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Descriptive Analyses of Connect for Success, Multi-Tiered Systems of Support, and Accountability Pathways:

Addendum to 2021 Evaluation of the School Turnaround Network and the School Turnaround Leadership Development Program

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A report prepared by the Center for Assessment, Design, Research and Evaluation (CADRE) at the CU Boulder School of Education.

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About CADRE

The Center for Assessment, Design, Research and Evaluation (CADRE) is housed in the School of Education at the University of Colorado Boulder. The mission of CADRE is to produce generalizable knowledge that improves the ability to assess student learning and to evaluate programs and methods that may have an effect on this learning. Projects undertaken by CADRE staff represent a collaboration with the ongoing activities in the School of Education, the University, and the broader national and international community of scholars and stakeholders involved in educational assessment and evaluation.

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Executive Summary

This is an addendum to a report prepared for the Colorado Department of Education (CDE) by the Center for Assessment, Design, Research & Evaluation (CADRE) at CU Boulder (Shear et al., 2021). CDE requested an addendum to the 2021 CADRE report presenting similar descriptive analyses for schools that participated in the Connect for Success (CFS) program and providing initial descriptive analyses of academic outcomes for schools participating in two other Empowering Action for School Improvement (EASI) programs: The Multi-Tiered Systems of Supports (MTSS) and Accountability Pathways Planning and Implementation (Pathways).

In this addendum, we provide a brief overview of CFS, MTSS, and Pathways programs. We first describe the demographic characteristics and prior academic performance among students enrolled in all schools receiving support through these programs, which we compare to the population of all schools in the state or to schools who were eligible to participate in a CDE-offered turnaround program but did not. Next, we describe trends in the Colorado School Performance Framework (SPF) accountability ratings among participating schools in the years leading up to, during, and following participation in each of the three programs. Finally, we describe trends in average student achievement and growth scores among schools participating in these programs as measured by the Colorado Mathematics and English Language Arts state assessments administered in grades 3-8. For schools participating in CFS, we also compare the trends in SPF ratings and achievement outcomes to a group of comparison schools that were eligible to participate in the CFS but did not participate in a CDE-offered turnaround program during the studied time period. We conclude with a discussion of the results and highlight the next phase of planned work focused on estimating the effects of participating in these CDE-offered programs on student academic outcomes.

Key findings from our analyses include:

1. The distribution of SPF ratings among schools participating in CFS changed slightly over time such that fewer schools received Priority Improvement or Turnaround SPF ratings after participation relative to before participation. This trend was also observed among comparison schools. The distribution of SPF ratings among schools participating in MTSS did not change systematically over time.

2. Trends in achievement and growth based on state assessment scores were consistent with small, positive effects of CFS, MTSS, and Pathways on school outcomes. In most programs and cohorts, descriptive analyses of achievement and growth revealed average negative trends in achievement and growth scores in the years leading up to program participation, but positive trends in the years following the first year of program implementation, suggesting a possible positive program effect on school achievement and growth scores.

3. Findings presented in this addendum for CFS largely align with findings presented in the prior CADRE report for the School Turnaround Network (STN) and School Turnaround Leadership Development (STLD) programs (Shear et al., 2021). Although CFS, STN, and STLD differ in the supports and funds provided to schools, descriptive analyses presented thus far suggest promising, though inconclusive, evidence about the effectiveness of these programs.

Limitations

A few important limitations should be taken into consideration when interpreting the analyses presented in this addendum:

1. We are unable to draw conclusions about the direct effect of turnaround program participation on school outcomes. This is due in part to the inability to develop comparison groups for MTSS and Pathways, and in part to the fact that schools self-select to participate in programs. We cannot directly compare the outcomes of participating schools to outcomes of non-participating schools without additional quasi-experimental statistical methods.

2. Our outcome measures are limited to administrative data. Although state standardized test data help provide information about student performance relative to a broad range of content, they may not provide information about student performance relative to specific turnaround supports.

3. Our analyses of schools participating in CFS, MTSS, or Pathways are limited to small samples of schools that make it difficult to draw generalizable conclusions.

4. Continued disruptions to state accountability testing due to the COVID-19 pandemic limits the availability of state test score outcome data. As a result, some programs and cohorts have minimal or no available state academic performance data for the period after program implementation.

Conclusion

Results presented in this addendum suggest promising evidence about the effectiveness of CFS, MTSS, and Pathways. However, the limitations highlighted point to the inability to draw causal conclusions. In a subsequent report, we will apply more sophisticated statistical analyses to estimate the causal effect of program participation for two multi-year interventions of interest (CFS and STN) on academic outcomes. Additionally, CADRE is currently conducting case studies of two former turnaround network schools that made and sustained dramatic improvements in academic performance in a relatively short period of time. Findings from this work and other future case studies can help form a clearer picture into how and in what ways these intervention programs appear to be facilitating positive school transformations and academic improvements at various sites.

Introduction

This is an addendum to a report prepared for the Colorado Department of Education (CDE) by the Center for Assessment, Design, Research & Evaluation (CADRE) at CU Boulder (Shear et al., 2021). An initial legislative report by CDE staff (Jaeckel et al., 2020) provided a list of Empowering Action for School Improvement (EASI) supported schools and districts and the amount of funding each school and district were awarded. The CDE report examined the academic performance and progress made by schools in one of three support programs offered by CDE: The School Turnaround Leadership Development program (STLD), the School Turnaround Network (STN), and the Connect for Success program (CFS). The results suggested improvements in academic achievement outcomes and accountability ratings by participating schools during the years reviewed. The subsequent CADRE report provided additional descriptive analyses of outcomes at the school level for schools in the STLD and STN programs. The descriptive results were consistent with small positive effects associated with program participation but did not find any consistent patterns that distinguished the performance of participating schools relative to eligible, non-participating schools.

CDE requested an addendum to the 2021 CADRE report to conduct similar descriptive analyses for schools that participated in CFS and to provide initial baseline descriptive analyses of academic outcomes achieved by schools participating in two other EASI programs: The Multi-Tiered Systems of Supports (MTSS) and Accountability Pathways Planning and Implementation (Pathways).

Guiding Questions

This addendum addresses four guiding questions posed by CDE staff. The first two questions apply to all three programs, and the remaining two questions only apply to the CFS program.

Across all programs, we investigate:

1. Which schools received CFS, MTSS, or Pathways support and how do they compare to the population of all schools statewide in terms of student demographic characteristics and prior student achievement?

2. What type of changes are observed over time in School Performance Framework (SPF) ratings and student achievement and growth metrics in schools that received CFS, MTSS, or Pathways support?

We also asked the following questions to guide the exploratory analyses for schools participating in the CFS program:

3. How do schools that received CFS support compare to the population of schools eligible to participate in terms of demographic characteristics and prior student achievement?

4. How do the trends in SPF ratings and student achievement and growth metrics at schools participating in CFS compare to these same metrics at a set of comparison schools that were eligible for CFS but did not participate in a turnaround program?

Analyses of all participating schools are intended to provide CDE with a detailed description of schools who have participated in the CFS, MTSS, and Pathways supports. Descriptive statistics highlight information about the composition of supported schools and the average performance of students in supported schools. Comparisons to state averages contextualize results and provide information about participating schools relative to the statewide population of schools.

For the MTSS program sponsored by CDE, no academic comparisons to other eligible schools are included because academic performance data are limited. The CDE-sponsored MTSS program started in 2017-18 and complete achievement data are available only until 2018-19 because the pandemic disrupted state testing and participation in subsequent years (2019-20 and 2020-21). For the Pathways program, we focus specifically on schools that received an implementation grant. All of these schools reached the end of the accountability clock (year five or beyond) and received a directed action from the State Board of Education (SBE). For this grant program, no academic comparisons with other schools are shared since the entire population of schools receiving a directed action received the implementation grant. Descriptive analyses of data for the MTSS and Pathways programs were conducted to learn whether there are patterns of performance across cohorts consistent with positive changes the programs were intended to support.

The additional analyses that compare the characteristics and outcomes of CFS schools to similar non-participating schools have two aims. First, comparisons of school characteristics are intended to reveal whether there are systematic differences between schools that do and do not participate in CFS. Second, comparisons of school outcomes are intended to evaluate whether trends are consistent with positive program effects, noting that we cannot attribute differences in observed outcomes to CFS alone.

Overview of the CFS, MTSS and Pathways Programs

This section provides a brief overview of the three programs studied in this addendum.

Connect for Success

The CFS program provides participating schools a structured program to learn about and begin implementing effective practices and strategies from High Achieving Schools (HAS). In 2014, five HAS were identified by CDE for a study based on the high academic achievement of particular student subgroups, including English language learners, students with disabilities, students experiencing poverty, and minority students (Colorado Department of Education, 2014). Staff from CDE conducted interviews, focus groups, observations, surveys, and document reviews with the goal of understanding how these five schools supported students in obtaining high levels of academic achievement. A number of themes emerged from the study including valuing relationships, investing and protecting time, effective performance monitoring, setting high and consistent expectations, and continuously improving (Mohajeri-Nelson et al., 2015).

CFS provides support to schools over the span of three years. In the first year, CDE conducts a diagnostic visit and provides a report that includes recommendations for the school. School leaders listen to a panel of HAS leaders and personnel and visit a HAS to observe effective

practices. During the first year, schools also identify or hire an implementation coach who works with an Implementation Manager from CDE to replicate HAS strategies. At the end of the first year, schools submit an implementation plan that outlines the specific HAS strategies they plan to replicate based on recommendations from CDE. During the second and third years, schools collect data to monitor progress, including parent surveys, personnel surveys, observation/ walkthrough data, interview data, and a quarterly progress monitoring report. The goal of CFS is that by the end of the third year of participation in the program, schools have successfully replicated effective HAS strategies, as measured by progress monitoring data.

Multi-Tiered Systems of Supports

MTSS is a framework for improving student well-being and academic outcomes through tiered interventions and supports designed to meet the varying needs of each student. In general, a MTSS framework prioritizes five key components: (1) increase state leadership capacity for MTSS infrastructure, (2) increase regional and district MTSS capacity and sustainability, (3) increase preschool to grade 12 school level capacity for MTSS through evidence-based practices, data-based problem solving, and short-cycle action planning, (4) support improved teacher effectiveness in the classroom, and (5) increase school partnerships with families, other schools, and the community.

