



Raising the Bar: Impacts and Implementation of the New Heights Program for Expectant and Parenting Teens in Washington, DC

April 2017

Purpose statement: This report shares the findings from an impact and implementation study of New Heights, a DC Public Schools program that provides a multi-faceted approach for supporting parenting students' educational attainment. This report demonstrates how the program made a significant impact on academic outcomes related to the program logic model, such as school attendance and credit accumulation, and a marginal impact on a more distal outcome of graduation. The report provides an in-depth description of the program model, and presents student and staff perceptions of its success.

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I. INTRODUCTION

The United States teen birth rate recently reached a record low of 24.2 births per 1,000 females ages 15 to 19 (Centers for Disease Control and Prevention [CDC] 2015). This represents a significant decrease over the past 20 years, when the rate was nearly twice as high.

Despite this progress, there is still much work to do. Great disparities in the teen birth rate exist by race and ethnicity; the birth rate for Hispanic and African American teens is nearly double that of non-Hispanic whites (CDC 2015). Each year, 250,000 teens become parents (or subsequent parents), and the extraordinary challenges they face have not diminished since the seminal publication of *Kids Having Kids* (Maynard 1997). Teen parents are still more likely to be from low-income families, unmarried, and experience multipartner fertility (Penman-Aguilar et al. 2013; Maynard and Hoffman 2008; Hoffman 2008), and they still face daunting challenges in building stable and healthy lives for themselves and their children (Mollborn 2007; Brien and Willis 2008).

Lacking sufficient resources for housing, food, health care, and child care, teen mothers have difficulty attending and completing high school, contributing to low educational attainment and employment (Hoffman and Maynard 2008). Teen pregnancy and parenting is the leading cause of high school girls dropping out of school, representing 30 to 40 percent of all female dropouts (Freudenberg and Ruglis 2007); only about half of teen mothers receive a high school diploma by age 22 (Perper et al. 2010).

Federal programs address both at-risk young families and teen dropout prevention, but these programs are not coordinated to specifically address the needs of teen parents. For example, the Federal Home Visiting Program (operated by the Health Resources and Services Administration within the U.S. Department of Health and Human Services [HHS]) supports evidence-based programs that improve the health and well-being of the children in young families. The U.S. Department of Education's High School Graduation Initiative, administered by the Office of Academic Improvement, provides funding to states and localities to implement evidence-based dropout prevention programs. However, until recently, federal programs have not explicitly focused on a clear programmatic gap—improving outcomes, including educational attainment, of the highly vulnerable teen parent. And within this gap, there is a lack of evidence on just what to do.

In 2010, the Office of Adolescent Health (OAH), HHS, launched the Pregnancy Assistance Fund (PAF) to fill this gap. This unique program focuses on helping expectant and parenting teens improve their immediate outcomes, such as access to health care and education, which in turn is hypothesized to delay a subsequent pregnancy and improve the long-term well-being of themselves and their children. The program allows for flexibility in programmatic approaches, substantive focus, and settings, with an expectation that grantees provide a comprehensive mix of supports and services and that over the next decade the PAF program will build an evidence base on effective multifaceted programs for teen parents.

New Heights: Supporting parenting students before they drop out

Similar to the dip in the nationwide teen birth rate, Washington, D.C., has also seen its teen birth rate cut in half in recent years (Martin et al. 2015). Still, teen births continues to be a significant issue for Hispanic and African American females in the District, with birth rates nearly 25 times that of non-Hispanic white females (CDC 2015). These births primarily occur among females living in the neighborhoods with the highest rates of poverty and violence (Perry-Undum 2013), making it especially difficult for these young mothers to access the services they need (Rolland 2006; McCoy 2015).

The poorest neighborhoods are also home to most of the city's large, comprehensive high schools. In these large high schools, nearly 10 percent of females are parenting.¹ These schools represent a convenient location for expectant and parenting students to receive services in support of their educational attainment, and the well-being of themselves and their children.

With a 2010 PAF grant, D.C. Public Schools (DCPS) central office staff refined and expanded a program—New Heights—that previously existed in just two high schools, making it available as of the 2011–2012 school year in all of the district's large comprehensive high schools. New Heights is a voluntary, school-based program of supports designed to help expectant and parenting students in DCPS navigate the challenges of pregnancy and parenthood and complete high school. Recognizing that expectant and parenting students can feel overburdened, embarrassed, and discouraged, the program seeks to reorient students toward thinking about achieving immediate educational and longer-term future goals and identifying clear pathways for achieving them.

Under contract from OAH, Mathematica Policy Research conducted this evaluation of New Heights. The evaluation addresses three primary questions related to program impacts and implementation:

1. What are the core components of the New Heights program model?
2. What is the impact of New Heights on academic outcomes, such as school engagement, credit accumulation, and graduation?
3. How is New Heights implemented, and what are students' and staffs' perceptions of the program?

This report presents the findings from the study of the New Heights program. In the next chapter, we describe the New Heights model. Chapter III discusses the impact study design, which makes use of data from three Washington, D.C. public agencies, and Chapter IV shares the findings on academic outcomes. Chapter V presents program implementation through the eyes of the dedicated staff who run it and the students who have been affected by it. The report ends with a brief conclusion.

¹ This statistic was compiled using data for this study for the nine large public high schools included in the study.

II. THE NEW HEIGHTS PROGRAM

The overarching goal of New Heights is to support expectant and parenting students and help them achieve educational success. Informed by multiple theories of youth development, the program highlights the importance of addressing systemic and individual factors (Lyons et al. 2013). New Heights treats expectant and parenting students as active decision makers in their lives and aims to draw upon their strengths to overcome adversity and reduce an emphasis on problems and barriers.

The New Heights model is also grounded in reducing school-based discrimination. Federal law (Title IX) requires that schools must not discriminate against expectant and parenting students (U.S. Department of Education 2013). This consists of making allowances, arrangements, uniform rules, and attendance policies to accommodate students who need additional assistance to participate fully in a school's programs and activities.

Through this evaluation, OAH sought to better understand the New Heights program goals and structure, and the ways in which the program supports expectant and parenting students in addressing the challenges they face when they have not yet completed high school. In this chapter, we describe the program model that was refined and rolled out to 11 additional District of Columbia public high schools with the 2010 OAH PAF grant.² We also present the role of the school-based coordinators in implementing the program.

Structured, yet flexible, approach

New Heights is a system of integrated school-based components designed to be flexible in its approach and address multiple dimensions of a teen parent's life. Any expectant or parenting student, male or female, enrolled in a school that offered New Heights can voluntarily enroll in the program and participate at any level that meets his or her needs.

