



Data Analysis in Cobblestone Learning Centers



Current Analysis

In this section, we would like to conduct some current situation analysis to explore whether there are some key issues we need to focus.

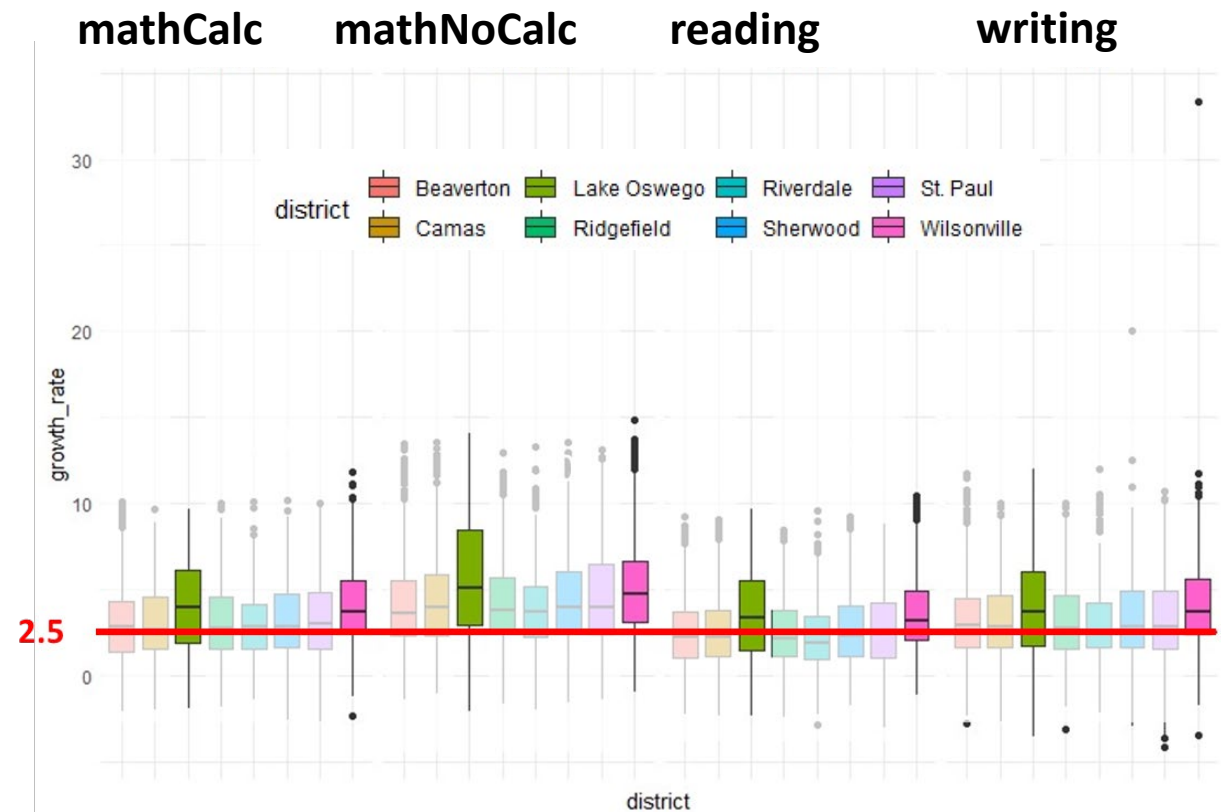
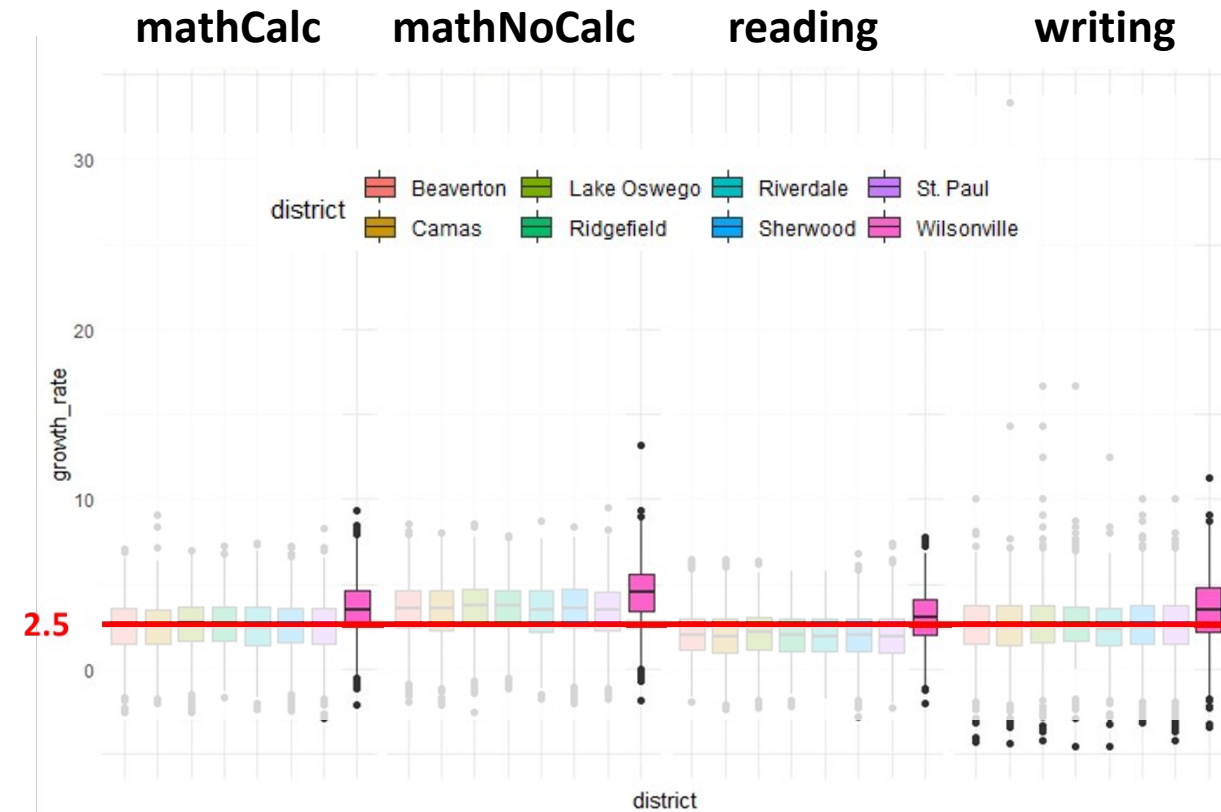
On the other hand, we want to understand student achievement and student/program outcomes across the student population as well.