Although the MTSS framework is applied in nearly all schools in Colorado, a small number of schools receive additional funding from CDE to support their MTSS initiatives. Schools receiving CDE-provided MTSS support can receive funding for up to two and a half years. Funding must be used to cover costs of an implementation coach and costs associated with MTSS implementation. Participating schools form a CO-MTSS School Implementation Team (C-SIT) at each school, and this team is charged with implementing MTSS strategies. Each C-SIT is tasked with providing data and information to CDE, attending MTSS professional development, and budgeting time and funds for MTSS.

Accountability Pathways Planning and Implementation

Pathways is a program for schools identified as persistently low performing based on the SPF and for schools on the “accountability clock” that will need to develop and propose a transformational plan for school improvement. Being on the accountability clock means that a school or district has received one of the two lowest SPF ratings (Priority Improvement or Turnaround). If a school or district receives Priority Improvement or Turnaround ratings for five consecutive years, the school or district must participate in a hearing with the SBE to receive a directed action. These actions include conversion to a charter school, granting of innovation status, external management, closure, or district reorganization.

For schools and districts nearing the end of the accountability clock that have not yet gone beyond five years (years three and four), the Pathways program supports one year of preparing for discussions with the SBE and receiving a directed action from the Board. For schools and districts that are in their fifth year or beyond on the accountability clock and have received a directed action from the SBE, the Pathways program supports implementation of the directed Pathway over the course of up to two and a half years. This addendum presents descriptive analyses only for schools that received a directed action from the Board. More specifically, our analyses focus on three cohorts of schools beginning in the 2016-17 school year that were in the fifth year or beyond on the accountability clock, that applied for Pathways funding, and

received a directive to use the funds to immediately implement interventions that can address persistently low academic performance.

Individual schools that receive Pathways implementation funding are eligible to receive up to $100,000 per academic year to implement the SBE directed action. Schools can apply for funding to last the length of the SBE directed action, which is up to two and a half years. If a school receives an SBE directed action for two years, for example, the school may apply for two years of the Pathways implementation funding. Funds can support consulting and technical assistance for Pathways implementation, technical assistance on resource allocation, stipends for teachers to attend Pathways implementation activities, opportunities to visit other school sites, access to facilitated meetings, community gatherings, and grant meetings, and fees for third-party providers contracted to implement the SBE directed action.

Program Eligibility

Schools that meet a specific set of criteria set by CDE are eligible to apply to participate in CFS, MTSS, or Pathways. Eligibility is primarily based on annual ratings received from the Colorado SPF accountability system. SPF ratings are based on academic achievement and academic growth for elementary and middle schools, and a composite of academic achievement, academic growth, and postsecondary and workforce readiness for high schools. A formula is used to calculate a numeric score that is then converted to one of four category ratings. From lowest to highest, these category ratings are: Turnaround, Priority Improvement, Improvement, and Performance. As noted in the prior CADRE report (Shear et al., 2021):

> The SPF ratings are important to understand in this context because eligibility to receive the [CFS, MTSS, or Pathways] support funding depends on a school's SPF rating. In brief, the theory of action is that CDE can use the SPF ratings to identify schools that need additional supports to improve teaching and learning. As a result, the state makes a number of different supports available to schools receiving the lowest two SPF ratings (Turnaround and Priority Improvement) (p. 6).

Eligibility Criteria

Although the eligibility criteria have changed from year to year, in general schools are eligible to receive funding for CFS or MTSS in a given year if they received one of the two lowest ratings on the SPF (Turnaround or Priority Improvement) two years prior to the first year they would participate in the program. Additional eligibility criteria in a given year may include federal identifications (refer to Table 1 for full eligibility criteria). For example, a school that received a Turnaround rating based on data from the 2016-17 academic year would be eligible to apply for funding during the 2017-18 EASI application cycle, and then begin participation in the 2018-19 academic year. Because tests are administered in the spring and SPF ratings are reported in the fall, school SPF ratings reflect student performance on tests from the previous academic year. We refer to SPF ratings by the year of the tests that were used to calculate the ratings. (e.g., SPF 2017 refers to the SPF scores calculated from 2016-17 state standardized tests that were administered in the spring of 2017 but would have been reported in the fall of 2017 during the 2017-18 academic year).

Table 1. Eligibility requirements, eligibility counts, and participation counts for CFS, MTSS, and Pathways Programs, by year.

Program	Cohort	SY First Funded	Eligibility Requirement	Eligible Schools	Schools in Cohort	% Participated
CFS	1	2015-16	PI/T on 2014 SPF	162	20	12%
	2	2016-17	PI/T on 2014 SPF OR less than 10% at benchmark on ELA & Math in 2015 at any grade level	271	7	3%
	3	2017-18	PI/T on 2016 SPF and/or federally identified (CS, TS, ATS) in 2016-17	283	13	5%
	4	2018-19	PI/T on 2017 SPF and/or federally identified (CS, TS, ATS) in 2017-18	347	10	3%
MTSS	1	2017-18	PI/T on 2016 SPF and/or federally identified (CS, TS, ATS) in 2016-17	282	15	5%
	2	2018-19	PI/T on 2017 SPF and/or federally identified (CS, TS, ATS) in 2017-18	345	7	2%
Pathways	1	2016-17	Year 5+ on the state accountability clock and received a directed action from the SBE	12	12	100%
	2	2017-18	Year 5+ on the state accountability clock and received a directed action from the SBE	2	2	100%
	3	2018-19	Year 5+ on the state accountability clock and received a directed action from the SBE	3	3	100%

Notes. a) PI=Priority Improvement, T=Turnaround, ELA=English Language Arts, CS=Comprehensive Support, TS=Targeted Support, ATS=Additional Targeted Support. b) The counts of participating Pathways schools displayed in the table only represent schools in their first year of Pathways implementation. Three schools that participated in a hearing with the SBE in 2016-17 participated in a rehearing in 2018-19 but are only reflected in the 2016-17 row of the table. c) The eligibility counts differ slightly between CFS and MTSS, because some of the schools that participated in each program did not meet the recorded eligibility rules, and we counted these schools as "eligible."

Table 1 displays the eligibility criteria for CFS, MTSS, and Pathways, as well as the number of schools eligible for and participating in each program each year. Schools were eligible to participate in the CFS cohort that began in the 2016-17 academic year if they had fewer than 10% of students scoring at benchmark in Math and English Language Arts (ELA) in 2014-15, the year before the statewide test reporting pause in 2015-16, at any grade level. Schools were also eligible to participate in the CFS or MTSS cohorts that began in the 2017-18 or 2018-19 academic year if they were flagged for Comprehensive Support (CS), Targeted Support (TS), or Additional Targeted Support (ATS) based on the federal Every Student Succeeds Act (ESSA) criteria in the year prior to the first year of participation.

Schools are eligible to receive Pathways support if they received Turnaround (T) or Priority Improvement (PI) ratings for three or more years and are planning to implement one of two pathways to completely re-envision and redirect the school's priorities and focus. The first pathway track supports schools in engaging in the re-envisioning and planning work in anticipation of moving into a new direction after reaching the end of the five-year accountability clock. The second pathway track is only provided to schools that received a directed action by SBE to implement a school-wide improvement effort. In this addendum, we focus only on schools who entered the second implementation track.

Participation in CFS, MTSS, and Pathways is not required or guaranteed. That is, schools that are eligible to apply to one or more of these programs are not required to apply, and among schools that do apply, CDE does not guarantee that all schools will receive funding for participation. CDE reviews school applications and applies a needs-based approach to award services and funding to schools. In general, these programs accept as many eligible schools as they are financially able to support each year. When a program cannot support all applicants, they use federal and state accountability ratings, as well as information about previous school turnaround funding, to prioritize and select schools demonstrating the greatest need. However, a school or district that is eligible for Pathways funding is generally prioritized for funding due to the demonstrable need.

The number of eligible and participating schools reported in Table 1 reflect the number of schools included in the data used for the analyses in this addendum. In the first cohort of CFS (2015-16), 162 schools across the state were eligible to apply for funding. Of the schools that were eligible to apply, 20 schools applied and were selected to participate in cohort 1. Across all CFS cohorts, although between 162 and 347 schools were eligible to apply for CFS supports based on eligibility criteria in any given year, only between seven and 20 new schools (3-12% of eligible schools) participated in each cohort. The number of schools in each cohort displayed in this table does not include Alternative Education Campuses (AEC) . There were 11 new schools that began participation in CFS in 2018-19, but one was an AEC and was therefore removed from our analyses.

The first year that schools participated in MTSS was the 2017-18 academic year. In 2017-18, 17 schools across the state received the MTSS funding, but two of the participating schools were AECs and are not included in the analyses. Thus, our analytic sample of schools as displayed in Table 1 consists of 15 schools in 2017-18 and seven schools in 2018-19, representing 5% and 2% of all eligible schools, respectively. Although schools can receive funding and support from MTSS for up to two and a half years, the 22 schools included here only received MTSS funding for one year.

Between 2016-17 and 2018-19, 17 schools were on year five or beyond on the state accountability clock and received directed actions from the SBE. All 17 of these schools received Pathways funding to implement their state directed action. Thus, in the analyses presented in this report, we do not separately present information for the eligible group of schools since it is identical to the participating group of schools.

CFS Eligible and Comparison Groups

In this addendum, we compare the group of schools that received CFS funding and support to two different groups of schools: the population of all schools eligible to participate in CFS and a slightly smaller group of comparison schools. We first compare the demographic characteristics and prior achievement data of participating schools to eligible schools in order to identify potential systematic differences in the schools that participate in CFS relative to all schools that were eligible to apply. We then compare achievement and growth score trends of CFS schools to all schools that were eligible for CFS funding, but that never participated in CFS or in any other turnaround program under the EASI grant during the 2017-18 academic year through the 2019-20 academic year. This eliminates schools from the group of all eligible schools that had participated in CFS in a prior year, or participated in a different EASI grant program during the studied time period.

We introduce this smaller comparison group in order to help further contextualize and interpret outcomes of CFS schools. Although this addendum reports descriptive analyses not intended to support inferences about the causal effect of a program participation on outcomes, the smaller comparison group may help to reveal, for example, whether observed changes in outcomes can be attributed to factors outside of program participation. An observed change in outcomes in both the participating and comparison schools could indicate a broader policy change or state-wide initiative and would suggest that the change in outcomes should not be attributed to CFS funding and supports. While observed differences found between participating and comparison schools cannot be directly attributed to program participation, these comparisons provide the first step toward informing the next phase of analytical work addressed in the discussion section: estimating the causal effects of the CFS, STN and the STLD programs on student outcomes.

