

# “Early Literacy Acquisition in PGCPS: Developmental Trajectory Patterns”

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# PRESENTATION OBJECTIVES

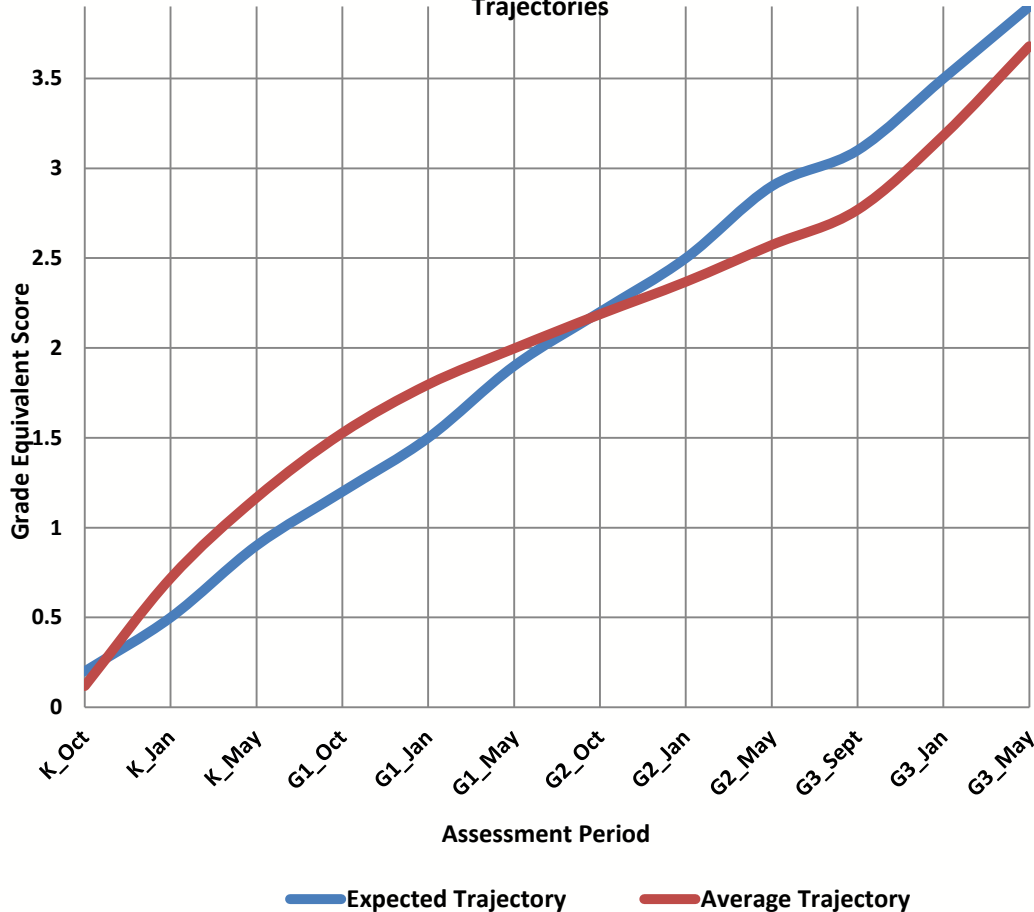
- ***To outline the study's purpose and scope.***
- ***To review key findings (September 2015 Report and April 2016 Follow-up).***
- ***Discussion on implications of the findings.***

# STUDY DESCRIPTION

- The report focuses on the **typical pattern of growth** in reading and examines **differential patterns of growth** among subgroups.
- A longitudinal panel data for 8939 students was created for a cohort that was followed from kindergarten (2009-10) through the end of third-grade (2012-13).
- Reading achievement was measured using a grade-equivalent score
  - obtained by converting the text score of DRA assessment (K to October of 2<sup>nd</sup> grade) and the SRI Lexile score (January of 2<sup>nd</sup> grade to the end of 3<sup>rd</sup> grade).
- A **Developmental Trajectory model** that captures the overall PGCPS growth pattern and a **Groups-Based Trajectory Model** to capture the various reading developmental trajectories that may exist in the student population were developed.

# Q#1A: WHAT IS THE AVERAGE K-3 READING DEVELOPMENTAL TRAJECTORY? AND HOW DOES IT DIFFER FROM THE EXPECTED K-3<sup>RD</sup> GRADE TRAJECTORY?

Figure 1: The Expected and the Average PGCPS Reading Developmental Trajectories



## AVERAGE DEVELOPMENTAL TRAJECTORY

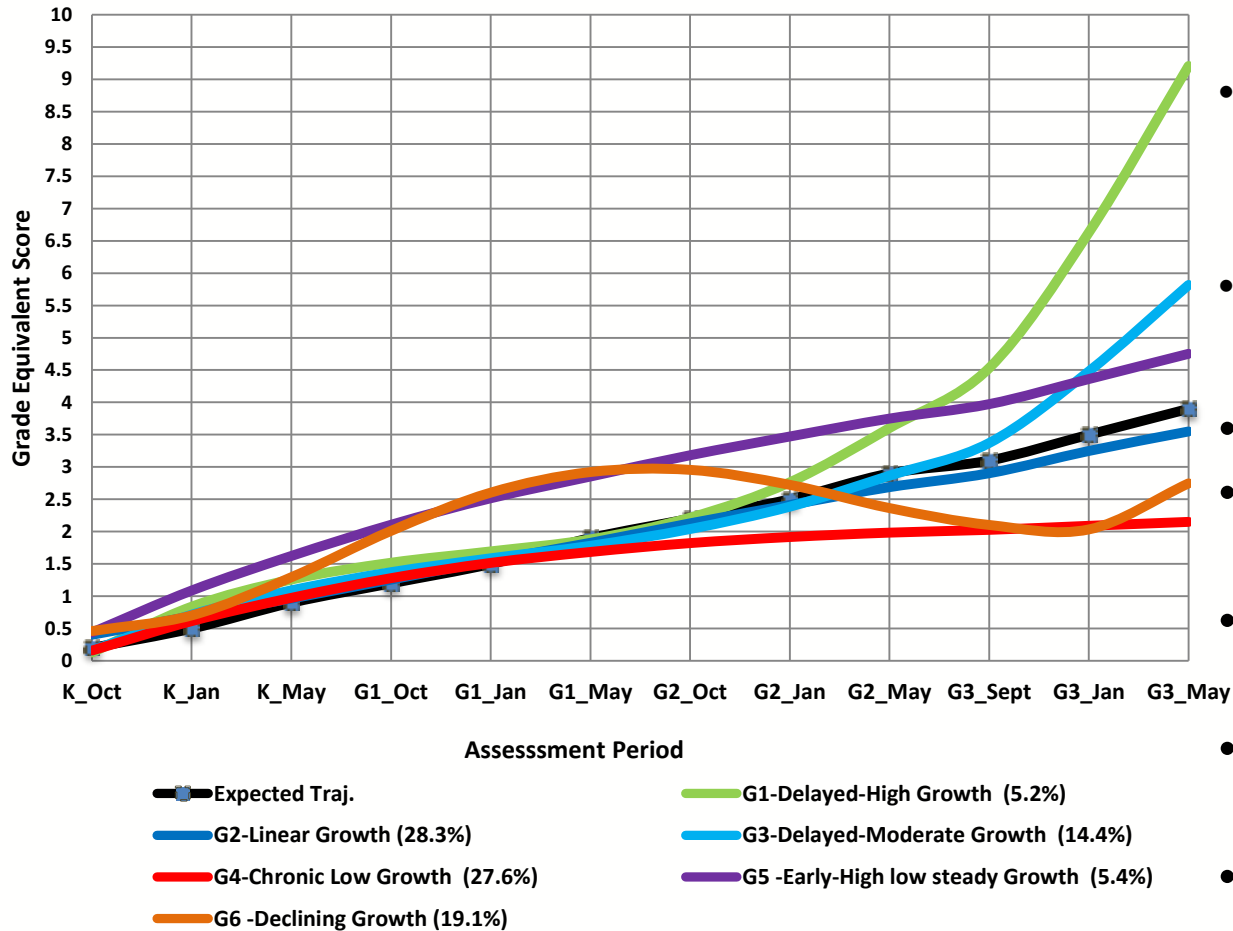
- Reading increased rapidly from K to early first grade.
- The rate of growth slowed down from the middle of 1<sup>st</sup> grade to the end of 2<sup>nd</sup> grade, and partially recovered in the 3<sup>rd</sup> grade.
- The average student had a growth of 1.31 grade-equivalent score during kindergarten.
- The average yearly growth for first grade, second grade and third grade were 0.59, 0.48, and 1.01 grade-equivalent scores, respectively.
  - the growth achieved in subsequent grades were equal to **45%, 37% and 77% respectively** of what it was at kindergarten.