New Heights: Then and now

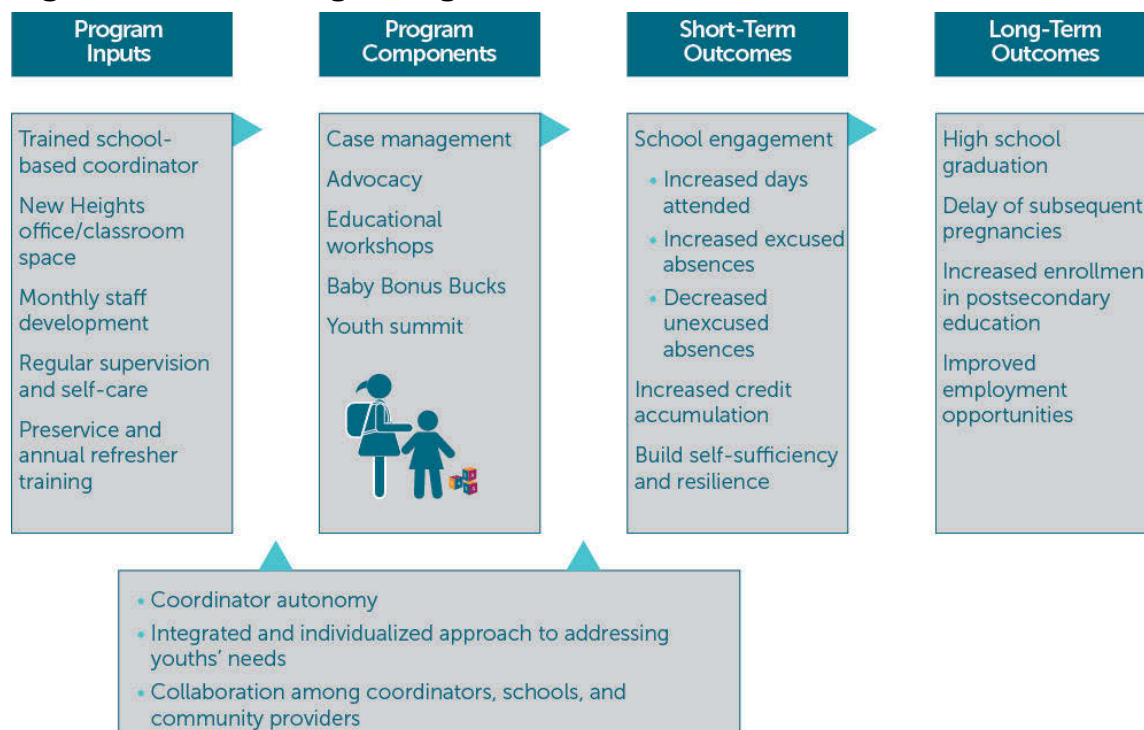
The program now known as New Heights began in the early 1990s in two of the largest DC public high schools—Anacostia and Cardozo High Schools. With federal funding, the program supported a large number of staff at each school who primarily helped parenting students complete TANF-related paperwork. Over time, the program transitioned to new leadership in the DCPS central office and evolved in both scope and structure. In 2010, New Heights received a three-year grant from OAH. This grant enabled the program to expand to 11 additional public high schools and two charter schools, with a coordinator serving each school. When grant funding ended in 2013, DCPS absorbed the cost of operating the program. As of the 2015–2016 school year, the program had been scaled back. It remained fully operational in 9 public high schools (including Anacostia and Cardozo), but was offering limited services in 4 high schools, and no longer operating in the charter schools.

² To learn about the intended program, we talked with two district administrators and three program leadership staff members in the Office of Youth Engagement. In Chapter V, we discuss how the program was implemented, drawing on additional data from the school-based coordinators, the students, and case files that coordinators maintained on the students.

New Heights’ key feature is placing a dedicated staff person, a coordinator, in every school. The coordinators are trained staff employed by the district who operate primarily out of a dedicated office or classroom space in each school. They lead program delivery in each school, delivering the program’s multiple components tailored to the needs of their students. Each coordinator serves as a free resource for their school, assessing the academic and personal needs of participating students and helping them identify concrete strategies and achievable goals to meet those needs.

Coordinators are responsible for integrating four main components into the regular school day: (1) advocacy, (2) targeted school-based case management, (3) weekly educational workshops, and (4) incentives. Taken together, these components aim to help expectant and parenting students identify their strengths to overcome barriers, become self-sufficient, and achieve educational success (Figure II.1). In the short term, New Heights seeks to increase school engagement through improved attendance. The program supports students in overcoming the barriers that keep them out of the classroom, thereby working to increase the number of days attended per year. But the program also helps students to understand the criteria for excused absences and the administrative process for having an absence designated as excused, as opposed to unexcused.³ The program also aims to increase credit accumulation and empower students to advocate for themselves and become self-sufficient. These short-term outcomes are expected to lead to long-term improvements, such as increased graduation rates, postsecondary enrollment, employment opportunities, and the delay of subsequent pregnancies.

Figure II.1. New Heights logic model



³ If a student accumulates 40 unexcused absences in a year, DCPS will disenroll the student. There is no cap on the number of excused absences.

The setting of the program is designed to encourage expectant and parenting students to continue attending school and reach students where they are most accessible, before they decide to drop out. Program activities, such as the workshops and one-on-one meetings with coordinators, are voluntary and expected to occur before, between, or after regular classes, such as during lunch period or when students have free time during the school day. Working closely with school administrators and teachers, coordinators are responsible for identifying and recruiting expectant and parenting students and assess their needs using a standardized needs assessment process. The program also serves as the point of contact with community partners and public services, facilitating the exchange of information and access to resources, such as transportation support and child care (either for school-based child care facilities or community-based child care options).⁴ Given the District's rich environment of nonprofits, New Heights has a well-developed system of community partners to provide students with access to legal assistance, early childhood education, mental health counseling, and college or career planning guidance. The school–community partnership and school-based coordinator aims to wrap care and support around an expectant and parenting student, improving the student's chances to stay in school and graduate.

New Heights core components



Advocacy. Coordinators are expected to educate school staff and empower expectant and parenting students to ensure that they receive the necessary accommodations to attend and complete school.



Case management. The program offers one-on-one targeted and tailored support to help students meet their academic goals. Coordinators are expected to (1) monitor and promote academic progress for each participant in close collaboration with teachers, counselors, and school administrators; and (2) help students manage all logistical or personal challenges—such as transportation, child care, or housing needs—to ensure that they can attend school every day.



Educational workshops. Held at least three times a week, lunchtime workshops provide supplemental education on relevant topics, such as parenting skills, career and financial planning, prenatal care, early childhood development, and healthy relationships. Organized by coordinators and delivered by vetted and trained community-based partners, workshops are open to all students and intended to increase access to community-based services.



Baby Bonus Bucks. New Heights offers a system of in-kind incentives that students can earn when they meet personal goals and use toward purchasing items, such as maternity and baby supplies. These incentives are designed to improve attendance, grades, and class participation. Each coordinator is expected to develop benchmarks and milestones based on his or her students' needs and goals.

⁴ Five of the study schools offer free site-based child care for eligible students.

Preparing coordinators to be the program backbone

The team of school-based coordinators is the foundation of the program. Their job is to work both independently and collaboratively to do whatever it takes to help expectant and parenting students overcome all obstacles that pregnancy and parenting place in the way of completing high school. Coordinators must be collaborative, experienced, skilled, and possess a can-do spirit. Each individual coordinator must also be a good fit for their school. New Heights has sought to select the right mix of coordinators and to provide the tools and training that are essential for meeting the needs of its students.

Coordinators draw on a diverse set of strengths and characteristics to implement the model, while tailoring it for their students and their schools. In 2015, when the data were acquired for this study, the coordinators were all female and many were former teachers; most also had experience in social work or counseling. A number of coordinators worked in DCPS and community-based organizations and reported leveraging those prior relationships to more effectively advocate on behalf of their students and identify appropriate resources. Staff were passionate about helping expectant and parenting students, had experience working with teens, and could relate to the challenges expecting or parenting students faced while in school.

To identify staff with the relevant combination of skills and characteristics for each school, New Heights leadership used a collaborative approach. Although the coordinators were categorized administratively as district central office staff, and the district funded their positions (not each school), program leaders recognized the importance of involving schools in the hiring process of each coordinator. When expanding the number of coordinators in 2011 under the OAH grant, the New Heights central office staff asked both school principals and short-listed candidates for input on placements, realizing that each coordinator and his or her school principal had to be comfortable working closely together. New Heights staff also considered any unique student needs or contexts across the expansion schools, emphasizing that in making a hiring decision for each school it was important for them to “see potential candidates through [our] students’ eyes to determine their fit for the program.” Driven by a belief that an interdisciplinary mix of coordinators would build on one another’s strengths, New Heights’ leadership staff looked for candidates from varied professional backgrounds. The program also offered competitive salaries and relied on a network of existing community partners to attract the right candidates.