Data and Analytic Samples

The descriptive analyses in this addendum draw on different data sources provided by CDE. The data sources used for this report reflect the same sources used in the prior CADRE report (Shear et al., 2021). In this section, we provide a brief overview of the program participation data and analytic sample unique to this addendum. Please reference Appendix A for a detailed description of all other administrative data used for the analyses (e.g., school and student demographic data, SPF rating data, and student achievement data).

Program Participation

CDE provided data files indicating which schools received CFS funds in each year from 2015-16 to 2020-21, MTSS funds in each year from 2017-18 to 2018-19, Pathways funds in each year from 2016-17 to 2019-20, and other non-CFS, non-MTSS, and non-Pathways funds through the EASI application process each year from 2017-18 to 2019-20. When presenting results by cohort below, for schools that participated in more than one cohort, we generally assign that school to the first cohort they participated in when tracking trends over time, unless otherwise noted.

Analytic Samples

The analyses in this addendum are based on two different populations of schools. The first population of schools includes all non-AEC elementary, middle, and high schools from the 2008-09 academic year through the 2018-19 academic year. The second population of schools includes all non-AEC elementary and middle schools for which student achievement test score and growth data are available. In some cases, schools enrolling students in elementary or middle school grades did not have sufficient achievement or growth data to be reported, and hence the second population does not include every elementary and middle school for all years.

Characteristics of Participating and Eligible Schools

This section describes the populations of participating and eligible schools in more detail. Table 2 presents the number of schools in each level (E=elementary, M=middle school, H=high school) by program and cohort, and the corresponding percentage of schools at each level averaged across cohorts (“Avg. Part. %”). We compare these percentages to the average across all schools that were eligible for the program (“Avg. Elig. %”) and the state population of schools in 2018-19 (“State % (2018-19)”). We do not report the distribution of schools that were eligible for Pathways since all schools that were eligible participated. Comparisons across participating schools, eligible schools, and all schools helps us to better understand the types of schools that were eligible for and participated in each program, as well as the extent to which eligible and participating schools differ from the state population of schools.

Table 2. Counts of schools by cohort and EMH level.

		Cohort				Averages		
Program	**Level**	**1**	**2**	**3**	**4**	**Avg. Part. %**	**Avg. Elig. %**	**State % (2018-19)**
CFS	E	18	7	10	6	82%	52%	51%
	M	0	0	1	0	2%	14%	15%
	H	0	0	0	2	5%	13%	15%
	EM	2	0	1	1	7%	9%	9%
	MH	0	0	0	1	2%	7%	5%
	EMH	0	0	1	0	2%	4%	4%
	Total	**20**	**7**	**13**	**10**			
MTSS	E	5	0			22%	52%	51%
	M	7	2			41%	14%	15%
	H	2	2			18%	16%	15%
	EM	1	2			14%	8%	9%
	MH	0	1			5%	6%	5%
	EMH	0	0			0%	4%	4%
	Total	**15**	**7**					
Pathways	E	2	2	1		29%		51%
	M	5	0	1		35%		15%
	H	2	0	1		18%		15%
	EM	1	0	0		6%		9%
	MH	2	0	0		12%		5%
	EMH	0	0	0		0%		4%
	Total	**12**	**2**	**3**				

Table 2 shows, for example, that 90% (n=18) of the schools that participated in cohort 1 of CFS were elementary schools and the remaining schools were combined elementary and middle schools. When averaging across CFS cohorts 1 through 4, the majority of schools participating in CFS (82% on average) were elementary schools, although only about half of eligible schools or all schools statewide were elementary schools. Only 9% of CFS participating schools enrolled high school students, relative to 22% of eligible schools and 24% of schools across the state. In contrast, only 22% of MTSS participating schools and 29% of Pathways participating schools enrolled elementary schools, while about 60% of the schools participating in each of these programs were middle and high schools.

Demographics

To further characterize the groups of schools that participated in CFS, MTSS, and Pathways, we present summary statistics for the demographic characteristics of students enrolled in these schools. Table 3 displays the total number of schools in each group, the average number of students enrolled, and the proportion of the student body represented by one of the four major student subgroups that are of particular interest for CDE: eligible for free or reduced-priced lunch (FRL), minority (non-white), English Language Learners (ELL), or students with an Individualized Education Plan (IEP). We report these demographic characteristics for each of the three groups of participating schools. Within each program, we average values across all participating schools in their first year of participation in the program. We also report demographic characteristics for all schools that were eligible for CFS in any cohort between 2015-16 and 2018-19, all schools that were eligible for MTSS in 2017-18 or 2018-19, and all schools across the state in the 2018-19 academic year as comparison points.

Table 3. Average school-level demographics and enrollment by program and eligibility.

	CFS		MTSS		Pathways	All Schools
Variable	Participants	Eligible	Participants	Eligible	Participants	Mean 2018-19
% FRL	74%	65%	47%	65%	79%	45%
% Minority	77%	63%	53%	64%	80%	45%
% ELL	35%	29%	24%	28%	34%	16%
% IEP	12%	12%	12%	12%	14%	11%
Enrollment	407	466	687	476	715	487
N Schools	50	525	22	406	17	1761

Schools participating in CFS enrolled a higher proportion of FRL, minority, and ELL students relative to the average of all schools across the state. For example, while all schools statewide enrolled 45% FRL-eligible students on average, schools that participated in CFS enrolled 74% FRL-eligible students on average. CFS participating schools also enrolled slightly higher proportions of FRL, minority and ELL students relative to schools eligible for CFS, although these differences are smaller. Schools that participated in CFS tend to be slightly smaller than the other eligible schools and the statewide average of schools. Participating schools enrolled 407 students on average, while all eligible schools enrolled 466 students on average and schools statewide in 2018-19 enrolled 487 students on average.

The MTSS participating schools also enrolled larger proportions of FRL, minority, and ELL students relative to the statewide average, but these differences were smaller than the comparison between CFS schools and the statewide averages. MTSS schools enrolled more students relative to the statewide average, with an MTSS average enrollment of 687 and a statewide average of 487. On average, unlike the comparison between CFS schools and other schools eligible for CFS, schools receiving MTSS funding enrolled smaller proportions of FRL, minority, and ELL students relative to other schools eligible for MTSS funding.

Lastly, schools participating in Pathways implementation served the largest proportions of students from historically marginalized groups, on average. Pathways schools served much larger proportions of FRL, minority, and ELL students relative to MTSS schools and the average school statewide, and slightly larger proportions of FRL, minority, and ELL students relative to CFS schools. Schools participating in Pathways were also on average, larger than schools participating in CFS or MTSS, or across the state.

Overall schools that participated in CFS, MTSS, and Pathways enrolled larger proportions of historically underserved students compared to the state averages. These differences were larger for schools participating in the CFS and Pathways programs than they were for schools participating in the MTSS program. Schools receiving MTSS funding served slightly smaller proportions of historically underserved students than the set of all schools eligible for MTSS funding. In general, the demographic characteristics found at schools participating in these programs highlight the importance of tracking the performance of these schools over time as part of the state's dedicated focus on equity.

Prior Achievement

In this section we compare prior academic achievement and student growth metrics across these same groups of schools. Because CFS, MTSS, and Pathways are designed to support low performing schools, we would expect to see that schools participating in one of these three programs have, on average, lower academic outcomes leading up to participation in the program relative to the state average. Table 4 displays average prior mean test scores and average prior mean growth percentiles (MGP) in Math and ELA for elementary and middle schools that participated in CFS, MTSS, and Pathways. The table also displays the average prior mean test scores and MGPs for the population of all schools that were eligible for CFS and MTSS and for the state average of schools in 2018-19 in order to help contextualize prior scores. Scores are averaged across the year prior to the first year of program participation for each of these groups. The mean test scores are standardized such that negative values represent means that are below the state average and positive values represent means that are above the state average. For mean SGPs (MGPs), values below 50 represent means that are below the state average and values above 50 represent means that are above the state average.

Table 4. Average test scores and mean growth percentiles (MGP) in the year prior to participation.

		CFS		MTSS		Pathways	All Schools
Subject	**Variable**	**Participants**	**Eligible**	**Participants**	**Eligible**	**Participants**	**Mean 2018-19**
ELA	Prior MGP	45	47	45	48	42	51
	Prior Mn. SS	-0.60	-0.43	-0.33	-0.40	-0.69	-0.03
	N MGP	45	352	12	284	12	1235
	N Mean SS	45	354	12	286	12	1244
Math	Prior MGP	43	46	47	46	40	50
	Prior Mn. SS	-0.62	-0.46	-0.36	-0.43	-0.76	-0.04
	N MGP	45	352	12	284	12	1235
	N Mean SS	45	354	12	286	12	1244

Note. Results in this table are summarized across elementary and middle schools that had a sample size of at least five and a test participation rate of at least 75%. Four of the 22 participating MTSS schools had participation rates lower than 75%. Of the remaining 18 schools, one did not have prior achievement data and five contained high school grades. These 10 schools were removed from the achievement and growth analyses. Thus, the MTSS data represent 12 participating elementary and middle schools with adequate achievement and growth data.

Average prior scores were lower among schools that participated in CFS relative to the population of all schools eligible for CFS (by about 0.15 student-level standard deviations) and relative to the population of all schools statewide (by about 0.58 student-level standard deviations). Participating schools also had lower average student growth percentiles relative to all eligible schools (by about three percentile points) and relative to the population of all schools (by about six percentile points). Table 4 also shows that prior mean scale scores were lower among schools that participated in MTSS relative to the population of all schools statewide, but were on average higher than the population of all schools eligible for MTSS. Schools that participated in Pathways had substantially lower achievement and growth scores in both subject areas relative to all schools statewide, and somewhat lower average prior scores and growth rates relative to schools participating in the CFS and MTSS programs. This finding for the Pathway schools is not necessarily surprising considering that these schools experienced low performance on the state SPF for several consecutive years before joining this program. In the following section, we move into analyses of SPF ratings for schools participating in CFS, MTSS, and Pathways.

