
IMPACT ANALYSIS OF VISION TO LEARN

Wendelin Slusser, MD, MS

Rebecca Dudovitz, MD, MS

Vision is Important for Learning

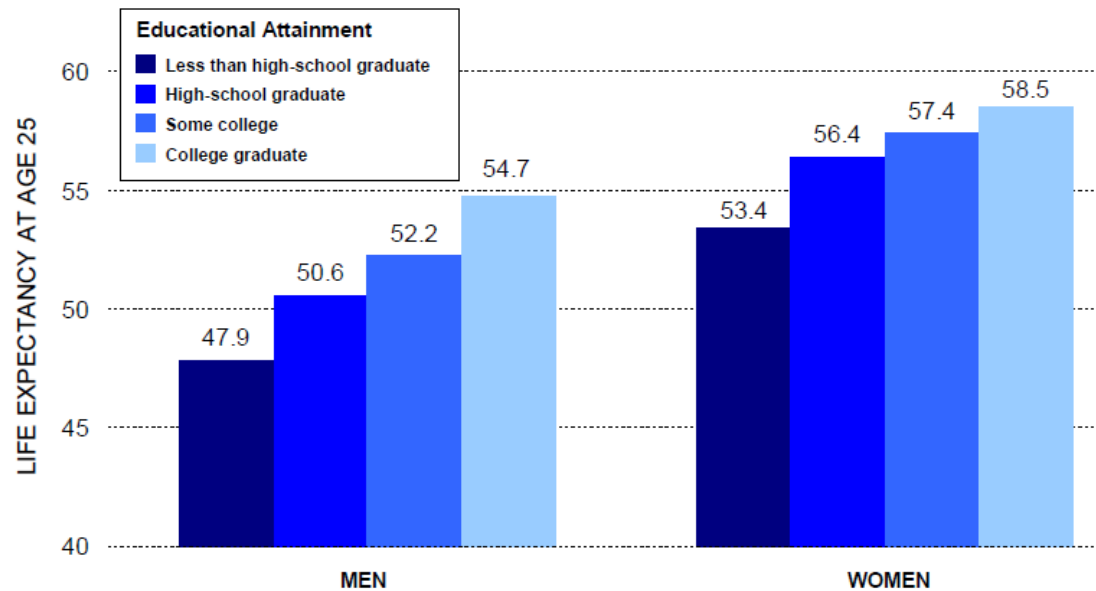
- Students with vision problems tend to have lower academic performance, as measured by test scores and grades.



The Education-Health Connection

- How students perform in school impacts their overall life trajectory:

- Employment, earnings
- Health behaviors, outcomes, life expectancy
- Impacts on the next generation



Source: National Longitudinal Mortality Study, 1988-1998.

- Interventions to support school function can have a profound effect on a child's life

Impact of Vision to Learn

- We hypothesized that VTL improves
 - Student focus and behavior in the classroom
 - Student ease and ability to complete schoolwork
 - School engagement and academic achievement
- Other potential benefits:
 - Classroom management
 - Student self-esteem
 - Family finances
 - Sports performance

There are virtually no published studies describing the impact of corrective lenses on children's academic performance.

Impact Analysis

- We preformed a mixed-methods evaluation
 - Qualitative study to understand how receiving glasses through VTL impacts students, families and teachers.
 - Quantitative study to determine whether receiving glasses was associated with improved academic performance



Qualitative Study

- **Methods:**

- 9 focus groups with 21 K- 8th grade students, 20 parents and 25 teachers who had been served by VTL
- Focus groups took place 3-12 months after students received corrective lenses.
- On average, teachers had more than 16 years of teaching experience



Qualitative Study

- Results:

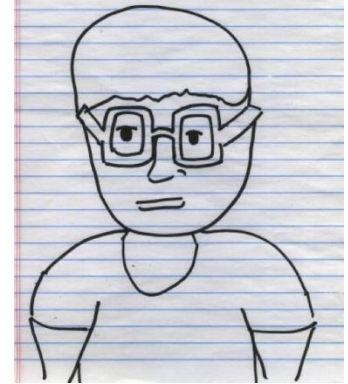
- Before they got glasses

- students had difficulty focusing, poor class participation; struggled to complete their work, often to the point of giving up.
 - Parents, students and teachers described significant stress related to coping with poor vision and poor school function

- After receiving glasses

- Students were able to pay attention in class, were more engaged, and were more willing to complete their schoolwork, contributing to better overall school performance.
 - Parents, students, and teachers reported improved psychosocial wellbeing

