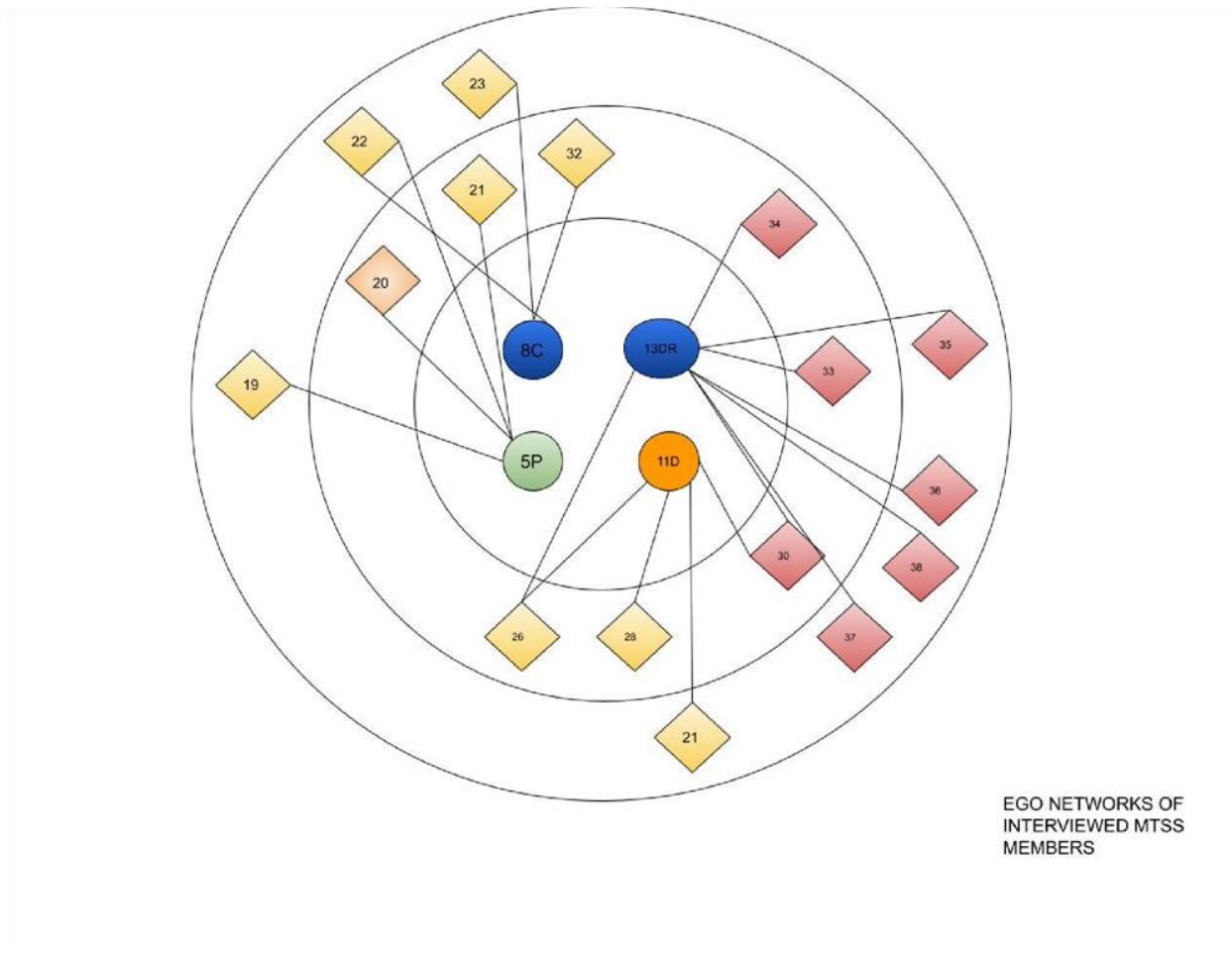
Figure 5. Interview respondents and identified alters on a concentric circle map

Meta Egonet Analysis

Due to the uniqueness of the MTSS training process, all teams in this study received training in a cohort style model from the same regional delivery system. This presents an opportunity to analyze all the ego networks of MTSS teams within this study in a unique context. Previous network maps portrayed the ego networks as separate entities, although they may have unrealized links because of the cohort model of training and coaching teams received. This is, in fact, the model that the State of California is using for many counties throughout the state.

County offices will be the training arm of the state and will adjust the requirements to meet the needs for each of their respective local education agencies. All the ego networks of MTSS team members participating in the study were included, thereby creating a meta ego network where all ego-alter relationships and measures can be explored and analyzed. With the assistance of a I was able to input the connections of each network member within the study. Social Network Visualizer (SocnetV) is a multi-platform, user-friendly, free software application for social network analysis and visualization (Kalamaras, 2015). Social Networks are created or imported from files and are drawn as graphs, where vertices depict actors or agents, and edges represent their ties. A node was created for each actor but was still formulated from the perspective of each ego. The software allows the user to input all the possible connections for each node, through a visual input format. For comparison, some other software programs require a number matrix to be utilized for data entry. For consistency, I used the same number identifiers as the previous network maps. While the previous network maps were constructed to visualize each individual network within a specific context; the use of the software results in a visualization that allows the depiction of all connections between all teams and network members within the MTSS cohort. Additionally, other network measures may be calculated with the assistance of the network visualizer. The figure below is a depiction of all the nodes randomly placed throughout the map. The connections are undirected, which assumes that resources and information flow both ways. Node sizes and colors are assigned by the software. The nodes become larger with more connections and the color changes on a red to blue spectrum. For example, red nodes have more connections than the blue nodes, and green nodes lie somewhere in the middle. In the network map below, shapes were assigned to distinguish between male and female actors. Female actors

have a diamond shape while male actors are designated with a square shape. The egos and alters are also designated with a label.

Figure 6. Meta-ego network map of MTSS respondents' undirected networks

Another unique feature of the software is its ability to calculate such measures for all actors within the network such as a degree. The degree indicates how prominent an actor is within a network. The degree matrix below shows the calculated degrees for all actors within the undirected MTSS network. The gray diagonal box indicates the degree for each actor within the network when all other elements are 0. Based on this measure, ego 13 is the most prominent actor with a degree of 9.
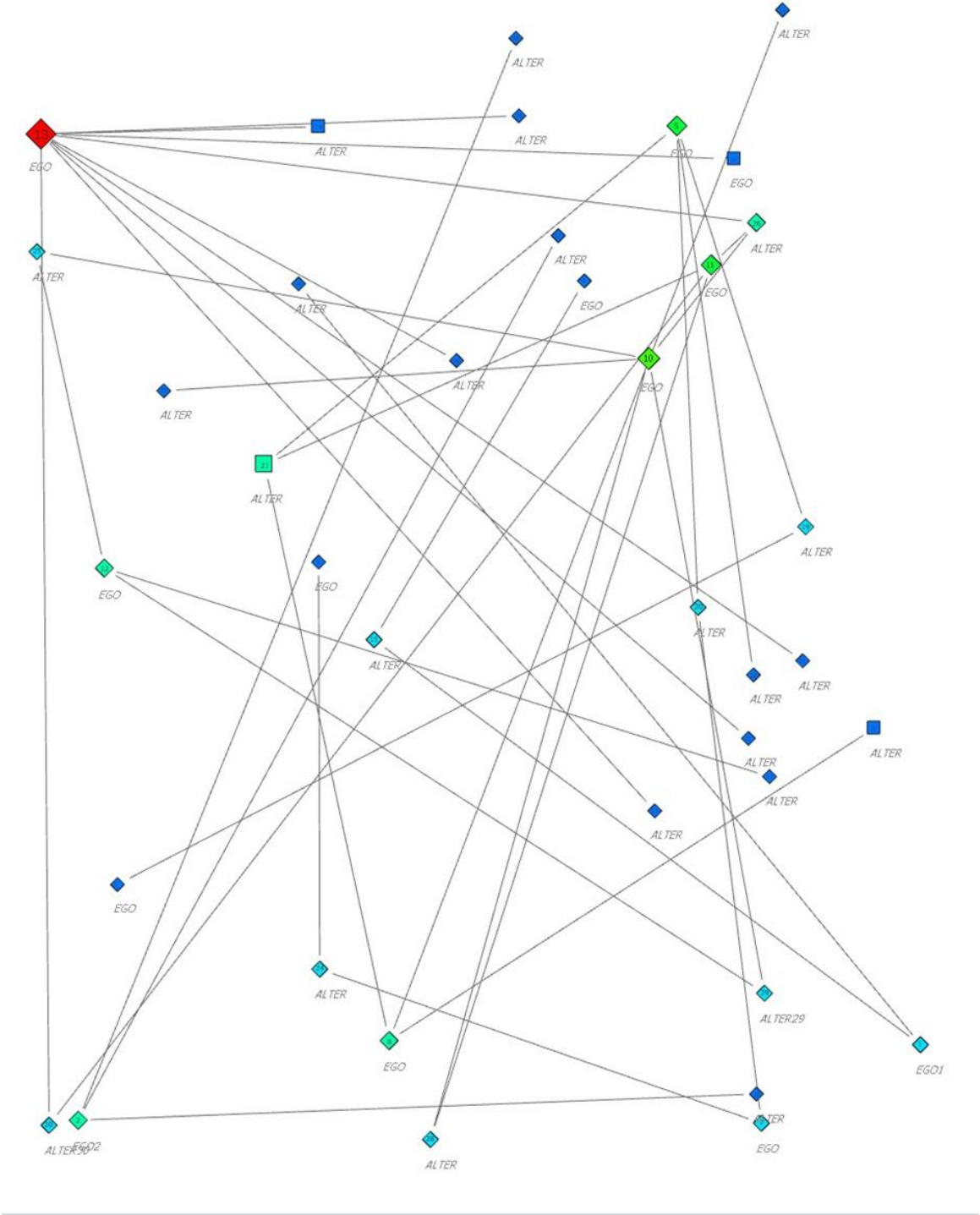
The degree matrix D of a social network is a NxN matrix where each element (i,i) is the degree of actor i and all other elements are zero.

