



Culture of Continuous
Learning Project



Strengthening Continuous Quality Improvement Practices in Early Care and Education Through a Breakthrough Series Collaborative: Methodology Report

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Introduction

The Culture of Continuous Learning (CCL) project aims to explore the implementation and outcomes of a specific continuous quality improvement (CQI) methodology—the Breakthrough Series Collaborative (BSC)^a—in early care and education (ECE) centers and systems. The BSC methodology can be considered an “intervention” in the sense that it is focused on changeable behaviors, is based on empirical evidence, and has the potential to improve outcomes for the target population.¹ Although prior research has found the BSC methodology effective in improving practices in other sectors, such as health care and child welfare,^{2,3,4,5} evidence in the ECE context is still emerging.⁶

The goal of the first phase of the CCL project (September 2016–September 2021) was to explore the BSC as a CQI methodology to support the use and sustainability of evidence-based social and emotional learning (SEL) practices in ECE centers. Seven Head Start and child care centers within a single community participated in the BSC in Phase I of the CCL project. The first phase descriptive study concluded that implementing a BSC in ECE centers was feasible and demonstrated promising improvements in ECE organizational climate and teaching practices.⁷ Based on these promising findings, the CCL project entered Phase II (September 2021–September 2026), which examined the implementation of three BSCs to support SEL practices in 19 Head Start and child care centers across three states. The goal of Phase II was to examine the implementation and outcomes of the BSC as a CQI methodology to support evidence-based practices in ECE centers *at a larger scale*, and to explore how ECE systems can support this CQI model in the future. The implementation of the BSCs in both phases of the CCL project was evaluated using a longitudinal mixed-methods case study design that involved focus groups, interviews, and surveys, in addition to examining documentation of BSC implementation. Phase II of the CCL project also included a landscape scan of quality improvement (QI) and professional development (PD) systems within states and Head Start regions to describe and characterize what types of QI approaches are currently available to ECE educators and programs.

This Methodology Report is a companion piece to the CCL Phase II Evaluation Report entitled “Strengthening Continuous Quality Improvement Practices in Early Care and Education through a Breakthrough Series Collaborative” and describes the primary data collection activities and analysis plans associated with the case study of CCL Phase II. Please see Appendix A for a glossary of relevant BSC terminology.

^a For a more detailed description of the BSC methodology, please see the introduction to the Evaluation Report entitled “Strengthening Continuous Quality Improvement Practices in Early Care and Education through a Breakthrough Series Collaborative,” to which this Methodology Report is a companion piece.

Research Questions and Hypotheses

The case study associated with Phase II of the CCL project was designed with two aims: (1) to evaluate the BSC as a methodology to support the use of evidence-based practices in ECE centers and systems and (2) to add to the evidence base for the CCL Theory of Change (see Appendix B), which was developed during Phase I of the CCL project. Seven research questions were developed for the Phase II case study; the research questions focus on participation in and satisfaction with the BSC (research questions 1 and 7); changes over time in mechanisms of change and short- and longer-term outcomes among BSC participants (research questions 2, 3, and 4); spread of improvements to those who did not participate directly in the BSC (research question 5); and sustainability of changes (research question 6).^b

1. **To what extent do centers participate in the BSC?** What are the key facilitators and barriers to participation?
2. **Does participation in the BSC activate key mechanisms of change and are any improvements sustained six months after the conclusion of the BSC?** Specifically, are there increases in participants' use of data, quality improvement activities, and psychological safety? Are any center-level or individual characteristics associated with the activation of key mechanisms of change? Is there an association between centers' level of participation in the BSC and change in key mechanisms?
3. **Does participation in the BSC improve short-term organizational and individual outcomes and are any improvements sustained six months after the conclusion of the BSC?** Specifically, are there improvements in self-efficacy, centers' organizational functioning (e.g., leadership at all levels, organizational climate), and individuals' attitudes and beliefs around SEL and CQI? Are any center-level or individual characteristics associated with change in short-term outcomes? Is there an association between centers' level of participation in the BSC and change in short-term outcomes?
4. **Does participation in the BSC improve longer-term organizational, classroom, and family outcomes and are any improvements sustained six months after the conclusion of the BSC?** Specifically, are there increases in employee retention, decreases in teacher-reported challenging behaviors, and improvements in SEL-promoting classroom practices and family engagement? Are any center-level or individual characteristics associated with change in longer-term outcomes? Is there an association between the centers' level of participation in the BSC and change in longer-term outcomes?
5. **Do improvements in SEL and quality improvement practices spread beyond staff who directly participated in the BSC?** Are any center-level or individual characteristics associated with spread of change in practices? Is there an association between centers' level of participation in the BSC and spread of change in practices?
6. **What changes do BSC participants see as being sustainable beyond the end of the project and what are key facilitators of sustainability?**
7. **To what extent were participants satisfied with their experience and what are their recommendations for improvement?**

To address research questions about change over time, spread, and sustainability, we collected data across multiple time points: baseline (T1, March-April 2024), mid-point (T2, October-December 2024),

^b Please note that the research questions as stated here and in various products from Phase II of the CCL project may differ from the research questions as initially developed and as stated in the Open Science Framework (OSF) Pre-Registration. The research questions cover the same content but are organized differently based on the focus and the intended audience for these products. The research questions, as initially formulated, are listed in the project's Open Science Framework (OSF) [Pre-Registration page](#).

post-BSC (T3, April-June 2025), and at the end of a six-month sustainability period (T4, October-December 2025). We used the hypotheses in Table 1^c to guide our research methodology and measures. These hypotheses are aligned with our evaluation’s logic model (see Appendix C).

Table 1. Research Hypotheses

Research Questions	Hypotheses
1. To what extent do centers participate in the BSC? What are key facilitators and barriers to participation?	This question is primarily exploratory/descriptive; however, we hypothesize that several state/regional factors may be related to effectiveness of implementation: i. State/regional leadership buy-in and engagement ii. A state approach that focuses on CQI (with less focus on compliance) iii. Offering incentives within the system for BSC participation (e.g., link to rating system) iv. States that are characterized by having PD or technical assistance (TA) offered as group/team coaching v. States that have PD/TA offerings that are a similar time commitment as the BSC vi. State-level policies that support paid protected planning time for staff in programs vii. Infrastructure that promotes intentional collaboration between Head Start and child care systems (e.g., co-location of Head Start Collaboration Office with Child Care and Development Fund) viii. The extent to which systems are centralized vs. decentralized We also hypothesize that several center-level factors may be related to level of participation, including but not limited to: i. Individual and organizational readiness for change ii. Paid protected planning time for center staff involved in BSC implementation iii. Previous involvement and positive experiences with state/regional QI offerings iv. A center leader who allows and supports others in exerting their leadership

^c Please note that the research questions as stated in various products from Phase II of the CCL project may differ based on the focus of the product and the intended audience for that product. For example, the seven research questions noted in the CCL Phase II Evaluation Report entitled "Strengthening Continuous Quality Improvement Practices in Early Care and Education through a Breakthrough Series Collaborative," listed in Table 1, differ from the seven research questions noted in the approved CCL Phase II Case Study Plan, and differ from the research questions as listed in the project’s Open Science Framework (OSF) [Pre-Registration for this project](#).

Research Questions	Hypotheses
2. Does participation in the BSC activate key mechanisms of change and are any improvements sustained six months after the conclusion of the BSC? Specifically, are there increases in participants' use of data, quality improvement activities, and psychological safety? Are there any center-level or individual characteristics that are associated with the activation of key mechanisms of change? Is there an association between centers' level of participation in the BSC and change in key mechanisms?	As we found in Phase I, we expect to find that participants will have improvements in mechanisms of change aligned with the theory of change from baseline (T1) to post-BSC (T3), and that those will be sustained through follow-up (T4). For example, we expect to see increases in data use, intra-organizational learning, and psychological safety.
3. Does participation in the BSC improve short-term organizational and individual outcomes and are any improvements sustained six months after the conclusion of the BSC? Specifically, are there improvements in self-efficacy, centers' organizational functioning (e.g., leadership at all levels, organizational climate) and individuals' attitudes and beliefs around SEL and CQI? Are any center-level or individual characteristics associated with changes in short-term outcomes? Is there an association between the centers' level of participation in the BSC and change in short-term outcomes?	We expect to find that participants will have improvements in short-term outcomes aligned with the theory of change from baseline (T1) to post-BSC (T3), and that those will be sustained through follow-up (T4). For example, we expect to see increases in self-efficacy, organizational functioning (leadership capacity, organizational climate), attitudes and beliefs around SEL, and attitudes and beliefs around CQI.
4. Does participation in the BSC improve longer-term organizational, classroom, and family outcomes and are any improvements sustained six months after the conclusion of the BSC? Specifically, are there increases in employee retention, decreases in teacher-reported challenging behaviors, and improvements in SEL-promoting classroom practices and family engagement? Are any center-level or individual characteristics re associated with changes in longer-term outcomes? Is there an association between the centers' level of participation in the BSC and change in longer-term outcomes?	We expect to find that participants will have improvements in longer-term outcomes aligned with the theory of change from baseline (T1) to post-BSC (T3), and that those will be sustained through follow-up (T4). For example, we expect to see increases in improvements in high-quality SEL classroom practices, decreases in teachers' perceptions of children's challenging behaviors, increases in evidence-based classroom practices, and increased positive collaboration and partnership with families.

Research Questions	Hypotheses
5. Do improvements in SEL and quality improvement practices spread beyond staff who directly participated in the BSC? Are any center-level or individual characteristics associated with spread of change in practices? Is there an association between centers' level of participation in the BSC and spread of change in practices?	As we found in Phase I, we expect that changes in SEL and quality improvement practices will spread throughout an organization, in all classrooms and at all levels of the program, not just in those parts directly connected to a BSC team member.
6. What changes do BSC participants see as being sustainable beyond the end of the project and what are key facilitators of sustainability?	We expect to see evidence of sustained improvements in outcomes as evidenced by maintenance of levels of outcomes at post-test.
7. To what extent were participants satisfied with their experience and what are their recommendations for improvement?	This question is primarily exploratory/descriptive; however, we expect that participants will be satisfied with their experience in the BSC.

Methodology

Location selection and site recruitment

Location selection

The first step of recruitment required selecting appropriate states or regions for the case study. Location selection involved two steps: 1) identifying states that met a set of descriptive criteria and 2) discussing the opportunity with states.

To begin identifying potential states and regions that met selection criteria, the research team reviewed descriptive information gathered as part of the landscaping activities, including 1) the degree to which states were implementing the Pyramid Model, 2) whether the CCDF administrator and Head Start Collaboration Officer were embedded in the same department, and 3) whether Head Start programs were participating in the state's QRIS or where Head Start participation in QRIS is mandatory. We started by identifying states that met both the first two criteria and then narrowed down the states by applying the third criterion. We identified 14 states that met the first two criteria, seven of which met all three criteria. Of the states contacted, four agreed to participate in an initial call to learn more about the CCL Phase II project.

The initial calls with states explored the potential readiness of states or regions to participate relative to the six readiness criteria: 1) willingness to partner to implement a QI strategy that includes organizational coaching, 2) interest/buy-in from state/system leaders for piloting a BSC in their QI system with up to eight ECE centers, 3) interest in SEL as a content area for QI, 4) interest in "improvement" in QI, 5) willingness/ability to commit to participating in the partnership for 24-30 months, and 6) willingness to explore offering a BSC as a QI strategy within their system in the future. Given these criteria, three states indicated they were interested in participating in the Phase II case study.

During Summer 2023, the CCL team held an introductory call with the three selected states. The CCL team shared that the project would like to implement the BSC with both child care and Head Start centers in each state and clarified the expected time commitments for each participating state. All state administrators agreed to participate in the project. The CCL team formally notified state representatives of our decision to confirm their participation on 6/16/2023.

