Promoting a Culture of Continuous Learning in Early Care and Education Settings

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Table of Contents

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Overview

Introduction

Young children and their families benefit from early care and education (ECE) settings implementing high-quality practices that support children's well-being, health, and safety. Activities to support quality are a focal point of federal and state investments, including over $1 billion of the Child Care and Development Fund and nearly $240 million in Head Start Training and Technical Assistance.[a] Quality improvement activities include a variety of delivery modes and content areas to address children's developmental needs and to align with the knowledge and skills of the ECE workforce. Quality improvement in ECE is challenging, and sustained changes in quality across ECE settings have not been widespread.

Quality improvement methods used in health care and other fields are of interest to ECE because of the research base indicating their effectiveness and because of their focus on both the content and the process of improvement. The Culture of Continuous Learning (CCL) project tested the *Breakthrough Series Collaborative (BSC)*, a quality improvement methodology developed by the Institute for Healthcare Improvement. As part of the CCL project, ECE centers participating in the BSC learned new strategies for improving evidence-based practices. Participating centers focused on improving teaching practices associated with children's social and emotional learning (SEL). Teams worked within their centers and across other centers participating in the project as part of a learning collaborative on a set of shared goals for change. They received support from experts and reflected on and shared their learning across centers. A key difference between the BSC and other quality improvement approaches used in ECE is the focus on both individual and organizational dynamics that support sustained changes in practice.

Purpose

The purpose of this report is to share findings from the BSC feasibility study in ECE centers. The feasibility study examined how ECE centers (i.e., child care centers and Head Start) participated in BSC quality improvement activities and the extent to which the BSC promoted changes in individual practices and organizational dynamics. The feasibility study assessed 1) the process of implementing a BSC in ECE centers, 2) whether participating centers developed a culture of continuous improvement, and 3) how the BSC fostered sustained changes in workplace climate and individual practices to support children's SEL.

Findings from the CCL feasibility study can inform recommendations for implementing and evaluating a BSC at a larger scale by including more ECE centers of different types, and across diverse geographic areas.

Methods

The CCL project used a case study design and mixed methods to assess the feasibility of implementing a BSC in ECE centers. The Feasibility Study Team collected data at two time points from staff in the seven participating ECE centers and from the team that implemented the BSC. Descriptive analyses examined changes over time in participation in BSC activities, perceptions of the BSC, quality improvement practices, organizational climate, and practices to support children's SEL.

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[a] https://www.acf.hhs.gov/occ/resource/ccdf-expenditures-overview-for-fy-2018-all-appropriation-years
https://eclkc.ohs.acf.hhs.gov/about-us/article/head-start-program-facts-fiscal-year-2019

Key findings

Findings from the feasibility study provide initial evidence that the BSC is feasible to implement in ECE settings. However, it is an intensive quality improvement methodology that requires significant investment of both time and resources. ECE centers in the CCL project varied in the degree to which they fully participated.

Characteristics that supported the feasibility of participating in and benefiting from a BSC included:

- A supportive and engaged Senior Leader[b] who encouraged staff to take ownership of the quality improvement process
- Strong organizational structures (e.g., established staff meetings, flexibility to hire additional staff or structure staff workdays) that could be used to support the BSC activities
- Classroom infrastructure that facilitated collaboration between teachers (e.g., doors leading to adjoining classrooms)
- An initially hospitable environment for change, including high levels of psychological safety for staff in the program

The CCL project documented the following initial changes across most outcomes of interest:

- Program teams shared and adopted successful tests of practice change across teams.
- Program teams reported new knowledge about how to make and sustain improvements using the tools and skills obtained through the BSC
- Program team members became more confident in collecting and using data and recognized that improvement is an ongoing process
- Team members gained an appreciation for seeing demonstrations of leadership across members of their program, regardless of a person's job title
- Job satisfaction changed over time among program team members in ways that aligned with their level of participation in the BSC

The CCL project also documented that some ECE centers faced challenges to fully participating in the BSC quality improvement activities. Challenges included:

- Staffing shortages
- Competing demands (e.g., meetings that conflicted with BSC activities such as day-long Learning Sessions or hour-long calls)
- Participation in other quality improvement initiatives or program requirements

Future implementation of a BSC across ECE centers will need to address the supports needed for centers with fewer initial resources or capacity to participate fully.

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[b] A Senior Leader is a high-level administrator from the ECE setting (e.g., center director) who is participating in the BSC and is responsible for providing leadership, support, and advocacy on behalf of the BSC team. This and other terms are defined in this report's glossary (see Appendix A).

Report Structure

In this report, first we will provide an overview of what the Breakthrough Series Collaborative is and the theory of change surrounding why we expect a BSC might be a feasible methodology to close the gap between what ECE practitioners know and what they do, and how practice change might be spread and sustained in centers. Next, we will describe the extent to which centers participated in BSC activities. Then, we will share findings from the case study of centers that participated in the BSC-SEL. Lastly, we will address the implications of the findings on implementing a BSC with ECE centers in the future.

Glossary

Breakthrough Series Collaborative (BSC)

- A quality improvement methodology aimed at helping organizations build a shared knowledge of evidence-based best practices and an understanding of how to implement improvements within their unique contexts.

Breakthrough Series Collaborative on Social and Emotional Learning (BSC-SEL)

- The name of the BSC implemented in early care and education (ECE) centers focused on social and emotional learning (SEL). The SEL content for the BSC-SEL was based on the Social Emotional Foundations for Early Learning Pyramid Model.

Culture of Continuous Learning (CCL) project

- A project that included implementing the BSC methodology and studying its feasibility in ECE centers.

Expert faculty coaches/faculty coaches

- Individuals with specific content expertise of the BSC who serve as advisors to the Implementation Team (faculty) as well as coaches to the participating BSC teams. In the BSC-SEL, faculty coaches included an ECE teacher, a parent, an ECE Director, an ECE policymaker, and a trainer in the Pyramid Model.

Implementation Team

- Experts in BSC methodology and ECE program operations who facilitated the BSC and oversaw implementation in participating centers as part of the project staff.

Feasibility Study Team

- Researchers who led the study assessing the feasibility of using the BSC methodology in ECE centers.

Senior Leader

- A high-level administrator or leader from the center (e.g., center director) participating in the BSC. This person is responsible for providing leadership, support, and advocacy on behalf of the BSC team. They also focus on how successful changes tested by the team can be scaled up, spread, and sustained.

Team Leader or Manager

- Center staff member who oversees team activities and actively guides the work of the BSC team. They serve as the liaison for all BSC-related assignments and activities, including data-related activities. Possible Team Leaders might include an associate director, education coordinator, or family engagement specialist.

Introduction

Young children and their families benefit from early care and education (ECE) settings that implement high-quality practices that support children's well-being, health, and safety. Activities to support quality are a focal point of federal and state investments, including over $1 billion of the Child Care and Development Fund and nearly $240 million in Head Start Training and Technical Assistance.[c] Quality improvement activities include a variety of delivery modes and content areas to address children's developmental needs and to align with the knowledge and skills of the ECE workforce. Policymakers and early childhood stakeholders have an interest in promoting and investing in quality improvement strategies and professional development supports that facilitate positive and sustained changes in quality. Quality improvement efforts such as coaching and training[d] have been used to varying degrees of success, with efforts often resulting in only temporary changes limited to an individual or classroom (Joyce & Showers, 2002). ECE leaders and staff are seeking opportunities to test new approaches to quality improvement that can promote meaningful and sustained changes in practice. **The purpose of this report is to share findings from the Culture of Continuous Learning (CCL) project, a quality improvement initiative tested in ECE centers aimed at supporting changes in practice by addressing individual and organizational factors that are associated with sustaining high-quality practices over time.**

Quality improvement methodologies used in health care and other fields hold promise for use in ECE because of their focus on both the content and process of change. The CCL project tested the Breakthrough Series Collaborative (BSC), a quality improvement methodology aimed at improving the uptake and sustainability of evidence-based practices through work in teams within and across organizations. The BSC methodology focuses on implementation in real-world settings. The methodology emphasizes spread and sustainability of practices through organization-wide changes in the use of data to inform improvement, continuous learning approaches, culture, and mindset. The BSC contrasts with traditional quality improvement approaches in ECE that focus more on individualized professional development. Because a BSC is designed to facilitate program level changes in addition to changes in individual practice, it has the potential to support sustainable and meaningful quality improvement in ECE centers.

The BSC methodology was developed by the [Institute for Healthcare Improvement](#) and the Associates in Process Improvement in 1995 for use in the health care field. It aims to bridge the gap between what is known to be best practice and what is implemented in real-life contexts. A BSC typically focuses on supporting the implementation of improvements in one content area or domain of practice. In the health care field, for example, improvement activities would be focused on a particular outcome (e.g., reducing infections) and specific evidence-based practices associated with that outcome (e.g., hand washing). The BSC methodology helps organizations build a shared knowledge of evidence-based practices and an understanding of how to implement improvements within their unique contexts. The success of using the BSC methodology is well-documented in the health care and social service fields (Institute for Healthcare Improvement [IHI], 2003; Daily et al., 2017). However, the BSC methodology has not yet been used widely in the ECE field. The CCL project examined the feasibility of implementing a BSC in child care centers and Head Start programs and evaluated whether initial changes in practices and outcomes were achieved. The

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[c] See https://www.acf.hhs.gov/occ/resource/ccdf-expenditures-overview-for-fy-2018-all-appropriation-years . See also https://eclkc.ohs.acf.hhs.gov/about-us/article/head-start-program-facts-fiscal-year-2019.

[d] A glossary of professional development terminology defines coaching and training in the following way: "Coaching is a relationship-based process led by an expert with specialized and adult learning knowledge and skills, who often serves in a different professional role than the recipient(s). Coaching is designed to build capacity for specific professional dispositions, skills, and behaviors and is focused on goal-setting and achievement for an individual or group." "Training is a learning experience, or series of experiences, specific to an area of inquiry and related set of skills or dispositions, delivered by a professional(s) with subject matter and adult learning knowledge and skills." Retrieved from https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/our-work/public-policy-advocacy/glossarytraining_ta.pdf.

BSC piloted in the CCL project focused on improving practices to support children's social and emotional learning (SEL).

The CCL project included an Implementation Team that was responsible for implementing the BSC methodology and a Feasibility Study Team to conduct the feasibility study. The CCL project was carried out by researchers at Child Trends in partnership with implementation collaborators at the University of Massachusetts Boston, the Center for the Study of Social Policy, and JRA Consulting, Ltd.

The report is structured in the following sections. First, we describe the context of quality improvement in ECE. We then provide further details about the BSC methodology, its theory of change and how it was implemented in ECE centers in the CCL project. Next, we address details about the feasibility study and the methods used to study implementation of the BSC in ECE centers. Findings from the feasibility study are presented in three sections that outline a) how ECE centers participated in the BSC, b) the extent to which ECE centers developed a culture of continuous learning, and c) initial evidence of outcomes of the BSC. We conclude with a set of lessons learned about implementation and considerations for supporting implementation of a BSC at a larger scale in ECE programs.

The Context of Quality Improvement in Early Care and Education

Opportunities for ECE programs to participate in meaningful quality improvement and professional development activities differ across states, communities, and program types; the requirements, structure, and delivery of quality improvement activities result in experiences for programs that vary in intensity and likely in effectiveness. Since each state has a unique structure to support quality improvement, either through their state or regional quality rating and improvement system (QRIS) and/or their state professional development systems, there is no single "business as usual" for quality improvement in ECE settings. For example, while most states have implemented a QRIS for ECE programs, the range and depth of quality improvement options available to programs vary. Nearly all QRIS offer coaching and consultation, but the number of hours, format and content varies across QRIS and across programs with different needs (National Center on Early Childhood Quality Assurance [NCECQA], 2020). Fewer QRIS offer peer to peer learning activities, though use of this format is increasing over time. QRIS typically serve child care centers and family child care programs; fewer Head Start programs receive quality improvement supports through a QRIS, even if they have a rating (NCECQA, 2020b). Head Start programs have access to supports from regional and national technical assistance providers, and a portion of each grant to local grantees is allocated for their own training and technical assistance (Harding et al., 2019). Nearly all center directors in Head Start report that they offer workshops sponsored by their own organization or another organization; most also offer coaching and consultation (Harding et al., 2019). Grantee directors are more likely to participate in networks of leaders and leadership institutes than center directors, indicating potential discrepancies in how opportunities are offered in Head Start (Harding et al., 2019).

Despite the variation in structure and delivery of quality improvement supports, quality improvement activities across states, communities, and program types are typically focused on individuals' skills and competencies. Coaching, consultation, and mentoring in QRIS offer strategies to help individual teachers and directors meet the quality standards outlined in the QRIS, including scores on observational tools such as the Classroom Assessment Scoring System (CLASS) and Environment Rating Scales (ERS). Less attention and limited technical assistance are focused on the organizational structures and workplace environments that can foster and sustain improvements over time. A concern among some QRIS leaders is that coaching individuals on the standards or observational tools can result in practice changes that are not sustained

because they are not embedded in the structures and processes of the program. They may also promote point-in-time demonstration of skills instead of skills that are part of everyday routines.

A related concern among leaders of quality improvement initiatives is the difficulty of implementing meaningful continuous improvement practices. Though QRIS and the Head Start Training and Technical Assistance often aim to focus on quality improvement and continuous learning, it is challenging to put these priorities into practice. While two-thirds of QRIS offer technical assistance that focuses on continuous improvement, there is variation in how each QRIS defines and implements this focus (NCECQA, 2020a). Continuous improvement may include completion of an assessment and goal setting but is less likely to include regular data collection and improvement cycles to test changes in practices (NCECQA, 2017). The 2016 Head Start Program Performance Standards require programs to engage in monitoring and continuous improvement, but evidence suggests that Head Start programs have progress to make in using data for program improvement (Derrick-Mills, 2015).

Overall, participation in quality improvement occurs in the context of low average wages for center-based staff ($12 per hour on average[e]) and minimal benefits. Over half of child care teachers received public income supports (such as the Earned Income Tax Credit or Supplemental Nutrition Assistance Program; Whitebook et al., 2018). As decision-makers consider what to include in a menu of options for quality improvement, it will be important to address compensation, benefits, and other workplace conditions that make it challenging to support the well-being of early educators.[f]

Addressing quality improvement in the current context thus requires approaches that consider the wide variety of experiences early educators have with quality improvement and the challenges in their workplaces. Approaches that acknowledge the importance of organizational structures and climate, collaborative approaches, and ongoing learning would be valuable in ECE systems.

Quality improvement methods used in health care and other fields are of interest to ECE because of the research base indicating their effectiveness and because of their focus on both the content and the process of improvement. Quality improvement methods provide tools that can be used across different teaching practices and focus on building dynamics across program leaders and staff that can support changes in practice over time.

The Breakthrough Series Collaborative as an Innovative Approach to Quality Improvement in Early Care and Education

The BSC methodology differs from other quality improvement programs, methods, and activities typically used in ECE programs. A BSC focuses on organizational systems and culture by recognizing that change effected in one part of a system requires changes in other parts of the system. In the CCL project, the BSC mobilized teachers, administrators, and parents, and facilitated a shared learning community to address a problem of practice.

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[e] See https://www.bls.gov/ooh/personal-care-and-service/childcare-workers.htm#tab-5.
[f] The terms *early educators* and *ECE educators* are used interchangeably throughout the report to add variety for the reader. Both terms refer to practitioners who care for and educate young children.

The process and structure of the BSC is typically delivered over a 12- to 18-month period. In the CCL project, the participating teams from the ECE programs attended quarterly, day-long Learning Sessions that included training, technical assistance, and collaborative learning activities. Between the quarterly Learning Sessions, the teams participated in Action Periods during which they used Plan Do Study Act (PDSA) cycles to test ideas and collect data to determine how well the changes worked. Participants were expected to learn by doing; attitudes and behaviors were hypothesized to change during the Action Periods. Teams were expected to learn and build confidence that the changes they were testing on a small-scale resulted in improvement. The teams could test practices across other conditions and bring other colleagues into the tests, thereby spreading the change across the program. Overall, the teams aimed to embed changes within the standard practices in their programs (including professional development, hiring, policies, procedures, etc.) so that changes would endure.

The following sections provide more detail about how five strategies used in a BSC were applied in the CCL Project with the aim of producing and sustaining quality improvement.

The interconnected elements of the Breakthrough Series Collaborative methodology

Collaborative Change Framework based on social and emotional learning

The Collaborative Change Framework (CCF; see Appendix D) is the content anchor for all work that is done by teams in a BSC. It serves as a roadmap throughout a BSC to guide a teams' assessment of their strengths and challenges, opportunities for improvement, and testable changes as well progress tracking over time. The CCF describes *what* elements (primary drivers) must change and *how* those elements must change (secondary drivers) to achieve the aims of the BSC. It also includes a set of metrics that teams in a BSC use to identify priorities and track and assess their own progress. The CCF describes the need and opportunity for improving SEL, or whatever the content goals are of the particular BSC that is being implemented, in child care centers and Head Start and the overarching aims that the centers in the BSC seek to achieve.

The CCF was developed by examining the research and practice guidance from the Center for the Social Emotional Foundations for Early Learning Pyramid Model[g] and by gathering the expertise of practitioners in the field. In the CCL project, the areas of the CCF included: SEL practices, partnering with families, racial equity and cultural competency, parents, and ECE leadership. We refer to the CCF for the BSC-SEL as the Driver Diagram to distinguish between CCFs in BSCs generally and the CCF of the BSC-SEL specifically. The Pyramid Model was chosen for the project because it has been extensively studied and widely used in ECE programs (including early childhood special education settings). It was developed to provide ECE educators with guidance on how to support young children's social and emotional development and address challenging behaviors. In addition, the state in which the CCL project took place had already adopted Pyramid Model in its ECE system. This state's early learning standards bring attention to these critical areas of development and learning and give the early childhood field a framework for best practices to support the development of these important competencies. All licensed ECE centers in this state are expected to use these standards to guide curriculum and instruction.

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[g] The Pyramid Model is a framework of evidence-based practices that support social and emotional competence in infants and young children. For more information see: https://www.pyramidmodel.org/.

Cross-role teams

The cross-role team, also referred to as the Core BSC team, is a multi-level team from each center participating in a BSC. According to the BSC theory of change (see Figure 1), these cross-role team members are expected to become champions who are essential for spreading changes across the center. In all BSCs, it is important for Senior Leaders to be engaged from the start so that they are learning with the team, helping to remove barriers to testing, communicating with the entire center, and identifying ways to sustain the changes through center's polices and protocols.

In the CCL project, each participating ECE center formed a four- to eight-member Core BSC team. These members were expected to participate in the BSC activities, and work together to test, spread, and sustain changes in SEL practices at their center. The Core BSC team included a Senior Leader (typically a center director), a Team Leader (typically a lead teacher or administrative staff member), other selected teachers and staff, and a parent representative. These multi-level, inclusive teams ensured that different perspectives were represented to identify opportunities to improve SEL practices. They helped develop and test creative solutions based on best practices and their own experiences as parents, teachers, and staff.

Expert faculty coaches/faculty coaches

Faculty coaches are critical to the success of the BSC methodology. Faculty coaches have expertise about the content of a BSC. They serve as

Key BSC Terms

Core BSC team

The multi-level, inclusive teams from ECE centers directly participating in the BSC-SEL. Members included center administrators, teachers, staff, and parents. Members were expected to participate in BSC activities.

Learning Sessions

Four day-long, in-person meetings offered for all Core BSC teams that 1) focused on various topics, or drivers, for making improvements in SEL practices; 2) taught key quality improvement concepts and tools; and 3) provided time for teams to develop and make plans for the period of time in between Learning Sessions.

Model for Improvement

Three key questions that help Core BSC teams clarify their goals for improvement, establish measures to determine if a specific change actually leads to an improvement, and select the most important changes to work towards. The three questions are: 1) what are we trying to accomplish? 2) how do we know a change is an improvement? and 3) what changes can we test that will result in improvement?

Plan Do Study Act cycle (PDSA)

A process that Core BSC teams used to test and make improvements that are focused on a common aim. A single PDSA cycle involves planning to test a small change, conducting the work to make the change, studying the effects of the change, and acting on what was learned (by adjusting what was done, taking a brand new approach, or scaling up the change).

Action Period

Period between Learning Sessions when Core BSC teams collected metrics data and tested changes in practice by using the Model for Improvement and PDSAs. The Sustainability Action Period took place after the fourth and final learning session. The focus of this final Action Period was on sustaining practices learned throughout the BSC process.

Affinity group calls

Senior Leader, Team Leader, teacher, and parent videoconferencing calls facilitated by expert faculty to bring Core BSC team members with similar roles and from different centers together to share progress, challenges, and ideas for PDSAs.

Monthly metrics

Monthly data collected by Core BSC teams and submitted to BSC Implementation Team to help teams quantify their progress in key domains of the Driver Diagram. In the CCL project, monthly metrics included children's behaviors and two-way communication with families.

BSC-SEL

The name of the BSC implemented in ECE centers focused on SEL. The SEL content for the BSC-SEL was based on the Pyramid Model.

advisors to the Implementation Team who have expertise in the BSC methodology, and they serve as coaches to the participating BSC teams.

In the CCL project, they represented key stakeholders in early education and had expertise in the primary drivers of the Driver Diagram: SEL practices, partnering with families, racial equity and cultural competency, parents, and ECE leadership. They played unique, multi-faceted roles in supporting the participating teams as well as the staff implementing the BSC. The faculty coaches helped teams apply the Driver Diagram and brainstorm changes to test throughout the BSC. The faculty coaches reviewed team metrics and implementation plans, facilitated creative brainstorming and problem-solving, shared practical tools and resources, and provided "real time" coaching at Learning Sessions and on conference calls. They advised the Implementation Team (see Appendix A for definition) in the planning of BSC activities, developing content-related materials and providing feedback and recommendations about the progress of the BSC teams. They promoted the goals, purpose, and process of the BSC, helping to build excitement, momentum, and buy-in from the teams.

