


Special Education Students' Academic Achievement Before and During COVID-19

Presenter:
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Background

- World Health Organization declares COVID-19 a pandemic in March of 2020 and schools close
- Subsequent issues likely to impact academic achievement
 - Hebebcj et al., 2020
 - Restricted interaction with teachers and peers
 - Inadequate infrastructure (e.g., power, internet access)
 - Lack of access to equipment such as laptops
 - Dorn et al., 2020
 - Reduced engagement in learning activities
 - Less extrinsic reinforcement
 - Increased stress
 - Greater inequities for disadvantaged students




Previous Research



Findings from Norm-Referenced Tests

- Kaufman Test of Educational Achievement, 3rd Edition (KTEA-3; Kaufman & Kaufman, 2014)
 - Raiford et al., 2021
 - Achievement scores "highly consistent" (p. 2) across 2019 and 2020 samples.
- Wechsler Individual Achievement Test 3rd Edition (WIAT-III; Wechsler, 2009)
 - Raiford et al., 2021
 - Similar results as found when examining KTEA-3 samples
- Lupas et al., 2021
 - Statistically significant increases in reading and spelling scores
 - No notable changes detected in math



Findings from Benchmark Tests

- MAP Growth assessments
 - Kuhfeld, Tarasawa, et al. 2020
 - Evidence of negative impact on math achievement
- i-Ready Diagnostic assessment
 - Curriculum Associates, 2021
 - Evidence of negative impact on math and reading achievement
 - > negative impact on mathematics
- Istation Indicators of Progress
 - Locke et al., 2021
 - Propose that school closures led to roughly two months of "learning loss" in reading
 - Propose grade-level variability in math
 - 1-month loss for 2nd grade, 2 for 3rd and 4th, and 3 for 5th and 6th
- Renaissance Star Assessments
 - Renaissance Learning, 2021, 2022
 - Evidence of negative impact on math and reading achievement
 - > negative impact for students with disabilities



Need for Study

- Limitations of previous research
 - Studies that used benchmark data
 - None were peer reviewed
 - None examined writing
 - Only two publications have used norm-referenced tests
 - Ralford et al. (2021) compared cross-sectional data, study was not peer reviewed
 - Lupas et al. (2021) examined learning loss specifically for students with ADHD
 - Little is known about the impact of COVID-19 on the academic achievement of students with disabilities
 - Renaissance Learning reported findings for students with disabilities, but did not disaggregate by disability category
- There is a need for additional research regarding the impact of COVID-19 on students with disabilities.



Purpose of Study

- Examine the impact of COVID-19 on special education students' scores on the Woodcock-Johnson IV Tests of Achievement (WJ IV ACH; Schrank et al., 2014).



Research Questions

- 1) Are significant declines in W Difference scores evident when comparing pre-pandemic WJ IV ACH scores to scores obtained during the pandemic?
- 2) Are Matthew Effects observed for special education students relative to a comparison sample from the WJ IV ACH normative data?
 - Both the present sample and a comparison sample created from the WJ IV Clinical Validity Studies were compared to normative data.
- 3) Did standardized effect sizes representing between-sample differences become larger during the pandemic?

Method



Procedure

- Used de-identified performance data to examine academic achievement before and during the pandemic
- Inclusion criteria:
 - Receiving special education and related services
 - WJ IV ACH scores from initial evaluation
 - WJ IV ACH scores from reevaluation during pandemic



Sample

- N = 96
- Sampled from a large Southwestern school district
- 38 schools (27 elementary, 11 secondary)
- Referral issue (National Percentage 2020-2021)
 - 71% SLD (33%)
 - 10% OHI (15%)
 - 5% ED (5%)
 - 8% ASD (12%)
 - 4% SLLI (12%)
 - 2% ID (6%)
 - 1% TBI (< 1%)
- Race
 - 57% Hispanic
 - 32% White
 - 5% Black
 - 2% Native American
 - 2% Multiracial
- 60% of participants were male