Qualitative Study

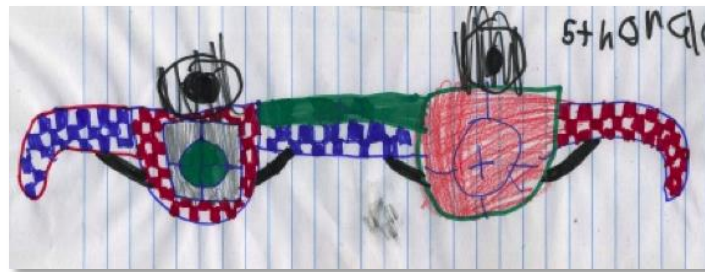


- Results:
 - Serving students in school increased both access to and use of glasses by
 - Addressing logistical barriers to accessing vision care
 - Changing the school culture to decrease the stigma associated with wearing glasses.

Quantitative Study

- Methods

- We examined the school records of 887 2nd-6th grade students attending 30 different public schools in Los Angeles who received glasses from VTL.
- We conducted piecewise regressions to compare their grades from each grading period in math and reading for the 2 years before they got glasses to 1 year after they got glasses.

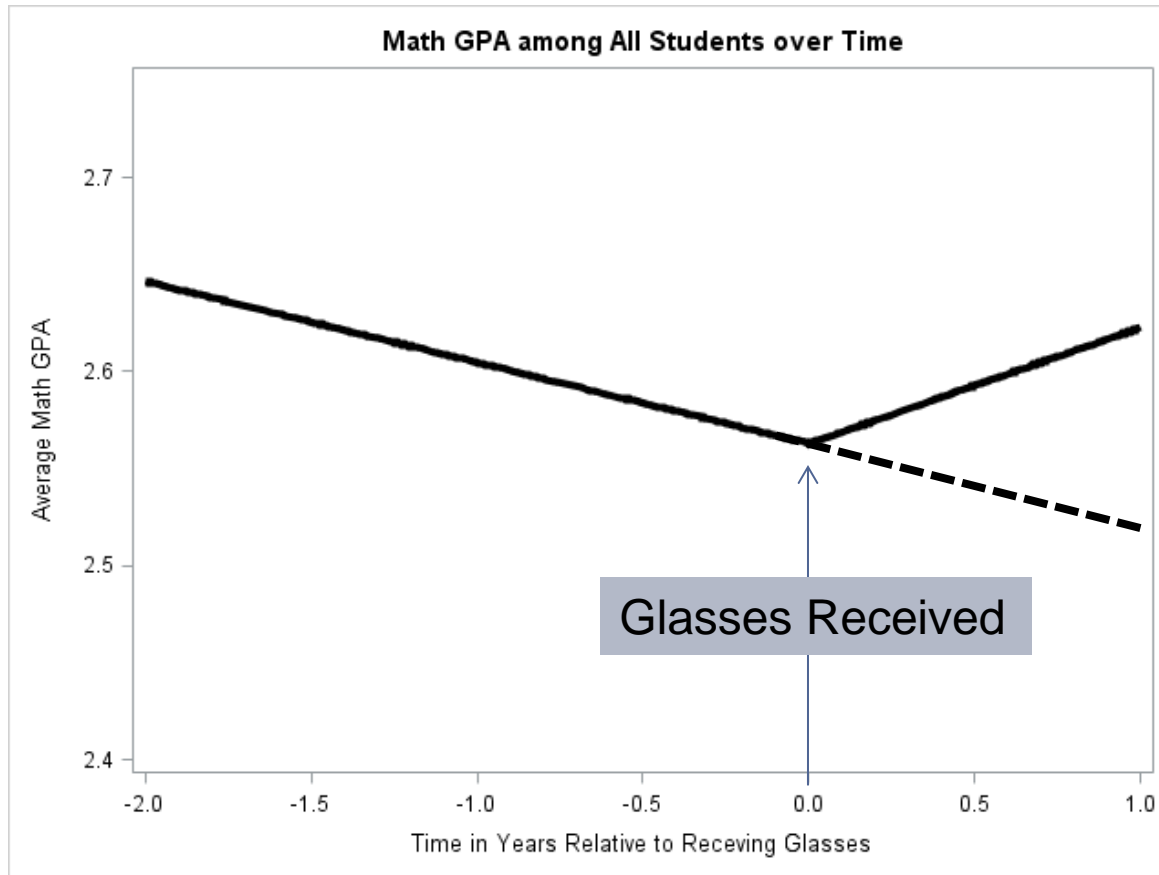


Quantitative Study

- Results

- before they got glasses, students on average had a downward trajectory in their math grades
- After they received their glasses, their math grades began to improve.
- The improvement in their math grade trajectory was statistically significant
 - 0.1 GPA points per year or +4% over 1 year.

