Magnet Schools

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Introduction

Magnet schools are public schools that provide a distinctive curriculum or instructional approach and that are open to students from outside a geographically defined attendance zone. The website for Magnet Schools of America reports that as of 2016, there were 4,340 magnet schools educating 3.5 million students nationwide. Of these schools, 51% are elementary schools, 18% are middle schools, and 31% are high schools. These schools are located in nearly every state in the country and are concentrated in urban areas. Approximately one-quarter of magnet schools use academic criteria for admission, and the rest use lottery systems or other nonacademic criteria for admission.

Originally, magnet schools were created by local school districts to achieve voluntary school desegregation. Often situated in neighborhoods with large minority populations, magnet schools were intended to attract racially diverse students from other areas of the school district. These schools often received enhanced resources. Today, magnet schools frequently emphasize goals other than racial integration, such as improving student achievement, retaining high-achieving students in district schools, developing educational innovations, and helping districts improve matches between school offerings and student interests.

Magnet schools and magnet-school programs vary along a number of dimensions. While most magnet schools are operated by a regular school district and are open only to students residing in that district, there are also interdistrict magnet schools operated by a district, a cooperative of multiple districts, or another agency. While some magnet schools are stand-alone schools, others are programs within schools that include both students who participate in the magnet program and others who do not. Some schools have a designated neighborhood school attendance zone and augment enrollments from that zone with students who apply from elsewhere, while others do not have an attendance zone and admit students exclusively by application. The prototypical magnet school is designed to attract nonminority students to attend school in neighborhoods with a high percentage of minority residents, but some magnet schools are designed to create access to schools in more advantaged parts of a district for students in struggling schools. The most common curricular themes are STEM and visual or performing arts, which together represent nearly half of all magnet schools. Nonetheless, a wide range of other curricular themes are used. Magnet schools also vary in the extent to which they emphasize integration vs. other educational goals, in whether or not they offer enhanced resources, in the admission criteria used, and in the recruiting strategies that they deploy.

This entry reviews evidence on the extent to which magnet schools achieve the goals of promoting racial and socioeconomic integration, improving student achievement and other student outcomes, and helping retain students in urban school districts. It also examines evidence on whether magnet schools have any unintended effects on the student composition and effectiveness of other schools in the districts where they are located. Of particular interest are whether the effect of magnet schools on these

outcomes may have changed as the focus of magnet-school programs has shifted from promoting racial integration to other goals and whether effects depend on the type of magnet-school program.

Key findings

Key finding #1. *Magnet schools tended to be more racially diverse than other schools in the same district during the desegregation era. However, the effects of magnet schools on district-wide integration measures are unknown.*

During the desegregation period, magnet schools tended to have more even shares of Black and White students than other schools in the districts where they were located. However, the overall effects of magnet schools on district-wide measures of integration also depend on the racial diversity of the schools that magnet students would have attended and the extent to which magnet schools helped stem white flight. To the extent that students move to magnet schools from schools where they are racially isolated, the moves tend to reduce overall segregation. However, what schools magnet students would otherwise have attended is frequently unknown, so the net effects have not been definitively established and likely varied across contexts.

Key finding #2. *Shifts away from desegregation goals have resulted in decreased diversity in some magnet schools and have limited the ability of magnet schools to reduce district-wide segregation across schools. Nonetheless, magnet programs that maintain focus on integration in legally permissible ways have contributed positively to integration goals.*

Despite legal restrictions on the explicit use of race in magnet-school admissions, many magnet schools still provide diverse learning environments. However, this appears to be the case mostly in places where magnet-school programs still explicitly emphasize integration or diversity goals, such as Connecticut and North Carolina's Wake County. There is evidence that where schools have de-emphasized integration goals, magnet schools have become less diverse. Additionally, the influence of school racial composition on choices families make to apply to magnet schools suggests that, in the absence of focused efforts, magnet schools have only a limited ability to promote integration goals.