Grade of Students at First and Second Measurement Occasion

Grade	Pre-Pandemic			During Pandemic		
	N	%	Cumulative %	N	%	Cumulative %
K	3	3.1	3.1	0	0.0	—
1	13	13.5	16.7	0	0.0	—
2	17	18.5	35.2	0	0.0	—
3	18	18.8	54.0	0	0.0	—
4	8	8.3	62.3	15	15.6	15.6
5	8	8.3	70.6	40	41.7	57.3
6	6	6.3	76.9	17	17.7	75.0
7	1	1.0	77.9	5	5.3	80.3
8	2	2.1	79.9	4	4.2	84.6
9	4	4.2	84.1	8	8.3	92.9
10	0	0.0	—	0	0.0	92.9
11	0	0.0	—	2	2.1	95.0
12	0	0.0	—	4	4.2	100.0

Month and Year of Testing


Month	Pre-Pandemic			During Pandemic		
	N	%	Cumulative %	N	%	Cumulative %
January	2	2.1	2.1	1	1.0	1.0
February	1	1.0	3.1	1	1.0	2.0
March	1	1.0	4.1	1	1.0	3.0
April	1	1.0	5.1	1	1.0	4.0
May	1	1.0	6.1	1	1.0	5.0
June	2	2.1	8.2	2	2.1	7.0
July	2	2.1	10.3	2	2.1	9.0
August	2	2.1	12.4	2	2.1	11.0
September	2	2.1	14.5	2	2.1	13.0
October	2	2.1	16.6	2	2.1	15.0
November	2	2.1	18.7	2	2.1	17.0
December	2	2.1	20.8	2	2.1	19.0
January	4	4.2	25.0	4	4.2	23.0
February	4	4.2	29.2	4	4.2	27.0
March	4	4.2	33.4	4	4.2	31.0
April	4	4.2	37.6	4	4.2	35.0
May	4	4.2	41.8	4	4.2	39.0
June	4	4.2	46.0	4	4.2	43.0
July	4	4.2	50.2	4	4.2	47.0
August	4	4.2	54.4	4	4.2	51.0
September	4	4.2	58.6	4	4.2	55.0
October	4	4.2	62.8	4	4.2	59.0
November	4	4.2	67.0	4	4.2	63.0
December	4	4.2	71.2	4	4.2	67.0
January	8	8.3	79.5	8	8.3	75.0
February	8	8.3	87.8	8	8.3	83.0
March	8	8.3	96.1	8	8.3	91.0
April	8	8.3	100.0	8	8.3	99.0

Instrument

- Woodcock-Johnson IV Tests of Achievement (WJ IV ACH; Schrank et al., 2014)
 - One of the most frequently administered tests of academic achievement (Benson et al., 2019; Lockwood et al., 2021)
 - Extensive validity evidence is available to support interpretations of scores derived from the WJ IV ACH (McGrew et al. 2014; Nilleksele et al., 2016)
 - Difference curves across age levels indicate rapid acceleration of growth in the academic skills included in this study from age six to about age 15.

W Scale

- The metrics of analysis in this study were *W* scores and *W* Difference scores (Woodcock & Dahl, 1971).
- W* scale represents proficiency in academic domains
 - Can be interpreted across age- and grade-level.
 - Centered at 500 (average performance at age 10-0)
- W* Difference scores are the difference between an examinee's obtained *W* score and an appropriate reference point
 - Reference point = median score for same-age peers.
 - A negative score indicates *W* score is below normative average.
- W* scale superior to standard scores when measuring change over time
 - Standard scores indicate relative rank.
 - More meaningful to compare changes in distance from an appropriate reference point on the *W* scale than it is to compare changes in relative rank.
 - The latter can occur due to individual differences in performance that are unrelated to proficiency status.