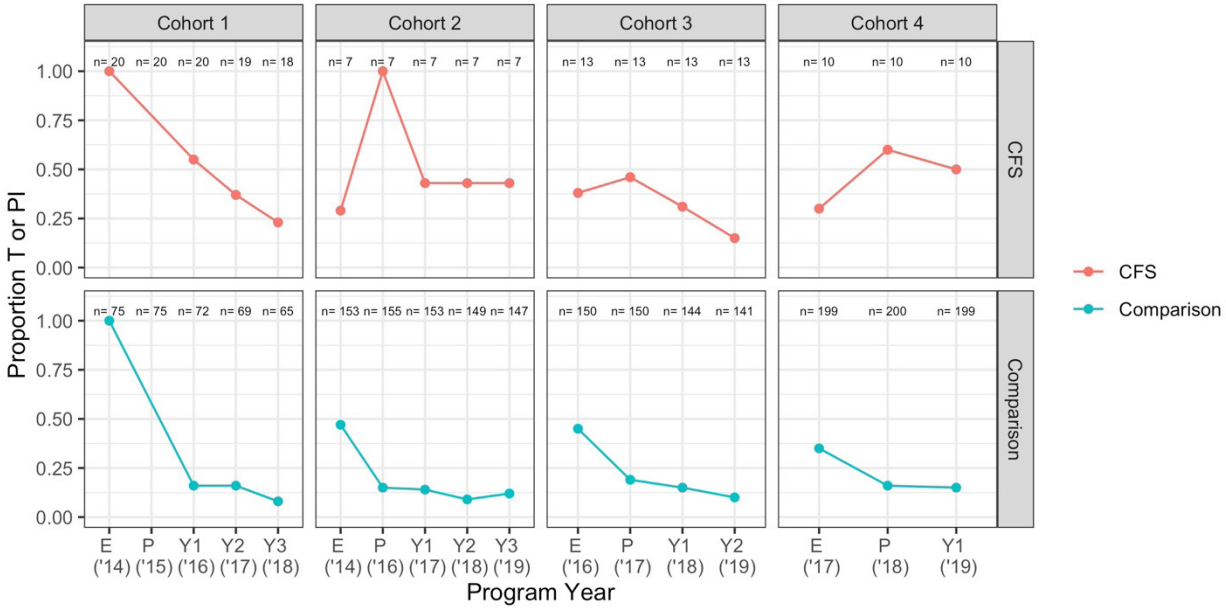
SPF Ratings

This section summarizes SPF ratings for schools that participated in one of the three turnaround programs. For CFS, we also compare SPF ratings of participating schools to SPF ratings of the group of comparison schools that were eligible for CFS but never participated in any turnaround program. Colorado annually reports SPF ratings for schools and uses these ratings as the primary metric for evaluating schools and districts. Part of the theory of action for all three turnaround programs is that program participation should support improved academic performance outcomes for students, which would then be reflected in SPF ratings. To examine whether or not this seems to be happening, we summarize SPF ratings before, during, and after turnaround program participation. Although we cannot use these descriptive analyses to directly support causal claims about the effectiveness of turnaround programs in improving achievement outcomes, examining SPF ratings over time can provide some initial indication of whether trends in outcomes are consistent with such positive effects.

CFS

Figure 1 displays trends in SPF ratings by cohort for schools that participated in CFS ("CFS") and the comparison group of schools ("Comparison"). We report ratings for up to five years for each cohort: the year of eligibility (E), the year prior to participation in CFS (P), and the first, second, and third years of participation in CFS (Y1, Y2, Y3) when available. Each dot in the figure represents the percentage of schools that received a PI/T plan rating based on scores from tests that were administered at the end of that year (see Appendix C for the distribution of individual SPF ratings). If CFS is successful in helping schools to improve achievement outcomes, we would expect this to be reflected by decreasing proportion of schools with PI/T plan ratings in years after participation begins.

Figure 1. Percent of CFS and comparison schools receiving PI/T ratings, by cohort.



Note. The sample size in cohort 1 participating schools drops to 19 in year two and 18 in year three due to school closures. One school closed in 2017-18 and one in 2018-19. The SPF ratings in the year of eligibility for cohort 2 reflect 2013-14 SPF ratings (there were no 2014-15 SPF ratings). This figure only reflects SPF ratings up to the 2018-19 academic year, limiting data from year three in cohort 3 and years two and three in cohort 4. E=eligibility year; P=year prior to participation; Y1/Y2/Y3=years 1, 2, or 3 of participation.

Since program eligibility is largely based on SPF ratings, we would expect to see most CFS participants and the comparison schools receiving PI/T ratings in the eligibility year. However, in cohorts 2, 3, and 4, up to 70% of schools that ultimately participated in CFS did not have a PI/T rating in the year of eligibility. For cohorts 2, 3, and 4, additional eligibility criteria were in place beyond SPF ratings; in these cohorts over half of participating and of comparison schools received the two highest ratings (Improvement or Performance ratings) in the eligibility year.

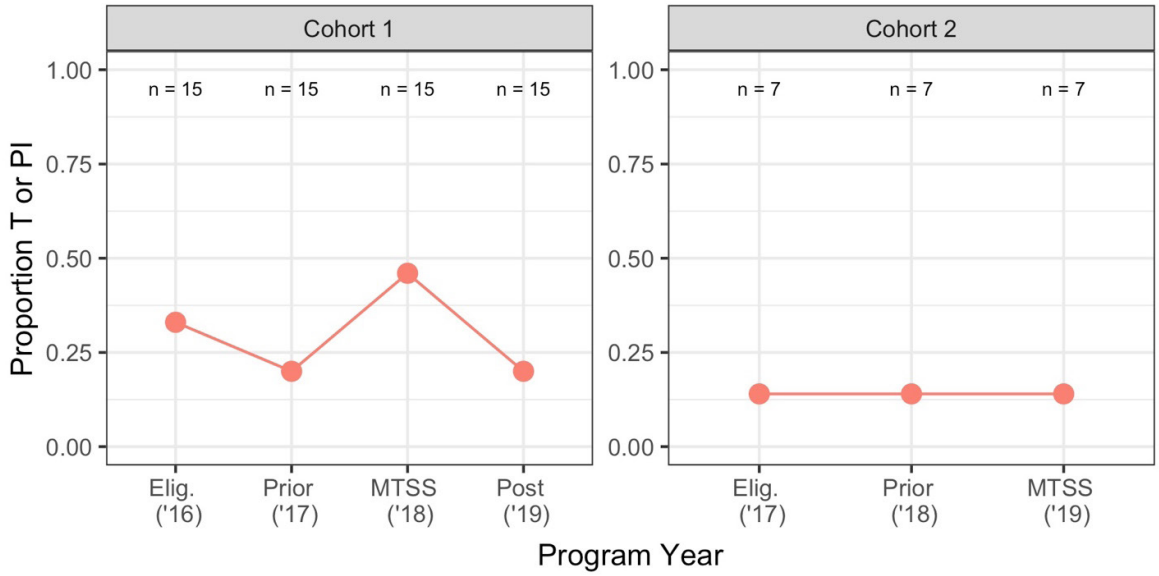
Among schools that participated in CFS in cohort 1, all schools received a PI/T plan rating in the year of eligibility (2013-14). By the end of the first year of program participation, just over 50% of schools still received a PI/T plan rating and by the end of the third year, it was down to 25% of schools. However, this steady improvement in SPF ratings was also reflected among comparison schools. That is, even among schools that never participated in CFS or any other CDE-offered turnaround program during this time period, SPF ratings improved over time. In cohort 2, only about 25% of schools that participated in CFS had a PI/T rating in the year of eligibility, but all schools had a PI/T rating in the following year. By the end of the first year of participation, only about 45% of participating schools still received a PI/T plan rating and that remained the case through year 3 of CFS participation. In cohort 3, the distribution of SPF ratings shifted over time such that by the end of year two of CFS participation, nearly 80% of schools had improved their SPF rating to an Improvement or Performance plan rating. In cohort 4, we observe a decrease in performance from the year of eligibility to the year prior to program participation. From the year prior to participation to the end of the first year of participation, however, average SPF ratings improved slightly such that about 50% of participating schools received a PI/T plan by the end of the first year (2018-19). This was the last year for which there are SPF ratings due to the pause on SPF ratings during the COVID-19 pandemic.

Overall, across cohorts, changes in the distribution of SPF ratings suggest slight positive improvements among CFS participants, but changes are relatively small for all but the first cohort, and the trends are inconsistent. Across all four cohorts, 60% of schools were rated PI/T in the year they were eligible for participation, 46% were rated PI/T after one year of participation and 28% were rated PI/T after three years of participation. Among the comparison schools, the percentages were 63%, 15%, and 11%. It is important to note, however, that these percentages are not directly comparable across the three years, since not all cohorts have three years of data. We cannot attribute positive changes in SPF distributions to CFS participation alone. The SPF ratings among comparison schools also improved during the same time periods, suggesting that factors outside of CFS participation could have contributed to changes in ratings observed in Figure 1.

MTSS

A key assumption of the MTSS program is that schools engaged in focused MTSS work will enact teaching and learning strategies that attend to the learning needs and well-being of students from varying backgrounds and interests. These strategies will then positively impact a school's culture and climate and eventually have a positive effect on student academic outcomes, such as the outcomes reflected in school SPF ratings. Figure 2 summarizes SPF ratings for schools that participated in MTSS in each of the two cohorts at four time points: the two years prior to participation in MTSS (Elig. and Prior), the year of participation (MTSS), and the year following participation (Post; only for cohort 1).

Figure 2. Percent of MTSS schools receiving PI/T ratings, by cohort.



Note. Since there were no state tests administered in the 2019-20 academic year, there are no SPF ratings displayed for the "Post" year in cohort 2.

Figure 2 shows little systematic trend in SPF ratings over time for schools participating in MTSS. Among cohort 1, the percentage of schools receiving PI/T ratings declined over time such that by the year following MTSS participation (2018-19), only 20% of schools received a PI/T rating, relative to 33% in the year of eligibility (2015-16). This improvement in scores was partially driven by a growing number of schools receiving a Performance rating (see Appendix C). Among cohort 2, the percentage of schools receiving PI/T ratings did not change over time. However, the distribution of specific SPF ratings did change slightly over time; no schools received a Turnaround rating two years prior to MTSS implementation, but one school did receive a Turnaround rating the year before implementation and the year of implementation (Appendix C). It is important to keep in mind that Figure 2 represents a small number of schools. The figure for cohort 1 summarizes data across 15 schools and the figure for cohort 2 summarizes data across seven schools, so a change in rating for one school results in a change of 7% and 15%, respectively, on the figure.

Overall, fewer schools in cohort 1 received PI/T plan ratings after participating in MTSS relative to before participation, although the change was small. In cohort 2 the percentage of schools receiving PI/T plan ratings did not change from before participation in MTSS to the end of the first year of participation. For cohort 2 we do not observe SPF ratings for the year following MTSS participation because accountability reporting was paused due to the COVID-19 pandemic.