Shared learning environment

The shared learning environment facilitates collaboration among all Core BSC teams across the BSC as they work on testing and implementing practices in support of a common goal. The shared learning environment provides structure for teams to spend time together and collaborate during in-person activities, during phone calls, and virtually using an online discussion forum. In a typical BSC, Learning Sessions span two days, with phone calls scheduled between the in-person Learning Sessions. The shared learning environment for the BSC-SEL was fostered through a set of structured activities that included a Pre-Work Day,[h] four in-person Learning Sessions, monthly conference calls that were specific to roles (i.e., affinity groups) or for the entire team, and an online forum discussion to support collaboration, Basecamp.[i] In addition to providing concrete guidance on SEL content and improvement tools and methods, each activity was designed to encourage teams to share what they were learning, including challenges, successes, and best practices. The shared learning environment is intended to build momentum across the BSC by supporting the team in working toward shared goals, celebrating successes, learning from failures, and jointly solving problems to address challenges.

Model for improvement

Core BSC teams worked on testing and implementing SEL practices at their centers using the Model for Improvement, which poses three simple questions: 1) what are we trying to accomplish? 2) how do we know a change is an improvement? and 3) what changes can we test that will result in improvement? These three questions helped teams clearly define their goals and priorities for change (outlined in the CCF), use the metrics to understand where they can improve, know whether changes resulted in improvements, track progress towards the aims, gather evidence, and identify practice-based changes to test. Teams worked to make improvements in their centers over the course of the BSC using PDSA cycles in which teams planned to test a change on a small scale; tested the change they planned; studied the effects of the change; and acted by making adjustments, taking a new approach, or expanding the test under different or broader conditions. Because of the cyclical, continuous learning approach of PDSAs, changes were first tested

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[h] At the Pre-Work Day, the Core BSC teams/cross role teams complete a series of assignments prior to the first Learning Session. Some assignments are conducted during the Pre-Work Day while others are done in the time between the Pre-Work Day and Learning Session 1. Assignments often include developing a team name, a team motto, completing a self-assessment based on the Driver Diagram, developing a data collection plan, and creating a "storyboard" for their team.

[i] Basecamp is a cloud-based application that provides tools for team collaboration online, using message boards, timelines, file sharing, and task assignments. Core BSC teams posted pictures of their PDSA forms, commented on others' posts, asked questions, and shared resources related to SEL and quality improvement.

quickly on a small scale and then increased over time based on learning as they moved toward full, sustainable implementation.

Breakthrough Series Collaborative theory of change

The CCL Project Team developed a theory of change grounded in research and theory that hypothesizes how the BSC, with its five inter-connected elements, is expected to influence change and sustain improvements in quality (Figure 1). The aims (impact) of the BSC-SEL were to improve SEL practices and classroom quality, increase children's social and emotional competence, and reduce challenging behaviors. The theory of change shows the pathways of influence from the inter-connected elements of the BSC methodology to its outputs (the BSC activities) which activate a set of mechanisms. These mechanisms are the enabling factors that produce the outcomes and the intended impact. We provide a brief summary of the theory of change in this section.[j]

As participants engage with the BSC activities, they are expected to establish new organizational structures and processes for learning how to improve. Activities such as the Learning Sessions, the collection of monthly metrics, the use of PDSA cycles to test changes and monthly conference calls across teams are intended to support these structures. **A key question for the CCL feasibility study asked about the feasibility of child care center and Head Start staff participating in the BSC activities.**

When teams participate in the activities and use the new structures and processes to reflect with one another and ask questions, they experience changes in their relationships, thinking, and mindsets. The BSC strategy and its outputs are hypothesized to influence relational dynamics both within and across the participating teams in ways that engage center leaders, teachers, and parents in collaboratively leading change. The BSC is also designed to shift individual mindsets from a compliance and a one-size-fits-all approach to an inquiry mindset focused on learning, adaptation, and testing ideas about how to implement improvements in practice. Improved psychological safety, team member efficacy, and relational dynamics contribute to a positive organizational climate. **A key question for the feasibility study asked about the degree to which these features of a culture of continuous improvement were evident in the participating programs.**

The theory of change identifies short- and long-term outcomes in two primary areas: the capacity for improvement and the content focus of the BSC which was SEL in the CCL project. A capacity for improvement is reflected in outcomes such as individual and collective efficacy, organizational climate, and knowledge and skills about how to make and sustain improvements. Ultimate impacts for SEL include increased knowledge and skills related to SEL, the use of high-quality teaching practices, and strong family partnerships. **A key question for the feasibility study asked about the extent to which participation in the BSC resulted in initial changes in short- and long-term outcomes.**

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[j] A more complete description of the Theory of Change is available in Douglass et al. (2019).

Figure 1. Breakthrough Series Collaborative theory of change for the Culture of Continuous Learning project
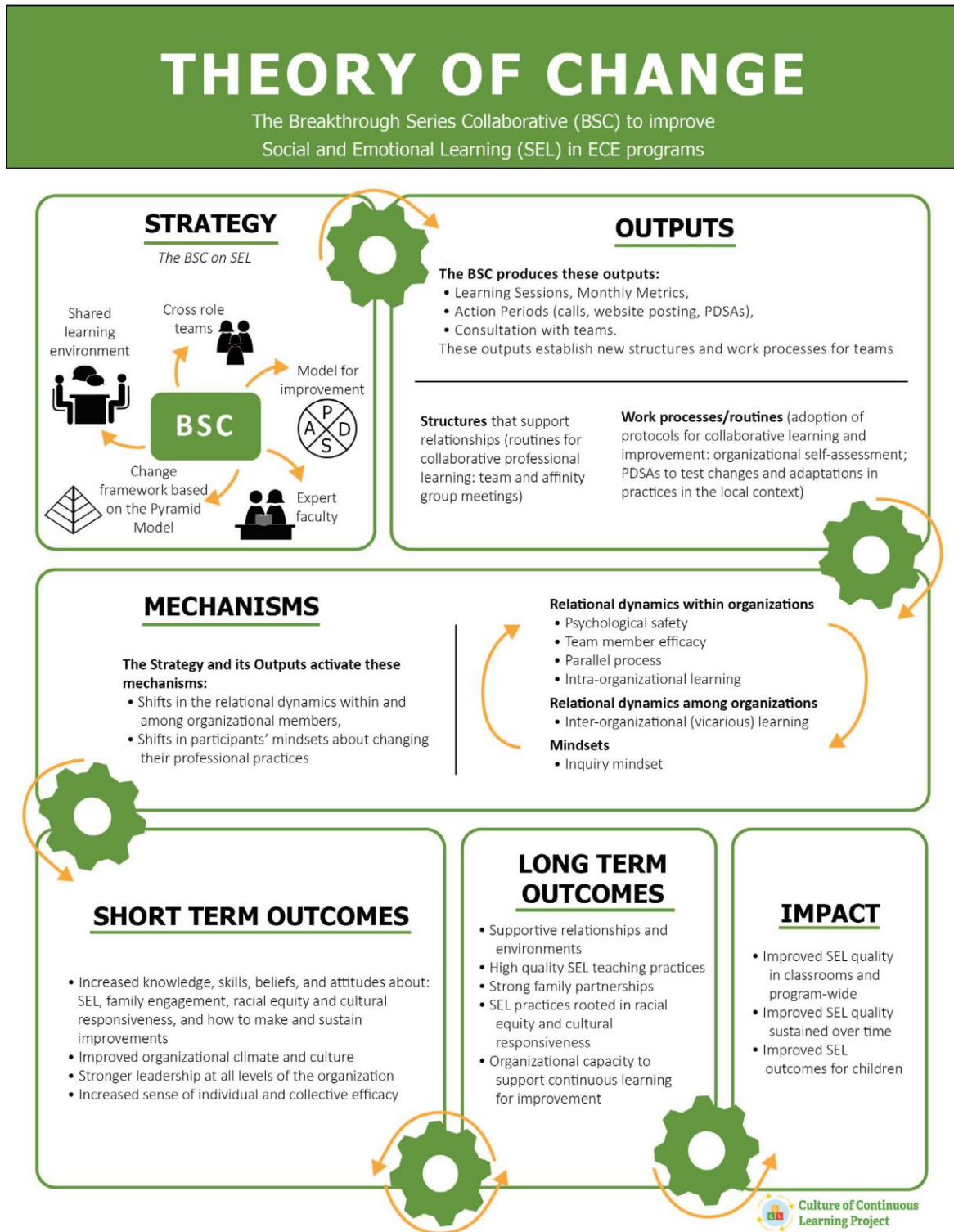
Source: Douglass, A., Halle, T., & Tout, K. (2019). *The Culture of Continuous Learning Project: A Breakthrough Series Collaborative for Improving Child Care and Head Start Quality: Theory of Change*, OPRE Report #2019-100, Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services. https://www.acf.hhs.gov/sites/default/files/opre/ccl_theory_of_change_brief.pdf

Studying the Feasibility of a Breakthrough Series Collaborative in Early Care and Education

The purpose of the CCL feasibility study was to examine how ECE programs participated in a BSC, the extent to which they developed a culture of continuous learning, and whether perceived changes in outcomes were measured as a result of participation. The feasibility study aimed to uncover lessons about implementation of a BSC in ECE programs and identify considerations for future practice and research of the BSC quality improvement methodology in ECE programs.

The project used a case study design to allow in-depth examination of processes and outcomes and to gain insights into the perceptions and experiences of participants. The approach we take throughout this report is to share illustrative examples using quotes and figures. Key themes represent those that are supported by more than one piece of evidence collected in the study.

Site selection process

Selection of sites to participate in a BSC is a critical activity in early implementation. The selection process allows prospective sites to learn about the purpose and activities in a BSC and to assess their interest and capacity to participate. The process also allows the Implementation Team to assess the applications submitted by prospective teams and determine their readiness for the process. This "mutual selection" activity is designed to promote a more successful BSC by ensuring that teams are ready to engage in the process and have the initial capacity to participate in the BSC activities. This implies that in theory some centers that apply to participate in a BSC may not be selected to participate, especially if the collaborative has the capacity to serve a limited number of centers and the demand to participate in the collaborative is greater. It also informs the implementation of the BSC so that initial planning can address the unique strengths and weaknesses of the teams and design appropriate supports.

The Implementation Team distributed information and materials to email lists of ECE programs to provide information about the BSC.[k] These materials included an invitation to participate in an information session to learn more about the BSC. The focus of the information session was to share an overview of the application process and an opportunity to ask questions.

The Implementation Team then emailed the application to prospective programs with instructions to return the application in one month. While programs reviewed the application, the Implementation Team conducted focused outreach through phone calls and emails to provide one-on-one support to applicants as they completed their applications by answering questions, offering guidance, and providing encouragement.

Seven programs applied to participate and all seven were selected. The Implementation Team noted that there were very few applications from Head Start centers. Additionally, twelve centers seriously considered applying but ultimately did not apply. The Implementation Team completed in-depth follow-up interviews with directors at six of these twelve sites to learn what programs identified as major barriers to participation throughout the application process. Specifically, center directors reported a lack of time to

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[k] ECE programs that had participated in Pyramid Model training were emailed information about the project. Additional detail about how the Implementation Team targeted their outreach to ECE programs in the geographical area where the project took place is omitted because of concerns this could identify centers that participated in the project.

participate in the BSC, competition from other early childhood quality improvement initiatives, and contextual issues such as staffing shortages.

Participants

The CCL project included a sample of seven child care centers and Head Start programs from a large city. Each participating center received a stipend of $3,500 that could be used at their discretion to support their participation in the BSC. The centers, while all determined to be a good fit for the BSC-SEL, differed in their structure and staffing, ranging in size from five to almost 20 classrooms, fewer than 50 to over 200 enrolled children under the age of five years, and less than a dozen staff to over 30.

With support from the Implementation Team, each of the seven participating centers formed a multi-level, Core BSC Team composed of representatives from their centers. Core BSC teams varied in size and makeup, but most were comprised of a Senior Leader[I] (e.g., center director), Team Leader (e.g., center administrator), teacher, and in some cases, a parent. The size of Core BSC teams ranged from four to eight, with six of the seven teams experiencing attrition in membership over time. Core BSC team members served as representatives for their center, participating directly in BSC activities (i.e., attending four in-person Learning Sessions and monthly affinity group calls, interacting on the shared online discussion forum (Basecamp site), collecting and submitting monthly metrics, and conducting PDSAs over a one-year period (see Figure 2 for a detailed timeline). Core BSC Team members from each of the centers, in addition to other staff members employed for more than 10 hours per week at their centers, were included in feasibility study data collection efforts (see Recruitment and Consent Process for more information).

In addition to participants associated with each center, the Implementation Team and faculty coaches were also included in data collection efforts as key informants on the BSC implementation. The Implementation Team was made up of six facilitators (including an improvement advisor trained in the BSC methodology) across the University of Massachusetts Boston, the Center for the Study of Social Policy, and JRA Consulting Ltd. Implementation Team members supported the T, meeting with them by phone over the course of the BSC process to provide consultation and facilitate in-person Learning Sessions. The faculty included five additional on-the-ground expert coaches with expertise in SEL and child development who supported and coached Core BSC teams about SEL and quality improvement practices. They were hired by the Implementation Team and received training on the BSC methodology and on their roles in the BSC. Faculty coaches were responsible for facilitating monthly affinity group calls with Core BSC Team members, leading breakout sessions and presentations at the in-person Learning Sessions and providing support to teams on the online discussion forum site.

Recruitment and consent process

The Feasibility Study Team distributed consent forms to Core BSC Team members and directors at the Pre-Work Day and asked for consent for the Implementation Team to share administrative data collected for the purposes of BSC implementation with the Feasibility Study Team.

The Feasibility Study Team recruited Core BSC Team members and other center staff members to participate in direct data collection activities (i.e., surveys, focus groups, interviews, classroom observations). The Feasibility Study Team distributed information about the study activities to staff who attended the Learning Sessions to share with staff from their center who were not able to attend. All staff at centers who worked 10 or more hours per week were eligible to participate in the direct data collection

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[I] Senior leaders were usually a center director. However, some teams split senior leader responsibilities across a center director and another high-level administrator or two high-level administrators.

activities and all eligible individuals who consented were included. To identify who was eligible, directors provided the names, roles, and email addresses of staff at their center who worked 10 or more hours per week.

In addition to signing consent forms to participate in the feasibility study overall, participants were also asked for their consent at the start of each survey, interview, and focus group. The Time 1 and Time 2 surveys distributed both online and as a paper form included a statement of consent describing the voluntary nature of the survey and its purpose.[m]

The study protocol and all recruitment and consent procedures and materials were reviewed and approved by Child Trends' IRB and OMB (Control No. 0970-0507, Exp. 03/31/2020).

Project timeline

The feasibility study collected data from multiple sources across all phases of implementation of the BSC. Both qualitative and quantitative data were collected and used in a mixed methods analysis of evidence, testing the hypotheses associated with the Theory of Change and the feasibility study research questions (see Appendix C for a full list of measures as they align with the research questions and the Theory of Change). Qualitative data sources included key informant interviews and focus groups; quantitative data sources included participant surveys, classroom observations, and BSC artifacts and administrative data (e.g., Learning Session notes, monthly metrics, attendance sheets). Due to the small sample size and the exploratory nature of this study, statistical analyses were not conducted to detect significant differences between subgroups. Figure 2 shows the timeline for BSC implementation and feasibility study data collection.

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[m] The Feasibility Study Team also conducted on-site observations using the Teaching Pyramid Observation Tool (TPOT™; (Hemmeter et al., 2013) and Teaching Pyramid Infant-Toddler Observation Scale (TPITOS™; Bigelow et al., 2019) in an effort to measure teachers' SEL practices. The TPOT and TPITOS were chosen because they are fully aligned with the Pyramid Model. Both Core BSC teachers and other center staff in infant/toddler and preschool classrooms participated in on-site observations. This report does not include recruitment methodology nor findings from the observations. The TPOT and TPITOS were designed for use in both research and quality improvement efforts. However, these tools are primarily for professional development purposes. While it was feasible to conduct on-site observations in the center classrooms that participated in the BSC, the data collected from the observations were difficult to interpret in the context of evaluating outcomes.

Figure 2. Timeline of Breakthrough Series Collaborative implementation and feasibility study activities
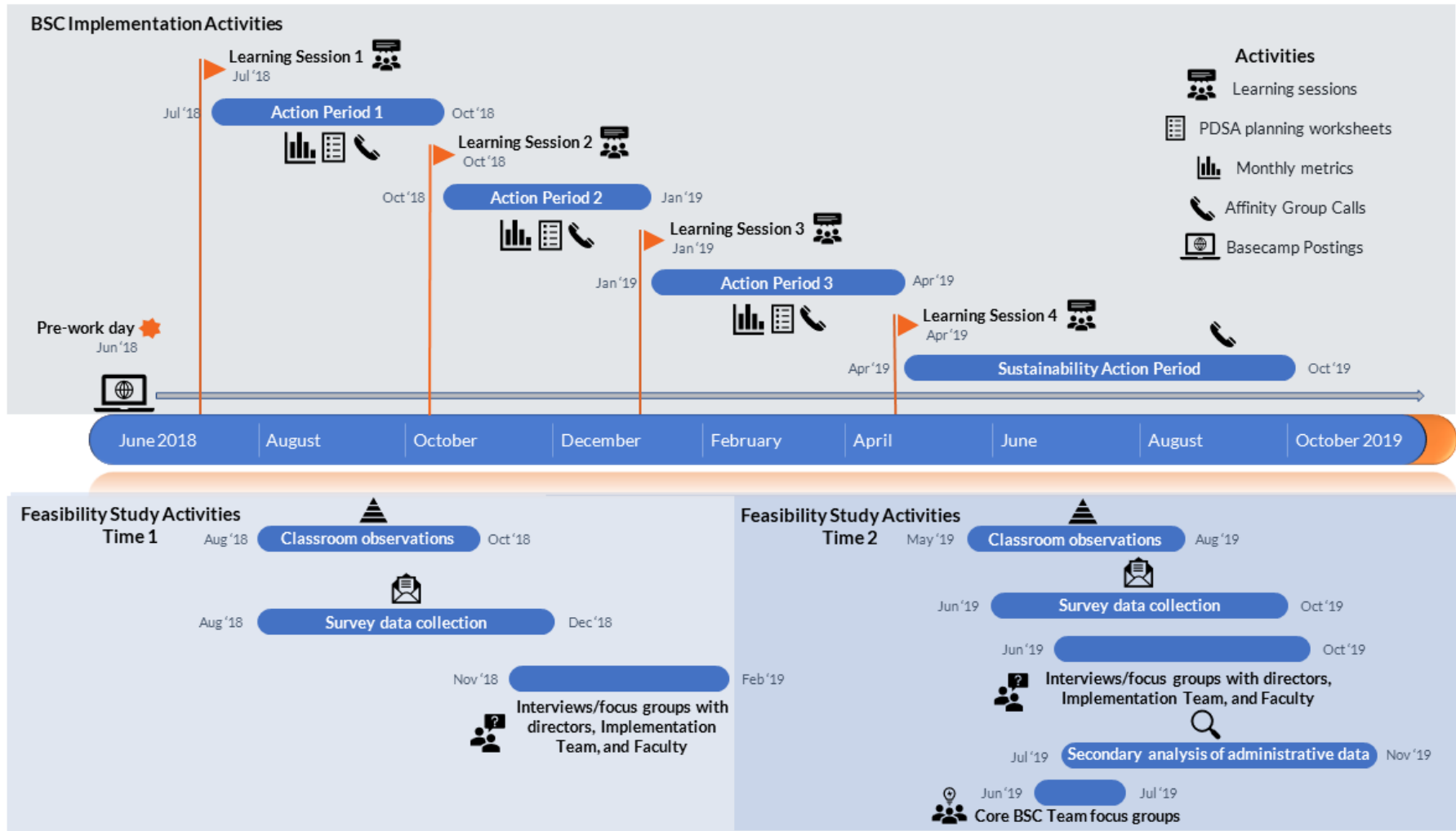
Source: CCL Feasibility Study Team.

Key Findings

The findings are reported according to the research questions emerging from the BSC theory of change.

- To what extent did programs engage with the BSC and participate in the activities offered to program teams?

- How successfully did programs begin developing a culture of continuous learning?

- Was there initial evidence that suggests participation in the learning collaborative was associated with desired outcomes related to teaching practices and organizational culture?

For each sub-section corresponding to these three research questions, we provide a brief overview of the key findings in a "findings at a glance" section and identify key data sources and measures examined for exploring the research question.[n] We conclude the findings section with a discussion of the lessons we learned about implementation and evaluation of a BSC in ECE programs.

Please note that, due to the small sample size of this project, some potentially identifiable information about the findings is purposefully not included in this report to protect the identities of the centers and center staff. In addition, because of the small sample size for this study, the Feasibility Study Team was not able to test the statistical magnitude of observed or reported changes in quality improvement or SEL practices over time. Consequently, any quantitative analyses presented in the findings are purely descriptive and exploratory in nature.

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[n] More detailed information on the alignment between research questions and data sources for this study can be found in Appendix B. Information about individual measures used in the feasibility study can be found in Appendix C.

Engagement and participation in the Breakthrough Series Collaborative

Findings at a glance: Engagement and participation

According to the BSC-SEL theory of change, a key step in ECE quality improvement is meaningful engagement of programs in improvement activities.

Program participation in activities varied across programs and over time.

