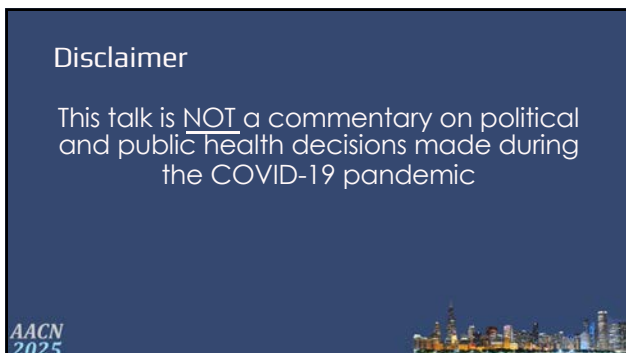


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Disclosure

Oxford University Press

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INTRODUCTION

- Spring 2020 school closures across globe impacted nearly 80 million students in the US (UNESCO, 2021) (image: Unicef)

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DURATION

- Huge variation by
 - state
 - location (rural versus urban)
 - public versus private

(Burbio School Opening Tracker, 2021)

- average of 58 weeks (UNESCO, 2021)

BUT 4-8 weeks in some areas, to more than a year in others (Burbio School Opening Tracker, 2021)

- Private opened faster even within same district (Miller 2020)

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Unicef report January 2021

<https://www.unicef.org/press-releases/children-cannot-afford-another-year-school-disruption>

“The cost of closing schools, which at the peak of the pandemic lockdowns affected 90 percent of students worldwide and left more than a third of school children with no access to remote education, has been devastating.”

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Definition of “closure” is not operationalized

- Virtual
- Hybrid
- In-person
- “Open” might be normal pre-pandemic schedules
- ...or just one day per week of in-person instruction in at least one grade

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One method of tracking closures:

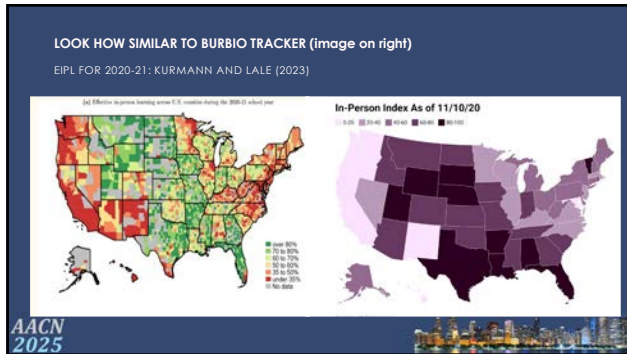
Effective In-Person Learning (Kurmman and Lale, 2023)

- Previous tracker studies had methodological issues:
e.g virtual vs hybrid
or availability of classes *but not uptake*
- This model used cell phone safe tracking mapped on schools to determine presence in schools
- In 2020-21, EIPL was lower for:
 - Public schools
 - Schools with larger share of non-white students
 - Schools with lower pre-pandemic test scores, lower ESSER funding
 - Schools in areas of higher affluence and education(ability to WFH? Risk perception?)

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“But schools were only closed a few months!”

- NAEP/Institute for Education Sciences 2021 survey of schools
- **HALF of 4th and 8th graders** were attending in person full time school in **MAY 2021**
- About **25-20% of 4th and 8th graders** were **FULLY REMOTE** in May 2021
- Racial disparity: 68% of white students in person full time, 41% Black, 45% Hispanic, 27% Asian
- Geographical disparity: California: 5% of 4th graders in person full time in May 2021 versus Nebraska: 93%

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Historical Educational Disruptions


- **Spanish Flu:** 80 days in only two major U.S. school districts (Smith, 2021)
- **Hurricane Katrina:** full year plus displacement (5 wks school lost; 20% lost 2 months; school reopening in affected areas @ 1 yr) (Hill, 2020; Pane, McCaffrey, Tharp Taylor, Asmus, & Stokes, 2006)
- **Hurricanes Irma and Maria hit Puerto Rico** in 2017; about ¼ of schools never reopened-mostly elementary and middle schools. (Katz, 2019)
 - children in high poverty areas disproportionately impacted: remediation consisted of increased workloads over shorter school days (due to power/water outages)

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- **Ebola:** Sierra Leone 2014-2015 radio programmed school; 2 short years with accelerated curriculum (Powers & AzzHuck, 2016)
- **War/Post-conflict societies:** e.g. Sierra Leone, 1991-2002: condensed/accelerated primary school>secondary school on time (Barica, Scillani, & Bonilla, 2017)
- **Syria:** ½ of the 1.5 million child refugees no access to education
- Extreme variability in complexities and duration

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Even brief closures linked to academic setbacks

Prolonged educational disruptions have been reported in localized areas e.g., a full year after Hurricane Katrina, associated with **lower academic achievement, with a disproportionately negative impact on marginalized groups**

Delayed routine healthcare, treatment disruption for those with disabilities, loss of school social services, and economic strain **exacerbate long-term effects** (Halgarten, 2020; Smith, 2021; P. Hill, 2020; Benner & Mistry, 2020; Wong et al., 2014)

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Three Interesting Historical Comparisons

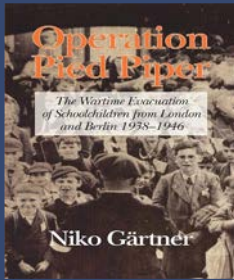


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ONE: Operation Pied Piper



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PIED PIPER

- 1939 evacuation of 800,000 British children from urban areas for safety from bombings
- Initially planned as 'camps' but costs led it to become more like foster family placement
- Messaging from govt as to obligations to send away children, anticipated benefits

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- This quote (Johnston 2021):

"It was simply taken for granted children would adjust to life....crisis of impending war drove the government to create evacuation as a solution...yet this generated another type of individual trauma which..was not regarded as a pressing issue."



Children wearing gas masks in 1940

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Spartacus Educational

- "...around a million children were now without schools. There were soon reports of increased acts of hooliganism..."
- "As well as losing their education, children from poor families lost their free milk and school dinners. Medical inspections in schools also came to an end and as a result there was a dramatic increase in the number of children suffering from scabies and headlice."

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Interesting historical tidbit:

Child evacuations in WWII led the psychoanalyst ANNA FREUD to open the HAMPSTEAD WAR NURSERIES for children impacted by war trauma

Studied the impact of traumatic separation on psychological adjustment and mental health

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TWO: Polio Epidemic: closures only a few weeks though!



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Interesting analysis: [Openculture.com 2020](https://www.openculture.com/2020/04/when-was-the-last-time-you-read-a-book.html)

- “Those who didn’t [have a radio] were left out, and school authorities had no way to track attendance”

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[illegible]

THREE: Brown v Board of Education

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[illegible]

THREE: Brown v Board (1954): Massive Resistance

- Attempts to resist desegregation led to shutdown of schools by refusing to fund public education
- In Prince Edward Co VA; Little Rock AK
- White children could use vouchers to fund private but no options for Black children
- In VA between 1959-63 about 1700 Black children had no public education


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Research later showed:

- Lower achievement test scores, language skills/reading
- Older students showed less educual attainment— less likely to return to school and entered workforce (SIMILAR TO WORLD BANK STUDY)

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Update:

2024 approval for scholarships for descendants of Virginians locked out of school during Massive Resistance


News

Virginia scholarship aiding those impacted by Massive Resistance and their descendants gets record funding

By David K. Johnson
Published May 22, 2024 at 10:15 AM EDT


1:29

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PRE PANDEMIC REMOTE LEARNING

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Billion dollar industry even before pandemic








E-Learning Market to reach USD 645 Billion in market size by 2030, growing at a CAGR of 13%: Straits Research

North America dominates the regional market and is estimated to reach an expected value of USD 76 billion by 2030 at a CAGR of 11.3%. The global e-learning market was worth USD 215 billion in 2021. It is estimated to reach an expected value of USD 645 billion by 2030 at a CAGR of 13% during the forecast period (2022-2030).

June 16, 2022 14:50 ET | Source: Straits Research

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PRE-PANDEMIC STUDIES ON REMOTE EDUCATION

Primarily focused on skill enhancement, higher education and training programs, rather than replacement of traditional classes in pre-school and elementary settings (Koc, 5 2005)

Previously identified challenges also encountered for remote learning during the COVID 19 pandemic:

access to technology and low student engagement, especially for low-income families and students receiving disability services (Fu, 2013; Kamenetz, 2020; Linne, 2014; Vekin, 2010)

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JUST LIKE “CLOSURE” HAD DIFFERENT MEANINGS, SO DOES “VIRTUAL”

- Hybrid instruction
- On/off days in school
- Remote instruction in the classroom setting
(STILL AN ISSUE due to teacher shortages: Elevate K-12)
- Synchronous
- Asynchronous (pre-recorded) presentations
- Learning Pods

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REMOTE STUDIES NOT GENERALIZABLE

No consensus definition of remote learning and programs have varied widely among schools (Wang, Towey, Ng, & Gill, 2021).

- Models: hybrid instruction, on/off days in school, remote instruction in the classroom setting, and synchronous as well as asynchronous (pre-recorded) presentations (Brady & Pradhan, 2020).
- Regional and state variability in the duration of remote learning, (MCH Strategic Data, 2021). “Opening” very broadly defined, from full pre-pandemic operations to at least one day of in-person instruction per week, in at least one grade (County of Los Angeles Department of Public Health, 2021).
- Private schools tended to return to in-person instructions more rapidly than public schools, even within the same district (Miller, 2020).

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EVIDENCE OF ATTENUATION OF LEARNING GAINS

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Why does it matter to neuropsychologists?


- Later life implications of early-life experiences well established
- Bidirectional relationship between academic skill acquisition and cognitive skill development (e.g. math and executive functions)
- Years of formal education may no longer accurately estimate learning
- Lower cognitive scores in adulthood may be misinterpreted as cognitive decline
- Pre pandemic normative data does not account for slower learning gains, psychosocial disruption that occurred
- Diagnostic challenges due to absence of instruction/slower gains

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First, a note.
Achievement scores were trending towards plateau or subtle decline in years leading up to pandemic

"The NAEP results make clear the failure of American schools to rebound from Covid. And despite the infusion of over \$100 billion in federal money to rescue American schools since the pandemic, there is no evidence of a turnaround."

Here you see where % below basic increased and % above proficient declined markedly around 2020, but trend was present

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Chart of the day from @ChadAlderman

"At the moment, American achievement scores are falling and gaps are growing, but it wasn't that long ago when the data were going in a much more positive direction."

A Tale of Two Eras

Source: National Center for Education Statistics, National Assessment of Student Progress (NAEP)

Again, this image shows how achievement was trending positively, turned down around 2013, then clear plummet 2019-2020

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NYT, Mervosh (2025)

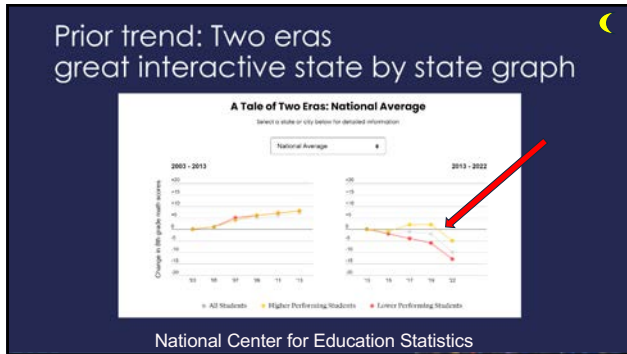
Most measured for LOWEST performers but not solely

Possible contributors:

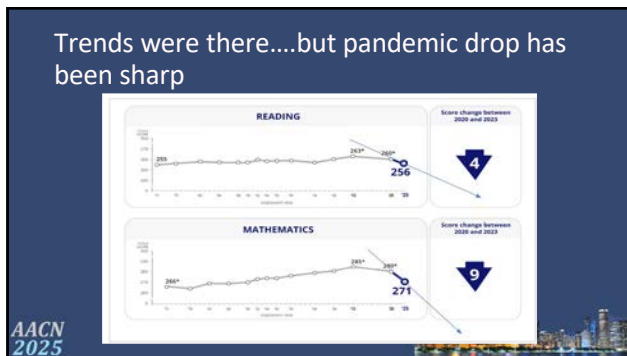
- Rise of cell phone use
- Great Recession
- School funding changes
- Curriculum changes
- Relaxation of school accountability measures

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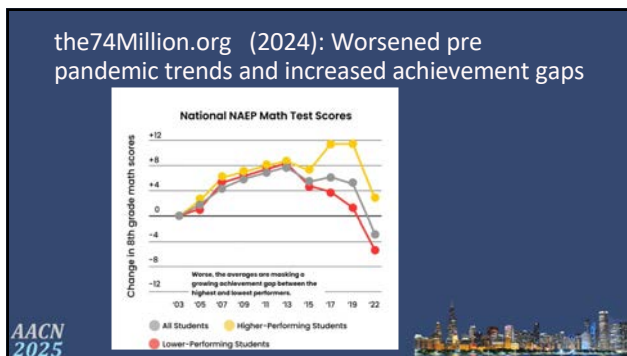
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HOT OFF THE PRESSES

Working Paper:
The Learning Crisis in the United States Three Years After Covid-19

GLO Discussion Paper, No. 1574

Provided in Cooperation with:
 Global Labor Organization (GLO)

Suggested Citation: Patrinos, Harry Anthony; Jakubowski, Maciej; Gajderowicz, Tomasz (2025): The Learning Crisis in the United States Three Years After Covid-19, GLO Discussion Paper, No. 1574, Global Labor Organization (GLO), Essen

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Patrinos et al 2025

Trends in International Math and Science

For first time, finding declines in MATH in 2023 TIMSS scores
“departure from the linear trend is uniquely large compared to results collected since 1999”

Thus, pandemic related educational disruption believed to underlie stark MATH declines, while trends in lower READING scores may have been present before pandemic

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Our thoughts on pre pandemic trends:

Pandemic school closures put the pre-existing issues on steroids; exponentially increased the problems

We advocate for new research and interventions and policy to avoid compounding damage or repeating ineffective actions

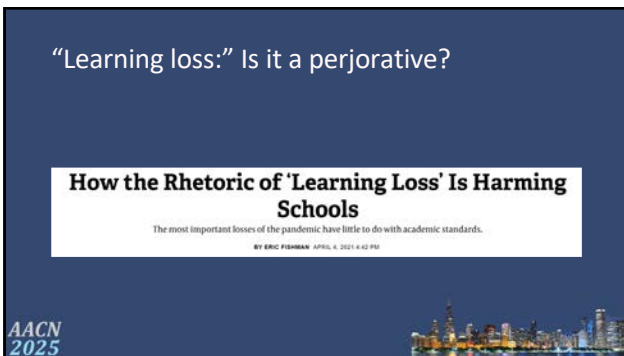
Sometimes it's hard to balance distaste for virtual or non traditional models with some intriguing and viable ideas. ****Keep an open mind. Demand data.****

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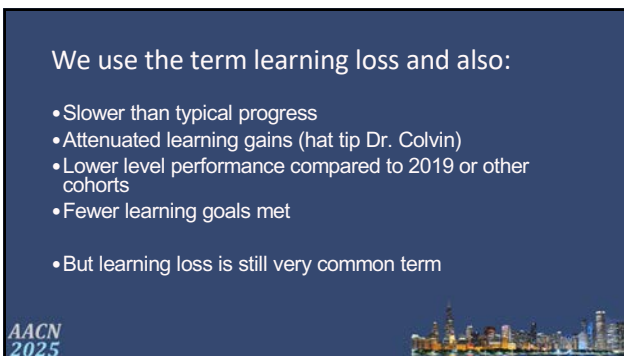
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Where are these data?
Surprisingly, not all in one place

- Think tank reports
- Not for profit research
- Professional organization papers e.g., NCLD
- Research studies (economists, education, psychology, etc)
- World Bank group
- Good groups at Harvard and Brown and Center on Reinventing Public Education (Arizona)
- School districts
- State testing
- National testing
- Investigative reporting

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Data now rolling in....

