



Using Multiple Achievement Measures to Understand the Effects of COVID-19 on Student Learning

Leslie Keng and Scott Marion, Center for Assessment

Daniel Silver, University of Southern California

Presentation at the National Council on Measurement in Education (NCME) Conference
April 22, 2022



Research Objective

We conducted a comprehensive set of studies to help understand the effects of pandemic-related disruptions on students' academic performance to address this overarching research question:

To what extent have pandemic related disruptions influenced student achievement in Utah?



Research Questions

1. *(Participation)* Which students participated in assessments and other measures during the 2020-2021 school year as a proportion of the underlying school population?
2. *(Performance)* What was the performance of students who participated in assessments during the 2020-2021 school year?
3. *(Trends)* To the extent that matched samples can be constructed, what do the results of a “fair comparison” illustrate in terms of comparative performance between the 2020-2021 and 2018-2019 school years?

Research Questions

4. *(Learning Model)* Based on the analyses described above, what is the relationship of learning model (remote, hybrid, in person) to student achievement?
5. *(Opportunity to Learn)* What were the results of the various opportunity-to-learn (OTL) measures during the 2020-2021 school year?
6. *(OTL and Performance)* How does the performance observed from the analyses described above relate to OTL measures?

Methodology

Study Data and Analysis

Data Sources

- 2020-2021 enrollment and test participation data for RISE and Utah Aspire Plus (RQ1)
- Student achievement data for RISE and Utah Aspire Plus from 2016-2017, 2018-2019, and 2020-2021 (RQ2, RQ3 and RQ6)
- 2020-2021 COVID Impact Questionnaire (RQ4)
- Spring 2021 Opportunity to Learn Survey (RQ5 and RQ6)

Where feasible, we disaggregated our analysis results by:

- Grade level and content area
- Student demographics (race/ethnicity, SES, SWD and EL)
- Primary learning model (remote/in-person/hybrid)

Metrics

For RQ1 (participation) and RQ3 (trends), we used the three metrics proposed by Ho (2021).

- The metrics are intended to “advance the goal of accurate score interpretations and fair trend comparisons among schools and districts.” due to the impact of pandemic disruptions.