## CONCLUSIONS FROM Q#1A: PATTERN OF GROWTH FOR THE AVERAGE PGCPS STUDENT

- The average student does not grow in a linear fashion:
  - S/he grew ***more than would be expected in kindergarten*** but the rate of growth ***started slowing down in the first grade***.
  - The slowing down of the rate of growth resulted in the average student ***falling below-grade expectation in second grade***.
  - Rate of growth ***recovered slightly in 3<sup>rd</sup> grade***, the gap between the observed & the expected levels of reading was narrowed by the end of 3<sup>rd</sup> grade.
- The average student's reading ability was slightly below expectation at the end of the school year in third grade.
- The ***transition into the second grade*** seems to be the grade at which the average student ***deviates from the expected path*** of proficient reading.
  - i.e. the skills level (or the grades) at which the average student seems to struggle is when the student is a transitional reader (from the middle of the first grade through end of second grade).

# Q#1B: HOW MANY UNIQUE READING DEVELOPMENTAL TRAJECTORIES ARE AVAILABLE IN THE SAMPLE?

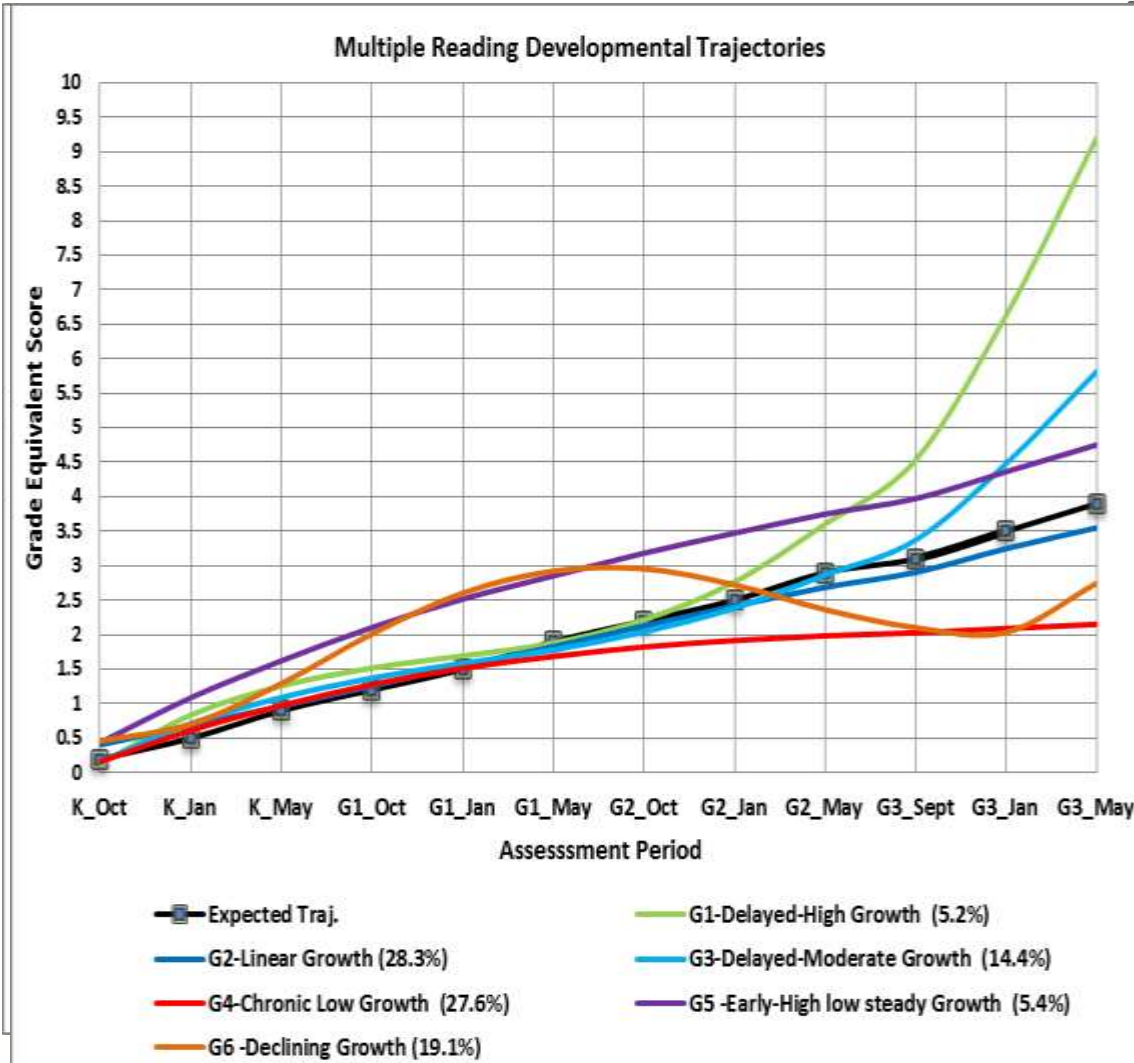
Figure 2: Subtypes of the average Reading Developmental Trajectory



## SIX DEVELOPMENTAL TRAJECTORIES

- The expected trajectory of consistent grade proficiency (Black)
- ‘Delayed-High Growth’ (Light Green)
- ‘Linear Growth’ (Blue)
- ‘Delayed-Moderate Growth’ (Light Blue)
- ‘Chronic Low Growth’ (Red)
- ‘Early-High Low Steady Growth’ (purple)
- ‘Declining Growth’ (Orange).