Key finding #3. *Attendance at many magnet schools, particularly oversubscribed middle and high school magnets, results in improved student achievement. However, the effects of magnet schools on academic measures of achievement vary widely.*

An early study using a national sample and recent studies exploiting data from admission lotteries find positive effects of magnet school attendance on achievement test scores. However, lottery-based estimates may be limited to oversubscribed magnets with accessible lottery records. Recent studies that have tried to estimate the effect of broader sets of magnet schools using alternative methods have found null or negative effects and suggest that the effects of magnet schools vary widely.

Key finding #4. *Research tells us little about which aspects or types of magnet schools most consistently improve student achievement.*

Given the evidence that the effect of magnet schools on student achievement varies considerably, it is desirable to know whether certain aspects or types of magnet schools are most effective. Unfortunately, existing studies do not identify the types of magnets that consistently improve student performance.

Key finding #5. *Magnet schools have helped urban districts retain high-achieving and socioeconomically advantaged students, but these enrollments may come at the cost of increased stratification across schools.*

District leaders are often concerned about retaining high-achieving students from socioeconomically advantaged families, and evidence indicates that magnet schools, particularly selective magnet schools, can help achieve this goal. However, worries remain that magnet schools achieve this goal by cream-skimming from other district schools and increasing stratification of schools by income and achievement.

Understudied questions? Several questions about magnet schools are understudied, particularly in comparison with other forms of school choice, such as charter and private schools. First, as noted, research says little about how the effects of magnet schools on either integration goals or achievement vary by the type of magnet or across different contexts. Second, few studies examine the effects of attending a magnet school on outcomes other than test scores. We know little about the long-term effects of magnet schools on high-school graduation, college enrollment and graduation, and labor-market outcomes. Additionally, given their role in promoting desegregation, more evidence on how attendance at racially diverse magnet schools influence student racial attitudes and intergroup relations would be useful. Finally, the systemwide effects of magnet schools on student achievement through competition, improved matching, changes in resource allocations, and other mechanisms are not well understood.

Policy implications. Absent other efforts, magnet schools should not be expected to have large effects on racial and socioeconomic segregation across schools. Magnet schools that do not explicitly target increased integration often exacerbate stratification by race, socioeconomic status, or ability. Nonetheless, many magnet schools provide diverse and improved learning environments for the students who attend them and can help improve student achievement. Magnet status alone, however, does not guarantee such benefits. Individual magnet schools should be designed with careful attention to context and monitored to ensure they are providing hoped for benefits. Efforts to make the highest-quality magnet schools accessible to all students through siting, recruitment, and admission choices may help limit the unintended effects of magnet schools on school stratification.

A brief history

Specialized public schools that draw students from across a district, particularly at the high-school level, predate magnet schools by many decades. Often, these were honors high schools with competitive admissions or vocational schools. However, the idea of developing schools with distinctive curricula or instructional approaches to attract students from a diverse set of neighborhoods first emerged in the 1970s as a part of desegregation plans.

Desegregation efforts in the late 1960s and early 1970s often involved mandatory assignment of students to racially balanced schools and engendered protest and white flight from many districts.[1] In response, some districts developed voluntary approaches to school desegregation that sought to allow and encourage parents to choose integrated schools. Magnet schools were among the most prominent tools used in these voluntary desegregation efforts. The federal courts approved the use of magnets for desegregation in *Morgan v. Kerrigan* (1976). Also in 1976, Congress created a federal grant program, the Magnet Schools Assistance Program (MSAP), which provided funding for districts interested in using magnet schools to promote desegregation.[2] Although improving educational options in urban school districts and retaining white and wealthier families was part of the motivation for magnet schools at this time, promoting voluntary racial integration was central to the mission and design of these schools.