Center recruitment

In Fall 2023, the CCL project team began recruiting child care and Head Start programs in the three states. To be eligible, programs had to be an ECE center with at least three classrooms. Additionally, we sought centers that had previous Pyramid Model experience. We also aimed to have at least two Head Start centers participate in each state.

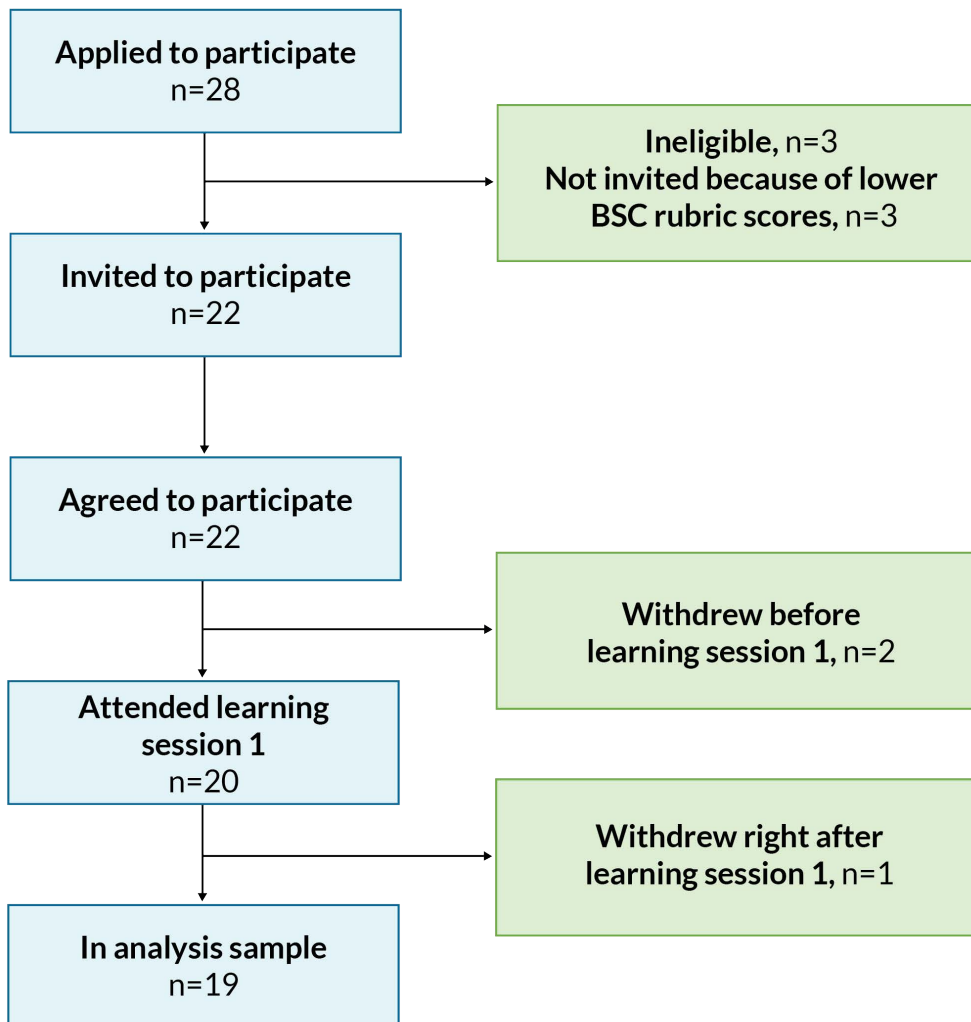
To recruit programs, the CCL team asked the state administrators who were engaged during the location selection process to provide lists of licensed ECE centers in their respective states that they thought should be invited to participate in this project. One state provided a list of programs to contact and ensured that the centers on the list were not already part of other intensive professional development opportunities in the state. In the other two states, the administrators did not provide a full list of ECE centers to contact, so we used publicly available sources to obtain lists of ECE centers.

In all three states, once we had lists of ECE centers, the CCL team emailed ECE program directors to share information about the BSC (including the link to a website with information about the BSC) and invite them to attend information sessions to learn what it would be like to participate in the project. The CCL project team also asked state administrators to make recommendations for trusted recruitment channels to advertise the BSC to ECE programs through social media, such as through the state Department of Early Care's Facebook page. All ECE centers that wanted to participate in the BSC were asked to complete an online application to help the CCL project team determine a center's eligibility to participate in our project. Elements of the application included program type, program capacity, number of classrooms, number of staff, experience with SEL content, and experience with the Pyramid Model. CCL project team members offered ECE center directors support on the BSC application as needed.

CCL project team members also used additional outreach methods to share information about the project with ECE center directors to increase the number of applications received. We also shared our project information with the National Association of Early Childhood Teacher Educators (NAECTE) private network across all three states. The survey for the BSC application opened in November 2023 and closed in February 2024 for recruitment in all three states. In total, 28 centers completed applications across the three BSC states. When needed, BSC staff members followed up with center leaders to help them finish a partially completed application so members from the CCL project team could comparatively review and evaluate the applications.

CCL project team members reviewed all applications to ensure that the ECE centers met basic eligibility criteria. After confirming eligibility, the CCL project team reviewed each application holistically for evidence of *readiness* and *commitment* to the BSC using a rubric with a scale of 0-2, with higher scores indicating greater readiness or commitment. This rubric was used to help the project team select participants from the pool of applicants. In total, 28 programs applied to participate in the BSC. A total of 22 centers were invited and initially agreed to participate, but three centers withdrew from the study before or right after the first learning session. The remaining 19 centers, inclusive of participating staff and parents, comprised our analysis sample (see Figure 1).

Figure 1. Center Recruitment and Enrollment in the Study



Sample

Head Start and ECE Centers

Head Start and other ECE centers were enrolled across the three states. The centers both within and across states—differed in their structure and staffing. See Table 2 for further center characteristics.

Table 2. Center Characteristics, by Location

Characteristic	Overall (n=19)	State 1 (n=6)	State 2 (n=4)	State 3 (n=9)
Program type				
Single-site child care center	5 (26%)	2 (33%)	0 (0%)	3 (33%)
Multi-site child care center	8 (42%)	2 (33%)	3 (75%)	3 (33%)
Head Start	6 (32%)	2 (33%)	1 (25%)	3 (33%)
Nonprofit	9 (47%)	4 (67%)	1 (25%)	4 (44%)
Serves children who receive CCDF subsidy	15 (79%)	5 (83%)	3 (75%)	7 (78%)

Characteristic	Overall (n=19)	State 1 (n=6)	State 2 (n=4)	State 3 (n=9)
Age groups served				
Infants/toddlers	17 (89%)	4 (67%)	4 (100%)	9 (100%)
Preschool	19 (100%)	6 (100%)	4 (100%)	9 (100%)
Kindergarten	3 (16%)	1 (17%)	0 (0%)	2 (22%)
School-age	3 (16%)	1 (17%)	0 (0%)	2 (22%)
Languages spoken by staff when working directly with children				
English	19 (100%)	6 (100%)	4 (100%)	9 (100%)
Spanish	11 (58%)	3 (50%)	0 (0%)	8 (89%)
Another language	8 (42%)	3 (50%)	2 (50%)	3 (33%)
Participates in QRIS	14 (74%)	4 (67%)	4 (100%)	6 (67%)
Is accredited (e.g., NAEYC)	8 (42%)	4 (67%)	0 (0%)	4 (44%)

Source: Center BSC applications (2024).

BSC team participants

A BSC team is composed of representatives from different roles within centers. BSC teams varied in size and makeup, but most were comprised of a senior leader (e.g., center director), team leader (e.g., center administrator), one or two teachers or support staff, and, in some cases, a parent. Tables 3 and 4 show the composition of each BSC team.

Participants were selected through purposive and convenience sampling; therefore, they are not representative of the population of state child care/Head Start staff. Instead, we aim to obtain variation in perspectives to understand the range of experiences regarding the BSC.

Table 3. Personal Background Characteristics of the BSC Teams, by Location

Characteristic	Overall (n=98)	State 1 (n=30)	State 2 (n=27)	State 3 (n=41)
Role				
Administrator (e.g., director, assistant director)	30 (31%)	8 (27%)	8 (30%)	14 (34%)
Teacher (e.g., teacher, assistant teacher)	40 (41%)	10 (33%)	12 (44%)	18 (44%)
Center support staff (e.g., educational coordinator, mental health specialist, cook)	18 (18%)	9 (30%)	3 (11%)	6 (15%)
Parent	10 (10%)	3 (10%)	4 (15%)	3 (7%)
Race/ethnicity				
Hispanic	19 (19%)	5 (17%)	0 (0%)	14 (34%)
Non-Hispanic Black	5 (5%)	1 (3%)	0 (0%)	4 (10%)
Non-Hispanic White	61 (62%)	22 (73%)	24 (89%)	15 (37%)
Other or multiple races	5 (5%)	2 (7%)	1 (4%)	2 (5%)
Missing	8 (8%)	0 (0%)	2 (7%)	6 (15%)
Age				
18-24	3 (3%)	1 (3%)	2 (7%)	0 (0%)

Characteristic	Overall (n=98)	State 1 (n=30)	State 2 (n=27)	State 3 (n=41)
25-34	25 (26%)	9 (30%)	7 (26%)	9 (22%)
35-44	41 (42%)	12 (40%)	13 (48%)	16 (39%)
45-54	12 (12%)	4 (13%)	1 (4%)	7 (17%)
55-64	8 (8%)	3 (10%)	2 (7%)	3 (7%)
65 and above	2 (2%)	1 (3%)	0 (0%)	1 (2%)
Missing	7 (7%)	0 (0%)	2 (7%)	5 (12%)
Languages spoken at home				
English only	71 (72%)	26 (87%)	25 (93%)	20 (49%)
Spanish	17 (17%)	2 (7%)	0 (0%)	15 (37%)
Other	4 (4%)	2 (7%)	1 (4%)	1 (2%)
Missing	6 (6%)	0 (0%)	1 (4%)	5 (12%)
Household income				
\$10,000 to \$39,999	10 (10%)	0 (0%)	5 (19%)	5 (12%)
\$40,000 to \$69,999	26 (27%)	7 (23%)	7 (26%)	12 (29%)
\$70,000 to \$99,000	12 (12%)	7 (23%)	3 (11%)	2 (5%)
\$100,000 to \$149,999	12 (12%)	4 (13%)	5 (19%)	3 (7%)
\$150,000 to \$199,999	8 (8%)	2 (7%)	1 (4%)	5 (12%)
\$200,000 and above	6 (6%)	3 (10%)	0 (0%)	3 (7%)
Missing	24 (24%)	7 (23%)	6 (22%)	11 (27%)

Source: T1, T3, and T4 BSC Participant Survey

Table 4. Professional Background Characteristics of the BSC Teams, by Location

Characteristic	Overall (n=98)	State 1 (n=30)	State 2 (n=27)	State 3 (n=41)
Highest level of education				
High school diploma or equivalent	1 (1%)	0 (0%)	1 (4%)	0 (0%)
Some college	17 (17%)	5 (17%)	7 (26%)	5 (12%)
Associate degree	13 (13%)	3 (10%)	6 (22%)	4 (10%)
Bachelor's degree	30 (31%)	12 (40%)	6 (22%)	12 (29%)
Some graduate school	7 (7%)	2 (7%)	1 (4%)	4 (10%)
Master's or doctoral degree	23 (23%)	7 (23%)	5 (19%)	11 (27%)
Missing	7 (7%)	1 (3%)	1 (4%)	5 (12%)
Higher education fields of study^{a, b}				
Early childhood education	36 (53%)	10 (45%)	11 (65%)	15 (52%)
Child development or developmental psychology	15 (22%)	8 (36%)	2 (12%)	5 (17%)
Elementary education	9 (13%)	5 (23%)	2 (12%)	2 (7%)
Special education	6 (9%)	0 (0%)	5 (29%)	1 (3%)
Education administration/management	5 (7%)	2 (9%)	1 (6%)	2 (7%)
Other education-related field	13 (19%)	4 (18%)	2 (12%)	7 (24%)
Teaching certificates or credentials^a				
Birth to 5 certificate or credential	48 (55%)	18 (30%)	13 (57%)	17 (45%)

