INTEROFFICE CORRESPONDENCE
Los Angeles Unified School District
Independent Analysis Unit

INFORMATIVE

TO: Members, Board of Education
Austin Beutner, Superintendent

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FROM: Glenn Daley, Director, Independent Analysis Unit
Analysts: Q. Tien Le, Ph.D., & Sydney Ganon

SUBJECT: MAGNET SMARTER BALANCED ASSESSMENT RESULTS, SPRING 2018

SUMMARY

This purpose of this informative is to provide supplemental analysis and context for the Office of Data and Accountability informative titled, "Magnet and Independent Charter School Smarter Balanced Assessment Results, Spring 2018" (November 5, 2018).

As detailed in the Office of Data and Accountability informative, all public schools in California, including charter schools, are required to administer the Smarter Balanced Assessments (SBA) in grades 3 through 8 as well as grade 11. The ODA informative compares descriptive results from 2017 and 2018 for the state, L.A. Unified, charter schools, and L.A. Unified magnet schools.

DESCRIPTIVE VS. CAUSAL STUDIES

When reading about student outcomes, some may assume that the results are causal, or that the results seen were directly caused by a specific academic program or intervention. This is not necessarily the case. Table 1, below, outlines the difference between descriptive and causal studies, both of which have value for educational research.

Table 1. Descriptive vs. Causal Studies

Descriptive Studies	Causal Studies
• Descriptive studies describe the situation at hand, or what exists. • Descriptive studies might answer the question, "What scores did magnet students get on the SBA?" • Descriptive studies do have value, and their value lies in understanding trends and patterns.	• Causal studies show that one variable causes the outcomes of another variable. • Causal studies answer the question, "Did X cause Y?" • For example, "Did enrolling in a magnet school increase students' SBA test scores?" • Random assignment of students to treatment and control conditions is a research design that allows for causal inferences.

Descriptive research and analysis is important, as the ODA informative on magnet and charter school achievement demonstrates. It tells us what the conditions are for different groups and allows us to see trends over time. Descriptive data allows us to see problems or abnormal results so that steps can be taken to mediate and improve conditions for students and schools.

The ODA informative provides descriptive results about SBA scores. Causal results are very difficult to determine and are not possible in this situation. Based on the data, we cannot answer the *causal* question of whether enrolling in a magnet school *caused* students' test scores to increase.

There are two main ways to measure the effect of magnet schools:

1. Randomly assign students to magnet and non-magnet programs, which is neither feasible nor ethical; or
2. Exploit random assignment resulting from lottery-based admissions in oversubscribed magnet programs,[1] which is also not feasible since L.A. Unified uses a priority point system to determine admission to magnet programs.

Since we cannot employ a causal design to measure the effect of magnet programs on achievement, the next best thing is to adjust for student and school characteristics in our statistical model. Adjusting for student and school characteristics allow us to determine correlations between school type and student outcomes that are *independent* of other factors, such as students' prior achievement.

COMPARING APPLES TO ORANGES

It is important to note that, as a whole, **L.A. Unified magnet schools are not directly comparable to charter schools or traditional L.A. Unified schools.**

L.A. Unified magnets include four highly gifted and 47 gifted magnet programs.[2] Only students who demonstrate ability or potential to work two years above grade level in academic subjects are accepted; the student body is different from other magnets and L.A. Unified schools.

Therefore, academic outcomes from these programs cannot be directly compared to other schools that do not have similar academic requirements, such as charters or traditional L.A. Unified schools. In order to compare descriptive data for L.A. Unified magnets to non-magnets or to charter schools, gifted magnet programs should be separated from the comparison group.

Previous IAU research also found that there were differences in student characteristics that predict magnet school enrollment, including that: [3]

- Magnet programs serve a smaller share of English learners than non-magnet programs;
- Magnets serve a smaller share of students with special needs; and
- Students with college-educated parents are 40% more likely to be enrolled in a magnet program compared to students whose parents did not graduate from college.

The measurable differences between magnet school and non-magnet school families comprise only one dimension of comparison. These two groups also differ on things that are difficult to measure such as disposition towards schooling and motivation to learn. Together, **these measurable and unmeasurable differences make it difficult to compare the results from magnet students and non-magnet students.** At a minimum, statistical adjustments should be made.

[1] Bifulco, R., Cobb, C. D., & Bell, C. (2009). Can interdistrict choice boost student achievement? The case of Connecticut's interdistrict magnet school program. *Educational Evaluation and Policy Analysis*, *31*(4), 323-345.
[2] L.A. Unified. (2018). Magnet Themes: Gifted+.
[3] Independent Analysis Unit. (2018 August 30). Student Composition of Magnet and Non-Magnet Programs.