So they [school principals] are on board and they have a hand in who is going to be a part of their school staff, who is going to help them fulfill the mission of that particular school because every principal has a different vision.... Even though the New Heights program is pretty standard, how it can be executed in each school can vary.

New Heights central office staff

To enable coordinators to do their jobs, New Heights developed a toolbox consisting of extensive training, ongoing professional development, guidance manuals, and a system of supports. A program manager in the central office was responsible for oversight and day-to-day guidance. Coordinators who joined the program in 2011, at the time of the expansion, attended a five-day preservice training that offered detailed guidance on the coordinators’ role. Veteran New Heights coordinators and an external consultant walked new coordinators through what their typical day might look like at their school, the different types of staff they would have to

build relationships with, and the types of information and resources they would need. Coordinators learned about the importance of assessing each school’s culture, identifying and communicating regularly with staff (such as the school registrar or homeless coordinator), using the school database to check credit accumulation, and understanding a student’s transcript. After the preservice training, coordinators attended annual two-day refresher trainings that reinforced the program’s approach and provided opportunities for staff to regroup, share experiences and questions, and receive support.

The staffing structure aims to promote collaboration at all levels, and to prioritize the self-care strategies coordinators use to manage the demands of the intensive work.⁵ Coordinators received ongoing monitoring and one-on-one feedback from the program manager, who rotated her time among schools year-round. Each week, she aimed to spend four days at a single school to observe its culture, the needs of the students, and the activities of the coordinator. The program manager could then provide more targeted support through supervision. Monthly staff meetings focused on topics coordinators wanted to prioritize, and regularly focused on self-care. The coordinators’ multiple roles—parent, mentor, teacher, and counselor—could be overwhelming, causing mental and emotional stress. The monthly meetings also provided opportunities to share questions and receive input on specific cases.

⁵ *Self-care* refers to strategies, activities, and practices that social workers can engage in on a regular basis to reduce stress, balance work and personal lives, and maintain and enhance short- and longer-term health and well-being (Cox and Steiner 2013).

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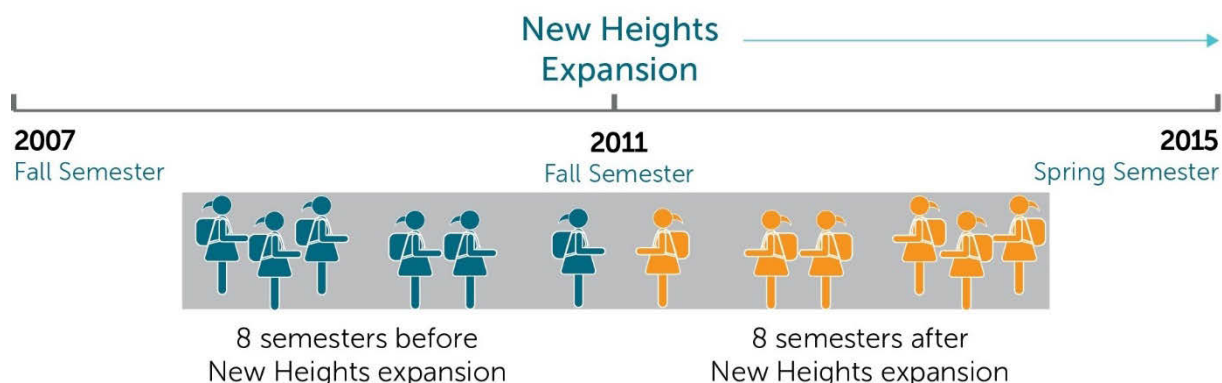
III. ASSESSING PROGRAM IMPACTS: DESIGN, DATA SOURCES, AND ANALYSIS METHODS

The opportunity to rigorously evaluate the effectiveness of New Heights arose when OAH funded a large expansion of the program to 11 additional DCPS high schools, beyond the two original schools, through a 2010 PAF grant. In this chapter, we first describe how we constructed treatment and comparison groups based upon the availability of New Heights in the study schools. We identify the multiple data sources we used to identify the sample and construct outcome measures, and then discuss our analytic methods.

Study design: A natural experiment

The New Heights program began in the expansion schools in the 2011–2012 school year. When this study was designed, four school years (eight semesters) had elapsed since the introduction of New Heights. We defined our pre-New Heights comparison period to similarly include four school years. The study spanned school years 2007–2008 through 2014–2015. Figure III.1 illustrates the timeline of this natural experiment.

Figure III.1. New Heights natural experiment timeline



This expansion constitutes a natural experiment in which *all* parenting females (not just New Heights participants) who attended these schools during and after the 2011–2012 school year create a treatment group that had the *opportunity* to participate in New Heights, whereas parenting females attending the same schools before the 2011–2012 school year create a comparison group that did not have the opportunity to participate in New Heights. Although New Heights might have affected parenting males as well, we focus on parenting females because they can be systematically identified as parenting and males cannot. The study also includes a second comparison group consisting of nonparenting females in the same schools.

We describe this as a natural experiment because the parenting females in our sample were not able to choose when New Heights was introduced in their high school, which means they were not able to choose whether they were in our treatment or comparison group. Although parenting females after the expansion can choose to participate in New Heights, our treatment group includes all parenting females, not only New Heights participants. Whether parenting females would be in the treatment or comparison group depended on the semesters in which they enrolled in a study school. The timing of enrollment in study schools is primarily due to when

students were born—it is unlikely to be due to a conscious choice to attend New Heights. In theory, students might have transferred to a New Heights study school to receive the program, but we see little evidence of this in our data. Fewer than 15 percent of New Heights participants transferred to a study school after becoming pregnant and, of those, about a quarter transferred from schools that had been implementing New Heights before the 2011 expansion (and not in our study sample) or transferred from a school that closed.

This feature of our design is similar to a randomized controlled trial (RCT), in which study participants cannot choose whether they are in the treatment or comparison groups because researchers randomly determine who receives the treatment. This is important because people who choose to participate in a program differ from people who choose not to participate—often in ways that are difficult to account for in statistical analysis (Rubin 1974; Holland 1986; Shadish et al. 2002). For example, people who choose to participate in a program might be more determined than nonparticipants to make a change in their lives.

Because our treatment group consists of all parenting females after the New Heights expansion, our primary impact analysis is on the impact of the *offer* of New Heights, not the impact of *participating* in New Heights. However, we also calculate the impact of New Heights on those who *chose* to participate.

Although this natural experiment shares some of the strengths of an RCT, it has some limitations that an RCT would not have. If other changes took place in DCPS at the same time as the New Heights expansion, we could mistakenly attribute the effects of those other changes to New Heights. Examples of changes include other policy changes and demographic shifts. Some types of changes we can account for, but others we cannot, at least not fully. The type of change that we can account for is a change that affects all students (not only parenting students) equally. We account for that type of change by including nonparenting females as an additional comparison group in our analysis. The type of change that we cannot fully account for is a change that affects parenting students differently—for example, if the characteristics of parenting females have changed over time. There could be reason to believe that the characteristics of parenting females has changed as the teen birth rate has fallen, but the implications of those changes for our impact estimates are ambiguous (and are discussed later in this chapter).

Data sources and outcome measures

The impact evaluation uses data from three administrative sources: (1) DCPS, (2) DC Department of Human Services (DC DHS), and (3) DC Department of Health (DC DOH).

DC DOH provided a record of all teens ages 14 to 19 who gave birth in Washington, D.C., from January 1, 2003, through December 31, 2014. DCPS provided data for the eight years included in the study—from school years 2007–2008 through 2014–2015. To form our evaluation sample, we merged DC DOH data with DCPS data on names, date of birth, and address. We counted a record as matched if at least two of those three variables were the same in both data files (the appendix contains details on the matching). This merge identified the parenting females who were in the New Heights study schools before and after the introduction of the program in 2011–2012.