Characteristic	Overall (n=98)	State 1 (n=30)	State 2 (n=27)	State 3 (n=41)
Other teaching or director certificate or credential	33 (38%)	14 (37%)	6 (26%)	13 (34%)
Missing	19 (22%)	4 (19%)	6 (26%)	9 (24%)
Years at current center^a				
Less than 1 year	8 (9%)	2 (7%)	3 (13%)	3 (8%)
1 to 3 years	19 (22%)	5 (19%)	7 (30%)	7 (18%)
4 to 5 years	16 (18%)	8 (30%)	5 (22%)	3 (8%)
6 to 10 years	13 (15%)	4 (15%)	2 (9%)	7 (18%)
11 to 15 years	9 (10%)	3 (11%)	2 (9%)	4 (11%)
More than 15 years	17 (19%)	4 (15%)	3 (13%)	10 (26%)
Missing	6 (7%)	1 (4%)	1 (4%)	4 (11%)
Years at other early childhood centers^a				
None	21 (24%)	6 (22%)	6 (26%)	9 (24%)
Less than 1 year	3 (3%)	1 (4%)	1 (4%)	1 (3%)
1 to 3 years	11 (13%)	5 (19%)	1 (4%)	5 (13%)
4 to 5 years	4 (5%)	1 (4%)	0 (0%)	3 (8%)
6 to 10 years	14 (16%)	4 (15%)	4 (17%)	6 (16%)
11 to 15 years	6 (7%)	1 (4%)	3 (13%)	2 (5%)
More than 15 years	22 (25%)	8 (30%)	6 (26%)	8 (21%)
Missing	7 (8%)	1 (4%)	2 (9%)	4 (11%)

Source: T1, T3, and T4 BSC Participant Survey

Note: ^a Not reported by parents.

^b Reported among those with an associate degree or higher.

Additional center staff and parents

At several points in time, we gathered survey information from additional staff and parents within the participating centers. Specifically, we surveyed staff and parents at T1 (i.e., baseline) and T3 (i.e., at the end of BSC implementation) to understand changes in organizational climate and family engagement, factors that are key to the CCL Theory of Change and our evaluation's logic model (see Appendices B and C). Participation in data collection varied over time and across centers. Where appropriate, we indicate staff and parent information in the tables in this report.

BSC staff and coaches

The CCL BSC staff included six facilitators (including an improvement advisor trained in the BSC methodology) across the University of Massachusetts Boston, Mathematica, and JRA Consulting Ltd. Additionally, the team included five additional on-the-ground coaches with expertise in social and emotional learning who supported center directors, staff, and teachers on BSC teams by providing content knowledge about SEL on a regular, ongoing basis. They were hired by the CCL team and received training on the BSC methodology and their roles in the BSC implementation.

Data sources

Qualitative and quantitative data sources included 1) surveys, 2) key informant interviews and focus groups, and 3) BSC implementation data. These data sources were collected multiple times across four data

collection time points: baseline (T1, March-April 2024), mid-point (T2, October-December 2024), post-BSC (T3, April-June 2025), and at the end of the sustainability period (T4, October-December 2025). Table 5 describes all data collection sources and the timing of their administration. Appendix D provides a graphical representation of the data collection timeline as it relates to the BSC implementation.

The case study protocols, including all recruitment and consent procedures and materials, were reviewed and approved by Child Trends' IRB and by OMB (Control No. 0970-0605, exp. 03/31/2026). Specific data collection instruments and protocols are available from the project's OMB package.



Table 5. Summary of Data Sources and Timing of Data Collection

Data Source	Description	Time 1 (Baseline)	Time 2 (Mid Point)	Time 3 (Post BSC)	Time 4 (Follow up)
Surveys^d					
BSC staff surveys	Captured demographics and background information of BSC staff.	X			
Center staff surveys	Collected survey data from administrators, teachers, and other staff at participating centers. We collected information on center-level administrative data (e.g., staff turnover), as well as individual-level data (e.g., changes in knowledge, attitudes, and practices) over the course of the BSC.	X		X	X
Parent surveys	Collected information on parents' perceptions of their level of collaboration with their child's center. Some survey items were only asked of those parents who participated in the BSC.	X		X	X (BSC parents only)
Key Informant Interviews and Focus Groups					
State/regional leadership Interviews	Discussion guides touched on these topics: • Knowledge about the BSC and buy-in • Perceived benefits and challenges of the project • Structural elements of the state's QI/PD systems • Alignment between the state's QI/PD systems and the BSC • Practical considerations for offering a BSC within state systems	X			X

^d Please note that, although individuals from the 19 centers comprised our analysis sample, two centers had stopped engaging in the BSC by the time we administered the post-BSC (T3) surveys. Individuals in these centers did not receive the post-BSC (T3) or follow-up (T4) surveys.

Data Source	Description	Time 1 (Baseline)	Time 2 (Mid Point)	Time 3 (Post BSC)	Time 4 (Follow up)
BSC staff and coach interviews/focus groups	Discussion guides touched on these topics: • BSC staff and coaches • Background about individuals • How the BSC compares to other experiences of QI • Factors that may have helped or hindered BSC participation • Perception of participant goals, needs, and expectations of the BSC • Reflection of BSC implementation • Perceived and observed changes for BSC participants • Sustainability of outcomes • Cost		X		X
BSC participant interviews/focus groups	Discussion guides touched on these topics: • State and center-level factors that may have helped or hindered BSC participation • Participant goals, needs, and expectations of the BSC • BSC elements that were most helpful and most challenging • Satisfaction/perception of BSC value • Feedback on the evaluation itself • Feedback on BSC implementation • Impacts of BSC participation • Spread of QI practices • Sustainability of QI practices • How the BSC compares to other experiences of QI • Cost		X		X

Data Source	Description	Time 1 (Baseline)	Time 2 (Mid Point)	Time 3 (Post BSC)	Time 4 (Follow up)
BSC Implementation Data					
BSC application	Provided information about whether the program was a Head Start program, along with certain characteristics of each participating program. Contributed to an index of BSC participation.	X			
Attendance logs	Documented attendance at all BSC activities. Contributed to an index of BSC participation.	X	X	X	X
Learning session feedback forms	Provided information about participants' satisfaction with BSC activities.	X	X	X	X
PDSA tracking data	Documented the number and focus of PDSA cycles conducted by BSC teams. Contributed to an index of BSC participation.	X	X	X	X
Monthly metric tracking data	Documented the number and consistency of monthly metrics tracked by BSC teams. Contributed to an index of BSC participation.	X	X	X	X

Measures

The variables used for analyses are aligned with the CCL Phase I Theory of Change and the CCL Phase II evaluation logic model (see Appendices B and C).

BSC implementation measures

Level of BSC participation. A center-level participation composite was created to reflect a center's overall participation in the BSC. The participation composite captured: a) attendance at the orientation day and each of four learning sessions, all-team calls, and affinity group calls (i.e., senior/team leader calls, teacher calls, or parent calls); b) submission of monthly metrics; and c) number and focus of Plan-Do-Study-Act (PDSA) cycles initiated. All centers participated in at least two of the four learning sessions, and 18 of 19 centers conducted at least one PDSA cycle (see Table 6). Fifty percent of centers attended at least nine all-team calls. As seen when comparing the means to maximum possible values in Table 6, learning sessions and all-team calls were fairly well attended, whereas affinity group calls were attended far less consistently. Among the affinity group calls, senior/team leader calls had a higher attendance than teacher and parent calls. On average, centers submitted an average of 13.1 monthly metrics over 11 months; centers had an average of 4.6 monthly submissions for Metrics 1 (classroom behavior) and 2 (family engagement), respectively, and 3.8 monthly submissions for Metric 3 (organizational climate).

Table 6. Center-level BSC Participation (n = 19 teams)

Participation Metric	Maximum Possible	Mean	SD	Median	Min	Max
Number of orientation + learning sessions attended	5	4.5	0.8	5.0	3.0	5.0
Number of all-team calls attended	11-12	7.4	3.5	8.0	1.0	12.0
Number of senior/team leader affinity group calls attended	6-7	2.8	2.0	3.0	0.0	6.0
Number of teacher affinity group calls attended	5-7	1.9	1.7	2.0	0.0	6.0
Number of parent affinity group calls attended	6	1.3	1.7	1.0	0.0	5.0
Number of monthly metrics submitted	33	13.1	12.1	14.0	0.0	33.0
Number of PDSAs initiated	n/a (not a specified number of instances)	6.8	6.1	6.0	0.0	21.0

Source: BSC Implementation Data (2024-2025).

Note: The maximum number of calls varied by state, so a range is presented above.

For analyses, we created a participation composite value by weighting each component of participation (see scoring and weighting in Table 7) to create a continuous score with a maximum possible value of 11.85 (range: 2.2-11.1). After creating the continuous score, we examined the distribution to determine how to create a categorical participation grouping variable. Categorical groupings represent *robust* (i.e., centers with participation scores in the top third of the distribution, $n = 6$) and *less robust* participation (i.e., centers with participation scores in the bottom two thirds of the distribution, $n = 13$). We used a similar approach in CCL Phase I, where we grouped centers into a robust participation group if they were above the third

quartile on the participation composite and a moderate participation group if they were below the third quartile.

Table 7. Elements of the Level of BSC Participation Composite

Activity	Scoring	# of instances	Total points possible	Weighting
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	11-12	24	0.1
Senior leader & team leader calls	0 - No representatives present from center 1 - One or more representative present from center	6-7	7	0.2
Teacher calls	0 - No representatives present from center 1 - One or more representative present from center	5-7	7	0.1
Parent calls	0 - No representatives present from center 1 - One or more 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 2 - Center submitted at least one datapoint for two metrics for the month 3 - Center submitted at least one datapoint for all three metrics for the month	11	33	0.1
PDSA frequency	0 - Center initiated zero PDSAs 1 - Center initiated one PDSA 2 - Center initiated two PDSAs 3 - Center initiated three PDSAs 4 - Center initiated four PDSAs 5 - Center initiated five PDSAs 6 - Center initiated six or more PDSAs	n/a (not a specified number of instances)	6	0.1

Activity	Scoring	# of instances	Total points possible	Weighting
PDSA Change Framework (CF) areas addressed	0 - PDSAs focused on zero areas of the CF 1 - PDSAs focused on one area of the CF 2 - PDSAs focused on two areas of the CF 3 - PDSAs focused on three areas of the CF 4 - PDSAs focused on four areas of the CF 5 - PDSAs focused on five areas of the CF	n/a (not a specified number of instances)	5	0.05

Level of satisfaction with BSC. After each of the four learning sessions, BSC team members (e.g., teachers, administrators, and parents) reported their level of agreement with four statements about how the session helped them interact with others, increased their understanding of using the BSC method, left them feeling empowered, and was a good use of their time (1 = “strongly disagree” to 5 = “strongly agree”). After the final learning session, participants responded to 19 questions about their perceptions of and satisfaction with the learning sessions, PDSA cycles, and affinity groups, as well as changes they had noticed to their teaching practices and classroom (1 = “strongly disagree” to 5 = “strongly agree”). Participants also reported their level of satisfaction with the BSC (1 = “very unsatisfied” to 6 = “very satisfied”), as well as whether they would recommend participating in BSC to other staff and whether they would like their regular TA provider to offer the BSC in the future (“yes,” “no,” “don’t know”).

Perceptions of BSC implementation. We asked administrators, teachers, and other staff about their perceptions of the BSC using four items. At T1, participants reported whether they had heard of the BSC (“yes” or “no”) and how much they thought they could benefit from participation in the BSC on a 0-4 scale, from 0 = “not at all” to 4 = “a great deal.” At T3, participants rated how much they thought they benefited from their center’s participation in the BSC on a 0-4 scale, from 0 = “not at all” to 4 = “a great deal.” At T1 and T3, BSC participants also rated how much they thought they benefited from their own participation in the BSC using the same scale.