Actor/Actor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Figure 7. Degree matrix for actors in the MTSS meta-ego network

The final meta visualization displays the degree centrality. Degree centrality is the sum of all connections to a single node. The following map is a combination of the interview and the survey responses, and it visually depicts a degree of prominence for each actor within the network. For the next diagram, any named connection from the survey was given at least a strength rating of 1.0. A connection that was named as a primary resource in the interview was given a strength rating of 3.0 and a secondary resource was given 2.0. The strength ratings are indicated adjacent to the line depicting a connection between network actors. Actors towards the center of the radial arcs have more connections and, thus, more weighted connections. Based on the diagram and the software calculations, nodes closer to the center have more and stronger connections in the meta ego network. The radial arcs assist in depicting importance within the network. Larger nodes indicate more connections. The sum weight of those connections also pulls nodes closer to the center. The visualization depicts a galaxy of ego networks and their related alters.

This is potentially a significant measurement in answering the question as to how networks affect and influence implementation. While alters tend to be on the outer radial arcs, some egos have fewer connections and influence. Ego 13 has the most connections and degree of centrality, which is perhaps due to their role as an MTSS director. Interesting to note is that ego 12 is depicted as a large node, even though its position is further out on the radial arcs. Egos 5, 8, 13, and 11 gravitate towards the center as they were able to describe the significance of their network connections and identify primary and secondary sources. Alter 21 is the closest alter towards the center. Although alter 21 did not participate in the survey or the interview, this individual was named by several network members, thereby indicating their importance within the network. If able to interview the other network members (alters), it would have been

interesting to see the resulting diagram if all the nodes were able to provide more context for their specific network.
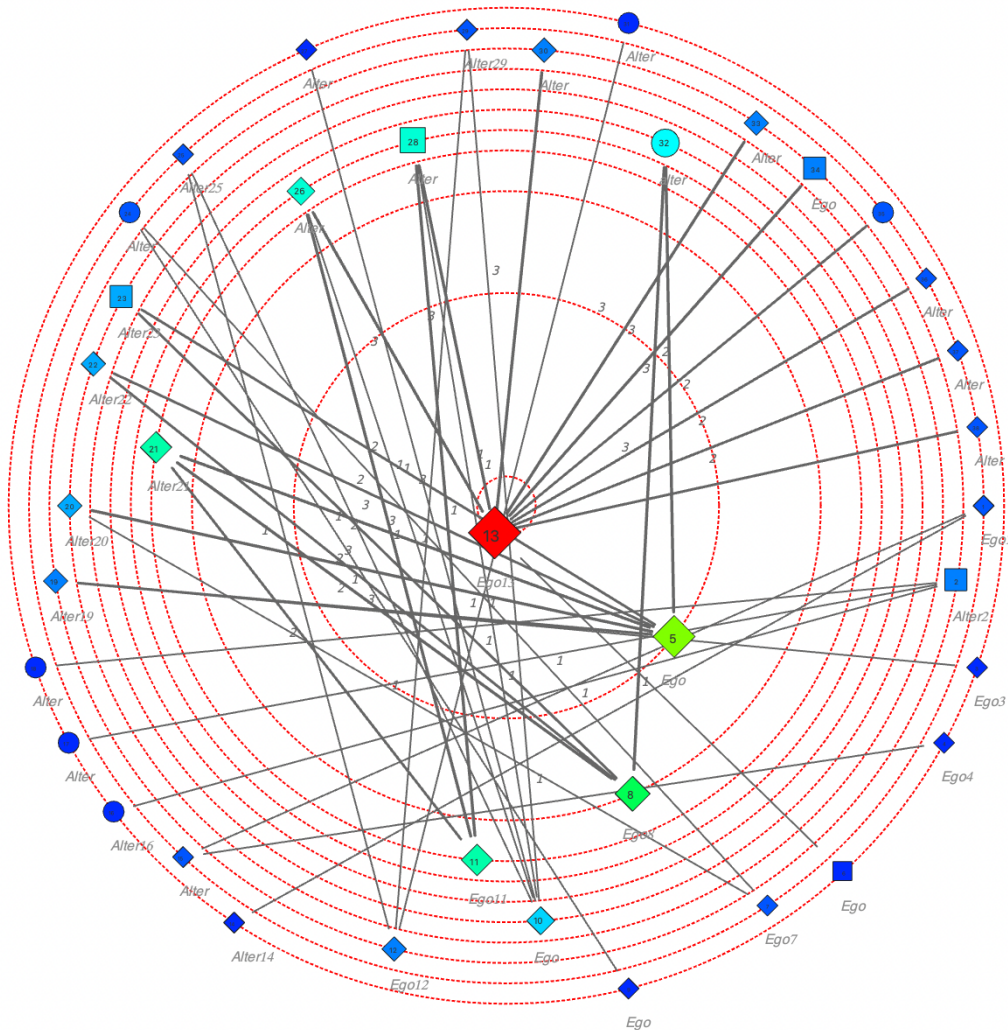
Figure 8. MTSS meta ego network on radial arcs

Ego Net Perspectives

In addition to the demographic information, three open-ended responses were collected from survey respondents to gather perspectives regarding the barriers, facilitators, and goals of implementation teams. This data adds depth and context to the connections visualized within the ego network maps. The data from those questions are presented in Table 10 below. The following questions were asked of each respondent: "What are the primary goals for your MTSS

team? What do you perceive as barriers to implementation? What do you perceive as facilitators of the implementation?"

The following are direct responses given by the survey respondents. Some answers are paraphrased to protect the identity of the respondents. Although ego one did not answer the open-ended questions, their data was still included in the study due to the available demographic data and alter data that enabled the mapping of their network. Ego 13 did not take the survey but agreed to an interview. Their answers were given in the interview portion of the study. The shaded egos represent the survey responses from the interview respondents. More context is derived from these responses within the interview portion of the study. Furthermore, the information from these survey answers helped shaped some of the semi-structured interview questions. Additionally, the data also allowed an initial look at how the implementation drivers presented themselves in the initial stages of MTSS implementation. The qualitative information begins to give context as to the factors implementations teams encounter.

Table 10. Open-ended survey responses by egos

EGO ID	Primary Goals	Barriers to Implementation	Facilitators of Implementation
1	Did not answer open-ended questions		
2	Technical assistance surrounding the student	COVID-19 restrictions, time, alignment among	Collaboration
3	Increase student achievement	Universal Tier 1 instruction	Continued training/coaching
4	Establish the tiers	Teachers who did not embrace tier1, wanting someone else to fix the problem	Getting teachers to buy into it.
5	Organize and structure the program; begin implementation	Staff Resistance	Success of interventions
6	Helping each school in the district to organize their efforts so that it is all connected and is seen through "everyone's lens."	A lack of understanding about how it will benefit the school and students by organizing their efforts	When this team gets to function highly as I know they can, they will be able to provide guidance and support to the school sites that will be helpful and practical
7	Improved student outcomes and school connectedness for students.	Getting actionable about the work	Getting clear on the next steps and who does what.
8	Support best first instruction, building the capacity of staff to better serve students	Time and competing initiative-system level leadership at the table	Helping people understand the benefits of a system approach
9	Support and access for all students in becoming the best versions of themselves.	Time and building a well-developed process	No answer
10	Provide the resources and systems to support students to excel.	None	All staff working together for the same goal.
11	Effectively and efficiently meeting the multiplicity of needs of each student in the least amount of time possible.	The greatest is the inequitable distribution of resources and understanding of the process	Proper training, as well as accountable measures, will allow the MTSS structure to work well.
12	More intentional and standardized. Being more data driven.	Our program is very regional, and some areas have different issues than others. They tend to work as silos rather than as a collective.	Our program shares the same value of making a difference in students' lives
13		Did not answer the survey; answers given in interview	

The goals for MTSS teams are generally aligned, responses such as "increase student achievement, improve student outcomes, meeting students' needs." These are all goals, MTSS implementation teams can find commonality. There is also commonality with regards to barriers.