Pathways

As mentioned, the Implementation Pathways schools included in this addendum are schools that were at the end of the accountability clock and had already received a directed action from the SBE. Participating schools received funds from CDE to support implementation of their directed action.

Table 5 displays the SPF ratings from 2009-10 to 2018-19 for each school that participated in Pathways. Table 5 also displays the hearing type in which each school participated, the directed action each school received from the SBE, and the year in which each school received the directed action. Most schools (n=15) participated in a first hearing with the SBE, while two schools participated in an early action hearing. Most schools received a "management" directed action, while some schools received other directed actions, including innovation, replace board/external management, and partial school closure/restructuring. In the years prior to receiving Pathways funding, between 25% and 50% of schools received a Turnaround plan rating, while the remaining received a Priority Improvement plan rating. Beginning in the first year of Pathway Implementation funding at least one school in every cohort received an Improvement or Performance plan rating. In cohort 1, three schools came off the clock in the first year of funding (2016-17). By 2018-19, two years after the directed actions, five of the 12 schools received an Improvement or Performance rating. In cohort 2, both of the schools received Performance plan ratings in 2018-19, the year after implementing the directed action. In cohort 3, one of the three schools received an Improvement plan rating in the first year of receiving funding.

Table 5. Annual SPF ratings for Pathways schools from 2010 to 2019.

		Final School Plan Type												
School	**Level**	**'10**	**'11**	**'12**	**'13**	**'14**	**'16**	**'17**	**'18**	**'19**	**Year on Clock by 2019**	**Hearing Type**	**Directed Action**	**Directed Action Year**
A	H	T	PI	PI	PI	PI	PI	T	PI	PI	Year 9	FH	M	2016-17
B	EM	PI	PI	PI	PI	PI	PI	I	I	PI	Year 1	FH	M	2016-17
C	EM	I	P	I	P	T	T	T	PI	I	Year 4 on Watch	FH	M	2016-17
D	M	T	T	T	T	T	PI	PI	PI	-	-	FH	M	2016-17
E	M	T	T	T	PI	T	T	T	T	PI	Year 9	FH	M	2016-17
F	M	PI	PI	PI	T	PI	PI	P	I	I	-	FH	I	2016-17
G	M	T	T	T	PI	PI	PI	PI	PI	P	-	FH	I	2016-17
H	EM ('10-'16)E ('17-'19)	T	T	PI	PI	PI	PI	PI	I	PI	Year 1	FH	M	2016-17
I	E ('14-'19)					T	PI	PI	PI	PI	Year 8	FH	RB/EM	2016-17
J	M ('14-'19)					T	PI	PI	I	I	-	FH	RB/EM	2016-17
K	H	PI	PI	PI	PI	PI	T	PI	PI	PI	Year 9	FH	I/M	2016-17
L	H ('10-'11, '19) MH ('12-'18)	T	T	PI	PI	PI	PI	I	I	I	-	FH	PC/R	2016-17
M	E	I	PI	PI	T	T	PI	T	I	P	-	FH	M	2017-18
N	E	I	PI	PI	PI	PI	PI	PI	P	P	-	FH	I	2017-18
O	E	I	I	PI	T	T	T	T	PI	I	Year 6 on Watch	FH	M	2018-19
P	H	I	PI	I	I	PI	PI	PI	PI	T	Year 5	EA	M	2018-19
Q	M	I	P	I	P	PI	PI	PI	T	PI	Year 5	EA	M	2018-19
		T=Turnaround			**PI=Priority Improvement**			**I=Improvement**			**P=Performance**			

Notes. This table only represents schools in their first year of Pathways implementation. Although six schools received funding in cohort 3, only three of these schools received funding for the first time. The thick black vertical line represents the year of directed action. Appendix D reports school names. FH=First Hearing; EA=Early Action; M=Management; I=Innovation; RB=Replace Board; EM=External Management; PC=Partial School Closure; R=Restructuring.

These observed changes in the SPF ratings of schools on the clock are noteworthy since the interventions at some of these schools resulted in improved ratings within a short period of time. Because we do not have a comparison group of schools to which we can compare these trends, we cannot directly attribute these changes to participation in the Pathways program. However, the improvement in SPF ratings seen during the first year of funding for five out of 17 schools is worthy of further investigation. CDE may want to identify and learn more about the strategies and approaches used to spur dramatic academic performance shifts at these schools.

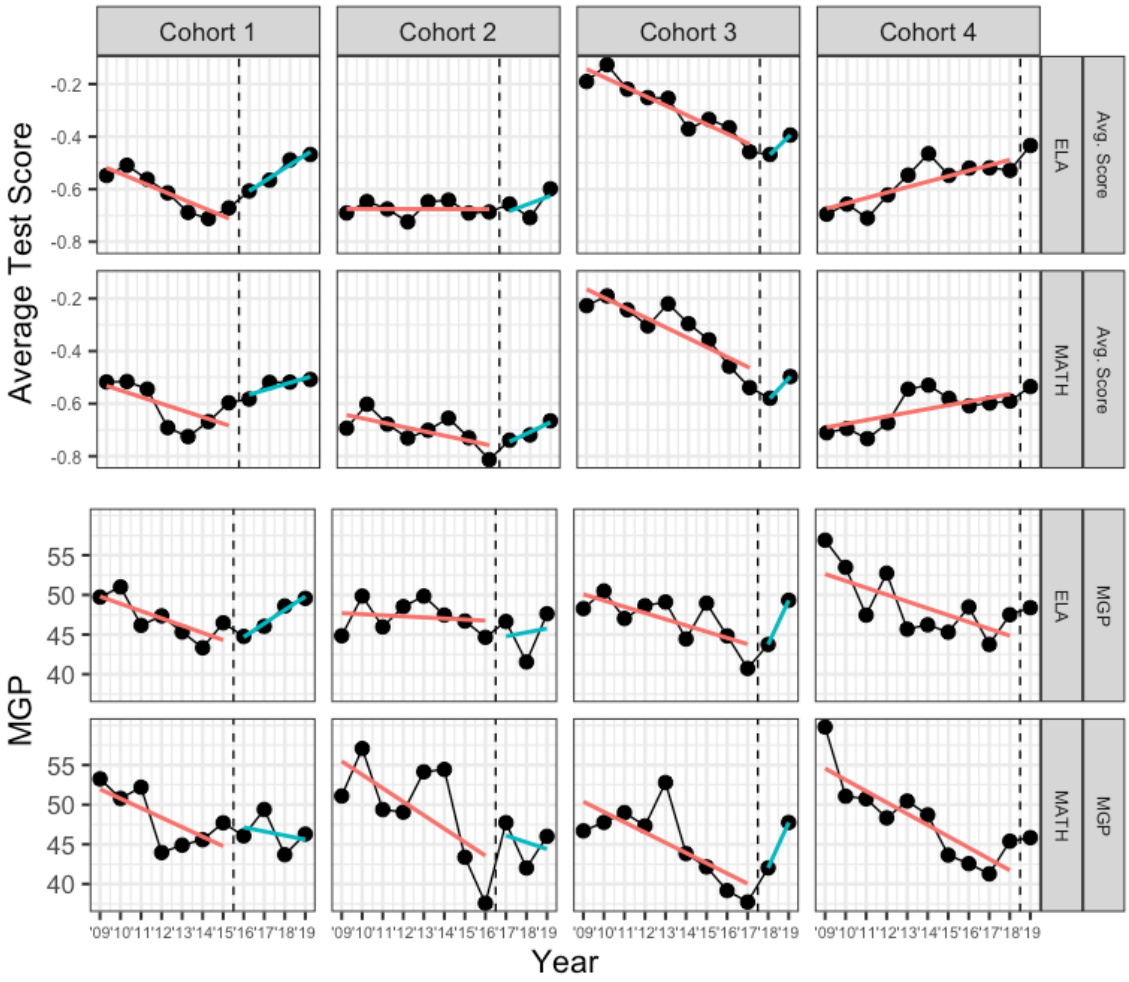
Achievement and Growth Trends

The SPF scores are calculated as a composite of different metrics. The complicated formula used to calculate SPF scores makes it difficult to fully understand achievement and growth trends via SPF scores alone. Thus, in this section, we summarize average scale scores and MGPs for all years from the 2008-09 academic year to the 2018-19 academic year for elementary and middle schools that participated in CFS, MTSS, and Pathways.

CFS

Figure 3 displays average scale scores and MGPs for elementary and middle schools that participated in CFS. In this figure, each dot represents average prior scores or MGPs across all elementary and middle schools that participated in CFS for a given year and cohort. The vertical dashed lines in the figure indicate the year in which the cohort began participation in CFS. The red lines fit to the data to the left of the vertical dashed lines are the pre-program trends across schools, and the blue lines fit to the data to the right are the trends beginning in the first year of program participation.

Figure 3. Mean scale scores and MGPs of participating CFS elementary and middle schools from 2008-09 to 2018-19, by cohort.



Results presented in the figure highlight negative pre-program trends in mean scale scores and MGPs in both Math and ELA for schools in cohorts 1 through 3. In cohort 4, however, while pre-program trends in MPGs were negative, the pre-program trends in mean scale scores were positive in both subjects.

We are limited in the extent to which we can examine post-participation outcomes because the CFS program began in the 2015-16 academic year, the program is three years long, and the achievement and growth data are only available through the 2018-19 academic year. In cohort 1, we observe outcome data for all three years of the program and the first year after, while in cohort 2, we observe outcome data for all three years of the program. In cohorts 3 and 4, however, academic outcome data from post-program implementation is limited to two and one year, respectively. Nonetheless, based on cohorts 1 and 2, there do appear to be generally positive trends in average scores and growth metrics such that, on average, mean scale scores

and MGPs appeared to increase over time in both math and ELA in years following participation. An important point to note is that there are only a small number of schools in each of these cohorts. The small size of each cohort explains some of the variability in average scores and growth rates from year to year seen in the figure.