Time spent on BSC activities. We asked administrators, teachers, other staff, and parents about the amount of time (in hours) they spent on a variety of BSC activities in a typical month (e.g., attending meetings with the center’s BSC team, collecting and submitting monthly metrics data), which was combined to calculate the total amount of time on BSC activities per month. Participants also reported what percentage of that time was outside their regular work hours.

Mechanisms of change

Use of data. We asked administrators how often they use data to support children’s learning and development at their center using two items drawn from the ExCELS Center Manager Survey.⁸ Items (e.g., “I review individual children’s data with other teaching staff to make decisions together about changing curriculum or classroom practices”) are rated on a 0-4 scale from 0 = “never” to 4 = “often” and averaged together to form a scale. We also asked teachers and other staff how often they and center management use data to support children’s learning and development using four items drawn from the ExCELS Teaching Staff Survey.⁹ Items (e.g., “I review individual children’s data with other teaching staff to make decisions together about changing curriculum or classroom practices”) are rated on a 0-4 scale from 0 = “never” to 4 = “often” and averaged together to form a scale.

Intra-organizational learning. We asked administrators, teachers, and other staff about the extent to which they engaged with quality improvement activities within their center over the last six months using seven items adapted from Nembhard (2012)¹⁰ and Brown et al. (2019).¹¹ Items (e.g., solicited ideas and feedback

from staff with whom you work; designed a change or a strategy to try out) are rated on a 0-4 scale from 0 = “never” to 4 = “a lot” and will be averaged to form a scale.

Inter-organizational learning. We asked administrators, teachers, other staff, and parents about the extent to which their BSC team engaged in a variety of learning experiences with other teams over the course of the BSC using seven items adapted from Nembhard (2012).¹² Items (e.g., interactions with members of other BSC teams during learning sessions; reviewing monthly measures data from other BSC teams) are rated on a 0-4 scale from 0 = “never” to 4 = “a lot” and will be averaged together to form a scale.

Team self-efficacy. We asked administrators, teachers, other staff, and parents about their BSC team self-efficacy using three items. Items (e.g., “Achieving our BSC team’s goals is well within our reach”; “Our BSC team can achieve its task without requiring us to put in unreasonable time or effort”) are rated on a 5-point scale from 1 = “strongly disagree” to 5 = “strongly agree” and averaged to form a scale.

Psychological safety. We asked administrators, teachers, and other staff about their feelings of psychological safety at their center using seven items from the Team Psychological Safety scale.¹³ Items (e.g., “people at this center are able to bring up problems and tough issues”; “people at this center feel it is safe to take a risk”) are rated on a 1-5 scale from 1 = “strongly disagree” to 5 = “strongly agree” and are averaged to form a scale.

Short-term outcomes

Leadership at all levels. We asked administrators, teachers, and other staff about leadership within their centers, including involvement of different individuals in decision-making, roles, and responsibilities, and the amount of influence teaching staff have at the center. These items were drawn from the ExCELS Center Manager and Teacher Surveys.¹⁴ Three variables were created from these responses: (a) the extent to which individuals beyond the director are involved in specific actions to improve how the center provides care and education to children (from directors/administrators only to multiple people/groups involved); (b) roles and decision-making at the center, formed as the average of three items rated on a scale from 1 = “strongly disagree” to 5 = “strongly agree” (e.g., including teaching staff in the center’s decisions creates tension among teaching staff); and (c) the amount of influence of teachers in different aspects of the center, formed as the average of four items rated on a scale from 0 = “no influence” to 4 = “a lot of influence” (e.g., developing plans for involving families, developing solutions to problems the center faces).

Organizational climate. We asked teachers and other staff about the extent to which teachers at their center have strong relationships, work together, and are committed to their center. This measure included subscales focused on socialization of new teachers (3 items), teacher collaboration (5 items), collective responsibility (5 items), school commitment (4 items), and teacher-teacher trust (5 items). These items were drawn from The Essential 0-5 Survey.¹⁵ Items were averaged to create both an overall score and subscale scores. Most subscales were rated on a 5-point scale; prior to creating the overall score, we transformed items that were rated on a different scale (e.g., teacher collaboration items are rated on a 4-point scale, so we will multiply responses by 1.25 to transform this to a 5-point scale).

Beliefs about social and emotional learning (SEL). We asked administrators, teachers, and other staff about their beliefs around SEL on two subscales adapted from Brackett and colleagues (2012).¹⁶ The comfort subscale included four items (e.g., “I am comfortable providing support for social and emotional skills to the children in this center”; “Taking care of children’s social and emotional needs comes naturally to me”) and were rated on a 1-5 scale from 1 = “strongly disagree” to 5 = “strongly agree” and averaged to form a scale. The culture subscale included four items (e.g., “My director creates an environment that promotes social and emotional learning for the children in our care”; “The culture in my center supports the development of children’s social and emotional skills”), also rated on the same 1-5 scale and averaged to form a scale.

Beliefs about continuous quality improvement (CQI). We asked administrators, teachers, and other staff about their beliefs regarding quality improvement efforts using the Beliefs and Attitudes subscale of the Beliefs, Attitudes, Skills, and Confidence in Quality Improvement measure (BASiC-QI).¹⁷ This subscale included nine items (e.g., “I enjoy quality improvement”; “I value quality improvement training as part of my professional development”), each rated on a 1-5 scale from 1 = “strongly disagree” to 5 = “strongly agree” and averaged to form a scale.

Self-efficacy. We asked administrators, teachers, and other staff about their feelings of self-efficacy in their work using 12 items from the Teacher Opinion Survey.¹⁸ Items (e.g., “if I keep trying, I can find some way to reach children with even the most challenging behaviors”) were rated on a 1-5 scale from 1 = “strongly disagree” to 5 = “strongly agree” and averaged to form a scale. Items were slightly adapted for administrators to apply to their work (e.g., “I can support my teachers in learning skills to handle children’s challenging behaviors”).

Longer-term outcomes

Social and emotional learning classroom practices. We asked teachers about the extent to which they had focused on social and emotional learning and supported children’s behavior in the past week in their planned lessons and in their interactions with children in the classroom using seven items (e.g., number of lesson plans implemented in the past week that explicitly focused on social and emotional learning; number of times in the past week they supported a child in regulating their behavior; number of times in the past week they had perceived challenging behaviors or a behavioral disruption among children in their classroom). Because these were newly developed items, we examined the distribution on these variables to inform our scoring approach.

Perceived problems with child behavior. We asked teachers to indicate challenges they experienced related to children’s behavior in the classroom using 10 items (0 = “no”; 1 = “yes”) drawn from the Perceived Problems Questionnaire¹⁹ (e.g., “I have a problem: knowing how to handle children’s aggressive behavior”; “getting children to learn and follow classroom rules and routines”). Items were averaged to calculate the proportion of problems endorsed.

Staff retention. We asked administrators about the total staff positions and staffing vacancies by role, which we used to calculate the percentage of staff vacancies out of the total staff positions as reported by administrators (see “center size” below). We also asked administrators to report how many staff had left their positions over the past 6 months, which we used to calculate a turnover rate out of total staff positions.

Family engagement. We asked administrators, teachers, and other staff about the extent to which staff at their center support families using three items adapted from the Strengthening Families™ Self-Assessment Tool for center-based ECE programs measure.²⁰ Items (e.g., “Program staff ensure that all families are included in all aspects of the program, including volunteer opportunities”) are rated on a 1-5 scale from 1 = “strongly disagree” to 5 = “strongly agree” and averaged to form a scale.

Other analytic variables

Other variables included in analyses were for descriptive characteristics, control variables, and predictors or moderators.

Paid planning time. We asked administrators about whether (and how much) paid planning time was available for teachers and assistant teachers at their center using five items. These items were drawn from the ExCELS Center Manager Survey.²¹ We created three variables from these responses: (a) a categorical variable indicating whether the center provided paid planning time to lead teachers only, both lead or assistant teachers, or no teachers; (b) the number of hours per week of paid planning time provided; and (c)

the proportion of planning time that is used for staff from different classrooms to collaborate and plan together (from 0 = "none" to 3 = "more than half").

Center size. We asked administrators about the size of their program in terms of the number of staff positions if their program was fully staffed. Responses at T1 were used to assess center size at the start of the BSC.

Head Start status. We used a binary variable indicating whether a center is a Head Start center (=1) or not a Head Start center (=0).

BSC participation status. We used a binary variable indicating whether an individual is a BSC team member (=1) or not a BSC team member (=0) based on team rosters.

Role. We asked all participants to provide information about their role at the center from a list of options: assistant teacher, aide, or apprentice; teacher; lead teacher; assistant director; director; component coordinator (education, family support, health/nutrition); support staff (administrative assistant, cook); and parent/caregiver. We created categories to group respondents by administrators, teaching staff, and parents/caregivers.

Years of experience. Administrators, teachers, and other staff reported the number of years they had worked at this center and in other early childhood centers (in separate items) on a 0-6 scale from 0 = "none" to 6 = "more than 15 Years." Responses were combined to calculate overall years of experience in early childhood.

Other demographic information. We asked all participants to provide information about their gender identity, race and ethnicity, language, year of birth, level of education (from 1 = "did not graduate high school" to 8 = "doctoral degree in research or professional practice"), and household income (from 1 = "less than \$10,000" to 13 = "\$200,000 and above"). Administrators, teachers, and other staff also reported their major or field of study, along with licenses, certificates, or credentials.

Table 8 summarizes information about the measures used for analysis. Descriptive statistics on analytic variables from these measures are provided for our analytic sample in Appendix F.

Table 8. Summary of Measured Variables, Data Sources, Respondents, and Crosswalk with Research Questions

Analytic Measures	Data Sources	Respondents	Relevant Research Questions
BSC Implementation			
Level of participation in BSC	BSC implementation data (various metrics)	BSC team members	1, 2, 3, 4, 5
Level of satisfaction with BSC	BSC implementation data (feedback forms)	BSC team members	7
Perceptions of BSC implementation	Surveys	All administrators, teachers, other staff (T1, T4)	1, 7
Time spent on BSC activities	Surveys	BSC team members (T3, T4)	1

Analytic Measures	Data Sources	Respondents	Relevant Research Questions
Mechanisms of Change			
Use of data	Surveys Focus groups, interviews	All administrators, teachers, other staff (T1, T3, T4)	2
Intra-organizational learning	Surveys Focus groups, interviews	All administrators, teachers, other staff (T1, T3, T4)	2
Inter-organizational learning	Surveys Focus groups, interviews	BSC team members (T3)	2
Team efficacy	Surveys Focus groups, interviews	BSC team members (T3, T4)	2
Psychological safety	Surveys Focus groups, interviews	All administrators, teachers, other staff (T1, T3, T4)	2
Inquiry mindset	Focus groups, interviews	BSC team members (T2, T4)	2
Short-Term Outcomes			
Self-efficacy	Surveys Focus groups, interviews	All administrators, teachers, other staff (T1, T3, T4)	3
Leadership at all levels	Surveys Focus groups, interviews	All administrators, teachers, other staff (T1, T3, T4) BSC team members (T2, T4)	3
Organizational climate	Surveys Focus groups, interviews	All teachers, other staff (T1, T3, T4) BSC team members (T2, T4)	3
Attitudes & beliefs about SEL	Surveys	All administrators, teachers, other staff (T1, T3, T4)	3
Attitudes & beliefs about CQI	Surveys	All administrators, teachers, other staff (T1, T3, T4)	3