Interestingly, although this data was gathered when COVID-19 protocols were established, only one respondent mentioned it as a barrier. There seems to be a common thread among the respondents in anticipating resistance amongst staff for a variety of reasons. While the first question articulated many goals alluding to positive outcomes, there seems to be at least a perception of resistance among team members and the teams they serve. The responses in terms of facilitators of implementation are a little more varied by lie within the realm of continued coaching, training, and understanding the benefits for students. Prior MTSS research has indicated that these are common among implementation teams (Mcintosh & Goodman, 2016).

Greyed boxes in the table above indicate the egos who elected to participate in phase two of the study which involved semi-structured interviews. The interview responses allowed to add deeper context to the survey responses as well as a more detailed inspection of interview respondents' ego networks.

Interview Analysis

To analyze the subsequent interviews, data from the initial survey responses above were used to derive initial codes. The survey responses informed the initial coding choices, which are depicted below in Table 11. The coding choices are also guided by the implementation science framework and the drivers needed for successful implementation.

Table 11. Coding Choices

Barriers to Implementation	Facilitators of Implementation	Implementation Goal
Passiveness/Staff resistance	Training/Coaching	Student achievement
Lack of understanding	Teacher Buy-in	Establish foundation
Time to build	Team Function	Improve student outcomes/meet needs
Resources	Clarity of process	Support access/provide resources
Silos rather than collective work	Shared values/collaboration	Standardize data/be intentional

Factors of implementation and team goals

The semi-structured interviews allowed for a deeper examination of those ego networks as well as the context and dynamics of those relationships. The first wave of coding was deductive and was broadly based on the research study questions and looked specifically for keywords and phrases related to the implementation challenges and facilitators. The audio from each of the interviews was transcribed with the assistance of the software on "otter.ai." A second transcription was carried out to verify the accuracy of the information and to replace the participants' names with pseudonyms. The participants were informed that they could cease the interview at any time and were provided an opportunity to review their interviews (Maxwell, 2012).

Analysis of the interviews was conducted with the use of qualitative analysis software, "Delve." Several rounds of deductive coding were performed through the additional lens of

implementation drivers of competency and organization in combination with the input from survey respondents. Under the organization, the driver exists the components of coaching, training, and selection. Within the competency driver, exists the components of systems intervention, facilitative administration, and data decision systems.

According to the previous studies in organizations utilizing implementation science, these features are common in well-implemented programs and innovations (NIRN, 2018). The interviews were reviewed several times to verify that these implementation code words were in conjunction with the survey responses. Throughout the interview analysis, I looked for evidence of these components from each interview respondent as well as refined the list of codes with the help of the Delve software. The software allowed for frequency analysis as well as contextual categorizing of phrases and keywords. The presence of the components and related drivers may not only affect the egos' MTSS team but may also shape the perspective of other actors within the network depending on their place within it. While the first phase of the study measured the egos' potential influence on the network, phase two focuses on how the egos may shape their network and their respective MTSS teams.

Interview Respondents' Perspectives

Part of this study was to understand the relationship of ego networks among the team members and their effect on the implementation of MTSS. This was explored further using semi-structured interviews. "Networks are a way of thinking about social systems that focus our attention on the relationships among the entities that make up the system" (Borgatti et al., 2018, p. 2). Their responses are framed within the context of drivers that are necessary to drive implementation. The egos that agreed to the interview portion of data collection consisted of two county MTSS members, one MTSS team member from an alternative setting, and a member

from a traditional elementary school setting. The interview respondents were given pseudonyms to protect their identity and maintain the confidentiality of their teams. Frances is our MTSS Director, Denise is the Director of the alternative school setting, Caya is the elementary school psychologist, and Kristina is the county coach. Although it was covered in chapter 2, I will also briefly define each of the drivers and the related components.

Implementation Driver: Organizational

The organizational drivers are utilized to establish the infrastructure and support needed to establish the environment for new programs and innovations. There are three subcategories of organizational drivers: facilitative administration, data support systems, and systems interventions. The interviews uncovered the contexts and the situations where these might be present for each of the respective teams.

Facilitative Administration

Facilitative administration depicts how leaders utilize various procedures to assist individuals in using the program or practice (NIRN, 2018). The information they use informs decision-making to help in the general implementation cycles and to keep the staff coordinated and focused on accomplishing the outcomes.

The expertise of these leaders was a significant quality for implementation teams. The interview respondents had numerous long stretches of involvement, and each had more than 18 years of experience within the education field. All respondents additionally had related knowledge with MTSS and had some related knowledge in preparing for MTSS in some other setting. All the interview members had at least one previous iteration of MTSS implementation experience and were either in a current administrative position or had recently held a site

administrative position. The direct quotes from the respondents will help in illustrating how a facilitative administration affects implementation. When asked about her role, the county member Kristina responded, "I have had school administration experience, and so as an executive leadership coach, I support school leaders, and superintendents or program managers at the district level and school improvement." While speaking about one of her team members, Kristina also stated, "she is our MTSS coordinator at the county and I would see she has a wealth of deep knowledge around MTSS."

Caya, the elementary school psychologist, spoke of her colleague when asked who she turns to for support in MTSS: "She really is the one who takes the leadership role, in you know, does our coordinating of meetings and, you know, so I would say right, in terms of that, but in terms of the rest of you know parceling out things, I really feel like it's all equal like we're really equal." Although she does name only one person as her primary source of information, she does indicate that there is a level of shared responsibility within her team.

Within the alternative school setting, Denise stated about a county contact: "She is critical because I did not know what MTSS was until I met her. We have been together now for about three years." Additionally, Denise spoke about her immediate supervisor: "My boss had some level of familiarity with MTSS before he was in his prior district. He and I can talk about all things MTSS." There is clear evidence from respondents to suggest that from the administration a high level of expertise is sought after to enable decision making and general implementation. Furthermore, administrative leaders are sought to provide critical support in facilitating implementation.

Data Support Systems

An effective data-driven decision-support system includes quality assurance data, fidelity data, and outcome data. Data needs to be reliable, regularly reported, integrated into everyday routines, accessible in classrooms and buildings, and usable for making student, teacher, and building decisions. According to the research from NIRN (2018), data should include both quantitative and qualitative indicators, with a focus on the experiences of practitioners, students, and families. It is essential for the implementation of MTSS to have systems that would inform decision-making. To guide decisions, I looked at how team members used both quantitative and qualitative data. As well as the type of data, the team members needed to be able to view all aspects of the data objectively.

In answering the question about what she looks for in individuals from whom she seeks data, Denise, the alternative education director, replied, "I'm looking for people who can be more objective, and you know data driven. Also, anecdotes, you know, are important. Qualitative data is just as important. I don't go to people who can't see both sides of the coin to come up with an equitable solution."

Frances, our MTSS director, had individuals from her local network but also resources outside the county network including state and national level trainers. About her initial experience in learning about MTSS, she stated: "They were all colleagues or friends of my current assistants. I forged relations with all these folks." One of her primary resources is also Kent Mcintosh, a leading researcher and academic expert in school violence prevention, bullying, school discipline, and racial disparities in school discipline. In asking about the factors that lead to seeking out certain individuals she stated, "I am learning or enhancing what I've already learned." Being able to talk about it and understand what it is, can be very scientific, because a lot of it is borrowed from PBS and those learning structures."

When Francis was asked what the most key factors were to be considered while deciding on

MTSS, she said,

> "In terms of my role and support, the leadership team has to be there. I don't want to train with anybody if it's just, I call them to check signers. I prefer to have folks there who can make decisions around alignment, around LCAP, and around whatever outward-facing commitments and goals you're telling the public. For me, the most important factor is, who is going to take ownership of this work, and are you all in, as far as the entire system."