Our approach to identifying parenting females might not identify all parenting females in the study schools, which would mean that parenting females would be in our nonparenting group. This could happen for two reasons. First, teens who gave birth outside of Washington, D.C., or before turning 14, are not included in DC DOH data and would therefore be misclassified as nonparenting females in our analysis. New Heights staff have reported that this is unlikely, because the majority of parenting females in DCPS received DC Medicaid and attended prenatal providers with admitting permission for DC hospitals only. Second, it is possible that a student is present in the DCPS and DC DOH data, but the records were not matched on two of the three variables. The implication of this type of misclassification is most likely a small reduction in the study's statistical power to detect an impact of New Heights, primarily because the number of parenting females in our analysis is reduced.⁶

We consider a female student to be parenting in a given semester if in the DC DOH data she is observed having given birth during or before that semester. For example, if a student gave birth on October 1, 2012, that student was classified as a parent in the fall semester of 2012 and in each semester thereafter. We also conduct sensitivity analyses that consider parenting to begin in nine, six, and three months before the student gave birth.

The outcome measures for the study come from DCPS data, which included all students enrolled in study schools in each semester included in the study period. These outcome measures align with the program's short-term objectives of keeping expectant and parenting students in school (which involves removing barriers to attendance and converting eligible unexcused absences into excused absences to avoid penalties such as truancy and disenrollment from school), earning more credits, and moving toward completion (Figure II.1). The outcome measures cover three different domains: school engagement (measured by the number of excused and unexcused absences per semester and by the number of days attended per semester), credit accumulation (measured by the number of credits earned per year),⁷ and the semester graduation rate (measured by the proportion of students 17 or older who graduate each semester). Note that this measure of high school graduation differs from a cohort graduation rate, which is the proportion of students entering 9th grade in the same year who graduate within a given period of time. The semester graduation rate is lower than the cohort graduation rate because the semester rate reports whether a student graduated within the most recent semester, whereas the cohort rate reports whether a student ever graduates within the given time period. The appendix contains more detail on construction of the outcomes.

Because this evaluation was designed several years after the introduction of New Heights, it was not possible to collect additional data directly from students eligible for New Heights to measure longer-term outcomes, such as postsecondary education and employment. Our outcome

⁶ The misclassification also means that the average outcomes for nonparenting youth are slightly distorted by the misclassification of parenting youth as nonparenting. Because misclassified youth likely represent a very small percentage of all nonparenting youth, this effect is likely negligible.

⁷ Credits are analyzed by year rather than by semester because the credits earned for full-year classes are recorded in the spring semester. Students entering DCPS in the 2007–2008 school year or later are required to complete 24 credits for graduation, and therefore on-time graduation requires 6 credits per year. A course meeting for five hours of instruction through the entire school year is worth one credit.

data are limited to what was available through DCPS.⁸ The DCPS data also include students' demographic characteristics.

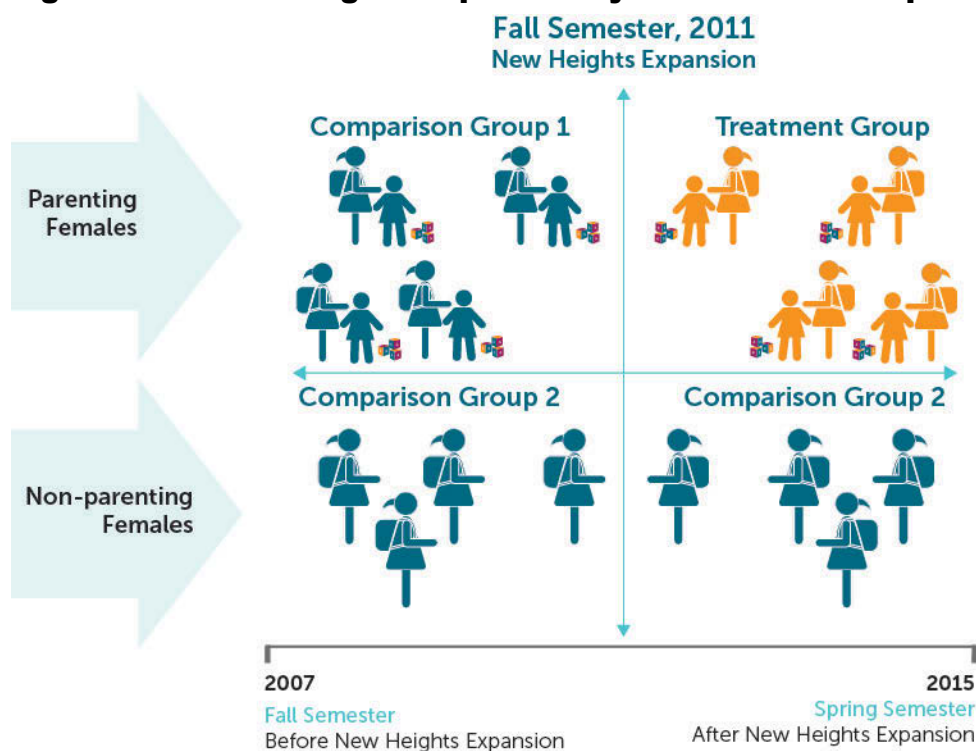
DC DHS maintains the New Heights participation database on behalf of the program. The database provides individual-level information on program participation. We used these data to identify parenting females in the study schools who ever participated in the program. We did not use DC DHS data to identify parenting females because these data include only the subset of students who were parenting females after the expansion of New Heights who chose to participate in the program. These data also cannot identify parenting females before New Heights expansion.

The schools and students in the study

The study schools include 9 of the 11 DC public high schools where New Heights became available in fall of 2011. These schools include Ballou High School, Columbia Heights Education Campus, Coolidge High School, Dunbar High School, Luke C. Moore High School, Roosevelt High school, Washington Metropolitan High School, Wilson High School, and Woodson High School. The study sample does not include the two schools in which New Heights was available since the early 1990s—Anacostia and Cardozo—because no pre-New Heights sample could be identified in the DCPS data. Two other expansion schools (Ballou STAY and Roosevelt STAY) are not included in the study because they are alternative night programs for credit accumulation and most students enroll for only brief periods. These students are otherwise enrolled in Ballou and Roosevelt, two schools in the sample. The appendix includes further details on this exclusion.

The analysis sample includes a treatment group and two comparison groups; a single impact of New Heights is calculated using all three groups. Parenting females attending study schools from fall 2011 through spring 2015 comprise the treatment group. The first comparison group is composed of parenting females attending study schools from fall 2007 through spring 2011. The second comparison group consists of nonparenting females in the same schools, over the same time periods. The purpose of the second comparison group is to account for other changes that took place in DCPS at the same time as the New Heights expansion so that we do not misinterpret those other changes as program impacts. Figure III.2 illustrates the treatment and comparison groups.

⁸ We considered measuring a subsequent birth. The prevalence rate of a subsequent births in the DC DOH sample is about 10 percent. To produce a statistically significant impact, the New Heights program would have had to nearly eliminate subsequent births.

Figure III.2. New Heights impact analysis uses two comparison groups

All students in the study sample attended a study school for at least one day from October 1 to May 1 in each school year. Conversations with school district administrators and New Heights staff informed our selection of this range of dates. Before October 1 and after May 1, enrollment records are a less reliable indicator of the school a student actually attended due to issues such as late enrollments and student transfers. In the appendix we describe analyses that assess the sensitivity of our impact findings to different approaches for identifying students enrolled in a study school in each school year.