Most magnet schools tried to ensure racial balance by capping the enrollments for each racial group or by otherwise explicitly using race in admission decisions.[3]

The number of magnet schools grew rapidly during the 1970s and 1980s. In the 1981–82 academic year, there were 1,019 magnet schools, and by the 1991–92 academic year, there were 2,433.[4] Several researchers argue that federal funding, primarily through the MSAP, played an important role in the creation and expansion of magnet-school programs.[5] Magnet schools were most prevalent in large, urban districts. In the 1991–92 school year, 79% of the 150 largest districts in the nation had magnet-school programs.[6]

Beginning in the 1990s, law related to school desegregation changed in ways that affected magnet schools. A series of rulings early in the decade facilitated the termination of court desegregation orders. Subsequently, many districts were released from court orders, and it became uncertain whether these districts or districts that had never been under court order could use race-conscious school assignment policies. During this period, many magnet schools chose not to use racial quotas to avoid exposing themselves to legal challenges.[7] The issue was resolved in *Parents Involved in Community Schools v. Seattle School District No. 1* (2007), in which the Supreme Court struck down the use of race in magnet-school admission decisions.

Facing these limitations, magnet schools are now often presented as a way to expand school choice and increase the competitiveness of district schools in the face of expanded parental options rather than as a tool for desegregation.[8] For instance, Magnet Schools of America argues that by allowing parents to choose a school, magnet programs improve parental satisfaction and student achievement.[9] Despite the waning of desegregation goals, magnet schools remain widespread, serving more than 3 million students in over 4,000 schools in 2016.[10]

Evidence

Key finding #1. *Magnet schools tended to be more racially diverse than other schools in the same district during the desegregation era. However, the effects of magnet schools on district-wide integration measures are unknown.*

Evidence regarding the effect of magnet schools on integration goals comes largely from case studies of specific districts and a handful of multidistrict studies. A clear finding from this literature is that Black and White students tended to have greater exposure to students of other races in magnet schools than in the typical schools in their districts. For instance, one study finds that during the 1992-93 and 1993-94 school years, the percentage of White students in the magnet schools it examined in Cincinnati was 43–54%, while the percentage of White students in neighborhood schools attended by the typical Black student in the district was less than 30%.[11] Using data from a representative sample of 600 school districts, another study finds that 29% of students in the general enrollment of schools housing magnet programs within schools were White compared with 39% of students in the magnet program in those schools. Similarly, while 35% of all students attending a magnet school to which they were already zoned were White, among those transferring in from outside the attendance zone, 41% were white.[12]

Although magnet schools themselves tend to be more racially mixed than the neighborhood schools that students would otherwise attend, it is possible that increased interracial exposure in magnet schools came at the expense of decreased interracial exposure in other schools. The net effect of magnet-school programs during desegregation on district-wide measures of integration is unclear. Several early studies concluded that desegregation plans that relied solely on magnet schools and other voluntary forms of school integration had limited impacts on the overall levels of racial isolation.[13]

An insightful analysis of how magnet schools might have affected segregation dynamics during desegregation uses application data from magnet high schools in Philadelphia in the 1990–91 and 1991–92 academic years. This analysis shows that students of White families from schools with high percentages of nonwhite students and from wealthier families from schools with high poverty rates were the most likely to apply for admission to magnet high schools. It also compares observed levels of segregation in the district with how much segregation there would be if no family used the magnet-school program. For both racial and poverty segregation, magnet schools were less segregated than neighborhood attendance zones and zoned schools became more segregated than attendance zones as a result of magnet schools. Overall, the level of segregation across all schools in the district was slightly higher than if all magnet students attended their zoned school instead.[14] More generally, we might expect the influence of race on choice of schools limits the ability of magnet schools to reduce district-wide measures of segregation.

Against this view, some researchers have argued that in the long run, desegregation plans that relied primarily on magnet schools and other forms of voluntary desegregation did more than mandatory desegregation plans to increase the exposure of Black students to White students by stemming the extent of white flight from districts undertaking desegregation efforts. Several studies provide evidence that following program adoption, districts with mandatory desegregation programs saw a faster acceleration in outflows of white students than those that adopted voluntary desegregation plans that relied heavily on magnet schools.[15] Comparing 20 districts for at least 10 years following the adoption of a desegregation plan, one study finds that relative to mandatory plans, voluntary plans were associated with smaller short-term increases in black-white exposure, but larger long-term increases.[16] Another study produces similar results using a larger sample of districts.[17] However, it is not clear that these studies adequately control for differences between districts with voluntary desegregation plans and those that adopted mandatory plans. Additionally, the plans classified as “voluntary” often involved targeted school closings and rezoning, and the role of the mandatory elements of these plans, as opposed to magnet schools, in increasing interracial exposure is unknown.