From her perspective it is clear a high level of ownership is needed from all who

participate in the process; not just the team members but the leaders who elect to have their

organization implement MTSS. The leadership needs to be present not just to authorize action

but to examine the local data as well.

While certain perspectives and attributes were shared by individuals from whom the data

was sought from, there was a lack of information to support teams using quantitative data to

guide decision-making. NIRN has indicated that both qualitative and quantitative data need to be

present to effectively guide decision-making. The respondents indicated the importance of using

the data; however, how that data was used to guide decision-making was not clear.

Systems Interventions

Systems intervention has to do with the organization's ability to seek resources and

actively collaborate with partners external to the organization (NIRN,2018). This component

primarily presented itself in who egos sought as sources of information or advice. The school

psychologist from the traditional school district specifically sought out someone from their

organization internally because they were familiar with the organization. In one instance, Caya,

our elementary school psychologist was asked, "Is there anyone outside your school network or

maybe in your personal network that you would go to for advice about MTSS?" The answer was simply "no."

In contrast, the three other respondents looked to both internal and external resources. The director of the MTSS team was asked, "Are there any individuals outside your immediate network that influence anything regarding MTSS, PBIS, or RTII?" Her reply was, "There are yes, they are in education but through the restorative justice lens. There are folks who are people in equity work. And when you're doing work like MTSS you have to be able to be prepared to address those inequities because you're talking about database decision making."

As previously mentioned, Frances also identified national figures, such as Kent Mcintosh, a leading researcher, and an authority on MTSS was named and identified as a primary resource. Additionally, the director also had other MTSS directors and individuals that existed outside the primary LEA in which they served.

From the alternative school setting, Denise emphasized the importance of making stakeholders, both internal and external to the organization, to be a part of the decision-making process. Specifically, Denise commented on the size and depth of the team stating, "Both executive directors are on the team. We have a person in charge of data, the person in charge of stakeholder involvement, and the person in charge of operations. And then we have home teachers, special ed, and general ed. We have our coach who is our specialist in positive school culture, PBS. We have our nurse; we have a counselor. So, we just tried to get representation from all divisions or all roles, as well as our regions, we have seven regions."

Though Denise did not originally name these as individuals who she sought advice or even consulted with, this indicates her team was larger and more networked than her ego

network would indicate. This is an aspect not explored in-depth in this study, that is the alter(s) of alters.

Implementation Driver: Competency

The competency drivers are activities that develop, improve, and sustain practitioners, administrators, and support staff's skills to implement programs and innovations that benefit students. The four competency components include selection, training, coaching, and fidelity assessment (NIRN,2018).

Selection

To effectively staff a program, it is necessary to specify the knowledge, skills, and abilities that are required. It means identifying skills and abilities, which are the prerequisites to the work ahead, and deciding on which of them will be developed once the person is hired. Selection materialized in the interviews through the attribute's egos identified within the alters they regarded as resources. Kristina, the county coach, specified the characteristics of those from whom she sought information and stated: "their ability to be forward-thinking and visionary. I would also say that there is a tenacity in the work, they have a strong belief that this is the right work." Caya, the school psychologist, identified attributes related to their expertise and made the comment about her counterpart, "she's a clinical psychologist, so I feel like she has some really unique insights into ideas for intervention or interventions that might work." With regard to building out their team, Denise stated specific roles and the people that could fill them,

> "We have a coach who is our specialist in positive school culture, we have a nurse and a counselor, we just tried to get representation from all divisions or roles. We have the person in charge of data, the person in charge of stakeholder involvement, the person in charge of operations and then we have home teachers special ed, and general ed. That was kind of how we chose our team and decision making, you know, responsibilities." She also elaborated on the general

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characteristics of team members, "their knowledge, their ability to see the big picture, the systems that are in place. Our MTSS team is used as a decision-making body, so they must be high-level thinkers."

Within the context of her team, Denise seems to have clearly defined roles for her team members. While this qualitative date indicates a network of individuals that have clear responsibilities, this was not necessarily evident in the network she initially identified.

When Frances, our MTSS director, was asked about whom she selected as her resources, she named several state and national figures in MTSS. When asked who was the most important in helping her make a decision regarding MTSS she stated,

> "They were all important initially as I was trying to build my capacity and enhance what I've already learned. Being able to talk about it because it can be very scientific." She also added, "It was about building a basic knowledge base to help others understand it."

Additionally, when asked about which leadership qualities she values the most from those she has worked with, she explained, "experience is what I really hold high for me, I want to work with folks who can reach back and say this is what I did when I was in the system." The component of selection also emerges in the demographics of interview and survey respondents.

Many egos and the alters named had considerable experience within the field of education. All the interview respondents had prior training in the MTSS framework. Furthermore, the statements made by the interview respondents indicate their team or network members should be individuals who support and believe in the work to be worthy of their time. Besides seeking those who may share similar perspectives, egos also sought out individuals who could continue to build their own capacity.

Training/Professional Learning

NIRN established this for knowing when, how, and with whom to apply new skills and the practices that are essential for teachers, practitioners, administrators, and staff. The training should include information related to the theory and underlying values of the program; using adult learning theories to engage participants and introduce components and rationale for crucial practice; provide opportunities to practice and receive feedback in a safe supporting learning environment.

Most of the training and/or professional development presented itself in the form of regularly scheduled training sessions with county representatives. The importance of training was evident in the interviews. Frances provides some context regarding her training experience during her first-time training in MTSS. The following statement was made when asked about the most important factors that need to be considered while deciding on MTSS.

> "And I walked out of there after eight sessions like, what did we just do over eight months like, how do you launch, how do you lift. What I brought to the inner circle was "I've gotten a lot of training, but how do we make it understandable?" "I don't want to train with anybody if it's just, it's, I call them to check signers. And again, that was an experience right. I went to eight months of MTSS training, but no one from the executive cabinet was there, or high senior leadership to say hey, indicate what our LCAP requirements were. You're sending this group of folks to these training sessions so for me the most important factor is, who has it and who's going to take ownership of this work, and are you all in, as far as the entire system."

The alternative director also indicated the importance of training. "And if we don't train everyone accordingly, accurately, we will definitely pay the price for it. Because we're so large, and everybody has their own idea about what they think should happen." Caya and Kristina did not speak of their training experience in depth. Kristina remarked, "there were specific things we called out for the team leadership training, but it is still hard to measure impact." This specific remark came in response to questions regarding the effectiveness of training. Caya, the school

psychologist, only recalled her initial experience while training in MTSS. She recalled, "it wasn't laid out like it is right now. It was very, very basic. It was just the three tiers. And it wasn't, it just wasn't as detailed as it was." It is clear from some of the quotes, that the MTSS process has undergone some evolution and there is evidence to support a desire to acquire a deeper level of training to facilitate understanding of MTSS implementation.

Coaching and Fidelity

Coaching and fidelity assessments are the essential components of the implementation of any innovation. Fidelity is quality assurance; it questions whether we are doing what we intend to do and whether we know it would make a difference. Fidelity sets a minimum standard for using an innovation. Coaching could be defined as the way to see how well any innovation is being used and help practitioners initially meet and then routinely exceed the fidelity standard.

The element of coaching presented itself in a few ways in the interviews. Firstly, coaching is built into the implementation process and in certain phases, all sites will partner with a county coach. Unfortunately, due to the pandemic, this element was severely diminished in its application. Many of the schools that were supposed to have an assigned county coach were only able to access their coach via virtual zoom sessions. While it was still provided as a resource, the lack of being on a school site and working with the team in person could limit the applicability of coaching strategies that may be in direct relation to the context of the school site. Kristina, the instructional coach, presented some perspectives about this implementation driver. In her role, her work was primarily with school administrators and the data was used to target specific areas of implementation of MTSS. From her perspective in coaching her leaders, she would give the following advice, "implementation needs to pause in order to celebrate small wins or unscaled victories so that you can recalibrate and reset next steps." With regard to fidelity assessment,

while it is an important component of the implementation, this activity takes place at least annually. Most teams involved in this study had not yet reached this point to be evaluated internally about the task of a fidelity assessment. This process is outlined and guided by the Schoolwide integrated framework for transformation or SWIFT. The interview respondents were also asked to elaborate on the possible barriers for implementation. This was a carryover from the survey, but the interview transcripts revealed more context.

Barriers to implementation

In the survey I previously consolidated, the perceived barrier(s) to implementation were found in the following areas: passiveness/Staff resistance, lack of understanding, time to build the framework/resources, and silos rather than collective work. Quotes from our respondents seem to support the presence of these barriers to implementation. The following quotes provide additional context for the barriers MTSS team encounter.