Analytic Measures	Data Sources	Respondents	Relevant Research Questions
Longer-Term Outcomes			
SEL classroom practices	Surveys	Teachers (T1, T3, T4)	4
Perceived problems with child behavior	Surveys	Teachers (T1, T3, T4)	4
Spread & sustainability of CQI practices	Surveys Focus groups, interviews	All administrators, teachers, other staff (T1, T3, T4) BSC team members (T4)	5, 6
Spread & sustainability of SEL practices	Surveys Focus groups, interviews	All administrators, teachers, other staff (T1, T3, T4) BSC team members (T4)	5, 6
Staff retention	Surveys	Administrators (T1, T3, T4)	4
Family engagement	Surveys	All administrators, teachers, other staff (T1, T3, T4)	4
Other Analytic Variables			
Paid planning time	Surveys	Administrators (T1)	1, 2, 3, 4, 5
Center size	Surveys	Administrators (T1, T3, T4)	1, 2, 3, 4, 5
Head Start status	BSC implementation data (application)	N/A	1
Individual BSC participation status (BSC team member or not)	BSC implementation data (application)	N/A	5
Role	Surveys	All administrators, teachers, other staff, parents (T1)	1, 2, 3, 4, 5
Years of experience	Surveys	All administrators, teachers, other staff (T1)	1, 2, 3, 4, 5
Other demographic information	Surveys	All administrators, teachers, other staff, parents (T1)	Sample characteristics

Analysis Plan

Qualitative analyses

Interviews and focus groups were transcribed verbatim and the transcripts were uploaded into Dedoose for analysis. Dedoose is a secure, web-based qualitative data analysis platform that offers a broad range of analytic tools and is highly conducive to team-based coding and analysis. The study team used a directed approach to content analysis,²² involving both deductive (*a priori*) and inductive (*emergent*) coding. The team developed an initial coding scheme based on the research questions, especially research questions 2, 3, 5, 6, and 7 (see Tables E1-E3). Then, using the initial coding scheme as a reference, the team independently reviewed a random subsample of transcripts and noted additional themes and patterns. With input from subject matter experts, activity leads, and the study principal investigators, the team refined the coding scheme based on the initial transcript reviews. The team followed this iterative process to produce a codebook that defines codes and their application (see Appendix E).^e Once the codebook was finalized, data were coded in Dedoose. For T1 and T2 qualitative data collection, all transcripts were double coded (i.e., coded by two coders). Coders met regularly to reconcile differences and reach consensus on codes. For T4 qualitative data collection, 30% of transcripts were double coded to confirm that coders were applying codes consistently. Any new codes that emerged through the process of coding were applied retrospectively to previously coded data. Once coding was completed, the team conducted analysis by running targeted queries to explore patterns in the data related to the research questions and through examination of code co-occurrence frequencies to explore themes of interest.

Quantitative analyses

Our quantitative analysis plans were pre-registered with [Open Science Framework](#).^f Any additional analyses not pre-registered were exploratory and were reported as such.

Data cleaning and descriptive statistics

Before conducting preliminary analyses or building analytic models, we cleaned the survey and implementation data from the case study. Prior to building our primary models, we examined the distributions and patterns of missingness for all dependent and independent variables across the full sample and by state to 1) determine whether variables needed to be transformed or recoded, 2) inform our plan for approaching missing data, and 3) inform whether other adjustments needed to be made to our analytic plan. Descriptive statistics for our main analytic variables are available in Appendix F.

Missing data and imputation

We used multiple imputation (MI) to handle missing data, retaining in the analytic sample all individuals from the 19 participating centers who completed at least one survey across the three survey time points

^e Appendix E provides the “parent” and “child” codes used in our qualitative coding scheme. A more complete codebook that provides examples/definitions of the qualitative codes is available upon request from the CCL research team.

^f As noted above, the research questions as stated in this report and other products from Phase II of the CCL project differ from the research questions as initially developed and as stated in the Open Science Framework (OSF) pre-registration. While the analyses described in this report align with the analyses we pre-registered with OSF, the way they are organized here differs from the OSF pre-registration. In our pre-registration, we noted that we would consider including state fixed effects and individual-level demographic variables as covariates in our models if appropriate. However, after conducting preliminary analyses, we decided not to include state fixed effects, as we were concerned this would mask patterns related to level of participation. In addition, although we tested role and years of experience as moderators of change, we did not include these or other demographic characteristics in models examining main effects of time because (a) we had limited statistical power to estimate additional parameters, and (b) we did not have clear hypotheses about how other demographic characteristics would be related to outcomes.

(T1, T3, or T4). Imputation was conducted in Stata using multivariate imputation by chained equations (MICE) with predictive mean matching (nearest neighbor). All key analysis variables from T1, T3, and T4 were included in the imputation model. We generated 10 imputed datasets and all primary analyses were conducted across these datasets with results pooled using Rubin's rules.²³

To account for the multilevel structure of the data, individual- and center-level identifiers were included as fixed-effect predictors in the imputation model. All analyses were then conducted within each imputed dataset and pooled in the standard way.

Model building

Here we describe the statistical models we used to answer each research question involving survey and implementation data. We will begin with null models that include only random intercepts to calculate the intraclass correlation coefficients (ICCs), which indicate the proportion of variance at each level of clustering (i.e., individuals and centers). This determined whether a multilevel modeling approach was warranted and would serve as a reference for assessing subsequent models.

Incremental model specification

The predictor variable was added. Then, the independent variables were added in a stepwise fashion. We assessed whether each addition improved model fit using likelihood ratio tests, changes in R^2 at each level, and/or information criteria—specifically Akaike Information Criterion and Bayesian Information Criterion (AIC/BIC).²⁴ We also explored whether random variation in slope and/or intercepts improved the model fit.

Model fit and comparison

We examined changes in R^2 (variance explained by predictor variables) for each model. We also examined residual diagnostics and intraclass correlation coefficients (ICCs) to assess model adequacy.

Covariates and interactions

Covariates were included based on theoretical relevance and prior literature. Interaction terms were tested when justified by hypotheses and retained if they significantly improved model fit and interpretability.

Contingency planning and adjustments

Although our primary analytic strategy involved multilevel modeling, practical constraints—such as sample size limitations, data structure and sparsity, or model convergence issues—necessitated adjustments to our plan. We monitored model diagnostics closely and remained flexible in our approach to ensure valid and interpretable results. If multilevel models failed to converge or exhibited poor fit despite attempts at simplification (e.g., removing interaction terms), we pivoted to alternative modeling strategies as needed. These alternative modeling strategies included:

- **Simplified multilevel models** with fewer predictors or random effects
- **Fixed-effects models** that omit random components, only if clustering effects are negligible
- **Traditional approaches** such as ANOVA or linear regression, particularly when nesting is minimal or when the data structure does not support multilevel estimation

Any such adjustments were guided by empirical diagnostics (e.g., convergence warnings, variance inflation, singular fits), theoretical justification, and consideration of statistical power. We documented all deviations

from the preregistered plan, including the rationale for switching models, and interpreted results in light of these changes.

Furthermore, given the goals of this case study, we planned to examine overall trends and patterns by state and by Head Start status (Head Start vs. not), even if state or Head Start status were not significant predictors or moderators of change over time, and even if sample size and power considerations limited our ability to test for significant interactions involving state or Head Start status. Due to sample size and power considerations, corrections for multiple testing were not conducted. Given the large number of analyses conducted, the Type I error rate is inflated, resulting in increased probability of false positives (i.e., significant findings that are due to error instead of true findings). Therefore, significant findings need to be interpreted with caution as the Type I error rates are inflated due to multiple testing.

Analyses by research question

1) How do ECE center-level factors facilitate or hinder effective implementation of a BSC conducted within state, Head Start, and regional QI systems?

Participation descriptives. We conducted descriptive analyses to characterize participation across BSC centers using the center-level BSC participation composite (both continuous and categorical versions), across the full sample and by state. For the continuous composite, we examined means, standard deviations, and ranges; for the categorical version, we examined frequencies and proportions across defined participation levels.

Facilitators and barriers. We used multiple regression to examine center-level predictors of BSC participation, with the center-level BSC participation composite as the dependent variable. We estimated separate models for the continuous composite (5 linear regression models, to retain the full variability across centers) and the categorical participation grouping variable (5 logistic regression models, to align with analyses in other research questions where outcomes are compared across defined levels of participation). Center-level predictors included paid planning time, baseline center turnover, average prior quality improvement experience, the discrepancy between administrator-reported and teacher/other staff-reported prior quality improvement experience, average baseline leadership at all levels, the discrepancy between administrator-reported and teacher/other staff-reported baseline leadership, and center size. Predictors were tested in a separate model,⁸ given our goals and concerns about potential shared variance among the predictors, which would make interpretation difficult. Models also included state fixed effects.

- 2) Does participation in the BSC activate key mechanisms of change and are any improvements sustained six months after the conclusion of the BSC?
- 3) Does participation in the BSC improve short-term organizational and individual outcomes and are any improvements sustained six months after the conclusion of the BSC?
- 4) Does participation in the BSC improve longer-term organizational, classroom, and family outcomes and are any improvements sustained six months after the conclusion of the BSC?

To address research questions 2, 3, and 4, we used multilevel models (MLMs) to examine main effects of time, moderation by center- and individual-level characteristics, and moderation by level of participation. The dependent variables (outcomes) we examined differed for each research question:

- Mechanisms (research question 2) included use of data, intra-organizational learning (i.e., quality

⁸ For both prior quality improvement experience and leadership at all levels, the models included two predictors: 1) the overall average and 2) the difference between the average of administrator-reported scores and the average of teacher/other staff-reported scores.

improvement practices), and psychological safety. Inter-organizational learning and team efficacy were also conceptualized as mechanisms but were not measured at T1. We therefore examined these descriptively but did not examine change over time.

- Short-term outcomes (research question 3) included self-efficacy, distributed leadership, organizational climate (collaborative teachers), beliefs around SEL (comfort and culture), and beliefs and attitudes about continuous quality improvement.
- Longer-term outcomes (research question 4) included SEL classroom practices, perceived child behavior problems, family engagement, and center turnover.

Main effect of time. We used MLMs, with responses nested in individuals and individuals nested in centers,^h to examine changes in mechanisms, short-term outcomes, and long-term outcomes from baseline (T1) to post-BSC (T3) and from baseline (T1) to follow-up (T4) among BSC participants, with time as the primary predictor. We examined change from baseline (T1) to post-BSC (T3) and follow-up (T4) in a single model; separate models were estimated for each mechanism or outcome of interest (e.g., one model for use of data, one model for use of continuous quality improvement practices). In each model, we included a binary T3 indicator (set equal to 1 for responses from T3) and a binary T4 indicator (set equal to 1 for responses from T4). This approach meant that the intercept represented scores at baseline (T1), the T3 indicator represented change from baseline to post-BSC, and the T4 indicator represented change from baseline to follow-up. We estimated 25 models (one for each mechanism/outcome) to examine the main effects of time.

Moderation by center- and individual-level characteristics. We tested whether four center-level characteristics (i.e., baseline paid planning time hours, extent of collaboration during paid planning time, center size, center turnover) and two individual-level characteristics (i.e., role, years of experience) moderated change from T1 to T3 and/or T1 to T4 by adding these as predictors of the intercept (i.e., level at baseline) and time slopes (i.e., both the T3 binary indicator and the T4 binary indicator) in the models described above. Because the intercept represented levels of the mechanism or outcome at baseline, including the moderator as a predictor of the intercept allowed us to test whether the mechanism/outcome varied by levels of the moderator at baseline (e.g., differed between administrators and teachers/staff at baseline). Including the moderator as predictors of the time slopes allowed us to test whether change from baseline (T1) to post-BSC (T3) or change from baseline (T1) to follow-up (T4) varied by levels of the moderator. Each potential moderator was tested in a separate model (e.g., one model testing years of experience as a moderator, one model testing role as a moderator), given our goals and concerns about potential shared variance among the moderators, which would make interpretation difficult. We estimated 150 moderation models (six separate models per each of 25 mechanisms/outcomes, given that we had four center-level and two individual-level moderators tested in separate models) to examine moderation by center- and individual-level characteristics.