THERE IS ONE CLEAR MESSAGE

Greatest impact on:

- Students from low-income households
- Students with limited English proficiency
- Students of color
- Students with disabilities
- Consistent with prior research and earlier projections* & highly consistent across states and even other countries**

* (Bailey, Duncan, Murnane, & Yeung, 2021)
** (Di Pietro, Biagi, Costa, Karpinski, & Mazza, 2020; Engzell, Frey, & Verhagen, 2021; Maldonado & De Witte, 2020; Rose et al., 2021)


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- Attenuation of learning gains now extremely well documented and highly consistent across countries and states—and in some cases, still declining
- Longer closures associated with greater attenuation of gains
- Marginalized students, students of color, and those with disabilities show hardest hit, increasing gaps, lower remediation gains
- Achievement gaps between groups widening with a K-shaped recovery

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World Bank studies (Patrinos et al)

- Global learning loss at .33 of a SD in 2023 (World Bank)
- EQUIVALENT TO NEARLY ONE FULL YEAR OF LEARNING
- Range of losses from half year of learning to more than a year
- Varies quite a bit across states/districts but even in areas with shorter closures, some districts saw loss

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Kuhfeld & Lewis, 2025: Not good

Newest data in Brookings Institute study examine national and state level test data

Modest recovery in MATH, with full recovery predicted in 7+ YEARS

CONTINUED DECLINE in ELA/Reading

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In MATH, only 8% of states have shown recovery to pre pandemic levels.

In ELA, about HALF of states either show no change or show further decline

Very uneven recovery complicates data: lower performing students and longer-closure districts (which typically had greater numbers of vulnerable students/students of color) recovering more slowly, especially Hispanic students and those from lower income households


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“The pandemic created gaps that, under ideal circumstances, would take multiple years of intensive, high-impact interventions to close.”

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K-12 Dive: DIBELS data

Dynamic Indicators of Basic Early Literacy Skills

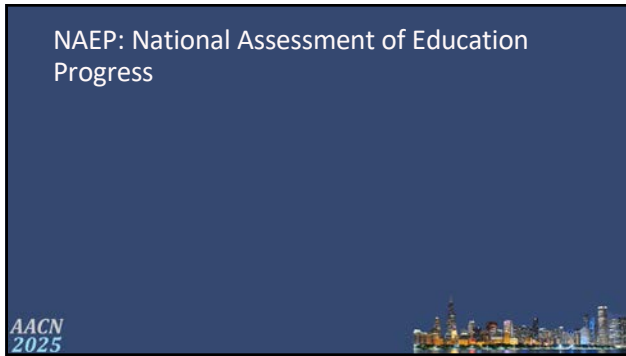
Mid-school year DIBELS assessment data

- Across K-2, only 56% of students are on track for learning to read.
- more than a quarter of K-2 students are far behind in early literacy
- fewer early elementary students far behind this school year compared to last

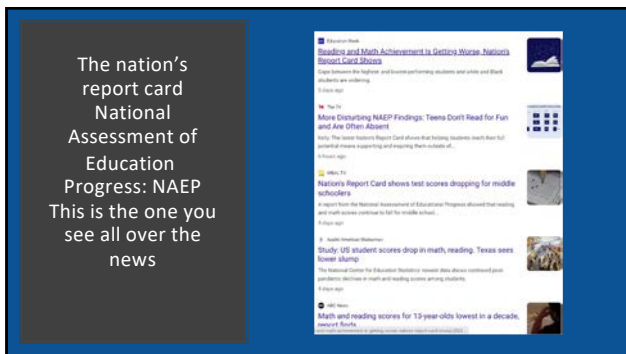
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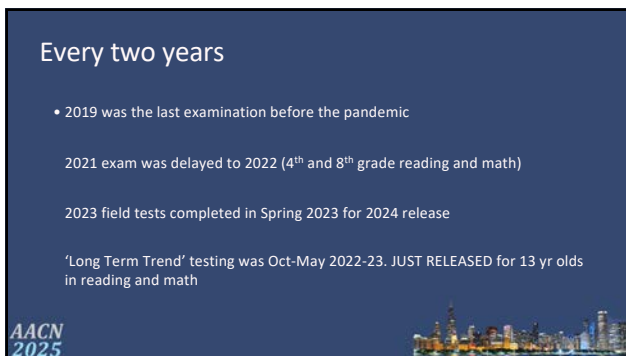
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2022 NAEP compared to 2019:

4th and 8th graders in reading and math

- **Largest ever decline in average reading scores** (5 points) and the **first ever decline in math scores** (7 points)
- **More 4th graders (25%) below basic level in math**
- Math scores **declined in all states**
- LOWER PERFORMING STUDENTS HAD FEWER REMOTE LEARNING SUPPORTS
- **Widening of pre-existing learning gaps** (e.g., the gap in math achievement between Black and White students increased by 8 points).

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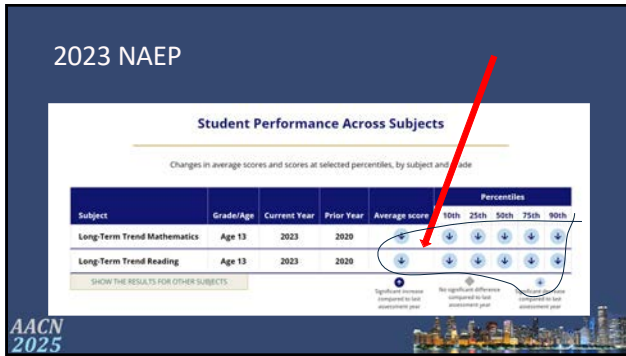
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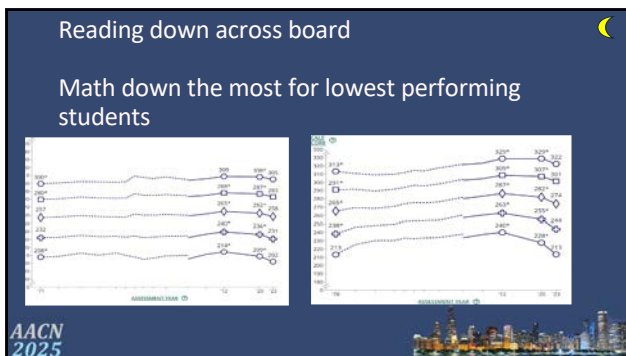
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Disparities exacerbated

- **Widened pre-existing gaps** for Black, Hispanic & American Indian students
- For example: 6 point declines for White students compared to 10-20 point declines for students of color in the same period

Also: for students of color, those with disabilities, those from economically disadvantaged households





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Montgomery County MD recently released 2022 data

MATH PROFICIENCY
2019: 42.5%
2022: 23%

That's bad enough—but for students of color, proficiency sank from 19% to 7-9%



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NEWEST NAEP RESULTS CAUSED A STIR



The 2024 Nation's Report Card to Be Released on January 29, 2025

Results will inform how our education systems are helping students make necessary gains in math and reading in 4th and 8th grades following steep score drops in 2022.

(Dec. 18, 2024, Washington, D.C.) The National Assessment Governing Board (Governing Board) announced today that the 2024 Nation's Report Card for the nation, states, and selected districts will be released on **January 29, 2025**.

The Nation's Report Card, also known as the National Assessment of Educational Progress, or NAEP, will report scores in math and reading for 4th and 8th grades. NAEP is the only nationally representative assessment of student achievement over time for the nation, states, and selected large urban districts.

Results will be available to the public on **January 29, 2025, at 12:01AM ET** at www.nationsreportcard.gov.



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How's this for analysis?

NAEP 2024

Washington Post article

"I don't know how many different ways you can say these results are bad, but they're bad. I don't think this is the canary in the coal mine. This is a flock of dead birds in the coal mine."

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NAEP 2024 NEW DATA

Dan Goldhaber: "5 alarm fire"..."risk of creating permanent group of students who may never catch up"

Jill Barshay: "The kids are not bouncing back."

Martin West, Vice Chair NAEP Board: "increase in inequality"

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More students scoring below *NAEP Basic*



*Significantly different from 2019 (p < .05) based on 2019-2024. NAEP is U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Education Progress Study. Reading assessment Grade 4 and 8, 2019 to 2024.

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NAEP 2024 NEW DATA

4th and 8th graders



Children in 4th grade were in Kindergarten as schools shut

Children in 8th grade were in 4th—learning to learn



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Thus, the new data were HIGHLY anticipated and important from a cognitive development perspective



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NAEP 2024 NEW DATA

Most large urban school districts have NOT recovered losses since pandemic. Including Florida!

TN and LA showed improvements-both had targeted recovery plans

Absenteeism still higher than 2019



75


NAEP 2024 NEW DATA

4th grade math has slightly increased—by 1-2 points

8th grade math “stable,” meaning increasing for higher achieving students—for lower achieving students, **BOTTOM IS FALLING OUT**

4th grade reading **NO RECOVERY**; 8th gr reading down for low

Students in lower quartiles have **WIDENING GAPS**—struggling most

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NAEP

In some schools “...students are reading more than a full grade level behind where they were pre-pandemic.”

Education

Virginia schools ranked dead last nationally in math recovery since pandemic, report says

The report says the loss is equivalent to 92% of the typical progress in math students make annually between grades 4 through 8.

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California: The Educational Opportunity Project from Stanford

AMAZING interactive maps and graphs like this:
change in average math scores from 2019-22 by % of yr in online learning

On left you see low remote areas like TX/FL, on right are places like VA, NJ, WA
Can see few areas improved, but concentration of lower scores in longer-remote areas

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Sometimes perplexing findings: California

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The New York Times

California Aims \$2 Billion to Help Students Catch Up From the Pandemic

A lawsuit accused the state of failing to provide an equal education to lower-income, Black and Hispanic students during the pandemic.

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State of CA settled a lawsuit agreeing to pledge \$2 billion in pandemic funds to help students recover

Focused on closures in 2020

About ONE FIFTH OF THE STATE'S PUBLIC SCHOOL STUDENTS did not have sufficient access to virtual education

"Some second-graders had online class only twice that spring; brothers had to share a single laptop, alternating to attend classes; a family living under the flight path for the Los Angeles International Airport had only a weak internet connection."

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Student math scores touch off 'five-alarm fire' in California
Analysis finds average eighth graders may have skills indicative of 5th grade

COVID's Missing Students: 48% of Kids in L.A. Are Chronically Absent This Year

2022 California standardized test results wipe out years of steady progress
Smarter Balanced scores dropped in math and English language arts

How Los Angeles Avoided National Academic Plunge During Pandemic
Nation's second-largest school district credits connectivity and teacher training for academic gains

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So.....How does LAUSD have better numbers than FL/SD?


After all, the state had

- highest chronic absenteeism in country
- -alarming reported score declines 2020-2022
- -large proportions of groups who have had disproportionate impact
- -longest periods of virtual, shown to correlate with losses

So why are they showing 'better' scores than places with LOWER absenteeism, scores, vulnerable groups, shortest virtual?

This is important because we'd want to REPLICATE approaches with good outcomes



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Some contributing factors to the numbers:

- Absenteeism rate doubled to 30 percent in 2022, massive enrollment declines
- Stanford scores include teacher ratings etc
- PROFICIENCY scores altered
- FEWER THAN 25% of students took the tests
- HUGE disparities in patterns of scores (e.g., low poverty areas vs high)



85





86

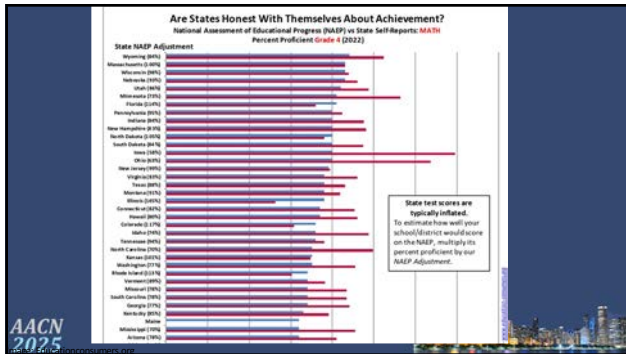
States have their own tests, as well

Beware—state testing may INFLATE proficiency results

The following chart shows **state proficiency rates (IN RED)** outpacing NAEP scores for that state **(IN BLUE)**



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State level findings

No comparisons to other years; tests often updated/alterd

Only 28% of third-graders are “at target” or “advanced” in mastering reading

Overall, Reading proficiency rose by 2.4%, math proficiency rose by 2.2%, and science proficiency rose by 1.7%.

BUT:
20-50+% achievement gaps between various groups like students of various ethnicities or lower income household students versus all students

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It appears younger students with developing language and reading skills have been more impacted than high school students

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Columbus OH city schools voted to lower academic goals (55% to 40% proficiency goals)



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Maryland

- 85% 7th graders below proficiency in Math
- AFTER remediation efforts
- Trend towards lower achievement was noted before pandemic but has been exacerbated



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Maryland MCAP (Moderately Maco 2024)

- In 9 districts of MD, fewer than 5% of students are "proficient" level in grade 8 Math
- MOST students in state public schools not proficient level in Math Grade 5 and 8

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Maryland

Targets lowered

- "The group set a target of seeing 63% of students in grades 3-8 marked as proficient in English Language Arts in the 2025-2026 school year.
-On Tuesday, the state board unanimously revised the target to 52% in 2025 and 57% in 2026 at the request of state education leaders."

94

Oregon 2024, Silverman (OregonLive)

- Despite 1.6 billion in pandemic recovery funds:
- 2/3 of a year behind in reading
- 1/4 of a year behind in math
- 2-3x greater loss and slower rebound than states with same length of closures like CA WA
- "we can't provide 60% of our students with one-on-one tutoring"
- Funds apparently were less often used on strategies with empirical support; instead used to shore up budgets/operations or things like smaller class size (did not work)

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MASSACHUSETTS

GAP

27% of lower income students met standards

vs

74% of higher SES students

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MICHIGAN


MICHIGAN M STEP: not required in 2020 or 2021

Marked decline in proficiency rates
ELA actually DOWN again, other subjects static

Report says being in the “learning to read” window when schools closed is associated with lower test scores—underscores our premise that critical windows would compound impacts of disruption

- This DESPITE Michigan getting the MOST recovery funds per student in US

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MacGillis 2023: Richmond VA

- “Richmond’s fourth through eighth graders had lost two full years of ground in math and nearly a year and a half in reading....
-Even more apparent was their difficulty with basic interactions — fifth graders hadn’t been in person since third grade; second graders, since kindergarten”

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NWEA MAP

NW Evaluation Association
Speaks to the importance of
timing, and critical windows

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NWEA MAP Growth

- 'Children in 4th grade when the pandemic hit lost at least a year of in-person learning, and transitioned to middle school during a chaotic period of teacher vacancies and rising absenteeism'
- '2023-24 results reflect the last tests administered before federal COVID relief funds run out'
Will there be further disruption?
 - 8th graders still more than a year behind in math and reading

100

SAT and ACT

SAT redesigned in 2016 but lower than in 2019

Interesting aside: SAT shows much higher graduation rates for those with the LOWEST SATs compared to earlier years

ACT lowest in 32 years

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International data

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Meanwhile.....

Early study out of Sweden (and a recent follow up) showed NO measurable learning loss for reading, even for children from disadvantaged homes (Engzell et al, 2021)

Sweden did not close elementary and middle schools



Hallin et al (2022) evaluated students in the Netherlands where there were brief closures (8 weeks) and *world's finest wifi access*
They found losses equivalent to 1/5th of a school year




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TIMSS Trends in International Math and Science

Got a lot of media attention recently
due to dire math declines






104

- SIGNIFICANT drop in MATH from 2019 to 2023
- Erasing progress made over last few decades
- Proportions of LOWEST performers 2-3x greater than in 2011
- Despite massive pandemic recovery funding

- US losses greater than other countries
- Lower performing students losing ground FASTER than peers—widened gaps
- New gender gap shown-- males> females scores

Via The 74million.org


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Nat Malkus on TIMSS

US math scores drop by 18 points for fourth graders and 27 points for 8th graders—huge declines on a scale where 30 points roughly equates to a year of learning

Test scores for some already declining before the pandemic (2011-15 or so)
 "...but in certain cases the pandemic made the achievement gap even worse."

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March 2025


The Learning Crisis in the United States Three Years After Covid-19

Harry Anthony Patrinos
University of Arkansas, IZA and GLO

Maciej Jakubowski
University of Warsaw

Tomasz Gajderowicz
University of Warsaw

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TIMSS data

"The losses amount to 0.36 SD for mathematics and 0.16 SD for science. (.20 SD is about 12 months of learning)

The average decline in mathematics performance among U.S. students is substantially greater than the global average.

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PISA: Program for International Student Assessment

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Math scores declined from 2018 to 2022
12 points or about 7 months of learning.

Larger declines for students with longer closures, and for lower-achieving students.

Countries with longest closures experienced losses of around .20 SD, about 12 months of learning.