The Growth Rate of performance before and after 2018

Before 2018, **Wilsonville** students have the highest growth rate on average

After 2018, **Lake Oswego** students have significant improved



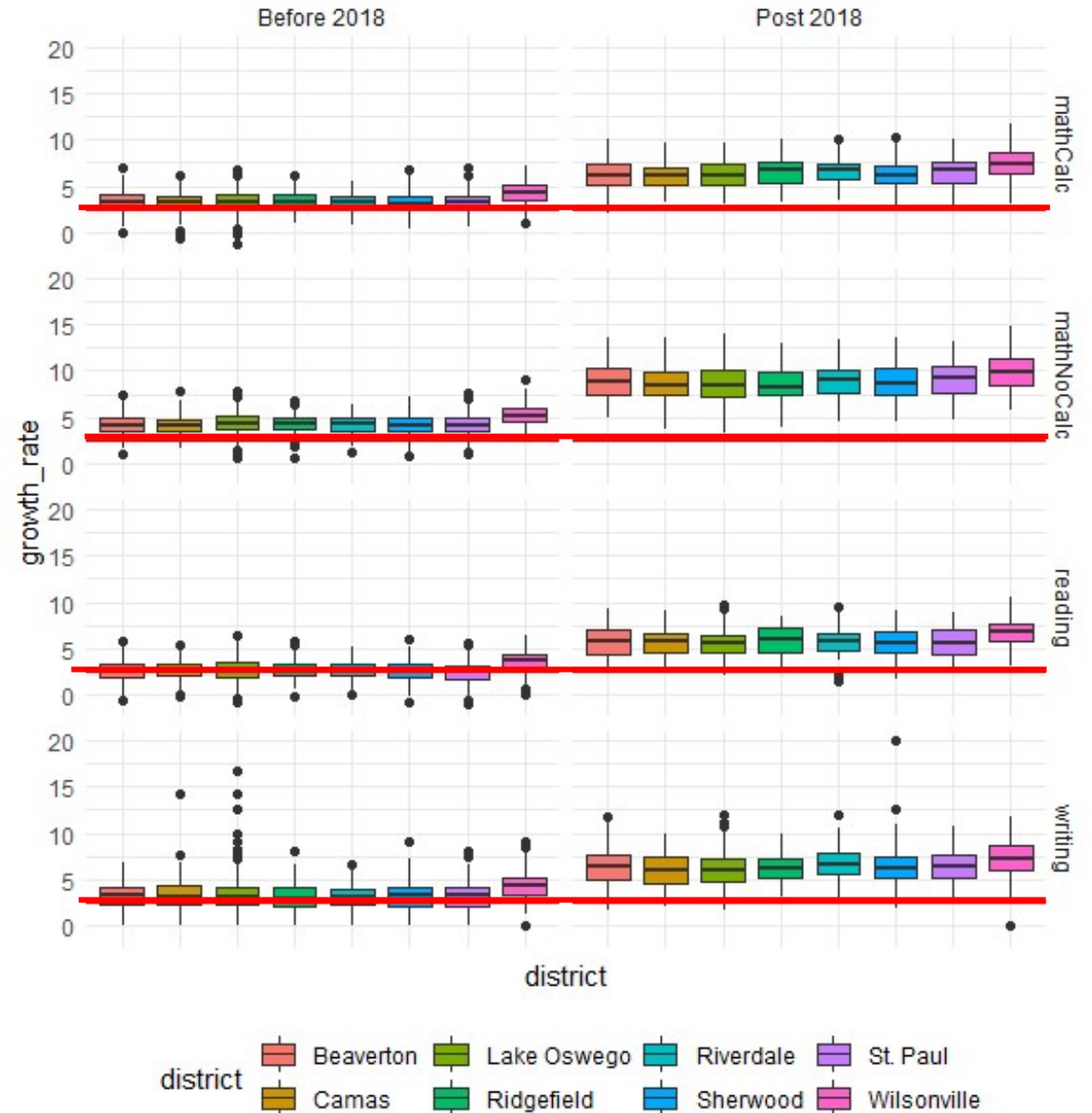
The reason why we want to analyze before and after 2018 is that Cobblestone Learning Centers launched online program in tutoring program. Therefore, we separate our data.