Match
Rate

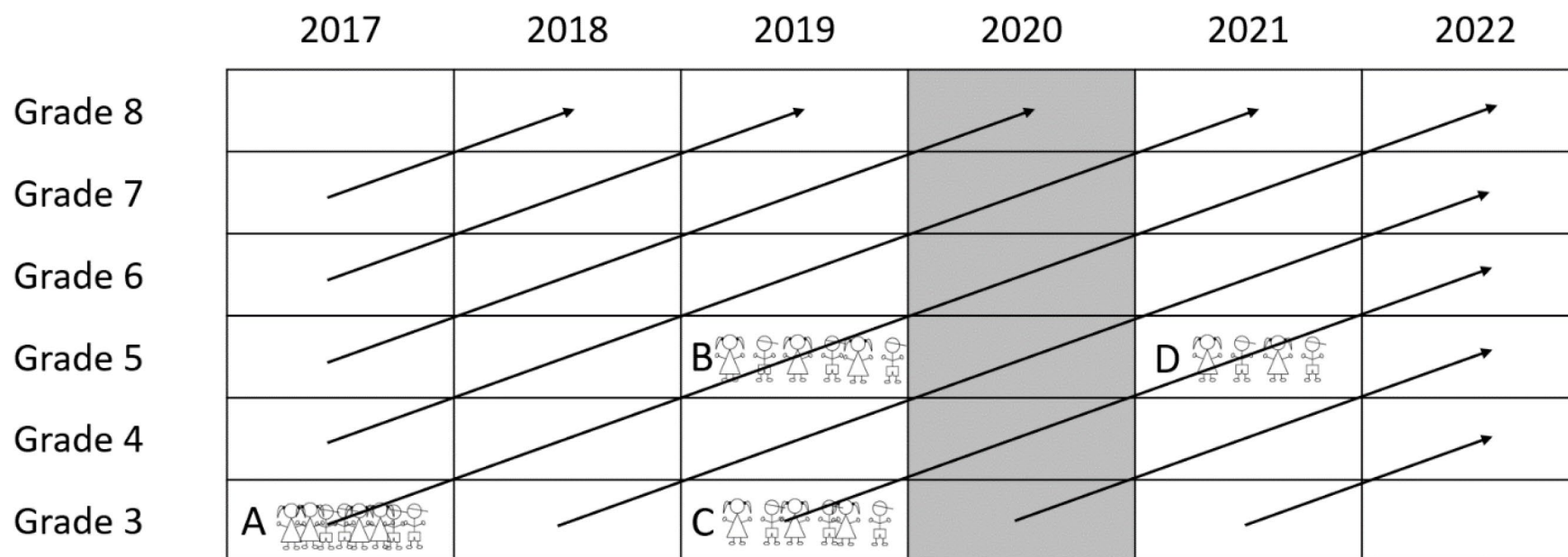
Fair Trend

Equity
Check

Ho's (2021) Three Metrics

| Metric | Question | Problem | Solution |
|-----------------|---|--|--|
| 1) Match Rate | What percentage of students have comparable test scores? | Students with comparable test scores are not representative of the usual tested population. | Prominently display the percentage of students with comparable test scores (and unusual declines in such percentages). |
| 2) Fair Trend | How much academic progress have students in 2021 made compared to academic peers in 2019? | Comparing 2021 academic proficiency to existing 2019 baselines confuses changes in populations with changes in proficiency. | Report progress compared to fairer 2019 baseline proficiency rates comprised of academic peers. |
| 3) Equity Check | What are best-case academic outcomes for students who do not have comparable scores? | We do not know the scores of <i>students who do not have comparable scores</i> . These may or may not be the most vulnerable students. | Report outcomes for academic peers of <i>students who do not have comparable scores</i> . |