# Q#1B: HOW MANY UNIQUE READING DEVELOPMENTAL TRAJECTORIES ARE AVAILABLE IN THE SAMPLE?



## DEVELOPMENTAL TRAJECTORIES

- K (BG) and 3<sup>rd</sup> (AG):
  - G1 and G3 (19.6%)
- K (BG) and 3<sup>rd</sup> (BG):
  - G4 (27.6%)
- K (AG) and 3<sup>rd</sup> (BG):
  - G2 (28.3%) ~OG (-.08)
  - G6 (19%)
- K (AG) and 3<sup>rd</sup> (AG):
  - G5 (5.4%)

# CONCLUSIONS FROM Q#1B: SIX UNIQUE DEVELOPMENTAL GROUPS

- The analysis revealed the prevalence of multiple trajectories, rather than one typical or normative trajectory.
- Three groups were reading above-grade level by the end of the third grade.
  - followed different pathways toward reading proficiently
- Common characteristic of these groups:
  - all **recovered early and substantively** more from the slowing of growth that occurred between 1<sup>st</sup> & 2<sup>nd</sup> grade.
  - enjoyed **above average growth in reading in the second grade** --in contrast to the acceleration of growth that occurred in the third grade for the rest of the sample.

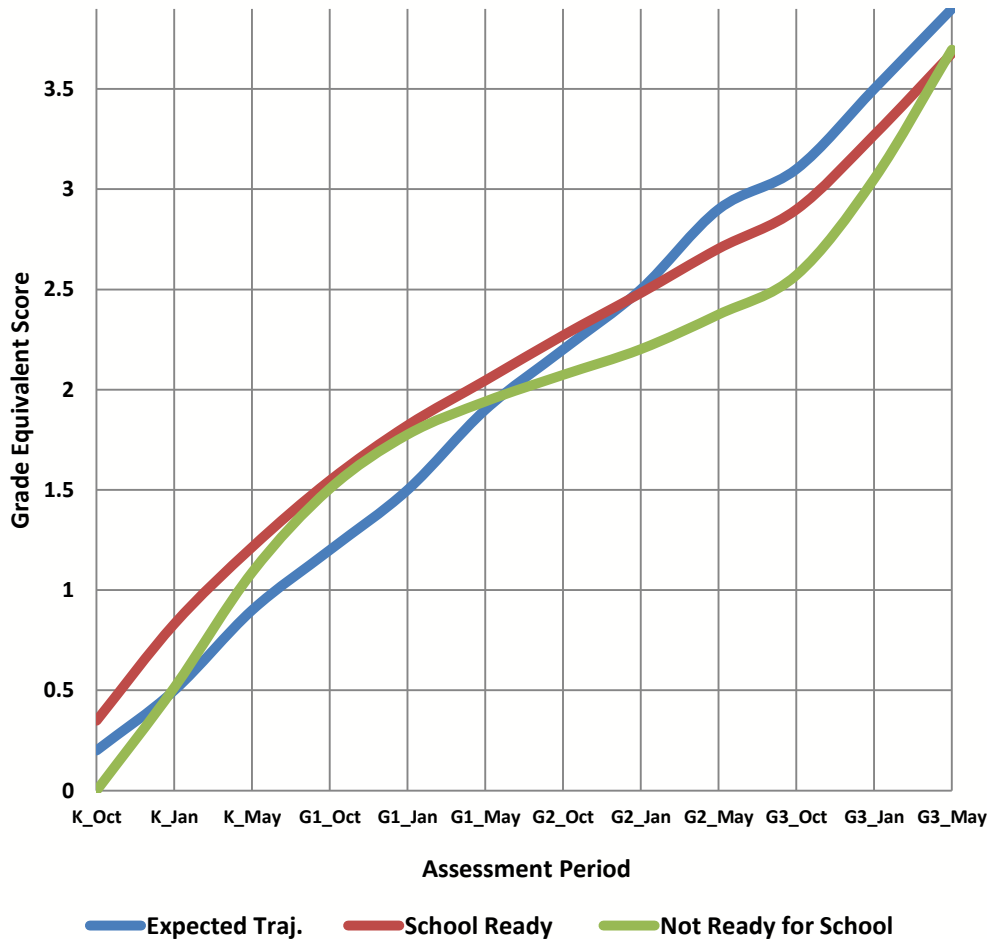


# CONCLUSIONS FROM Q#1B:SIX UNIQUE DEVELOPMENTAL GROUPS

- Three groups were not proficient readers by the end of the third grade:
  - They followed different paths to underperformance.
  - **A common characteristic:** they either experienced low rates of growth or had a negative net gain in the second grade.
    - The **'linear growth'** group - rate of its growth was too low to compensate for the observed deviation from the expected path in second grade and is barely below expectation at the end of 3<sup>rd</sup>.
    - The **'low-chronic growth'** group experienced much smaller rate of overall growth that declined overtime (plateaued in the second grade).
    - The **'Declining Growth'** group - precipitous decline in its rate of growth in the second grade and finished the third grade reading below its own reading level at the beginning of the second grade.

# #2A: DO 'READY FOR SCHOOL' KINDERGARTENERS HAVE A TRAJECTORY THAT IS DIFFERENT FROM THOSE WHO WERE 'NOT READY FOR SCHOOL' IN LANGUAGE AND LITERACY?

Figure 3: Average Reading Trajectories by Readiness for School

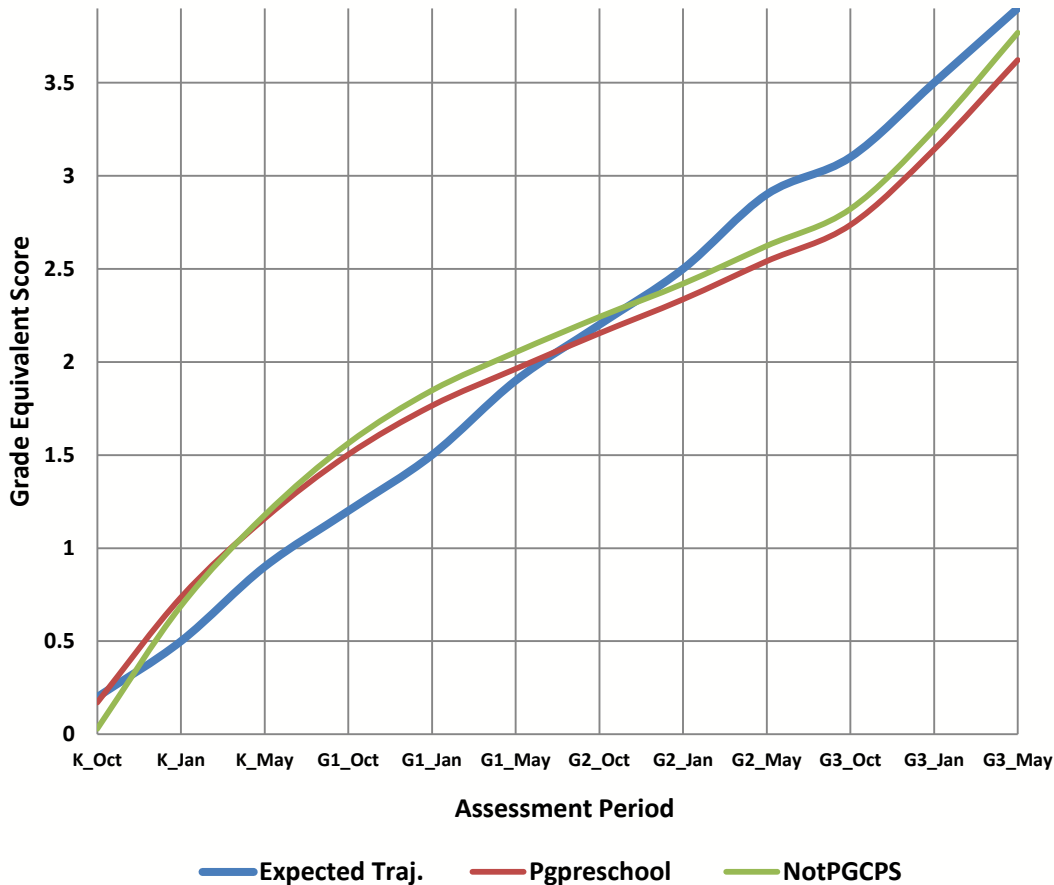


## READINESS GAP AT SCHOOL ENTRY

- During the first assessment period in kindergarten, students who are school ready were already reading at a higher level.
- Growth in reading for school ready students (57% of the sample) slowed down at a *smaller rate and a semester later*.
- Students who were not ready for school had slightly better growth in the third-grade.