Passive Staff Resistance

In the area of passive staff resistance, Frances provided more context from her perspective as an MTSS director working with various LEAs. Though she does not specify a particular school she said, "new teachers can sometimes be tainted by veterans, so it depends on the values of those individuals that may provide a barrier or facilitator towards implementation." She also elaborated that a lack of understanding and training could present itself as a barrier. "It was just understanding like the terminology, understand then for me, it's also important that I understand that I can apply that activity to it so I can help explain it to someone else, so initially it was just about how do we build-out."

> Caya, from her perspective as an elementary school psychologist, added staff
> members view this as, "oh, it's one more thing on my plate, you know, and there's

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so much I think that is going to be rolled out at the lower tiers that, and especially for our SST process, and I, I just think that there's going to be some barriers to it."

Lack of Understanding

Another barrier mentioned and that had an evidentiary basis was the knowledge base needed to facilitate implementation. Kristina provided from her context that without data understanding, it might be hard to accomplish, "And so while we're collecting data, it's really hard at this time, I'd say to measure impact yet. But that is a huge goal of ours because we want to know that the work that we're doing is having an impact." This could be an indication of where her team was in the process of implementation. This seems to indicate that not many on her team had a high level of understanding or even data to inform the decision-making process. She also added, "lack of vision or compliance, that idea of here's another hoop, we've done this before, what's going to be different about it? And so, their action orientation is sometimes compromised because there are competing commitments." This was a common perception among egos within the network and demonstrates that, at least, a passive level of resistance, especially from staff that may not have been fully trained.

Facilitators of implementation

Respondents were also asked about perceived facilitators to implementation. Several examples were provided by our interviewees. Kristina elaborated in her context as a county coach, "I would say like other administrators or Tosas (teacher on special assignment) somebody who is truly dedicated to the MTSS work. I feel like there is a stronger implementation when that's definitely under somebody's purview." She also added, "implementation plan that has regular follow through and support." Moreover, she elaborated on the characteristics of the team members as facilitators of implementation, "I would just say that those that are just willing to try

something like there is this we can do it together approach and they do not operate under therefore it is not going to work. It is this positive asset-based lens."

In her context, Denise in the alternative school setting stated that the team members acted as facilitators of implementation: "knowledge, their ability to see the big picture, the systemic systems that are in place Because our MTSS team is used as a decision-making body, so it has to be, they have to be high-level thinkers." Denise added that training and learning were important for the entire team, "We had to really get clear on what MTSS was and how we could use it to assist us in improving our efficiency and effectiveness."

The quotes above provide an evidentiary basis that there are facilitators to implementation and the people in their respective organizations are the primary catalysts toward successful implementation. There are also commonly held perceptions as to the barriers to implementation. The characteristics and attributes of the individuals to drive implementation and address the issues at a systemic level are what egos perceive as positive factors. Frances elaborates on the matter, "experience is what I hold really high for me, I want to align myself with folks who can reach back and say this is what I did when I was in the system." The quantitative and qualitative data support the notion that expertise within the system and within MTSS are highly sought-after attributes of individuals on teams as well as within the egos' networks.

Summary of Findings

This study sought to find how the ego networks of implementation teams affect the implementation of a multi-tiered system of support. The study also sought to elicit perspectives from the respondents as to the other factors influencing implementation. Data was collected through an initial survey of team members from various MTSS implementation teams. The

survey was followed by a series of interviews of MTSS members who consented to the interview. An analysis of both the quantitative and qualitative data yielded several key findings: (a) ego networks and their teams are influenced by key individuals with expertise in MTSS, (b) ego networks possess similar attributes in relation to the respective ego, (c) egos with diverse backgrounds tend to have larger and more diverse networks and egos who have more connections tend to have more social capital and access to resources both inside and outside of their MTSS teams, (e) barriers of implementation include a lack of understanding and initial resistance related to time constraints and competing commitments, and (f) factors that contribute to successful implementation include the expertise of team members and their willingness to take ownership of implementation. Moreover, these key findings will be discussed in-depth in Chapter five.

Chapter Five: Discussion

Overview of the Study

This study explored the ego networks of MTSS implementation teams, and how those networks informed and influenced team members in the process of implementation. In this study, the goal was to study the gap between implementation practice and the relational aspects between team members.

Discussion of Findings

This study yielded important findings about the ego networks of MTSS implementation team members and their influence on those teams and the implementation process. Furthermore, the examination of those networks yielded data from a sample of actors within those networks as well as their potential to influence their respective teams and educational institutions. This study aimed to provide decision-makers, educational partners, and leaders with information in building, developing, and guiding their MTSS implementation teams. Another methodological advantage of using ego network analysis as the focal point of this study was in terms of network boundaries. Unlike whole social network analysis, ego network analysis allows respondents to include actors not part of their primary MTSS team (Borgatti et al., 2018).

Influence of Ego networks

Contacts between individuals in organizations or teams are important in the adoption of new practices or programs. This has been a long-studied aspect of organizations including theories such as the diffusions of innovations theory (Rogers, 2003) and Bandura's social learning theory. Because of their ability to allow for the examination of relationships between

team members, ego networks were chosen as a lens through which to analyze MTSS implementation teams. I was interested in this aspect because I wanted to understand how a person's position affects their team members and MTSS implementation overall. Social capital, which is defined as the benefits that actors can secure because of their network connections (Portes, 1998), is a key driver of innovation. There are two fundamental approaches to studying individuals' social capital: one focuses on the structure of the ego's own network, while the other focuses on the characteristics of the alters to whom the ego is connected (Lin et al., 2001).

The data presented in this study suggests there are key relationships that influence the egos' decision-making process and many of the networks rely on both internal and external resources to inform their practice and decision making. Data regarding the extent of the relationships within the ego networks of MTSS team members suggests networks are homophilous with regards to gender, race, and expertise. While this may indicate a level of trust among network members as prior research indicates (Fischbach, 2018), this also leads to network redundancy. Network redundancy means that the resources, connections, and ultimately points of view are shared. While necessary to aid the flow of information and resources, different viewpoints and unique perspectives are limited.

The data also suggests the structure of networks at the local school site level may be more reliant on smaller networks to drive implementation. The average network size of all survey respondents was 3.6. When accounting for the educational context of egos, the average size of those in a traditional school setting was 2.6, those in the alternative setting was 4, and those at the county level 5. The networks are larger at district and county levels and therefore have a larger pool of resources and information at those levels. The data also suggests as networks became larger, networks also became more diverse in representation. Networks with diverse

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representation allow for non-redundant connections, which as a result allows for different viewpoints and unique perspectives to enter the network. Our MTSS director had the most connections and the most non-redundant connections. With those connections, the opportunity exists to bring those unique perspectives to the MTSS network through the redundant connections other network members may share.

The intention of MTSS is to respond to the diverse needs of all students. Those needs can only be met with diverse views and voices from the decision-makers and the networks that inform their decision-making. Looking from this point of view, leadership that promotes change in schools moves beyond the actions of a solitary person to include social and professional connections (Cook & Odom, 2013). This is discussed further in the next finding.

Social capital in context

The characteristics of actors may provide information and understanding of how those characteristics may influence other actors in the network or team members. One of the most common measurements in ego network analysis is the ego-alter ties. This is the number of alters an ego has a direct connection or the degree of their network. Degree or tie-central tendencies are dependent on the name-generator method. Another common metric in social network analysis is homogeneity. The homogeneity of networks may provide some insight into the influence of ego ties on one another. The data in this study suggests networks of MTSS teams are mostly homogeneous in terms of gender, race, and experience. 84 percent of egos included in this study identified as female. In fact, only two egos identified as males and only three alters from all networks were identified as male. Furthermore, 62 percent of respondents also identified as Caucasian.

Data from the networks of implementation teams is in congruence with demographic information from the California Department of Education which indicates the education workforce is 73 percent female and 63 percent identifies as Caucasian (California Department of Education, 2021). Though changing the demographic makeup of the larger education workforce is certainly necessary to answer the needs of an increasingly pluralistic, diverse, and global society; this may be an area where decision-makers can make an immediate impact when considering the composition of their MTSS teams. Data further suggest expertise and prior experience with MTSS is a factor common among network members. 46% of respondents had moderate experience with MTSS, 61% of respondents had experience with RTII and another 31% had experience with PBIS. Furthermore, team members rated their team members and reported, the following: 62% had some experience with MTSS and RTII while another 32% reported some experience with PBIS.