The total sample size is about 11,000 youth, with some variation across outcomes. In the four years before New Heights expansion, the sample includes 524 parenting and 6,741 nonparenting females. In the four years after New Heights expansion, the sample includes 452 parenting and 5,595 nonparenting females. These numbers do not sum to the total sample size because some students are in the data both before and after the New Heights expansion, and some are in the data both before and after they become parents. Of the 6,741 female students observed as nonparenting before the expansion of New Heights, 225 were also observed as parents after the expansion.⁹

Changes in students' parenting status and exposure to New Heights is a useful feature of the data because it enables us to incorporate information about how outcomes change for individual students as they become parents and as New Heights becomes available to them. For example, a student can be observed as a nonparenting female in a semester before the expansion of New

⁹ The appendix provides a detailed accounting of sample size and overlap across groups. The standard errors in the impact analysis accounts for the fact that the same student can appear multiple times in the data.

Heights, then can also be observed as a parenting female in a subsequent semester before the expansion of New Heights, and finally can be observed as a parenting female in a semester after the expansion of New Heights. Because outcomes are measured for each semester in which an individual is observed in the DCPS database, this one student would be observed in the treatment group and each of the two comparison groups.

Evidence suggests that the characteristics of parenting females could have changed over time—fewer females are giving birth, and those who do are more likely to be African American and less likely to be Hispanic. Using CDC data, Martin et al. (2015) reported a 49 percent decline in the number of live births to females ages 15 to 19 in the District. The drop was larger for Hispanics (54 percent) than for African Americans (44 percent). Our data also reflect these trends. In our analysis sample, the proportion of parenting African American females rose from 81 percent before New Heights expansion to 84 percent after expansion, whereas the proportion who are Hispanic declined from 18 to 15 percent. Conversely, the proportion of nonparenting African American females dropped (from 77 percent to 71 percent) and the proportion who are Hispanic rose (from 15 to 18 percent). We also see evidence that parenting females after the expansion of New Heights were younger at the time they entered 9th grade than parenting females before the expansion (a difference of about 1.5 months).

Changes in the characteristics of parenting females over time could distort our estimates of the impact of New Heights. To best address this issue with the available data, we statistically adjust for students' age, race, and ethnicity in our impact analysis. We also conduct a sensitivity analysis that includes only African American youth. Our analysis cannot account for any unobservable (unmeasurable) differences between parenting females before and after the expansion of New Heights (see the appendix).

Impact analysis methods

Impacts are estimated using the treatment and comparison groups described previously. We use regression adjustment to control for differences in students' characteristics among these groups. Our primary analysis consists of three steps. The first step in calculating impacts is to calculate the difference in outcomes between the post-2011 treatment group and the pre-2011 comparison group. This post-pre difference is an accurate estimate of program effects only if nothing else changed in the schools or the surrounding areas since the New Heights expansion, which would have similarly affected the outcomes of interest (such as school policies aimed at academic engagement and completion). If any other changes affecting outcomes for parenting females occurred, then the observed impacts could not be attributed solely to the program. To address this concern, in the second step we calculate post-pre difference in outcomes of interest over the same time period for nonparenting females in the same schools, because New Heights should not affect nonparenting females. To better estimate the true New Heights impact, in the third step we subtract the change in outcomes for nonparenting females from the change in outcomes for parenting females. This approach to estimating impacts is sometimes called a difference-in-differences approach.

Our primary analyses examine the impact of the offer of New Heights, akin to an intent-to-treat analysis for an RCT. That is, the treatment group includes both parenting females who participate in New Heights and parenting females who do not participate; 75 percent of the

parenting females between fall 2011 and spring 2015 have a record of New Heights program participation. We use linear regression to calculate program impacts, adjusting for differences between the treatment and comparison groups with respect to students' age and race and ethnicity. We adjust standard error estimates to account for the fact that there are multiple semesters of data for each student. We also account for multiple hypothesis testing within the school engagement outcome domain due to the multiple outcomes in that domain. The appendix reports our impact equations and other technical details.

Though our primary analyses examine the impact of the offer of New Heights, we would logically expect the impact of the offer to be the result of program participation. To calculate the impact of participation in the New Heights program, we divide our intent-to-treat or primary impact of the offer of New Heights by the proportion of parenting females who participate in the program (75 percent); this is the impact of treatment on the treated (Bloom 1984; the appendix describes the technical details of this method and its assumptions).

A retrospective design such as this, drawing from three administrative data sources, involved numerous decisions on sample construction and outcome specification. In addition, a non-experimental, multiple comparison group design such as this involves many more analytic decisions than a typical experimental evaluation that estimates point-in-time impacts for two easily defined groups. We conducted numerous sensitivity tests, described in the appendix, to understand whether our findings depended on sample construction, outcome specification, and analytic approaches. Findings that are highly sensitive to research methods are considered less credible (Leamer 1985). The appendix describes these analyses in detail.

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IV. IMPACT FINDINGS: DEMONSTRATING THE EFFECTIVENESS OF NEW HEIGHTS

New Heights is intended to support expectant and parenting students to stay in school and graduate. In this chapter, we present our main impact estimates of the effect of New Heights on outcomes related to these objectives across three domains: (1) school engagement, which includes unexcused absences per semester, excused absences per semester, and days attended per semester; (2) credit accumulation, measured as credits earned per year; and (3) the semester graduation rate.

As described in Chapter III, we compare outcomes of a treatment group consisting of parenting females attending study schools from fall 2011 through spring 2015 to a comparison group consisting of parenting females attending study schools from fall 2007 through spring 2011. We refer to the difference between these groups as the post-pre difference among parenting females. Because this difference combines the effect of New Heights with any other school- or district-wide changes that might influence outcomes for all students, we compare it with the post-pre difference among nonparenting females to disentangle effects of New Heights from unrelated time trends. Assuming that no unobserved district-wide trends differentially affect the outcomes of parenting females, and that nonparenting females are not affected by New Heights but are affected by other school- and district-wide changes, this difference-in-differences—the difference between the post-pre difference among parenting females and the post-pre difference among nonparenting females—estimates the true New Heights impact.

In this chapter, we first present impacts of New Heights on all parenting females, including New Heights participants and nonparticipants. We next present program impacts on New Heights participants and the sensitivity of our findings to different approaches to calculating impacts. Finally, we discuss the magnitude of the observed impacts by describing the extent to which New Heights closed the gap between parenting and nonparenting females.

Impact of New Heights on parenting females

As noted previously, we control for district- and school-wide changes that affected all students over the study period by comparing the post-pre difference among nonparenting females to the post-pre difference among parenting females. Among nonparenting females, the post-pre difference is close to zero for unexcused absences per semester, days attended per semester, and for the semester graduation rate (Table IV.1). This suggests that the expansion of New Heights occurred when school- and district-wide policies were not having an effect on those outcomes. However, excused absences did increase among nonparenting females after New Heights expanded, as did credits earned per year. Through conversations with DCPS staff we learned that after the expansion DCPS changed the definition of an excused absence. DCPS staff also reported that the number of credits required for graduation increased and that the district improved scheduling to enable students to acquire more credits. These changes highlight the benefit of using a comparison group of nonparenting females to control for other policy changes taking place in DCPS and the effect those could have on nonparenting females.

New Heights had positive impacts on all domains examined. New Heights improved school engagement through reduced unexcused absences per semester, increased excused

absences per semester, and increased days in attendance per semester among parenting females (Table IV.1). New Heights increased the number of credits earned per year. New Heights might have also increased the semester graduation rate of parenting females, though this finding is of marginal statistical significance and is less certain than the others based on the results of sensitivity tests.

Table IV.1. Impact results

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits earned per year	Semester graduation rate ^a (percentage)
Parenting females					
Pre-expansion average	24.2	5.9	58.2	4.5	16
Post-expansion average	19.5	8.3	61.6	6.4	19
Post-pre difference	-4.7***	2.4***	3.4***	1.9***	3**
Nonparenting females					
Pre-expansion average	13.2	2.1	73.9	5.9	24
Post-expansion average	13.0	3.1	73.9	6.8	25
Post-pre difference	-0.2	1.0***	-0.05	0.9***	0
New Heights Impact	-4.5***	1.4**	3.4***	1.1***	3*

Sources: DCPS administrative data, DC DOH administrative data.