Significant change in growth rate of tutoring program before and after 2018

As we analyze the effectiveness of each program, we discovered that there is a significant growth rate improved in Tutoring program before and after 2018.

On the other hand, there is no significant change in others program.[appendix]

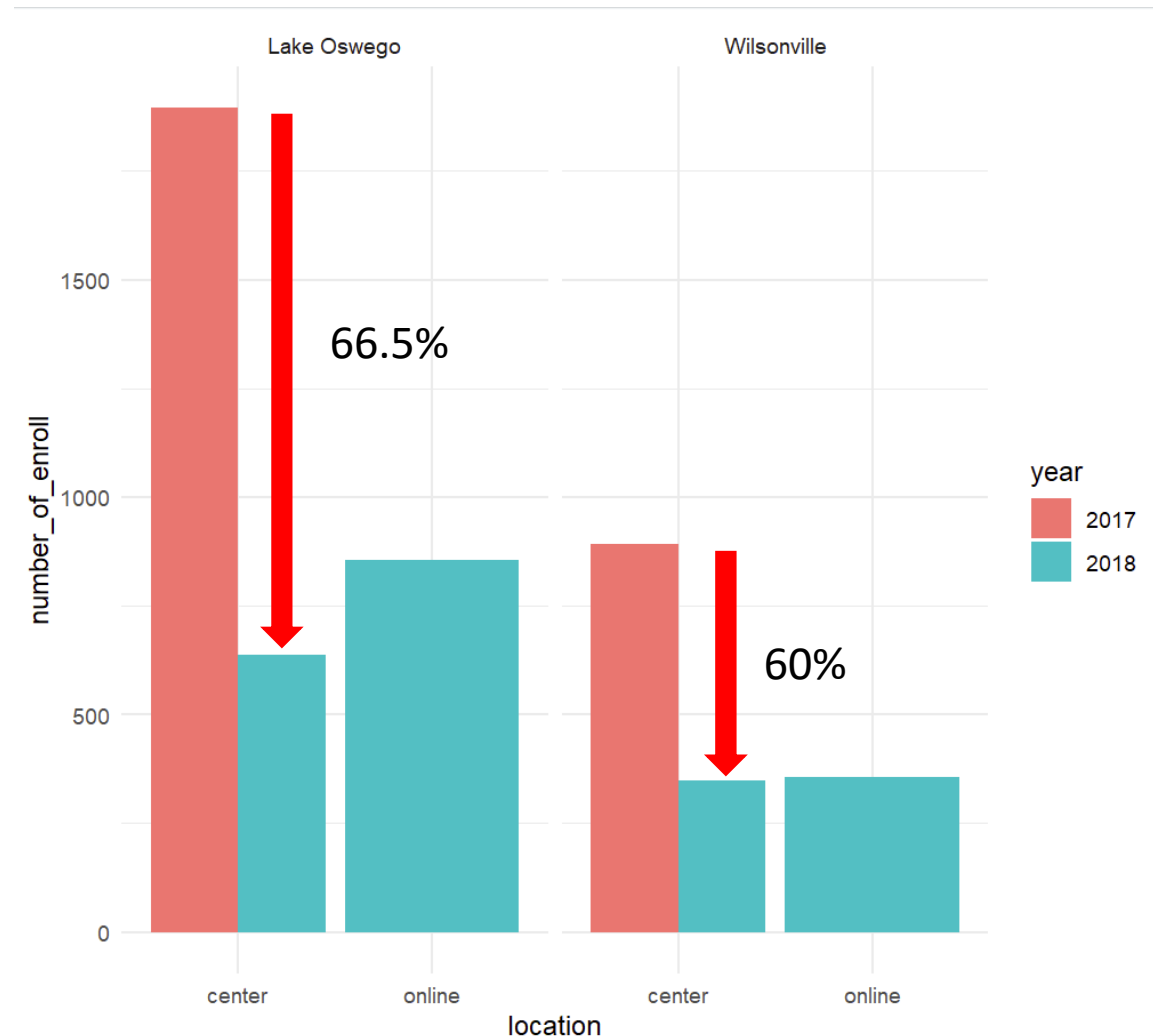
Effectiveness of Tutoring Program Given by District Before and After 2018



Significant change in enrollment of tutoring program in 2017 and 2018

The significant change in tutoring online may explain why there is a significant improvement on the growth rate of student performance in Lake Oswego. The graph show us that the number of people enrolling in center tutoring program decrease by 66.5% in Lake Oswego, versus 60% in Wilsonville.