The data procured in this study also suggests individuals from diverse backgrounds may have larger and more diverse networks and result in more connections. Although specific demographic information was not gathered for all alters, the alters identified by egos that identified as African American were not only more diverse but also more experienced in education and in MTSS. For example, the two African American respondents hold Doctorates in education, have over 20 years of experience within education, and had more than one previous iteration of implementing MTSS within their career. Prior studies also support the idea that peers from diverse backgrounds "reduce unconscious implicit biases inside and outside the classroom and lead to innovative and social cohesion" (Warner & Duncan, 2019). It is also interesting to note that in the mega-ego network maps one of the alters (Alter 21) has a higher degree of centrality when considering all the ego networks involved in the study. The data also suggests

alter 21 had more social capital than all but three of the egos within the study. Though this alter did not participate in the study, the person was identified and had a diverse background when compared to the other actors within the network. This could be a potential consideration for leaders when assembling implementation teams. Prior research indicates a greater diversity of educators may help mitigate feelings of isolation, frustration, and fatigue that may contribute to educators of color leaving the profession when they feel they are alone (Carver-Thomas, 2018). This is certainly an issue that can also be addressed in the composition and construction of MTSS teams. There is some data to suggest that the attributes of certain egos may lead to greater interaction and influence among actors in a network.

Ego-Alter Connections

Data suggests there are alters and egos that share connections in the larger MTSS meta-ego network. I have shown in Figure 8 in the meta ego-network map, that there are at least some connections between networks. This relates to the second research question, which is about how ego networks affect implementation. Egos' attitudes and points of view permeate their networks, leading to the conclusion that connected or shared actors may share not only the same resources but also the perspectives and attitudes that shape MTSS implementation. Prior to the shutdown required due to the pandemic restrictions, team members indicated a high frequency of meeting with their named alters. 25% of respondents indicated they met at least 4-5 times a week. Another 16% indicated at least 2-3 times a week and another 25% indicated they met at least once a week. This would suggest a high level of trust between egos and their alters.

Though the data and frequency of interaction were limited due to the isolation required during the pandemic, there is some data to suggest increasing connections between teams and shared resources may be beneficial for not only team members but also their networks. The

cohort model also increases the opportunities for egos and consequently their teams to access resources outside of their immediate network and LEA. Relational capital has also shown beneficial outcomes for networks. Relational capital is based on mutual trust and close interaction at the individual level (Kale et al., 2000). Trust facilitates exchanging and learning through close one-to-one interaction between collaborators (Kale et al., 2000). Increasing the frequency of interaction and opportunities to work with internal and external network members in an organization could have positive benefits in implementation. This is also in line with MTSS implementation research recommendations that suggest state-level educational agencies need to leverage local resources to help facilitate implementation (Goodman et al., 2019).

Ego-Net Perspectives

Derived initially from the surveys then subsequently the interviews, the perspectives of egos shape and are shaped by their teams and inevitably their networks. Several commonalities exist among all respondents. All respondents commonly held the reasons for their work in MTSS was to improve overall outcomes for all students. However, there was also the common view that they would face resistance from staff and have difficulty implementing MTSS if their respective staff were not adequately trained. Furthermore, the interviews indicated a deep level of relationship between egos and their named alters. The interviews revealed the context of those relationships. Named alters were highly trusted individuals and, like their corresponding egos, had a deep level of experience within education as well as prior experience with MTSS. All the interview respondents had well over two decades of experience within education and were familiar with the failings of the system. Moreover, all respondents also had experienced a prior iteration of the implementation of MTSS in another setting. Regarding team composition,

respondents believed that MTSS team members should be informed of data, but also be responsive to addressing equity issues in the context of their LEA.

Implementation drivers are crucial components that promote the usage of the program or practice and its subsequent influence on students. Implementation drivers ensure that essential competencies are developed, necessary organizational support is provided, and engaged leadership is provided (SISEP, 2013). Though the interviews revealed the implementation drivers were mostly present, the one driver lacking sufficient evidence was the use of data-based decision-making. A few of our respondents alluded to the important use of data but did not specifically state in what ways data emerged in their practice. This is partially due to the early stages of implementation each team was in but as implementation proceeds, data is a key driver of successful implementation as the research would indicate (NIRN,2013).

Implications for Policy

Policymakers and decision-makers should consider the relational aspects of MTSS implementation teams and the potential effect they have on proper implementation. This study focused on the individual members of MTSS teams, how their social networks affect implementation, and what factors teams encounter. Pragmatic applications include intentional exploration of team members connections during the construction phase of respective teams. Furthermore, activities that encourage cross-team interaction could also strengthen connections and exposure to additional resources for local MTSS networks.

This study suggests those relationships exist and have the potential to impact implementation but is heavily reliant on a small group of individuals, representing larger constituencies to implement, sustain and improve MTSS. Policies and practices that encourage collaboration at the local and regional level could improve implementation capacity but also

provide solutions to commonly held barriers to implementation. Social relationships between educational practitioners are increasingly viewed as a crucial resource in educational research and practice (Moolenaar & Sleegers, 2010).

This study supports the idea for teams to build up interpersonal learning ties with network members whom they consider an expert in the field. It also supports the idea that team members could better represent the constituencies that they serve. Defining the principles and competencies of professionals who support implementation in human services also provides an important opportunity to acknowledge the specific skills needed to develop relationships, build trust, and address power differentials that are central to the role of implementation support teams (Metz et al, 2021). Professionals look for team members with complementary expertise to make it possible to achieve the implementation goals their teams define. Team members also look for team members with similar life and professional experiences. Team members mostly learn by actively doing things together on the job. The practice of cohorting teams in the context of this study provide opportunities for crossing networks, sharing connections, and removing barriers to resources. As a result, team members' networks expose leaders and their teams to resources and access to staff to whom they may not otherwise have access.

Implementation is a complex and lengthy process. Many statewide initiatives have failed due to a lack of alignment, coordination, and support at local, regional, and state levels. Local education agencies are often reliant on a small group of individuals to ensure fidelity in implementing programs (Goodman et al., 2019). Their relationships could be better leveraged and supported by implementing policies that support access to resources, knowledge, and a broader base of educators.

Implications for Social Justice

Decision-makers when assembling implementation teams should consider not only the expertise of individuals but also the diversity of their teams to better represent the students and communities which they serve. Currently, the State of California reports the largest percentage of students of color are Latino at 54%. However, only 20% are represented in the teacher workforce. 63% of the California teacher workforce is white (CDE, 2022). A recent report issued by the California Department of Education made several recommendations to increase the diversity of the educator workforce within the state (Bristol et al., 2021). The CDE educator diversity advisory groups made five primary recommendations, among the recommendations include: Create communities of practice for county offices of education and for local school districts to build their capacity to recruit, support, and retain teachers of color. Promote deeper partnerships and collaboration among LEAs, institutes of higher education (IHEs), and community-based organizations (CBOs) to build institutional pathways for candidates of color (Bristol et al., 2021, p 2.). School and team leaders have an opportunity to promote diversity within the construction of their MTSS teams. Additional legislation is not required to staff MTSS teams with individuals from diverse backgrounds with extensive educational experience. Admittedly, the pool of staff, teachers, and administrator candidates must better reflect their larger constituencies.

Within the context of this study, evidence suggests egos from diverse backgrounds with decision-making power have large and diverse networks. Driving meaningful change in schools requires a profound comprehension of both learning and the context wherein learning happens (Ogawa et al., 2008). Prior research also suggests that greater diversity leads to differentiation of resources and higher social capital (Van Der Gaag & Snijders, 2005). Distributing the

knowledge, resources and expertise is a common barrier for all implementation teams in various contexts. Implementation is described as a multi-year process, in the process of team building, increased connections and access to the most inexperienced team members could improve outcomes for staff and students.

Recommendations for MTSS Leadership and Teams

The goal of this study was to examine the relationships between MTSS team members and the surrounding networks they access for information, resources, and advice. Prior MTSS research has suggested professional development, such as in-service training, peer and external coaching, and access to professional learning communities can help facilitate the integration of MTSS (Mcintosh & Goodman, 2016). All the prior contexts mentioned require the development of relationships. It is my recommendation that future studies expand upon the relational factors affecting MTSS teams and implementation. This is an acknowledged gap in implementation research (Palinkas, et al., 2011). Furthermore, it bears repeating that the team members need to better represent their local constituencies. There is an acknowledgment of a lack of representation in the larger teacher workforce, but MTSS teams are constructed mostly by local leadership. Efforts to recruit and retain teachers of color with extensive knowledge in education should be a primary goal of local MTSS leaders. Teachers from diverse backgrounds can not only identify more closely with the students but also bridge the gap of knowledge and build stronger relational capital for the MTSS team. Representation matters, especially for students that are the most vulnerable.