Moderation by level of participation. We used MLMs to examine whether the center-level BSC participation composite moderated the extent of change from T1 to T3 and/or T1 to T4. The categorical participation variable (i.e., robust vs. less robust) was added as a predictor of the intercept and time slopes, similar to the models described above. Including the categorical participation variable as a predictor of the intercept allowed us to test whether the mechanism/outcome varied between centers with robust and less robust participation at baseline. Including the categorical participation variable as predictors of the time slopes allowed us to test whether change from baseline (T1) to post-BSC (T3) or change from baseline (T1) to follow-up (T4) differed between centers with robust and less robust participation. In supplemental models, we used the continuous version of the participation composite as a predictor. We estimated 25 models using the categorical participation variable (one for each mechanism/outcome) and 25 models using

^h Although most outcomes were estimated using three-level MLM (responses over time nested in individuals and individuals nested in centers), center turnover was included as a center-level outcome in a two-level MLM (responses over time nested in centers). In addition, parent-reported family engagement was aggregated to the center level, since individual parent responses could not be linked over time; these outcomes were therefore also included as a center-level outcome in a two-level MLM (responses over time nested in centers).

the continuous participation variable (one for each mechanism/outcome) to examine moderation by level of participation.

5) Do improvements in SEL and quality improvement practices spread beyond staff who directly participated in the BSC?

To address this research question, we used MLMs to examine changes from T1 to T3 and T1 to T4 in mechanisms, short-term outcomes, and longer-term outcomes among the full sample, including both BSC participants and non-BSC participants within participating centers. The primary predictors were time (i.e., the T3 binary indicator and the T4 binary indicator described above) and BSC participation status (i.e., a binary indicator set to 1 if the individual was a BSC team member and set to 0 if not). BSC participation status was included as a predictor of the intercept, (i.e., level at baseline), as well as slopes for time (i.e., both the T3 binary indicator and the T4 binary indicator). Because the intercept represented levels of the mechanism or outcome at baseline, including BSC participation status as a predictor of the intercept allowed us to test whether the mechanism/outcome differed between BSC team members and non-BSC team members at baseline. Including the BSC participation status as predictors of the time slopes allowed us to test whether change from baseline (T1) to post-BSC (T3) or change from baseline (T1) to follow-up (T4) differed between BSC team members and non-BSC team members. We estimated 25 models (one for each mechanism/outcome) to examine spread.

In supplemental analyses to parallel the analyses we ran with BSC participants, we limited the sample to non-BSC participants and examined main effects of time and moderation by center-level participation (as described above). These analyses tested the extent of change (and moderation of change) among non-BSC participants only. As with the models for BSC participants, we estimated 25 main effect models and 25 models testing moderation by level of participation.

6) What changes do BSC participants see as being sustainable beyond the end of the project and what are key facilitators of sustainability?

Research question 6 was addressed primarily through qualitative analyses (see “qualitative analyses” section). Quantitative analyses examining change through T4 (follow-up) are described under research questions 2, 3, and 4 above.

7) To what extent were participants satisfied with their experience and what are their recommendations for improvement?

We conducted descriptive analyses of participant satisfaction using feedback form data, examining means, standard deviations, and ranges for continuous variables and frequencies and proportions for categorical variables. Analyses were conducted across the full sample and separately by state, and we tested mean differences between states.

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Appendices

Appendix A. Glossary of key terms

Term	Definition
Action period	Period between learning sessions when 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 (i.e., final) learning session.
Affinity groups	Role-specific groups (senior leader, team leader, teacher, and parent) facilitated by coaches to bring 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	Videoconferencing calls facilitated by BSC staff to bring together all 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)	The Breakthrough Series Collaborative is a quality improvement delivery methodology that is used to support organizations and systems to improve practice in a specified content area or domain of practice. ²⁵ The BSC is designed to close the gap between knowledge and practice.
BSC staff	Experts in BSC methodology and ECE center operations who facilitate the BSC and oversee implementation in participating centers as part of the project staff.
BSC participants	Individuals in the CCL project who participate in data collection activities (e.g., surveys, interviews, and focus groups), including BSC staff, BSC teams, and coaches.
BSC teams (see also cross-role teams)	Multi-level, inclusive teams from each ECE center that participates in a BSC. Each team is made up of representatives from different center leadership levels (e.g., program directors, administrative staff, teachers, and parents). Each team appoints a senior leader (typically a center director) and a team leader (typically an administrative staff person or teacher).
Change Framework	A document or graphic that is used within a BSC to depict the evidence-based practices associated with the focus for improvement. This document or graphic guides the topics covered within learning sessions and helps team members select the changes they want to test during action periods. A Change Framework includes “primary drivers” (i.e., key elements or domains) of change that are associated, through research evidence, with desired outcomes within a topical area. The primary drivers have several “secondary drivers” (i.e., specific strategies or opportunities) associated with them, also based on research evidence. In the CCL project, the primary drivers within the Change Framework were based on the Pyramid Model, an evidence-based framework for supporting SEL outcomes in infants and young children.
Coaches	Individuals who have specific content expertise related to the BSC and who serve as advisors to BSC staff and as coaches to the participating BSC teams.
Continuous quality improvement (CQI)	An ongoing improvement process in which practitioners use data to identify strengths and opportunities for improvement and then test, implement, learn from, and revise solutions. ²⁶

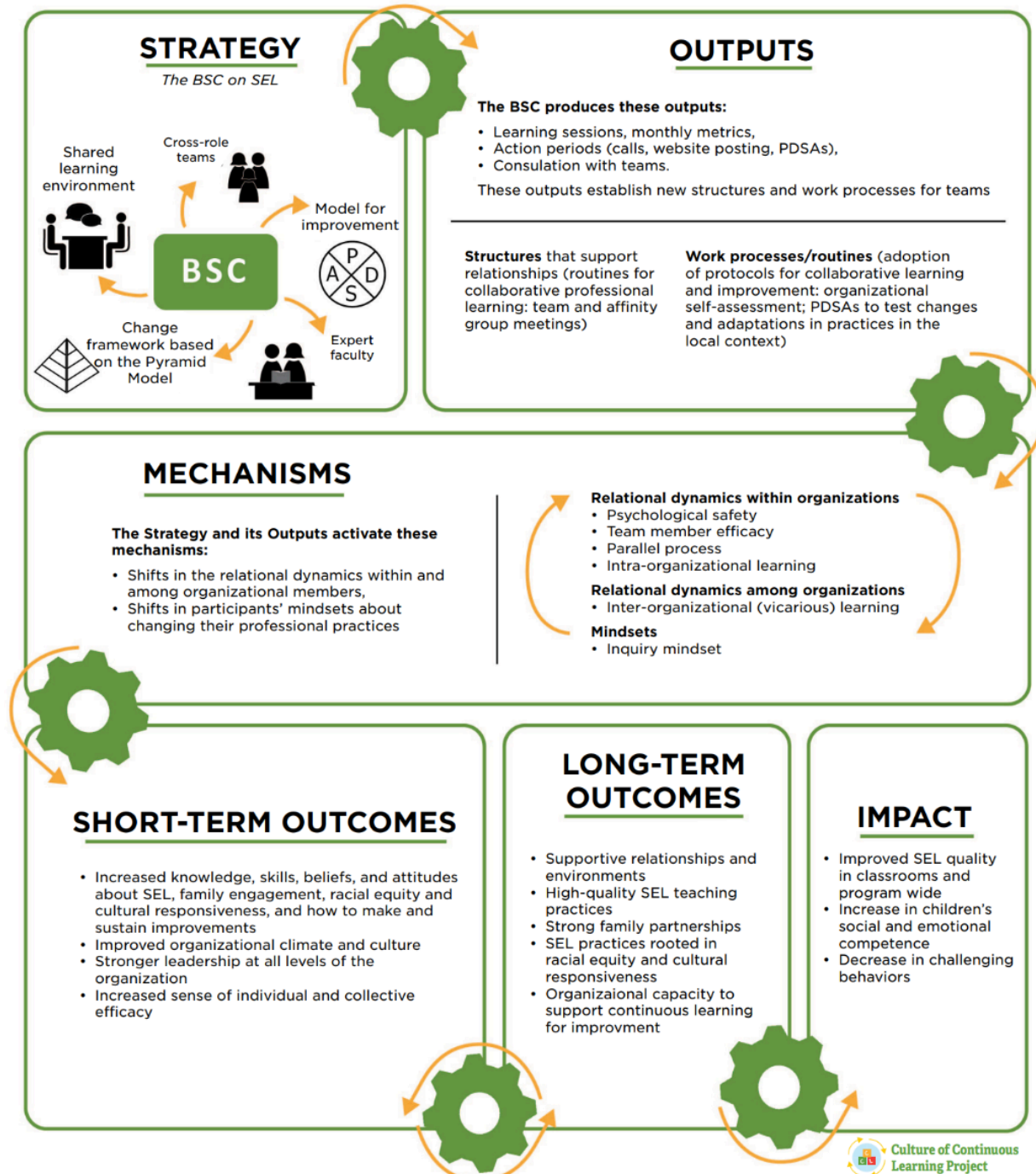
Term	Definition
Cross-role teams (see also BSC teams)	Multi-level, inclusive teams from each ECE center that participates in the BSC. Each team is made up of representatives from different center leadership levels (e.g., program directors, administrative staff, teachers, and parents). Each team appoints a senior leader (typically a center director) and a team leader (typically an administrative staff person or teacher).
ECE educators	Individuals who provide early care education (ECE) to children ages five or younger.
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.” ²⁷
Learning sessions	Full-day, in-person meetings offered over the course of a BSC for all BSC team members that 1) focus on various topics, or drivers, for making improvements in practices; 2) teach key quality improvement concepts and tools; and 3) provide time for teams to develop plans for the period of time in between learning sessions. For example, in the BSC, there are typically three or four full-day learning sessions over a 12-month period.
Long-term outcomes	The desired increase and sustainment in knowledge and skills related to SEL, the use of high-quality teaching practices, and strong family partnerships as a result of the implementation of a BSC, according to the CCL Theory of Change.
Mechanisms of change	In the CCL Theory of Change, the dynamics and mindsets that specify how the outputs of a BSC (e.g., learning sessions, affinity groups, etc.) activate individual and collective learning and improvement that results in achieving the desired short-term and longer-term outcomes.
Model for Improvement	Three key questions that help 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 data collected by BSC teams and submitted to BSC staff to help teams quantify their progress in key domains of the Change Framework. For example, in the BSC, monthly metrics included children’s behaviors and two-way communication with families.
Plan-Do-Study-Act cycle (PDSA)	A continuous quality improvement process that BSC teams use 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).
Center	In this report, “centers” refers to Head Start, Early Head Start, and child care centers. Centers may have single or multiple locations that provide services. QI may be delivered to individuals working in programs or to entire programs.
Professional development (PD)	Refers to the overall goal of promoting an increase in knowledge, skills, and/or dispositions of the ECE workforce. PD activities are defined as a “continuum of learning and support activities,” inclusive of activities such as training, coaching, and TA. ²⁸ PD is one quality improvement delivery method.