RESULTS

To understand the differences in test scores between magnet and non-magnet schools that are independent of student and family characteristics, the IAU analyzed 2017-2018 SBA scores in a statistical model that adjusted for student prior achievement, demographics, and school characteristics.[4] Because it controls for prior test scores at the individual student level, this is a growth model, not merely a status model.

Table 2 presents the difference in SBA scores between magnet enrollees and non-magnet students. After adjusting for students' prior achievement, student characteristics, and school characteristics, we find no significant differences in SBA scores between magnet and non-magnet students. *However, when gifted magnets were excluded from the analysis, we find that magnet students in non-gifted programs outperform non-magnet students by roughly 0.01 standard deviations. This is considered a very small difference by the standards of educational research.*

Table 2. Regression of 2017-2018 SBA Scores on Student Prior Achievement, Student Demographic Characteristics, and School Characteristics

	Including Gifted Magnets		*Excluding Gifted Magnets*	
	Model 1	**Model 2**	**Model 3**	**Model 4**
	SBA Math	**SBA ELA**	**SBA Math**	**SBA ELA**
Magnet	-0.001	-0.000	0.012**	0.009*
	(0.004)	(0.004)	(0.004)	(0.004)
Number of students	150,841	151,045	144,313	144,513

Note. Standard deviations are in parentheses.
** p < 0.05. ** p < 0.01. *** p < 0.001.*

One possible explanation for the Models 1 and 2 results is that students in gifted magnet programs in these models deflate the magnet school scores because they had already reached the highest scores possible. The IAU models take into account prior achievement, so the results tell us whether the magnet student's outcome is different from what we would expect to see for a student in a non-magnet program. Once students consistently earn top scores, there is no room for growth.[5]

Once gifted magnet programs are removed from the analysis (Models 3 and 4), the data show that students in magnet programs are making slightly more progress on SBA scores than students in non-magnet programs, taking into account prior achievement.

Prior IAU research comparing magnet programs to students' assigned residence school found that magnet enrollees from all racial/ethnic backgrounds tend to move from lower-achieving to higher-achieving schools.[6] This may help to explain why SBA scores are higher for students in non-gifted magnet programs than in traditional L.A. Unified schools.

It should also be noted that the sample size in all of our models is quite large, exceeding 140,000 students. As a result, very small differences will be detected as statistically significant. Given our large sample size and the small magnitude of the difference between magnet students and non-magnet students, it is important to remember that **there is a difference between practical significance and statistical significance.** Statistical significance tells us whether the result is larger or smaller than we would expect

[4] The regression model controlled for prior SBA Math and ELA scores, gender, IEP status, EL status, parent education level, program, free or reduced price meal status, gifted status, and race and ethnicity. The model also controlled for program averages, including test scores.
[5] The IAU model includes a cubic term, which partially adjusts for floor and ceiling effects. However, it is imperfect, and the point remains valid.
[6] IAU. (2018). Student Composition of Magnet and Non-Magnet Programs.

by chance. Practical significance is whether or not we should care about the result. While statistically significance, a difference of 0.01 standard deviations may not be practically significant enough to justify policy changes.

KEY TAKEAWAYS

A comparison of non-gifted students in magnet and standard programs with similar prior levels of achievement and family backgrounds showed that students in non-gifted magnet programs scored slightly higher than similar non-gifted students in the District. ~~Controlling for previous SBA scores and a variety of student, family, and school characteristics, there is a very small positive association with higher scores, *i.e.*, higher growth, for students who are enrolled in non-gifted magnets compared to students enrolled in non-magnet programs.~~

However ~~it is important to note that there are~~ this analysis does not account for all of the pre-existing differences between the students enrolled in magnet programs and non-magnet programs. ~~when making these comparisons~~. Probably the students in magnet programs have a different attitude toward school, given that they have made the conscious choice to attend a specialized program and may have to travel some distance to attend. This attitude may be enough to explain the extremely small difference in test scores between non-gifted magnet and non-magnet students in L.A. Unified. ~~It is also essential to understand the differences between descriptive and causal results when considering changes to District policy or programs. While these results are not causal, they control for many of the factors that would confound causal interpretations. It is also important to note the difference between practical and statistical significance.~~

Thus~~, after applying the above controls,~~, there appears to be very little if any practical difference between magnets and non-magnet programs in student growth.

~~It is also important to remember that t~~The original purpose of magnet schools was to *desegregate* schools and that the District's magnet schools are part of a court-ordered voluntary integration program. Thus, the best way to evaluate the success of magnets programs is to assess their effectiveness in ~~Though it is valuable to understand the impact of magnet schools on student achievement, it is equally important to focus on the role of magnet schools in~~ reducing the harms of racial isolation. To the extent that some of these programs also offer innovative instruction, focused evaluation of curricula and instructional innovation is valuable.

APPENDIX

Regression of 2017-2018 SBA Scores on Student Prior Achievement, Student Demographic Characteristics, and School Characteristics.