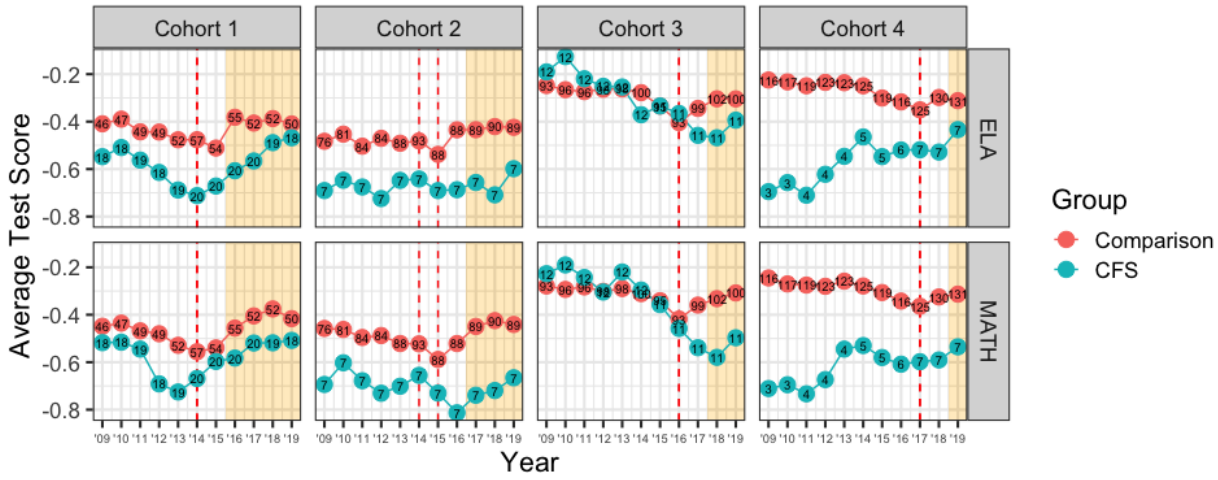
Table 6 displays average year to year changes in the mean scale scores and MGPs across elementary and middle schools in CFS cohorts 1 through 4. The table displays these data across pre-program participation years ("Pre"), post-program participation years ("Post"), and across all years from the 2008-09 academic year through the 2018-19 academic year ("All"). The first row, for example, summarizes trends in average ELA scores averaged across CFS cohorts 1 through 4. In the pre-participation period, ELA mean scale scores are averaged across 293 school-by-year data points. ELA average scale scores declined by about 0.01 standardized scale score points per year, on average, across all CFS schools during pre-participation years. On average, year-to-year changes in mean scale scores and MGPs were negative prior to CFS participation, and positive after CFS implementation.

Table 6. Changes in average scores and MGPs pre- and post-program of participating CFS elementary and middle schools.

		Pre			Post			All		
Subject	**Statistic**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**
ELA	Mn. SS	293	-0.01	0.16	127	0.04	0.16	420	0.01	0.16
Math	Mn. SS	293	-0.01	0.18	127	0.03	0.16	420	0.00	0.18
ELA	MGP	290	-0.36	8.7	127	1.33	9.9	417	0.16	9.1
Math	MGP	290	-0.91	11.0	127	1.20	12.0	417	-0.27	11.3

We must be cautious about attributing the positive changes in post-program implementation scores to program participation alone. We do not know, for example, what the trends over the same time period would have looked like for these schools had they not participated in CFS. In order to try to get a better sense for the extent to which the program itself may have contributed to changes in outcomes or whether these trends represent changes that would have been observed in the absence of participation, we next compare schools that participated in CFS to the comparison group of schools. Figure 4 below displays trends in mean scale scores in Math and ELA for CFS participants and the comparison schools described above.

Figure 4. Trends in mean scale scores in Math and ELA for CFS participants and control schools.



Note. In cohort 2, the figure displays two vertical dashed lines. The line on the left represents the 2013-14 academic year, which is the year that was used to determine CFS eligibility in 2016-17. The line on the right represents the 2014-15 academic year, which is the year that would have been used to determine CFS eligibility in 2016-17, had there been available test score data.

Figure 4 displays trends in mean scale scores before and after program implementation for both CFS and comparison schools. In this figure, the blue dots represent the average of all CFS-participating schools, and the red dots represent the comparison group of schools. The dashed vertical lines represent the year of data that program eligibility was based on, and the shaded yellow background of each individual figure represents the during- and post-program period for each cohort. The numbers displayed in each dot represents the number of schools across which the data are summarized.

These comparisons help us to better contextualize CFS academic performance trends and determine whether these trends are potentially consistent with CFS having a positive effect on student achievement in participating schools. In cohort 1, trends in average scale scores align relatively closely between participating and comparison schools; in both groups there is a slight decline in average scores prior to program implementation followed by a slight increase in scores after the start of the CFS program. Among participating schools, average scale scores begin increasing prior to program implementation, a trend that is also observed for the comparison schools suggesting this might be due to factors besides CFS participation.

In cohort 2, it is more difficult to discern specific patterns, possibly due to the small sample size. However, there does appear to be a positive trend in cohort 2 after initial program implementation. Math scores, on average, increase from 2017 to 2019 (years one through three of program participation), and ELA scores increase from 2018 to 2019 (years two and three of program participation). Comparison schools in cohort 2 similarly experienced an average increase in mean scale scores, but this upward trajectory begins earlier than the increase observed among participating schools. It is difficult to draw definitive conclusions for cohort 2 given the small sample size and small changes in scores, but there are potential improvements in scores that may be consistent with a positive effect of CFS. However, the observed increases for comparison schools around the same time make it difficult to attribute this solely to participation in CFS.

In cohort 3, we observe a decline in average test scores among participating schools prior to participation in CFS. We do not observe the same decline in average test scores among comparison schools prior to 2017-18. Average scores were lower in the 2015-16 year than in other years, but the trend in scores was otherwise relatively flat among comparison schools. From the first year (2017-18) to the second year (2018-19), average scores tended to increase among both participating and comparison schools, but this increase was more pronounced among participating schools.

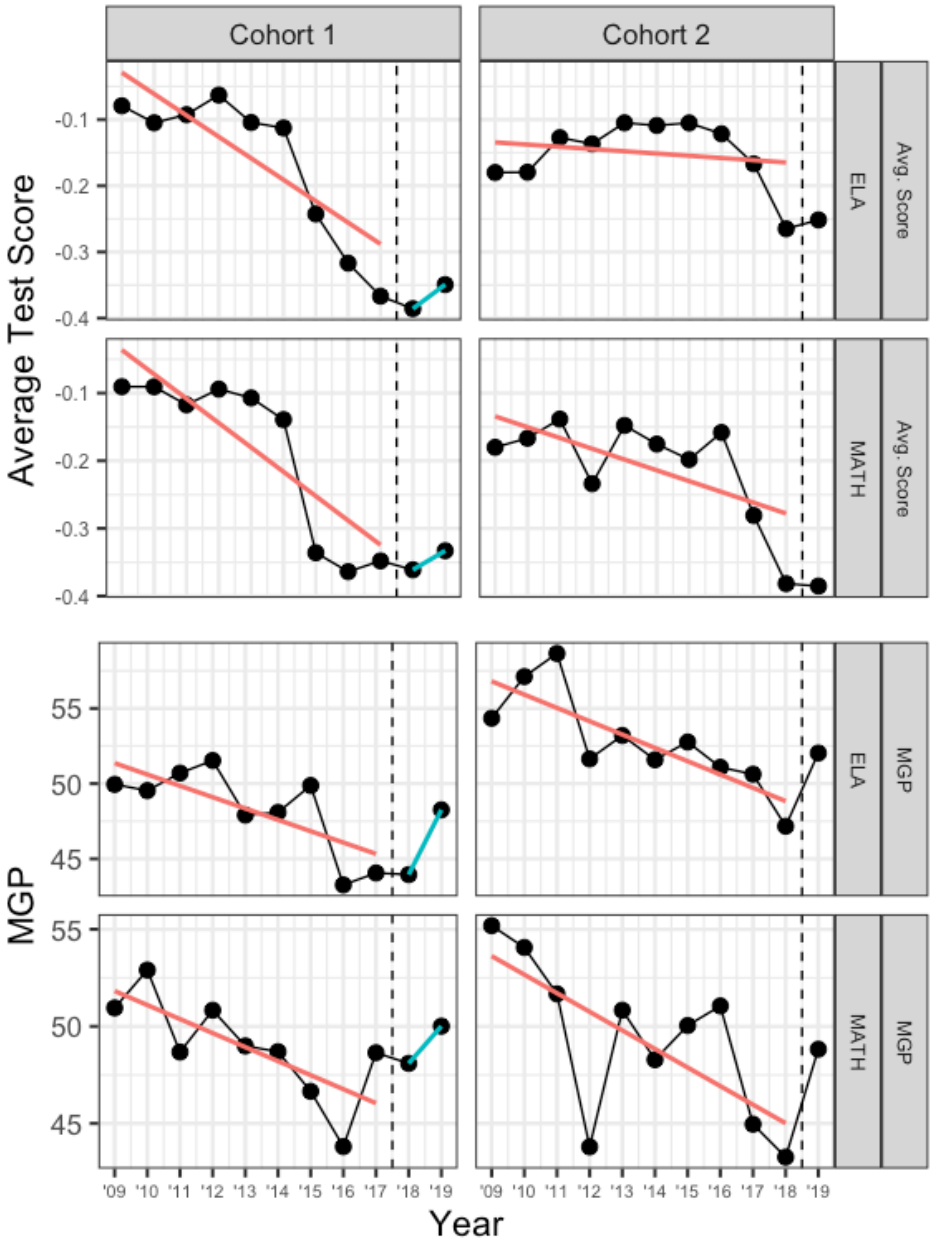
We cannot discern meaningful trends among schools that participated in cohort 4 since there is only one year of achievement data available post-program participation. We do, however, observe an increase in achievement scores from the year prior to program participation (2017-18) to the first year of program participation (2018-19). Although this gain is not reflected among the comparison schools, we also cannot attribute this positive change to participation in the program, since this improvement occurred soon after schools began receiving CFS funding or supports.

Taken together, there are no clear consistent patterns in the trends in scores among CFS participants relative to comparison schools across cohorts. The post-participation trends in the figures provide some evidence consistent with small positive effects, but trends in these years were often positive for the comparison schools as well. We are unable to clearly attribute the trends in scores to participation in CFS alone without further investigation.

MTSS

Figure 5 displays average scale scores and MGPs for MTSS elementary and middle schools in cohorts 1 (13 schools) and 2 (four schools). Figure 5 displays substantial variation in mean scale scores and MGPs among participating elementary and middle schools over time. However, the average trends in scores and MGPs over time prior to MTSS implementation, which are represented by the red lines, are negative across cohorts and subjects. On average, mean scale scores and MGPs appear to have been lower at the time of MTSS implementation than in earlier years. It is difficult to examine post-implementation trends due to the recent time frame and lack of available test data, but the averages in the years after program participation appear to either remain level or slightly increase relative to prior years. Additional years of data would be necessary to help establish a clearer understanding of changes in outcomes after schools participated in the state funded MTSS program.