- Some programs had consistent team representation at in-person activities, while others sent only one or two representatives or did not attend at all.

- Participation in in-person activities decreased over time.

- Senior leaders on teams had competing responsibilities that made it difficult for some to participate.

- Indicators of program participation were compiled to identify two groups of programs: two programs with "robust" participation and five programs with "moderate" participation. These groups of participants differed on other organizational characteristics, with robust participation programs appearing to have greater capacity for engagement at the outset of the project.

Programs completed data collection on the monthly metrics.

- All programs were able to collect and submit monthly metrics data, but this process was more challenging for some to complete on a regular basis.

- Identifying a staff person to lead the metrics collection facilitated the process.

Participants enjoyed the learning collaborative and found it to be different than other quality improvement initiatives.

- Participants reported positive perceptions of the activities in the learning collaborative.

- Participants valued the in-person meetings and the opportunities to interact with other team members through monthly calls.

- Participants liked the team and group coaching they received on SEL practices.

To understand engagement and participation in BSC activities, we examined artifacts of the BSC process, such as attendance lists for Learning Sessions and affinity group calls, and the number of monthly metrics centers gathered and shared during Action Periods. Additional artifacts of the BSC process included analyses of online discussion forum posts and the "yearbook" assembled for each center by the Implementation Team during the Sustainability Action Period that summarized in the form of a few PowerPoint slides what the center did while participating in the BSC. Qualitative data sources included interviews with Implementation Team members, interviews with faculty members, interviews with center directors, and focus groups with Core BSC teams. Together, these data offered a portrait of how teams and individuals participated in the BSC.

Participation in the Breakthrough Series Collaborative varied across and within centers

The Feasibility Study Team examined the level of centers' participation, engagement, and enthusiasm for Learning Sessions, monthly metrics, calls (e.g., affinity group calls, BSC team calls), site visits, and the online

discussion forum. Figure 3 demonstrates that Core BSC teams' members participated in the in-person Pre-Work Day and Learning Sessions to varying degrees. While centers were informed of and aware of the expectation to participate in Learning Sessions when they applied for the project, participation at in-person sessions varied over time and across sites, despite the logistical support that center directors reported they did to support staff attending in-person activities, such as organizing transportation, creating opportunities for collaboration as a Core BSC Team, and encouraging enthusiasm for the BSC-SEL. Core BSC teams fluctuated in size as teachers sometimes stepped in to take the place of another who could not participate, but the range over the course of the BSC was 3-8 members per center. **Variation in Learning Session participation occurred *within* centers over time, and also *across* centers.** For example, a Team Leader from Centers B, D, and G attended each of the five all-day, in-person convenings. And a Team Leader from Centers A and E attended four of the five all-day, in-person convenings. A Team Leader from Center C did not attend any of the in-person meetings, although a Senior Leader did attend at least two of the five in-person convenings.

Figure 3. Core Breakthrough Series Collaborative Team members attendance at in-person activities
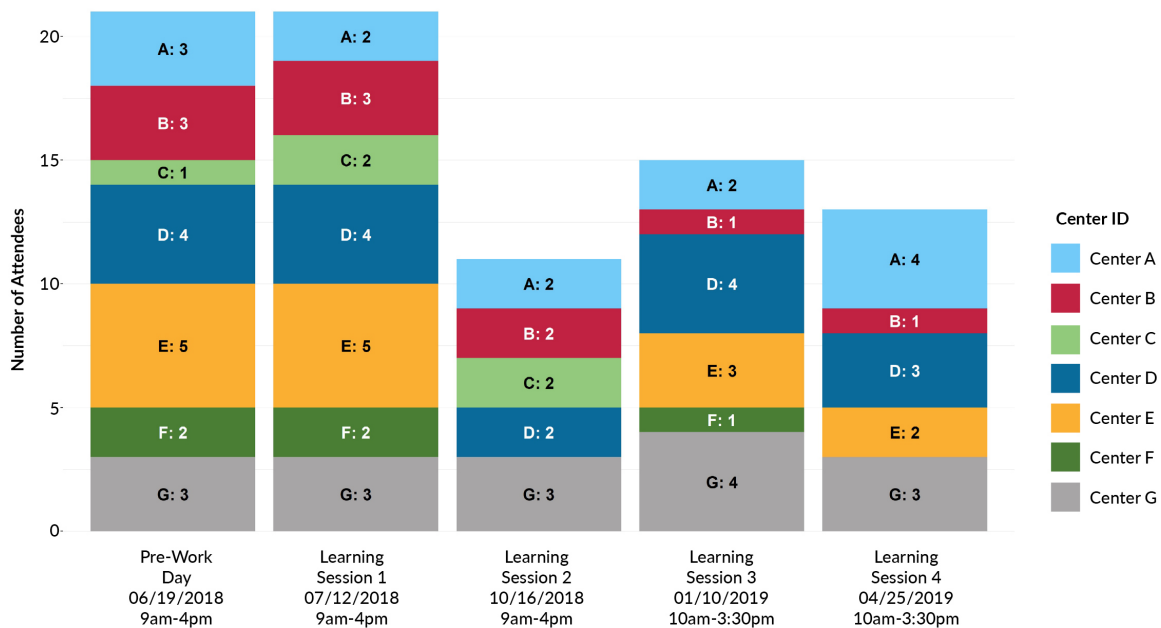
Source: Implementation Team records.

Within a Core BSC Team, the Senior Leader is expected to play an important role in enabling participation, facilitating changes in the programs to support improvement, and helping set the tone and model to others that participating in BSC activities is valuable. As seen in Figure 4, Senior Leaders varied in their attendance on conference calls. Senior Leaders did not all consistently participate in the Senior Leader Call, with only three Senior Leaders (in Centers A, C, and D) attending more than half (between 60% and 90%) of the calls. Senior Leaders in four of the seven centers attended between one and three Senior Leader Calls out of the 10 that were held.

Figure 4. Senior Leader calls attended by center
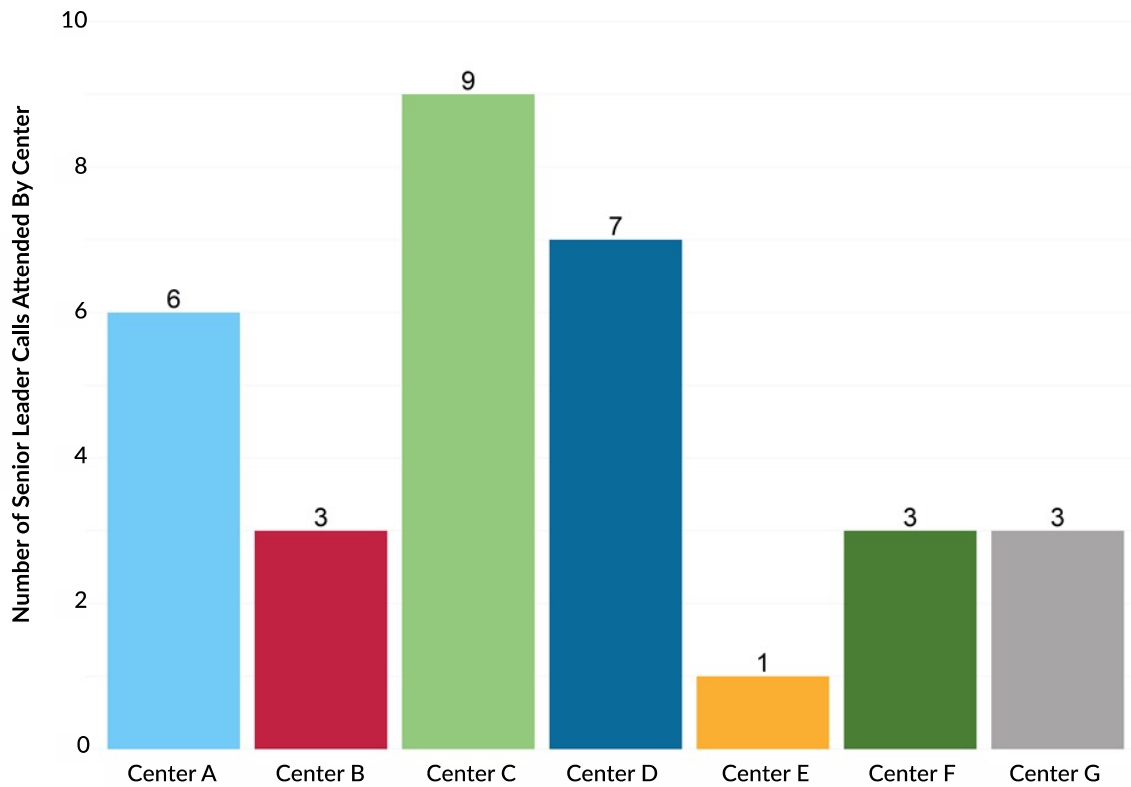
Source: Implementation Team records.

During the in-depth phone interviews the Feasibility Study Team conducted with Senior Leaders, they expressed their interest in participating in calls, and their perception that attendance was beneficial. However, other obligations such as impromptu meetings sometimes prevented them from more fully participating in all activities, including the Senior Leader calls.

> It [the Senior Leader activities] was helpful if I could have participated more. I think that my position here and also having to attend meetings or impromptu meetings sometimes...those prevented me from participating in the BSC as I wanted to as a ... leader. – Senior Leader

> I like the conference calls personally because it makes me feel important. Because your voice is being heard...You'd be surprised when you hear different centers going through the same thing you're doing. And most of the time, you're really helping someone out when they hear your voice, and when you hear their voice, they're helping you out. – Senior Leader

Documentation of monthly metrics varied by center

Monthly metrics are the data that Core BSC teams collect and submit to Implementation Team Members about children's behaviors and two-way communication with families. Documenting and measuring metrics over time is a way to quantify progress Core BSC teams make in key domains of SEL over the course of the

BSC. The BSC lasted 12 months, so if centers had collected data every month, they would have data for 12 months on each of these two topics.

The number of monthly data points collected by each center varied, as seen in Figure 5, in large part due to not having enough staff and/or due to not having an existing data system in place. Three centers collected some data on children's challenging behaviors for seven or more consecutive months (Centers A, D, and G). Two centers (Centers A and D) collected data on challenging behaviors consistently (i.e., for 10 or more months), while two others (Centers E and F) only submitted metrics on challenging behaviors for one month.

Figure 5. Number of months centers submitted metrics on challenging behaviors
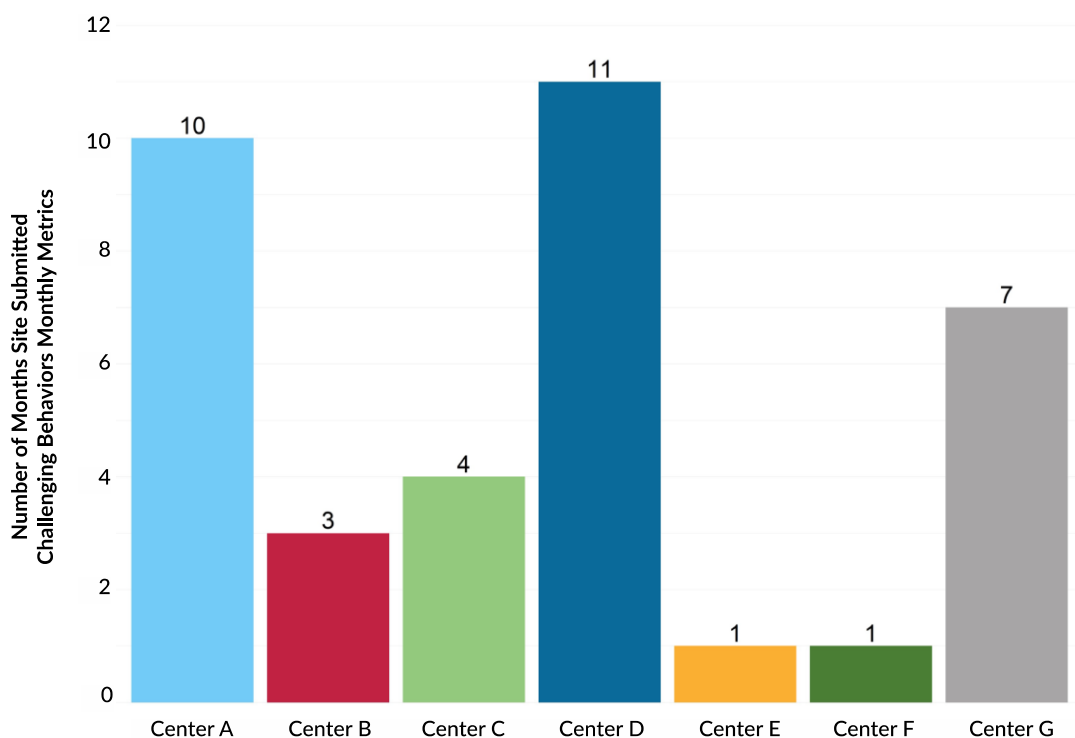
Source: Implementation Team records.

As seen in Figure 6, three centers (Centers A, D, and G) collected some data for six or more consecutive months about communication between teachers and families. Center B collected metrics on two-way communication between teachers and families for two months, while Center F collected these metrics for one month.

Figure 6. Number of months centers submitted metrics on two-way teacher-family communication
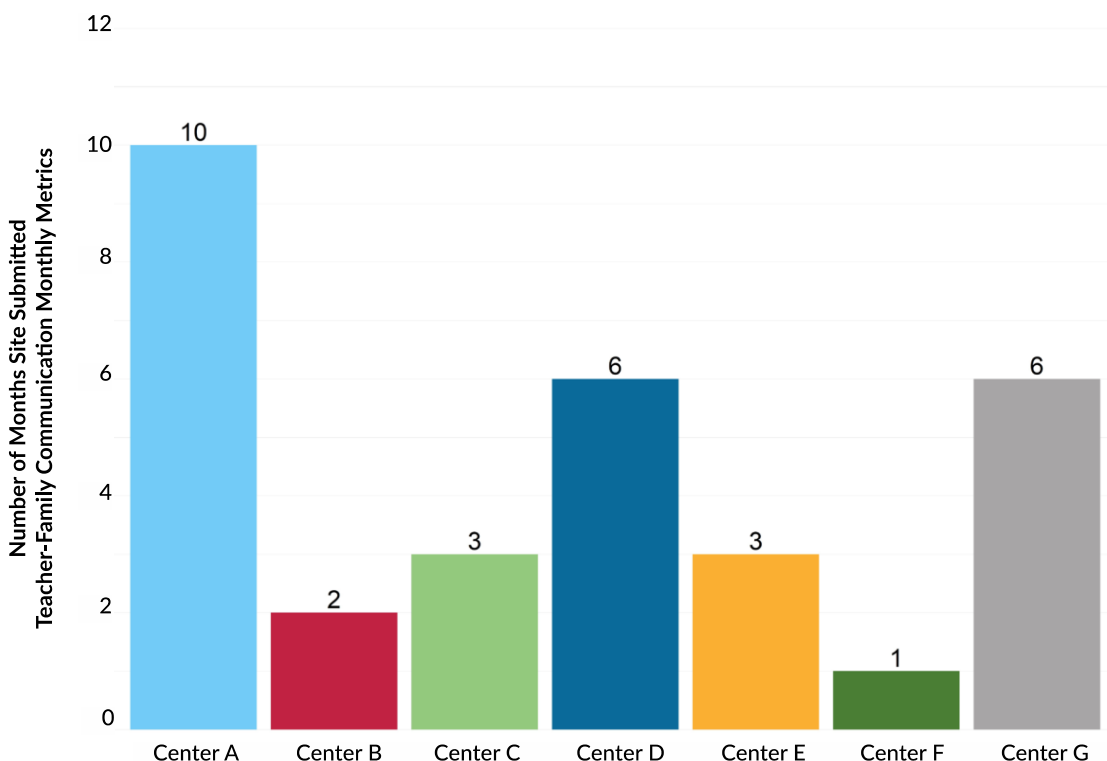
Source: Implementation Team records.

Overall, four teams struggled to collect monthly metrics on a regular basis. There were three centers (Centers A, D, and G) that collected data on challenging behaviors and two-way communication relatively consistently.

While other monthly metrics were developed by the Implementation Team based on the Change Framework, Core BSC teams were only asked to report on these two monthly metrics. It is not unusual for BSC teams to collect data on a subset of the metrics. Implementation Teams tailor each BSC to the capacity of the teams that participate. The centers that participated in the BSC did not have robust existing data systems and spent time at the beginning of the project learning and working on establishing a process for collecting data. To support teams in collecting data, the Implementation Team encouraged them to focus on the two metrics that were most important and essential to their work. This allowed teams the space to focus on process (tracking metrics) and some content (SEL practices).

The qualitative data provide further insight about the variation seen across centers in their ability to collect the monthly metrics. For example, one director reported being short on staff, which made it hard to meet this expectation.

> [Discussing collecting monthly metrics] collecting the data from teachers, we have specific times, one day a week to collect. But then, on those days, it might not be the right time to be able to do the observation and provide the information for me to enter. So that is where it was difficult. We had to figure out to switch it - if it's not Tuesday, switch it on a Thursday, whether it's morning, we started switching it in the afternoon to see what works well. Again, with staffing, sometimes the teacher doing the data is out. – Core BSC Team Member

Another director indicated their center hired a special project person who was tasked with collecting the monthly metrics. This center had more consistently collected and submitted monthly metrics over the course of the project. Not all centers may have the resources to hire a special project person to manage the monthly metric data collection.

> …using the observations and the collection [monthly metrics]…That's where the special project person was really good. He was good around taking the data, analyzing it. Because if they can't see the analysis of something, it makes it hard from them to understand why do [sic] we keep doing this.
> – Senior Leader

Participants felt the Breakthrough Series Collaborative on Social and Emotional Learning was different than other professional development experiences

Participants discussed the BSC in comparison to other "trainings." Trainings, workshops, or classes were the typical frame of reference for the ECE staff, and they talked about the activities in these terms. For example, they frequently referred to the in-person Learning Sessions as a "workshop." This is important because participants were comparing the BSC to "business-as-usual" professional development methods.

> *"When we're doing the BSC, it's a team approach. So, we have management, we have the teachers, the supervisor, you know, all looking at data…And of course, there are those [Learning Sessions], everyone is coming together. So, they are learning as a group, similar to if they went out and did an intentional training…"* –
> Senior Leader

The Feasibility Study Team interviewed Senior Leaders to better understand their experiences with the BSC and their perceptions about how it compared to other ECE trainings. Two Senior Leaders commented that the on-going support their centers received from the Implementation Team made it more hands-on, and therefore they were more easily able to apply what they were learning in their center. This was in contrast to their experiences in other professional development and quality improvement activities. And, a Core BSC team member reflected how they felt closer to their co-workers as a result of participating in the BSC.

> One of the things I liked about this program was that it would be more hands-on rather than just going to a training and then after the training's over, you try to implement the program…they assist us with implementation which was one of our issues from the very beginning. – Senior Leader

> Other models that we've taken… if we go to class individually or even if we did it together, there wasn't a lot of follow-through. What I like about the BSC is the follow-through to help you implement what you're learning. – Senior Leader

> It was always a teamwork type of aura. It was never a part where you're singled out. Coming through the door where you're just one person. I come in now, it's a group of four, and we're all in the same field, so we're all like one small family. That was really helpful and really good for me.
> – Core BSC Team Member

Participants had very positive perceptions of the Breakthrough Series Collaborative on Social and Emotional Learning

Core BSC Team members participated in a focus group with their team to describe their perceptions and experiences with the BSC.[o] Members reported that the Learning Sessions were engaging and inspired them when they returned to their centers. One Core BSC Team member said, "When we did our first [Learning Session] – when we came back, we were just excited to get it going." At another center one member said, "It [the BSC] was a lot of fun. All the games were so fun. To have a whole group running and laughing [at Learning Sessions] …" A Core BSC Team member at the same center said, "What I liked was switching it up and talk to people and give you thought-provoking questions. I learned a lot about other people's culture."

The Feasibility Study Team also interviewed six of the seven directors individually during no less than two of the three interview time points and they were asked to reflect on the BSC-SEL. One director pointed out that the Learning Sessions were unique because it gave the staff an opportunity to be with staff from other centers and it allowed them to focus on the content of the day:

> They [Core BSC Team members] were excited about, they liked the trainings [Learning Sessions] because they are away from everything. They don't get the opportunity all the time. They are away from everything and they can actually concentrate. It was actually good for them to be around other programs.

Two groups of centers appeared to emerge based on their participation profiles

The theory of change posits that participation/engagement in BSC activities (as documented in the outputs of the BSC-SEL) activates mechanisms that lead to sustained changes in practices at the individual and organizational levels. The Feasibility Study Team examined how participation varied across centers. Some BSC activities were weighted more heavily than others in the Feasibility Study Team's analysis of level of participation. In particular, attendance at Learning Sessions and on Senior Leader calls were weighted the most, while participation on Basecamp was weighted the least (see Table 1). In-person activities were given the most weight because they were the primary way in which centers received information about SEL practices and quality improvement strategies. They prepared centers for all the work they would go on to do during actions periods, including participating in phone calls, conducting PDSA cycles, and collecting and submitting monthly metrics. Senior Leader calls were particularly important and weighted more heavily because the Senior Leader was responsible for supporting participation in all other aspects of the BSC (e.g., calls, metrics, PDSAs, etc.). They created the space to support their center's participation and are key in facilitating buy-in and supporting spread in practices and knowledge sharing across their center. The Feasibility Study Team asked the Implementation Team to review the proposed weighting of the BSC activities for the purpose of categorizing level of participation; there was agreement across the Feasibility Study Team and the Implementation Team in the proposed differential weighting of BSC activities.