Number of enrollment in tutoring program in 2017 and 2018 between Lake Oswego and Wilsonville

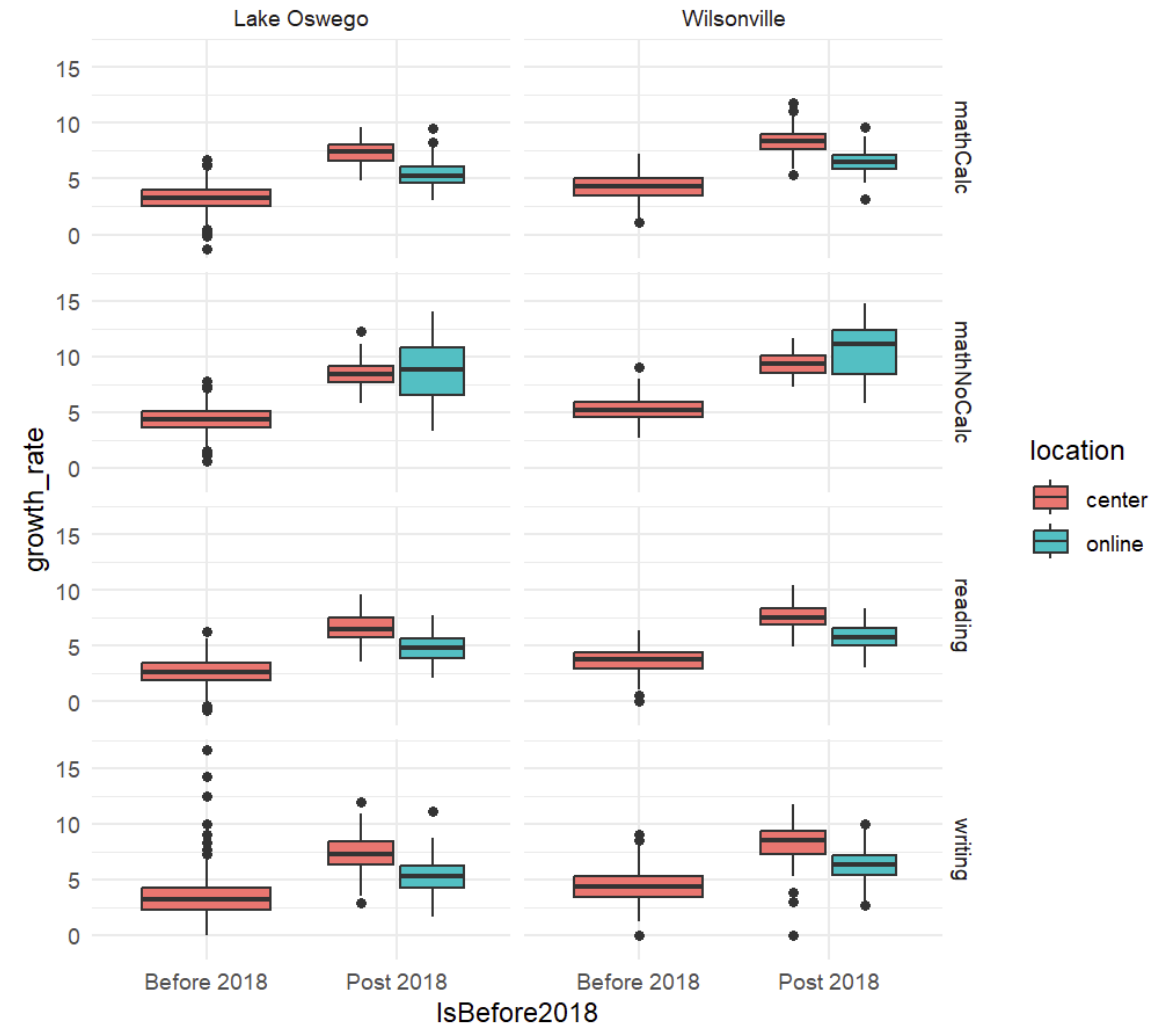


The growth rate in tutoring program is **better than before**

The graph shows that after launching the online tutoring program, the performances of students are better than before no matter for those students who take online programs or those who take center programs.

This situation indicates that hybrid location, perhaps, is a good way to improve performance since adding online program influences the performance of center program.

Effectiveness of tutoring program before and after 2018 in Lake Oswego and Wilsonville





Effectiveness of Programs

In this section, we would like to analyze the effectiveness of programs and the utilization of programs orders.

Since students may have taken different number of programs, we categorize them into 4 subset.

