



A Study of a New Curriculum: The Effect of Easton Weed and Seed's 'Summer Nights' Program on Summer Learning Loss

Shannon Nitroy

Advisers: Chris Ruebeck, Lafayette College Department of Economics
 Jeff Liebner, Lafayette College Department of Mathematics



ABSTRACT

Summer learning loss describes students' tendencies during summer vacation to forget material learned during the previous school year. Easton Weed and Seed's 2013 Summer Nights program included a curriculum component intended to reduce attendees' summer learning loss. My thesis analyzes DIBELS test score data from the Easton School District to determine whether this curriculum helped reduce summer loss. While the sample size was small, I was able to use several statistical methods to compare results for Summer Nights attendees to those of other Paxinosa students. I also look at factors that are associated with repeat attendance, such as characteristics of curriculum activities and distance of student's home from Centennial Park. Finally, I discuss the challenges of data collection in a community setting and use this to provide ideas for further research.

ABOUT SUMMER NIGHTS

- Held June 24-August 15, 2013 from 4-7pm Mon-Thurs at Centennial Park in Easton's West Ward.
- Each night included a free dinner followed by a curriculum activity and an activity run by a community partner (YMCA, Kellyn Foundation, Cops and Kids, etc)
- This year, the curriculum element was added in an effort to reduce summer learning loss in elementary students
- The program also focuses on the Search Institute's Family Assets Framework, a set of assets proven to improve the quality of life for those families and communities that have more of them

Summer Nights was started to address several community needs. The West Ward is an economically disadvantaged neighborhood where many children lack access to structured summer activities, transportation, and regular meals. There are few activities for children between 4 and 7 p.m., and many of them would otherwise be unsupervised during that time.

DIBELS AND BENCHMARKS

The DIBELS exam is scored differently based on grade level and time of year, due to changes in the difficulty of the questions proportional to grade level.

There are three levels into which students are classified based on their scores. These are *well below benchmark*, *below benchmark*, and *at or above benchmark*.

The following tables depict how many students are at each benchmark in Spring 2013 and Fall 2013 and the conditional probabilities of a student being in a particular benchmark in the fall, given the benchmark he/she was in during the spring.

Spring benchmark	Fall benchmark				Proportion of Total
	Well Below	Below	At or Above	Total	
Well Below	145	17	12	174	0.35
Below	28	29	40	97	0.19
At or Above	10	19	203	232	0.46
Total	183	65	255	503	100

Attended:	Fall Benchmark				Proportion of Total
	Well Below	Below	At or Above	Total	
Spring Benchmark	Well Below	Below	At or Above	Total	Proportion of Total
Well Below	13	0	0	13	0.48
Below	0	2	1	3	0.11
At or Above	0	1	10	11	0.41
Total	13	3	11	27	100

Frequencies of students at each pair of levels.
 Top: All of Paxinosa
 Bottom: Summer Nights attendees only

Spring benchmark	Fall benchmark			
	Well Below	Below	At or Above	Total at Benchmark
Well Below	0.83	0.1	0.07	174
Below	0.29	0.3	0.41	97
At or Above	0.04	0.08	0.88	232

Attended:	Fall Benchmark		
	Well Below	Below	At or Above
Spring Benchmark	Well Below	Below	At or Above
Well Below	1.00	0.00	0.00
Below	0.00	0.67	0.33
At or Above	0.00	0.09	0.91

Conditional probabilities of being in each Fall benchmark, given Spring benchmark
 Top: All of Paxinosa
 Bottom: Summer Nights attendees only

RESULTS



These graphs suggest that summer learning loss is occurring in the sample. Each grade has a higher maximum score than the previous one on the DIBELS scale. If students' reading proficiencies all progressed as they should, the other graphs would look like Grade 1 but shifted to the right. The flattening of the curves tells us that some students progress while others continue to score on the lower end. The red lines mark the three benchmark levels.

LIKELIHOOD OF ATTENDANCE

Students are more likely to attend the program again after they attend once. The probability of any given Paxinosa student attending Summer Nights one night is

$$\frac{(\text{number of attendances})}{(\text{number of possible attendances})}$$

which comes out to 0.008 or 0.8%. The probability of a student attending again after attending once is modeled solving for p in the following binomial distribution:

$$(1-p)^{x_i}(p)^{y_i}$$

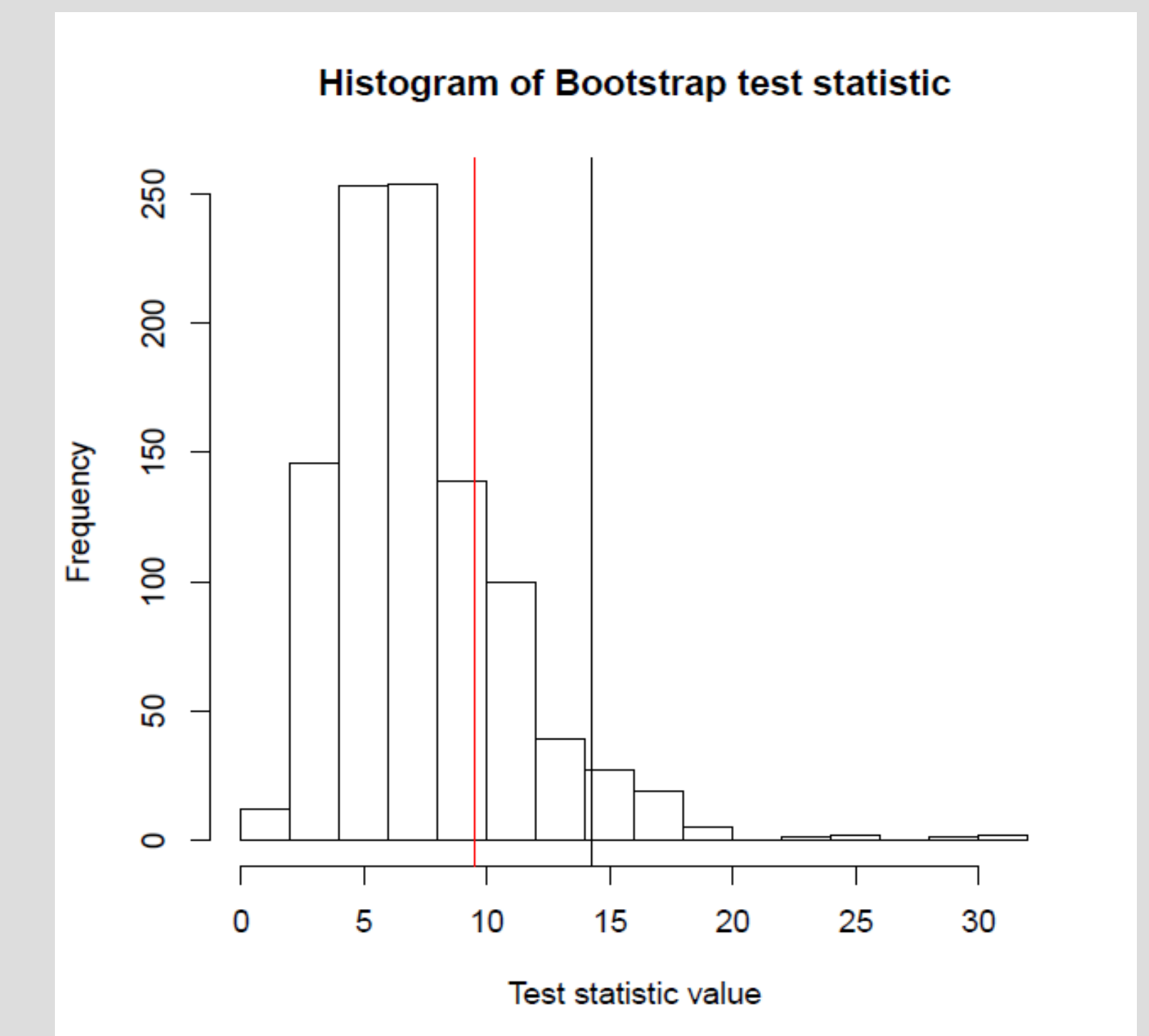
where x_i is the number of attendances by student i after the first attendance, and y_i is the number of days not attended by student i after the first attendance. A computer program finds the solution to be 0.124, or 12.4%, which is much higher than the probability of random attendance.



Volunteer Donna Ruggiero leads students through a curriculum activity.

BOOTSTRAP SIMULATION

- A bootstrap resampling procedure compared the observed benchmark distribution of Summer Nights attendees to 1000 random samples of Paxinosa students who did not attend Summer Nights.
- These samples were structured so that those students selected match the observed sample in terms of grade, gender, and ethnicity.
- A test statistic was calculated for each trial and the observed sample. Below is the histogram that reports the frequencies of the values this statistic takes on. The red line indicates the value of the test statistic for the observed sample, and the black line indicates the rejection region. If the red line were to the right of the black line, the value would be significant. However, I find there is no significant difference between the Summer Nights sample and a random sample of demographically similar Paxinosa students.



CONCLUSIONS

- It is difficult to come to a conclusion about Summer Night's effect on Paxinosa students' learning loss due to small sample size
- Students that attended Summer Nights are more likely to stay at the same benchmark levels from spring to fall
- Paxinosa students at the below benchmark designation are slightly more likely to move up in benchmark
- Those who attend Summer Nights at least once have a higher likelihood of returning

FUTURE STUDIES

- Improve attendance measures
- Focus on measuring Summer Nights' impact on Family Assets
- Program is moving indoors to Easton Area Community Center, could examine difference in effect due to this change



Nice weather made activities go more smoothly.



Working on the map of Easton's West Ward mural project