# #2B: DO STUDENTS WHO ATTEND PGCPS PRESCHOOL PROGRAMS HAVE A TRAJECTORY THAT IS DIFFERENT FROM THOSE WHO DO NOT ATTEND PGCPS PRESCHOOL PROGRAMS?

Figure 4: Average Reading Trajectory by Preschool Status



## PRESCHOOL STATUS

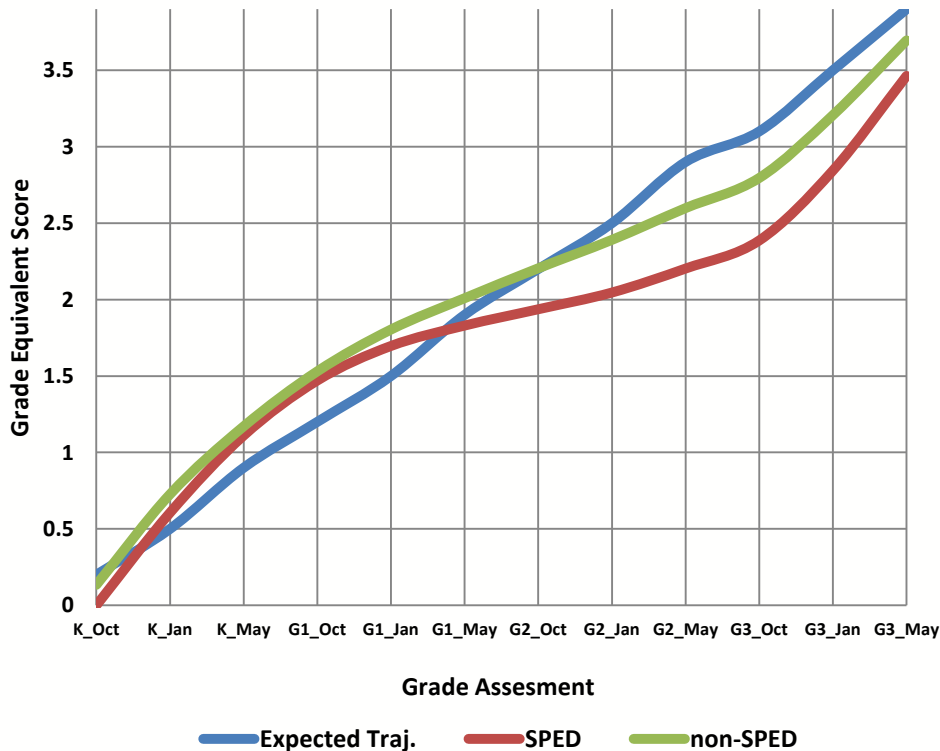
- PGCPS preschoolers (Pre-K or head Start), 61% of the sample), had higher rates of growth in reading in the 2<sup>nd</sup> & 3<sup>rd</sup> grades.
- Both groups had the same reading level at kindergarten entry and on K to 1<sup>st</sup> grade growth pattern.
- There was no significant gap between the two groups at the end of the third-grade.

- **School readiness in language and literacy at school entry:**
  - School ready students enjoyed substantively more net growth in the first and second grades and maintained grade proficiency longer than their peers who were not school ready.
  - The average students fell below the expected path of proficiency but a school ready student enjoyed two more semesters of proficiency in the second grade.
- **Type of preschool attended:**
  - PGCPS preschoolers were not reading at higher levels at school entry and do not have a rate of growth that were different from that of non-PGCPS preschoolers in kindergarten to early first grade.
  - Even though the average growth rate in subsequent grades was higher for PGCPS preschoolers than for those who did not attend preschool in PGCPS, it did not result in significant performance gap at the end of the third grade.

# Q#3: AVERAGE READING DEVELOPMENTAL TRAJECTORY AND STUDENT CHARACTERISTICS

**Q#3A: Do Special Education (SPED) students have a trajectory that is different from students who are not SPED students?**

Figure 5: Reading Trajectory by Special Education needs during Kindergarten



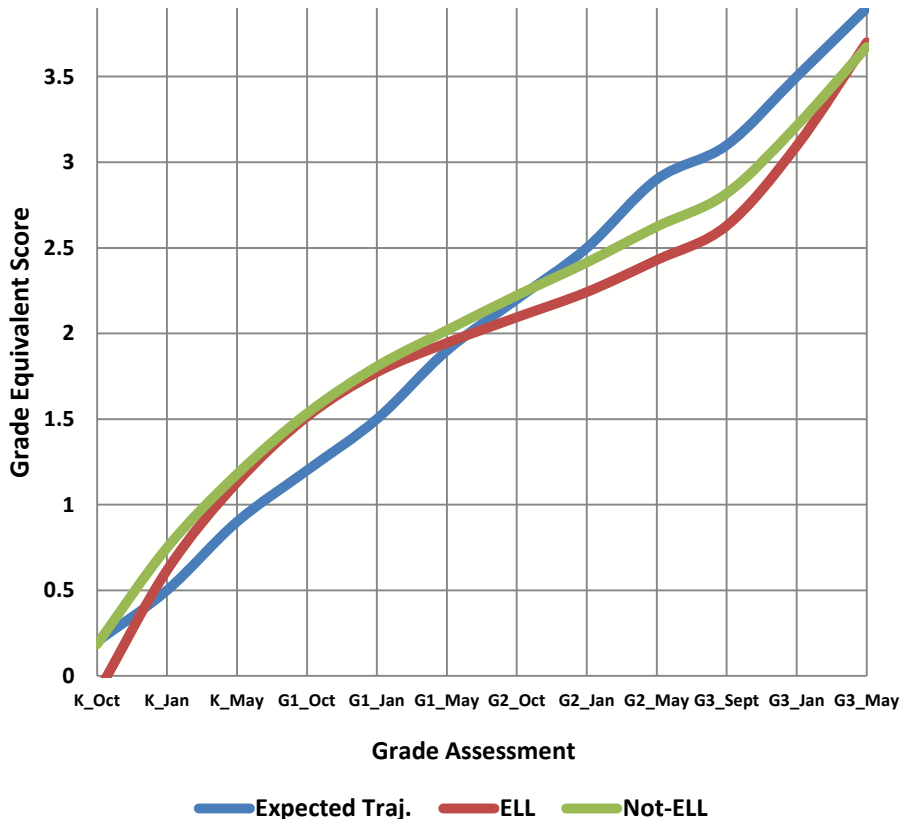
- 6.8% of the sample entered kindergarten as SPED students.
- SPED students were not significantly different at kindergarten entry and through early first grade.
- SPED students had lower rates of growth in reading in first and second grades.
- They had a growth rate similar with the average non-SPED classmate in the third grade.

