

# ***EARLY CHILDHOOD REGRESSION DISCONTINUITY STUDY***

**STUDY BRIEFING (Date: September 13, 2016)  
SUPPLEMENTAL SLIDES (Date: October 4, 2016)**

# How much does Connecticut PreK boost normal expected growth in academic achievement?

| Claim  | Translation following Lipsey et al. (2012)  |
|--|---|
| <p>Large, positive and statistically significant effects on a subset of student's early <u>literacy</u> skills<br/>(Effect size: 0.69)</p> | <p>On average, a child who attends state-funded School Readiness full-day or school-day prekindergarten will receive approximately a 50% boost in their early <u>literacy</u> skills, in comparison to a child who does not attend PreK</p> |
| <p>Large, positive and statistically significant effects for most student's early <u>numeracy</u> skills<br/>(Effect size: 0.48)</p>       | <p>On average, a child who attends state-funded School Readiness full-day or school-day prekindergarten will receive approximately a 40% boost in their early <u>numeracy</u> skills, in comparison to a child who does not attend PreK</p> |

# Age-Based PreK Studies Using RD:

## *Ensuring an Apples to Apples Comparison (1)*

### The basic idea:

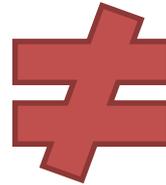
- The “gold standard” for looking at impact or outcomes of programs are lottery-based designs
- In the context of PreK, if we used a lottery system, the groups we would need to compare are outcomes for those that:
  - Outcomes for those that planned to attend & completed PreK (*treatment group*), *versus*
  - Outcomes for those that planned to attend & *did not* complete PreK (*control group*)
- For ethical reasons, we cannot use a lottery system to decide who gets to complete PreK and who does not. This means we have to use another design to look at impact or outcomes of PreK.
- The best alternative option is a regression discontinuity (RD) design. Therefore, the RD design is the industry standard in PreK evaluations.

# Age-Based PreK Studies Using RD:

## *Ensuring an Apples to Apples Comparison (2)*

In an RD design, we cannot create the 2 groups for comparison from kindergarten students only, as the students who show up in K, but did not attend state-funded School Readiness full-day or school-day PreK, do not meet the first condition for comparison. That is, they never planned to attend this type of PreK program.

Students in K who **planned to attend** state-funded PreK



Students in K who **did not plan to attend** state-funded PreK



### Examples of potential differences:

- Sally is a new immigrant and so wasn't in state
- Chester went to an excellent private PreK
- Stephanie stayed home with her grandmother

# Age-Based PreK Studies Using RD: *Ensuring an Apples to Apples Comparison (3)*

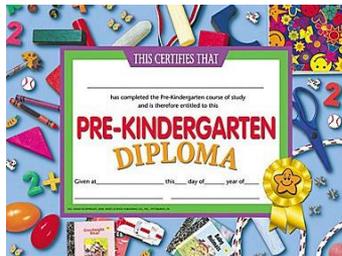
We can, however, create the two comparison groups using students who attend School Readiness state-funded full-day or school-day PreK, combined with information about (a) their birthdays and (b) enrollment cut off date. In this scenario, whether you were born on a day that made you eligible for PreK is random, and naturally creates control and treatment groups.

*For students close to the enrollment eligibility date, the only difference between these two groups is that*

One group experienced PreK  
(Treatment)



Students in K who completed  
state-funded PreK



One group had to wait until the next  
year to experience PreK (Control)