Future Research

This study examined the ego networks of MTSS teams and how they may support implementation. Furthermore, this study supports prior research on the relational ties between network actors' leadership that are influenced and are fundamental to systemic change. Further study is necessary to assess patterns of implementation and how those relational ties impact leadership and implementation. This study provided an opportunity to examine the infrastructure currently in use throughout the state to begin the implementation of MTSS statewide. As implementation progresses, social network studies throughout the process could help bridge the research-to-practice gap.

Furthermore, this study seems to indicate knowledge, resources, and influence exist in positions of authority at very high levels of MTSS teams. Further study is recommended in areas that examine how information and influence are distributed down from executive leadership to the most inexperienced practitioners. Knowledge and resources exist but not necessarily in the most effective levels of practice. Methods of social capital measurements such as position or resource generator measurements could yield data beneficial for implementation teams (Van Der Gaag & Snijders, 2005). As MTSS continues to permeate throughout California, an examination of embedded resources for implementation teams versus resources that require networks to bridge could potentially reveal factors that enable successful implementation of MTSS. Additionally, programs and policies need to encourage the development of a more diverse educational workforce, especially in areas of that affect implementation of programs meant to benefit diverse populations. Based on the data available, MTSS teams in this study did not accurately represent the constituencies they serve.

Limitations

The current world pandemic has been a significant limitation. Some schools or implementation team members were not able to participate in the MTSS process or delayed their implementation due to logistical and resource considerations. Training had already been delayed for the original cohort, and the training calendar was altered for the second cohort participating in this study. Furthermore, coaching, a significant component of the MTSS process, did not occur as intended. The original design intent of the MTSS process was to have county resources provide coaching to LEAs as they began implementing the framework. Due to the status of the pandemic, coaching and training were limited to virtual sessions. This issue, among others, varied for different LEAs and was dependent on their context. Additionally, the county office providing the training was constantly adjusting its training to meet both live and virtual settings. This fluctuated throughout the study.

All but one of the interviews were conducted virtually through a video conference platform. When indicating their networks on the concentric circle design the image was reconstructed from the live input participants gave, with permission from the participants. One interview was conducted in person and perhaps consequently, also produced more detailed network information and a larger network was also indicated. In "normal circumstances" the school site implementation of the MTSS framework into the school system would take place the same school year in which the implementation teams began the training. Due to the pandemic, the MTSS framework as it was intended may not be fully applied until schools return to an in-person setting.

There are also limitations regarding the design of the study. While the initial survey allowed the researcher to potentially cast a wider net of potential respondents, the depth and details of data were much more nuanced in the interviews. The interview portion of the study

provided much more detailed, nuanced, qualitative, and quantitative data. The interviews also allowed respondents to elaborate on the context of those relationships, though respondents may have not specifically named people as potential network connections they alluded to others being involved in the MTSS process. Moreover, the interviews allowed respondents to help describe from their perspective some of the factors they face in their specific educational context. Additionally, the size of the respondent pool limited the number of potential candidates to interview. Though this was an intentional practice by county training teams, a small number of schools participated in the MTSS implementation process, which resulted in a small sample size. As a result, the findings are not generalizable to other regional or local implementation teams.

Although students are currently in need of more support, schools may not be able to deliver those support as intended due to world events and local issues. Measurement of student outcomes is therefore limited until schools fully return to in-person settings. Furthermore, MTSS is a multi-year process, this study occurred during the initial exploratory and initial implementation phases for teams involved in the study.

Conclusion

MTSS teams are the primary catalyst for the successful implementation of programs and interventions designed to benefit all students. Many statewide initiatives have failed due to a lack of alignment, coordination, and support at multiple levels. Local education agencies are often reliant on a small group of individuals to ensure fidelity of the implementation of programs. By leveraging the social networks of team members, resources, support, and alignment can be better achieved by further study and exploration of personnel resources. One of the primary recommendations from NIRN to improve implementation is to have professional development, training, and coaching closer to implementers to better respond to contextual and scheduling

needs. This allows for the building up of local capacity and professional networks can be better accessed by primary implementers (Goodman et al., 2019). Studies using sociometric techniques and focused on developing the local networks of implementation teams could prove beneficial to current and future intervention practitioners. Effective implementation capacity is essential to improving education for the benefit of all students. Students and children around the world are suffering. Gaps that existed prior to the pandemic were only exacerbated over the past two years. Educational systems and in fact any human service system must constantly re-evaluate and revisit the support systems designed to meet those needs. The people within those systems are the most significant medium for facilitating change. Proper installation of MTSS would allow schools to inventory, overhaul, and augment their systems of support.

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MTSS Implementation Team Network Survey

Start of Block: Default Question Block

Q1 What is your name?

Q2 What is your role within your school or local education agency?
o Administration (1)
　　o Staff Member (2)
　　o School Psychologist (3)
　　o Counselor (4)
　　o Social Worker (5)
　　o Education Specialist (6)
　　o Other (7) _____

Q3 What is your racial identity? Select all that you identify with
☐ African American or Black (1)
　　☐ Native American or Indigenous (2)
　　☐ Asian (3)
　　☐ Hispanic or Latino (4)
　　☐ Filipino (5)
　　☐ Pacific Islander (6)
　　☐ White (7)
　　☐ Other (8) _____

Q4 What gender do you identify as? Select all that you identify with.
　　☐ Male (1)
　　☐ Female (2)
　　☐ non-Binary (3)
　　☐ Other (4) _____

End of Block: Default Question Block

Start of Block: Block 1

Q5 Who would you seek advice from or consider your primary resource(s) in regards to

PBIS (Consider people internal and external to your team to include personal and

professional contacts). Please identify name and role.

Q6 Who would you seek advice from or consider your primary resource(s) in regard to

RTII? (Consider people internal and external to your team to include personal and

professional contacts). Please identify name and role.

Q7 Who would you seek advice from or consider your primary resource(s) in regard to

MTSS. (Consider people internal and external to your team including personal and

professional contacts). Please identify name and role.

End of Block: Block 1
Start of Block: Block 2
Q8 Briefly describe your primary role at your local education agency?
Q9 Briefly describe your primary role(s) within the MTSS team?

Q10 Describe your experience in education? (Rephrase) (short answer)
Q11 What do you perceive as barriers to implementation?
Q12 What do you perceive as possible facilitators to implementation?

Q13 Would you be willing to participate in a 30–45-minute interview in regard to MTSS

implementation? Please include your contact email and phone number.

o Yes (place contact information in box below (1)
o No (2)
o No (3)
          End of Block: Block 2

Appendix B

Semi-Structured Interview Questions

1. How would you describe MTSS to someone who is not aware of what it is?

2. What has been your experience with MTSS prior to undergoing training with the County?

    a. Have you had any experience with tiered systems of support?

3. What were the reasons your organization or LEA decided to undergo MTSS training?

    a. Are your goals more academic, behavioral, or social-emotional concerns?

    b. Did your team find consensus regarding those goals?

4. Do you believe your organization can be successful in implementing the MTSS framework?

5. Who do you rely on regarding your knowledge base about MTSS?

    a. Primary, secondary and tertiary sources?

6. How do you think this implementation process through the county is informing your team's practices?

    a. Is there anything you would change?

7. What do you believe are the primary difficulties with the installation of MTSS?

8. What has your organization done in recent memory to address issues of inequality that students may face?

    a. Have any been successful?

    b. What were the contributing factors to the success or failure of those initiatives?

9. What do you believe are your personal strengths that may contribute to the success of your team?

10. What are your team's strengths that may contribute to the success of implementation?

a. What may be some weaknesses?

Appendix C

University of California San Diego
Consent to Act as a Research Subject

Ego Networks of Multi-Tiered System of Support Teams

Who is conducting the study, why have you been asked to participate, how were you selected and what is the approximate number of participants in the study?

Jose Diaz, a graduate student at UCSD is conducting a research study to examine the MTSS implementation process and EGO networks of MTSS teams You have been asked to participate in this study because you are part of an implementation team installing the MTSS framework with guidance from the San Diego County office of Education. There will be approximately 30 participants in this study.

Why is this study being done?

The purpose of this study is to examine factors that influence MTSS implementation teams as they begin installation of the framework. This will be accomplished through an exploration and social network analysis of team members. The study will survey willing team members. Team members will identify by name and position, members and alter they deem significant actors within their own network. Following the administration and analysis of the survey results, significant "actors" will be interviewed. Through those interviews, this study will gather descriptive information regarding that ego's network. The analysis of those networks may elicit themes and data that could provide consequential information regarding the barriers and facilitators towards implementation.