# #3: AVERAGE READING DEVELOPMENTAL TRAJECTORY AND STUDENT CHARACTERISTICS

**Q#3B: Do English Language Learners (ELL) have a trajectory that is different from those who are not ELL students?**

- 26.3% of the sample entered Kindergarten as English Language Learners (ELL).
- ELLs were not significantly different at kindergarten entry and through early first grade.
- ELLs had lower rates of growth in first and second grade and *higher rate* of growth in the *third* grade.

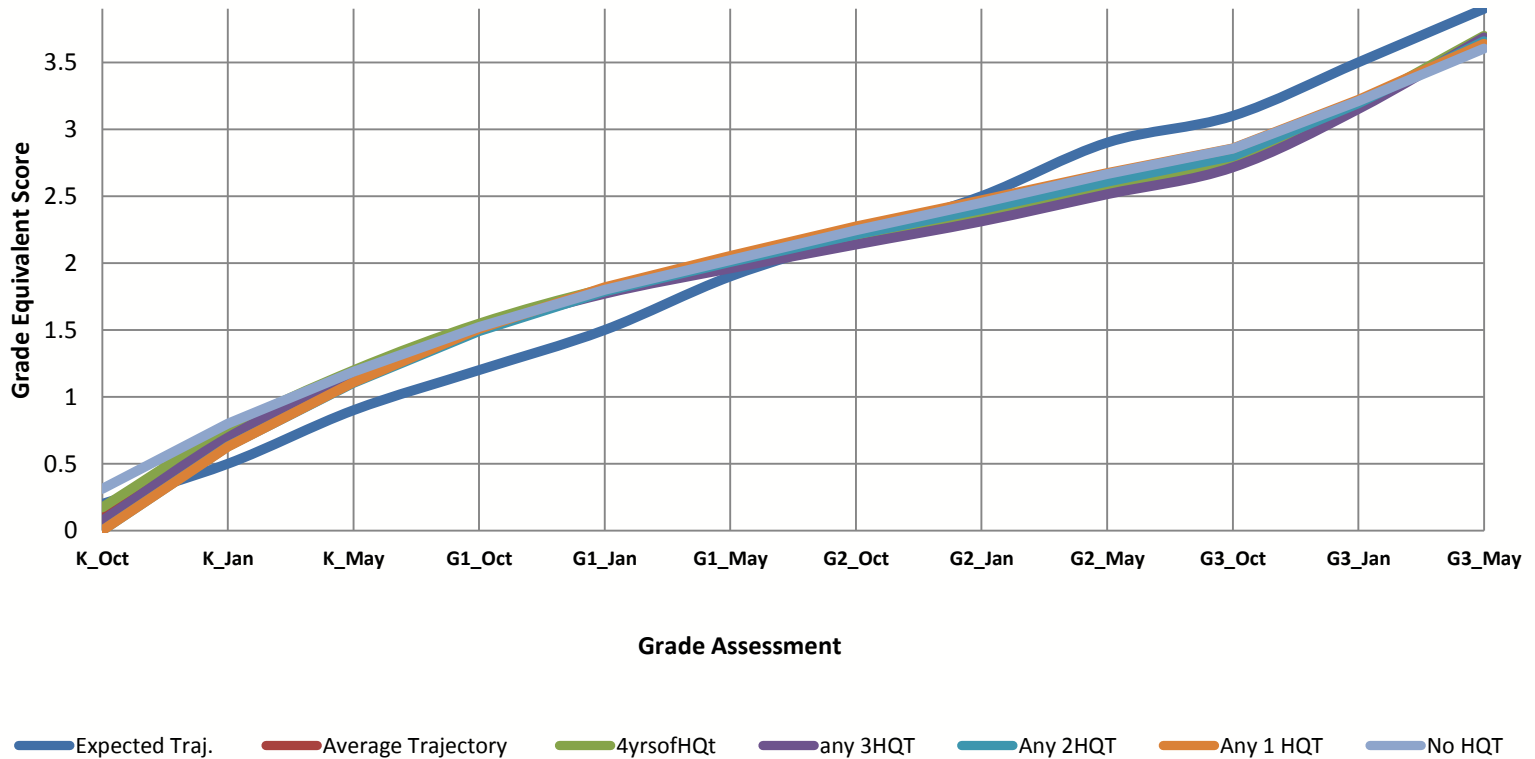
Figure 6: Average Reading Trajectory by Language ability during K



# #4: TO WHAT EXTENT DOES THE QUALITY OF INSTRUCTION FROM KINDERGARTEN TO END OF THIRD GRADE CHANGE THE READING TRAJECTORY?

- The average trajectory was equally descriptive of the growth of pattern of all students irrespective of the years of instruction by highly qualified teacher.

Figure 7: Average Reading Trajectory by Quality of Instruction



## **CONCLUSIONS FROM Q#4: NO VARIATIONS IN THE AVERAGE READING DEVELOPMENTAL TRAJECTORY BY QUALITY OF INSTRUCTION**

- All trajectories had similar pattern of growth. All were similar with the average path of growth in (a) sharp increase from kindergarten to early first grade, (b) the way they deviated from the expected path of growth during second grade and (c) finished third grade reading slightly below-grade expectation despite the recovery made in the third grade.
- As a context, the average number of years taught by highly qualified teacher for the whole sample was 2.9 years, with half of the students receiving at least three years of instruction by a highly qualified teacher.



# CONCLUSIONS

- This study :
  - employed two different measures that capture different skills at different levels of reading development, and standardized them for easy comparison.
  - developed a profile of K-3<sup>rd</sup> grade developmental trajectory where word reading and reading comprehension are studied simultaneously.
  - helps understand the dynamics of reading development from the beginning of formal instruction until students are expected to start to read to learn.
- The trajectory approaches identified the early acceleration in kindergarten, the slowing down of growth in first and second grades and the recovery in the 3<sup>rd</sup> grade.
  - The ***slumping of growth*** in this study for the average student occurred from the middle of the first grade through end of second grade, with slight variations in the onset and degree of the slump
  - The ***general pattern*** - rapid acquisition of the basic skills during the stages of emergent and early reader followed by a decline in the rate of progress during the transitional reader stage and some recovery of the rate of progress in the third grade.

# CONCLUSIONS

- Results are similar to previous studies that found that **children learning to read English seem to undergo a longer lasting growth spurt in kindergarten and Grade 1** (Hill, et al, 2008; Skibbe et al., 2012) and a **slumping of the rate of growth in subsequent grades** (Snow, Burns, & Griffin, 1998).
- The literature offers two possible explanations for the slump in growth:
  - (1) **The slump is an artifact:** i.e, the tasks in school and the tasks in assessment instrument may change so much between grades that it is not sensible to compare progress and success on such different tasks and measures.
    - In this study, the slump started much earlier than the change of assessment instrument from the DRA to the SRI in the middle of the second grade.
    - Moreover, the standardization of the assessment into grade-equivalent measure and the identification of multiple trajectories that experienced various levels of growth during the typical slump period ***demonstrate that the trend is not just an artifact.***

# CONCLUSIONS

(2) It is not so much of a second grade slump but a “**primary-grade streak**,” (Snow, Burns, and Griffin, 1998) that is, that some children have problems in the earlier assessments/grade that are hidden while so much else is being learned.