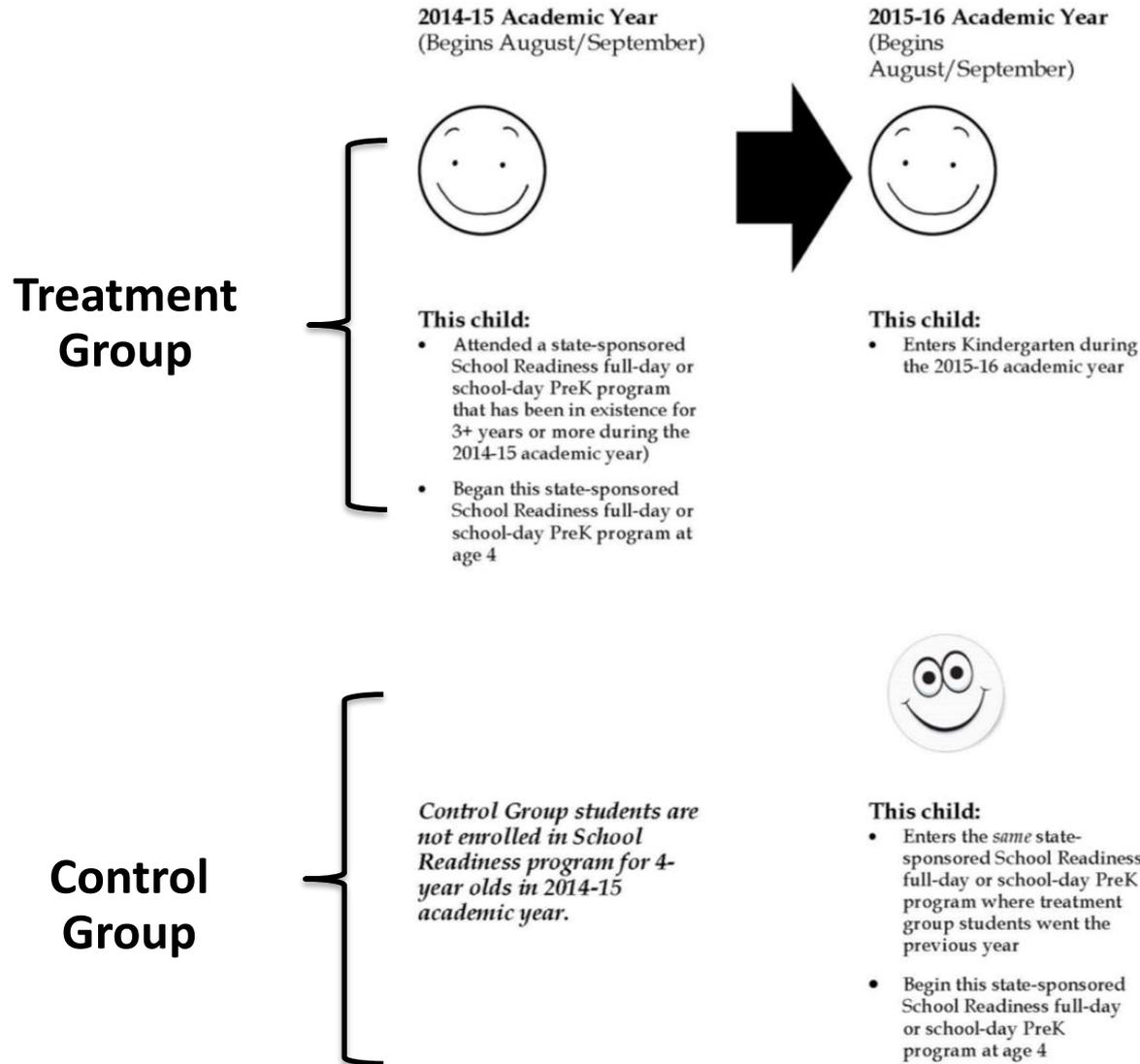


Students who are attending  
state-funded PreK



# Age-Based PreK Studies Using RD:

## *Apples to Apples Comparison in this Study*



**Both the treatment and control groups are given the same tests in 2015-16 during the same time period**

# References & Sources

Lipsey, M. W., Puzio, K., Yun, C., Hebert, M. A., Steinka-Fry, K., Cole, M. W., & Busick, M. D. (2012). *Translating the Statistical Representation of the Effects of Education Interventions into More Readily Interpretable Forms*. National Center for Special Education Research. Retrieved from: <http://files.eric.ed.gov/fulltext/ED537446.pdf>

## Photo sources:

<http://www.buildingfamilies.net/wp-content/uploads/2014/09/bigstock-Elementary-School-Kids-Group-I-50081939.jpg>

[http://www.lyricalchildren.com/uploads/5/7/4/0/57407589/8399613\\_orig.png](http://www.lyricalchildren.com/uploads/5/7/4/0/57407589/8399613_orig.png)

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