For countries with shorter closures, learning loss is fairly equally experienced—but in countries with longer closures, learning loss greatest for lowest achievers.

Tabellini, M., Cristofolini, F., & Patrino, D. A. (2023). COVID-19, school closures, and student learning outcomes: New high-resolution time series from 2018 to 2022. *Journal of Public Economics*, 221, 104917. <https://doi.org/10.1016/j.jpubeco.2022.104917>

109

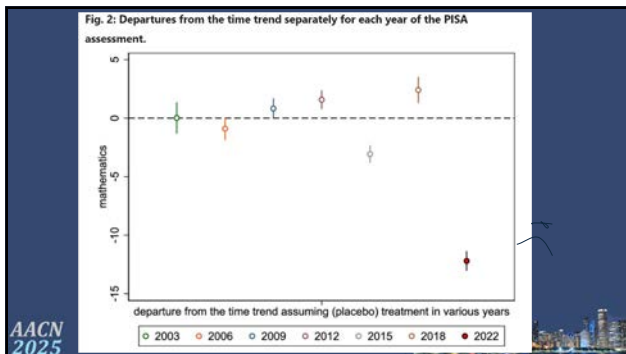
Patrinos 2024, on PISA scores

“Between 2018 and 2022, there was an average decline in scores of 14 percent of a standard deviation, equivalent to seven months of learning—*after controlling for pre-Covid trends*”

MAY TRANSLATE TO NATIONAL GDP LOSSES LONGER TERM

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One more thought:


- Remember: up to 750,000 students not represented in these data

If most of the students lost to system are the most vulnerable.....

....are these findings an UNDERESTIMATE of losses?




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Why so few angry parents?



114

- Underinformed about student progress
- Underinformed about district losses
- Data not transparent
- Parents not aware of compensatory services
- Litigation is costly
- Students age out of system before impact






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Nationwide, 80% of parents say their child is getting Bs or better

90% believe their child is at or above grade level in math

But standardized testing shows more than half below proficient!
(Gallup, 2023)






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WHY ASSESSMENTS
EXPLORE STATE DATA
TESTING 1-2-3 BLOG


Honesty Gap

The "Honesty Gap" is the discrepancy between what a state and the National Assessment on Educational Progress (NAEP) each consider to be "proficient."

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Up to 25-30+% discrepancies in state data and national tests in some states

"More states are lowering proficiency "cut scores" on their annual statewide assessments, obscuring student progress or lack thereof...

.....States that lower proficiency standards may show exaggerated gains..."

Next slide shows NAEP results released 2025, alongside state summative assessment data for 2023-24

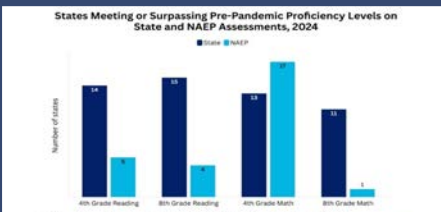
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There is discrepancy between NAEP and state testing results; states with lower proficiency standards may show exaggerated gains in standardized testing

States Meeting or Surpassing Pre-Pandemic Proficiency Levels on State and NAEP Assessments, 2024




Subject	State	NAEP
4th Grade Reading	14	3
8th Grade Reading	13	2
4th Grade Math	13	10
8th Grade Math	11	1

This graph reflects the number of states that have returned to or exceeded their 2019 proficiency levels on NAEP and state assessments. State assessment results should be interpreted with caution, as tests and proficiency cut scores may vary over time. Means and high scores did not provide grade-level data and are excluded on this chart. Select state scores are based on preliminary data.

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Future Ed



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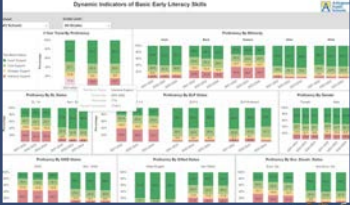
Lack of transparency/accessibility of data

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Example: Arlington data visual hot mess,
with *NO COMPARISON* to pre pandemic!



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Example: California

“Information about the state’s 5.8 million students and their schools is spread across at least five websites, each outfitted with dozens of filters, drop-down menus and color-coded graphics. That scattered approach to data transparency prevents parents from truly understanding how their children’s schools are faring — and taking action to improve them, according to a report released today.”

• *This speaks to the point that parents are not aware of losses at individual level*

<https://calmatters.com/education/12-education/2024/03/parent-data/>

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“I have a Ph.D. in education policy and I can barely navigate these sites. How do we expect a typical parent to access this information and make sense of it?”

— MORGAN POLIKOFF, PROFESSOR AT USC

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Even FL where schools opened rapidly, and transparency pretty good, testing has altered and data are difficult to interpret/compare to prior years:

Please note, the 2022-2023 results for the Florida Assessment of Student Thinking (FAST) and Benchmarks for Excellent Student Thinking (B.E.S.T.) End-of-Course (EOC) assessments are based on provisional achievement level cuts that are linked to each assessment's respective 2021-2022 reporting scale, as required by s. 1008.34(7)(d), Florida Statutes. Therefore, comparisons should not be made between the 2023 data and previous years' data. For 2023-2024 and beyond, scores will be reported on a new scale adopted by the State Board of Education October 18, 2023.

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Geduld, 2024

<https://www.the7million.org/article/new-report-special-ed-students-english-learners-face-greatest-setbacks/>

"One of our researchers started referring to this as ghosting," said Lake. "That the parents were being ghosted by their schools ... [and] not getting information about how their kids were doing academically."

"Ultimately, they felt blindsided when they found out just how far behind their children had fallen...."

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Alterations in Curriculum, Cutoffs, Grading Criteria etc

- Actual instruction time is lost with shutdown days and virtual format and other strains eg, loss of instructors
- This can result in reductions of curriculum content as noted with Maryland State Department of Education, 2020
- Like telling time and counting money for elementary students! 57% of math lessons omitted at some grade levels (Khan, 2021)
- This may continue to be an issue: some areas looking at cutting more advanced standards/curriculum for various reasons (eg, Boston, California)

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Example: Baltimore

State lowered benchmark for math proficiency from 46% to 37% and lowered ELA benchmark

Students missing more than a THIRD of classes still promoted

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Example: New Jersey
2022 Pilot study

- During its pilot year in 2022, 60.6% of students failed the reading portion and 50.5% failed the math portion
- They lowered the benchmark and called it "graduation-ready" not "college career-ready"
- So in 2023, 80.5% of NJ's graduating students passed 10th reading and 55% passed Algebra 1 or Geometry


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- Grade inflation
- Changes to standards required for pass/graduation
- Lower proficiency cutoffs
- Defer diagnosis or special services because 'due to closures not LD'
- Change test content and scoring
- New methods of calculating learning growth
- Make it nearly impossible to find data on learning loss


The effect of these changes is to mask declines, even if well-intentioned

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Is the tide turning? NJ Train station ad




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THE FREE PRESS

EXCLUSIVE: A High Schooler Graduated with a 3.4 GPA. He Couldn't Even Read.



Now, the Tennessee teen is suing his school district, Frannie Block reports.

By Frannie Block

02.12.25 — Education

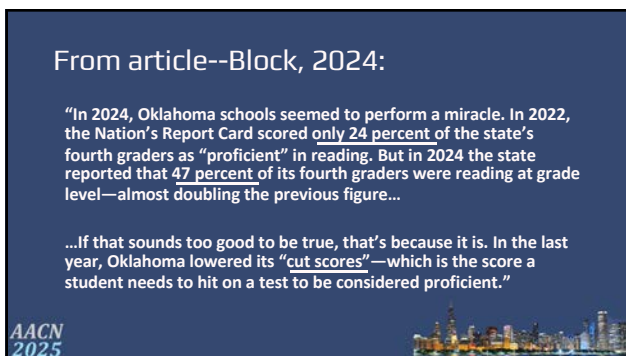
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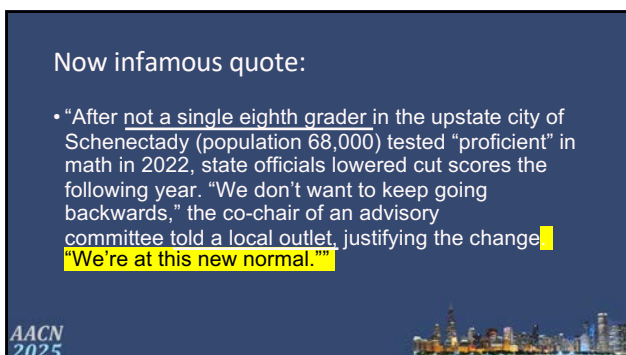
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Jacobson, 2024: Cost of lower cutoffs

“These assessments are how we help identify students for extra support and assistance,” she said. “Now there will be a lot of kids that aren’t going to be getting those high-dosage tutoring sessions or who aren’t going to be getting that additional support in math that they might need.”


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Delayed School Entry

**US kindergarten enrollment lags post-pandemic as families explore alternative early education options**

Once considered crucial in America for foundational skills, kindergarten is now viewed as less urgent by some parents

Associated Press

Published December 19, 2023 6:25am EST

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Delayed School Entry

- Compared to 2019, fewer elementary-aged children entering school
- Steepest drop in kindergarten
- Delayed entry seen more often in families with limited financial resources or in school districts that only offered remote learning
- As a result, those children, especially students of color, with limited financial resources and/or those in urban school districts, may enter formal schooling at an older age and may struggle to keep up (Goldstein & Parlapiano, 2021)

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FIGURE 1: PRESCHOOL ENROLLMENT DECLINED IN NEARLY EVERY STATE



<https://www.the74million.org/article/report-pandemic-erased-a-decade-of-growth-in-pre-k-enrollment/>

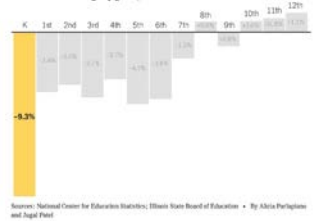
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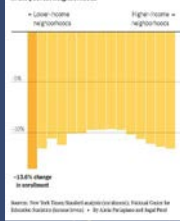
The Kindergarten Exodus by Goldstein & Parlapiano, *New York Times*, 8/7/21

Fall enrollment change by grade, 2019 to 2020



Sources: National Center for Education Statistics; Illinois State Board of Education. By Alicia Parlapiano and David Finkel

Kindergarten losses were deepest in schools in the poorest neighborhoods



Sources: New York Times Student Expenditure Survey; National Center for Education Statistics (enrollment). By Alicia Parlapiano and David Finkel

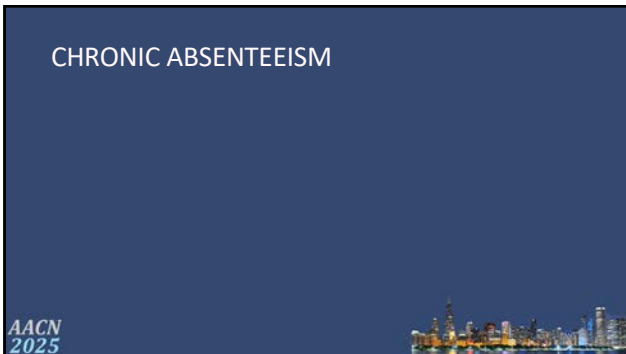
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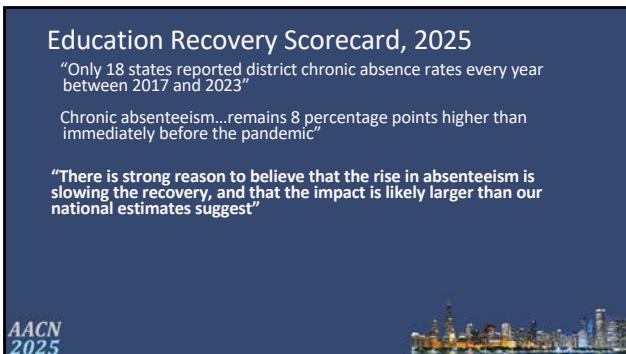
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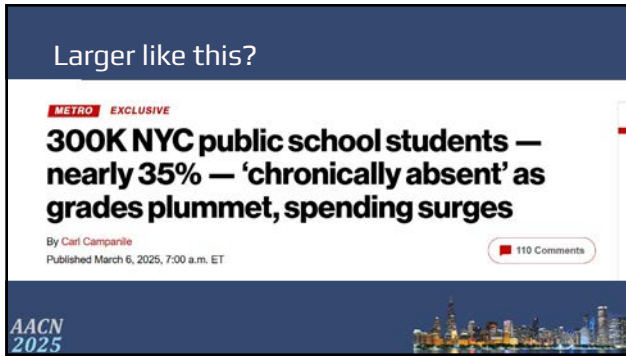
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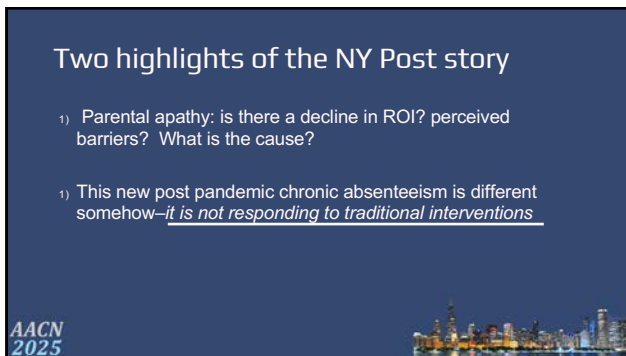
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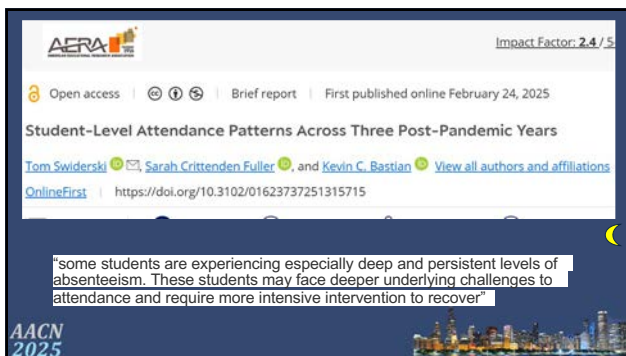
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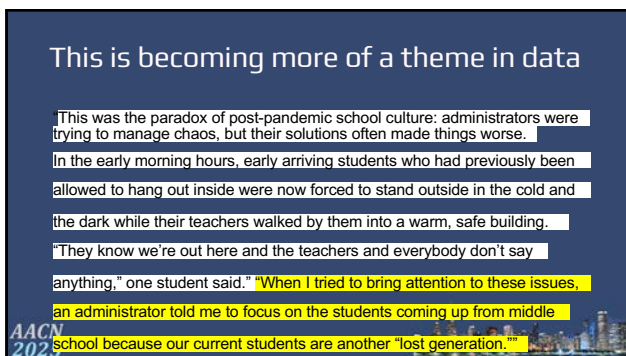
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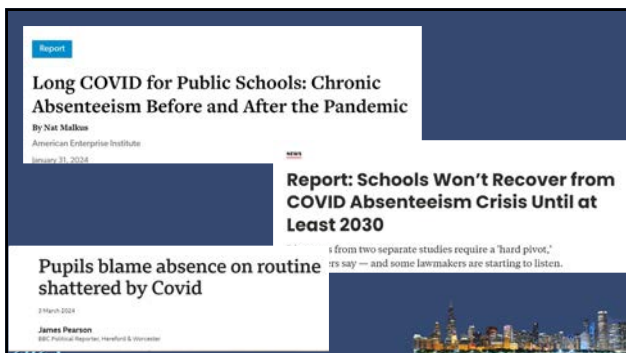
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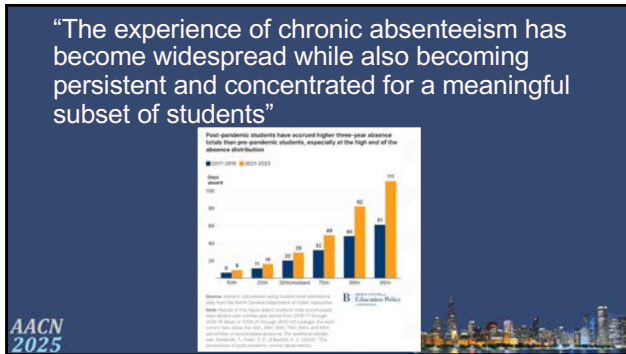
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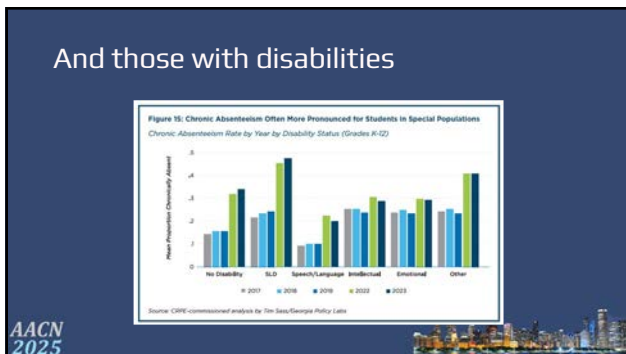
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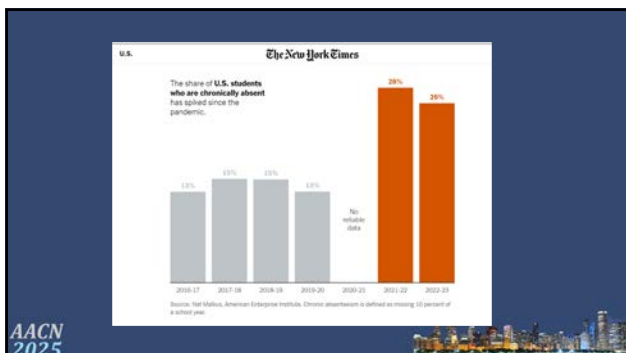
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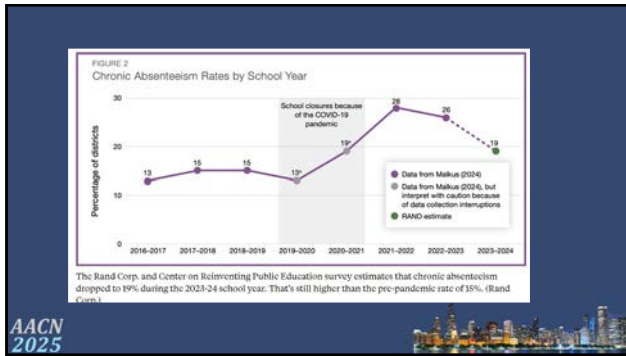
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- *Parental* apathy has been unanticipated complication
- Example: missing Fridays and Mondays
- Transportation issues eg, bus systems, gas prices
- <https://www.thefhillion.org/article/report-parental-apaty-blamed-for-rise-in-chronic-absenteeism/>