One study examines the effects of adding magnet schools to desegregation plans in the 150 largest districts in the U.S. as of 1991. It found that “(a)mong voluntary plans, the increase in interracial exposure is almost the same for plans with and without magnets, and among mandatory plans, the magnets are associated with a greater increase in interracial exposure than the same plan without magnets when compared to no plan at all”.[18] Somewhat at odds with primary findings, districts with a higher percentage of magnet schools experienced negative changes in interracial exposure.

Beyond the effects of magnet schools on racial integration across schools, concerns were raised about the racial segregation of students within racially mixed magnet schools. This concern has been especially pronounced for magnet programs housed within regular schools, where the students participating in the magnet-school programs, who are more likely to be white and nonpoor, may be largely separated from students attending from the neighborhood attendance zone. Studies that raise this concern about segregation within partial-site magnet schools are based on case studies with small to very small samples, and the evidence remains largely anecdotal.[19]

Key finding #2. *Shifts away from desegregation goals have resulted in decreased diversity in some magnet schools and have limited the ability of magnet schools to reduce district-wide segregation across schools. Nonetheless, magnet programs that maintain focus on integration in legally permissible ways have contributed positively to integration goals.*

In some places, the shift away from explicit integration goals and policies has resulted in decreased diversity within magnet schools. For instance, following the release from a court desegregation order in

1999, participation of suburban students in the 23 magnet schools in St. Louis dropped from a high of more than 1,400 students in the 1997–98 academic year to fewer than 100 in the 2011–12 academic year. While the proportion of Black and White students enrolled in the school district changed little between 2006 and 2010, the percentage of Black students in magnet schools increased by 6 points, and the share of white students dropped by 6 percentage points, decreasing the exposure of Black students to White students in magnet schools.[20] Similarly, a federal mandate requiring a magnet-school program in a large urban district to stop using race-based admission quotas in 2003 resulted in a decrease of Black–White exposure in the district's magnet schools of roughly 7 percentage points.[21]

Despite these findings of decreasing interracial exposure in magnet schools, some magnet schools remained more racially diverse than the schools that their students might otherwise have attended. In Connecticut, for instance, during the 2006–07 school year, exposure to white students among Black and Hispanic magnet school students from Hartford, New Haven, and Waterbury was much higher than for students in those cities attending district schools. The percentages of white and nonpoor students in the magnet schools attended by these students were substantially higher than those in the district schools that they most recently attended.[22] Notably, Connecticut's interdistrict magnet-school program did not use explicitly race-based admissions; however, it did have explicit integration goals and chose magnet-school themes, locations, and admission policies to promote integration.[23] Similarly, using data from the 2006–07 to 2013–14 school years, in a large urban district with more than 100 magnet schools, traditionally underserved students attending magnet schools encountered more White students and fewer Hispanic students, fewer students living at or below the poverty level, and fewer English learners than their counterparts in district schools.[24]

Beyond the studies discussed in the last two paragraphs and a few other case studies, there is no systematic evidence on whether or not magnet schools have, on average, become less diverse in recent decades. Nor is there systematic evidence identifying the contexts in which magnet schools have maintained diverse populations.

Also unknown is whether contemporary magnet schools increase or decrease district-wide measures of racial integration and interracial exposure in their districts. One study compares the levels of segregation across school attendance zones to observed levels of school segregation across all schools including magnets, charters, and private schools for 22 large school districts during the 2000–2001 school year. It finds that schools are considerably more segregated than if all students attended their geographically assigned schools.[25] A similar comparison using 2002–03 data from Durham, North Carolina, finds that public school-choice programs increase racial and socioeconomic segregation relative to a counterfactual in which all students attend their geographically assigned schools.[26] Although these studies do not isolate the effect of magnet schools from charter and private schools, and ignore how family residential choices respond to expanded schooling options, they suggest the ability of magnet schools to reduce racial segregation in the absence of race-conscious admission policies is limited.