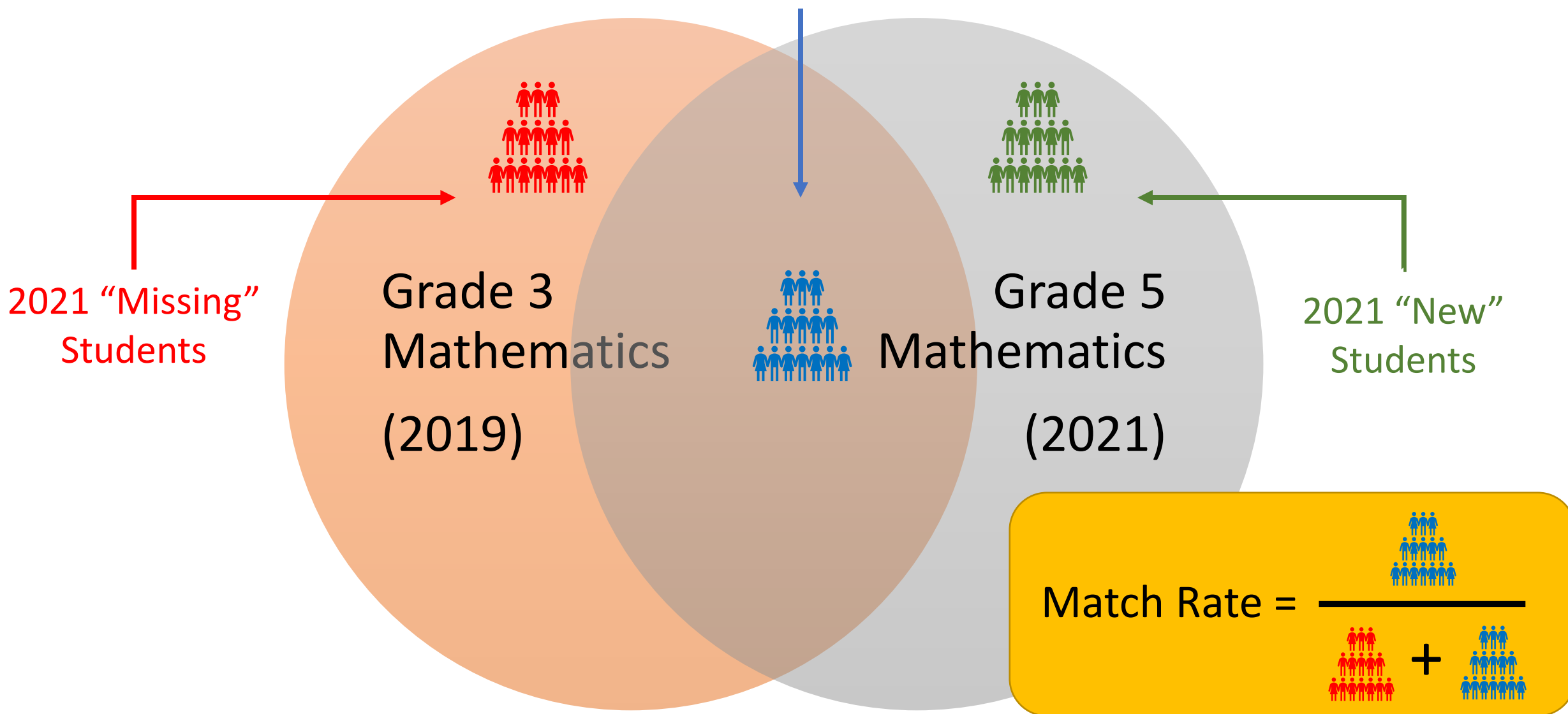
Match Rates



Match rate: % of students with comparable test scores

- % of students in Cell C also with scores in Cell D.

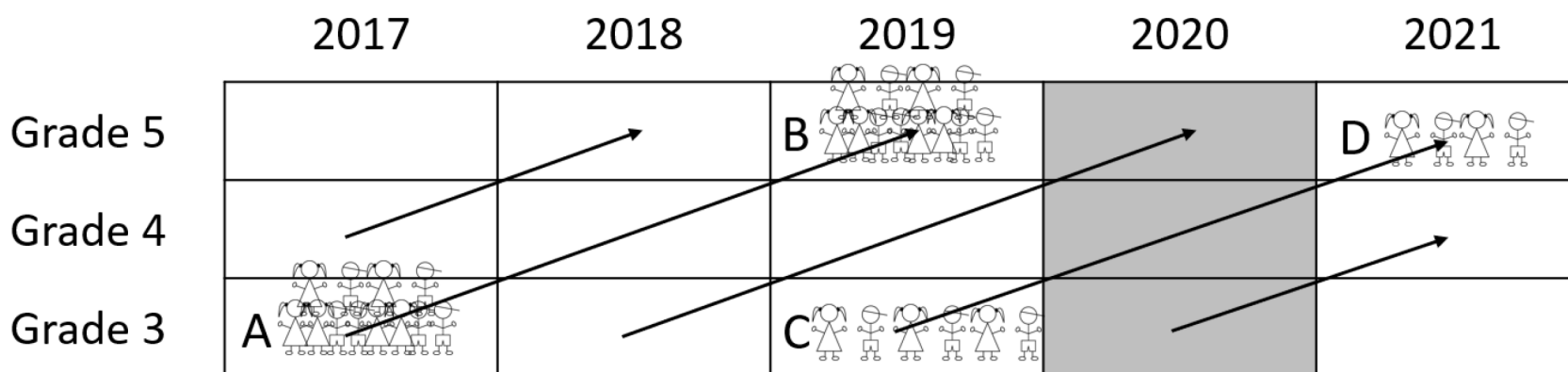
2021 “Comparable” Students (Students with comparable test scores)



Fair Trend and Equity Check

Fair Trend – how the “comparable” students would have performed *without* pandemic related disruptions

Equity Check – how the “missing” students would have performed *if they had tested* and *without* pandemic related disruptions