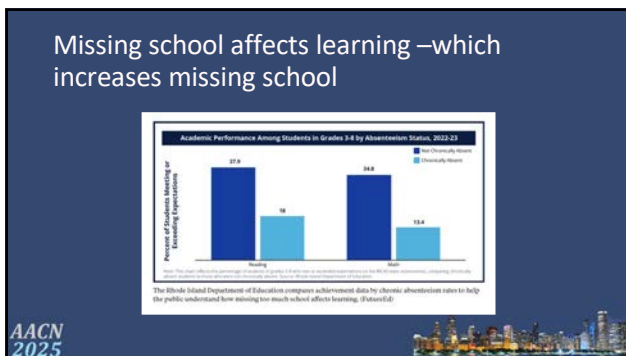
EDUCATION HUB Early childhood K-12 schools Higher education Meet the team

Transit nightmare: Thousands of Baltimore kids can't get to school on time

Liz Bessie and Gene Martin
3/16/2025 5:20 a.m. EST 43 WIREIMAGE

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Attendance Works noted:

- "Most but not all states include all absences when calculating chronic absence. Attendance Works advises against excluding absences, no matter the circumstance."
- "States continue to use widely varying definitions of a day of attendance for both in-person and virtual settings. The lack of a common definition of a day of attendance makes it difficult to interpret and compare data from districts within and across states."

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Goldman & Gracie 2024

- "Our results show that differences in attendance rates can explain up to one third of the differences in outcomes between students in high- and low-poverty schools,
- negative effects that persist into adulthood."

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Teacher Chronic Absenteeism Also!

the work

With No Chemistry Teacher, Chicago Student Teaches Her Own Class: 'They Forgot About Us'

At Clemente Community Academy, students are missing critical instruction time because of absent teachers. It's one of a number of CPS schools struggling because of a teacher shortage.

By Mina Bouni · September 11, 2024 · Updated September 12, 2024

Credibility: Original Reporting On the Ground Sources Cited

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Sparks, EdWeek (2025)

Teacher shortage has rebounded
Still chronic low staffing for science and special education positions
Persistent staffing challenges for schools with high poverty rates

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Interesting theory Bienen & Kennedy, 2023, City Journal

- “Indeed, poor student behavior before the pandemic may have been an under-discussed driver of prolonged school closures. In March 2020, teachers suddenly found themselves freed from the exhausting, frustrating, and occasionally frightening need to manage students’ behavior. While many teachers will admit that Zoom school was awful, it had one major benefit: a new behavior-management tool—the mute button.”

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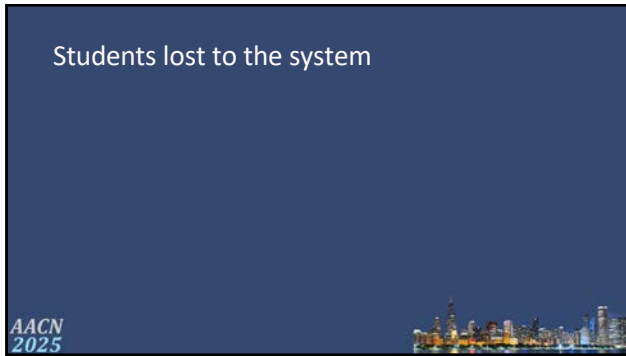


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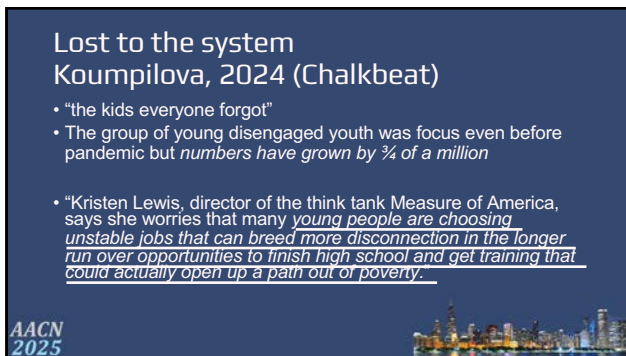
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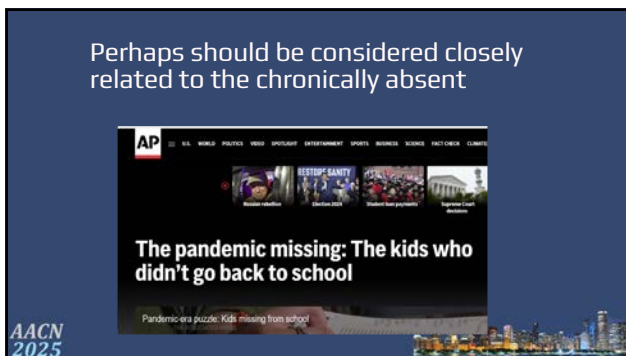
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The pandemic-era puzzle: Kids missing from school

Pandemic-era puzzle: Kids missing from school

2023 AP and Stanford report found that....

230,000

eligible students missing from school enrollment.

Didn't move. Didn't enroll in private education. Didn't home school.

They are not accounted for in the NAEP data.

NAEP 2025

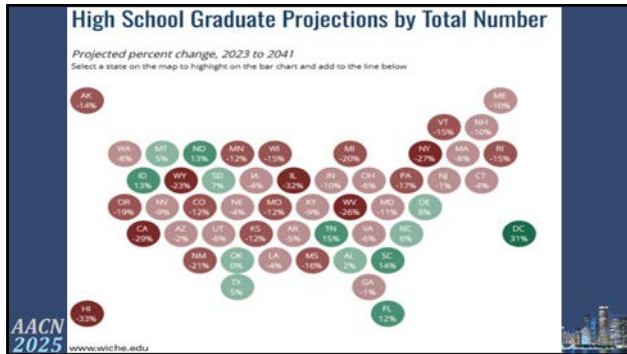
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[illegible]

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The 74million: pre and post pandemic projections

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ASIDE FROM THE HUMAN COST, THERE IS AN ECONOMIC ONE

- Budgets are based on school attendance—facing misallocated funds and/or massive budget shortfalls
- Already some concerning signs schools are less than interested in reporting high absenteeism:
 - NJ reported 100% attendance during pandemic, in contrast to other methods of reporting
 - WA state designated 'mental health absence' days requiring no documentation at all
 - In Maryland (MCPS) schools reported incorrect absentee data (e.g., did not remove chronically absent students; student data system defaults to "Present")

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"San Francisco is canary in the fiscal cliff coal mine"

How Does a School District Go Broke With \$1.1B in Revenues? When It Spends \$1.3B

absenteeism. With a state takeover of its budget and declining student enrollment, San Francisco is the canary in the fiscal cliff coal mine.

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San Francisco

- Used one time federal relief to pay for staff so have to lay off
- Has not adjusted for declining enrollment/budget
- Poor attendance tracking leads to budgetary poor projections
- Poor fiscal management/staffing levels to juggle mammoth funding

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REMEDICATION - where are we now?

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ESSER FUNDS

\$200 Billion sent to states' public, private, charter schools




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Road to Recovery Project

4 districts, 340,000 students
Schools serving greater % of marginalized group students than average
Looked at tutoring, small group, digital, extended learning...

"served few students and had minimal (if any) positive effects on student achievement"

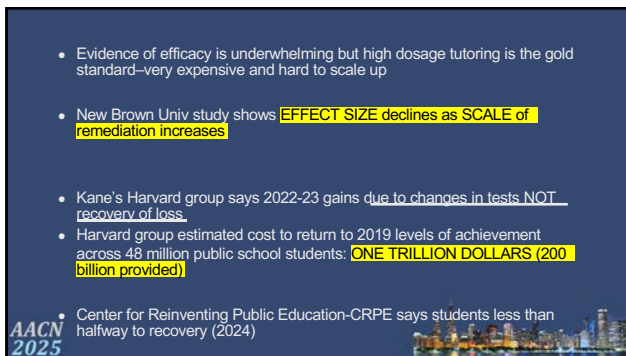
"To catch up, student learning will need to move at a faster pace than it did prepandemic."

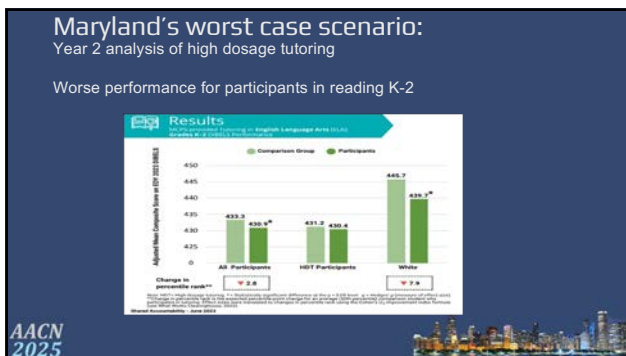
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Has English learner recovery stalled?



- Villegas, 2024
- Proficiency rates ranging from 1-9% for English learners in four urban centers
- Some methodological issues—like English learners eventually leave that group so higher scorers exit data
- Lots of diversity in data (age, level proficiency, grade, etc)
- Chronic absenteeism is huge challenge



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GOLDHABER, ET AL, ATTEMPTED TO ESTIMATE COST OF RECOVERY

Alarm bells: they estimate schools could provide HIGH DOSAGE TUTORING TO EVERY STUDENT and still not make up for pandemic loss



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GREAT RESOURCE for state by state

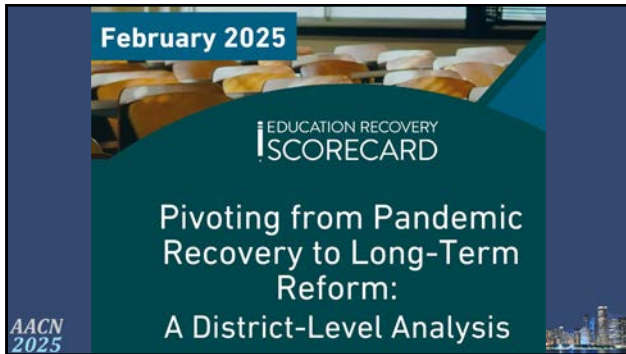
Academic recovery for school districts in 43 states

Click on a highlighted state below for more information.

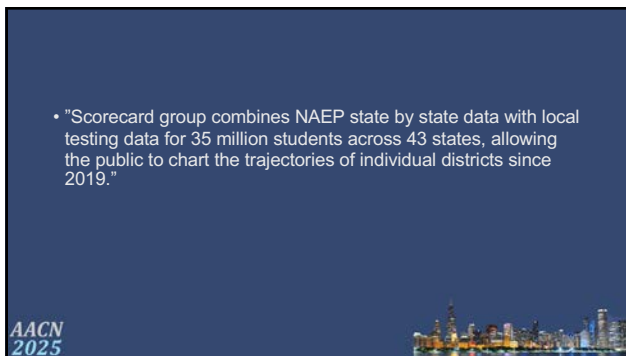




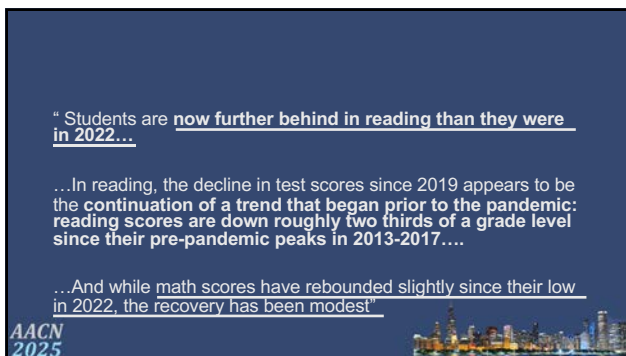
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Continued..

"As of Spring 2024, the average U.S. student remained nearly half a grade level behind prepandemic achievement in both math and reading."

"The highest income... districts are nearly 4 times more likely to have recovered in both math and reading than the lowest income... districts"

"Student achievement grew more in districts that spent more on academic interventions, such as tutoring or summer school"

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Center for Education Policy Research,
Harvard
Educational Opportunity Project, Stanford
NWEA
Dewey, Fahle, Kane, Reardon & Staiger 2025

- "94 percent of elementary and middle schoolers live in districts that still have not returned to pre-pandemic levels in math and reading..."

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Continued...

- "Given all the money that's been spent, and the fact that students already lost ground between 2019 and 2022, you would have expected that there would be some bounce-back in reading," Kane said. "But no, actually. Students continued to lose ground, especially at the bottom end."

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Continued....

- “Set against the continuing fall in literacy, a slight rebound in math scores — about one-tenth of one grade level since 2022 — represents most of the good news.”
- There was positive impact of federal ESSER funds in poorer communities, ...”prevented an even greater freefall in learning,” but noting there were higher-impact ways to speed recovery

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Continued...

“ 14 percent of the richest districts (i.e., those where household income is higher than in 90 percent of other places) have returned to 2019-era learning in both math and reading, compared with less than 4 percent of the poorest districts.” (!!)

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Good example of modest ROI

With federal funds now expired, and no new federal appropriations on the horizon, ESSER's final impact can begin to be measured. For every \$1,000 spent per student between 2022 and 2024, the authors estimate, math scores increased by roughly .005 standard deviations (a scientific measure showing the distance from the statistical mean).


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Mississippi, Tennessee, Louisiana all stand
outs for impacts of remediation efforts

Referred to as the “Southern Surge” in early reporting

Some of these areas had implemented pre pandemic changes to
curriculum and reading protocols

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2025 San Francisco Chronicle


NEWS

**Mississippi's education miracle: A model for global literacy
reform**

By Harry Anthony Patrinos, University of Arkansas
March 26, 2025

f x t e

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A ‘poor’ state with high % of vulnerable
students

Specifically, stats suggest MS rebound from reading literacy crisis

2013 Literacy Based Promotion Act

Phonics, fluency, vocabulary, reading comprehension foci

repeat 3rd grade if achievement progress goals unmet (similar to TN
plan)

ALIGNED WITH NAEP TEST


Students gained about a year of progress

Retention >>higher ELA scores in 6th grade

Progress/higher scores associated with longer term economic
gain/state income

Can this plan be generalized?