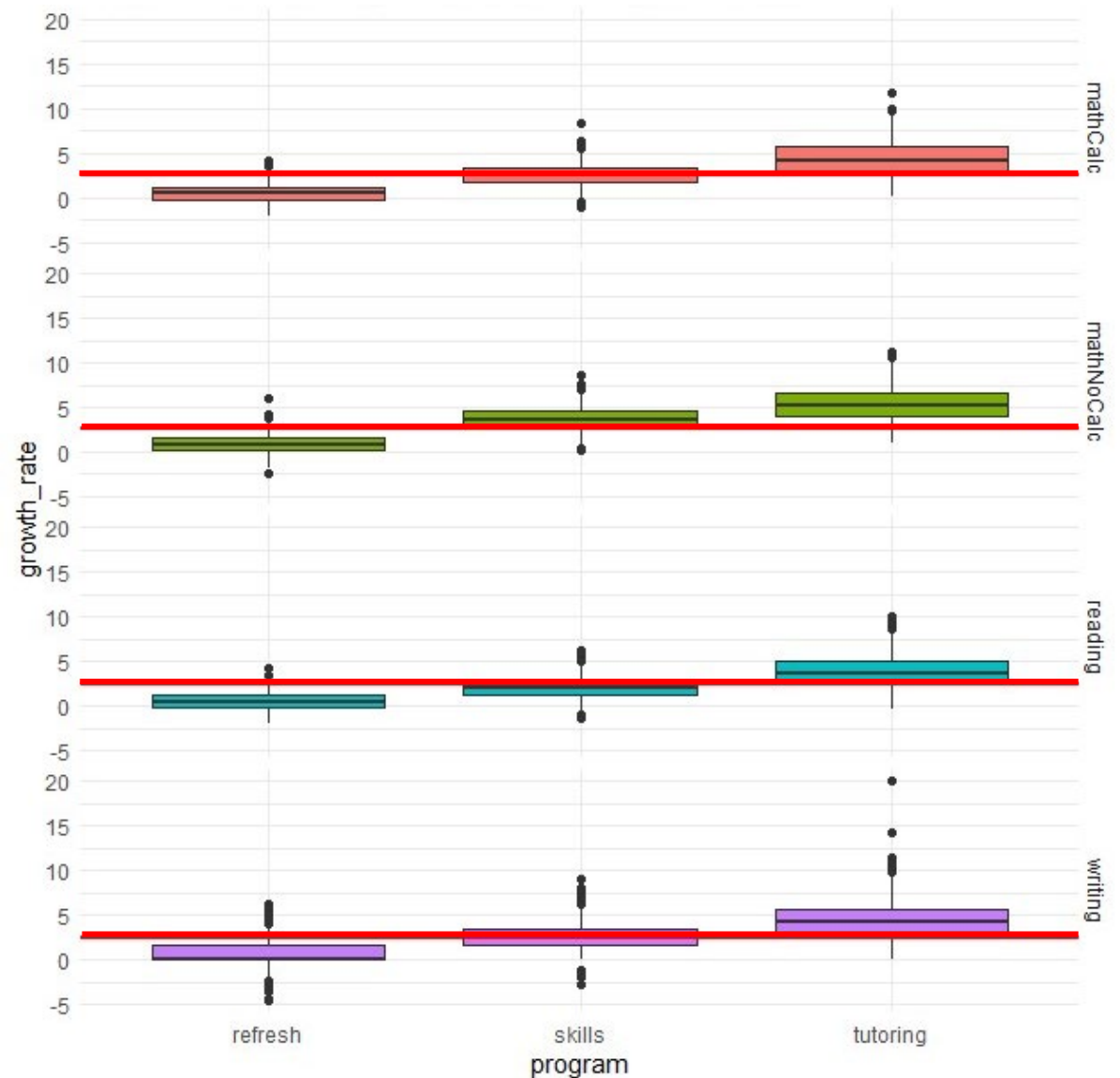
Lastly, we will compare the program orders overall with the ones in Wilsonville since it has the best performance among the districts.



Tutoring is the most effective program when student taking one program

For those student who take one program, the best choice of program to improve their performance is tutoring program.

Effectiveness of Programs When Taking One Program



Compare the class arrangement in overall with the arrangement in Wilsonville when student takes two programs

Wilsonville

T: Tutoring S: Skills R: Refresh

Overall

Subject	Program order	Median of Growth Rate	Rank
mathCalc	TT	9.705	1
	TS	9.045	2
	SS	9.01	3
mathNoCalc	TT	12.225	1
	ST	11.64	2
	TS	11.455	3
reading	TT	9.185	1
	TS	8.28	2
	ST	7.89	3
writing	TT	9.81	1
	SS	8.93	2
	ST	8.7	3

Subject	Program order	Median of Growth Rate	Rank
mathCalc	TT	7.855	1
	SS	7.09	2
	ST	7.005	3
mathNoCalc	TT	9.64	1
	SS	9.38	2
	ST	9.275	3
reading	TT	6.645	1
	SS	5.82	2
	TS	5.74	3
writing	TT	7.84	1
	SS	7.02	2
	TS	7.02	2

We compared the different program arrangements and growth rates between overall and **Wilsonville**. We can see that **Wilsonville**, as a benchmark city, is indeed growing at a much higher rate than the average. Perhaps the program arrangements in **Wilsonville** can be apply to other districts.