Based on the number of activities (outputs) in which centers participated and the differential weighting of those activities as described earlier, two groups appeared to emerge.[p] Two centers whose weighted participation scores were above the third quartile of scores, suggesting that they participated in BSC activities more frequently and/or in the activities that were believed to be most influential in supporting quality improvement, were categorized as having 'Robust' participation while the five centers whose

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[o] Five of the seven centers participated in the team focus groups. To protect the identities of the centers, we do not include additional details about which centers participated in the focus groups.
[p] Please recall that due to small sample sizes, we could not test for statistically significant differences in level of participation. These designations were based on observed differences in weighted participation scores.

weighted participation scores were below the third quartile, suggesting that they participated in BSC activities less frequently and/or in activities that were believed to be less influential in supporting improvements, were categorized as having 'Moderate' participation. The categorization of centers into these two participation groups was used as a structure for examining subsequent process and outcome measures associated with the remaining two research questions. However, due to the small sample size, statistically significant differences between the groups could not be tested and apparent differences are only descriptive in nature. While there was variation in level of participation in the BSC activities, it should be noted that all seven programs that participated in this study were highly motivated to engage in an intensive quality improvement experience, as indicated by their self-selection to apply for the BSC-SEL.

Table 1. Scoring metrics for how the Feasibility Study Team calculated centers' participation in the Breakthrough Series Collaborative on Social and Emotional Learning

Activity	Scoring	# of Instances	Total Points Possible	Weighting
In-Person Activities (pre-work day and Learning Sessions)	0 – No representatives present from center 1 – One representative present from center 2 – More than one representative present from center	5	10	0.25
All Team Calls	0 – No representatives present from center 1 – One representative present from center 2 – More than one representative present from center	11	22	0.1
Senior Leader Calls	0 – No representatives present from center 1 – One representative present from center	10	10	0.2
Teacher Calls	0 – No representatives present from center 1 – One or more representative present from center	9	9	0.1
Team Leader Calls	0 – No representatives present from center 1 – One representative present from center	6	6	0.1
Monthly Metrics	0 – No data for the month from center 1 – Center submitted at least one datapoint for one metric for the month (either challenging behavior or	11 months (June '18 – April '19)	22	0.1

Activity	Scoring	# of Instances	Total Points Possible	Weighting
	conversations with families) 2 – Center submitted at least one datapoint for both metrics for the month (both challenging behavior and conversations with families)			
PDSAs	0 – Center submitted zero PDSAs in the action period 1 – Center submitted one PDSA in the action period 2 – Center submitted more than one PDSA in the action period	3 Action Periods	6	0.1
Basecamp Participation	0 – No participation from center in the action period 1 – At least one interaction/post from center in the action period 2 – At least one interaction post from two or more people from center in the action period	3 Action Periods	6	0.05

Source: CCL feasibility study team.

Implications for feasibility of participation in a Breakthrough Series Collaborative among early care and education settings

An involved Senior Leader who facilitated buy-in from staff appeared to be key in supporting participation in the BSC because Senior Leaders had the authority to support teachers in taking off time to join calls and attend Learning Sessions, which were the primary ways Core BSC teams received information about SEL practices and quality improvement strategies. Senior Leader participation specifically may have been key in ensuring coordinated efforts in the center and a cohesive Core BSC team.

Infrastructure, policies, and resources to ensure space and time for the Core BSC team to connect about their work during Action Periods (e.g., implementing PDSAs, collecting metrics, etc.) seemed to be key in supporting engagement. Without structures and resources to support data collection and data entry, submitting metrics consistently may have been challenging for centers.

Developing a culture of continuous learning

Findings at a glance: Developing a culture of continuous learning

A culture of continuous learning is created when relationships and processes among teachers, directors, and other administrative staff in a program support curiosity, questions, and reflections about current practices. They are interested in learning from failures as well as successes and learning from one another. The BSC in the CCL project focused on sparking and amplifying these mindsets and relationships.

The CCL project documented multiple indicators of a culture of continuous learning in centers.

- In some centers, teachers and directors entered the project with mindsets and organizational practices that support continuous learning. Measurement of these constructs showed little change over time. This orientation toward learning and new ideas may have motivated centers to apply to participate in the project.

- Teachers and other staff were encouraged to take initiative and demonstrate leadership in trying and promoting new practices, regardless of their formal title in the program.

- The teams interacted with other centers to share learning and identify opportunities to test new practices. Working with teams in other centers exposed participants to new ideas they may not have considered, as well as opportunities to learn from what worked well and what did not in other programs.

- Teams began to experience some shifts in their mindset about how they approach working with children and families and how they approach relationships with co-workers.

Some personal characteristics associated with a culture of continuous learning appeared to differ across the robust and moderate participation groups. (Note: Researchers did not analyze statistically significant differences between groups due to the small sample size.)

- Directors' and teachers' beliefs in their ability to make decisions that result in positive outcomes ("efficacy") are part of a culture of continuous learning. Directors and teachers in the robust participation group started high and stayed high on measures of efficacy. Directors and teachers in the moderate participation group started lower on measures of efficacy but changed positively over time.

- Psychological safety refers to a sense of trust and security that expression of ideas is welcome in the program. Measures of psychological safety did not change over time; however, directors and teachers in the robust participation group started and stayed higher on the measure than those in the moderate participation group.

In this section, we present findings associated with how change was activated among participants and in centers participating in the CCL project. The findings suggest that by engaging in the BSC activities, participants may have experienced shifts in the relational dynamics within their center and in their mindset about how they approach their work with children and families and how they approach their relationships with co-workers.[q] These psychological changes and shifts in relational dynamics illustrate the mechanisms in

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[q] Due to the small sample size, no findings were tested for statistical significance.

action. The Feasibility Study Team measured several constructs using standardized survey instruments, conducted in-depth interviews with center directors and Implementation Team members, and conducted focus groups with core BSC Team members. Findings from the quantitative and qualitative data collection are presented in this section.

Psychological safety

Psychological safety is an indicator of the extent to which work environments were a safe space to try new ideas, make mistakes, and provide input or ask for help. The Psychological Safety measure (Edmondson, 1999) examined staff's feelings of psychological safety and learning behavior in work teams. Example items included, "If you make a mistake at this center, it is often held against you," and "Teachers at this center feel it is safe to take a risk (e.g., trying something new in the classroom)."

Centers characterized as having robust levels of participation (i.e., they were more involved in BSC activities) had staff who reported higher levels of psychological safety at Time 1 compared to centers that participated less frequently (see Figure 7). There was not much change in reported levels of psychological safety between Time 1 and Time 2, but there appear to be group differences at both time points. Centers characterized as having moderate levels of participation started and stayed lower in psychological safety over time. Due to the small sample size, no findings were tested for statistical significance.

Figure 7. Psychological safety by participation group at time 1 and time 2
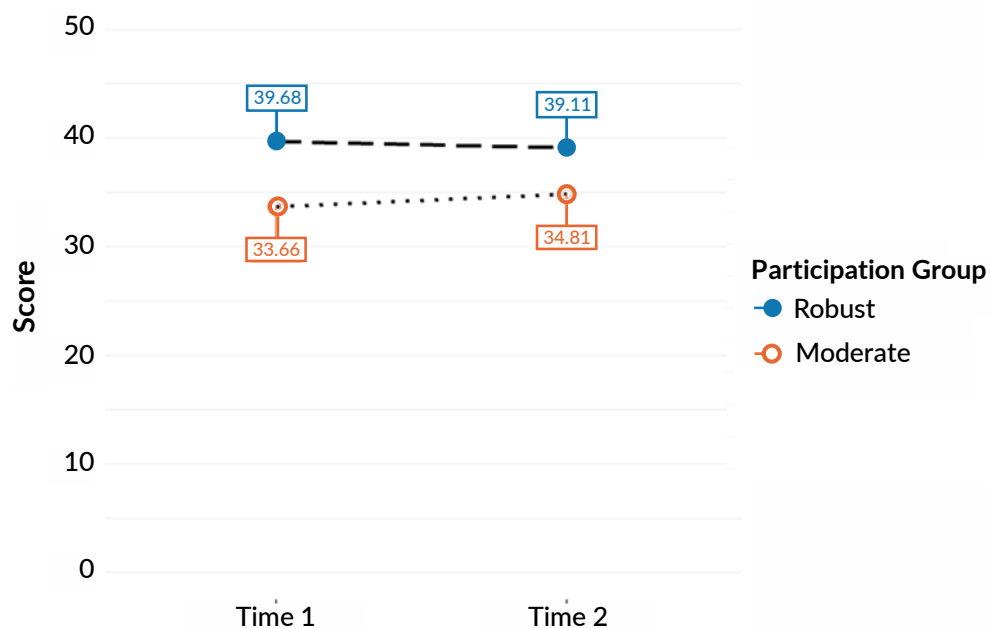
Source: CCL feasibility study.
Note: Due to the small sample size, no findings were tested for statistical significance.

Director efficacy

Director efficacy (measures the extent to which directors feel they can make their own decisions to produce a desired outcome, which is another indicator of positive intra-organizational dynamics. Example items for directors included questions about whether directors felt respected by staff and whether they felt they

could effectively handle management tasks. The Feasibility Study Team used three sections from the directors' sense of efficacy scale (Bloom, 2017). The first section asks directors whether they feel that they have low, medium, or high levels of competence and confidence. The second section asks directors to indicate which of several statements best represents their perceptions of their current position with regard to several factors (e.g., authority, respect of staff, respect of families, use of time, management tasks). The third section asks directors to rate their level of competence and confidence in their knowledge and skills in a variety of areas (e.g. promoting policies and practices that ensure children's health and safety, building strong family partnerships, managing an early care and education program and its staff, and promoting leadership capacity at all levels of an organization). For the director efficacy scale, the Feasibility Study Team calculated the scores from the three parts of the instrument to arrive at a total score ranging from 34 to 135.[r] As shown in Figure 8, directors from centers characterized as having robust participation in the BSC reported higher levels of efficacy at Time 1 compared to center directors from centers with moderate participation. Directors from centers characterized as having robust participation reported similar levels of efficacy at Time 1 and Time 2; however, center directors from moderately participating centers reported higher levels of efficacy at Time 2. Directors from all the participating centers reported nearly identical levels of efficacy at Time 2.

Figure 8. Director/assistant director efficacy by participation group
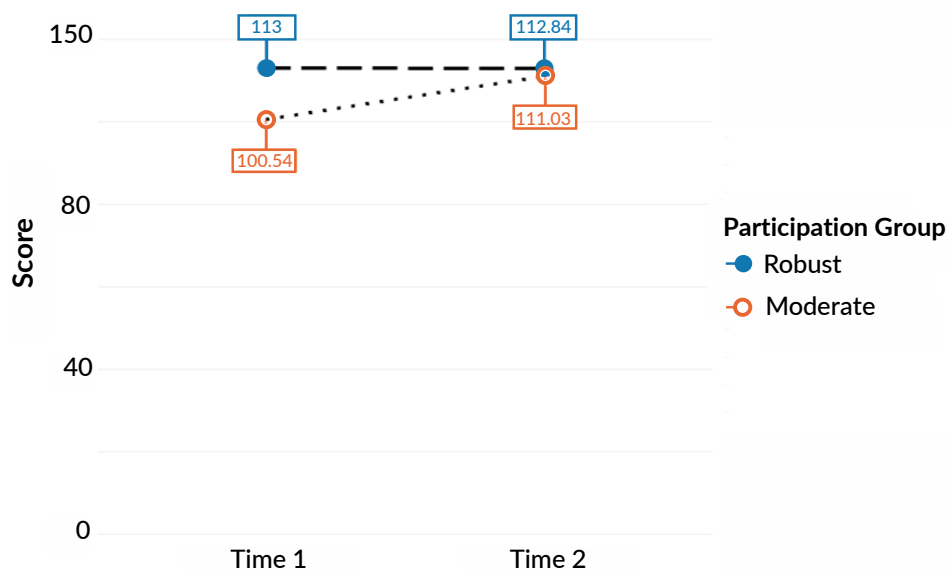
Source: CCL feasibility study

Note: Due to the small sample size, no findings were tested for statistical significance.

Teacher efficacy

The Teacher Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001; VandeWiele, 2001), adapted for use with ECE teachers, measures the extent to which teachers feel they can make their own decisions to

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[r] The descriptive scale included one question about how directors rate their levels of competence and confidence, with total possible points ranging from 1-3. The second scale included eight questions about how the director perceived their job, with total possible points ranging from 8-32. The third scale included 25 questions about directors' competence/confidence, with total possible points ranging from 25 – 100. The total points possible on the director efficacy scale ranged from 34 (1+8+25) to 135 (3+32+100).

produce a desired outcome, which is an indicator of positive intra-organizational dynamics. The teachers' sense of efficacy scale consists of 20 questions. Example items for teachers included, "How much can you do to make positive changes in your care setting?" and "How much can you do to calm a child who is upset?" All teachers from the participating centers answered items about their ability to perform certain tasks in their current role, such as the ability to make positive changes and implement activities as planned. Respondents rated items on a scale of 1-9, where 1 indicated that the teacher believed their impact was "nothing" and 9 indicated that they believed they could influence the item "a great deal." Total scores for each respondent could range from 20-180, with higher scores indicating more feelings of personal efficacy for teachers. Figure 9 shows findings on the levels of teachers' perceived efficacy at the start of the BSC-SEL (Time 1) and then at the end of the BSC-SEL (Time 2), for both Core BSC Team members and other center staff. Teachers' sense of efficacy regarding their ability to perform tasks and make positive changes increased over these two timepoints, with a change in mean across all teachers from 133 to 145.

Figure 9. Teacher efficacy by participation group
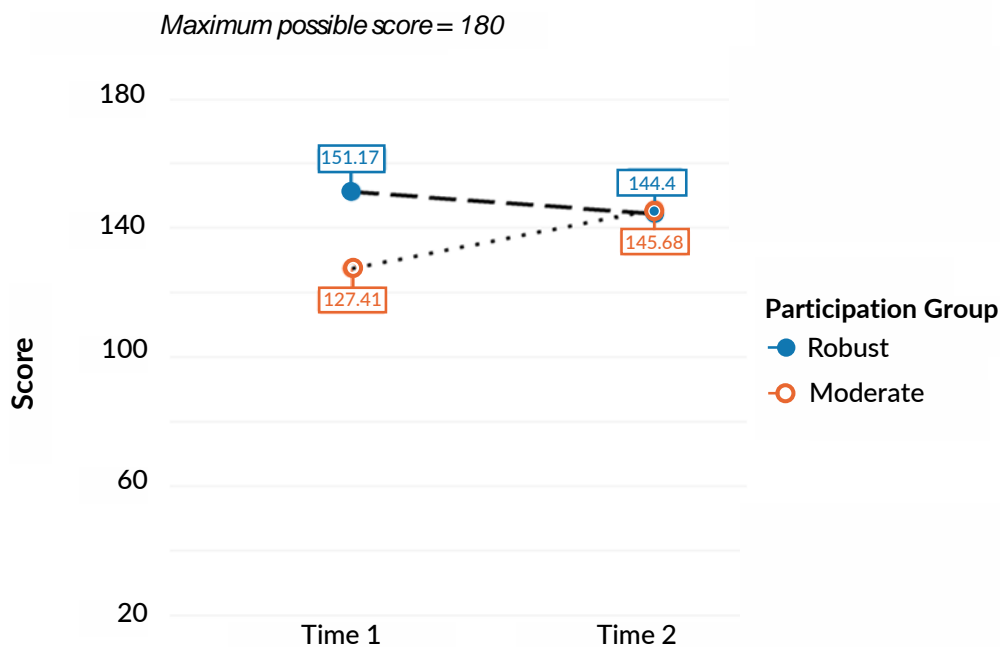
Source: CCL feasibility study.

Note: Due to the small sample size, no findings were tested for statistical significance.

Centers with moderate participation in the BSC-SEL appear to have had more room to grow in their efficacy, whereas the staff at centers with robust participation seem to have started with higher levels of self-efficacy, and they remain high (but teachers' efficacy drops at Time 2). There appears to be convergence in efficacy scores at Time 2 across the two groups of centers.

Inter-organizational learning

Inter-organizational dynamics capture the relationships and interactions among participating centers. The interviews included questions about perceptions of the shared learning environment (e.g., Learning Sessions, online discussion forum, calls). The responses indicated that inter-organizational dynamics shifted as Core BSC team members began sharing information across centers and learning from one another. The Feasibility Study Team asked Senior Leaders and Core BSC Team members to reflect on their experiences

participating in a professional community of ECE educators who were all focused on improving how they support children's SEL. The responses indicated that senior-level staff and staff just entering the field valued being able to collaborate with others.

> One center [was] trying to change their expulsion [policy]...nobody likes to kick kids out, but you have some kids that there's no way to handle...you feel like you're letting yourself down, the parents down. How do you deal with that...? Being able to put your minds together, get input from teachers and parents – that was really helpful. - Senior Leader

> As someone newly entering the field, it was nice to speak to people who have been in the field and have a lot of experience. It was valuable for me to get their insight and to just have conversations...it gave me insight into what kind of mindset do I need to approach the work with. - Core BSC Team Member

The team learning climate was also captured using Nembhard's inter-organizational learning activity items (Nembhard, 2012). The intent was to capture the team learning climate among teams. Inter-organizational items asked respondents to indicate the extent to which their teams interacted with others at Learning Sessions and on the online discussion forum (i.e., Basecamp), used monthly metrics, and joined affinity group calls.

In the Time 2 Survey only, respondents were asked to self-report on their participation in BSC activities (e.g., attending a Learning Session, doing a PDSA). Respondents could answer with one of the following choices: "I don't know," "never," "rarely," "sometimes," "regularly," or "a lot." Only Core BSC Team members' responses were analyzed to assess inter-organizational dynamics (Nembhard, 2016). Core BSC Team members were most likely to report actively engaging in interactions during Learning Sessions; almost all (94%) of the 16 Core BSC team member respondents reported that they engaged in interactions during Learning Sessions "regularly" or "a lot." Core BSC Team members reported being less involved in affinity group calls, reporting monthly metrics, and interacting on Basecamp; the plurality of respondents said they "sometimes" engaged in these three BSC activities (see Table 2).

Table 2. Summary of Core Breakthrough Series Collaborative Team members' responses to self-report of engagement in Breakthrough Series Collaborative activities

	I don't know	Never	Rarely	Sometimes	Regularly	A lot
Interactions during Learning Sessions (n = 16)	6%	0%	0%	0%	31%	63%
Monthly all-team calls (n = 16)	6%	0%	0%	31%	31%	31%
Affinity group calls (n = 16)	6%	0%	0%	44%	38%	12%
Interactions via BSC Basecamp (n = 16)	6%	0%	13%	50%	6%	25%
Monthly metrics report exchange (n = 15)	13%	0%	7%	40%	13%	27%

Source: CCL feasibility study, Time 2 survey.

The Feasibility Study Team conducted in-depth interviews with the faculty members to ask about their reflections of how the centers were participating in the BSC. Faculty coaches have unique perspectives as

experts in the content (i.e., supporting children's SEL), but new to the BSC methodology. One faculty member reflected about the centers' participation: "I think people really developed a professional connection, for sure…It was a community that felt very comfortable and trusting in sharing what works for them with each other and sharing their thoughts with each other."

Inquiry mindset

Inquiry mindset captures a curiosity or willingness to try out new practices. People become an active part of their own learning by posing questions that can be investigated and answered through their engagement in the learning process, as opposed to a one-size-fits-all approach to address challenging situations. In-depth interviews with directors and faculty members included questions about centers' use of PDSAs, desire to improve practices, and use of data.

> *"A PDSA mindset – so they are approaching things as a PDSA. Whether [they were] tracking that. I didn't get the sense that [they] were tracking that but approaching – it changed the way [they] approached [their] project as a leader. [They were] telling other programs about [their] experiences with it. Spreading the community that way." – Faculty member*

While centers didn't always write down plans for PDSAs, they expressed curiosity in testing new approaches and reflecting on the outcomes. One director reported,

> I…take things I've learned through the conference calls and stuff like that back in the classroom and say to them [the teachers], 'Well, did you try it this way? Let's try it this way and see how it will work.'

Another director shared,

> I see the staff [Core BSC Team members], they take notes when things are being shared from all the participants [on calls]. And they say, 'Okay, great. Let me do this in my classroom. Let me see how that will go in my room.'

Implications for feasibility of building a culture of continuous learning in early care and education settings

Because centers self-selected into the BSC, some mechanisms related to improvement outcomes, such as positive group dynamics, trust, and a willingness to try new things, may have been activated even before the start of the BSC-SEL. A center that signs up to participate in a novel quality improvement program may already have an "inquiry mindset" or desire to try new problem-solving strategies. A BSC may be most feasible in ECE centers where staff are excited about the model and have a desire to try something new.

Evidence based on the findings from the seven centers that self-selected to participate in the BSC-SEL suggests that the BSC is feasible to implement in ECE centers regardless of their starting point. It is flexible and meets participants where they are. Even centers that participated moderately in the BSC still saw gains in level of teacher and director efficacy, although levels were already high at Time 1 so gains appear modest; efficacy scores converged between participation groups at Time 2. Centers characterized by robust participation were already scoring quite high on these measures and had less room to grow, however the changes observed suggest that the BSC supported these centers' strengths in ways that allowed them to make promising changes.

Initial evidence of short-term outcomes of the Breakthrough Series Collaborative

Findings at a glance: Changes in teaching practices and organizational culture

A key question when assessing the feasibility of a quality improvement method in ECE centers is whether it has promise to change the outcomes of interest. The CCL project targeted practices to support children's SEL, knowledge, and skills related to the process of making improvement, and features of workplace culture that support continuous learning. The extent to which team members in each program shared their new learning with non-team members and whether changes were sustained over the six months following participation in the learning collaborative were also desired outcomes.