Term	Definition
Psychological safety	A team climate characterized by interpersonal trust and mutual respect, where people feel safe to contribute ideas, ask questions, offer feedback, and take risks without fear of judgment. ²⁹
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. It guided the creation of the Change Framework and the content delivered for the BSC in the CCL project. ^{30, 31}
Quality improvement (QI) delivery methods	The mode of quality improvement that is provided to the ECE workforce. For example, quality improvement can be delivered through training or coaching to either individuals or organizations.
Quality improvement (QI) delivery systems	The wider systems that provide support to ECE programs and the ECE workforce to increase the quality of the care provided to young children. These systems are diverse and include approaches such as professional development for the ECE workforce (inclusive of training and technical assistance), federal and state grants, financial incentives/rewards, measurement and rating systems, data systems, and higher education. ³²
Quality Rating and Improvement System (QRIS)	A systemic approach to “assess, improve, and communicate the level of quality in early and school-age care and education programs.” ³³ Ratings or levels are assigned to ECE programs that meet a set of defined program standards. Some states have recently shifted to remove ratings from their system and focus only on QI. Other data sources may refer to these systems as Quality Improvement Systems (QIS).
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	The desired increase in knowledge, skills, beliefs, and attitudes in a particular content area as a result of the implementation of a BSC, according to the CCL Theory of Change.
Social and emotional learning (SEL)	The process of building knowledge and skills to identify and manage emotions, feel and show empathy for others, effectively problem-solve and cope with challenges, and build and maintain supportive relationships with others. ³⁴
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.
Technical assistance (TA)	“The provision of targeted and customized supports by a professional(s) with subject matter and adult learning knowledge and skills to develop or strengthen processes, knowledge application, or implementation of services by recipients.” ³⁵ TA may include combinations of information and resource dissemination and referrals, coaching, mentoring, consultation, professional development advising, and peer-to-peer TA, as well as other forms of support.
Training	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 expertise and adult learning knowledge and skills. A planned sequence of training sessions comprises a training program. ³⁶

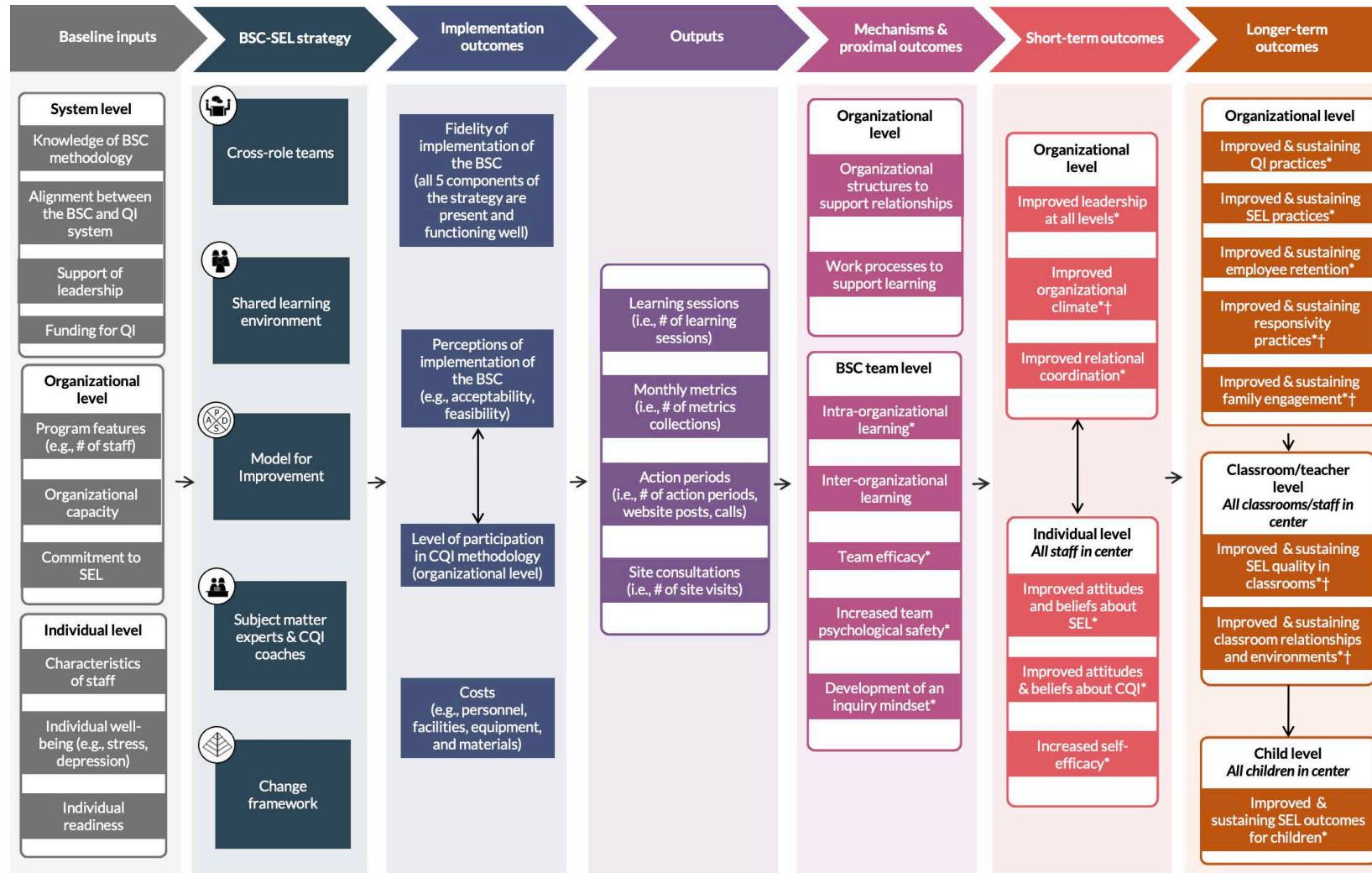
Appendix B. CCL Phase I Theory of Change

THEORY OF CHANGE

The Breakthrough Series Collaborative (BSC) to improve Social and Emotional Learning (SEL) in ECE programs



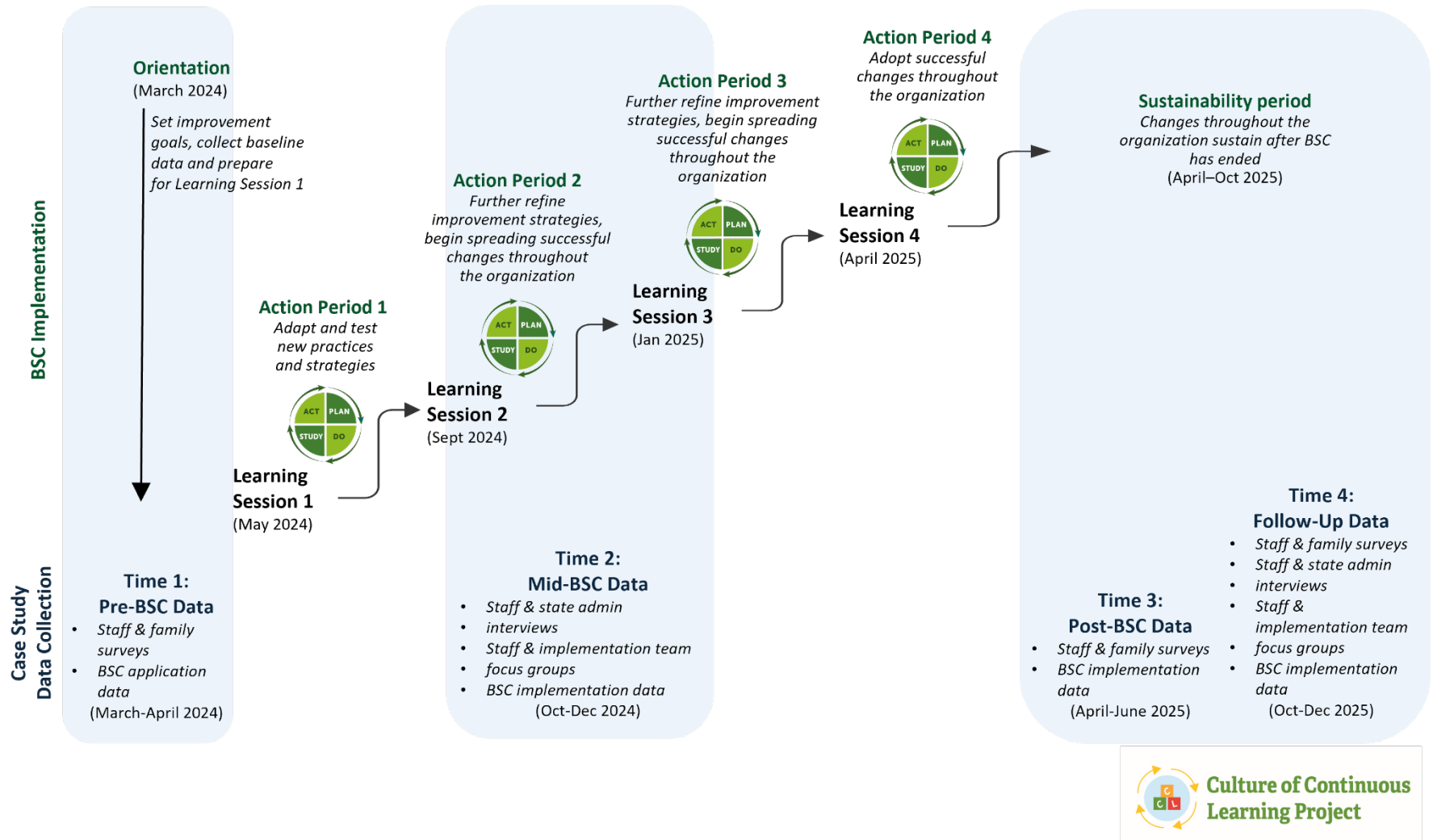
Appendix C. CCL Phase II Evaluation Logic Model



*Requires data collection at both baseline and either during or post-BSC in order to determine change/growth in the construct over time.

† Based on the Change Framework. The five primary drivers are: relationships & environments; social skills & emotional competencies; family partnership; cultural responsiveness; and organizational capacity & support.

Appendix D. Timeline for CCL Phase II BSC Implementation and Case Study Data Collection



Appendix E. CCL Phase II Qualitative Coding Scheme

Table E1. Coding Scheme for T2 and T4 Focus Groups and Interviews with BSC Team Members

Parent Code	Child Code
Type of ECE program	Child care
	Head Start
Role in EC program	Administrator/senior leader
	Teacher
	Other staff
	Parent
Level of participation/engagement	More involvement*
	Less involvement*
	Satisfied with inclusion in the BSC*
	Decision-making*
Center-level challenges	Money/funding
	Staffing
	Delegation
	Location
	Competing priorities
	Time
	Organizational capacity*
Staff-level challenges	Time
	Technology
	Data
	Commitment
BSC implementation-level challenges	Unclear goals/expectations
	Lack of support
	Lack of participation
	Overwhelm with BSC process
Other challenges	N/A
Readiness to participate in the BSC	N/A
	N/A
Successes with the BSC	More team communication/collaboration
	Building strong relationships
	Family engagement
	Shared learning
	Support from coaches/BSC staff
	Tracking/use of data
	In-person engagements
	Other

Parent Code	Child Code
Changes resulting from BSC participation	Relationships and classroom environments
	Children's social skills and emotional competence
	Family partnerships
	Welcoming and responsive climate
	Organizational capacity and support
	Level
	Self
	Team
	Cross-team
	Program
	Classroom
	Attitudes and beliefs*
	Leadership*
	Compliance vs. CQI culture*
	Other
	No changes made
Spread of strategies*	Successes
	Barriers
Sustainability*	Methodology
	Mindset
	Strategies
	Content
	Additional support needed
Facilitators to participation*	Center-level facilitators
	Discussion of compliance vs. CQI focus*
	Pre-existing facilitators*
	State-level facilitators
	Discussion around state QI/PD systems*
	Intrinsic facilitators
	Additional supports needed
	Other
Expectations for the BSC	Alignment between expectations and experiences
	Lack of alignment between expectations and experiences
	Goals for the BSC/reason for participation
BSC compared to other PD activities	Similar
	Different
	Other QI/PD experiences*
	Organizational*
	Individual*
	Training*
	Coaching *

Parent Code	Child Code
Perceptions of the evaluation	Avenues for PD*
	Complementary state systems *
	Positive
	Neutral
	Barriers to participation
Lessons learned	Ideas for improvement
	Program-level lessons
	Suggestions for BSC improvement
Use of BSC language	More SEL strategies*
	N/A

Note: *Time 4 code only

Table E2. Coding Scheme for T2 Focus Groups with BSC Staff and Coaches

Parent Code	Child Code
Roles	Coach
	BSC director
	BSC manager
	BSC coordinator
Centers' level of participation/engagement	N/A
Centers' readiness to participate in the BSC	N/A
Staff members' readiness to participate in the BSC	Training/supports received
	Prior experience
	Additional supports needed
	Learning by doing the job
Center-level challenges	Money/funding
	Staffing
	Delegation
	Location
	Competing priorities
	Time
Staff-level challenges	Time
	Technology
	Data
	Commitment
Challenges for staff members	Logistics
	Building relationships
	Engaging teams
	Other