Findings and Conclusions

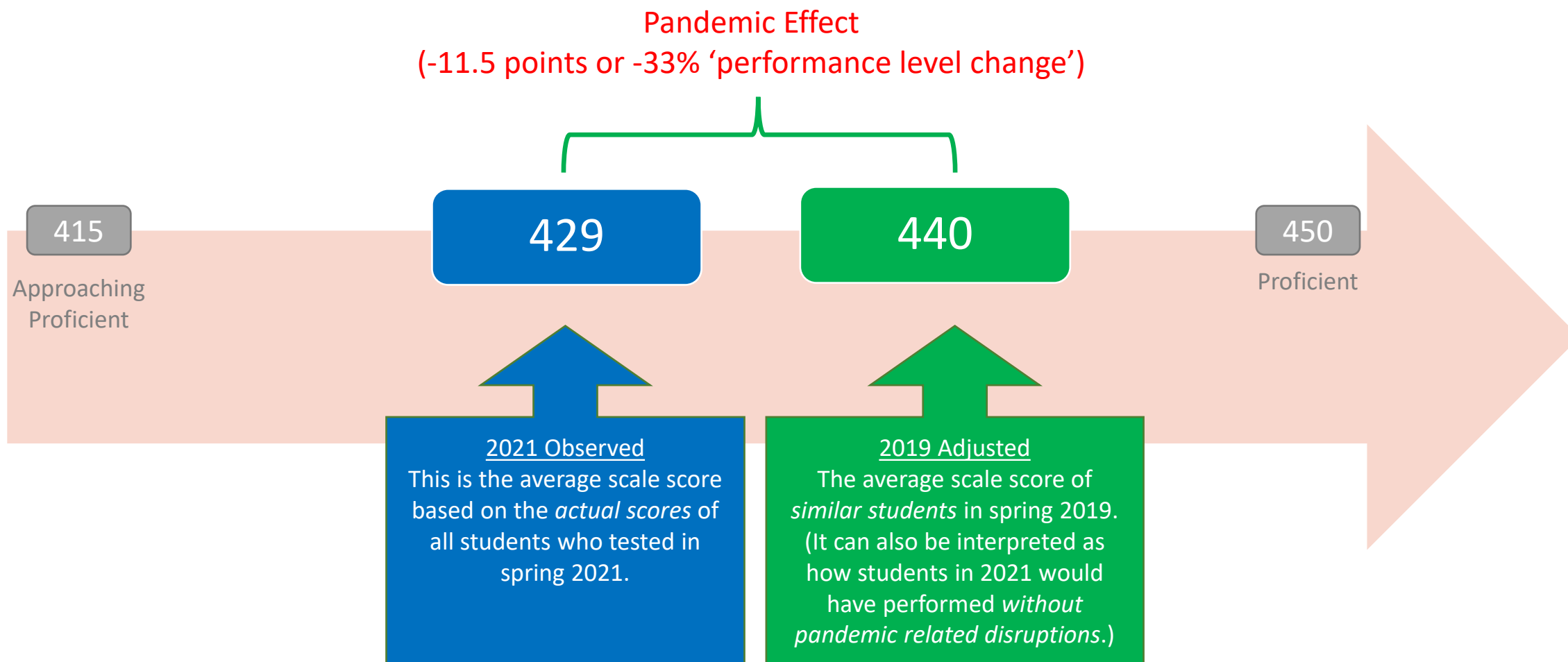
Key Findings: Participation

- Fewer students participated in 2021 compared to 2019 and this drop was substantial for historically underperforming groups of students.
- Therefore, it was critical that all subsequent analyses accounted for—to the extent possible—the non-representative differences in participations between 2021 and 2019.

Key Findings: Performance and Trend

- Across RISE and Utah Aspire Plus assessments, student achievement in 2021 dropped compared to 2019.
- This was observed for all students and for various disaggregated student groups in 2021 compared to 2019.
- Larger drops in achievement were observed for traditionally lower-performing groups.
 - This includes Black, Native American, Latinx, Pacific Islander, students from low-income families, students with disabilities and English learners.