Math GPA among All Students



Slope Estimate and Difference in Slope Pre- and Post-intervention		
Time Interval	Slope	P-value
Pre-intervention	-0.04	0.0002
Post-intervention	0.06	0.0108
Pre vs. Post	0.10	0.0011

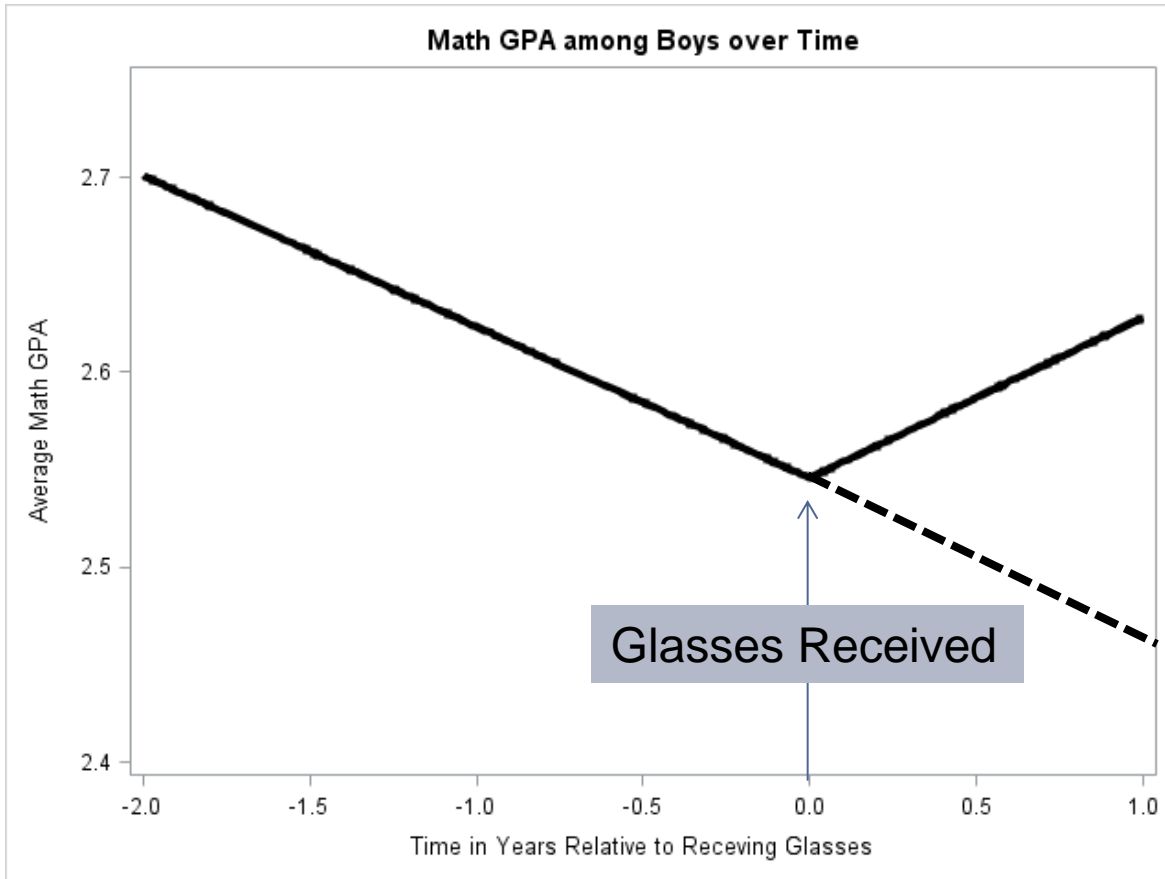
Quantitative Study

- Results

- Compared to girls, boys showed a more dramatic improvement in their math grade trajectory.
 - For boys, the estimated difference in their trajectory was 0.2 GPA points per year or +8% over 1 year.