	Model 1 SBA Math	Model 2 SBA ELA	Model 3 SBA Math (excludes gifted magnets)	Model 4 SBA ELA (excludes gifted magnets)
Magnet	-0.001	-0.000	0.012**	0.009*
	(0.004)	(0.004)	(0.004)	(0.004)
SBA Math	0.652***	0.231***	0.650***	0.230***
	(0.003)	(0.003)	(0.003)	(0.003)
SBA ELA	0.199***	0.608***	0.199***	0.608***
	(0.003)	(0.003)	(0.003)	(0.003)
SBA ELA (squared)	-0.002	0.034***	-0.002	0.035***
	(0.001)	(0.001)	(0.001)	(0.001)
SBA Math (squared)	0.029***	-0.008***	0.031***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)
SBA ELA (cubic)	-0.008***	-0.029***	-0.008***	-0.029***
	(0.001)	(0.001)	(0.001)	(0.001)
SBA Math (cubic)	-0.018***	-0.004***	-0.017***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Female	-0.024***	0.118***	-0.024***	0.119***
	(0.003)	(0.003)	(0.003)	(0.003)
Special Needs	-0.134***	-0.151***	-0.136***	-0.152***
	(0.004)	(0.004)	(0.004)	(0.004)
English Learner	-0.050***	-0.183***	-0.050***	-0.180***
	(0.009)	(0.009)	(0.009)	(0.009)
Newcomer	0.150***	0.035	0.148***	0.034
	(0.027)	(0.027)	(0.027)	(0.028)
Long-Term ELs	-0.038***	0.016*	-0.036***	0.017*
	(0.008)	(0.008)	(0.008)	(0.008)
Parent Education				
HS Graduate	0.009*	0.012**	0.008*	0.011**
	(0.004)	(0.004)	(0.004)	(0.004)
Some College	0.019***	0.028***	0.018***	0.029***
	(0.004)	(0.005)	(0.005)	(0.005)
College Grad	0.038***	0.041***	0.037***	0.040***
	(0.005)	(0.005)	(0.005)	(0.005)
Grad School/Post Grad	0.051***	0.052***	0.048***	0.050***
	(0.006)	(0.007)	(0.007)	(0.007)
Decline to Answer	0.013**	0.010*	0.012**	0.009*
	(0.004)	(0.004)	(0.004)	(0.004)
Dual Language	-0.015	-0.027***	-0.019*	-0.030***
	(0.008)	(0.008)	(0.008)	(0.008)
Transitional Bilingual	-0.032**	-0.029*	-0.033**	-0.032**
	(0.011)	(0.011)	(0.011)	(0.012)
SEI	-0.010	-0.006	-0.010	-0.008
	(0.007)	(0.007)	(0.007)	(0.007)
FRL	-0.034***	-0.035***	-0.030***	-0.033***
	(0.005)	(0.006)	(0.006)	(0.006)
Gifted	0.145***	0.117***	0.156***	0.126***
	(0.004)	(0.004)	(0.004)	(0.005)
RFEP	0.049***	0.029***	0.050***	0.032***
	(0.007)	(0.007)	(0.007)	(0.007)
Student Race/Ethnicity				

AI/AN	-0.029	0.012	-0.030	0.014
	(0.027)	(0.028)	(0.028)	(0.029)
Asian	0.110***	0.064***	0.112***	0.067***
	(0.006)	(0.006)	(0.006)	(0.006)
Black	-0.043***	-0.044***	-0.044***	-0.046***
	(0.005)	(0.005)	(0.006)	(0.006)
Pacific Islander	0.023	-0.011	0.024	-0.011
	(0.019)	(0.020)	(0.020)	(0.020)
Unknown Race	0.078	0.087	0.071	0.080
	(0.071)	(0.072)	(0.073)	(0.074)
White	0.034***	0.031***	0.029***	0.025***
	(0.005)	(0.005)	(0.005)	(0.005)
School Avg SBA ELA	-0.271***	0.547***	-0.288***	0.538***
	(0.012)	(0.012)	(0.012)	(0.013)
School Avg SBA Math	0.463***	-0.321***	0.504***	-0.299***
	(0.011)	(0.012)	(0.012)	(0.012)
% EL at school	0.183***	0.308***	0.206***	0.318***
	(0.013)	(0.014)	(0.014)	(0.014)
% Latinx at school	0.132***	0.121***	0.132***	0.120***
	(0.008)	(0.008)	(0.008)	(0.008)
_cons	-0.152***	-0.196***	-0.161***	-0.200***
	(0.008)	(0.008)	(0.009)	(0.009)
N	150,841	151,045	144,313	144,513

Note. Standard deviations are in parentheses. For parent education, the reference category is "Not HS Grad." The reference category for the race/ethnicity variables is "Hispanic/Latino."

** p < 0.05. ** p < 0.01. *** p < 0.001.*