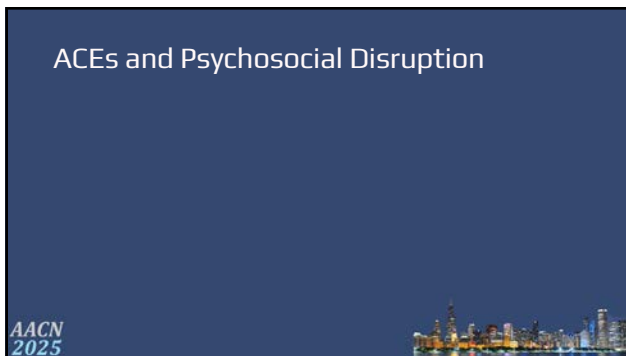
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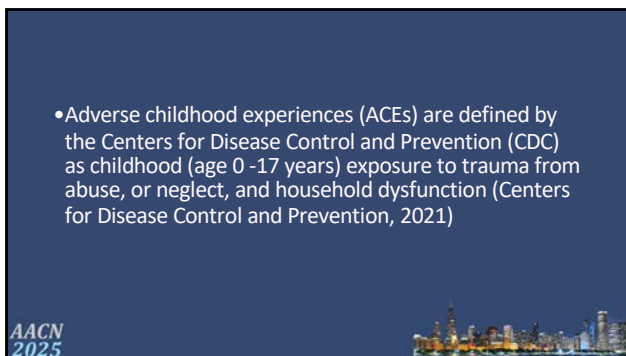
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Adverse Childhood Experiences

- Earlier data showed increase and we predicted this would impact later life functioning
- Annie E. Casey Foundation report (2024)
- "Today 2 in 5 or 40% of kids have experienced at least one of what experts call adverse childhood experiences – trauma such as the loss of a parent from incarceration, divorce or death; housing or food insecurity; exposure to violence or substance use; and forms of abuse. In Mississippi and New Mexico, half of children experienced such trauma, according to 2021-22 data."

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- ACE risk has been greater during the COVID-19 pandemic due to increased household economic instability, parent stress, neglect, and maltreatment (Sahle, Ofori-Asenso, & Renzaho, 2020; Sonu, Marvin, & Moore, 2021).

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- Reduced pandemic period access to family support from child welfare and juvenile justice systems (Absher, Maze, & Brymer, 2021)
- Child abuse and domestic violence may have been more likely to go undetected without reports from school officials and reduced home 19 visits from state welfare agencies (Fegert et al., 2020; Sharma et al., 2021).

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Psychological/Mental health

Increase of depression and anxiety among children and adolescents after the onset of the COVID-19 pandemic in Europe: a systematic review and meta-analysis

Helena Ludberg-Wall¹, Indra Darnheim², Lisa M. Pfadenhauer³, Jörg M. Fegert⁴, Martin Bujard⁵

→ More details

Popul. Med. 2023;50(supplement):A1064

• DOI: <https://doi.org/10.1032/popmed/151428>

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Dose response relationship: Stringency of disruptions/closures and increases in mental health challenges

- "Effect estimates were considerable higher, when pandemic-related restrictions were more stringent or school closure occurred"

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PEDIATRICS Content Authors/Reviewers Collections Multimedia Blogs

Volume 152, Issue 5
November 2023

ARTICLES | OCTOBER 20 2023

Pediatric Mental Health Emergencies During 5 COVID-19 Waves in New York City **OPEN**

Deborah A. Levine, MD  F. Stephen Orr, MD; Katherine A. Nash, MD; Will Simmons, MPH; Zachary M. Grinspan, MD, MS; Erica L. Abramson, MD, MS; Shari L. Platt, MD; Cori Green, MD, MS

Address correspondence to Deborah A. Levine, MD, Department of Emergency Medicine, Weill Cornell Medicine, 525 E 68th St, 607.30, New York, NY 10065. E-mail: cori@leone@med.cornell.edu

Pediatrics (2023); 152(5): e2022090553
<https://doi.org/10.1542/peds.2022-060553> Article history

204

Wild data: Ferwana I, Varshney LR. 2024

- The impact of COVID-19 lockdowns on mental health patient populations in the United States.
- Mental health data from 7 million users/insurance dataset
- Age 1 to 90 included

205

- Lockdowns increased the usage of mental health facilities in regions with lockdowns *in comparison to regions without such lockdowns.* (KNOW YOUR EXAMINEE'S HISTORY!)
- Usage increased by 18% in regions with a lockdown compared to 1% decline in regions without a lockdown, female>male.
- **"Mental health was more sensitive to lockdowns than to the presence of the pandemic itself."**

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Global Burden of Diseases Study 2021

- 11.8% increase in new cases of mental disorders ages 5-24
- Anxiety disorders leading cause of disability
- Depressive disorders rose to 4th place
- Especially for FEMALES
-and higher SES groups (interpret with caution, various factors)

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Psychological/Mental Health

- Orben, A., Meier, A., Dalgleish, T. *et al.* Mechanisms linking social media use to adolescent mental health vulnerability. *Nat Rev Psychol* **3**, 407–423 (2024).
<https://doi.org/10.1038/s44159-024-00307-y>
- Includes Dr. Blakemore -- at the forefront of mental health impacts of pandemic for youth

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Similar to our theory of interaction between developmental period and educational disruption

- "...we review mechanisms by which social media could amplify the developmental changes that increase adolescents' mental health vulnerability.....changes to behaviour, such as sharing risky content and self-presentation, and changes to cognition, such as modifications in self-concept, social comparison, responsiveness to social feedback and experiences of social exclusion. We also consider neurobiological mechanisms that heighten stress sensitivity and modify reward processing."

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Reduced Social Connectedness

- increased social isolation
- decreased opportunities for peer networks/social learning
- fewer opportunities to model behavior OR compare child behaviors
- decreased exercise, increased screen time, sports disrupted






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Relationship between Social Connectedness and Mental Health CDC ABES Study, 2021

School Connectedness	Close	Distant
Poor Mental Health during Pandemic	28.4%	45.2%
Poor Mental Health during Prior 30 Days	23.5%	37.8%
Suicidal Ideation	14.0%	25.6%
Suicide Attempt	5.8%	11.9%

https://www.cdc.gov/mmwr/volumes/71/wonder/7103a3.htm?_g_chE=97103a3_w

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

Substance Use, Misuse, and Abuse

Temple, et al (2022)
 Herzig, et al (2023)
 Lamar, et al, (2021)

Large-scale longitudinal studies of adolescents (N=1,188) - negative change in family finances increased alcohol use in adolescence

Adolescents experiencing COVID-19 negative life changes more likely to initiate cannabis use

Increase in parent problematic alcohol use in March/April 2020 (witnessed by children)


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School-Based Mental Health Services

- Schools are a primary provider of mental health services, particularly for youth with public insurance, from low-income households, or of color
- Schools offer individual counseling/therapy, case management, and referral to outside mental health services
 - 77% decline in students referred for mental health services in MA

<https://www.aacn.org/press-releases/aacn-action-to-address-childhood-mental-health-issues>
<https://www.aacn.org/press-releases/aacn-action-to-address-childhood-mental-health-issues>
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<https://www.aacn.org/press-releases/aacn-action-to-address-childhood-mental-health-issues>


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Has psychological dip reached nadir?

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The Economist

Weekly edition The world in brief War in the Middle East War in Ukraine United States The world economy Business Artificial Intelligence

United States | Glow-up

Young Americans are getting happier

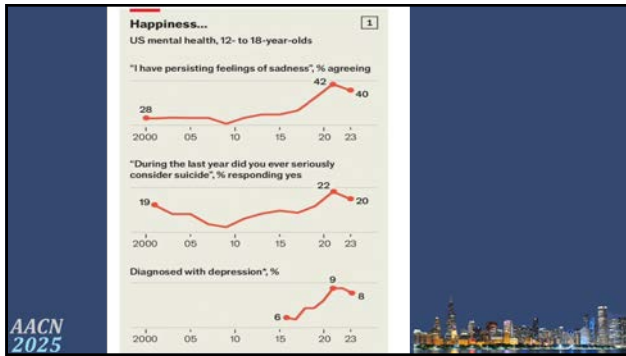
Depression and anxiety seem to have peaked a couple of years ago



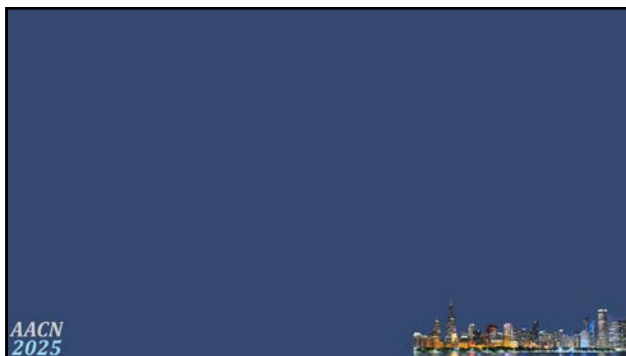
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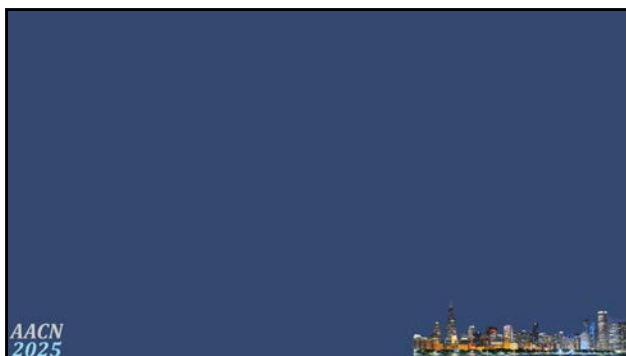
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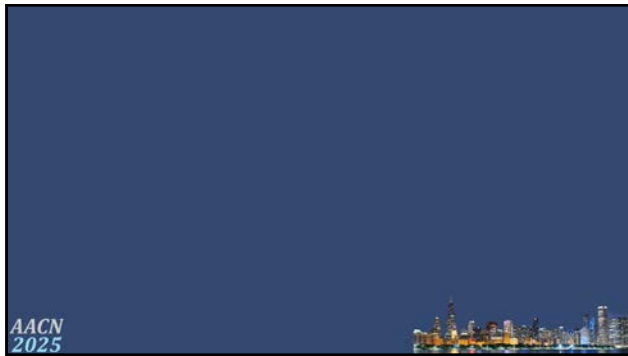
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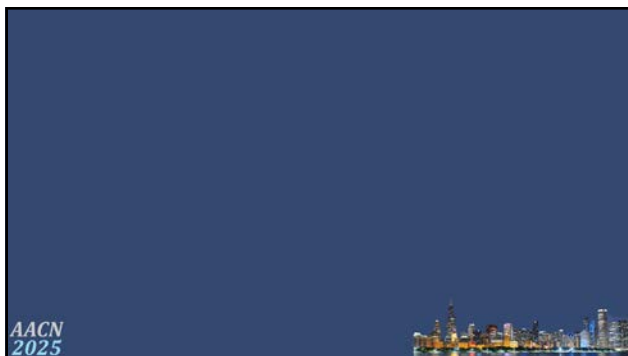
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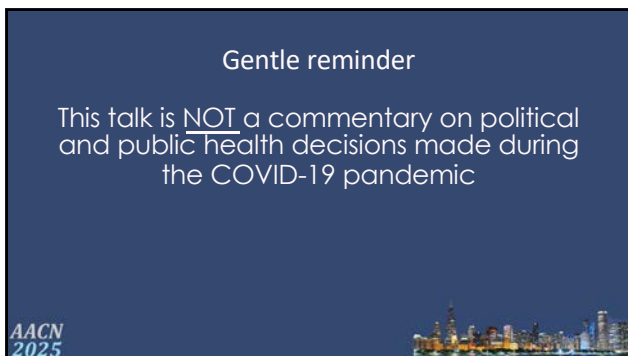
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DOE: Efforts to shutter the department

<https://fordhaminstitute.org/national/resources/960-why-secretary-mcmahon-shouldnt-waive-federal-testing-requirements-charles>

Recent big concern has been waiving of test requirements, data collection

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Recommended reading for potential DOE closure

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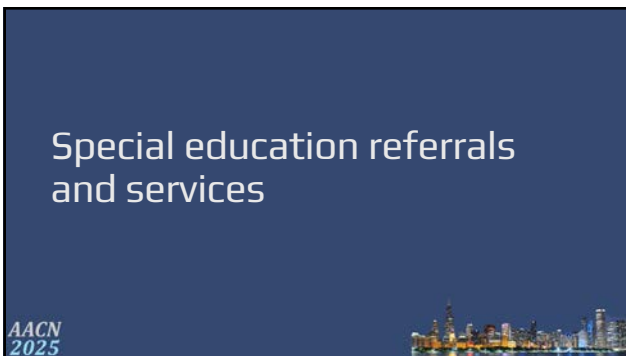
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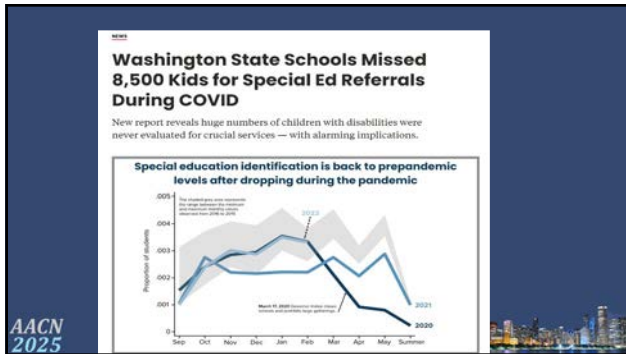
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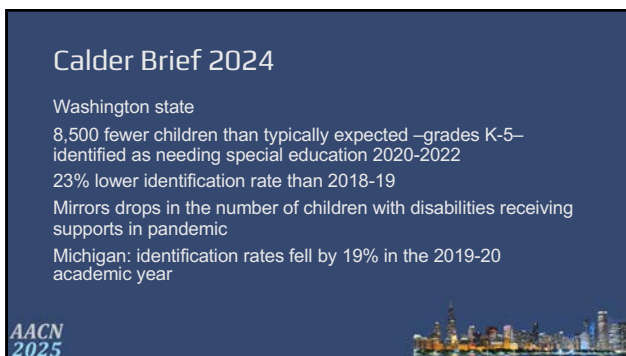
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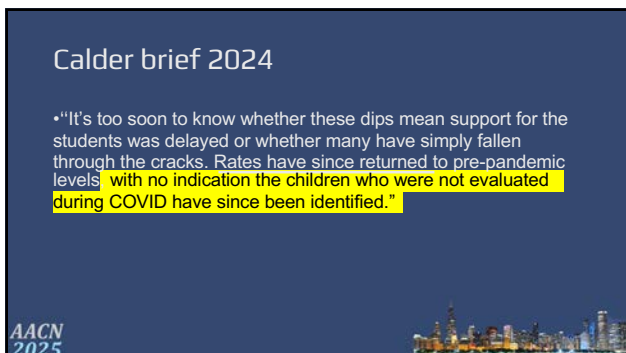
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Why is early referral/ID important?

JOURNAL ARTICLE EDITOR'S CHOICE

Early access to language supports number mapping skills in deaf children

Kristin Walker, MA, Emily Carrigan, PhD, Marie Coppola, PhD

The Journal of Deaf Studies and Deaf Education, Volume 29, Issue 1, January 2024, Pages 1-18, <https://doi.org/10.1093/deafed/enad045>

Published: 20 December 2023 Article history

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Journal of Deaf Studies and Deaf Education

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Article Contents

Sign language delays in deaf 3- to 5-year-olds with hearing parents

The Journal of Deaf Studies and Deaf Education, enad043, <https://doi.org/10.1093/deafed/enad043>

- Unexpectedly high rates of language/cognitive delays in children of deaf parents and also children of hearing parents
- Important to be able to identify which children may have actual language delays rather than in catch-up made in learning ASL/exposure to home modeling
- No pandemic related analysis reported (data represent span from 2016-2022 ratings)

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Cochrane Trusted evidence. Informed decisions. Better health.

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Cochrane Evidence Synthesis and Methods


Do early intervention programmes improve physical and mental development in babies born too early?