The CCL project documented initial changes across most outcomes of interest.

- Examples of successful changes reported by participants included family engagement strategies, options for recognizing staff contributions, and techniques for supporting staff well-being under stress. Successful changes were shared and adopted across teams.

- Center teams reported new knowledge about how to make and sustain improvements using the tools and skills obtained through the learning collaborative.

- Becoming familiar with data and data collection procedures helped program team members become more confident in their work and recognize that improvement is an ongoing process.

- Team members gained an appreciation for seeing demonstrations of leadership across members of their program, regardless of a person's job title.

- Job satisfaction changed over time among center team members in ways that aligned with their level of participation in the learning collaborative. Members of teams with robust participation appeared to have higher satisfaction scores at both time points compared to those with moderate participation on all the dimensions that were measured – working conditions, co-worker relations, the work itself and supervisor relations.

- Some team members reported challenges in sharing the tools from the learning collaborative with other center staff. Other team members provided examples of how they shared learning across other staff in their centers.

- Center team members reported little change over time on a measure of beliefs about SEL. Scores on the measure did not appear to differ by robust or moderate participation groups.

Across the processes and outcomes examined, initial evidence indicates that implementing a learning collaborative in ECE centers is feasible and a promising strategy for addressing challenges in current quality improvement initiatives. Though further testing of the methodology is necessary, the findings from this pilot provide decision makers with information about how challenges in ECE quality improvement can be addressed using a method from the health sector.

There is initial, and promising, yet limited evidence that the centers that participated in the BSC experienced changes in short-term outcomes in teaching practices, organizational culture, and continuous quality improvement practices. The evidence is limited primarily because of the case study design and the small sample included in the study. We present findings demonstrating how centers made changes, spread

changes among their colleagues, and in a few cases, with other teams in the collaborative, and sustained changes six months after the BSC ended.

To examine the short-term outcomes described in the Theory of Change, the Feasibility Study Team used measures to evaluate center staff's knowledge, skills, beliefs, and attitudes about SEL, family engagement, racial equity, cultural responsiveness and how to make and sustain improvements over time. Data were collected from quantitative surveys about ECE practitioners' perceived problems, perceptions of burnout and emotional exhaustion, beliefs about SEL, and feelings about the work environment. We also include findings from in-depth interviews with Implementation Team members and interviews with center directors as evidence of outcome data.

In this section, we will present evidence about how the BSC supported centers in applying skills in SEL and improving their organizational climate and culture, including stronger leadership across organizational levels, and increased sense of efficacy.[5] We also present how centers sustained changes in quality improvement during and after the BSC, including their experiences using data and their perceptions about the helpfulness of BSC activities and processes.

No changes in beliefs about social and emotional learning

To examine how center staffs' beliefs about SEL changed during the BSC, participants completed survey questions at Time 1 and Time 2. Survey items asked respondents to rate their level of agreement with statements such as "Taking care of children's social and emotional needs comes naturally to me," and "The culture in my center supports the development of children's social and emotional skills." There were virtually no differences in the endorsement of positive beliefs about SEL by the two participation groups (see Figure 10). SEL belief scores stayed mostly consistent from the beginning to the end of the BSC, with virtually no difference between groups based on level of participation in the BSC structures and processes. It is important to remember that centers that participated in the BSC were required to have completed trainings on SEL before applying to join the project. It may be that more sensitive measures are needed to capture changes in practice beyond those identified in the beliefs about SEL measure.

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[5] The CCL project used a tool capturing teacher (Tschannen-Moran & Woolfolk Hoy, 2001; Vande Wiele, 2001) and director efficacy (Bloom, 2019) to measure how centers were developing a culture of continuous learning. The findings from those tools were reported earlier in this report and are not repeated here. The CCL project acknowledges that the BSC theory of change represents cycles of improvement such that there is an expectation of improvement over time in the same elements (e.g., efficacy) over time.

Figure 10. Social and Emotional Beliefs Scale by Participation Group
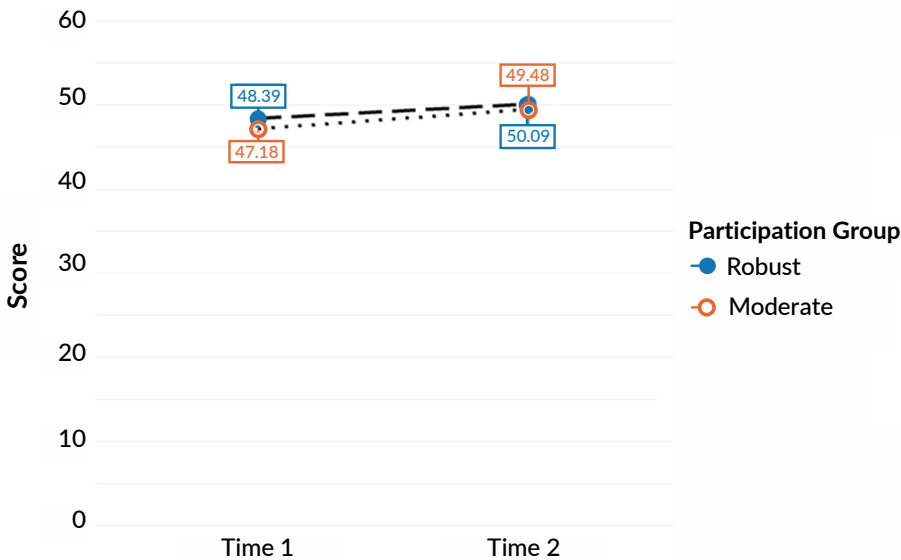
Source: CCL feasibility study.

Note: Due to the small sample size, no findings were tested for statistical significance.

Changes in organizational climate were associated with participation levels

To examine changes in organizational climate, center staff reported on how satisfied they were at their job using the Early Childhood Job Satisfaction Survey (ECJSS; Bloom, 2010). The first part of the ECJSS asks respondents to indicate how strongly they agreed or disagreed to several statements about different aspects of their work life. The 50 questions in Part I of the ECJSS were organized into the following categories: co-worker relations, supervisor relations, the work itself, working conditions, and pay and promotion opportunities. For each category of Part I in the ECJSS measure, there was stability or an increase in job satisfaction from Time 1 to Time 2 over the course of the BSC (see Figure 11). Centers characterized by "robust" participation in the BSC started with higher levels of job satisfaction, which indicates that stronger organizational climates may relate to level of participation. On dimensions where robust participants were already high (co-worker relations and the work itself), less growth was noted (perhaps as they reached a ceiling). However, growth from Time 1 to Time 2 was noted for centers characterized by robust participation in working conditions and supervisor relations. Centers characterized by "moderate" participation in the BSC were lower on job satisfaction dimensions compared to the "robust" participation centers. Among the "moderate" centers, growth over time was most notable from Time 1 to Time 2 in co-worker relations and the work itself.

Figure 11. Early Childhood Job Satisfaction Survey – Part I: Facets of job satisfaction by participation group
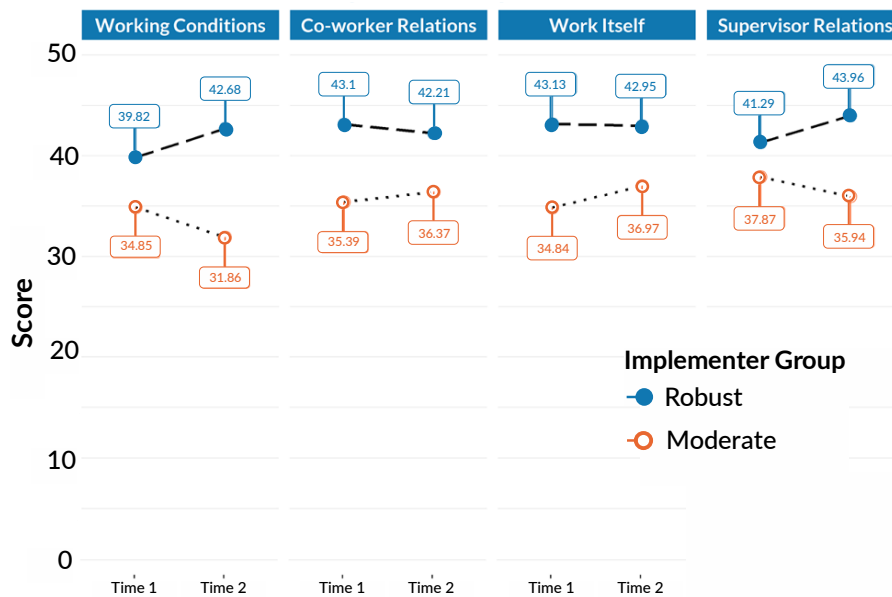
Source: CCL feasibility study.

Note: Possible scores on the ECJSS can range from 0 – 50.

Note: Due to the small sample size, no findings were tested for statistical significance.

The Early Childhood Work Environment Survey (ECWES; Bloom, 2015) provides an additional portrait of staff's perceptions of organizational climate. Although results are only available for four of the seven centers due to low response rates at one of the time points,[t,u] variation was noted across participating centers in the perceptions of organizational climate (see Figure 12 and Figure 13).

Centers A and E (in purple and yellow, respectively), tended to show increases in different aspects of organizational climate over time. Program D (in green) showed decreases over time in 8 out of 10 indicators of organizational climate. Program C (in light blue) scored consistently lower than the other centers on all aspects of organizational climate. This program also showed less dramatic shifts over time in staff's perceptions of organizational climate, and had equal number of indicators (i.e., 5) show an increase over time as a decrease over time. It is important to note that this center did not have much representation on their Core BSC team/cross-role team from teachers and other staff members at the center (i.e., it comprised mostly of senior leadership). The dotted line in Figure 12 and Figure 13 represents the national norm.

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[t] Centers with fewer than 5 respondents at one time point are excluded from the figure.

[u] While our overall response rates for the Early Childhood Work Environment Survey (ECWES) and the Time 1 and Time 2 surveys fell short of our goal of ≥80%, it is comparable with response rates of similar studies of quality improvement collaboratives (e.g., Nembhard, 2012).

Figure 12. Early Childhood Work Environment Survey (ECWES) – Part A: Staff's ratings of organizational climate by center, part 1
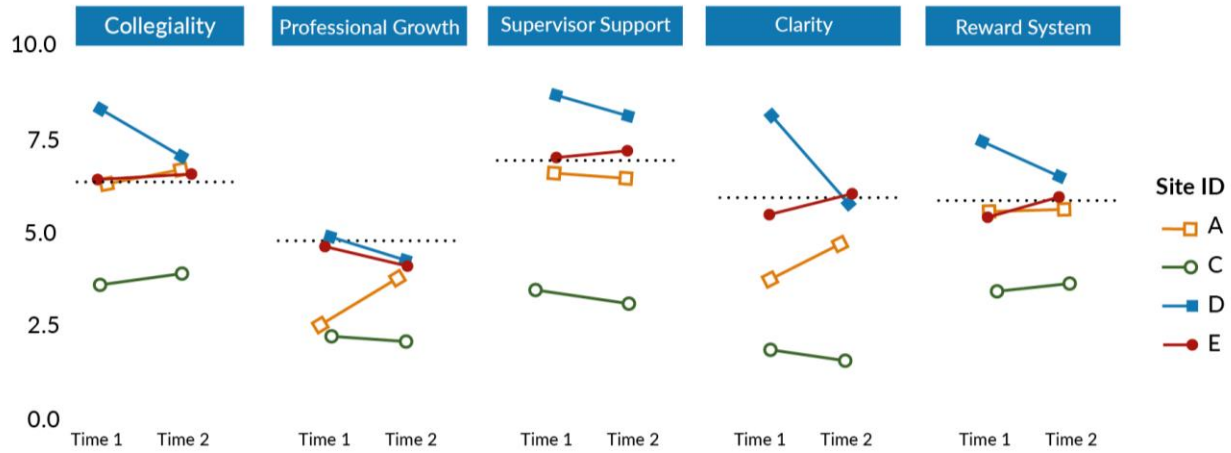
Source: CCL feasibility study.
Note: Response rates by center for pre (post): A = 11 (7); C = 10 (8); D = 5 (10); E = 8 (26)
Note: Due to the small sample size, no findings were tested for statistical significance.

Figure 13. Early Childhood Work Environment Survey (ECWES) – Part A: Staff's ratings of organizational climate by center, part 2
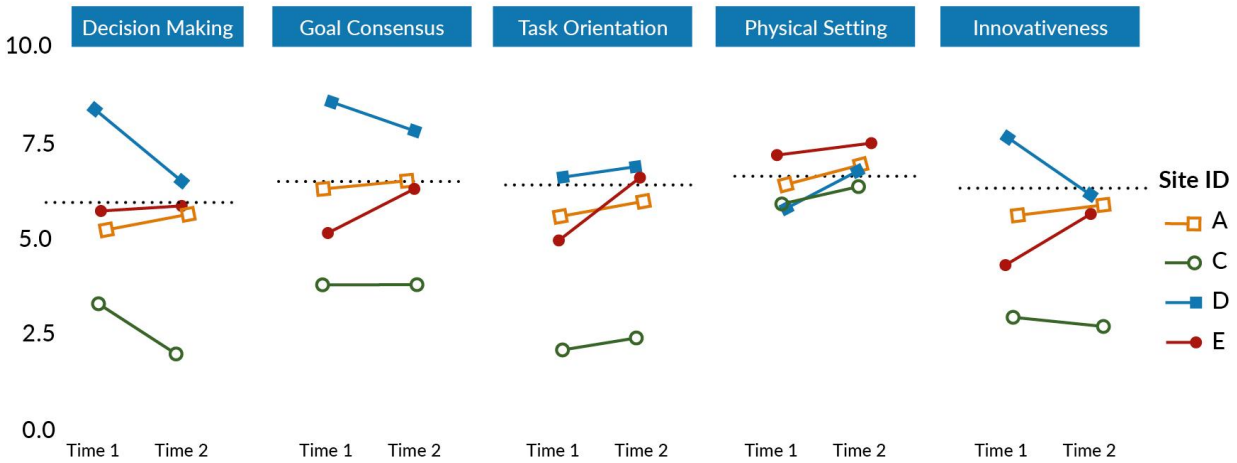
Source: CCL feasibility study.
Note: Response rates by center for pre (post): A = 11 (7); C = 10 (8); D = 5 (10); E = 8 (26)
Note: Due to the small sample size, no findings were tested for statistical significance.

Stronger leadership across organizational levels

Another short-term outcome of the BSC is improving leadership across all levels at an organization. The Feasibility Study Team asked BSC participants about their perceptions of this during group and individual interviews and documented examples of changes in perception about who took initiative and played leadership roles. For example, one Core BSC Team member reported during a focus group:

> I would say leadership, in our pre-K, afterschool, [infant/toddler classrooms has improved]– [the teacher] takes the initiative to work with the children in the classrooms and share what she learned with other teachers...So adapting what they've learned, from what I've observed in the center, have made them better in their jobs as teachers compared to what it was before.

"She [a Core BSC Team teacher] has grown quite a bit because she asks a lot more questions, she wants to have the lead on a lot more things, she wants to get a lot more things done in terms of data collection and making sure others do the same. So, she has definitely grown and is taking a major step to becoming one of the leaders." – Senior Leader

Increased efficacy

Changes in self-efficacy among team members were reported across centers. For example, one focus group participant discussed how she felt an increased sense of individual efficacy in her practice by collecting monthly metrics. She reflected on how observing the metrics data helped her see where the children in her care needed more social and emotional support.

> Yeah, it [monthly metrics] was useful for me because I noticed then that some children had a harder time transitioning from one area to another during feeding or nap time. I was able to focus on that and change that, so they don't cry...Writing it down and seeing it every week, I was like, 'Oh, whoa, she really needs help doing this,' so it did help me a lot. *- Core BSC Team member*.

Spread of quality improvement practices to other center staff

The BSC methodology when used in other sectors has been found to accelerate the uptake of new practices and increase the likelihood that these practices will be spread throughout the organization and sustained over time (IHI, 2003; McPherson et al., 2015). There was some evidence of the spread of new practices in this study. For example, one center invented a phrase called, "Take 5," to convey a message to one another that they needed to take a break. This phrase became a mantra that many of the center staff ended up adopting as a way to decompress from a perceived stressful situation. Staff even developed a poem to share the policy: "Take a walk, have a talk, take a minute just to think, have a cool drink, stretch your back, blow some steam, we know what you mean. Just TAKE 5." This "Take 5" strategy was aligned with the fifth "driver" in the CCF: Organizational Capacity and Support (see Appendix D). At the Learning Session, the center shared the "Take 5" motto and what it meant with the other centers from the collaborative that attended the Learning Session in an effort to share successful strategies to help them support children's social and emotional development. The "Take 5" message was initially a PDSA cycle that turned into a successful strategy that spread throughout the center (see Figure 14).

Figure 14. Spread of the "Take 5" strategy through Plan Do Study Act cycles

STARTED SMALL AND DEVELOPED THE IDEA
Center focused on center climate and staff wellness. One Teacher tested the idea of working with her co-teacher on a system to be able to step out for a 5-minute break if she needed. The team learned about the strategy from a training.

BROADENED TEST AND CONTINUED TO LEARN
The team learned that strategy was really helpful for staff to stay present and calm. It was spread to other teachers to test.

MADE PERMANENT!
The entire center embraced the strategy of TAKE 5 to promote staff wellness and support. The policy was communicated to the entire staff. Teachers know that if they need a break, they can call the non-teaching staff to step into the classroom for 5 minutes in order to ensure appropriate ratio. The team created a catchy name – TAKE 5 – and a poem to share the policy.

Source: Implementation Team.

While the qualitative data provided several instances of spread of practices to other center staff who had not directly participated in the BSC activities, the quantitative data from the study provided a more mixed picture. Over half of the Core BSC Team members reported using data to test small changes compared to 14% of their peers in those same centers who didn't participate directly in the BSC (see Figure 15). This suggests that it was difficult to spread specific QI strategies and tools to other staff at the center. However, evidence on inquiry mindsets suggested that the way the centers approached improvements at their centers did change over the course of the BSC even if they weren't using PDSAs formally. About a quarter of all respondents, both those who directly participated as well as peers in the participating centers, reported "sometimes" testing changes using PDSA cycles (see Figure 15).

Figure 15. Example 1 of spread of quality improvement practices: Use of PDSA cycles
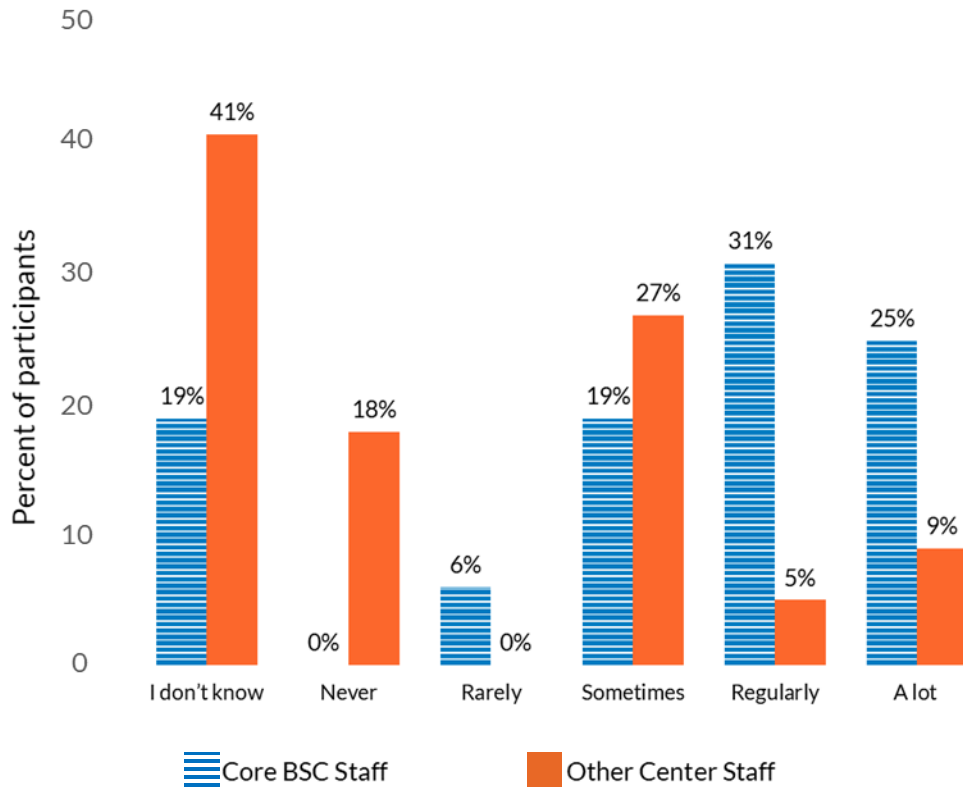
Source: CCL feasibility study.

Note: Due to the small sample size, no findings were tested for statistical significance.

A similar pattern was found for solicitation of ideas and feedback from staff (see Figure 16).