Figure 5. Mean scale scores and MGPs of participating MTSS elementary and middle schools from 2008-09 to 2018-19, by cohort.

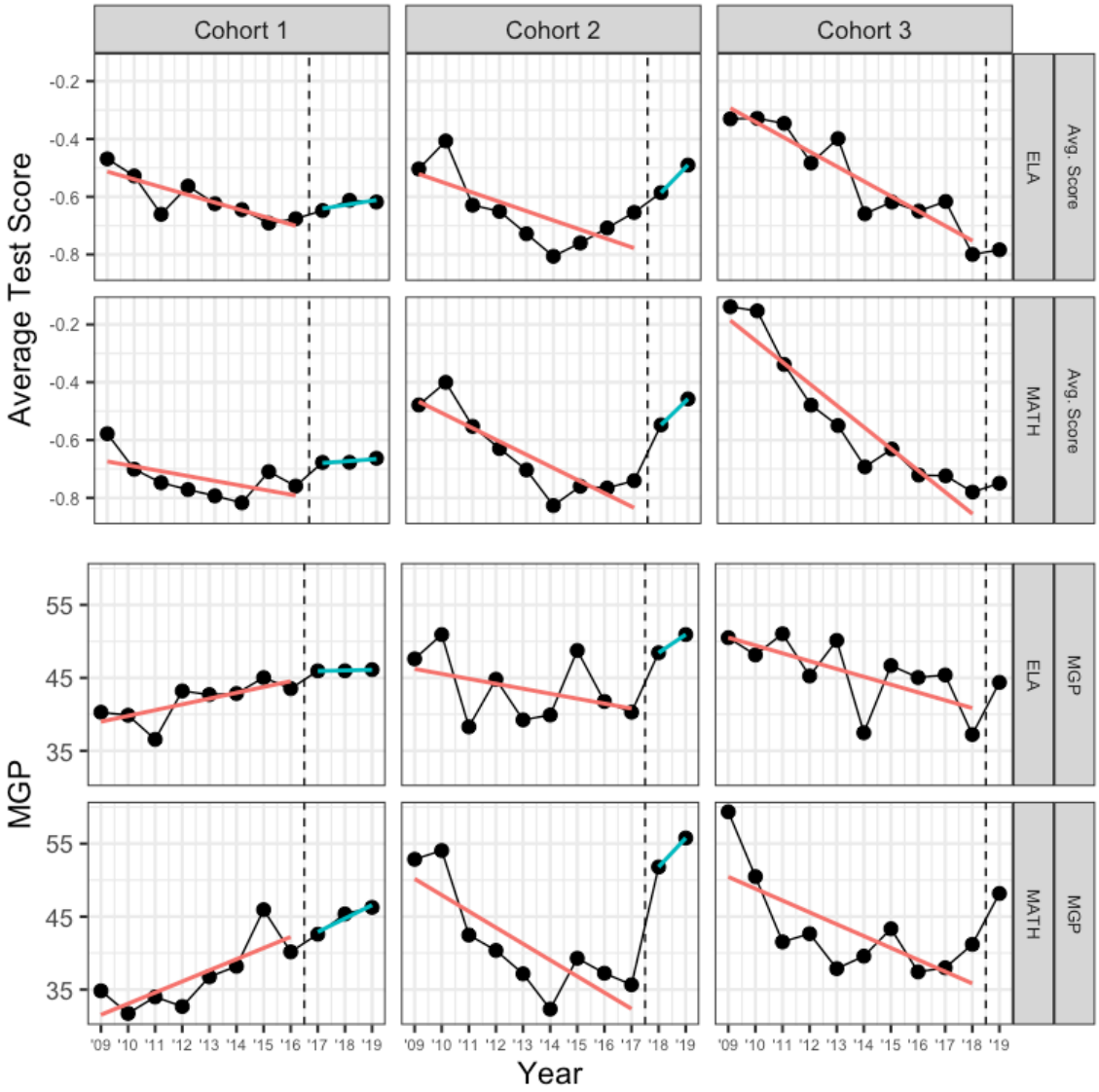


Pathways

Figure 6 displays average scale scores and MGPs for Pathways schools in cohorts 1 (eight schools), 2 (two schools), and 3 (two schools). On average, we observe a negative trend in mean scale scores for cohort 1 schools but a positive trend in MGPs in the years leading up to participation in Pathways. Schools in cohorts 2 and 3 experienced negative trends in mean scale scores and MGPs in the years leading up to participation in Pathways. In cohort 1 the negative pre-participation trend in average scores reverses in the post-participation years, while the

positive pre-participation trend in MGPs continues. In cohort 2 the post-participation average scores increase, although this follows a trend that appears to have started prior to program participation. The MGPs in post-participation years were high relative to the observed values in pre-participation years. However, this figure represents very few schools, so results presented are particularly sensitive to changes within an individual school. In addition, there is only a single year of post-participation data available for cohort 3, making it difficult to compare to the pre-participation trends.

Figure 6. Mean scale scores and MGPs of participating Pathways elementary and middle schools from 2008-09 to 2018-19, by cohort



Discussion

The programs examined in this addendum and in the earlier CADRE report (Shear et al., 2021) form an essential part of CDE's strategies to advance student equity. As seen in this addendum and the earlier report, except for the MTSS program , these lowest performing schools for the most part, serve a disproportionate number of historically underserved students. For this reason, tracking the performance of these schools and understanding the potential impact of these initiatives is critical to learn whether these strategies have accrued any benefits to students. Although the results shared in this report are mixed, the generally consistent and small positive effects found for these programs on student achievement and growth may indicate some possible benefits that these programs may be having on student academic outcomes.

Among CFS schools, trends were consistent with small, positive program effects. The trends in achievement and growth scores were mostly negative in the years leading up to program participation, but positive in the years following the first year of program implementation. Although these trends are consistent with small positive program effects on school achievement and growth scores, the timing of the increases did not always correspond directly with program participation and there were positive trends observed in outcomes for the comparison schools as well. These additional observations suggest there could be other factors that contributed to the increases in outcomes, and we should not attribute changes solely to program participation. Trends in achievement and growth among the MTSS and Pathways schools also tended to be negative in the years leading up to program participation, with the exception of growth scores in cohort 1 Pathways schools. Although there was some evidence of positive trends in scores among these schools after receiving funding, we cannot identify clear trends due to the limited number of years for which there are available test score data post-program implementation.

As a reference point, we can also compare the CFS outcomes presented in this addendum to STN and STLD outcomes reported in the prior CADRE report (Shear et al., 2021). On average, trends in CFS outcomes were similar to those observed for STN and STLD schools. Although the specific pre- and post- trends in achievement and growth outcomes are not identical between CFS, STN, and STLD, trends in achievement generally improved around the time of program implementation among schools in all three programs. However, as was noted in the report and this addendum, schools in the comparison groups for each program also experienced similar average improvements in SPF ratings during the same time periods, suggesting that improvements should not be attributed to participation in these programs alone. Although CFS, STN, and STLD differ from one another in the supports and funds provided to schools, descriptive analyses presented thus far suggest promising, though inconclusive, evidence about the effectiveness of these programs.

Limitations

There are a few important limitations that should be taken into consideration when interpreting the analyses presented in this addendum, many of which mirror those in the earlier CADRE report (Shear et al., 2021).

First, the analyses in this report cannot be used to draw direct conclusions about the effect of program participation on student outcomes. The key reason for this is that schools either self-select to participate in the programs or are identified for participation based on specific criteria.

As a result, participating schools can differ systematically from non-participating comparison schools in important ways, and may also have been implementing other initiatives intended to affect student outcomes simultaneously. The analyses in this report cannot clearly disentangle the extent to which any changes in outcomes were caused by participation in these programs or were also affected by other factors.

A second limitation is the use of administrative test score data as the only outcome measures. Although state standardized test data provide information about a broad range of important content knowledge and skills, they do not provide information about other valued outcomes that may be related to specific turnaround supports. Turnaround supports provided to schools often focus on nonacademic outcomes such as school climate and student well-being, for example, but we do not have the ability to observe improvements in these areas based on test score data alone.

A third limitation to the analyses presented in this addendum is drawing conclusions based on a small number of participating schools. With only 20 or fewer participating schools in each program cohort, trends in outcomes for each cohort are particularly sensitive to trends in individual schools and there is substantial variability in outcomes from year to year. The small sample sizes also raise questions about whether observed results can be generalized to Colorado schools more broadly, or whether the results observed are specific to the schools in the analyses.

Finally, the timing of these programs and the continued disruptions to state accountability testing due to the COVID-19 pandemic limited the availability of even the administrative test score data. Trends in academic outcomes are only observed through the 2018-19 academic year. As a result, some programs and cohorts have minimal or no academic outcome data for the time period after program implementation. The pause on state testing in 2020 and disruptions in 2021 will continue to limit the use of test scores for evaluating these and other programs in the near future.

Future Directions

In a subsequent report, we will apply additional statistical analyses to estimate the causal effect of program participation on academic outcomes. Although data constraints and the nature of the programs make it nearly impossible to estimate causal effects for MTSS and Pathways schools, we plan to estimate these effects for the CFS, STN, and STLD programs. Results from these future analyses will extend beyond descriptive summaries and ideally provide a clearer indication as to whether these turnaround programs were effective in improving student and school outcomes as intended. Additionally, CADRE is currently conducting case studies of two former turnaround network schools that made and sustained dramatic improvements in academic performance in a relatively short period of time. Findings from this work and other future case studies can help form a clearer picture into how and in what ways these intervention programs appear to be facilitating positive school transformations and academic improvements at various sites.

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Appendix A: Detailed Description of Data

The analyses in this report are based on the same data used in the prior CADRE report (Shear et al., 2021). The following description of the data sources is reproduced from the prior report (p. 11-13).

School and Student Demographic Data

School and student demographic data are drawn from CDE's October count enrollment files, which report official school enrollment for each public school in Colorado and include data about student demographic characteristics of students enrolled at each school. These demographic characteristics are based on the major student sub-groups reported for CDE accountability purposes and include the percent of students identified as male or female, the percent of students identified as belonging to a minority racial/ethnic group3, the percent of students eligible for free or reduced-price lunch (FRL), the percent of students identified as English Language Learners (ELL), and the percent of students with an individualized education plan (IEP). We also received files indicating whether each school was designated as an Alternative Education Campus (AEC) each year and whether each school was designated as "rural" or "small rural" per CDE guidelines.

