

If You Offer It, Will They Come? Patterns of Application and Enrollment Behavior in a Universal Prekindergarten Context

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Background/Context: To date, there has been very little research on the families and students who are eligible to attend a no-cost prekindergarten program but choose not to participate, despite take-up rates in the five state universal programs averaging only 71% (Friedman-Krauss et al., 2018). Some non-attenders likely attend tuition-based prekindergarten, but others do not attend any center-based program. Information on who does not take up universal prekindergarten, particularly among low-income children who likely have fewer alternative options, may help states and localities better target recruitment and outreach efforts.

Purpose/Objective/Research Question: To address this gap in the literature, we examine the student, neighborhood, and elementary school characteristics of BPS kindergarten students who did and did not apply to the BPS prekindergarten program.

Setting and Population: We use data from the Boston Public School's universal prekindergarten program in 2008-2009 and 2009-2010. Our sample is 8,391 kindergarten students who enrolled in a Boston Public Schools elementary school for at least one day of kindergarten. We focus on BPS kindergarten students because by revealed preference, their families are interested in public schooling options. About half applied to Boston prekindergarten in the prior year and half did not. Among non-applicants, about 32% enrolled in private preschool, 36% in Head Start, and 22% in no form of non-parental care.

Intervention/Program/Practice: The Boston Public Schools (BPS) prekindergarten program is open to any child in the city, regardless of income or other risk factors. During our study years, it was based entirely in the public schools, paid teachers on the same scale as K-12 teachers, and subjected teachers to the same educational requirements of K-12 teachers (e.g., a master's degree within five years and grade range certification). BPS prekindergarten offered enrolled families a full school day of care, with before- and after-school options available in most schools. Teachers used research-based language-, literacy-, and math curriculum, supported by training and coaching. A previous study found that the program has substantial positive impacts on children's language, literacy, mathematics, executive function, and socio-emotional readiness for kindergarten (Weiland & Yoshikawa, 2013).

Research Design: We use student-, school-, and neighborhood-level data to compare the characteristics of kindergarten students who did and did not apply to the BPS prekindergarten program. Using a mix of descriptive analyses, including spatial analysis, we use administrative data to identify groups of students more or less likely to apply to the prekindergarten program and the longer-term implications of application choice on subsequent school enrollment decisions. We also use a proxy indicator for where students lived in the city to estimate differences in neighborhood characteristics for applicants and non-applicants and to identify neighborhoods with higher and lower application rates using "hot spot" and "cold spot" mapping.

Data Collection and Analysis: Our key student-level measures (gender, race, free-reduced-lunch status, home language, special education status, third grade test scores, grade retention and special education placement in kindergarten through third grade) are drawn from administrative records and parent reported measures of prekindergarten care setting. Using district-created geocodes, we link individual students to data from the 2006-2010 American Community Survey 5-year estimates to capture the characteristics of students' neighborhoods and examine the spatial distribution of appliers and non-appliers across the city. Finally, we use administrative data from the Massachusetts Department of Education to link students to school-level characteristics in kindergarten through third grade.

We use simple bivariate linear regression to estimate the difference in means between non-appliers and appliers and Geographic Information Systems (GIS) software to generate corresponding maps visualizing our findings. We also use GIS to identify areas of the city with particularly high and low application rates to identify neighborhood that would benefit for specific recruitment to the prekindergarten program.

Findings: We find that prekindergarten non-appliers are more likely to be non-White ($SD = 0.27$) and low income ($SD = 0.11$) than their applier peers (Table 1). At third grade, we find that appliers score higher than the average BPS third grade student on both math and English language arts, are more likely to be placed in special education services, and less likely to be retained in grade. We also find considerable heterogeneity within the non-applier group based on where or if a student attended a prekindergarten program other than the BPS program. For example, we find that prekindergarten non-appliers who did not attend any alternate form of prekindergarten are substantially more likely to be dual language ($SD = 0.58$) than are prekindergarten appliers. Our findings suggest that students who attend no form of prekindergarten are the most disadvantaged group of BPS kindergarten students, whereas student who attend private prekindergarten are the most advantaged.