Compare the class arrangement in overall with the arrangement in Wilsonville when student takes three programs

Wilsonville

T: Tutoring S: Skills R: Refresh

Overall

Subject	Program order	Median of Growth Rate	Rank
mathCalc	TTS	16.84	1
	TST	16.08	2
	SST	15.03	3
mathNoCalc	SST	19.34	1
	STS	18.6	2
	TTS	18.43	3
reading	TST	12.8	1
	TSS	12.47	2
	STS	11.94	3
writing	SST	14.29	1
	STS	14.29	2
	TTR	14.04	3

Subject	Program order	Median of Growth rate	Rank
mathCalc	SST	11.87	1
	STS	11.49	2
	TTT	10.835	3
mathNoCalc	SST	16	1
	STS	15.36	2
	TSS	15.15	3
reading	STS	10.15	1
	TRT	9.45	2
	SST	9.4	3
writing	SST	11.76	1
	STS	11.63	2
	TSS	11.48	3

If we observe the curriculum arrangement, we can see that the arrangement of the two programs is mostly consistent with **Wilsonville's**, but as the number of programs increases, the difference between the overall curriculum arrangement and **Wilsonville's** curriculum arrangement gradually increase. Just as the case with previous, other districts could consider the programs arrangement in Wilsonville. After all, it has higher growth rate in every subjects.

Compare the class arrangement in overall with the arrangement in Wilsonville when student takes four programs

Wilsonville				T: Tutoring S: Skills R: Refresh				Overall			
Subject	Program order	Median of Growth Rate	Rank	Subject	Program order	Median of Growth Rate	Rank	Subject	Program order	Median of Growth Rate	Rank
mathCalc	RTRT	26.72	1	mathCalc	SSTT	15.19	1	mathCalc	SSTT	15.19	1
	RSTT	22.08	2		TRTR	14.815	2		TRTR	14.815	2
	TRTR	21.82	3		SSTR	14.69	3		SSTR	14.69	3
mathNoCalc	RSTT	35.36	1	mathNoCalc	TRTR	23	1	mathNoCalc	TRTR	23	1
	TSTS	29.93	2		SRST	21.32	2		SRST	21.32	2
	TRTR	28.84	3		TTTR	19.96	3		TTTR	19.96	3
reading	TRTR	21.23	1	reading	STST	12.715	1	reading	STST	12.715	1
	RTRT	19.74	2		SSTR	12.495	2		SSTR	12.495	2
	STSR	19.34	3		TTTR	12.33	3		TTTR	12.33	3
writing	RTRT	23.21	1	writing	TTTR	15.94	1	writing	TTTR	15.94	1
	TTTT	21.43	2		SSTR	14.73	2		SSTR	14.73	2
	TRTR	20.97	3		TRTR	14.06	3		TRTR	14.06	3

We can consider adjecting the program schedule for students when the programs reaches two or more sessions. As usual, we compare the performance in Wilsonville with the ones in others district. Perhaps, If other districts try to align with **Wilsonville's** schedules as much as possible, they can have a better growth rate in different subjects.

Location Analysis

In this section, we would like to discover the effectiveness of online and center.

Since online have been applied to refresh programs in 2016 and was only applied to tutoring programs, we analyze them separately.