Note: All regressions include school- and semester-fixed effects, age indicators, race and ethnicity indicators, and an indicator for being over age when entering 9th grade. Statistical significance is based on a two-tailed t-test, with standard errors made robust to serial correlation within students. Statistical significance of the New Heights impact on the three outcomes in the school engagement domain are based on *p*-values adjusted for multiple comparisons using a Bonferroni adjustment. Numbers might not sum due to rounding.

^a The semester graduation rate is the proportion of students who graduate each semester. The analysis is restricted to students who are at least 17 years old each semester. The semester graduation rate is a marginal measure of graduation, whereas the more commonly used cohort graduation rate is a cumulative measure. The semester graduation rate is lower than the cohort graduation rate.

* Significantly different from zero at the .10 level.

** Significantly different from zero at the .05 level.

*** Significantly different from zero at the .01 level.

New Heights reduced the number of unexcused absences per year among parenting females. As described in Chapter II, New Heights sought to improve school engagement through a combination of advocacy, case management, and the use of incentives. Consistent with this objective, New Heights reduced unexcused absences by 4.5 days per semester among parenting females. Relative to the pre-expansion average among parenting females, this represents a reduction in unexcused absences of about 18.6 percent.

New Heights increased excused absences per semester among parenting females. When students accumulate too many unexcused absences they can be subject to administrative penalties such as disenrollment from school. As part of their advocacy work, New Heights coordinators helped parenting students to understand when their absences related to pregnancy, maternity leave, and child care could be excused; helped students to advocate for themselves; and empowered them to submit the necessary paperwork to have an absence excused (Chapter II). As evidence of the effectiveness of this work, the New Heights impact among parenting

females was an increase in excused absences of 1.4 per semester. This represents a 23.7 percent increase in excused absences relative to the pre-expansion average among parenting females.

New Heights increased days attended per semester. The impact of New Heights expansion on the days attended per semester was about 3.4 days, or about 7.0 days per school year. Relative to the pre-expansion average among parenting females, this represents an increase in days attended of about 5.8 percent.

New Heights increased credits received per year. By reducing unexcused absences, increasing days attended, and monitoring and providing incentives for academic progress, New Heights sought to increase credits earned among parenting females (Chapter II). Reflecting the potential for these efforts to increase credits accumulated, New Heights caused an increase of 1.1 credits per year. Compared with the pre-expansion average among parenting females, this constitutes a 24.4 percent increase in credits earned per year.

New Heights might have increased the semester graduation rates among parenting females who were 17 or older. New Heights theorizes that credit accumulation and improved school engagement will ultimately increase the graduation rate. New Heights had less opportunity to affect this outcome after the expansion than the more proximal outcomes of attendance and credits, because high school completion is observed only at the end of students' time in high school, whereas the other outcomes are observed throughout the period of enrollment. Also, as described in Chapter III, we restricted this analysis to students who are at least 17 years old, which reduced the sample size to about half of those available for the other outcomes, which would have reduced the study's statistical power to detect an impact on graduation. Nevertheless, New Heights had a marginally significant positive impact on this measure of graduation.¹⁰ The New Heights impact on semester graduation was an increase of about 3 percentage points, representing an 18.8 percent increase in the number of parenting females who graduated relative to the pre-expansion average.

Impact of New Heights on participating parenting females

In this section, we present estimates of the New Heights impact on parenting females who have a record of any program participation. This analysis is based on the same difference-in-differences strategy and the same analytic samples used for our primary impact analyses, though the impacts pertain to the subset of parenting females who chose to participate in New Heights (see the appendix for more information and a discussion of the technical issues in conducting this analysis).

For all outcomes, impacts are larger for the sample of parenting females who were New Heights participants, compared with the sample of all parenting females eligible for the program in the study schools (Table IV.2). The program has a large impact on the parenting students it serves, and our primary impact results were attenuated by the parenting females in the schools not participating in the program (about 25 percent of the parenting females in the schools had no record of program participation). New Heights reduced the number of unexcused absences

¹⁰We refer to an impact estimate that is significant at the 10 percent level as marginally significant because it is more likely to have resulted from random chance than an impact that is significant at the 5 percent level.

among participating female parents by 5.8 days per semester, increased the number of excused absences by 1.7 days per semester, and increased the number of days attended by 4.4 days per semester. New Heights increased the number of credits earned among participating female parents by 1.4 credits per year. New Heights also increased high school completion rates among participating female parents by 4 percentage points (though this finding is significant only at the 10 percent level).

Table IV.2. Impacts for program participants

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits per year	Semester graduation rate (percentage)
Impact of New Heights expansion (from Table IV.1)					
New Heights impact on parenting females	-4.5***	1.4**	3.4***	1.1***	3*
Impacts on New Heights participants					
Impact on New Heights participants	-5.8***	1.7**	4.4***	1.4***	4*

Sources: DCPS administrative data, DC DOH administrative data, and New Heights participant database.

Note: All regressions include school- and semester-fixed effects, age indicators, racial and ethnic indicators, and an indicator for being over age when entering 9th grade. Statistical significance of the New Heights impact on the three outcomes in the attendance domain are based on *p*-values that are adjusted for multiple comparisons using a Bonferroni adjustment. Statistical significance is based on a two-tailed t-test.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

The positive impact of New Heights is robust to choices in methods

Our primary impact analyses involve decisions about the research methods we use to address multiple technical issues. The study’s findings could potentially be sensitive to these decisions. Findings that are highly sensitive to research methods are considered less credible (Leamer 1985).

Our overall finding—that New Heights positively affected attendance and credit accumulation—accurately reflects our data, not our choices in research methods. Except for the impact on high school graduation, we find that the positive impacts of New Heights are at least marginally significant for most of the 20 alternative methodological approaches that we examined¹¹ (see the appendix).

The magnitude of New Heights’ impacts

New Heights has statistically significant impacts on students’ outcomes, but statistical significance does not necessarily mean that the impacts are substantively meaningful. For example, although we find that the impact on credit accumulation for program participants is statistically significant, it might not be apparent whether an increase of 1.4 credits per year is a meaningful change for parenting females.

¹¹ Significantly different from zero at the .01 level, two-tailed test.

To assess whether the impacts of New Heights are *substantively* significant (not just statistically significant), we compare the magnitude of the New Heights impacts for program participants to the gap in outcomes that existed between parenting and nonparenting females before the New Heights expansion using those outcomes for which a *narrowing* of the gap is the primary objective—days attended per semester, credits earned per year, and the semester graduation rate. Lipsey et al. (2012) recommended this type of benchmarking to gain a better understanding of the substantive importance of evaluation findings. This outcome gap is a highly relevant benchmark for assessing the impact of New Heights—the ultimate success for New Heights would be to close the gap between parenting and nonparenting females as much as possible on days attended and to eliminate it for credits per year and the semester graduation rate.

We find that the impact of New Heights contributed to a substantial narrowing of the outcome gap between nonparents and parents, particularly the gap in credits earned each year (Table IV.3). The impact on credits earned per year represents closing 99 percent of the gap between nonparents and parents before expansion. In other words, New Heights helps parenting students progress through school at the rate of their nonparenting counterparts. The impact on days attended represents closing 28 percent of the gap between nonparents and parents before expansion. Considering that parenting females will be absent for the birth of their babies, for several weeks thereafter, and when their children are ill or child care falls through, it is unreasonable to expect that New Heights would completely close this gap. The impact on the semester graduation rate, though only marginally statistically significant, represents closing 50 percent of the gap between nonparents and parents before expansion.