We find small but statistically significant differences at the neighborhood and elementary school levels that align with our student demographic findings. For example, we find that there are neighborhoods in Boston with statistically significantly higher and lower rates of prekindergarten application, suggesting that targeted recruitment in certain areas of the city could improve equity in application to the program (Figure 1). We also find that students who do not apply to prekindergarten in BPS are more likely to attend lower-performing elementary schools, elementary schools with more students of color, and elementary schools with more economically disadvantaged students in kindergarten through third grade. Non appliers entering relatively lower-quality elementary schools in kindergarten than their applier peers suggests that there may be downstream enrollment effects of choosing not to apply to the prekindergarten program.

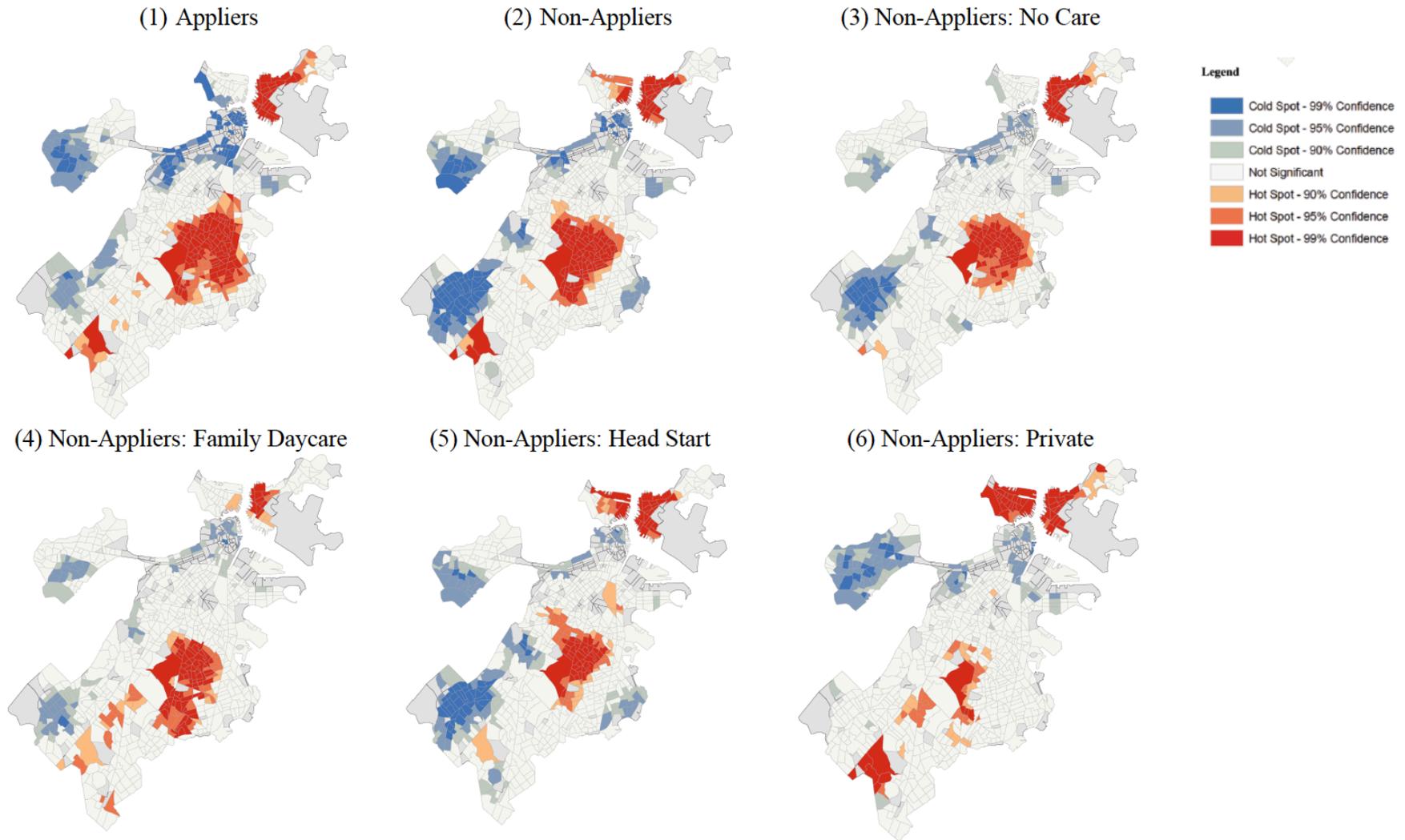
Conclusions and Policy Implications: Our study provides some of the first descriptive information on the socio-demographic characteristics and spatial distribution of families who opt out of applying to universal prekindergarten programs. As more localities implement universal prekindergarten, our findings can inform the work of policymakers and practitioners in developing recruitment strategies that promote equitable and universal enrollment.