Parent Code	Child Code
BSC-level challenges	Unclear goals/expectations
	Lack of support
	Lack of participation
	Overwhelm with BSC process
Other challenges	N/A
Successes with the BSC	More team communication/collaboration
	Building strong relationships
	Family engagement
	Shared learning
	Support from coaches/staff
	Tracking/use of data
	In-person engagements
	Other
Successes for staff members	Implementing participant feedback
	Providing personalized assistance to BSC members/teams
	Building trust with teams
	Other
Center-level facilitators	Center-level facilitators
	State-level facilitators
	Individual facilitators
	Additional supports needed
	Other
Changes resulting from BSC participation	Relationships and classroom environments
	Children's social skills and emotional competence
	Family partnerships
	Organizational capacity and support
	Level
	Self
	Team
	Cross-team
	Program
	Classroom
	Other
	No changes made
Expectations for the BSC	Alignment between expectations and experiences
	Lack of alignment between expectations and experiences
	Goals for the BSC/reason for participation
Adaptation made to the BSC	N/A
Lessons learned	Program-level lessons
	Suggestions for BSC improvement
Scaling up the BSC	State-level
	Program-level

Table E3. Coding Scheme for T2 and T4 Interviews with State ECE Leaders

Parent Code	Child Code
Role in EC system	Professional development
	QRIS
	Head Start
	Time in role
	Other
BSC knowledge	SEL/Pyramid Model
	High level of support
	CQI
	Individualized
	Organization-wide learning
	Cross-role team
	Collaborative learning*
	Use of BSC language
	Was developed outside of ECE
	Other content areas
Perceived benefits	Increase reach of PD
	Individual coaching
	Organizational coaching
	Increase quality of child care
	Aligns with initiatives
	Generate educator buy-in
	Research
	CQI
	Other
Barriers to state admin participation ⁺	Time/capacity
	Other priorities at the state level
	Challenges recruiting centers
BSC compared to existing supports	Unique More data/research focused
	Similar
	Similar method
	Similar content
Features of existing PD/QI System	CQI vs. compliance
	QI/PD systems together or separate ⁺
	QI system undergoing significant redesign
	QI/PD system current challenges
	Eligibility ⁺
	Head Start eligibility ⁺
	Depends on training itself ⁺
	License-exempt providers ⁺

Parent Code	Child Code
	Goals of PD/QI systems
	Increase skills ⁺
	Required hours ⁺
	Increase quality ⁺
	Affordable ⁺
	How educators learn about PD/QI ⁺
	Newsletters ⁺
	Social media ⁺
	Websites ⁺
	Partner organization ⁺
	Individual has to seek it out ⁺
	Licensors ⁺
	Evaluating educators' PD needs ⁺
	Policies and resources that support/incentivize participation in PD
	Coordination with other entities ⁺
	Coordination need between HS and child care ⁺
SEL in 4 quadrants ⁺	Quadrant 1 examples ⁺
	Quadrant 2 examples ⁺
	Quadrant 3 examples ⁺
	Quadrant 4 examples ⁺
PD in other content areas ⁺	N/A
Barriers to educators engaging in QI/PD	Educator time/capacity
	Timing/format
	Lack of advanced trainings
	Lack of financial incentives
	Staffing
	Setting-specific
	State-specific barriers
	Other
BSC alignment with state goals	General alignment
	Aligned with QRIS initiatives
	Want more BSC
	Hesitations [*]
Gap in own knowledge	N/A
Criteria that BSC needs to meet [*]	Aligned with state priorities [*]
	Addresses a gap in state supports [*]
	Evidence of effectiveness [*]
	Feasible to implement [*]
	Credits available [*]

Parent Code	Child Code
Practical implementation*	Internal capacity*
	Hire a vendor*
	Pilot vs. statewide*
	Financial resources*
	Buy-in*
	Sustainability considerations*
	Other*

Note: + Time 3 code only; * Time 4 code only

Appendix F. Descriptives for analytic sample and analytic variables

Table F1. Descriptives for BSC Analytic Sample

	Time 1 (Baseline)			Time 3 (Post BSC)			Time 4 (Follow Up)		
	n	M	SE	n	M	SE	n	M	SE
Mechanisms									
Data use	88	2.33	0.12	88	2.55	0.13	88	2.57	0.14
Intra-organizational learning	88	2.33	0.08	88	2.67	0.10	88	2.72	0.12
Psychological safety	88	3.90	0.07	88	3.81	0.09	88	3.79	0.09
Short-Term Outcomes									
Self-efficacy - positive subscale	88	4.00	0.05	88	4.06	0.07	88	4.09	0.07
Self-efficacy - negative subscale	88	2.28	0.07	88	2.38	0.09	88	2.38	0.10
Leadership at all levels: Roles/responsibilities	88	3.84	0.07	88	3.64	0.10	88	3.63	0.09
Leadership at all levels: Teacher influence	88	2.50	0.11	88	2.48	0.14	88	2.56	0.12
Essentials: Socialization of new teachers	58	3.29	0.13	58	3.14	0.13	58	3.30	0.15
Essentials: Teacher collaboration	58	1.57	0.09	58	1.44	0.14	58	1.40	0.13
Essentials: Collective responsibility	58	2.74	0.12	58	2.53	0.15	58	2.63	0.14
Essentials: School commitment	58	3.95	0.11	58	3.84	0.12	58	3.92	0.13
Essentials: Teacher-teacher trust	58	3.79	0.11	58	3.56	0.13	58	3.66	0.13
SEL Beliefs: Comfort	88	4.11	0.08	88	4.21	0.09	88	4.23	0.08
SEL Beliefs: Culture	58	4.13	0.08	58	4.02	0.10	58	4.03	0.10
CQI Beliefs	88	4.44	0.06	88	4.41	0.07	88	4.42	0.08
Longer-Term Outcomes									
SEL practices: # of SEL lessons	40	2.92	0.41	40	2.76	0.37	40	3.23	0.46
SEL practices: # times supported behavior regulation	40	10.81	1.81	40	10.49	1.96	40	9.63	1.73
SEL practices: # times supported prosocial behavior	40	8.21	1.52	40	8.76	2.06	40	8.34	1.41
SEL practices: # times supported emotion understanding	40	10.60	1.98	40	11.03	2.38	40	11.21	2.16
SEL practices: # times perceived challenging behavior	40	8.19	1.33	40	8.18	1.71	40	10.05	2.19
SEL practices: # times used negative tone	40	2.38	0.53	40	2.44	0.58	40	1.95	0.54
SEL practices: # days with no challenging behavior	40	1.43	0.29	40	1.59	0.42	40	1.34	0.31
Perceived problems	40	0.22	0.04	40	0.21	0.05	40	0.17	0.04
Family engagement practices	88	4.18	0.07	88	3.97	0.11	88	4.11	0.09
Center turnover ^a	19	0.07	0.02	19	0.04	0.01	19	0.08	0.02
Individual- and Center-Level Characteristics									
Program size ^a	19	28.28	3.03	-	-	-	-	-	-
Paid planning hours ^a	19	2.31	0.38	-	-	-	-	-	-
Collaborative planning time ^a	19	0.99	0.24	-	-	-	-	-	-

Source: T1, T3, and T4 BSC Participant Survey

Note: ^aMeasured at the center level.

Table F2. Descriptives for Non-BSC Analytic Sample

	Time 1 (Baseline)			Time 3 (Post BSC)			Time 4 (Follow Up)		
	n	M	SE	n	M	SE	n	M	SE
Mechanisms									
Data use	287	2.41	0.08	287	2.46	0.10	287	2.41	0.09
Intra-organizational learning	287	2.63	0.05	287	2.65	0.07	287	2.77	0.06
Psychological safety	287	3.69	0.05	287	3.60	0.06	287	3.59	0.06
Short-Term Outcomes									
Self-efficacy - positive subscale	287	4.00	0.03	287	3.91	0.05	287	3.96	0.04
Self-efficacy - negative subscale	287	2.48	0.06	287	2.45	0.07	287	2.48	0.07
Leadership at all levels: Roles/responsibilities	287	3.35	0.05	287	3.24	0.05	287	3.24	0.07
Leadership at all levels: Teacher influence	287	2.52	0.08	287	2.43	0.11	287	2.51	0.10
Essentials: Socialization of new teachers	277	3.27	0.09	277	3.24	0.09	277	3.32	0.11
Essentials: Teacher collaboration	277	1.49	0.07	277	1.49	0.09	277	1.39	0.08
Essentials: Collective responsibility	277	2.84	0.07	277	2.64	0.09	277	2.60	0.09
Essentials: School commitment	277	3.98	0.06	277	3.82	0.06	277	3.85	0.08
Essentials: Teacher-teacher trust	277	3.80	0.05	277	3.65	0.07	277	3.67	0.06
SEL Beliefs: Comfort	287	4.11	0.06	287	4.15	0.07	287	4.14	0.07
SEL Beliefs: Culture	277	4.11	0.05	277	3.91	0.06	277	3.95	0.06
CQI Beliefs	287	4.18	0.06	287	4.08	0.05	287	4.14	0.06
Longer-Term Outcomes									
SEL practices: # of SEL lessons	235	2.64	0.20	235	2.30	0.25	235	2.74	0.24
SEL practices: # times supported behavior regulation	235	9.79	0.83	235	8.58	0.88	235	8.21	0.83
SEL practices: # times supported prosocial behavior	235	8.83	0.78	235	7.89	0.93	235	7.91	0.87
SEL practices: # times supported emotion understanding	235	9.75	0.90	235	8.97	0.87	235	9.33	0.78
SEL practices: # times perceived challenging behavior	235	7.25	0.73	235	7.45	0.73	235	9.11	1.06
SEL practices: # times used negative tone	235	2.22	0.23	235	2.05	0.29	235	1.86	0.27
SEL practices: # days with no challenging behavior	235	1.28	0.13	235	1.39	0.17	235	1.23	0.15
Perceived problems	235	0.36	0.03	235	0.35	0.03	235	0.31	0.03
Family engagement practices	287	4.27	0.06	287	4.10	0.08	287	4.16	0.07
Center turnover ^a	19	0.07	0.02	19	0.04	0.01	19	0.08	0.02
Individual- and Center-Level Characteristics									
Program size ^a	19	28.28	3.03	-	-	-	-	-	-
Paid planning hours ^a	19	2.31	0.38	-	-	-	-	-	-
Collaborative planning time ^a	19	0.99	0.24	-	-	-	-	-	-

Source: T1, T3, and T4 Non-BSC Participant Survey

Note: ^aMeasured at the center level.

Table F3. Descriptives for Parent (BSC and non-BSC) Sample

	Time 1 (Baseline)			Time 3 (Post BSC)		
	n	M	SE	n	M	SE
Parent voice						
Orientation toward early education	272	3.33	0.05	94	3.43	0.09
Including parents as partners	272	3.24	0.05	94	2.94	0.11
Teacher communication	272	2.92	0.06	94	2.91	0.12
Teachers' interactions with children	272	4.13	0.07	94	4.30	0.12
Sensitive to family needs	272	3.15	0.06	94	3.22	0.11
Parent influence on the program	272	2.46	0.08	94	2.87	0.13
Family engagement						
Knowledge/confidence	272	4.60	0.04	94	4.72	0.06
Welcoming and responsive climate	272	4.48	0.04	94	4.54	0.07
Parent/family influence and decision-making	272	3.85	0.07	94	3.85	0.12

Source: T1 and T3 Parent Survey

Note: Descriptives in this table represent the number, mean, and standard error of parent responses. However, because the parent survey was anonymous and parent data could not be linked over time, data were aggregated to the center level for the purposes of analyses.

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