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Review of 44 studies and 5000+ babies born preterm

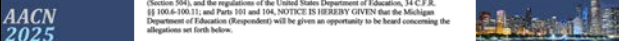
- 'Early developmental interventions improve mental development at the preschool age'
- But the pandemic cohort enters school age without that bump in mental development, **which may impact learning trajectories**



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Michigan federal investigation






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"For example, one parent told MDE by email that their child's school district was not able to provide any speech services other than emailed handouts during the spring of 2020 and 'offer[ed] nothing over the summer so that kids with IEPs will not obtain specialized help for about 6 months.'

...Another parent emailed MDE to report that their daughter's school was saying they are unable to accommodate her IEP if she is in virtual learning," that she received no one-on-one time with her special education teacher, and that "[t]his is all against what she has in her IEP and the school is saying they can't accommodate the IEP."



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Special education teacher shortage

•<https://www.the74million.org/article/at-special-ed-teacher-shortage-hearing-panelists-debate-dismantling-ed-dept/>

•In 2023, 21% of schools were not fully staffed in special education

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Case examples

Illustration in medicolegal and clinical work

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In Medicolegal practice...

<p>"Jeremy"</p> <p>Birth injury litigation; 7 year old</p> <p>Small for gestational age, required intubation on delivery</p> <p>Bilateral parietal-occipital hemorrhagic infarction (MRI 1st week of life)</p> <p>Bilateral sensorineural hearing loss</p> <p>Left exotropia; microcephaly; right hemiplegia</p>	<p>Timing of evaluations- underwent independent evals pre-2020 & 2022; clinical eval in 2021</p> <p>Opportunity for direct examination of progress and impact of disruption</p>
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Jeremy - medicolegal example

Disruption

- Special education preschool program closed in March of 2020
- Not permitted for full return to school until fall of 2021
- Hearing aid use declined/inconsistent during virtual learning/intervention (data logging of HA use)
- Multiple sources of "minimal to no" progress during virtual learning

Challenges

- Assessment measure selection
- Interpretation of results in light of noteworthy disruption of needed/necessary intervention

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Strategies to Address Challenges

At least mention it!

Sample validity considerations:

"Of note, all measures administered represent comparison to children that have not experienced prolonged educational disruption, as there are no existing tests normed on children that have experienced prolonged educational disruption. This was considered in interpretation of Name's present performance and comparison to previous results."

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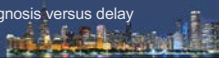


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Medicolegal considerations

- Significant risk with not mentioning and considering educational disruption in pediatric (and adult) medicolegal matters and interpretation of findings
- Disconnection from real life experience of juries, who also experienced that disruption
- Masked versus unmasked assessment results for those with hearing loss/HA use
- Challenge with ID diagnosis
 - Must demonstrate consideration of sensory access
 - Intervention and typical instruction access
 - Important considerations for timing of ID diagnosis versus delay

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Elisa

7yo white female

Repeating 1st grade

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Referral & Psychosocial Hx


Referred for evaluation by occupational therapist

- In interview, parents reported pediatrician visit that had told them she did not have autism, citing intact language skills (age 3)
- Left-handed
- Lives with parents and younger brother (2 years); parents note younger brother surpassed her with appropriate greeting skills (hi and bye to others)
- Fam hx: left-handedness, motor clumsiness resembling Elisa's, sound sensitivity, psychosis
- Significant psychosocial stressors related to pandemic, limited family support

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Medical Hx

- Chronic constipation beginning at entry to preschool
- Medications: Mirilax daily; bowel clean out ~ 2 months
- Toileting/soiling accidents
- No currently scheduled f/u w/GI
- Diet: restricting foods - stopped eating meat in 2020, skipping lunch

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Elisa - Educational History

- Preschool entry (private) age 3 - noticed "behind" socially, shy and nervous around new children, less interactive than others
- Preschool teachers referred to ChildFind; classroom observation, evaluation begun - then preschool closed & pediatrician not concerned
- Zoom preschool - Elisa could not engage
- Kindergarten - homeschool attempted, limited social opportunities
- 1st grade - small, private school - "overwhelming"
- School staff recommended repeating 1st grade, parents agreed
 - Play difficulties, overwhelm
- Has been asked to stay home on PE days at her current school
- No concerns with math/reading

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Consider the Impact of COVID-19 Pandemic on Development and Access to Education and Special Education Services in Case Conceptualization

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2024-2025	2020-2021	2021-2022
Current grade	Grade when school last shut down in spring 2020	Grade when school last shut down in spring 2021
4th year college	11	12 (only have had graduation outside of parents on campus)
3rd year college	10	11
2nd year college	9	10
1st year college	8	9
12	7	8
11	6	7
10	5	6
9	4	5
8	3	4
7	2	3
6	1	2
5	K	1
4	Pre-K/Preschool	K
3	Pre-K/Preschool	Pre-K/Preschool
2	Preschool/Daycare	Pre-K/Preschool
1	1 (prequel about childcare situation)	1 (prequel about childcare situation)
Kindergarten	1 (prequel about childcare situation)	1 (prequel about childcare situation)

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Previous Evaluations

Occupational therapy

Developmental coordination disorder - receiving OT 1:1 services; engaging well

OT Goals: Improve texture tolerance, fine motor control of pencil, motor coordination (intoeing); engages in social skills group at the OT practice at time of evaluation

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Elisa - Observations



Photo of examiner taped to her shirt

Some sound substitutions

Gassy, audibly passing gas, denying pain, did NOT want to use clinic bathroom

Intoeing bilaterally, clumsy, poor trunk control when seated

Strong cicada interest, difficulty changing topic away from cicadas






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Elisa - Selected Results

Wechsler Intelligence Scale for Children – Fifth Edition (WISC-V)

Composite Scales	Standard Score
Verbal Comprehension	116
Visual Spatial	126
Fluid Reasoning	106
Working Memory	100
Processing Speed	95
Full Scale IQ	113

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ADOS-2



Difficulty with reporting events, even with probes

Gestures and language not integrated

Limited understanding of social relationships

Highly specific topics of interest

Repetitive hand mannerisms and some sensory exploration of objects

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Parent & Teacher Ratings - SRS-2

SRS Scales	Mother		Teacher	
	T-Score	Range	T-Score	Range
SRS-2 Total Score	61	Mild	75	Moderate
Restricted Interests and Repetitive Behavior	62	Mild	89	Severe
Social Communication and Interaction	60	Mild	71	Moderate
Social Awareness	65	Mild	67	Moderate
Social Cognition	49	Normal	69	Moderate
Social Communication	63	Mild	71	Moderate
Social Motivation	58	Normal	67	Moderate

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Academic - WIAT-4, Grade-Based norms

Subtest	Standard Score
Word Reading	120
Listening Comprehension	139
Receptive Vocabulary	141
Oral Discourse Comprehension	130
Reading Comprehension	108
Spelling	104
Math Problem Solving	114
Numerical Operations	119
Math Fluency - Addition	85
Math Fluency - Subtraction	98

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Memory - WRAML-3; NEPSY-II

Subtest	Scaled Score
Story Memory	6
Story Memory Recall	7
Story Memory Recognition	12
Sentence Memory	6

Subtest	Scaled Score
Memory for Designs	7
Memory for Designs - Content	6
Memory for Designs - Spatial	9
Memory for Designs Delayed	8
Memory for Designs Delayed - Content	11
Memory for Designs Delayed - Spatial	6

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Other Ratings

Parent BASC-3: T>70 Anxiety, Depression, Somatization
Teacher BASC-3: T>70 Atypicality, Withdrawal, Developmental Social Disorders

Parent ABAS-3:
Practical SS=74; Conceptual SS=79
Discussion about supports needed; lack of social demands

Parent D-REF: Attention/Working Memory; Compliance/Anger Management
Teacher D-REF: Activity Level/Impulse Control



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Family Feedback

- Family expressed disbelief and devastation as pediatrician comments taken without question
- School placement discussion/IEP
- Need to address feeding and GI needs
- Challenge in seeing possibility of GI/feeding issues improving
- Parental depression - activation around parent training and coaching/intervention
- Trusting relationship with OT

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Discussing in documentation

Provisional diagnosis

Her profile is felt to be consistent with a diagnosis of an autism spectrum disorder, and this diagnosis is provided on a provisional basis in light of the fact that Name's opportunities for development of many key social skills has been hampered by pandemic related difficulties in accessing typically expected education and opportunities for social interaction during preschool and kindergarten. This diagnosis should be revisited within a year after ongoing and continued access to typical instruction and social interaction opportunities.

Sensory access concerns

Present findings must be interpreted within the context of Name's known sensory and medical needs, and noteworthy period of prolonged educational disruption that directly impacted his ability to access educational and therapeutic intervention. Name's known hearing loss and reliance on hearing aids to access spoken language magnify his difficulties with language, particularly if he does not have consistent access to or use of his hearing aids, which was disrupted during the period of educational disruption lasting for more than a year. Records reviewed indicate his access to spoken language is limited unless he wears his hearing aids. Observation and reports suggest that he consistently has access to and is a successful user of his hearing aids while at the Name of School.

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Takeaways

Consideration of child access to experience/intervention

Normative data fit - address and consider goodness of fit - not discussing it doesn't make it go away

Families with delayed diagnosis and support needs - advocacy within stressed systems

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Neurodevelopmental Implications

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A
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What keeps us up at night?



Benjamin Franklin

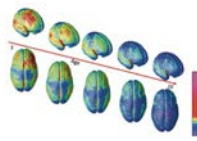


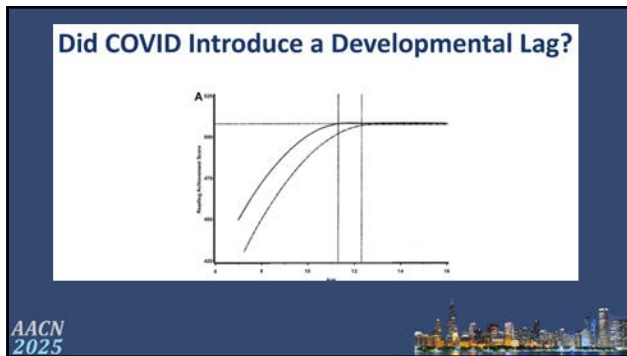
Fig. 3
Right lateral and top views of the dynamic sequence of GCM activation over the cortical surface. The color bar shows a color representation in units of GCM volume (Engley et al. 2016).

From Giedd, et al., *Neuropsychology Review*, 2010

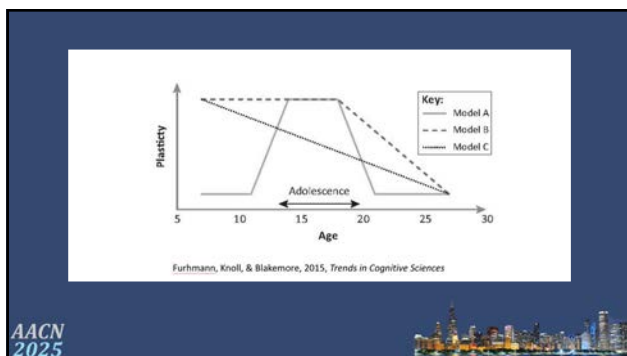
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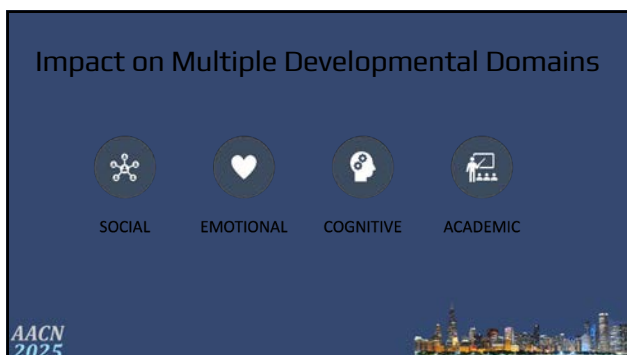
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Possible Critical Periods

- Language Acquisition in Preschool Years
- School Readiness
- Social and emotional learning
- Functional Independence in Early Adulthood



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April 22, 2024

Developmental Milestone Attainment in US Children Before and During the COVID-19 Pandemic

Sara B. Johnson, PhD, MPH^{1,2,3}; Molly Kuehn, MD¹; Jennifer O. Lambert, MD, MHS¹; et al

➤ Author Affiliations

JAMA Pediatr. 2024;178(6):586-594. doi:10.1001/jamapediatrics.2024.0683



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Original Investigation

April 22, 2024

Developmental Milestone Attainment in US Children Before and During the COVID-19 Pandemic

Sara B. Johnson, PhD, MPH^{1,2,3}; Molly Kuehn, MD¹; Jennifer O. Lambert, MD, MHS¹; et al

➤ Author Affiliations

JAMA Pediatr. 2024;178(6):586-594. doi:10.1001/jamapediatrics.2024.0683

Results A total of 50 205 children (25 852 [51.5%] male; mean [SD] age, 18.6 [16.0] months) and 134 342 ASQ observations were included. In adjusted models, significant age-specific mean score decreases from prepandemic to intrapandemic were observed in communication (−0.029; 95% CI, −0.041 to −0.017), problem-solving (−0.018; 95% CI, −0.030 to −0.006), and personal-social (−0.016; 95% CI, −0.028 to −0.004) domains. There were no changes in fine or gross motor domains prepandemic to intrapandemic.

changes in caregiver concerns about the child's behavior. While changes in developmental screening scores were modest (2%-3%), nationwide, this could translate to more than 1500 additional recommended developmental referrals over baseline each month.



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Table 2 Adjusted log-binomial regression analysis for skill attainment between the CORAL and BASELINE cohorts—complete case analysis

Developmental milestone	Baseline cohort (n=1000)	CORAL cohort (n=1000)	Adjusted log-binomial regression model ^a (n=1000)	Adjusted risk ratio (95% CI)	P value	Regression diagnostics
Gross motor	Yes 55.7 (201/358)	Yes 56.1 (203/358)	Yes 56.1 (203/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Fine motor	Yes 58.4 (213/358)	Yes 58.4 (213/358)	Yes 58.4 (213/358)	1.00 (0.94 to 1.08)	AIC: 1.90	
Communication	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Overall	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Verbal skills	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Non-verbal skills	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Overall	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Verbal skills	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Non-verbal skills	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Overall	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Verbal skills	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Non-verbal skills	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	
Overall	Yes 55.7 (201/358)	Yes 55.7 (201/358)	Yes 55.7 (201/358)	1.00 (0.91 to 1.11)	AIC: 1.87	

^a Log-binomial regression models for each skill, adjusted for age at assessment in days, gender, gestational age at birth, and maternal education. AIC, Akaike Information Criterion. CI, confidence interval. CORAL, Current Research in Autism Spectrum Disorders. Overall, overall risk ratio for all skills. Verbal, expressive and receptive language. Non-verbal, fine motor and visual perception. Overall, overall risk ratio for all skills. Verbal, expressive and receptive language. Non-verbal, fine motor and visual perception.

Byrne S, et al. Arch Dis Child 2023;108:20-24. doi:10.1136/archdischild-2021-323441

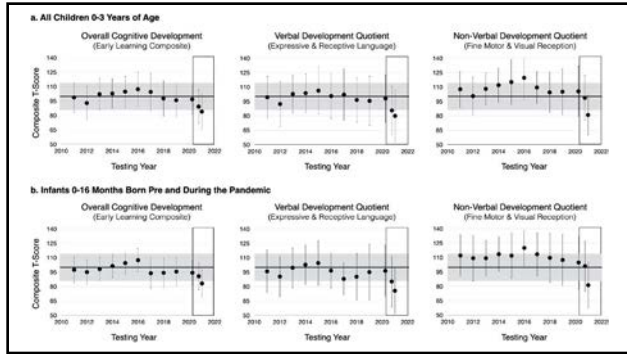
Compared to those born before the COVID-19 pandemic, babies born during the pandemic were less likely to show normal social communication milestones at age 12 months.

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- Recent meta-analysis of 8 studies (> 21,000 infants)
- Used standardized questionnaire (ASQ-3) not performance measures
- ASQ-3 domains:
 - gross motor
 - fine motor
 - personal-social
 - problem-solving
 - communication
- Communication skill delays
- Overall risk of NDI was comparable to pre-pandemic cohort

Hessami K, Nemeskürthy AM, Monteiro S, et al. COVID-19 Pandemic and Infant Neurodevelopmental Impairment: A Systematic Review and Meta-analysis. JAMA Netw Open. 2022;5(10):e2238941. doi:10.1001/jamanetworkopen.2022.38941

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The Cot20s: Children of the 2020s

- Born in 2021
- Language development at 9.5 months unchanged from pre-pandemic cohort
- Not associated with vaccination or infection
- Longitudinal follow up will occur
- **Very rich source** of data, 8733 children

Research and analysis
Children of the 2020s: first survey of families at age 9 months

Findings from wave 1 of the Children of the 2020s (Cot20s) longitudinal study.