Figure 16. Example 2 of spread of quality improvement practices: Solicitation of ideas and feedback from staff
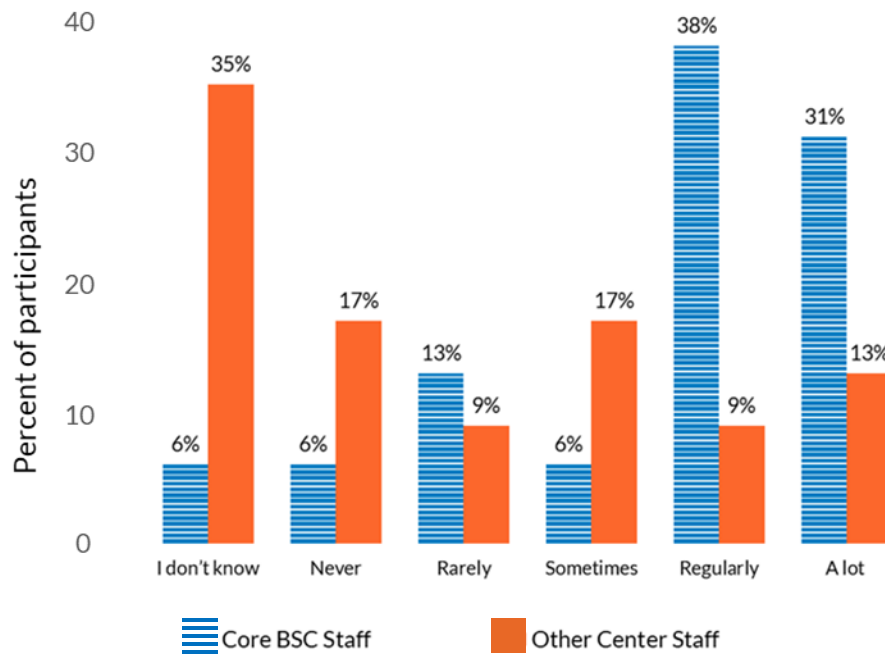
Source: CCL feasibility study.

Note: Due to the small sample size, no findings were tested for statistical significance.

Centers expressed and shared an interest in sustaining quality improvement practices

In sustainability interviews directors expressed their plans to continue to use PDSAs and data in their practice. One director shared: "These PDSAs are very helpful...it kind of made it feel more like policy...this is how we solve problems now. There's a problem, let's try this. And take out PDSAs and figure out the what the problem is."

During interviews, directors and Senior Leaders talked about how becoming familiar with data and data collection procedures has helped them feel more confident about their work and how improvement isn't something that is achieved and completed; rather, it's an ongoing process.

> *"The biggest lesson for me was around the data. I've always done data, but never in that way...This was a more broad way of gathering information. Specifically, I had to open my mind to it too because originally I was like, 'yeah, yeah, we already do that.' But, we really weren't doing that." – Senior Leader*

> I think the challenge for a lot of early educators is the technology part of data collection. So, helping them with that can give them some confidence with that part and it just helps them move forward on that. And then we just have to be mindful that it's an ongoing process...making sure it keeps moving forward. - Senior Leader

> I want to get back into using [the challenging behaviors metrics] because I think it will be very helpful when you sit down to talk to a parent...it is a good tool, so I want to go back to it. - Senior Leader

Successes in spread and sustainability of quality improvement practices

During interviews and focus groups, Core BSC Team members discussed how they talked about what they were learning and testing with their co-workers. These discussions appeared to inspire colleagues to try some of the strategies that the Core BSC Team members were leading. The qualitative interviews suggest that when teachers feel safe to discuss their learnings and experiences with co-workers, they end up spreading quality improvement practices beyond the Core BSC Team that attended Learning Sessions and participated in phone calls and conducted PDSAs.

"All of our classrooms are set up where there is a joining door between the two classrooms in the middle…What I found was the teacher that is in the BSC team, whatever she's trying out, she would actually tell the other teacher that is not a part of the BSC team about it, that it worked. Then the other teacher would try it too with a child…So it's like a ripple effect."
– Senior Leader

> I was taking what we were learning in the infant/toddler classroom and I was bringing it here [to the pre-K classroom] and try to implement with pre-K. We had one child in pre-K here…he was not very vocal or responsive at first. I worked with teachers, and we implemented strategies we had learned from the BSC – now he's one of the most talkative kids in the class, he's come out of his shell in such a big way. – Teacher

Challenges in spread and sustainability of quality improvement practices

Despite the mechanisms in place that allow for staff to collaborate and build trust to share and spread quality improvement practices, teachers reported during feasibility study interviews that it was challenging for co-workers to experience the same understanding about the BSC methodology (e.g., PDSAs) without having participated in the Core BSC Team. One Senior Leader explained that "It'd be easier for the staff if someone different came in and did workshop on that [PDSAs] so they know hands-on how to do it."

> "I broke it down and said, 'well this is what I learned in this program that I'm in and this is what you can do.' Some of them really spun off on it and some of them, I think, they needed to be in the Core team itself. Something like this, I feel like is hard because the center is so big to implement with everyone." – Senior Leader

Spread of social and emotional learning practices

Participants reported that several new practices tested in PDSAs spread either amongst center staff or across the centers participating in the BSC. Most centers tested practices that centered around supporting children's development and environment, teaching practices around supporting children's social skills and emotional competencies, partnering with families to support children's development, and improving their organizational culture. Many centers reflected they did not test many PDSAs associated with promoting racial equity and cultural responsiveness to support children's development. The following examples show how PDSAs were spread across center staff:

1. One center developed a practice in which teachers could excuse themselves from the classroom for up to five minutes to take a needed break. A co-worker would take over for the teacher. This became known as "Take 5." This practice spread across the center among staff who were not part of the Core BSC Team.

2. The second was about supporting children's social and emotional development by identifying one teacher to consistently be in the classroom when children were dropped off in the morning, thereby easing children's transition for the day. This extended to when children went down for naps and transitioned to new classrooms in the center too.

3. The third was centers that adapted new welcoming practices at drop-off for engaging both parents and children that included saying to hello to parents and children by name.

Implications for feasibility of using the Breakthrough Series Collaborative methodology for achieving, spreading, and sustaining desired outcomes in early care and education settings

Characteristics that appear to support the feasibility of producing positive outcomes of a BSC in ECE included:

1. An involved Senior Leader who can build information sharing about the content and BSC strategies into existing systems (e.g., staff meetings, professional days)

2. Classroom and organizational structures that facilitate collaboration between teachers

Given that centers that participated more robustly in the BSC also had higher ratings of organizational climate than the moderate participation group at the start of the BSC, there may be reason to believe these centers had more established systems and structures to facilitate participation at the outset.

Lessons Learned Implementing a Breakthrough Series Collaborative in Early Care and Education Settings

Because the BSC methodology is new to the ECE field, it is important to understand if changes or accommodations are needed. In this section, we describe the adaptations made by the Implementation Team to accommodate leading a BSC with ECE centers. The findings in this section are themes collated from the qualitative data collected during the Time 1 and Time 2 interviews with the expert faculty and the Implementation Team. During the qualitative coding process, the Feasibility Study Team identified excerpts from the interviews that were about "variations or adaptations" to the BSC and how the BSC "fit or aligned" with the context of the ECE centers. The adaptations that the Implementation Team made in the BSC are summarized in this section as *opportunities*, *challenges*, and *responsiveness to the local context*. We conclude by presenting recommendations that the Implementation Team and faculty shared if they were to conduct another BSC with ECE centers in the future.

The Implementation Team pointed out that thinking about "adaptations" may not be "the right word because [the BSC] is meant to be a responsive model." The findings described in this section highlight how the Implementation Team used the five inter-connected elements to meet teams where they started in order to be responsive and keep them engaged in the BSC in a meaningful way.

Responding to opportunities

Shortening the length of the Learning Session from two days to one day was a key change to the methodology. The Implementation Team knew based on their experience recruiting and selecting centers that ECE centers throughout the local area were struggling with hiring and retaining ECE teachers. The application review process, and subsequent conversations with selected teams, led the Implementation Team to make some changes in the initial phase of BSC implementation. Several of the selected center directors were concerned about scheduling their teams to be off-site for two days in a row for the first Learning Session. In addition, based on reviewers' assessments of teams' strengths and weaknesses in the application, the Implementation Team identified a need to provide early supports to teams to effectively conduct their self-assessment and form complete teams. Therefore, the Implementation Team decided to

modify the BSC schedule, replacing the two-day Learning Session with a Pre-Work Day and holding the first one-day Learning Session one month later. This enabled the Implementation Team to deliver enhanced supports early in the process, before the first Learning Session, to build team capacity. Shortening the length of the Learning Session from two days to one day meant that the seven centers only had to find substitute teachers or arrange for Core BSC Team members to be out of the classroom/center for one day, not two days.

The Implementation Team launched the BSC in the summer of 2018. There were pros and cons with launching in the summer, especially in the ECE sector since many centers operate their centers differently during the school year (September – May) compared to the summer months (June – August). One advantage of launching the BSC in the summer allowed participating centers to have a "soft start" to the BSC. Further, the Implementation Team held a Pre-Work Day in June 2018, a month before the first Learning Session took place, so the Implementation Team could fully launch the BSC during the first Learning Session. One Implementation Team member reported she would like to use the model of having a Pre-Work Day in other BSCs she leads. Completing the BSC over a 12-month timeline allowed for five in-person events (one Pre-Work Day and four Learning Sessions). One Implementation Team member said this "made a huge difference just to keep it regular."

The Implementation Team reflected that for the Implementation Team to have one point of contact for centers was essential and allowed for a deep connection with teams. In addition, this person designated as the point of contact already had a deep connection to the ECE field, which afforded credibility with teams. The point of contact sent emails to the centers reminding them about the in-person events, scheduled in-person center visits, and reminded the centers about the all-team calls. An Implementation Team member said of their Implementation Team colleague, "[their] regular connection with teams was tremendous at keeping this [the BSC] in the forefront."

> In a lot of the series [other BSCs I have helped lead as a member of the Implementation Team] I don't think we [have someone in this role] and it often results in a little bit more distance from chasing teams down from trying to get people to respond to emails or calls and there's not that touch point. I don't feel like we feel as connected to the teams as we did in this one.
> – Implementation Team member

Another implementation member said that having one person serve in the role as primary contact with centers…

> '…de-compliance-ified' it…it was opposed to making it a project where teams were going to have to do something because you know someone was making you do it. It took it out of that and made it much more by choice. – Implementation Team member

Another way the implementation of the BSC-SEL was responsive to centers was in the way Implementation Team Members described or marketed some of the processes of the BSC. They referred to the phone calls scheduled during the last few months of the BSC as "virtual field trips." They noted strong attendance and engagement by the BSC teams. To prepare for the "virtual field trip," Implementation Team Members asked teams to submit pictures of their ECE environment in advance. Teams talked about their environments in very engaged ways and other teams on the call responded with questions. During group calls that were scheduled earlier in the BSC process, Implementation Team members asked teams to come prepared to talk about a specific topic during the call. Using pictures as a frame for the calls later in the series made it visual and participatory. Framing these calls as "show and tell" resulted in more teams participating in and during calls. One Implementation Team member reflected that having the calls framed this way helped because "there was some trust stuff. I think there was feeling it was worthwhile. I think there is developmental stuff

in there," acknowledging that participation in calls at the beginning of a series may not be as robust because the trust hasn't been built yet.

The faculty reflected about their implementation of SEL best practices rooted in the Pyramid Model. During a Time 1 semi-structured interview with three of the five faculty, none said they were making adaptations to how they support teams' SEL practices based on the size of centers. Faculty reported they were focused on relationship-building with the centers and ensuring the Pyramid Model fits for individual centers and classrooms.

Responding to challenges

The Implementation Team reflected on their experience conducting BSCs in other sectors and acknowledged that a barrier to implementing a BSC in ECE settings is the lack of planning time that teachers have. They are "always in front of somebody." The logistical challenges of squeezing in a phone call during one's lunch hour is not unique to ECE; however, this BSC is unique in that it is operating in the context of limited ECE staff and "the fact that child care is working on a shoestring budget to begin with. There is less room, their margin for this group."

Another barrier that the Implementation Team reported as early as the Time 1 interview was about the level of parent involvement on each Core BSC Team. An Implementation Team member acknowledged that "having a parent come to an all-day meeting [Learning Session], that structure is tough…we have to think about another way for them to get QI [quality improvement] training." Another Implementation Team member commented that "having a shared experience and bonding might help keep the parents involved." One suggestion was to incorporate a parent into every PDSA and ask the parent what they think of the learning. Another suggestion to engage parents is to bring them together for a quarterly call led by the parent faculty coach.

An Implementation Team member shared that having all-day meetings was challenging to convene during the day on a weekday. She reflected on the pros and cons of offering Learning Sessions on a weeknight or weekend. Some teams may have work policies in place (e.g., non-exempt status employees) precluding them from working overtime. Further, if Learning Sessions were offered on a weeknight, it would have to be done over the course of two evenings and one Implementation Team member worried that it would "dilute the process since people can only realistically do two to three hours in an evening."

An Implementation Team member said it is essential that BSC implementers clearly communicate in plain language to teams early and often about what teams will receive for attending an all-day meeting. She said in addition to giving a stipend to teams, she recommends distributing stipends to teams the day of the meeting. Another element essential to creating a welcoming environment is to provide food to teams. Further, she highlighted that the Learning Sessions for the BSC were held on a University campus, which consists of many large buildings, not easily accessible by car or nearby parking. She also suggested that if a Learning Session were held on a weekend or evening that it would be important to offer child care:

> A stipend has to be labeled, told up front you are going to get $250 for coming for the day. And we have child care and we can't give food, we couldn't give food in the last one which I think is the biggest incentive. If you say there is lunch and dinner, people say wow I get a free lunch and a couple bucks, yeah! But you go to bring your own lunch, you got to find the place, which isn't easy. Which [the site for Learning Sessions] is a nightmare to get to, poor things, and we are in another building which is much easier. I just think it is an unfamiliar place. – Implementation Team member

A faculty coach reflected on their role as faculty coach and said a limitation of the BSC is that it did not allow faculty to interact with teachers and families:

That is one of the drawbacks of the BSC. By following the formula of these Learning Sessions, certain calls, the Basecamp, some of that really did not sit with the availability of the teachers. We lacked the ability to interact with families through this model. That just didn't work. We had very few families participate and that should have been something of priority, especially with the Pyramid [Model]. – Faculty coach

An interesting challenge that one Implementation Team member pointed out was operating a BSC in the context of a research study. The Implementation Team member commented that if the BSC were being administered in a state as part of a state-funded system,

...there would be different pieces of infrastructure in place than how we were...we were more thinking about it in terms of the [research] study at times rather than things that you might think about for a collaborative or technical assistance process all the time. – Implementation Team member

During a typical BSC, a research team is not part of the BSC process. For the CCL project, it was important for the implementation and research teams to collaborate about the timing of activities to reduce burden as much as possible on participants and to ensure the implementation team and the research team maintained a unified message whenever communicating with participants about the goals and activities within the CCL project. For example, members of the research team attended each Learning Session to observe and used the opportunity to briefly describe the purpose of the research study and the data collection activities While it can be challenging to implement a BSC at the same time as gathering rigorous data on the BSC's effectiveness, such coordinated activity has been successfully accomplished in other sectors such as health care and home visiting (Nadeem et al., 2013; Nores et al., 2018; Schouten et al., 2008; Wells et al., 2017). It is necessary to establish efficacy of this quality improvement's methodology in ECE settings, as well. We address some specific considerations for coordinating BSC implementation and research activities in the Recommendations section of this report.

Responding to the local early care and education context

The BSC is designed to be responsive to the context in which it is being implemented. The Implementation Team responded to challenges associated with staffing shortages in the ECE centers by using targeted and direct outreach to centers to encourage them to prioritize participation in various activities. Attending and participating in the BSC calls and Learning Sessions was challenging at times for centers due the shortage of staff and limited staff availability. It is possible that centers would have been more engaged and participated in BSC activities to a greater extent if the centers were adequately staffed. To encourage and spark interest and excitement in the BSC activities, the Implementation Team relied on human connection – phone calls – not email, as an outreach strategy. The Implementation Team used participation data from calls to inform what the Implementation Team's next steps would be in terms of outreach. If they noticed patterns such as a lot of teachers missing calls, the Implementation Team project manager would call the center(s) to make a pitch about participating next time, to learn about what was preventing staff from joining a call, and to discuss what the Implementation Team could do to support centers to enable them to be on a call:

Every week, [the Implementation Team] decided what works for our plan for the week or what we needed, or whatever we needed, so then we decide how many people – what is the reasonable amount of people we will get on this call or that call or come to the Learning Session or whatever it may be....I would make a call and find out where everybody was at. – Implementation Team member

The Implementation Team project manager also called centers before the Learning Sessions to remind people to preview and describe what the Learning Session would be about so the centers could get excited about it ahead of time. Email was not as effective to spark centers' interest and engagement. The

Implementation Team project manager described calling centers to spark interest about an upcoming Learning Session where centers were asked to prepare a skit for the rest of the teams. Upon calling centers prior to the Learning Sessions, the Implementation Team project manager would tell them:

> And also what is going to happen during the Learning Session and for example at one Learning Session they all promoted what - they talked about what they did in the skit one. Or different things. And they were so over the moon - they are such EC [early childhood] teachers. You want the product and show it off and do it and people did it in all different ways and they were really excited that. That was what it was going to be. But when we did it on email, they weren't really sure what it means, and no, just going to be a couple minutes, you could play a game, and remember I was in the hallway, so we had been at their center, so we know. We can translate that to, 'Oh, you're just going to come and show what you did. Not anything scary or sketchy. Standing up in front of a group of thirty people, it is nerve wracking. So, just working with people with that. – Implementation Team member

An Implementation Team member who has consulted on other BSCs reflected on leading a BSC in the ECE sector, which is under-resourced and under-funded and experiencing a shortage in the workforce. Implementing a BSC stressed under-resourced centers and this Implementation Team member reflected on the opportunity costs of not pushing centers harder in the beginning to participate.

> I feel in the beginning we almost backed off too much and we were being too responsive to [teams' concerns about the level of effort a BSC takes]. So we backed up a little too much; I wish we hadn't backed up too much, but I think by doing it, it kept all the teams engaged, honestly.
> – Implementation Team member

In summary, this Implementation Team member expressed concern that centers might have dropped out if they were pushed harder. The Implementation Team recalibrated their efforts based on teams' capacity to engage, and by doing so, met teams where they were.

Considerations for future Breakthrough Series Collaboratives in early care and education settings

The Implementation Team and faculty discussed several considerations for future BSCs, including but not limited to:

- Evaluating centers' degree of "readiness" for and commitment to change.

- Gaining buy-in from Senior Leaders.

- Increasing participation by adapting to the local context.

- Factoring in constraints to the timeline (e.g., considering starting in the summer or when the "school" year starts) when making decisions about when to start the BSC and when to schedule in-person activities and phone calls.

- Tailoring the BSC content, in contrast to requiring it to focus on SEL.

- Modifying the online learning community to enhance engagement.

One Implementation Team member recommended evaluating whether centers are ready to participate in the change process before fully implementing a BSC. "Readiness" for change is often assessed during the application process for a BSC, but an ongoing commitment to change should continue to be monitored throughout the BSC. They said that more investment needs to be put into building commitment to change, which means the "...whole center needs to be open minded to the changes but from the beginning with the

Senior Leader and the teachers being open-minded to hearing what people have to say and trying different things in the classroom with staff and the new models."

The Implementation Team member went on to say that it is key that Team Leaders and/or Senior Leaders are open-minded. "Their jobs are the strongest and difficult. I would just say a few people or even one person that is ready for new vision and can spread it like wildfire, that's what happens."

When asked about other recommendations about implementing a BSC-SEL in ECE settings, a faculty member talked about how racial equity should be more than one driver:

> I think the racial equity driver – that should be an umbrella. That shouldn't be a driver. That should be an umbrella. That should be a way of thinking and taught in the pre-work session. It should not be thought of as a driver, it should be thought of as a shift in your thinking. And there should be exercise on shifting your thinking. And every Learning Session there should be a check-in to see how people are thinking about it. I don't think it should be an add-on. These are the drivers, push SEL, do this, do that, and do things through racial equity and social justice lens and for family engagement. I think it should be an umbrella through it, under which all the activities happen.
> – Faculty coach

Study Limitations

The study was designed as an embedded case study, with an intentionally small sample size to examine the implementation of an innovative quality improvement methodology. To the extent that quantitative measures were gathered, they are presented in this report to show patterns of findings, not to test statistically significant differences between centers. Further studies are needed to be able to determine the magnitude of links between participation in a BSC and quality improvement in early childhood environments. Additionally, more research with a larger sample size is needed for researchers to determine whether observed differences and changes among ECE centers that participate in a BSC are statistically significant or occur by chance. The authors do not encourage the reader to draw conclusions that are generalizable beyond the seven ECE centers that participated in this case study of implementing a BSC in ECE settings.

The Feasibility Study Team encountered a few sampling and data limitations which are described in the following sections.

Sample limitations

The sample for this feasibility study was limited to the seven centers that participated, and only one of those centers was a Head Start program, thus eliminating our ability to compare findings (albeit only descriptively) between child care and Head Start centers. As was noted at the time of center selection, this underrepresentation of Head Start centers was due to a lack of applications to participate in the BSC from Head Start centers.

Data limitations

Two of the seven participating centers did not complete the Time 2 survey. One of these centers also opted out of all study interviews, as well as observations at Time 2. This limited the ability to look at changes over time in those centers and reduced the overall number of centers contributing to the data presented in this report for data collected at Time 2. Two centers also opted out of sharing data with the Feasibility Study

Team, limiting possible analysis of their application materials, Basecamp postings, PDSAs, site visit notes, and other information collected for the purpose of the BSC. While the feasibility study did include multiple measures of workplace climate, the ECWES data presented in this report are based on a smaller sample of respondents at Time 1 compared to Time 2. ECWES data from three of the seven participating centers were excluded entirely because fewer than five respondents at each center completed the survey at either Time 1 or Time 2. In addition, data collected from the onsite classroom observations were not included in this report. The data collected from the TPOT and TPITOS observation instruments, although developed for use for both training and research (Hemmeter et al., 2015), were difficult to interpret in relation to evaluating classroom outcomes due to our small sample size and the nature of how the measures are scored.