A more recent study comparing observed segregation patterns to segregation across school assignment zones uses data for the 2016–17 school year from Wake County, North Carolina. It finds that magnet-school transfers decrease the enrollment of Black students by approximately 3 percentage points in schools that previously had an above-average representation of Black students and increase the percentage of White students enrolled at schools that previously had a below-average representation of white students, decreasing the racial isolation of Black and other nonwhite students.[27] Although these results indicate that magnet-school transfers reduce segregation, the authors argue that these reductions are small compared with the maximum reduction in segregation that might be achieved given the number of magnet-school transfers. Additionally, the authors characterized the magnet program in Wake County as a controlled choice program because the district prioritizes more affluent

families in magnet assignments to encourage more diversity within schools. Thus, like the program in Connecticut, this magnet-school program still maintains goals related to desegregation.

Overall, this evidence suggests that magnet schools can create diverse learning environments and even reduce system-wide segregation, but only if explicit integration and diversity goals are adopted and magnet schools are designed with careful attention to the contexts in which they operate. For instance, interdistrict enrollment may be necessary in places such as Connecticut with high levels of segregation across districts, and siting, recruitment, and admission policies must be designed to promote diverse enrollments.

Key finding #3. *Attendance at many magnet schools, particularly oversubscribed middle- and high-school magnets, results in improved student achievement. However, the effects of magnet schools on academic measures of achievement vary widely.*

The primary challenge in estimating the effect of magnet-school attendance on student achievement is the fact that magnet-school students are self-selected. Self-selection can create differences between magnet-school students and any students to whom they might be compared. The two most common methods of addressing this bias are (1) to exploit the random assignment of students to magnet schools based on admission lotteries and (2) to use statistical methods to control for differences between magnet-school and non-magnet-school students. These two approaches pose well-known tradeoffs. Estimates derived from the comparison of lottery winners and losers rely on fewer assumptions but can be computed only for oversubscribed schools that have adequate admission records. Matching methods and statistical controls require stronger assumptions but can often be applied to more representative samples of magnet schools. Analyses have shown that methods of statistical control that use pre-magnet test scores can closely replicate lottery-based estimates in at least some circumstances.[28]

Table 1 summarizes the studies that have estimated the impact of attending a magnet school on measures of student academic achievement. One of the few national studies of magnet-school effects uses a sample of city students in eighth grade in 1988 from the National Education Longitudinal Study to estimate differences in tenth-grade achievement between students attending comprehensive public high schools and students attending magnet high schools. In analyses that control for differences in eighth-grade test scores and an extensive set of family background characteristics, it finds that magnet schools are more effective than regular schools at raising student proficiency in reading and social studies.[29] Interestingly, estimates of magnet-school benefits are virtually unchanged when controls for the student composition of the school and indicators of the school environment are added, leaving questions about why magnet schools help improve student achievement.

More recently, a number of studies have measured treatment effects by comparing the average outcomes of lottery winners who are offered admission to a magnet school with the average outcomes of applicants who were denied admission because they lost the lottery. These studies have consistently found that attending magnet schools improves student achievement.[30] One study used lotteries to estimate the impact of magnet schools in San Diego and found that winning a magnet school lottery at the high school level increased mathematics achievement 2 and 3 years later by approximately 0.2 standard deviations. The researchers did not, however, find any statistically significant effects on reading achievement, nor did they find any effects for elementary- or middle-school magnets.[31] Another study examines four middle-school magnets in a large Southern school district and found that magnet attendance had positive impacts on mathematics achievement for fifth and sixth graders, although those impacts were uneven across schools.[32] Another examines two interdistrict schools serving grades 6-8 and 6-12 in Connecticut and finds positive effects of 0.14 standard deviations on eight grade math scores and 0.28 standard deviations on eight grade reading scores.[33] Another used admission lotteries

to identify the effect of magnet attendance in an unidentified, mid-size urban district, and finds that attendance at a first-choice magnet school increased test scores by 0.16 standard deviations in math and 0.19 standard deviations in reading.[34]

One study also demonstrates that matching models using pretreatment test scores as controls, closely replicates estimated effects based on lotteries.[35] The study then uses these matching models to estimate effects for a larger set of Connecticut interdistrict magnet middle and high schools. The study finds that the average effect of these schools on mostly Black and Hispanic students from the cities of Hartford and New Haven ranged from 0.12 to 0.15 standard deviation on eighth- and tenth-grade math and reading. The estimated effects on suburban students were smaller for math but larger for reading.