What will happen to you in this study and which procedures are standards of care and which are experimental?

If you agree to being this study, the following will happen to you:

1.Participate in an online survey.
2. Invitation to participate in a semi-structured interview.

How much time will each study procedure take, what is your total time commitment, and how long will the study last?

Survey: 10-15 minutes
Interview: 30-45 minutes
Total time commitment: 45-60 minutes
Study to take place March-June 2021
What risks are associated with this study?

Participation in this study may involve some added risks or discomforts. These include the

following:

A potential for the loss of confidentiality, the researcher will use password encryption for all

computer files. Participant data will be stored in a locked drawer of the home office of the PI.

This will protect the confidential information and the confidentiality of the participants.

1. The PI will keep all research data on paper (artifacts, transcriptions and analysis coding work) locked in a file cabinet in my home. The PI will be the only individual with access to this cabinet. All digital data (audio recordings, transcriptions, data analysis and study writing) will be stored on PI's personal computer with password encryption. The PI will keep a back-up of all digital data on an external storage drive that the PI will keep locked in a storage cabinet along with any hard copies of data. This is likely to be an effective strategy to minimize the risk of someone other than the researcher gaining access to the files. In order to further prevent loss of participant confidentiality, the PI will remove all identifying information from all documentation of participant information (interview and audio transcripts, surveys). The PI will assign pseudonyms by participant and keep the key to the codes in a password protected file on PI's personal computer that is password protected and only the PI will have access to the password. The PI with access to all research data, keys, pseudonyms, and passwords. This is likely to minimize the risk of loss of confidentiality. Research records will be kept confidential to the extent allowed by law. Research records may be reviewed by the UCSD Institutional Review Board.

2. There is a minor risk that district employees will read the study and attempt to identify the participants for evaluative purposes. The PI will use pseudonyms for subject in any resulting reports or publications to further minimize the risk of participant loss of anonymity. This is likely to prevent the loss of anonymity. Participation in this study is not connected in any way to the employment status of any individual participating in the study and participants' identity will not be disclosed at any time.

3. There is a minor risk that those who take the survey may feel stress, boredom or discomfort in answering questions related to their colleagues and networks. During the survey, participants have the option of not answering any question. They also have the option to discontinue at any time. This should minimize any stress or discomfort participants may have responding. Because this is a research study, there may also be some unknown risks that are currently

unforeseeable. You will be informed of any significant new findings.

What are the alternatives to participating in this study?

The alternatives to participation in this study are not to participate.

What benefits can be reasonably expected?

There may not be any direct benefit to you from participating in this study. The investigator,

however, may learn more about the dynamics of implementation teams, and education

professionals may benefit from this knowledge.

Can you choose to not participate or withdraw from the study without penalty or loss of

benefits?

Participation in research is entirely voluntary. You may refuse to participate or withdraw or

refuse to answer specific questions in an interview or on a questionnaire at any time without

penalty or loss of benefits to which you are entitled. If you decide that you no longer wish to

continue in this study, you will be required to notify the investigator.

You will be told if any important new information is found during the course of this study that

may affect your wanting to continue.

Can you be withdrawn from the study without your consent?

The PI may remove you from the study without your consent if the PI feels it is in your best

interest or the best interest of the study. You may also be withdrawn from the study if you do not

follow the instructions given you by the study personnel.

Will you be compensated for participating in this study?

No compensation will be provided for participating in this study.

Are there any costs associated with participating in this study?

There will be no cost to you for participating in this study.

What if you are injured as a direct result of being in this study?

If you are injured as a direct result of participation in this research, the University of California will provide any medical care you need to treat those injuries. The University will not provide any other form of compensation to you if you are injured. You may call the Human Research Protections Program Office at 858-246-HRPP (858-246-4777) for more information about this, to inquire about your rights as a research subject or to report research-related problems.

Your Signature and Consent

You have received a copy of this consent document.

You agree to participate

_____

Printed Name

_____

Signature

_____

Date

Appendix D

Online Survey Consent Form

You are being invited to participate in a research study titled Ego Networks of MTSS implementation teams. This study is being conducted by Jose Diaz from the University of California-San Diego (UCSD) and California State University-San Marcos (CSUSM). You were selected to participate in this study because you are a member of an MTSS implementation team. The purpose of this study is to examine the factors that influence the implementation of the MTSS framework. MTSS is designed to meet the needs for all students. The study aims to survey implementation team members and apply social network analysis to identify key team members to include influential "actors" internal and external to the implementation team. An analysis of that survey data will allow for a determination of who teams rely on and deem as significant resources of information and influence. Post analysis of the survey data will inform the next phase of the study which will include semi-structured interviews. Semi-Structured interviews will provide descriptive data and will show the flow and reciprocity of information. If you agree to take part in this study, you will be asked to complete an online survey/questionnaire. This survey/questionnaire will ask about connections between team members and other "alters" connected internally or externally to implementation team members. You may be contacted to participate in an interview pending the results of the survey.

There may not be any direct benefit to you from this research. The investigator, however, may learn more about how implementation team members are influenced by their social networks.

There are minimal risks associated with this research study. The following risks may occur 1)
    loss of confidentiality if an unauthorized person gains access to participants' surveys, 2) loss
    of anonymity and risk of district employees gaining unauthorized access and attempts to

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identify participants for evaluative purposes, and 3) possible boredom, stress or discomfort

in answering questions.

To minimize the risks the following precautions will be used:

1) to minimize the risk of #1 above, loss of confidentiality, I will use password protection for digital files holding participant data and a locked safe in my home office to protect confidential information and the confidentiality of participants. I will keep all research data on paper (analysis coding) locked in a safe in my home. I will be the only individual with any ability to access this safe. I will keep all digital data (survey data, data analysis, and memos) stored on my personal computer which is password-protected, and only I have access to the password. I will keep a back-up of all digital data on an external hard drive that I will keep locked in a safe in my home and all paper research data. This is likely to be an effective strategy to minimize the risk of someone other than the researcher gaining access to the files. In order to further prevent loss of participant confidentiality, I will remove all identifying information from all documentation of participant information(surveys). I will assign pseudonyms to each participant and keep the key to the codes in a password-protected file on my personal computer that is also password protected. I will be the only person with access to all research data, keys, pseudonyms, and passwords. This is likely to minimize the risk of loss of confidentiality.

2) Regarding #2 above, I will use pseudonyms for subjects in any resulting reports or publications to further minimize the risk of participants' loss of anonymity. This is likely to prevent the loss of anonymity.

3) To minimize the risk of #2 above. I will stress to each potential participant that whether or not they choose to participate in this study is not connected in any way to their employment status at their LEA or school site and that their identity will not be disclosed at any time (see items1-2). Additionally, I will stress that there will be no negative outcomes towards participating or not participating.

4) Regarding #3 above, on the survey, participants have the option of not answering any question. They also have the option to discontinue at any time. This should minimize any boredom, stress, or discomfort they may have in responding.

Research records will be kept confidential to the extent allowed by law and may be reviewed by

the UCSD Institutional Review Board.

Your participation in this study is completely voluntary and you can withdraw at any time by

simply exiting the survey. Choosing not to participate or withdrawing will result in no penalty or

loss of benefits to which you are entitled. you are free to skip any question that you choose.

If you have questions about this project or if you have a research-related problem, you may contact the researcher, Jose Diaz at 619-928-2802. If you have any questions concerning your rights as a research subject, you may contact the UCSD Human Research Protections Program Office at 858-246-4777.

By clicking "you agree" below you are indicating that you are at least 18 years old, have read this consent form, and agree to participate in this research study. Please print a copy of this page for your records.

Appendix E

UNIVERSITY OF CALIFORNIA, SAN DIEGO

AUDIO/VIDEO RECORDING RELEASE CONSENT FORM

As part of this project, a recording will be made of you during your participation in this research

project. Please indicate below the uses of these recordings to which you are willing to consent.

This is completely voluntary and at your discretion. In any use of the recordings, your name will

not be identified. You may request to stop recording at any time or to erase any portion of your

recording.

1. The recording can be studied by the researcher for use in the research project ___Initials

2. The recording can be used for scientific publications. _____ Initials

3. The recording can be reviewed at meetings of scientists interested in the study of the

Ego Networks of MTSS implementation teams. _____ Initials
You have the right to request that the recording be stopped or erased in full or part at any time.

You have read the above description and give your consent for the use of recording as indicated

above.

_____ _____
Signature   Date   Witness Date