Math GPA among Boys



Slope Estimate and Difference in Slope Pre- and Post-intervention

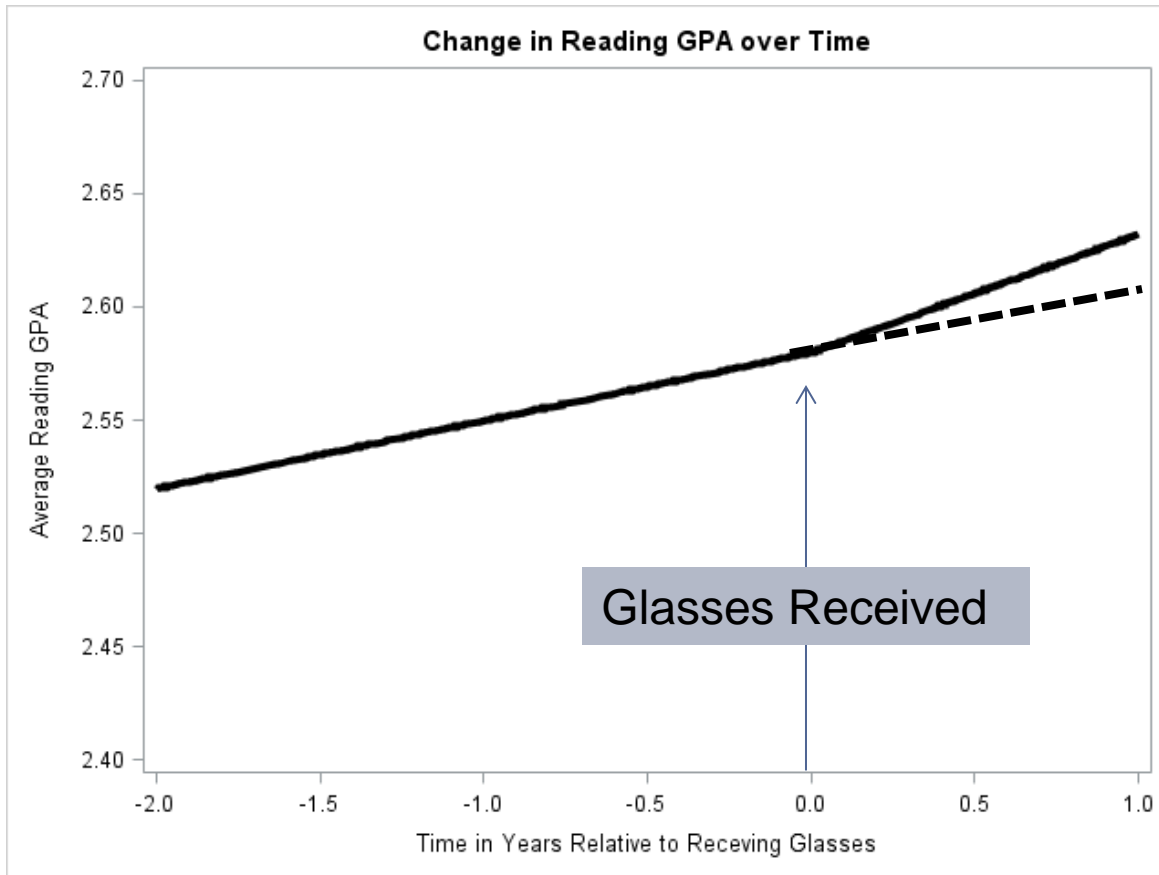
Time Interval	Slope	P-value
Pre-intervention	-0.08	<.0001
Post-intervention	0.08	0.0183
Pre vs. Post	0.16	0.0006

Quantitative Study

- Results

- In reading, students also had an improved trajectory in their grades after receiving glasses, though this was not statistically significant.
- Prior to receiving glasses, students' grades in reading increased by an average of 0.03 GPA points/year.
- After receiving glasses, the average annual GPA change increased to 0.05 GPA point over 1 year.
- There was no significant difference in these results when comparing boys versus girls

Reading GPA among All Students



Slope Estimate and Difference in Slope Pre- and Post-intervention		
Time Interval	Slope	P-value
Pre-intervention	0.03	0.0016
Post-intervention	0.05	0.0080
Pre vs. Post	0.02	0.3959

Limitations

- Only data for 1 year after being served
- Does not account for prescription strength or whether students actually wear glasses
- GPA may be subjective and is difficult to compare across classes, grades, and schools
- No good comparison group
 - Though results look favorable when compared to students who were referred to VTL and did not need glasses

Next Steps

- Compare academic trajectory of VTL students with “typical” students.
- Evaluate whether there is a dose response with greater academic gains seen in students requiring higher strength prescriptions.
- Determine whether the impact varies by age/grade level or academic performance prior to being served.
- Quantify the cost-savings to the education and healthcare system as well as potential economic impact of the delivery model.
- Develop intermediate outcome measures for quantifying the impact on classroom behavior and school function.

Acknowledgements

- Collaborators:
 - Nilufar Izadpanah, BA
 - Paul Chung, MD, MS
 - David Elashoff, PhD and Erin Duffy, MS of the UCLA CTSI biostatistics program
- Cynthia Lim and LAUSD's office of Data and Accountability
- Dolores Mission, Nevin Elementary and Harrison Elementary Schools for their enthusiastic participation
- AMAZING VISION TO LEARN STAFF!