RISE Grade 7 Mathematics (2019 vs. 2021)



| RISE | 2020-2021 <i>Observed</i> Avg. Scale Score | 2018-2019 <i>Fair Trend</i> Avg. Scale Score | Pandemic Effect | % Performance Level Change |
|---------------------|--|--|--------------------|----------------------------------|
| Grade 5 ELA | 387 | 399 | -12 | -25% |
| Grade 6 ELA | 415 | 436 | -21 | -54% |
| Grade 7 ELA | 426 | 434 | -8 | -17% |
| Grade 8 ELA | 446 | 456 | -10 | -19% |
| Grade 5 Mathematics | 368 | 378 | -10 | -39% |
| Grade 6 Mathematics | 400 | 411 | -11 | -31% |
| Grade 7 Mathematics | 429 | 440 | -11 | -33% |
| Grade 8 Mathematics | 466 | 480 | -14 | -27% |
| Grade 6 Science | 849 | 852 | -3 | -33% |
| Grade 7 Science | 849 | 850 | -1 | -11% |
| Grade 8 Science | 850 | 852 | -2 | -22% |

| Utah Aspire Plus | 2020-2021 <i>Observed</i> Avg. Scale Score | 2018-2019 <i>Fair Trend</i> Avg. Scale Score | Pandemic Effect | % Performance Level Change |
|----------------------|--|--|--------------------|----------------------------------|
| Grade 9 ELA | 199 | 201 | -2 | - 6% |
| Grade 10 ELA | 201 | 204 | -3 | - 9% |
| Grade 9 Mathematics | 195 | 202 | -7 | - 24% |
| Grade 10 Mathematics | 194 | 201 | -7 | - 27% |

Key Findings: Performance and Trend

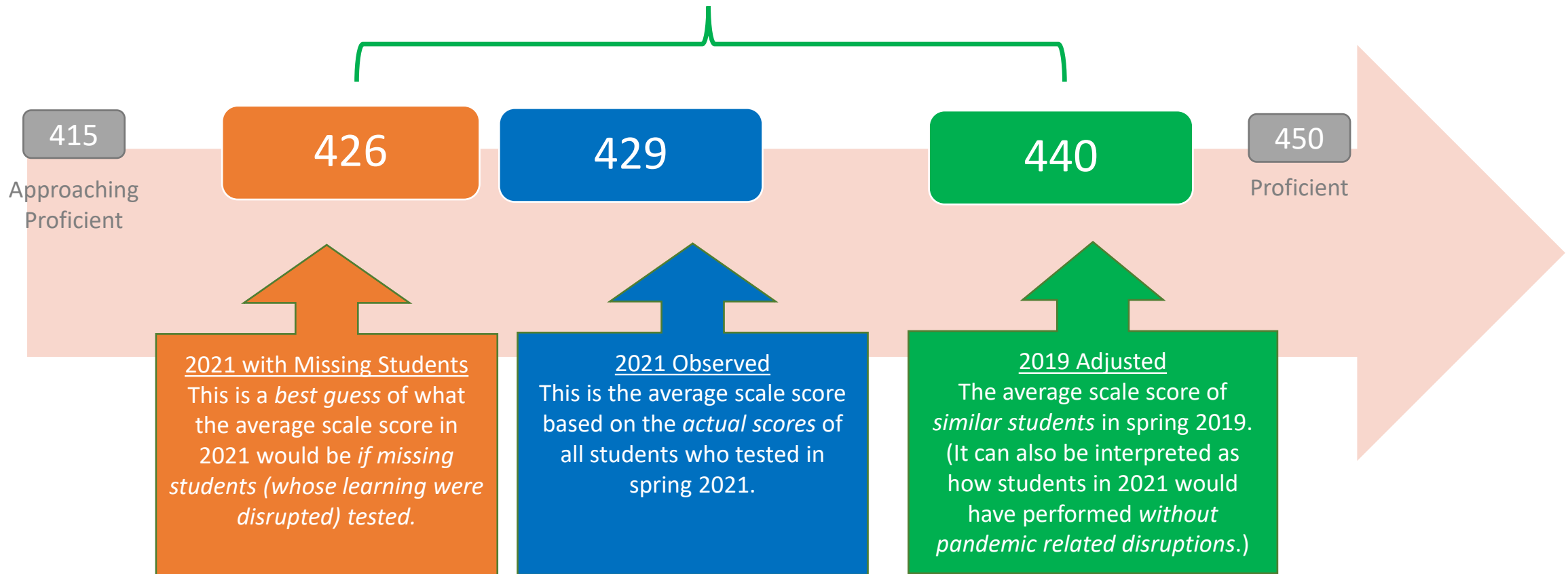
‘Missing’ students (those who participated in 2019 but 2021) were lower performing in 2019 compared to those who participated in both years.