Recommendations

The BSC is a system change methodology that engages participants across roles and levels within an organization to support the implementation and sustainability of evidence-based practices and continuous quality improvement strategies. The data collected in the feasibility study can inform future implementation and evaluation of a BSC in ECE settings. The following key considerations were developed based on the project findings and were tailored to the roles of various actors within a BSC, including BSC implementers (i.e., those who will be leading and facilitating a BSC), ECE practitioners and leaders, and ECE researchers.

Considerations to support feasibility

BSC implementers (those who will be leading and facilitating a BSC):

- Develop recruitment tools and tailored products such as videos to show how a BSC is different from typical quality improvement approaches in ECE.

- Ensure centers are "ready" to participate in the BSC by assessing whether the center has time, staff, and dedicated leadership available to participate in BSC activities.

- Continue to monitor centers' commitment to change throughout the life of the BSC.

- Gain buy-in from Senior Leaders.

- Be responsive to time constraints of ECE centers as well as the local ECE context, (e.g., conducting shorter in-person Learning Sessions as well as briefer conference calls at times that are most convenient for classroom-based staff; considering the school calendar when scheduling in-person activities and phone calls).

- Support teams in maintaining their core members over time. For example, to better engage parents, bring them together for a quarterly call led by the parent faculty coach. To better engage teaching staff on core BSC teams, use language that resonates with teachers such as referring to an affinity group call as a "virtual field trip" and "show and tell." Lastly, if staffing challenges emerge, the implementation team and faculty coaches should work quickly to help strategize creative solutions to address staff-shortages.

- Modify the online learning community to enhance engagement (e.g., prioritize a platform that allows teams to have supportive synchronous discussions or chats (instant messages) around testing changes and fostering idea sharing or inter-organizational learning instead of simply posting resources or posting status updates.

ECE practitioners and center leaders:

- Ensure centers have commitment to making improvements in the content of the BSC that is offered and an awareness of the quality improvement methodology and expectations for participation in the process.

- Ensure there is time for staff to participate in all-day meetings off-site, monthly phone calls during the day at the center, and time to think about challenges and ways to try to improve them.

- Ensure there is at least one staff person on each team can serve as the Team Leader and primary point of contact to both the Implementation Team and fellow team members about participating in the BSC activities.

- Ensure staff are committed to and have the capacity to collect data to inform their improvement work.

ECE researchers:

- To the extent possible, use data collected as part of the BSC process for research purposes so that data collection for evaluation is more seamless for participants, and data can be analyzed and used rapidly.

- Develop direct relationships with participating ECE centers to facilitate data collection efforts for evaluation purposes.

- Streamline data collection tools to reduce burden even further for ECE staff participants.

- Consider measures of change for each driver and evaluate outcomes based on team's individual areas of focus.

- Expand study efforts to more centers for a larger sample and the ability to conduct more robust subgroup analyses.

Conclusions

The work of quality improvement in ECE is challenging, and sustained changes in quality across ECE settings have not been widespread. The goal of the CCL project was to examine the feasibility of implementing the BSC, a quality improvement methodology found to be effective for bringing about practice change and improving outcomes in other sectors such as health care and child welfare, in ECE settings. The BSC is different than most quality improvement methods typically used in the ECE field because it addresses both the individual and organizational factors that are associated with sustaining high-quality practices over time.

While the BSC is an innovative and promising quality improvement methodology that is compatible with the needs and priorities of ECE centers, it does require sustained engagement and considerable time and resource investment. Specifically, the BSC requires a commitment of 12 to 18 months for multiple members of a program, including parents, to participate in the effort. Support is needed to facilitate participation, prevent attrition, and foster completion of expected project activities.

The CCL project documented variation in the degree to which centers engaged with and benefitted from the BSC. Centers with robust participation shared key characteristics, including:

- Strong and/or innovative organizational infrastructure

- Supportive senior leadership

- High levels of initial psychological safety among staff

While the BSC methodology is intended to "meet programs where they are" and help all programs improve practices and outcomes, the feasibility study findings suggest that centers with initial strengths in organizational climate and culture will be better able to engage with the BSC. Practitioners and/or policymakers considering use of the BSC with ECE centers should consider the additional supports or

adaptations needed to help centers with fewer initial resources or capacity to engage in this type of quality improvement process.

Interviews with key informants identified that competing demands (e.g., other meetings, staffing shortages, parenting responsibilities) can impede engagement with the BSC methodology. Future implementation of the BSC in ECE settings will require proactive and ongoing attention to addressing the challenges faced by Senior Leaders, program staff, and most importantly parents for engaging in the BSC structures and processes.

In sum, the BSC methodology tested in the CCL project has promise for ECE settings. Staff in center-based ECE programs participated in the activities and reported engagement in the content and the quality improvement process. The research team documented initial changes in practices that demonstrated movement toward a mindset about continuous learning and improved organizational support for improvement activities. The initial findings also highlight the challenges that ECE centers navigate that make it difficult for them to participate in quality improvement. Further research is needed on a larger and more diverse sample of ECE programs to determine the effectiveness of this quality improvement methodology within ECE programs and systems. Though further testing of the methodology is necessary, the findings from this pilot provide decision makers with information about how challenges in ECE quality improvement can be addressed using a method from the health sector that focuses on both individual and organizational change.

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Appendix A. Glossary

Term	How the term appears in the middle of a sentence	Definition
Action Period	Action Period	Period between Learning Sessions when Core BSC teams collected metrics data and tested changes in practice by using the Model for Improvement and PDSAs. The Sustainability Action Period took place after the fourth and final learning session.
Affinity group	affinity group	Role-specific groups (Senior Leader, Team Leader, teacher, and parent) facilitated by faculty coaches to bring Core BSC team members with similar roles and from different centers together to share progress and challenges with the BSC methodology, and to share ideas for PDSAs.
All-team calls	all-team calls	Videoconferencing calls facilitated by Implementation Team Members to bring together all Core BSC teams to share progress, challenges, and ideas for PDSAs typically conducted on a monthly basis and focused on specific pre-identified topics.
Breakthrough Series Collaborative (BSC or "Collaborative")	BSC or Collaborative	A quality improvement methodology aimed at helping organizations build a shared knowledge of evidence-based best practices and an understanding of how to implement improvements within their unique contexts.
BSC artifacts	BSC artifacts	Administrative documents collected by the Implementation Team Members over the course of the BSC-SEL. These documents included ECE center applications to participate in the BSC-SEL, completed assignments from the Pre-Work Day, monthly metrics submissions, attendance trackers, PDSA trackers, site visit notes, Basecamp postings, and Learning Session evaluations collected from attendees.
BSC-SEL	BSC-SEL	The name of the BSC implemented in early care and education centers focused on social and emotional learning (SEL). The SEL content for the BSC-SEL was based on the **Pyramid Model**.
Basecamp	Basecamp	Basecamp is a cloud-based application that provides tools for team collaboration online, using message boards, timelines, file sharing, and task assignments. Core BSC teams posted pictures of their PDSA forms, commented on others' posts, asked questions, and shared resources related to SEL and quality improvement.
Collaborative Change Framework (CCF; *also known as the Driver Diagram)*	CCF	A guiding document for a BSC to guide the changes tested by teams. In the BSC-SEL the CCF was based on the Pyramid Model that outlined key elements or primary drivers linked to SEL outcomes. The CCF broke down each primary driver into secondary drivers, or specific opportunities and strategies, that centers could try out and test over the course of the BSC-SEL to influence and improve children's SEL outcomes.
Culture of Continuous Learning Project (CCL)	Culture of Continuous Learning Project (CCL)	Culture of Continuous Learning project that included implementing the BSC methodology and studying its feasibility in ECE centers.

Term	How the term appears in the middle of a sentence	Definition
Core BSC teams/cross-role team	Core BSC team/cross-role team	Multi-level, inclusive teams from each ECE center participating in the BSC-SEL. Each team is made up of representatives from different center leadership levels (e.g., program directors, administrative staff, teachers, and parents). Each team appointed a senior leader (typically a center director) and a team leader (typically an administrative staff person or teacher). These teams were direct participants in the BSC methodology.
Driver Diagram *(also known as the Collaborative Change Framework)*	Driver Diagram	A guiding document for a BSC to guide the changes tested by teams. In the BSC-SEL the Driver Diagram was based on the Pyramid Model that outlined key elements or primary drivers linked to SEL outcomes. The Driver Diagram broke down each primary driver into secondary drivers, or specific opportunities and strategies, that centers could try out and test over the course of the BSC-SEL to influence and improve children's SEL outcomes.
ECE	ECE	Early care and education
Embedded case study design	embedded case study design	Study design that includes embedded cross-site comparisons
Expert faculty coaches	faculty coaches	Individuals who have specific content expertise related to the BSC who serve as advisors to the Implementation Team (faculty) and as coaches to the participating BSC teams. In the BSC-SEL, faculty coaches included an ECE teacher, a parent, an ECE Director, an ECE policymaker, and a trainer in the Pyramid model,
Feasibility Study Team	Feasibility Study Team	Researchers, from Child Trends, who led the study assessing the feasibility of using the BSC methodology in ECE centers.
Implementation Team/BSC Implementers	Implementation Team	Experts in BSC methodology and ECE program operations who facilitated the BSC and oversaw implementation in participating centers as part of the project staff.
Inquiry mindset	inquiry mindset	The way people "approach their problems of practice with curiosity and a desire to test possible solutions and strategies to learn what works and what may not work" (Douglass et al., 2019).
Learning Sessions	Learning Sessions	Full-day, in-person meetings offered over the course of a BSC for all Core BSC team members that 1) focused on various topics, or drivers, for making improvements in practices; 2) taught key quality improvement concepts and tools; 3) provided time for teams to develop and make plans for the period of time in between Learning Sessions. In the BSC-SEL, there were four full-day Learning Sessions over a ten-month period.
Mechanisms	mechanisms	In the CCL Theory of Change, the dynamics and mindsets that specify how the outputs "activate changes that result in achieving the short-term and long-term outcomes."

Term	How the term appears in the middle of a sentence	Definition
Model for Improvement	Model for Improvement	Three key questions that help Core BSC teams clarify their goals for improvement, establish measures to determine if a specific change actually leads to an improvement, and select the most important changes to work towards. The three questions are: 1) what are we trying to accomplish? 2) how do we know a change is an improvement? and 3) what changes can we test that will result in improvement?
Monthly metrics	monthly metrics	Monthly data collected by Core BSC teams and submitted to BSC Implementation Team to help teams quantify their progress in key domains of the CCF. In the BSC-SEL, monthly metrics included children's behaviors and two-way communication with families.
Other center staff	other center staff	Early care and education staff who are not members of the Core-BSC team.
Outputs	outputs	In the CCL theory of change, the "primary activities and products of the BSC process (e.g. learning sessions, monthly metrics, Action Periods)" (Douglass et al., 2019).
Plan Do Study Act cycle (PDSA)	PDSA	A continuous quality improvement process that Core BSC teams used to test and make improvements. A single PDSA cycle involves planning to test a small change, conducting the work to make the change, studying the effects of the change, and acting on what was learned (by adjusting what was done, abandoning the test, or scaling up the change).
Pre-work	pre-work	A series of assignments done by BSC teams prior to the first Learning Session. Some assignments are conducted during the Pre-Work Day while others are done in the time between the Pre-Work Day and Learning Session 1. Assignments often include developing a team name, a team motto, completed a self-assessment based on the CCF, developing a data collection plan, and creating a "storyboard" for their team.
Pre-Work Day	Pre-Work Day	An introductory in-person kick-off session held before the first Learning Session to help Core BSC teams get oriented to the BSC methodology, assess their center based on the CCF, and get to know the faculty coaches and other BSC teams.
Psychological safety	psychological safety	The feeling people develop when they "begin to feel more safety around sharing their opinions, voicing new or different ideas, testing changes on their own, sharing data, learning from both successes and failures, and learning from one another."
Pyramid Model	Pyramid Model	The Pyramid Model for Supporting Social Emotional Competence in Infants and Young Children is a framework of evidence-based practices that support social and emotional competence in infants and young children that provided the content delivered through the BSC-SEL. It guided the creation of the CCF for the BSC-SEL.
SEL	SEL	Social and emotional learning

Term	How the term appears in the middle of a sentence	Definition
Senior Leader	Senior Leader	High-level administrator or leader from the center (e.g., Center Director) participating in the BSC. This person is responsible for providing leadership, support, and advocacy on behalf of the BSC team. They also focus on how successful changes tested by the team can be scaled up, spread, and sustained.
Short-term outcomes	short-term outcomes	The desired increase in knowledge, skills, beliefs, and attitudes as a result of the mechanisms that "activate individual and collective learning and improvement"
Structures	structures	The secondary outputs produced by the BSC that "foster new routines for collaborative professional learning, building relationships, and improving communication."
Team leader (or team manager)	Team Leader	Center staff member who oversees team activities and actively guides the work of the BSC team. They serve as the liaison for all BSC-related assignments and activities, including data. Possible team leaders might include an associate director, education coordinator, or family engagement specialist.
Work processes	work processes	The secondary outputs produced by "the BSC that teach participants how to change practices by using tools to collect and use data to inform tests of change and improvement."

Appendix B. Alignment of Culture of Continuous Learning Feasibility Study Research Questions and Selected Data Sources

CCL Feasibility Study Research Questions	BSC-SEL Theory of Change Component Targeted	Constructs of Interest	Data Sources Aligned with Constructs of Interest
1. To what extent did centers engage with the learning collaborative and participate in the activities offered to program teams?	Strategy & Outputs	Learning Sessions Monthly Metrics Regular Calls (affinity group calls; BSC Team Calls) Site Visits Online Discussion Forum Spread of SEL and QI practices among and also beyond Core BSC Team members	Implementation Tracker Interviews with Implementation Team members Interviews with faculty members Interviews with site directors Focus groups with Core BSC teams Discussion forum postings Key informant interviews BSC-SEL Implementation artifacts
2. How successfully did centers did begin developing a culture of continuous learning?	Mechanisms	Psychological Safety Team member efficacy[v] Parallel process Intra-organizational learning Inter-organizational learning Inquiry mindset	Psychological Safety (Edmondson, 1999) Teacher Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001; VandeWiele, 2001), adapted[w] Directors' Efficacy Scale (Bloom, 2019) Intra-organizational dynamics scale (Nembhard, 2012) Inter-organizational dynamics scale (Nembhard, 2012) Interviews with Implementation Team members Interviews with faculty members Interviews with site directors Focus groups with Core BSC teams

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[v] Team member efficacy is examined using a measure of individual efficacy that looks across teachers; There is not a separate measure of "team efficacy."
[w] Findings from teachers within Core BSC teams will be presented and discussed in the Mechanisms section.

CCL Feasibility Study Research Questions	BSC-SEL Theory of Change Component Targeted	Constructs of Interest	Data Sources Aligned with Constructs of Interest
3. Was there initial evidence that suggests participation in the learning collaborative was associated with desired **outcomes** related to teaching practices and organizational culture?	Short-term Outcomes	Increased knowledge, skills, beliefs, and attitudes about SEL, family engagement, racial equity and cultural responsiveness and how to make and sustain improvements Improved organizational climate and culture Stronger leadership at all levels of the organization Increased sense of individual and collective efficacy[x]	Perceived Problems Questionnaire (Johnston, 1984) (T1 vs. T2) Maslach Burnout Inventory: Emotional Exhaustion Scale (Maslach et al., 1997) (T1 vs. T2) Social and emotional beliefs scale (Brackett et al., 2012), adapted (T1 vs. T2) Early Childhood Work Environment Survey (Bloom, 2015) (T1 vs. T2) Interviews with Implementation Team members Interviews with site directors Teacher Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001; VandeWiele, 2001), adapted (T1 vs. T2)[y] Directors' Efficacy Scale (Bloom, 2019) (T1 vs. T2)
4. What **adaptations** are needed for successfully implementing a BSC with ECE centers?	Not applicable	Adaptation Responding to Opportunities and Challenges Responding to the Local Context	Interviews with Implementation Team members at Time 1 and Time 2, and sustainability interviews with Implementation Team members conducted in 2020, six months after the fourth Learning Session.

Source: CCL Feasibility Study Team.

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[x] The Teacher Sense of Efficacy Scale is a measure of individual efficacy and in this study is being examined across teachers. There is not a separate measure of "collective efficacy."
[y] Findings from all center staff will be presented and discussed in the short-term outcomes section.

Appendix C. Feasibility Study Measures

The feasibility study used a mixed-methods approach to capture data on each component of the theory of change, from strategy through short-term outcomes.[z] Qualitative and quantitative data sources included 1) observation data, 2) survey data, 3) interview and focus group data, and 4) BSC implementation artifact data. Classroom observations were conducted by observers unaware of which classrooms had teachers participating on the Core BSC teams.

Surveys

Surveys included measures of organizational climate, psychological safety, and self-efficacy obtained from teachers and staff at participating centers both early and later in the implementation of the BSC-SEL. Both Core BSC Team members and non-Core BSC Team members were asked to complete surveys.

Early Childhood Work Environment Survey (ECWES; Bloom, 2015)

The ECWES was used to measure the organizational climate of the seven centers participating in the BSC-SEL. The ECWES was developed specifically for ECE settings and is administered online by an organization called New Horizons. All center staff at participating centers who worked more than 10 hours per week were eligible to complete the ECWES. The survey was fielded at two time points (i.e., early on in the BSC and again after the completion of the final Learning Session). The ECWES included questions about staff's perceptions about various organizational practices and took approximately 15 minutes to complete. Survey questions fell into ten dimensions (listed below) that helped the Feasibility Study Team better understand the collective perceptions of staff in each center. Specifically, the tool helped decipher what things were going well in the center and better isolated areas that need to be strengthened (addressing research questions 8, 9, and 10). Example ECWES items about work attitude included asking the respondent to indicate if they "intend to work here at least two more years," and "I sometimes feel trapped in my job." In order to generate an ECWES profile, center directors also completed a Center Background Information Form prior to completing the ECWES. This form gathered information about the center's funding sources, age groups served, and other center characteristics. After closing data collection for the ECWES, an electronic Work Environment Profile summarizing the aggregate results for each center was autogenerated by New Horizons and sent to the Feasibility Study Team to review. Results were presented on the dimensions below:

- Collegiality

- Opportunities for professional growth

- Supervisor support

- Clarity

- Reward system

- Decision-making influence

- Goal consensus

- Task orientation

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[z] The time frame for the CCL Project permits only short-term outcomes of the BSC-SEL to be assessed within this initial feasibility study. Future studies of the BSC-SEL model may permit assessment of long-term outcomes and impact.

- Physical environment
- Innovativeness

Time 1 and Time 2 Survey

As part of the feasibility study data collection, the Feasibility Study Team developed and fielded a survey with staff at the ECE centers that participated in the CCL project (both Core BSC Team members and additional center staff). The purpose of the survey was to answer key implementation and outcomes research questions that could not be answered through a secondary measures review nor observation only. We included some standardized, proprietary measures into a single survey so that from a staff person's perspective, they were only completing one survey. The list of the separate measures included in the full survey includes:

- ***Background Information.*** All respondents to the survey were asked about education level (highest level of education attained and the degree field), age, sex, race and ethnicity, and income (total household income level). Some of these questions overlap with the ECWES but were administered again in the Time 1 and Time 2 surveys so that individual responses could be captured by the Feasibility Study Team rather than aggregated at the center-level.

- ***Early Childhood Job Satisfaction Survey (ECJSS; Bloom, 2010).*** The Feasibility Study Team used the Early Childhood Job Satisfaction Survey to measure the discrepancy between existing and ideal working conditions as perceived by the employee. The tool measures five unique facets of the working environment. Respondents were asked to rate 50 items using a Likert scale about the extent to which they agreed or disagreed with different aspects of their job. Example items included "I feel encouraged and supported by my colleagues" and "My supervisor respects my work." In part II, respondents rated five aspects of their position using a Likert scale as being ideal or not ideal. Example items included "Relationship with co-workers" and "Relationship with supervisor." In part III, respondents were asked to check three job characteristics they value most for personal and professional fulfillment. Examples included "Colleagues-working with people I like," and "Security or the assurance that my position is secure." In part IV, respondents were asked to write their top two satisfactions and frustrations with their current job. Lastly, in part V, respondents answered questions regarding their commitment to their center and the early childhood field.

- ***Psychological Safety (Edmondson, 1999).*** The Psychological Safety measure examines staff's feelings of psychological safety and learning behavior in work teams. The survey measures the trust staff have in each other not to gain personal advantage at someone else's expense. Example items included, "If you make a mistake at this center, it is often held against you," and "Teachers at this center feel it is safe to take a risk (e.g. trying something new in the classroom)."

- ***Maslach Burnout Inventory Educators Survey – Emotional Exhaustion subscale (Maslach et al., 1997).*** The Feasibility Study Team used the Emotional Exhaustion subscale of the Maslach Burnout Inventory (MBI), to assess how staff members felt about their job and their reactions to work. The rationale for including burnout was that it may be relevant for successful participation in the BSC. Participants were asked to rate how often items like, "I feel emotionally drained from my work" and "Working with people all day is really a strain for me," were true for them. The Maslach Burnout Inventory has three subscales in all: Emotional Exhaustion, Personal Accomplishments, and Depersonalization. To decrease burden on participants, the Feasibility Study Team decided to only use the Emotional Exhaustion subscale, as it has the strongest psychometric properties.

- ***Perceived Problems (Johnston, 1984, as adapted by Bloom).*** The Perceived Problems questionnaire is a checklist about teachers' perceptions of day-to-day problems preschool teachers experience. We used selected items from this scale to identify teachers' areas of concern in social and emotional behavior in their classrooms. The full questionnaire includes 45 yes/no items; however, for the purpose of the

feasibility study, we administered only 10 items that pertained to social and emotional learning (SEL) and development. Sample items included, "I have a problem getting children to do what I ask them to do," and "I have a problem controlling the noise or energy level in the room."