Table 2: Comparison of BPS kindergarten enrollees who did and did not apply to BPS prekindergarten on observable baseline characteristics

	<u>Apppliers</u>	<u>Non-Apppliers</u>	<i>Care type in four-year-old year for Non-Apppliers</i>				
			None	Private	Head Start	Family Daycare	Unknown
<i>Child Characteristics (%)</i>							
Male	53.53	51.28	50.67	52.40	51.44	50.79	49.93
<i>Race</i>							
White	14.88	10.93	8.49	21.68	6.16	5.96	6.97
Black	29.19	34.69	27.98	35.24	35.52	30.95	41.36
Hispanic	43.84	44.59	52.79	33.51	48.24	55.16	43.11
Asian	9.19	6.54	8.35	5.24	7.60	4.36	5.52
Mixed/Other	2.89	3.24	2.39	4.34	2.48	3.57	3.05
Free/Reduced Price Lunch	74.38	82.48	87.80	63.14	93.84	87.69	85.49
Special Education	17.09	7.25	4.51	4.70	10.72	5.96	7.99
Dual Language	41.5	39.7	51.33	22.07	42.99	36.50	50.00
Born outside USA	5.28	7.91	10.48	4.88	4.16	3.97	18.14
<i>First Language</i>							
English	58.66	62.16	49.86	78.58	57.89	65.08	56.1
Spanish	21.83	21.95	31.70	11.93	24.66	23.02	21.37
Vietnamese	4.72	1.78	3.71	1.90	0.96	0.00	1.16
Other	19.72	18.23	20.02	10.40	18.33	13.50	30.38
<i>Third Grade Outcomes</i>							
Third grade test score- ELA (<i>SD</i>)	0.17	0.02	-0.13	0.31	-0.04	-0.18	-0.06
Third grade test score- Math (<i>SD</i>)	0.16	-0.01	-0.13	0.25	-0.08	-0.15	-0.09
Ever Special Education in K-3 rd grade	26.87	19.69	18.83	16.00	22.88	19.04	20.17
Retained in Grade in 1 st -2 nd grade	9.40	15.52	19.21	9.92	16.15	16.00	19.05
Enrolled in BPS in 3 rd grade	81.35	78.37	80.90	75.07	84.64	78.17	70.68
N	4,220	4,171	754	1,105	1,249	252	689

Note: Bolded values are those that are statistically significantly different from the applier mean at the $p < 0.001$ level. In addition to the five non-applier counterfactual subgroups we present in this table, 120 students enrolled in other public districts in MA and 2 enrolled in a charter school. Means for this group available upon request.

Figure 1: Distribution of appliers and nonappliers by care type: (1) appliers, (2) nonappliers, (3) nonappliers: no care, (4) nonappliers: family day care, (5) nonappliers: head start, (6) nonappliers: private care



Note: The Hot Spot Analysis tool of ArcGIS calculates a Getis-Ord-Gi* statistic for each spatial feature. To determine statistically significant differences in densities for a given group within a spatial feature, the local sum of the group for the feature and its neighbors is compared with the sum of all features, with a resulting z score and p value based on the difference between the expected local sum and observed local sum. Relevant maps for the students missing counterfactual data and for students who attended another public school district for prekindergarten are available upon request.