Student Performance Framework (SPF) Ratings

Historical SPF ratings for each school from the 2009-10 AY through 2018-19 AY, including whether schools were identified for Comprehensive Support or Targeted Support under Federal ESSA rules in 2017-18 through 2018-19, were provided by CDE accountability office. School SPF ratings are based primarily on annual student achievement test scores. These tests are administered each spring, while the SPF ratings are reported in the fall. As a result, the SPF rating for a school in any given AY is based on test score data from the prior AY. A school that received funding for the STLD program in the 2018-19 AY, for example, would have been eligible to apply for this funding if the school's SPF rating were PI/T in the 2017-18 AY, but the SPF rating that applied for the 2017-18 AY would have been based on standardized testing from the spring of the 2016-17 AY. There are some missing data in the SPF ratings. First, due to the transition in tests used for state accountability during the 2014-15 AY, there were no SPF ratings assigned in the 2015-16 AY, which would have used the spring 2015 test results. Second, in a small number of cases an official SPF rating may not be assigned to a school due to exceptions such as low participation rates in accountability testing or other exceptions, although these are relatively rare.

Student Achievement Data

We summarize student achievement data from Spring 2009 through Spring 2019 at each school using two different metrics: average test scores and average student growth percentiles (SGP). We include these metrics for tests measuring student achievement in math and English Language Arts (ELA) in grades 3-8 for every year, and in grades 9-11 in years when year-end accountability tests were administered in these grades. We summarize achievement data at the school level because the STLD and STN programs are awarded to an entire school.

The average test score for each school is computed by averaging across all valid test scores at each school in each year. Before calculating average test scores for each school, we first standardized students' test scores by grade, subject, and year at the statewide level. This is to account for the fact that different tests are administered in each grade and subject, and that there have been changes to the tests used within grades over time. These changes to tests across grades and years complicate interpretation of the student achievement trends during the years the STN and STLD programs were implemented, something we discuss further below. As a result of standardizing test results, a value of 0 represents the statewide average score in a given grade, year, and subject; positive values represent averages that are higher than the statewide average and negative values represent averages that are lower than the statewide average.

We also summarize trends in SGP over time. Since 2009, Colorado has used the SGP methodology to measure "growth" in student learning each year. Each student's SGP indicates how a student's current year test score compares to other students in the state who had similar prior test scores in the same subject. We summarize these at the school-level by computing the mean SGP (MGP) at each school, which differs slightly from the median SGP used in the SPF calculations. We use the mean SGP because it has been shown to have lower sampling variability and better statistical properties (e.g., McCaffrey et al., 2015). The MGP is intended to provide an indicator that better represents a school's effect on student learning than does the average test score in a single year, which does not take into account how much progress students have made in the past year. Two limitations of MGPs relative to average test scores are that they cannot be computed for as many students (a student must have appropriate prior year test scores), and they tend to contain more random sampling error and measurement error than do average test scores.

Appendix B: Additional Information about Pathways

The SBE in Colorado has three primary types of hearings available to low-performing schools and districts: early action, first hearing, and rehearing. Schools and districts that are not yet at the end of the accountability clock but that are in years three or four on the accountability clock have the option to participate in an early action hearing, which replaces the directed action hearing with the SBE that would take place after five years on the clock. Schools and districts that are at the end of the clock (year five) participate in a first hearing with the SBE. Schools and districts that have previously been heard by the SBE have the option to participate in a rehearing. Early action and first hearings typically take place in February, March, April, or May. Rehearings typically take place in November of the same calendar year. This report analyzes data from schools' first year of participation in Pathways. This includes schools that participate in early action hearings and schools that participate in a first hearing. Table B1 summarizes school counts by hearing types.

Table B1. Number of schools and districts receiving Pathways support by hearing type.

Hearing Type	N Schools
Early Action	2
First hearing	15

Of the 17 schools that participated in Pathways, two schools had an early action hearing and 15 had a first hearing.

At the hearings, the SBE provides schools and districts with a directed action, or a prescribed action that the school or district must take in an effort to improve. There are a series of different directed actions that the SBE prescribes, including: innovation, management, innovation/management, partial school closure/restructuring, or replace board/external management. Table B2 displays the number of schools that received Pathways support by type of directed action. These data are summarized across all years and cohorts of schools that participated in Pathways.

Table B2.Number of schools and districts receiving Pathways support by directed action.

Directed Action	N Schools
Innovation	3
Innovation/Management	1
Management	10
Partial School Closure/Restructuring	1
Replace Board/External Management	2

The most common directed action prescribed by the SBE to schools was management. 10 of the 17 schools were assigned a management directed action in either their early hearing or first hearing with SBE.

Appendix C: Distributions of SPF Ratings

Figure C1 displays the distribution of SPF ratings for CFS schools and comparison schools by year and cohort. Figure C2 displays the distribution of SPF ratings for schools that participated in MTSS. These figures provide more detailed information about the specific distribution of ratings among participating and comparison schools. In Figure C1, for example, the Y1 bar for cohort 1 (AY 2015-16) represents the distribution of SPF ratings among cohort 1 schools based on 2015-16 test scores.

Figure C1. The distribution of SPF ratings for CFS schools and comparison schools.

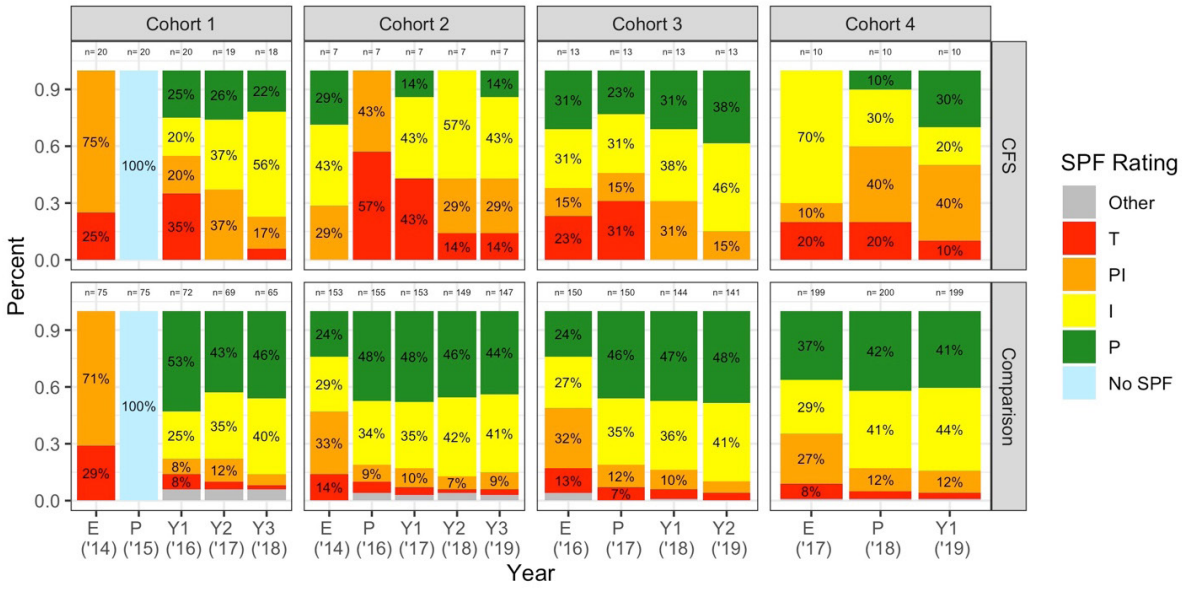
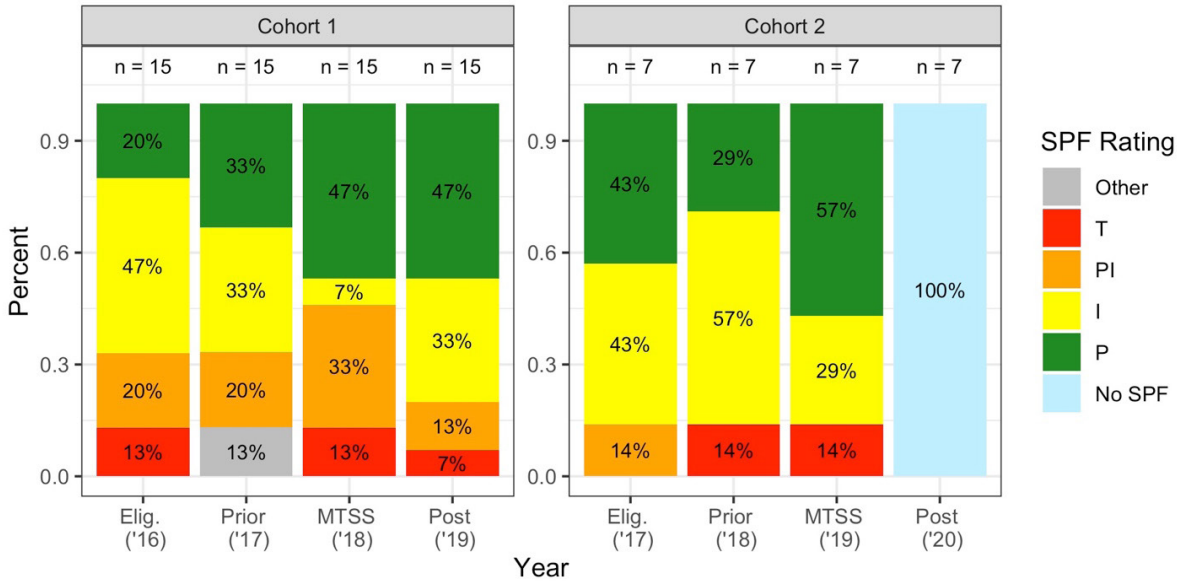


Figure C2. The distribution of SPF ratings for MTSS schools.



Appendix D: School Codes and Corresponding School Names

School Code	School Name
A	Adams City High School
B	Peakview School
C	Aguilar Junior-Senior High School
D	Heroes MS
E	Risley International Academy of Innovation
F	Franklin Middle School
G	Prairie Heights Middle School
H	Bessemer Elementary School
I	Hope Online Learning Academy Elementary School
J	Hope Online Learning Academy Middle School
K	Aurora Central High School
L	Destinations Career Academy of Colorado
M	Manaugh Elementary School
N	Martinez Elementary School
O	Minnequa Elementary School
P	Gateway High School
Q	North Middle School Health Sciences and Technology