- **Beliefs Around Social and Emotional Learning (Brackett et al., 2012, adapted).** The purpose of this survey was to gather background information about teachers, including experiences with professional development and beliefs about SEL that may be useful for understanding levels of participation in the BSC. Everyone except parents on Core BSC teams were asked questions about professional development, including the topic area of trainings attended in the past two years and the number of continuing education credits received within the past two years. A section in the questionnaire also asked about quality improvement initiatives the respondent had engaged in within the past two years and the respondent's perception about how useful they were. Finally, this survey captured beliefs about SEL using items adapted from Brackett et al. (2012).

- **Teachers' Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001; VandeWiele, 2001, adapted).** The Feasibility Study Team used an adaptation of the Teachers' Sense of Efficacy Scale to assess self-efficacy in teachers. The scale was adapted for early childhood teachers and was used to better understand factors relating to successful participation in the BSC. The question stem and response categories were drawn from Tschannen-Moran and Woolfolk Hoy (2001) and the introductory wording and many of the individual questions were drawn from VandeWiele (2001). Sample items included, "How much can you do to make positive changes in your care setting?" and "How much can you do to calm a child who is upset?" Only teachers were asked to complete this section.

- **Directors' Efficacy Scale from the Directors' Role Perception Survey (Bloom, 2019).** The Feasibility Study Team used sections from the Directors' Role Perception Survey to address self-efficacy in directors. Only subsections from the Directors' Role Perception Survey were used to better understand factors relating to successful participation in the BSC. Topics addressed in this scale focused on leadership and management, including managing staff, using data to promote continuous quality improvement, and implementing developmentally-appropriate curriculum. Only directors completed this section.

- **Self-report of BSC Activities.** In the Time 2 survey only, we asked all participants to self-report on their participation in BSC elements (e.g., attending a Learning Session, receiving coaching from a BSC Implementation Team member or faculty, doing a PDSA, etc.). The information was used by the Feasibility Study Team to determine 1) the extent of BSC participation (among Core BSC Team members) and 2) the spread of BSC practices (among others within the participating centers who were not themselves participants in the Core BSC Team). Additionally, this section of the survey asked participants about the experience of their BSC team's participation in the BSC-SEL (e.g., engaging in Learning Session interactions, soliciting ideas and feedback, using PDSAs, etc.).

- **Intra-organizational and inter-organizational learning activity items (Nembhard, 2012).** The team learning climate was captured using Nembhard's intra-organizational and inter-organizational learning activity items. The intent was to capture the team learning climate, both within teams and between teams. Intra-organizational items asked respondents to indicate the extent to which their team used PDSAs and solicited and exchanged ideas and feedback with others at their center. Inter-organizational items asked respondents to indicate the extent to which their teams interacted with others at Learning Sessions and on the online discussion forum (i.e., Basecamp), used monthly metrics, and joined affinity group calls.

Interviews and focus groups with Key Informants

Key informant interviews and focus groups with directors, Core BSC Team members, Implementation Team members, and faculty provided additional qualitative information on the facilitators and barriers to implementing the BSC-SEL.

Key Informant Interviews with Center Directors

The Feasibility Study Team developed an in-depth interview protocol that was conducted with center directors (or an alternative representative for each center) at two time points (i.e., midway through the BSC process and shortly after the final Learning Session). The purpose of the in-depth interview was to address topics that could not be answered by survey or observation. In-depth interviews were scheduled separately with each director and took place over the phone. Topics covered in the key informant interviews with center directors included, but were not limited to:

- perceptions of organizational readiness for the BSC as a quality improvement methodology
- organizational culture and spread of SEL practices within the center
- the feasibility of implementing a BSC at their center
- the cost of participating in the BSC
- perceptions and experiences with "spread"
- directors' perceptions of sustainability of BSC and SEL practices beyond the fourth Learning Session

Key Informant Interviews with Implementation Team

The Feasibility Study Team developed a semi-structured interview protocol that was used with members of the Implementation Team in group and one-on-one interviews (depending on availability) and administered at two time points (i.e., midway through the BSC process and shortly after the final Learning Session). The purpose of the interviews was to gather the Implementation Team's perceptions of working with the individual Core BSC teams and to document lessons learned about the BSC in ECE settings. Topics included but were not limited to:

- their definition of successful participation in the BSC
- perceptions of readiness of the Core BSC teams and how teams established their goals
- successes and challenges
- strengths and limitations of a 12-month timeline for the BSC
- model adaptations
- resources and costs
- thoughts about sustainability in these centers, as well as expansion beyond the study centers

Key Informant Interviews with Faculty

The Feasibility Study Team developed a semi-structured interview protocol that was conducted with members of the BSC-SEL faculty in group and one-on-one interviews (depending on availability) and administered midway through the BSC process and again after the final Learning Session. The purpose of the interview was to gather the faculty's perceptions of working with the individual Core BSC teams and to document lessons learned about supporting SEL practices in ECE settings. Topics included but were not be limited to:

- their definition of successful changes to SEL practices
- perceptions of readiness of the Core BSC teams
- successes and challenges

- strengths and limitations of a 12-month timeline for making changes to SEL practices

- thoughts about sustainability of SEL practices in these centers

Core BSC Team Focus Group

The Feasibility Study Team developed a focus group protocol that was conducted with staff at the ECE centers who participated in the Core BSC teams and was administered after the final Learning Session. The purpose of the focus group was to answer key implementation and outcomes research questions that could not be answered through a secondary measures review nor observation only. Topics covered by the focus group protocol included, but were not limited to:

- BSC elements that were beneficial and challenging for BSC Team members

- strengths and limitations of a 12-month timeline for the BSC

- perceptions and experiences with "spread"

Observations[aa]

Observations were conducted before and after the implementation of the BSC-SEL and provided an objective assessment of changes in SEL practices in center classrooms.

Observations were conducted to capture and describe teaching practices related to SEL at two time points in the BSC-SEL process (i.e., soon after the first Learning Session and again after the completion of the final Learning Session). The observational tools selected for the feasibility study were the Teaching Pyramid Observation Tool (TPOT) and the Pyramid Infant-Toddler Observational Scale (TPITOS) for preschool and infant/toddler classroom observations, respectively, as these observational measures are most closely aligned with the Center for the Social Emotional Foundations for Early Learning Pyramid Model on which the BSC-SEL Collaborative Change Framework and Driver Diagram were based. Two trained observers conducted observations in preschool and infant-toddler classrooms of Core BSC Team teachers and preschool and infant-toddler classrooms of other teachers at participating centers. This allowed for comparisons across classrooms of Core BSC Team teachers and others at participating centers. Observations in classrooms of other teachers at the centers were also used to determine "spread" in quality improvement practices beyond Core BSC teams.

Teaching Pyramid Observation Tool (TPOT; Hemmeter et al., 2013)

The TPOT was used as the observational tool in a selection of preschool classrooms (with children between the ages of two and five years old) at participating centers. It has three subscales with items documenting how preschool teachers implement the Pyramid Model. The first subscale is called Key Practices and includes items such as, "Teachers engage in supportive conversations with children" and "Teacher acknowledges the children's communication to him or her." The second subscale is Red Flags. An example Red Flag that could be observed is, "Transitions are more chaotic than not." The third subscale is Responses to Challenging Behavior. It includes items such as, "Teacher responds to children by stating the expected

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[aa] This report does not include recruitment methodology nor findings from the observations. The TPOT and TPITOS were designed for use in both research and quality improvement efforts. However, these tools are primarily for professional development purposes, where a coach discusses the results with the teacher. While it was feasible to conduct on-site observations in the center classrooms that participated in the BSC-SEL, the data collected from the observations were difficult to interpret in the context of evaluating outcomes. See more about conducting on-site observations to measure teacher-level outcomes about social and emotional teaching practices in the Lessons Learned about Feasibility section.

behavior in positive terms (i.e., what to do) or providing instruction in an acceptable behavior." The tool relies both on observed behaviors and teacher report to determine item scores. The observation takes approximately two hours to fully complete. At the end of the observation, observers conducted a 15- to 20-minute interview with the lead teacher to collect additional information and determine final scores. If the teacher was unavailable to complete the interview immediately after the observation, the observer arranged to complete the interview over the phone as soon as possible.

The Pyramid Infant-Toddler Observation Scale (TPITOS; Bigelow et al., 2019)

The TPITOS was used as the observational tool in infant and toddler classrooms. It involves three main elements: 1) observing for red flags; 2) observing specific routines (i.e., free play, feeding/mealtime, structured group activity) and then assessing child engagement; and 3) observing specific routines (i.e., free play, feeding/mealtime, physical care routine, and structured group activity) and then rating behavioral and environmental items. Example items include "Adults provide children with opportunities to make choices (e.g. 'this book or this book' or 'you can sit and listen to a story or play with the toys')" and "Adults show physical affection toward children and smile at them."

Breakthrough Series Collaborative artifacts

Outputs of the BSC-SEL, such as documentation of attendance at and content of Learning Sessions and affinity group meetings, or number and type of PDSAs completed by participating Core BSC Team members—were all collected as artifacts of BSC implementation and contributed to the assessment of whether and how ECE centers engaged in BSC activities and changed their structures and work processes over the course of their participation in the BSC-SEL. Furthermore, observations of the Learning Sessions provided insights into the relational dynamics within and across organizations, and how those may change over the course of an organization's participation in a BSC.

The following BSC artifacts contributed to the Feasibility Study Team's understanding of level of participation in the BSC:

- Attendance records at BSC activities noted in the Implementation Tracker
- Monthly Metrics Spreadsheets
- Analysis of discussion board postings

Appendix D. Collaborative Change Framework

A Breakthrough Series Collaborative to Support Social and Emotional Learning in Early Education and Head Start: Collaborative Change Framework

Introduction

The Breakthrough Series Collaborative (BSC) to Support Social and Emotional Learning (SEL) in Early Education and Head Start was a unique quality improvement collaborative that took place over a twelve-to-eighteen-month period. During the collaborative, centers made improvements in their practices, policies, and environments to support children's SEL, using the Pyramid Model from the Center for the Social and Emotional Foundations for Early Learning. The Pyramid Model has been extensively studied in early childhood and early childhood special education settings and is used widely in child care and Head Start centers.

What is a Breakthrough Series Collaborative?

The Breakthrough Series Collaborative methodology differs from other ECE quality improvement initiatives as it supports change by building capacity and recognizing leaders across an organization, rather than through a single coach or consultant. It promotes change through collaborative teams that include staff at all levels and families and engages teams in problem-solving that takes local context into account. A goal of the BSC is to spread and sustain change. BSCs have supported practice and process improvements in the health, child trauma, and child welfare fields, but has not yet been widely tested in ECE. It includes:

- Learning opportunities to enhance knowledge and skills in SEL and quality improvement

- Collaborative teams (teachers, administrators, and families) working with faculty and BSC staff to become skilled at quality improvement, to set specific goals and test improvements

- A Change Framework that is the roadmap for teams to move beyond concepts in SEL to actual change strategies

- A supportive learning collaborative where teams network, learn from one another, share ideas and problem solve challenges together

- Collecting and using data to learn about what is going well and where improvements are needed

- Small tests of change, or Plan-Do-Study-Act cycles (PDSAs), to build evidence to make and spread improvements in early childhood care and education settings

What is the Change Framework?

The Change Framework is the *content* anchor for all work that is done by teams in the BSC. It serves a roadmap throughout the BSC to guide teams' assessment of their strengths and challenges, where they can improve, and what changes to test as well as tracking their progress over time. The Change Framework describes **the need and opportunity** for improving SEL in child care and Head Start and the **overarching aims** that the centers in the Collaborative seek to achieve through adopting evidence-based practices in SEL. The **Driver Diagram** describes *what* elements (primary drivers) must change in a child care or Head Start center and *how* those elements must change (secondary drivers) to achieve the aims of the BSC. This

Change Framework was developed by examining the research and practice guidance from the Pyramid Model, and gathering the expertise of faculty, coaches, and practitioners in the field.

The need and opportunity for improving social and emotional learning practices

From infancy onward, children's growing ability to express, understand, and regulate emotions and to form social connections are essential to their development. Socially- and emotionally-competent children understand their own and others' emotions, form positive relationships, and have developmentally appropriate levels of self-regulation. They are more likely to take advantage of learning opportunities in the classroom and to achieve academic success as they move through school. Social and emotional development has received considerable attention from the early childhood research and practice communities (e.g., Denham, 2006; Barrett et al., 2016; Hyson, 2004). This attention has focused on two of the overarching aims for teacher practices: 1) to increase positive social behavior in young children and 2) to reduce challenging behaviors (Hemmeter & Fox, 2008).

It is widely recognized that SEL is an area in which instructional quality can be improved and teachers often express interest in additional supports (Cimino et al., 2007; Fox et al., 2003; Hemmeter & Fox, 2008). For example, challenging behaviors is an area for which early educators frequently seek additional professional development supports (Cimino et al., 2007). Early educators play a key role when it comes to supporting the development of young children's social skills and positive behaviors. Early learning policies reflect a growing attention to enhancing teaching quality in this domain, as demonstrated in the prioritization of social-emotional health in the reauthorized CCDBG and in Head Start. In addition, recent policy statements from both Head Start[bb] and federal agencies address expulsion and suspension practices in early care and education (ECE) settings (U.S. Department of Health and Human Services & U.S. Department of Education, 2016) resulting in a growing need for teachers to be equipped with the right skills to manage challenging behavior in the classroom with a culturally competent approach.

A commonly used approach to promoting SEL is the Pyramid Model intervention (Fox et al., 2003). The Pyramid Model (Fox et al., 2003) has been extensively studied in early childhood and early childhood special education settings, and is used widely in child care and Head Start centers in the geographic region where the feasibility study took place. The model was developed to provide early educators with guidance on how to support young children's social-emotional development and address challenging behavior. It clearly articulates the teaching practices that support children at three levels: universal/primary strategies, targeted/secondary strategies, and individualized/tertiary strategies.

Overarching aims

Over the course of the BSC, all teams will be striving to achieve three overarching aims:

1. Increase the number of classrooms that show improvement in providing high-quality, SEL environments
2. Increase children's social and emotional competence
3. Reduce challenging behaviors

[bb] See http://eclkc.ohs.acf.hhs.gov/policy/im/acf-im-hs-16-01 for links to new requirements in the Head Start Performance Standards about expulsions and suspensions.

The Driver Diagram

The five primary drivers in this Change Framework, along with their related secondary drivers, describe the structures, processes, practices, and norms required for SEL practices to be adopted by participating centers in the BSC and for teams to achieve the overarching aims.

1. *Nurturing, responsive and supportive relationships and environments* are critical factors in supporting social and emotional development and promoting appropriate, pro-social behaviors. Children learn and develop through their relationships with adults. By building nurturing, positive relationships with children, teachers can support children's self-esteem, sense of safety, and positively influence behavior. The design of classrooms, schedules and activities can contribute to promoting children's positive engagement in their environments and prevent challenging behaviors.

2. *Teaching social skills and emotional competencies* in the context of children's culture and language: Children develop social skills and emotional competencies through explicit teaching of emotional literacy, problem-solving skills, and positive peer relationship skills and practicing those skills with the support of teachers in daily interactions and when challenges arise.

3. *Family partnership* to promote the adoption of evidence-based SEL practices: Families are children's first teachers. It is critical for early education centers to collaborate with families to promote their children's social and emotional development at home and in the center through developing positive relationships with parents, promoting parents' confidence and competence, and connecting to concrete supports when needed.

4. *Racial equity and cultural responsiveness* in promoting the adoption of evidence-based SEL practices: To implement the Pyramid Model effectively, centers must address implicit bias and promote cultural responsiveness and equity. These are essential to nurturing positive adult-child relationships; supporting positive adult-adult relationships (staff-staff and staff-families); promoting positive identity development for children; and reducing inequities in perceptions of and responses to children's behaviors, including decisions about disciplinary actions.

5. *Organizational capacity and support* to promote the adoption of evidence-based SEL practices: In order to support the social and emotional development of children, teachers must feel valued, respected, and supported by their colleagues and leadership as well as have the tools, resources and training necessary to effectively implement the Pyramid Model practices.

Figure 17 provides a visual display of the inter-relationships among the five primary drivers in this BSC. Although we know that the primary drivers are inter-related and inter-connected, calling them out as distinct helps break the more complex issues into discrete and manageable "chunks." The drivers help teams recognize the need for change at various "levels" of their system.

Figure 17. How the Five Primary Drivers are related and connected
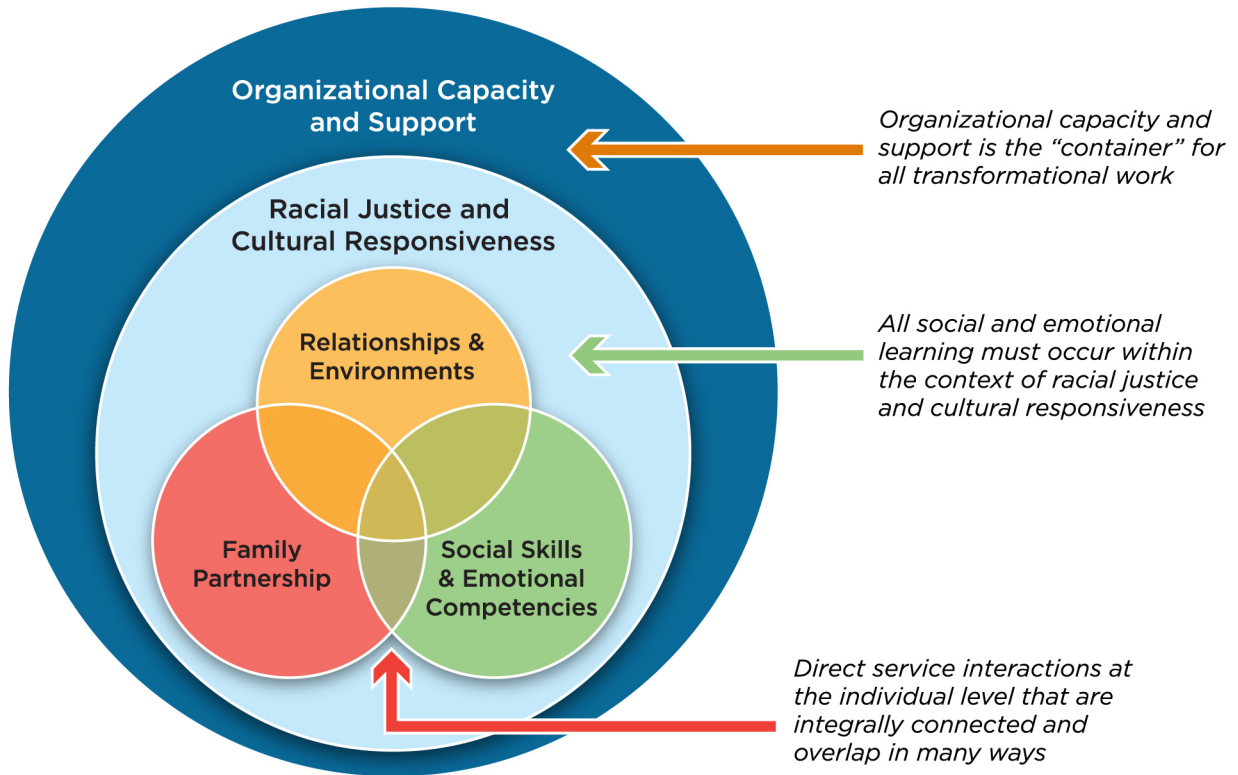
Source: Implementation Team

Each of these primary drivers is then further broken down into more specific opportunities and strategies that centers can test out in practice called Secondary Drivers, described in Figure 18 below:

Figure 18. Driver Diagram

Primary Drivers	Secondary Drivers
Relationships and Environments	• Design classrooms in responsive ways • Develop and maintain predictable schedules, routines and activities to promote smooth transitions • Design activities to promote engagement • Provide directions • Teach behavior expectations • Teachers develop nurturing, meaningful relationships with children and colleagues
Social Skills and Emotional Competencies	• Teach children to express emotions appropriately • Teach children problem solving skills • Teach children positive peer relationship skills • Encourge children's autonomy • Embed opportunities for children to practice skills in daily routines and interactions • Use effective strategies to respond to challenging behaviors
Family Partnership	• Use open, consistent communication with families • Invite and support parent participation in the classroom and center • Develop postive, respectful, meaningful, culturally affirming relationships with families • Connect families to concrete supports in times of need • Collaborate with families to support the parent-child relationship and the families' promotion of their child's social and emotional competencies • Support/promote parent confidence/competence (parental resilience)
Racial Equity and Cultural Responsiveness	• Have and use a system to collect and review data by race/ethnicty, language, gender, and ability • Provide ongoing professional development and reflection opportunities for staff on cultural responsiveness, implicit bias, and race equity • Honor and reflect diverse identities and families in the classroom and center environment • Develop clear policies and guidelines for preventing challenging behaviors that are free from bias, and ensure equity and fairness
Organizational Capacity and Support	• Create a culture of collaboration in the classroom and center • Use facilitative leadership and reflective supervision • Support healthy staff, stress-reduction, adult relational competencies, self-regulation • Use data systems to track behavior and social and emotional competence • Ensure access to mental health consultation to support individualized interventions for children with persistent challenging behaviors, disabilities, or developmental challenges • Maintain effective staffing patterns (ratios, hours, breaks, time off, staffing consistency, primary caregiver model, continuity of care model) • Nurture a postitve workplace climate where staff feel supported and valued • Provide ongoing training and coaching

Source: Implementation Team