Who were the “missing students”?

- For RISE: Higher: % of Native American students
- For Utah Aspire Plus: Higher % of Latinx, Native American, Black, and Pacific Islander students, as well as student from low-income families, students with disabilities, and English learners

RISE Grade 7 Mathematics (with Missing Students)

Pandemic Effect with Missing Students
(-14.4 points or -41% of 'performance level change')



Key Findings: Learning Model Trends

- Most schools were in-person or hybrid during 2020-2021.
- For RISE, the higher performing students appeared to have learned in-person or in hybrid mode.
- For Utah Aspire Plus, the higher performing students appeared to have learned remotely.

Achievement by Learning Model

| Learning Model | RISE | | Utah Aspire Plus | |
|-------------------|---------------|--------------|------------------|--------------|
| | # of Students | % Proficient | # of Students | % Proficient |
| Regular In-Person | 175,736 | 43.5% | 35,066 | 41.6% |
| Remote | 22,336 | 36.2% | 3,833 | 44.6% |
| Hybrid | 478,377 | 43.5% | 102,327 | 41.5% |
| Online School | 12,414 | 32.3% | 1,651 | 37.5% |

Note: The table above includes *student-level* statistics based on the primary 2020-2021 learning model of the school for each student.

Learning Experience: OTL Survey

Most of this school year I have attended school.

How many times were you quarantined and required to stay home from school?

I am satisfied with my learning this year.

Learning at school was harder this year due to safety guidelines like physical distancing or wearing masks.

Compared to a school year not affected by COVID-19 how much do you feel you learned this year?

I watched recorded lessons.

I joined live lessons with my teacher(s).

I used learning software or online programs such as Canvas Google Classroom etc..

I had access to individual help from my teacher(s) if I needed help with learning.

An adult in my household was available if I needed help with learning.

I had good internet access.

I had access to a computer or tablet that connected to the internet.

I shared a computer or tablet that connected to the internet with at least one other person in my home.

[USBE OTL Dashboard](#)

Key Findings: Learning Experience Trends

In general, higher performance on RISE and Utah Aspire Plus was associated with students who:

- Experienced more in-person learning,
- Quarantined less frequently,
- Had higher satisfaction with their learning,
- Did not find learning harder due to safety guidelines,
- Had ready access to teacher to support their learning,
- Had ready access to learning support from an adult in their household,
- Had ready access to good internet and an internet-connected device,
- Did *not* share an internet-connected device at home.

Conclusions

- Despite heroic efforts by teachers and leaders during the past two school years, the results reveal unprecedented impacts on both student participation and academic achievement on the Utah assessments.
 - For example, in some cases, we observe over two times the declines in student achievement in Utah compared to the effects attributed to Hurricane Katrina on students from New Orleans.
- The results are noticeably lower for students from certain racial and ethnic groups as well as English learners and students with disabilities.

Conclusions

- These findings must be interpreted along with other information, both local assessment and OTL indicators, to best determine the actions necessary to address learning disruptions.
 - State assessment results in 2022 will be an important source of confirmatory information.
 - In the near-term, educators and school leaders must rely on assessment information closest to the teaching and learning process to guide acceleration efforts.



www.nciea.org