- It may be that there had been less need for certain knowledge and abilities until second grade and failure to thrive in those areas might not be noticed until then.
- This possibility is **the likeliest explanation** because students who were ready for school at kindergarten entry experienced smaller degree of the slump in growth.

# CONCLUSIONS

- As previous studies have indicated the reason that emergent literacy skills are important for children entering elementary school is not that children with low levels of those skills cannot succeed in the task of learning to read.
  - Rather, ‘the reason is that schools provide an age-graded rather than skills-graded curriculum in which *early delays are magnified at each additional step* as the gap increases between what children bring to the curriculum and what the curriculum demands’ (Whitehurst and Lonigan, 1998).
- It is, therefore, important that there is **focus on skills in the early stages of literacy development** for preventing reading difficulties that may appear later when students are learning to read in the transitional stage.
- Future research and interventions should also seek to **identify the correlates of improving the acquisition of reading skills in the transitional stage** (late first grade through the end of second grade).

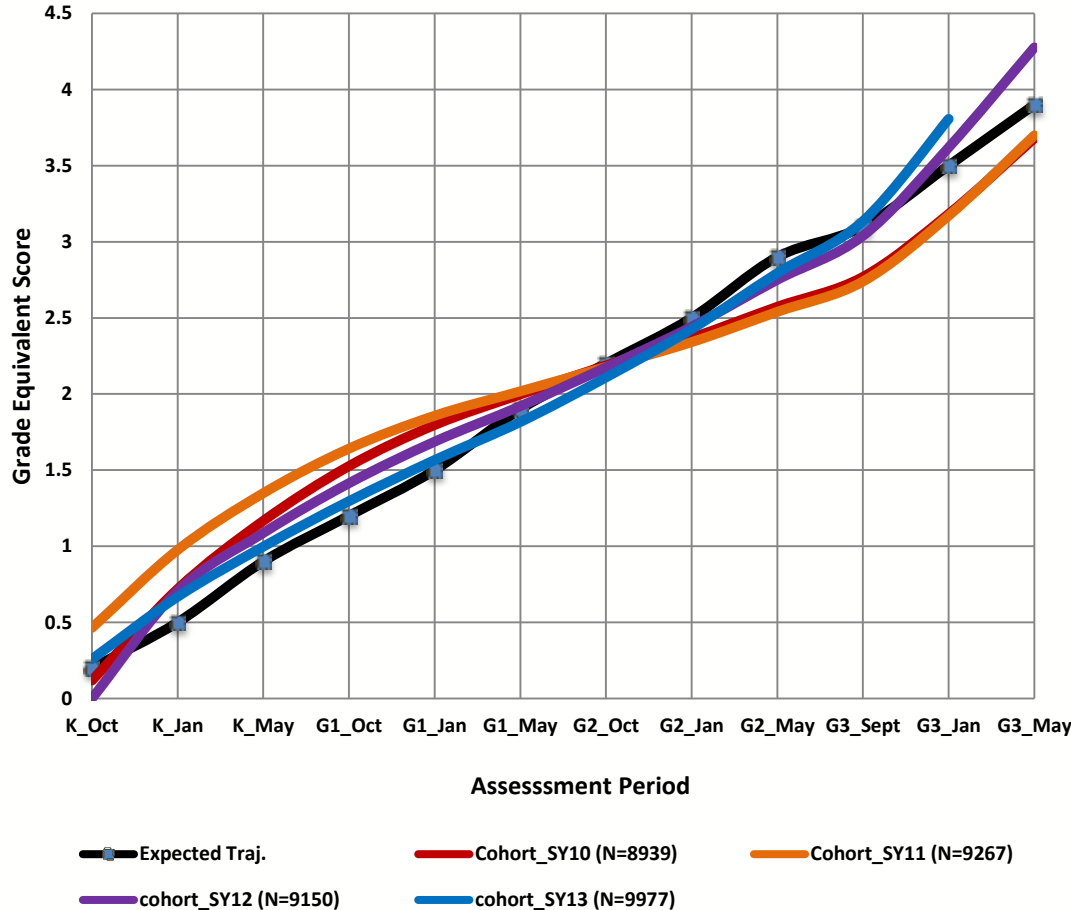
# FOLLOW-UP STUDY

- The report, which was based on the Kindergarten Cohort of SY2010, was completed in September 2015.
- In response to questions during the presentation to Teaching & Learning on April 5, and to further validate the conclusions made, I conducted a follow-up study.
- The ***Average Reading Trajectory*** (Research Question **1A**) and ***Multiple Group Trajectories*** (Research Question **1B**) for three subsequent cohorts (SY2011, SY2012, SY2013) were developed for the follow-up study.
- The results are discussed next.