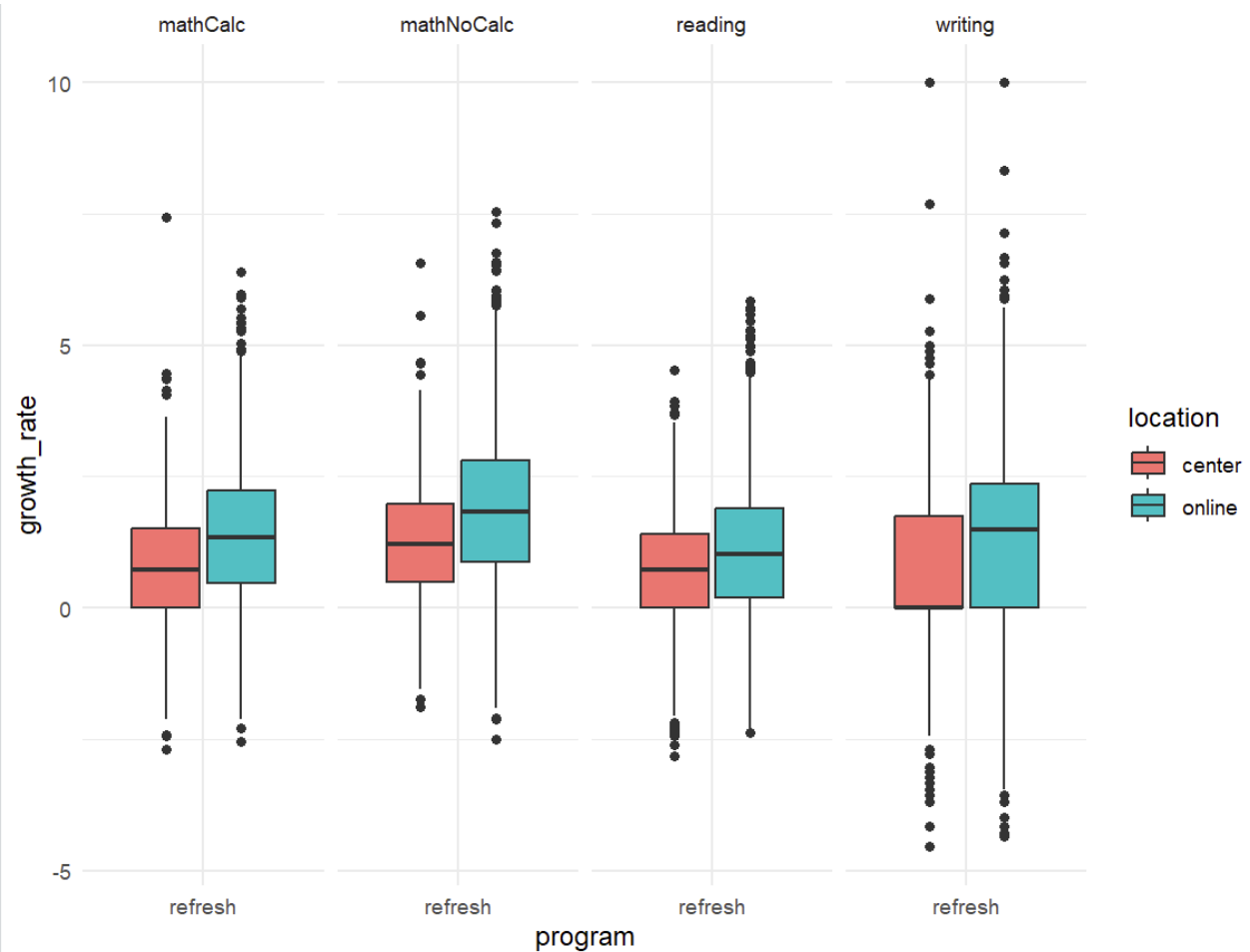


Online programs are slightly better than center-based program in refresh

The boxplot shows that the growth rates in online refresh program are slightly better than the center refresh program, except for the writing subject.

Perhaps, when a student want to improve his writing performance through refresh program, center is not the best option for him.

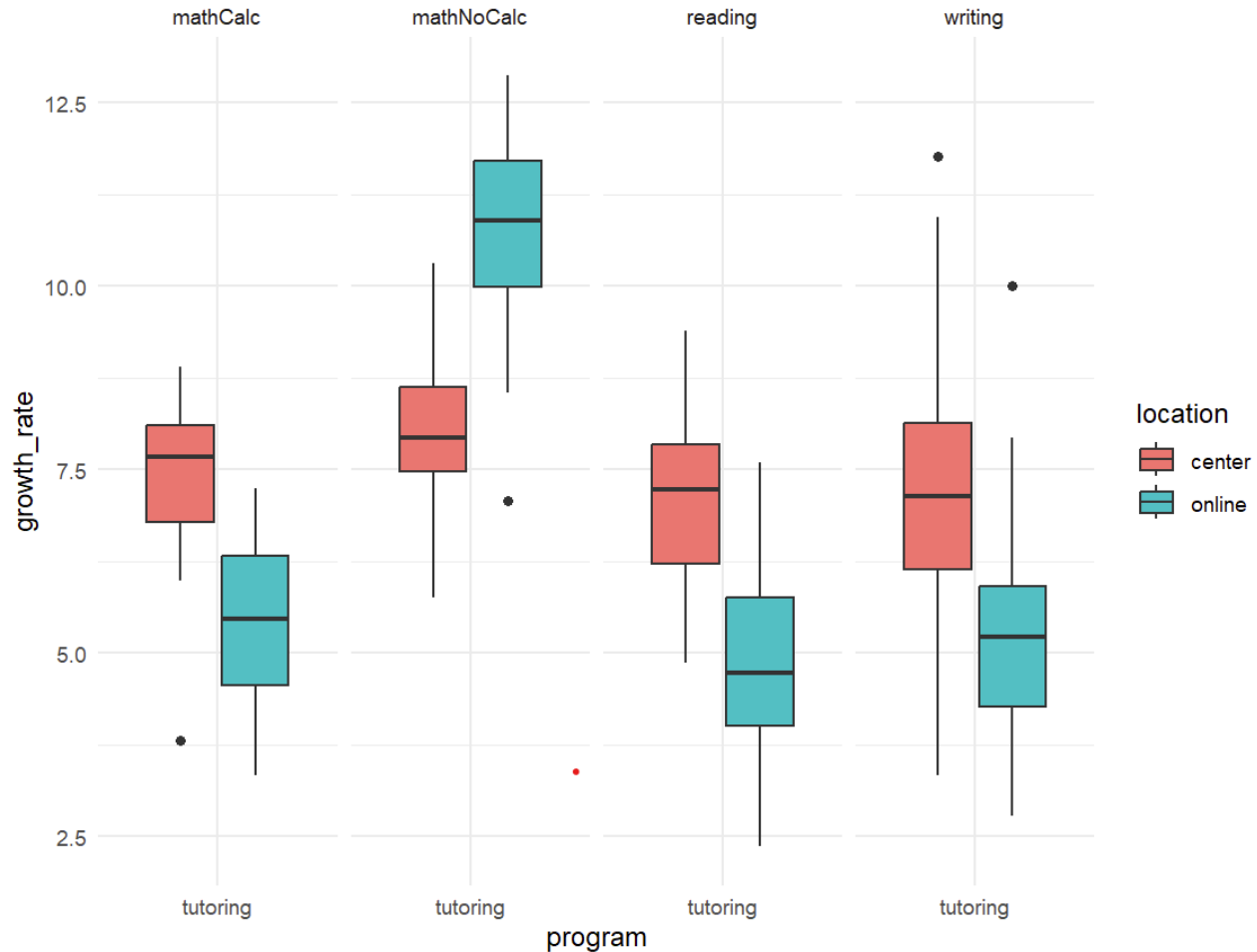
The Effectiveness of Refresh Program on Subject