Table IV.3. Interpreting main impact results

	Days attended per semester	Credits per year	Semester graduation rate (percentage)
Pre-expansion average among nonparenting females	73.92	5.93	24
Pre-expansion average among parenting females	58.21	4.51	16
Pre-expansion gap	15.71	1.42	8
Impact on New Heights participants	4.4***	1.4***	4*
Percentage of gap closed	28	99	50

Sources: DCPS and DOH administrative data.

Note: The pre-expansion averages are regression adjusted. Regressions include school- and semester-fixed effects, racial and ethnic indicators, and an indicator for being over age when entering 9th grade. *p*-values are based on standard errors made robust to serial correlation within students. Statistical significance is based on a two-tailed t-test.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

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V. PERSPECTIVES ON NEW HEIGHTS PROGRAM IMPLEMENTATION

The New Heights program made a positive impact on academic outcomes for parenting females in DCPS, improving school engagement, credit accumulation, and possibly graduation rates. New Heights also closed the gap between parenting and nonparenting students, and in particular in the number of credits earned per year. In this chapter, we provide insights into how the program might have achieved these outcomes. In particular, we describe the activities of the coordinators in implementing the program model and the nature of the relationships the coordinators built within the schools and with the students.

Data were gathered through interviews with DCPS administrators, New Heights program leadership, and most of the coordinators working in the expansion schools, who were the focus of this report. To verify what we learned, we observed three coordinators in the schools, spoke with 29 New Heights participants, and reviewed the case files of 28 additional participants.¹²

This data collection effort sought to describe the delivery of the New Heights program in spring 2015. This study component was not designed to identify the relative effectiveness of any particular components of the New Heights program or whether the program, as implemented in DCPS, could be similarly replicated and effective elsewhere.¹³ In DCPS, some combination of the program model, its implementation, and a highly dedicated team of program leaders and coordinators came together to improve the academic outcomes of parenting students in the expansion schools.

Highly dedicated coordinators do what it takes

Coordinators were responsible for integrating advocacy, individual case management, and referrals; group workshops; and the use of incentives called Baby Bonus Bucks (BBBs) (Chapter II). Staff received a week-long training in conducting these tasks, which they considered solid preparation for their role, and they received continuous support through school-based supervision and monthly meetings in the central office. As we observed coordinators on the job, spoke to them about their work, and reviewed their case files, we learned that they implemented each of the four aspects of their role in coordination with the other aspects. Tailored and targeted case management involved advocacy, the effective use of incentives, and connecting expectant and parenting students with local resources. The coordinator's selection of workshop topics supported students' needs, which the program simultaneously met through case management.

Coordinators did whatever it took to ensure that students kept pace with their academic work. A typical day for coordinators consisted of juggling a variety of tasks and roles—advocacy and case management came together to support academic progress. Coordinators identified eligible students through word of mouth; outreach and announcements at school events and meetings; and referrals from school nurses, counselors, and other participants. After students enrolled in the program, coordinators conducted a detailed assessment of needs based on which

¹² We selected schools and students for observations, focus groups, and case files to provide representation across all schools, but also based on convenience.

¹³ Given the retrospective nature of the study, it was not possible to assess fidelity to the program model or quality of the program as delivered to the youth in the full sample.

students developed achievable goals, both academic and personal. Coordinators helped each student identify specific steps to achieve her goals, and connected the students with school- or community-based resources as needed. For example, coordinators would help students identify missing assignments and tests, the documentation they might need for credit accumulation, and whether they needed support acquiring housing or child care.

Coordinators worked closely with teachers and students to monitor grades, credit accrual, homework completion, and class attendance. New Heights' school-based offices provided a space where program participants could complete work under supervision and with support. Through daily contact with teachers, school nurses, guidance counselors, security staff, and administrators, coordinators identified key issues as they arose, and supported students in making academic progress. They worked with school social workers and mental health teams to stay informed about the individual education plans for students with special needs. Coordinators also helped students better understand attendance policies and the steps they could take to advocate for themselves, such as making sure students' absences were excused when they were home with a sick child.

In addition to monitoring and promoting academic progress, coordinators worked to identify and help students resolve logistical and personal challenges outside of school. For example, they mediated between students and their family members or other service providers (such as day care staff), attended court appointments, and conducted home visits. They helped find housing for students with limited or no access to housing (because family or friends had evicted them). The coordinators arranged for day care vouchers, child care assistance, and scholarships for attending college or vocational education programs. By targeting and eliminating these sources of stress outside of school, coordinators enabled students to focus on their academic work.



A student's depression and exhaustion influences his or her ability to be in school and learn. There are other barriers as well, but if you are tired and hopeless in the morning and it is hard to get out of bed, it is going to impact the time you get to school, it will impact your attendance.

New Heights coordinator

One of the most time-consuming aspects of a coordinator's role was making sure that students came to school and attended class. As one coordinator emphasized, "You can't teach kids when they're not here." Coordinators did everything they could to ensure that students were in school: texting and calling students daily with reminders and check-ins, conducting home visits to check on absent students, providing mass transit vouchers, and even driving students to and from school if necessary. At the school level, coordinators supported teachers and administrators in understanding the Title IX requirements for equal access to education (Chapter II). When students were late for excusable reasons, such as doctor's appointments, the coordinators made sure students were allowed into class.¹⁴ Coordinators ensured that the school applied its uniform policies fairly to expectant students (Vignette 1). For students on extended leave, such as after having a baby, coordinators helped students enroll and participate in the Home Hospital Instruction Program, an instructional and support program offered by DCPS to

¹⁴ DCPS policy states that students have to be present before 20 percent of the school day was completed to be admitted into class and counted as attending on that day.

all students who expected to be confined to home or hospital for three weeks or more. One of the coordinator's main responsibilities was to make sure students on leave received their homework packets to complete at home, and ensure that they were able to make up any work that they were unable to do from home.

Vignette 1: Advocating for school attendance

Rachel walked slowly up the steps to her high school. Even at 7:45 a.m., the May sun was unbearably hot. She carried a heavy backpack and her feet felt tired and swollen after the 25-minute walk from her apartment to the school. She lived alone with her 19-year-old brother. Her mother had died the previous year due to lung cancer, and she had never met her father. Her brother worked at a convenience store during the day and at gas stations at night to support them. Rachel wore a skirt and a long loose-fitting top to cover her growing belly. She was 16 years old and almost four months pregnant. Her boyfriend (and the father of the baby) was a junior at the same school, and they had been together for about eight months.

Rachel's high school was a newly renovated building. Upon entering the building, everyone went through a metal detector and their belongings were x-rayed.

At the front doors, Rachel joined other students as they passed through the metal detectors and had their bags examined by the security guard. Looking at Rachel, the guard stopped her and indicated that her clothes did not fit the uniform code. Rachel sighed and was about to respond but then spotted Ms. Carter standing behind the school entrance. Julia Carter ran the school's New Heights program for pregnant and parenting students. Ms. Carter walked over and took the guard aside. "Hi Harry, how are you? Rachel here is one of our New Heights students. She just enrolled last week. Her uniform doesn't fit anymore. Can you add her name to your list so this doesn't happen again? I'll make sure she gets a note as well."

The security guard remembered the information session he had attended at the beginning of the school year with Julia Carter and other school administrators. At the session he had learned that federal law required schools to accommodate the needs of pregnant teens and that not allowing them to attend school because their clothes didn't fit anymore was considered discrimination.

The guard made a note and returned Rachel's backpack. Looking relieved, Rachel walked into the school with Ms. Carter. She ignored the stares of other students standing behind her, and tried to pull her shirt down further to hide her belly.