# FOLLOW-UP Q#1A: *THE AVERAGE K-3 READING DEVELOPMENTAL TRAJECTORY IN SUBSEQUENT COHORTS*

## AVERAGE TRAJECTORY BY COHORT

Average Reading Developmental Trajectory by Cohorts

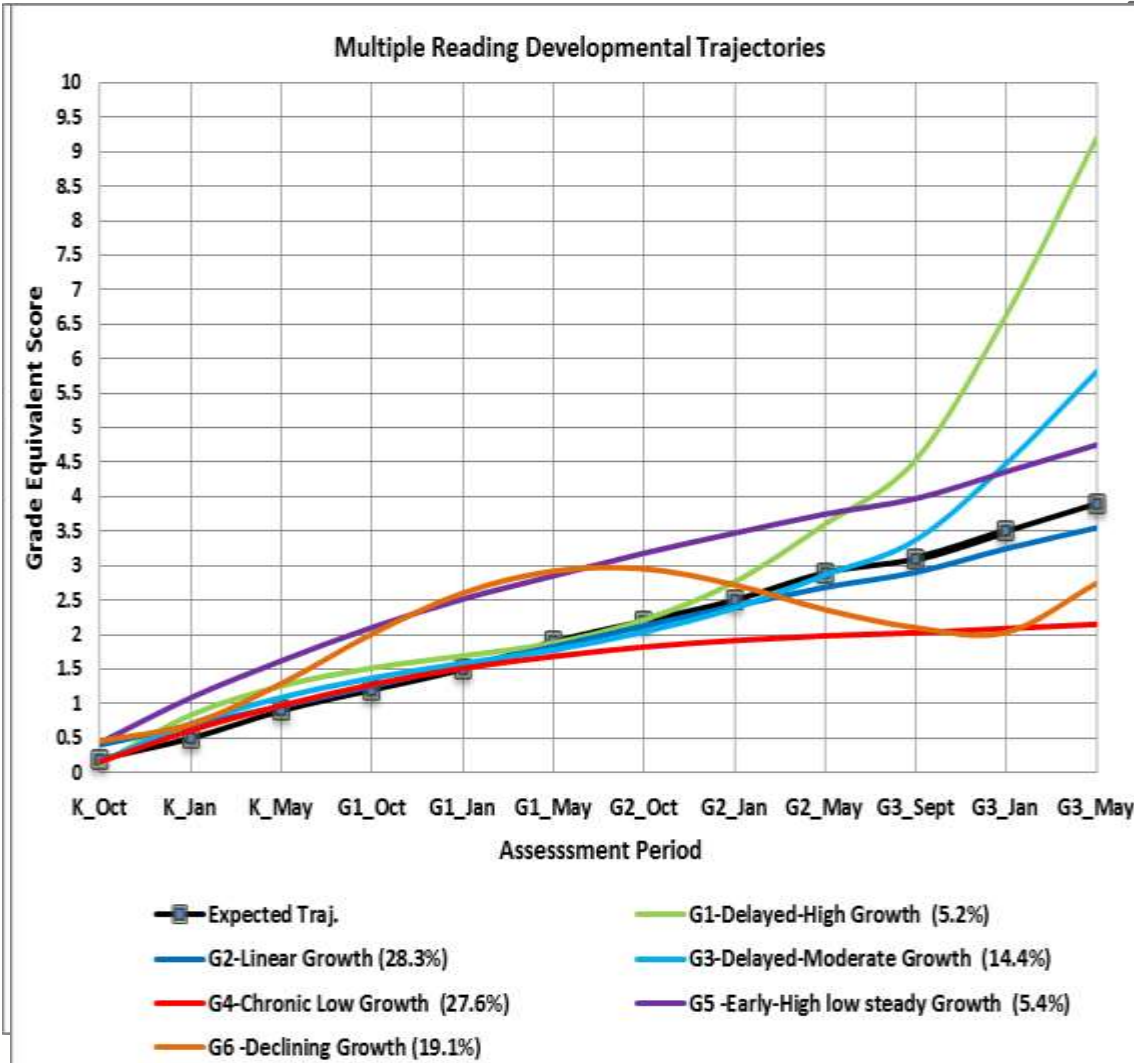


- The general pattern of the PGCPS early reading trajectory holds the same for all cohorts.
- However, the rate and onset of decline in growth and the onset and rate of *recovery* is different.
- The gap between the expected and the average trajectory is narrowed.
  - That is, growth curves for the last two cohorts (SY12 and SY13) are closely aligned to the expected trajectory.
- As a results, students who entered PGCPS as kindergarten students in SY12 and SY13 were reading at grade level expectation in the third grade.

## CONCLUSIONS FROM FOLLOW-UP Q#1A: PATTERN OF GROWTH FOR THE AVERAGE PGCPS STUDENT BY COHORT

- The earlier conclusion about the *general pattern of growth* is supported.
  - i.e. rapid acquisition of the basic skills during the stages of emergent and early reader followed by a decline in the rate of progress during the transitional reader stage and some recovery of the rate of progress in the third grade.
- Between SY13 and SY16, the average student's reading ability at the end of G-3 has shifted from **slightly below to above grade level expectation**.
- The transition into the 2<sup>nd</sup> grade remains to be the grade at which the average student deviates from the expected path of proficient reading.
  - However, the *slumping of growth* is much smaller for the most recent cohorts.

# Q#1B: HOW MANY UNIQUE READING DEVELOPMENTAL TRAJECTORIES ARE AVAILABLE IN THE SAMPLE?



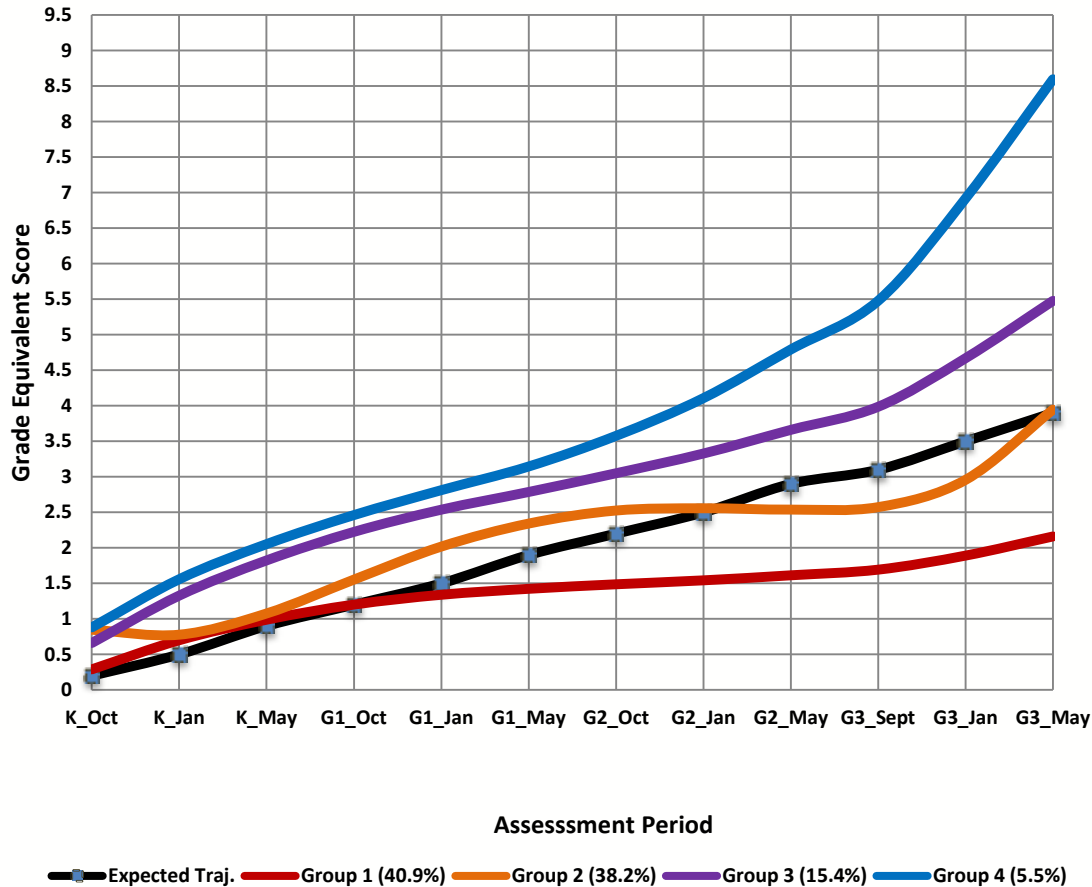
## DEVELOPMENTAL TRAJECTORIES

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- K (BG) and 3<sup>rd</sup> (BG):
  - G4 (27.6%)
- K (AG) and 3<sup>rd</sup> (BG):
  - G2 (28.3%) ~OG (-.08)
  - G6 (19%)
- K (AG) and 3<sup>rd</sup> (AG):
  - G5 (5.4%)