From: *Discontinuity in Education*
Published 30 November 2023

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A retrospective cohort study analyzing the changes in early childhood development during the COVID-19 pandemic

Early Human Development
Volume 192, May 2024, 105995

Sahar Bismah^{1,2,3,4,5}, Maja Kataric^{1,2,3,4,5}, Chung-Ti Wu^{1,2,3,4,5}, Roland Hertz^{1,2,3,4,5}, Brian A. Lynch^{1,2,3,4,5}

Highlights

- Overall, the COVID-19 pandemic had no effect on children meeting developmental milestones.
- Some high-risk groups' developmental milestones were negatively affected by the pandemic.
- COVID-19 Pandemic may be exacerbating existing inequities in child development.

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Increased Risk for Vulnerable Children

Percentage of infants and toddlers birth through age 2 served under IDEA, Part C, by primary early intervention service setting: Fall 2018

Prior to the COVID pandemic, about 3% of children aged 0-2 were receiving EI, including about 6% of 2yo.

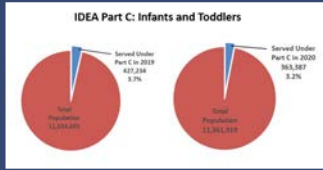
The majority of services were provided at home.

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42nd Annual Report to Congress on the Implementation of the IDEA, 2020

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Change in EI Services



- A majority of programs/systems transitioned to hybrid services (57% reported by CDC) with limited empirical evidence for efficacy
- 15% decline in number of children who received EI during beginning of pandemic

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Dutch recommendations for extra language support for pandemic toddlers

- 2024 <https://www.dutchnews.nl/2024/11/lockdown-toddlers-need-extra-language-support-research/>
- Univ of Utrecht showed smaller vocabulary for toddlers age 2-3 during lockdowns, compared to pre-2020 toddlers
- Language development underpins cognitive and social development
- What are long term implications? Does this delay recover completely or alter trajectories of other skill development?

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UK assertive on impacts

Impact of Covid lockdowns to disrupt England's schools into the 2030s, report says

Analysis from the Association for School and College Leaders warns extensive problems with learning, behaviour and absence to come



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School starters born during pandemic lack communication skills, Ofsted says

English primary schools having to help infants catch up on speech and language to cope with lessons



Guardian 2024

- OFSTED report October 2024
- DELAYS MEAN TRAJECTORY OF PROGRESS LIKELY ALTERED

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TheUpshot

The Youngest Pandemic Children Are Now in School, and Struggling

Teachers this year saw the effects of the pandemic's stress and isolation on young students: Some can barely speak, sit still or even hold a pencil.




By Claire Cain Miller and Sarah Mervosh July 1, 2024

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Miller & Mervosh

- "But the impact on the youngest children is in some ways surprising: They were not in formal school when the pandemic began, and at an age when children spend a lot of time at home anyway...."
- The early years, though, are most critical for brain development. Researchers said several aspects of the pandemic affected young children — parental stress, less exposure to people, lower preschool attendance, more time on screens and less time playing."

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Anecdotes from the New York Times piece:

- "Brook Allen, in Martin, Tenn., has taught kindergarten for 11 years. This year, for the first time, she said, several students could barely speak, several were not toilet trained, and several did not have the fine motor skills to hold a pencil."
- "Children don't engage in imaginative play or seek out other children the way they used to," said Michaela Frederick, a pre-K teacher for students with learning delays in Sharon, Tenn. She's had to replace small building materials in her classroom with big soft blocks because students' fine motor skills weren't developed enough to manipulate them."

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"They're about two years behind": fears for children born during lockdown as they start at school

Covid's world of masks and remote health visits has created a generation at risk of social and emotional difficulties



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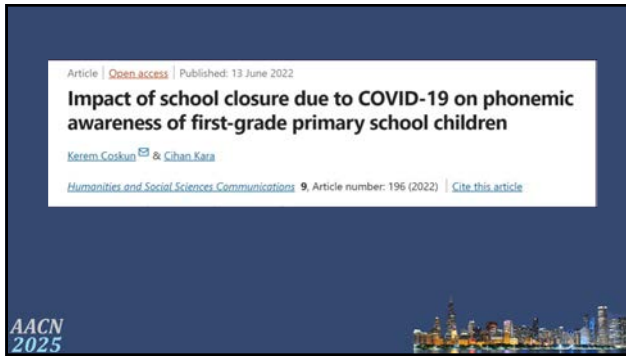
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Guardian:

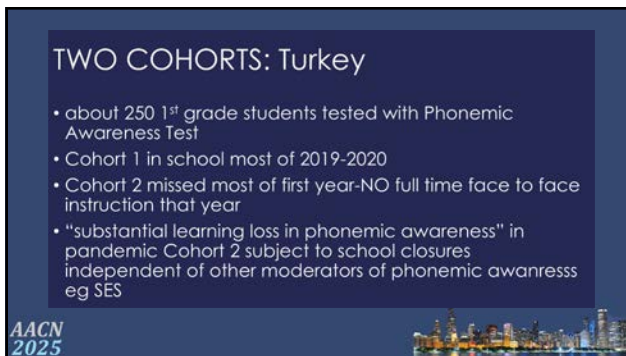
- "staff in primary schools are reporting very serious problems of arrested language development, lack of toilet training, anxiety in being in social spaces, and depressed executive function"
- "mistake to think schools have returned to pre-pandemic normality that ignores "the massive scale and enduring persistence of Covid-19 impact in education".
- "Eleven-year-olds affected by interrupted learning are entering secondary school with very different problems to those born and young in the pandemic entering primary schools, who are displaying acute developmental needs."

• <https://www.theguardian.com/education/article/2024/sep/09/impact-of-covid-lockdowns-to-disrupt-englands-schools-into-the-2030s-report-says>

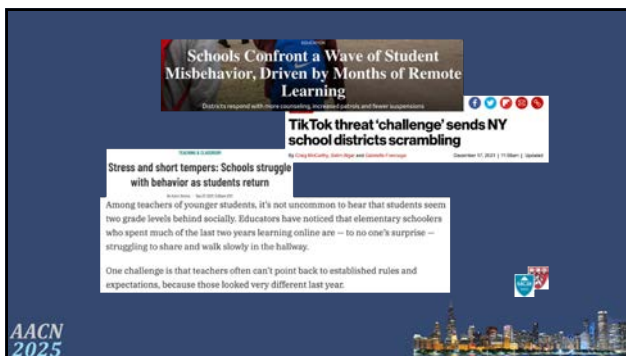
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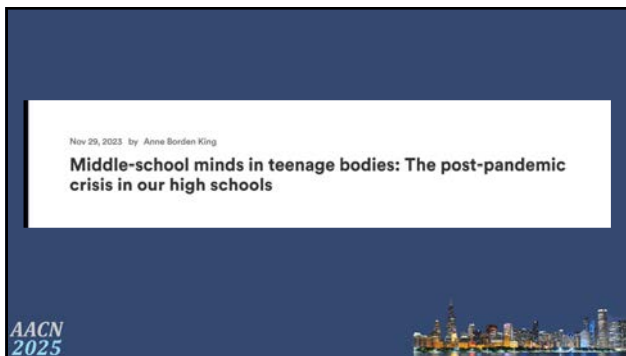
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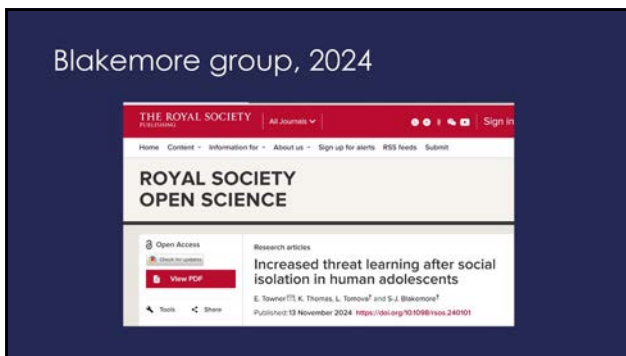
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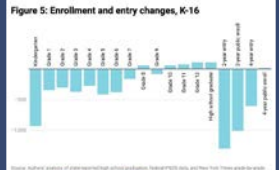
- adolescents age 16-19
- Social isolation was linked to stronger learning of threat cues
- Threat learning implicated in PTSD, OCD, anxiety
- Question: did social isolation of teens in pandemic make them more vulnerable to development of those conditions?

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Transition-Aged Youth

Figure 5: Enrollment and entry changes, K-16




Source: Author's analysis of data reported by state education agencies (SEAs) to the U.S. Department of Education (DOE) in the 2020-2021 and 2021-2022 school years. Data are presented by state and by year. Data are not available for Alaska, Hawaii, and Puerto Rico.

•Among those 18 to 24, 71% lived with their parents in June 2020, up from 63% in February 2020

•Among 16 to 24, the percent who were neither enrolled in school nor working rose from 11% in February 2020 to 28% in June 2020

•In 2021, 71% of parents reported a delay in driver's education for their teenagers

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<https://www.pisa.org/monitor/2021/03/numbers-young-people>


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Neuroimaging Studies of Pandemic-Era Cohorts


RESEARCH ARTICLE | NEUROSCIENCE

COVID-19 lockdown effects on adolescent brain structure suggest accelerated maturation that is more pronounced in females than in males

Neva M. Cornejo, Ariel Rokem, and Patricia K. Kuhl

Contributed by Patricia K. Kuhl, received February 27, 2024; accepted July 26, 2024; reviewed by Russell T. Shinohara and Leah H. Somerville


September 9, 2024 | 121 (38):e2403200121 | <https://doi.org/10.1073/pnas.2403200121>

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MRI structural data
 Adolescents prior to and after the pandemic lockdowns
 Normative model of 'cortical thickness change with age during typical adolescent development'
 Cortical thickness post-COVID data compared to normative model
 Accelerated cortical thinning more widespread, greater in magnitude in females than in males.
 "When measured in terms of equivalent years of development, the mean acceleration was found to be 4.2 y in females and 1.4 y in males...
 Accelerated brain maturation as a result of chronic stress or adversity during development has been well documented."

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Tokyo adolescents

- Hippocampal volume increased during first wave of COVID lockdowns/closures, for teens
- Koike and Cai (2024)

cents had fewer stressors during the school closure.^{33,34} Thus, we speculated that the increased hippocampal volume might be associated with stress reduction in adolescents. Discussion about hip-

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Effects of COVID-19 pandemic on structural brain development in early adolescence

L. van Drunen^{1,2,3,4,5,6,7}, Y. J. Toenders^{1,2,3,4,5,6,7}, L. M. Wierenga^{1,3,4} & E. A. Crone^{1,2,3,4}

- social brain regions (medial PFC, TPJ, amygdala, hippocampus)
- peri-pandemic group (N=204) showed accelerated development of mPFC and hippocampus compared to pre-pandemic group

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Scientific Reports | (2024) 14:15000 | <https://doi.org/10.1038/s41598-024-32754-7>





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[illegible]

ORIGINS-ENIGMA

- "Extremely rapid growth in the first few years of life may make the brains of infants and young children especially vulnerable to environmental insults, such as poverty and preterm birth, and also especially responsive to interventions."
- "As in prior studies of regional brain volumesdifferent structures attaining maturation at different ages. This finding suggests that different regions will have different windows of vulnerability/opportunity."

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

2023 Center for Science and Policy in UK-Cambridge WORKSHOP REPORT

- How does stress in the school setting impact development and learning?
- Covered "sensitive periods" e.g. school readiness and emerging behavioral control; language acquisition and small caregiver settings; adolescence and peer-led learning and self esteem and creativity

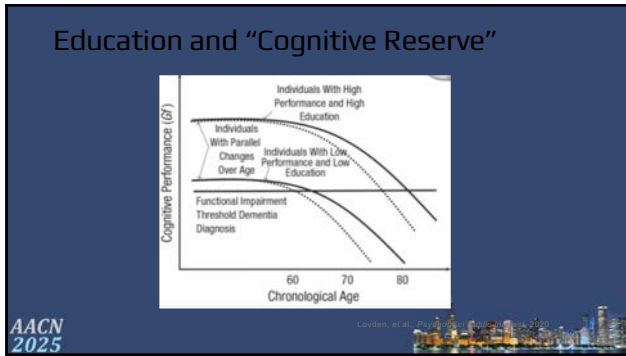
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Education is a Social Determinant of Health

- Life expectancy
- Chronic medical conditions (e.g., hypertension, diabetes)
- Adult Mental Health Disorders (e.g., mood, anxiety, substance abuse)
- Health Behaviors (e.g., smoking)
- Quality of Life
- **Risk of dementia, "cognitive reserve"**

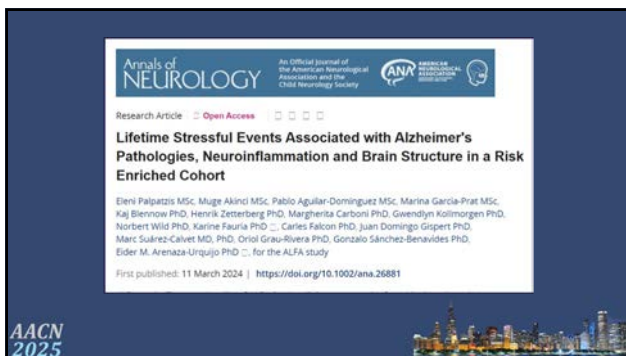
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- Chronic stress has been shown to affect brain structure and inflammatory processes
- Measured Accumulated Stressful Life Events
- Increased beta amyloid noted for males with high SLEs AND psychiatric illness— not seen for psych disease only
- Lower gray matter (limbic region) volumes for women with higher SLEs and those with higher SLEs + psychiatric illness

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Benefits of Early Childhood Education

- Improved Health Outcomes
- Increased high school graduation
- Better jobs and higher employment
- Reduction in crime, welfare dependency, child abuse and neglect



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<https://www.edc-europe.org/en/our-work/early-childhood-education>

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Some Sobering Statistics

- Students with lowest-level of math achievement are 50% more likely to be unemployed after high school (Casey Foundation)
- Drop in math scores between 2019 and 2021 will reduce collective lifetime earnings of the 48 million pandemic-era students by \$900 billion (Casey Foundation)
- Total impact of lost lifetime earnings due to attenuated learning gains may be \$17 trillion globally (World Bank-UNESCO-UNICEF)

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<https://www.caseyfoundation.org/press-releases/2022/04/2022-04-20-01>

<https://www.caseyfoundation.org/press-releases/2022/04/2022-04-20-02>



<https://www.worldbank.org/en/news/press-release/2021/02/2021-02-20-01>

<https://www.unicef.org/press-releases/2021/02/2021-02-20-01>

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ORIGINS-ENIGMA

- lower maternal education associated with smaller hippocampal volume (LONG TERM FACTOR FOR FUTURE BIRTH COHORTS???)
- "Maternal education positively predicted thalamic volume ... Anomalous development of the thalamus can significantly affect development of other cortical and subcortical brain structures and can impact cognitive outcomes"
- "caudate, putamen and pallidum volumes were also significantly lower with lower maternal education, similar to findings observed in previous studies"

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NORMATIVE DATA




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Normative data collected prior to the pandemic do not account for the impact of prolonged educational disruption, slower learning gains, or psychosocial challenges


Colvin, Reesman, Glen 2024

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So, are lower scores due to:

- Learning disorder?
- Normative drift?
- Altered test administration?
- Extraordinary psychosocial disruption?
- Curriculum changes?
 - Medical/mental health care disruption?

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pre pandemic normative data may not be sufficient means of classification, estimating expected level of performance, or measuring gains/losses

The most basic variable—education level. What does 12 yrs of educ mean for examinee vs normative group?