Other studies have used alternative statistical methods in the absence of admission lotteries to measure the effects of a broader range of magnet schools. The most informative of these studies control for test scores prior to students entering a magnet school and other background characteristics and deploy a variety of matching and regression methods. In contrast to the Connecticut study, the most recent and comprehensive of these studies find that the average magnet school does not improve student achievement. For example, one study uses data on students in Marion County from the 2008–09 to 2012–13 academic years to estimate the effect of 21 magnet schools primarily located in Indianapolis on student test scores in grades 5 through 8. They find that students made smaller test-score gains in magnet schools than in the school they previously attended.[36] Another study examines the effects of over 100 magnet schools in an unidentified, large urban district from the 2006–07 academic year to the 2013–14 academic year and finds null to small negative effects on average.[37] Another uses data from the 2012–13 school year to estimate magnet-school effects in five different districts and finds that estimated effects vary widely from large positive effects to large negative effects across schools, including across magnet schools in the same districts. The average effects across all sites were close to zero and statistically insignificant.[38]

Key finding #4. *Research tells us little about which aspects or types of magnet schools most consistently improve student achievement.*

Clearly, many magnet schools, particularly oversubscribed magnet middle and high schools, have positive effects on academic achievement. However, it is much less clear that the average magnet school has positive effects on achievement. Given the apparent variation in magnet-school impacts, it would be useful to identify aspects or types of magnet schools that consistently improve student achievement. Unfortunately, studies that have found positive magnet-school effects say little about which aspects of these schools contributed to achievement gains. Whether less racially and economically isolated environments, the organization of instruction around a particular theme, enhanced resources, higher-quality teachers, or some combination of these aspects accounts for magnet school effects remains unclear.

Nor is it clear whether certain themes or types of magnet schools are particularly likely to have positive effects on student achievement. A few older studies used admission lotteries to estimate the impacts of career academies. Specialized vocational high schools predate magnet-school programs and typically do not adopt district-wide integration as a primary goal. However, many career academies are schools of choice that offer specialized curriculum and programming, and thus, share some of the key elements that define magnet schools. Evaluations of career academies have found positive effects on academic and labor-market outcomes, although the effect estimates varied across different subgroups of students.[39]

High schools with academic admission criteria, sometimes referred to as “exam schools,” are another type of specialized school of choice that predates the magnet-school movement but that shares important features of magnet schools. Several influential studies have examined exam schools. One study analyzes a randomized lottery for elite, magnet gifted and talented programs and finds that program participants performed better in science but not in other subjects.[40] Multiple studies have used regression discontinuity designs to estimate the effects of “exam schools” in New York, Boston, and Chicago and find null or small effects on test scores, college enrollment, the quality of college attended, or college graduation.[41]

Another study examines a large enough number of magnet schools to compare average impact estimates across schools with different themes and to compare whole-school magnets and within-school magnet programs. None of the several themes examined, including career prep and STEM, showed positive effects on test scores, on average. It found positive effects on reading test scores for magnet programs within a school, but these estimates were not robust across statistical models and it found mostly negative effects for whole-school magnets.[42] Again, it is difficult to say how far these findings can be generalized beyond the magnet schools in this one school district, which had a very low percentage of nonwhite and nonpoor students and which achieved only limited amounts of school diversity.