# FOLLOW-UP Q#1B: MULTIPLE DEVELOPMENTAL TRAJECTORIES BY COHORT

Subtypes of the average Reading Developmental Trajectory: Cohort\_SY11

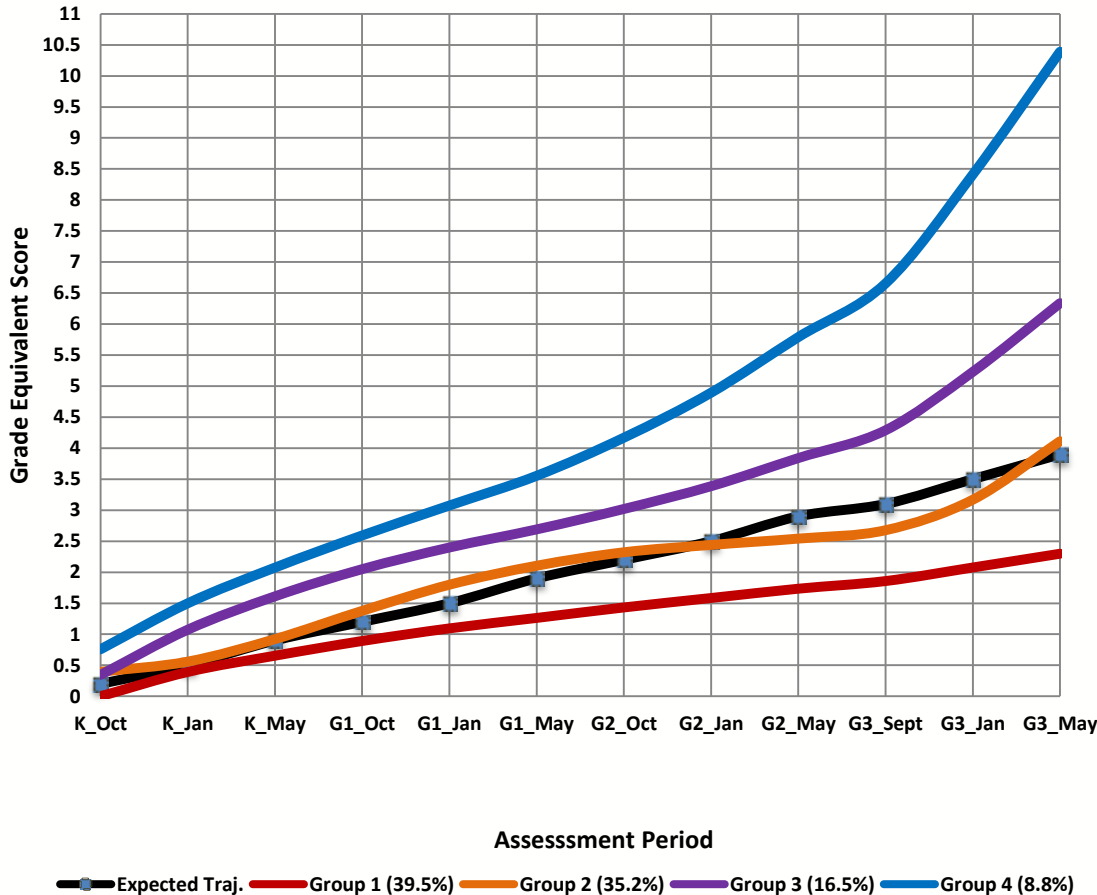


## TRAJECTORIES FOR SY2011 COHORT

- K (BG) and 3<sup>rd</sup> (BG):  
■ **G1 (41%)**
- K (AG) and 3<sup>rd</sup> (OG):  
■ **G2 (38%) ~OG (-.03)**
- K (AG) and 3<sup>rd</sup> (AG):  
■ **G3 and G4 (21%)**

# FOLLOW-UP Q#1B: MULTIPLE DEVELOPMENTAL TRAJECTORIES BY COHORT

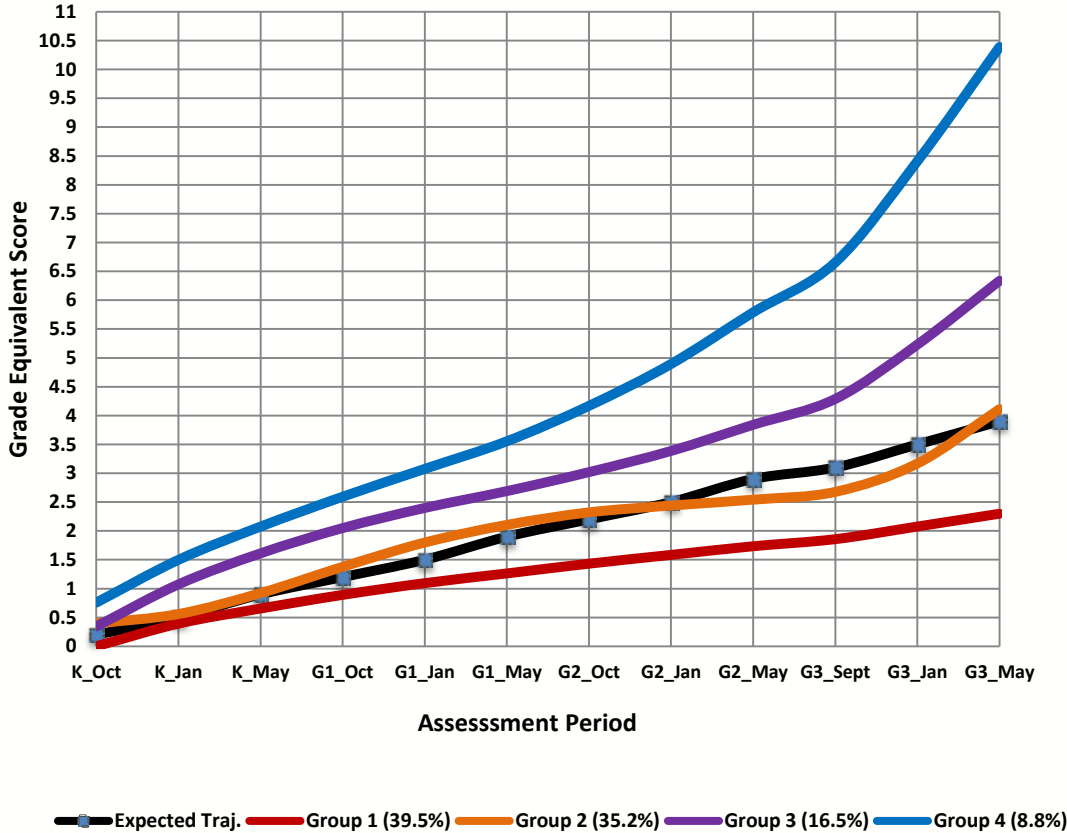
Subtypes of the average Reading Developmental Trajectory: Cohort\_SY12



## TRAJECTORIES FOR SY2012 COHORT

- K (BG) and 3<sup>rd</sup> (BG):  
■ G1 (40%)
- K (AG) and 3<sup>rd</sup> (OG):  
■ G2 (35%)
- K (AG) and 3<sup>rd</sup> (AG):  
■ G3 and G4 (25%)

Subtypes of the average Reading Developmental Trajectory: Cohort\_SY12



## TRAJECTORIES FOR SY2013 COHORT

- K (BG) and 3<sup>rd</sup> (BG):
  - G1 (43%)
- K (AG) and 3<sup>rd</sup> (AG):
  - G2, G3 and G4 (57%)

## Positive Trends:

- The proportion of students who read **below-grade expectation** in the third grade is **declining overtime**.
- The proportion of students who maintain **on-or-above grade** expectation reading from K-3<sup>rd</sup> grade has **increased**.
  - As the proportion of students with '*declining growth*' *patterns decreased*.

## Concerns:

- Across cohorts a significant proportion of students, **about 40%, are characterized by chronic low growth pattern**.
  - i.e. they start Kindergarten reading below expectation and remain below expectation throughout their four years of schooling.

**THANK YOU FOR YOUR TIME!!**

**ANY QUESTIONS OR COMMENTS?**