Longitudinal Comparisons



Mean *W* Difference Scores and RPI Scores for the Study Sample

Test	Before/During/Endpoint	Mean <i>W</i> Difference Score	Mean RPI Score
Word Attack	Before	-15.1	60.7
	During	-10.2	64.8
Letter Word Identification	Before	-44.4	22.1
	During	-39.7	29.2
Passage Comprehension	Before	-38.8	37.8
	During	-34.8	38.1
Calculation	Before	-23.5	50.8
	During	-19.3	52.5
Applied Problems	Before	-25.5	44.8
	During	-20.7	41.8
Spelling	Before	-10.6	50.2
	During	-6.7	51.5
Writing Samples	Before	-22.8	60.0
	During	-14.4	70.1

Note: *W* Difference scores represent the distance of an examinee's *W* score average at the examining grade level based on *W*100 normative data. A negative score indicates performance below the reference point. * = statistically significant decline during pandemic. † = statistically significant improvement during pandemic. RPI = Reading Proficiency Index. The average range for this index is 42 to 50. Scores ranging from 07 to 40 was indicative of limited to average proficiency. Scores ranging from 41 to 67 indicated below proficiency and scores below 40 indicated that proficiency is not reached.



Standardized Effect Sizes for Between-Sample Differences

Test	Measurement/ Age Grouping	WI IV Clinical Sample Compared to WI IV Normative Sample	Study Sample Compared to WI IV Normative Sample	Study Sample Compared to WI IV Clinical Sample
Word Attack	First	-1.7	0.71	-0.97
Word Attack	Second	-5.575	0.07	3.04
Letter-Word Identification	First	-0.93	-1.325	-0.395
Letter-Word Identification	Second	-1.188	-1.485	-0.297
Passage Comprehension	First	-0.84	-1.737	-0.897
Passage Comprehension	Second	-2.065	-1.737	-0.372
Calculation	First	-1.25	0.62	-0.63
Calculation	Second	-0.65	0.435	-1.085
Applied Problems	First	-0.98	-1.25	-0.27
Applied Problems	Second	-1.171	-1.188	-0.017
Spelling	First	-0.8	-1.22	-0.42
Spelling	Second	-2.235	0.26	-2.5
Writing Samples	First	-0.2	-0.19	-0.01
Writing Samples	Second	-0.9	-0.68	-0.22




Discussion



Conclusions


- Results indicate significant declines in math computation and spelling.
 - Suggests that additional remediation is needed to address these declines
- Some evidence of decline in word decoding proficiency
 - Notably, our sample fared well relative to a pre-pandemic comparison sample of children with disabilities.
- Strong evidence for Matthew Effects when comparing students with disabilities to normative data.
- Some support for conclusion that school closures further contributed to learning loss beyond disability status alone






Situating Findings Within Previous Research


- Like studies that analyzed benchmark data, we found moderate declines in basic math skills and minimal declines in reading.
- Our math findings differ from what was reported by Raiford et al. (2021) and Lopes et al. (2021)
 - Plausible reasons for differences include:
 - Unlike Raiford et al., we used a repeated-measures design
 - Unlike Raiford et al. and Lopes et al.:
 - We used the W scale
 - We collected data further into the pandemic
- Consistent with Raiford et al. (2021), we did not find evidence of a negative impact on writing. In fact, we found small increases in writing proficiency.


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Limitations


- Average time between test administrations was three years, factors other than COVID-19 cannot be ruled out.
- Relatively small sample
- Generalizability of findings limited by sampling from a single school district.

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Implications

- First study to examine learning loss experienced by a special education student population across disability categories
- Only study that has examined changes in scores from triennial evaluations conducted prior to, and during, COVID-19.
- Future research is needed to examine the long-term effects of the pandemic
- Longitudinal data is needed to establish growth norms
 - Students with disabilities
 - Students without disabilities
- Increased use of the W scale would facilitate more accurate monitoring of change over time

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Questions &
Comments

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