Online program are significantly better than center-based program in mathNoCalc

The boxplot shows that in tutoring program, center program are significantly better than online program, except for mathNoCalc subject. Therefore, if a student want to improve his mathNoCalc subject through tutoring program, online sounds a good way to deliver the lecture.

The Effectiveness of Tutoring Program on Subject





Appendix

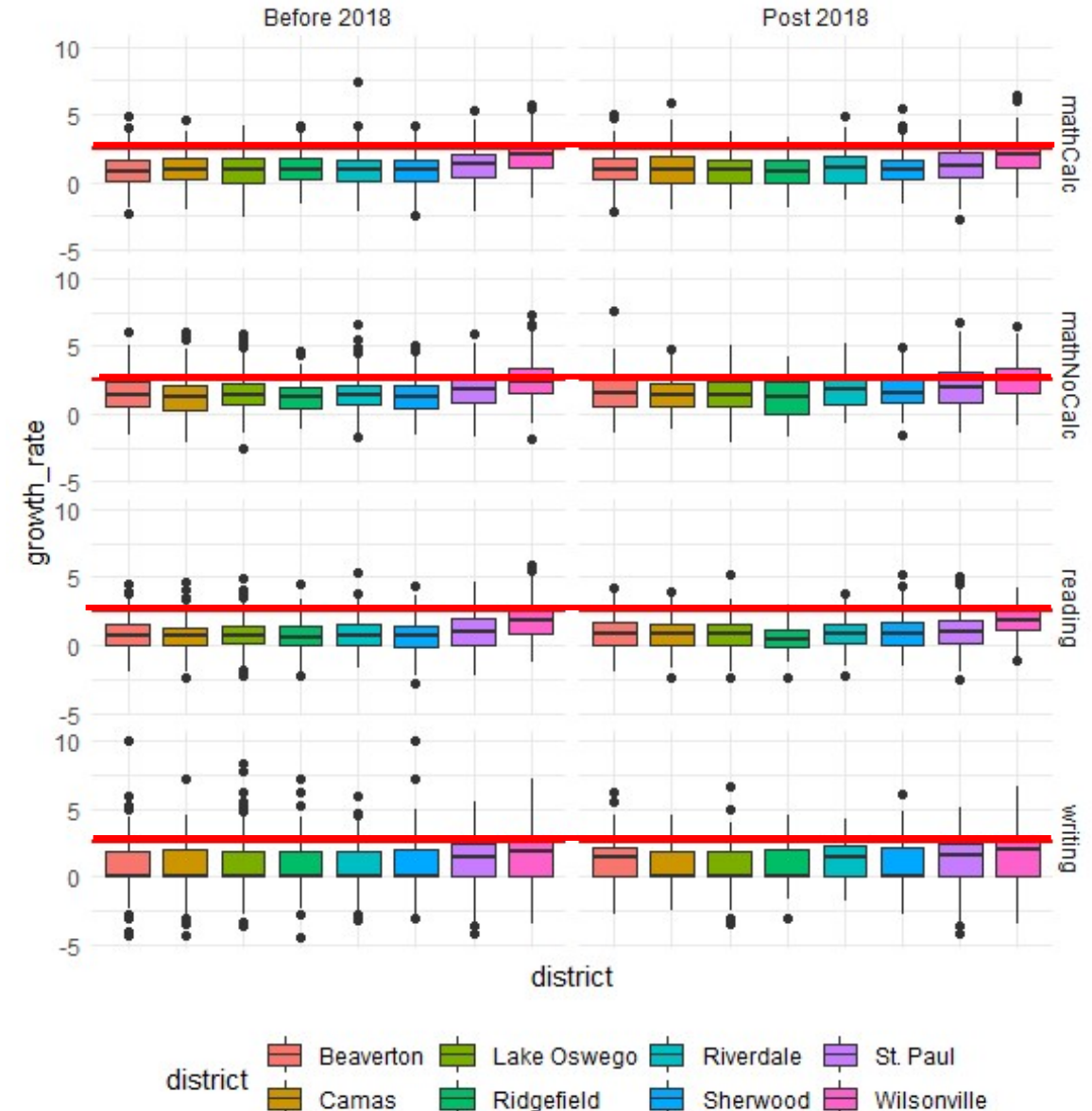
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