Key finding #5. *Magnet schools have helped urban districts retain high-achieving and socioeconomically advantaged students, but these enrollments may come at the cost of increased stratification across schools.*

By comparing admission lottery winners and losers in an unidentified mid-size urban school district using data from the 1998–99 academic year to the 2006–07 academic year, a study shows that magnet programs helped the district attract and retain students from households that were at risk of leaving the district. The households whose decision to leave the district was influenced by whether or not they had access to a magnet school had higher incomes, more education, and children who scored higher than their counterparts from the typical district household. It also finds that magnet schools were most effective in attracting households that had young school-age children.[43]

Related to the notion that magnet schools help to attract and retain students in urban school districts is the idea that magnet-school options can help attract families to neighborhoods in city districts. A few studies show that policy changes that increased access to magnet schools in certain neighborhoods led to increased property values and higher incomes among new homebuyers and decreased moves out of those neighborhoods.[44]

These findings fit the image of magnet schools, particularly of selective magnet schools targeting high-achieving students, as a way for urban school districts with declining enrollments to retain high-income families and high-achieving students. Such a goal might be important to help ensure financial and other forms of support for struggling school districts. Some have also advocated for using magnet schools as part of coordinated efforts to promote the economic development of central cities.[45]

However, creating schools that can help retain or attract high-income families and high achieving students may come at the cost of increased stratification across schools within districts. Concerns that magnet schools might increase stratification of this kind date back to the desegregation era. Using survey data from a representative sample of 600 districts in the 1991–92 academic year, a study reports that students from lower socioeconomic backgrounds and students with special needs were underrepresented in magnet programs relative to their overall presence in the districts, a pattern that was most pronounced in high-minority and low-income districts. This result suggests that magnet

schools might increase the isolation of disadvantaged students in neighborhood schools as discussed above.[46]

The primary means through which magnets might increase stratification by ability and socioeconomic status is by selecting or being selected by students who are higher achieving than the students in the schools they otherwise would have attended, a phenomenon sometimes referred to as cream-skimming. This form of selection is perhaps most likely at the roughly 25% of magnet schools that use academic criteria to make admission decisions, but it might also be a concern at other types of magnet schools if higher-achieving students are more likely to exercise school choice. One recent paper directly examines the question of whether or not magnet schools cream-skim. Using longitudinal statewide data from two states, authors find that students with above-average achievement relative to their prior school are 18 and 9 percentage points more likely to enter magnet schools than students with below-average achievement in Tennessee and North Carolina, respectively.[47] However, this study limits the definition of magnet schools to those that have specialized academic programs targeting gifted and talented students. This type of magnet might not be representative of the broader range of magnet schools, and, specifically, might be much more likely to have selective admission criteria. Other schools of choice in this study that do not have programs targeting gifted and talented students are characterized as open-enrollment schools and may include some schools that others would consider magnets. There was no evidence that this type of school engaged in cream-skimming.

Additionally, the effect of cream-skimming by magnet schools on the exposure of students in other district schools to high-achieving or high-SES students can be complicated, particularly if a significant proportion of high-achieving students in magnet schools would otherwise leave the district. Using data from all students who began ninth grade in September 1996 in the school district of Philadelphia, a 2004 study compares the composition of ninth-grade student bodies at neighborhood high schools to what that composition would be if every ninth grader in the district attended the high school to which they were geographically assigned. The analysis shows that the composition of the lowest-achieving neighborhood high schools was affected little by selective magnet schools because few of the students zoned to these schools qualified for admission to the magnet schools. Rather, most students in selective magnet schools were drawn from high schools with relatively high achieving attendance zones. The study also finds that some nonselective magnet schools were more likely to attract relatively high-achieving students from the most disadvantaged high schools.[48]

These results suggest that the effects of magnet schools on the exposure of students in other schools to high-achieving students are likely to depend on context. For instance, the effect of magnet schools on the amount of stratification by achievement and SES is likely to depend on the degree of such stratification in the absence of magnet schools. Additionally, the interaction of recruitment and admission practices with pre-existing levels of stratification is likely to matter.