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- "Allow performance to be placed into categories (e.g., from very superior to impaired), which is necessary for important decision-making such as diagnoses"
- "useful for establishing therapeutic goals and evaluating intervention effectiveness"
- "Selecting appropriate ND will affect neuropsychological assessment result interpretation accuracy, reducing the probability of false diagnoses of cognitive impairment"
- "reference values are more precise in the year they are created (Mitrushina et al., 2005)"
- "ND for children and adolescents were less common (9.5%), highlighting a critical need for future pediatric normative studies"

* Ace delCacho-Tena, Bryan B Chelot, Juan Carlos Arevalo-Laguarda, Paul B Perrin, Diego Rivera, Luana Odebrecht-Landa, Normative Data Estimation in Neuropsychological Tests: A Systematic Review. Archives of Clinical Neuropsychology, Volume 36, Issue 3, May 2024, Pages 382–398. <https://doi.org/10.1093/acn/wnae016>

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Compounding challenge for norms

Evaluation of people with disabilities



See: APA Guidelines for Assessment and Intervention with Persons with Disabilities (2022)

Available at:
<https://www.apa.org/about/policy/guidelines-assessment-intervention-disabilities.pdf>

GUIDELINE 13

Psychologists strive to ensure the validity of assessments by considering disability-related factors when selecting assessment tools and evaluating test norms.

People present with a range of disabilities that may affect the psychologist's selection of tests included as part of a psychological assessment. As for any population being assessed, the psychologist strives to determine whether the assessment tools have been normed with appropriate samples. Who was included in the standardization groups? The relevant validation data should support each measure's use with people who have specific disabilities, just as they support its use for broader populations. Because disability status may significantly alter the meaning of test scores, test developers should strive to either include individuals with relevant disabilities in their norming groups or develop separate norms.

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This is NOT just applicable to academic testing

Bidirectional relationship between academic and cognitive skill development



e.g. math skills associated with executive functions




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Psychological assessment also

Early data show pandemic cohort scores higher on PAI scales (Nails et al 2023)

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SO: a typically developing child's scores may appear spuriously low

We USE THESE SCORES in differential diagnosis!

Are the scores lower due to recent concussion? Learning disorder undiagnosed? Epilepsy medicine? Psychosocial stressors in and since pandemic? Social isolation?

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We use education level to select norms and estimate premorbid functions

There is already evidence that distance learning is not comparable to an equivalent period of in-person learning

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We already know educational quality makes it hard to rely on yrs of education

Years of education may not accurately estimate abilities for persons of color who had lower educational quality (Byrd et al 2005; Manly et al 2002)

So will it now be much harder to use yrs of education as estimate for those students with longer virtual, unreliable tech?

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What about Academic Achievement Scores?

In >500 outpatients @ MGH, estimates of IQ remained stable, but academic achievement scores were lower over the course of the pandemic.

Measure	PRIOR	Y1	Y2
General Cognitive Ability	~105	~105	~103
Numerical Operations	~100	~100	~98
Word Reading	~95	~85	~82

Colvin, et al., Psychological Assessment, 2023

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Pediatric normative update challenges

Differential Ability Scales - 2nd Edition (DAS-2) - School age normative update (2023)

Entire normative update sample masked administration for child/examiner or both (collected after Feb 2022)

Does this represent your current clinical practice?

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Forensic and Medicolegal Assessment

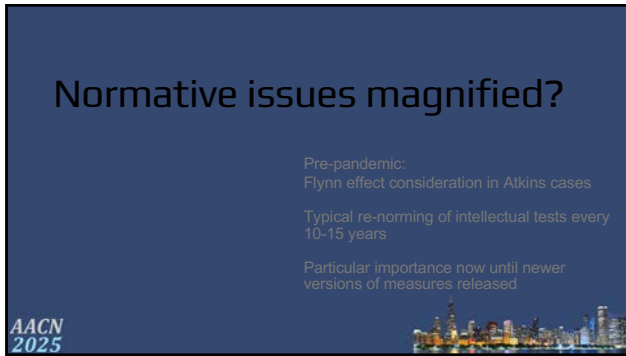
Use of appropriate normative data sets is critically important

Highlighted by professional position statements

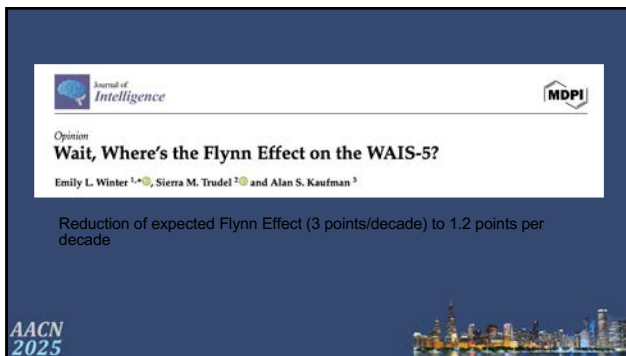
See NFL settlement and Judge Brody's 2020 order on neurocognitive normative data choice

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Reverse Flynn Effect: for younger adults with lower education? Interaction effect to come?

- "The largest differences in mean ability scores were often observed for participants between the ages of 18 to 22..... reverse Flynn effect was also present across all levels of educational attainment rate of decreasing scores being steeper for those with less than a 4-year college degree." ent, with the
- Data collected 2006 through 2018
- Potential interaction between this trend and educational disruption for those with lower education?
- Research needed!

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Pediatric Medicolegal Considerations


Normative data issues - address head on

Access to intervention and typical educational experiences during sensitive periods

Reliance on previous pandemic-era assessments done while masked/virtual or missed

Missed screenings

Conclusion considerations - overshadowing risk


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But we don't have perfect normative comparison in every case.

Analogy of linguistics and normative data/testing?

Responsibility when considering disability issues and accessibility of our tools?

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Linguistics Analogy

sometimes the perfect measure or normative data set is not achievable or available, and declining the referral may have high costs for patient

in some cases clinician may proceed and even diagnose based on medical records, interviews, repeat testing/monitoring etc

explain potential problem at outset, consent for eval, delineate clearly any limitations to conclusions, **be very familiar with the literature on linguistically/culturally appropriate eval**

consider normative data "closest approximation" for broad information on how measures affected eg. letter fluency lower but if given different letters may be 'average'


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(Additional) Implications for Pediatric Neuropsychological Practice

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The Current Landscape

- COVID-19 pandemic educational disruption was unprecedented in extent and duration
- Children may be on different developmental trajectories
- Children with NDDs and/or those impacted by racial/ethnic disparities were particularly impacted
- Long-term implications for population health outcomes and society
- Need for ongoing services and supports

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The Current Landscape

- High(er) demand for services
- Increased risk of delayed intervention
 - Autism: early intervention associated with greater inclusion in regular education classes, longer intervention periods associated with better outcomes
 - ADHD: treatment associated with reduced substance use, anxiety, depression, and risk of injury (TBI and MVA)

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Original Investigation
April 22, 2024

Developmental Milestone Attainment in US Children Before and During the COVID-19 Pandemic

Sara B. Johnson, PhD, MPH^{1,2}, Emily Kuehn, MS¹, Jennifer G. Linder, MD, MPH¹, et al.
1 Author Affiliations
 JAMA Pediatr. 2024;178(5):589-594. doi:10.1001/jamapediatrics.2024.0983

changes in caregiver concerns about the child's behavior. While changes in developmental screening scores were modest (2%-3%), nationwide, this could translate to more than 1500 additional recommended developmental referrals over baseline each month.

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What Can Neuropsychologists Do?

Risk-based assessment practices	Diversify practice models	Partner with other providers (pediatricians, neurologists, etc.)	Know the special education services landscape
Make provisional diagnoses informed by local knowledge	Research post-pandemic changes in test scores	Advocate for renorming of tests when needed	

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Altered Trajectories: Considering the Long-Term Impact of Educational Disruption during the COVID-19 Pandemic on Neurodevelopment and a Call to Action for Neuropsychology
Maria R. Carter¹, Jennifer Rasmussen², Sarah E. Clark³




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Risk-Based Consultation and Brief Assessment Models

1. Use clinical knowledge to identify children at risk for autism or learning disorders
2. Leverage school-based evaluations in clinical practice
3. Diversify practice models to incorporate shorter evaluations and parent consultations

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Altered Trajectories: Considering the Long-Term Impact of Educational Disruption during the COVID-19 Pandemic on Neurodevelopment and a Call to Action for Neuropsychology

Mari K. Culkin¹, Jessica Roseman², W. Samuel Glaze³

Neuropsychology consultation to identify learning disorders in children and adolescents: a proposal based on lessons learned during the COVID-19 pandemic


M. K. Culkin, G. A. Fischell, K. L. Beebe, M. R. Capomonte, C. S. Berry, J. Murphy, A. S. Doyle, S. M. O'Keefe & E. B. Bratten

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Risk-Based Assessment Practices

Determine **scope** and **timing** of evaluation based on:

- Developmental history
- Psychosocial risk factors (e.g., poverty, ACEs, etc.)
- Medical complexity
- Potential cost of delayed diagnosis or intervention
- Leverage prior testing, including through schools



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Practical Guidance

- Prioritize those with increased risk *prior to pandemic-related school closures* as candidates for early intervention
- Recognize increased risk for delayed identification and intervention in *younger* children
- Recognize increased risk for children from *marginalized groups*
- Consider child's developmental stage during the pandemic and impact on psychosocial environment

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Returning to this...Impact on Clinical Decision- Making

- False Negative -> Delayed intervention
- False Positive -> Unnecessary intervention

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Examples of Risk-Based Pediatric Services

- ASD Telehealth Evaluations for Toddlers and Preschoolers
- ADHD/LD Parent Consultations for School-Aged Children

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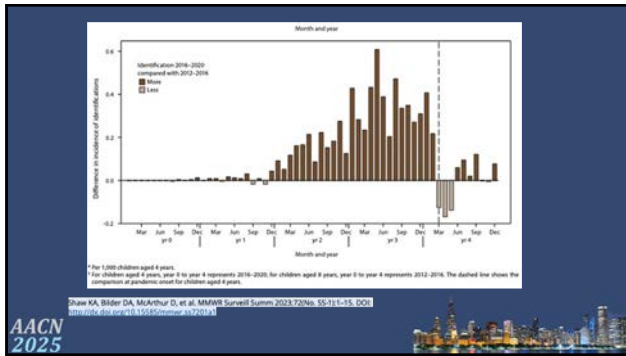
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FIGURE 3. Difference in number of developmental evaluations and incidence* of autism spectrum disorder identification among children aged 4 years in 2020 during calendar years 2016–2020 and children aged 8 years in 2020 during calendar years 2013–2016, by month† — Autism and Developmental Disabilities Monitoring Network, 11 sites, United States

Shaw KA, Bilder DA, McArthur D, et al. MMWR Surveill Summ 2023;72(Nos. SS-1):1–15. DOI: <https://doi.org/10.15585/mmwr.mm7201a1>

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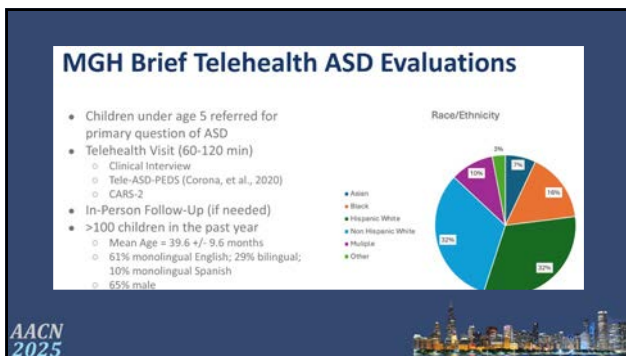
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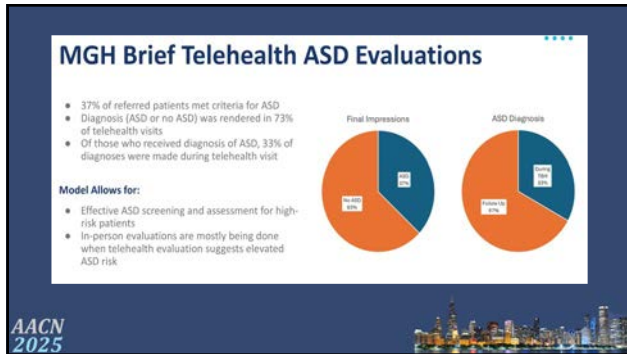
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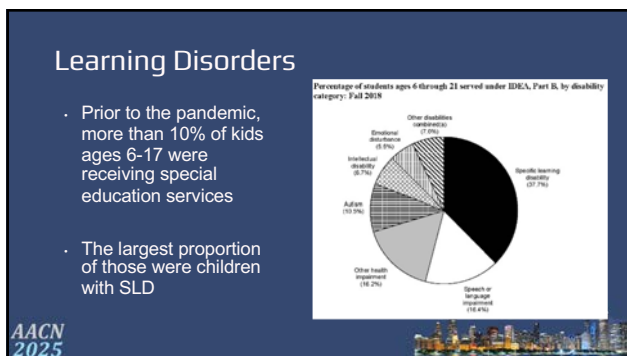
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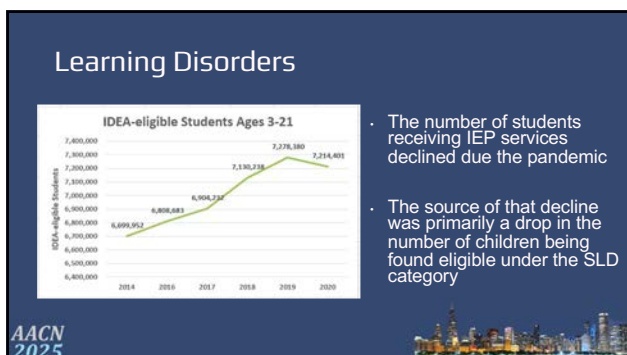
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IDEA Criteria for Learning Disability

"a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations."

This term includes conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

Specific learning disabilities are not primarily the result of visual, hearing, motor disabilities, mental retardation, emotional disturbances, or of environmental, cultural, or economic disadvantage"

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DSM-5 Criteria for Learning Disorder

"Difficulties learning and using academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 months, despite the provision of interventions that target those difficulties..."

"The affected academic skills are substantially and quantifiably below those expected for the individual's chronological age, and cause significant interference... as confirmed by individually administered standardized achievement measures and comprehensive clinical assessment"

"The learning difficulties are not better accounted for by... psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction"

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Risk Factors for Learning Disorders

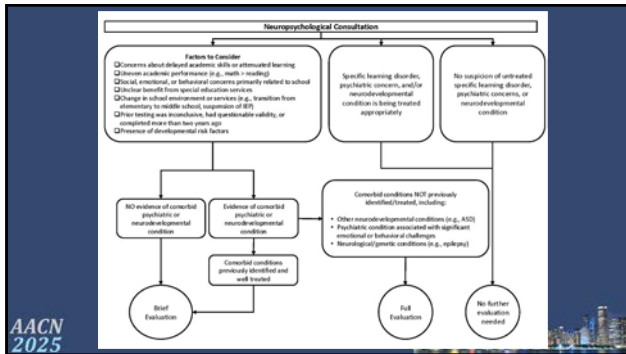
Risk Factor	Specific Learning Disability		
	Reading	Writing	Math
Prematurity	✓	✓	✓
Medical or neurological conditions (e.g., seizures, stroke, diabetes)	✓	✓	✓
Family history of learning difficulties	✓	✓	✓
Other neurodevelopmental disorder (e.g., ADHD, ASD)	✓	✓	✓
Early language delays	✓	✓	
Fine motor challenges		✓	✓
Gross motor challenges and/or hypotonia		✓	✓
History of grade retention	✓	✓	✓

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Colvin, Forchelli, Capwana, et al., 2021, Child Neuropsychology



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Advocacy and Education

- Communication with schools
- Communication with other health care providers (pediatricians, psychologists, psychiatrists, SLPs)
- Students from disadvantaged groups
- Students with disabilities

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Assessment during COVID-19 Pandemic

Special Issue: Clinical Assessment in the Time of COVID-19
Guest Editors: Jaime L. Anderson, Angel Blanch

Clinical Assessment in the Time of COVID-19:
Introduction to the Special Issue

Jaime L. Anderson, Angel Blanch, Julie A. Suhr

Author Affiliations

Anderson, J. L., Blanch, A., & Suhr, J. A. (2023). Clinical assessment in the time of COVID-19: Introduction to the special issue *Psychological Assessment*, 35(1), 896-900.
<https://doi.org/10.1037/psa0001281>

Abstract

The COVID-19 pandemic placed much of the practice of psychological assessment in

Psychological Assessment
Editor: Julie A. Suhr

Psychological Assessment

(2023 Volume 35, Issue 11 (Nov))

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Research post-pandemic changes in test scores

Advocate for renorming of tests when needed

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THANK YOU!



Neurodevelopment in the Post-Pandemic World
The Impact of COVID-19 on Children's Neurodevelopment
Molly Colvin, Jennifer Reesman, Tannahill Glen

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