Table 1: Summary of studies that estimate effects of magnet schools on academic achievement

Study	Years Covered	Sample	Method	Estimated Effects on Academic Achievement
Crain et al. (1992)	1988	Ninth graders in 133 career magnet high school programs in New York City	Randomized admission lotteries	Statistically significant gain in reading scores.[a]
Gamoran (1996)	1988–90	Tenth graders in 48 stand-alone magnet high schools in NELS	Matched comparison	Statistically significant positive effects on tenth-grade science, reading and social studies test scores; statistically insignificant positive effects on tenth-grade math scores.[a]
Betts et al. (2006)	2002–04	Magnet school applicants in San Diego	Randomized admission lotteries	Statistically significant positive effect of winning a magnet lottery at the high school level on math achievement two and three years later (0.2 s.d.). No significant effects for elementary and middle schools, and no significant effects on reading.
Ballou (2007)	1998–2004	Applicants to four nonselective and one selective magnet middle schools in a large Southern school district	Randomized admission lotteries	Statistically significant positive effect on math in fifth grade (18% of normal years' growth) and sixth grade (10% of normal years' growth) for the selective magnet, and a statistically insignificant effect on math in fifth grade and statistically significant positive effect on math in sixth grade (54% of normal years' growth) for nonselective magnets

Bifulco, Cobb, & Bell (2009)	2004–07	Applicants to 19 middle- and high-school interdistrict magnet schools in Connecticut	Randomized admission lotteries & matched comparison group design	Three years of exposure to a magnet middle school increased reading achievement (0.15 s.d. for city students and 0.27 s.d. for suburban students) and math achievement (0.13 s.d. for city students and 0.10 s.d. for suburban students). Two years of exposure to a magnet high school increased math scores (0.14 s.d.) and reading scores (0.15 s.d.) for city students. High school effects on suburban students were smaller and statistically insignificant.
Hastings, Nelson, & Zimmerman (2012)	2006–09	Applicants to eight magnet high schools in a midsize urban district	Randomized admission lotteries	Marginally significant positive effects of two years of exposure on math (0.163 s.d.) and reading (0.183 s.d.). Statistically insignificant positive effect on writing.
Bui, Craig, & Imberman (2014)	2008–10	Applicants to two oversubscribed, gifted and talented magnet middle-school programs in a large urban district in the Southwest	Randomized admission lotteries	Achievement in math and reading did not improve for students placed in the magnet school's gifted and talented program. Lottery winners attained a statistically significant 0.28 s.d. improvement in science scores.
Abdulkadiroglu et al. (2014)	1997–2009	Applicants to six traditional exam high schools operating in Boston and New York	Regression discontinuity	For Boston exam schools, small negative effects on math scores (-0.053 s.d.), negative effects on seventh-grade English scores (-0.11 s.d.), and positive effects on tenth-grade English scores (0.095 s.d.). For New York, null to small negative effects on math, English, history, and science scores.

Abdulkadiroglu, Angrist, & Pathak (2017)	2011–12	Applicants to nine exam high schools in Chicago	Hybrid regression discontinuity and propensity score matching	Statistically insignificant effects on tenth-grade math and reading scores.
Wang, Schweig, & Herman (2017)	2010–13	24 magnet schools, located in five urban school districts in four states that initially received MSAP funding in the 2010-2011 academic year	Propensity score matching	Mean effects across all 24 sites were -0.005 s.d. for math and 0.027 s.d. for reading, which are both statistically insignificant. School-specific effects for math scores ranged from -0.397 to +0.417 s.d., and for reading scores, they ranged from -0.430 to 0.361 s.d. Statistical tests rejected the null hypothesis that differences across schools were due solely to chance.
Berends & Waddington (2018)	2008–13	21 magnet schools in the greater urban Indianapolis area	Matched comparison group design with student fixed effects	-0.07 to -0.14 s.d. for math scores and -0.04 to -0.11 for reading scores. Statistical significance varied with the model used.
Harris (2019)	2007–14	121 magnet schools in one of the nation's largest school districts	Matched comparison group design with student fixed effects	Negative effects for students zoned to a school with a magnet program (-0.058 s.d. for math scores and -0.038 s.d. for reading scores), and null effects for non-magnet-school students in schools with magnet programs and for students who chose magnet-school programs.
a. Effects not reported in terms of normalized z-scores				

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