Ms. Carter took the heavy backpack from Rachel and gently guided her past the entrance hallway toward her locker. She could sense Rachel's discomposure and embarrassment. This was the first time Rachel had been stopped but it had been a common occurrence in the past before New Heights began operating in the school. Ms. Carter tried to talk with Rachel to distract her. "I'm usually here every morning, in case you need me. What are you doing for lunch today? Why don't you stop by the office; we'll have food and you can meet some other girls in the program." Rachel nodded silently and left quickly to get to her first class. Ms. Carter made a mental note to find Rachel before lunch and encourage her to attend that day's workshop on healthy relationships. Perhaps some friendly faces would be good for her.

[Note: This vignette does not describe an actual day, but is an illustration based on the experiences of multiple participants and school-based coordinators. Sources for this vignette are program materials, observation notes, participants' case files, focus groups with youth, and staff interviews.]

Coordinators used the BBB program as an incentive to recruit students into the program, promote academic achievement, and participate in group workshops. Coordinators generally had discretion in defining the milestones for earning a specific number of BBBs; some coordinators jointly determined this with program participants to encourage a strong connection to the program. In general, students earned BBBs each time they met a personal goal, such as improving their grades, completing missed work, participating in class consistently, and attending workshops. Students redeemed their BBBs for a variety of baby and maternity products, including clothing, toys, cribs, car seats, high chairs, breast pumps, baby monitors, and educational materials for the student and the baby. New Heights purchased and distributed many of these items, but community partners or other donors donated some. Essentials such as diapers and formula were not part of the incentive program, and coordinators provided these to students on an as-needed basis.

Weekly workshops were a mechanism for providing supplemental education on relevant topics and connecting students with community-based providers. Workshops were organized into five broad categories: Personal Health Education, Parenting Education, Interpersonal Education, Life Skills Education, and Mental Health Education. Within each category, New Heights staff suggested workshop topics that could support academics, parenting, physical and mental health, healthy relationships, and postsecondary education and employment. Ultimately, the coordinators determined workshop content, depending on the needs of their students; some coordinators involved students in selecting the topics and the providers. Coordinators and central office staff used a structured vetting rubric to assess community-based providers on their ability to deliver engaging and instructive workshops. For example, providers were assessed to ensure that content was medically accurate, culturally appropriate, and encouraged participation by students. On average, each study school offered about 53 workshops per year.¹⁵

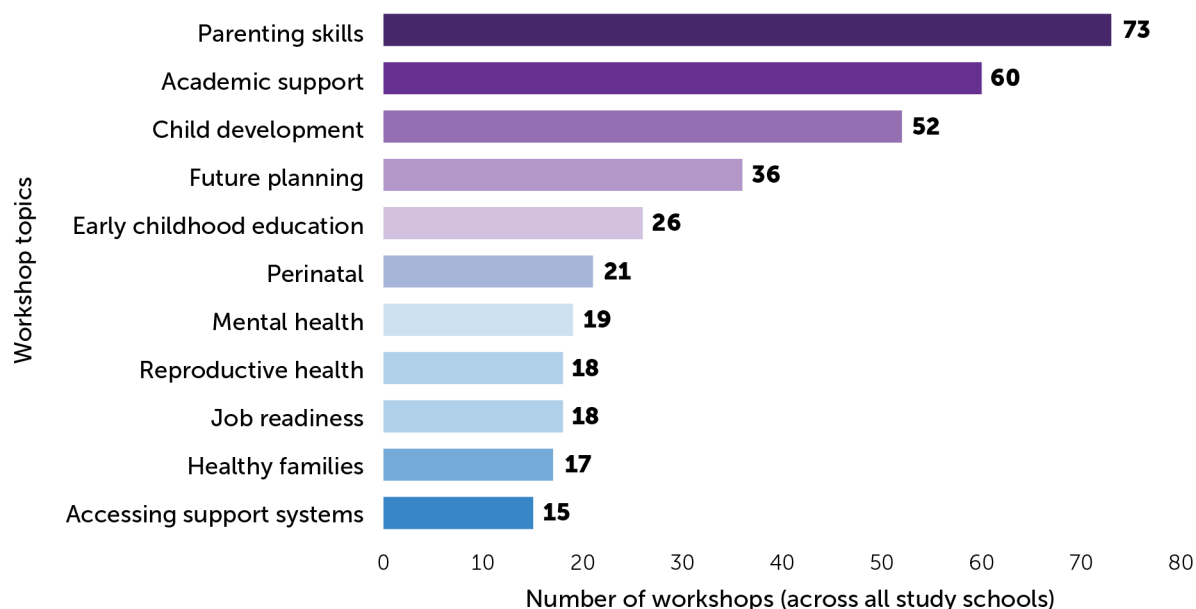
As shown in Figure V.1, workshops on parenting, child development, academic support, and planning for the future were most frequent.¹⁶ Although there was no minimum participation requirement for students, staff actively encouraged all New Heights participants to attend each workshop through word of mouth and by offering BBBs for participation. However, attendance at workshops was lower than coordinators and other New Heights staff would have liked: the average New Heights participant attended about 20 percent of the workshops offered.¹⁷

¹⁵ Workshop data were available for eight of the nine study schools.

¹⁶ Schools also offered workshops on Time Management (2), Friends (2), Empowerment Group (3), Program Introduction (6), Community Resources (7), Financial Literacy (8), Romantic Relationships (8), Sexual Exploitation (9), News & Updates (9), and Nutrition and Physical Activity (11). Parenthesis indicate the number of workshops offered.

¹⁷ Eight of the nine study schools reported students' workshop attendance in 2014–2015. Workshop attendance ranged from 12 to 56 percent of all offered workshops.

Figure V.1. Educational workshops in 2014–2015



Note: Reports of workshops conducted in 2014–2015 in eight of the nine study schools, recorded in the New Heights participation database maintained by the DC DHS.

The coordinators’ caseloads and frequency of interaction with students varied by school. Coordinators reached out to students regularly but ultimately students decided the extent to which they interacted with the program. Caseloads fluctuated but, for most coordinators, averaged 10 to 20 students who actively engaged with the program every month. Coordinators reported that they saw active participants either daily or multiple times per day.¹⁸ Depending on students’ needs, coordinators saw some students on a weekly basis or less frequently. The variability in the frequency with which they saw students reflects the flexible nature of the program.

“ We don’t provide a service to students—they don’t just come to get the voucher. They come and we teach them how to get a child care voucher. We will step in if there is a problem, but we really want them to learn to advocate for themselves.

New Heights coordinator

Through all aspects of their work, coordinators continuously emphasized the need for students to learn how to advocate for themselves. Coordinators worked with students to set achievable targets and define concrete pathways to overcoming challenges. The weekly workshops offered additional education, specific linkages, and resources for students to use in becoming self-sufficient. Coordinators reported that through advocacy, case management and referrals, group workshops, and the appropriate use of incentives they helped often overwhelmed expectant and parenting students effectively navigate a large school system

¹⁸ Based on staff interviews and a staff survey administered to 11 coordinators.

bureaucracy and access community-based resources so that they could stay engaged in school and make progress toward completion.

Coordinators fostered collaboration within schools

Given the program’s emphasis on collaboration between school staff and the coordinators, developing visibility in the school and building credibility with the staff was critical to its success. Coordinators were central office staff, placed within a school. Recognizing this dynamic, New Heights’ coordinators worked hard to develop relationships with and access to teachers, administrators, support staff, and students, which were important for getting buy-in for the program.

To integrate into the school team and secure program support, coordinators reported that they highlighted program benefits and the ways in which the program could relieve teachers’ and administrators’ burdens. When the relationships developed, teachers and coordinators often worked together to connect with and engage hard-to-reach students. For example, one coordinator said she often sat with students who exhibited disruptive behaviors in class to let the teacher and the student know she was there as a resource. For students on leave, coordinators worked closely with teachers to offer assistance (such as making copies) in preparing homework packets, and ensuring those packets got to students and that the assignments made it back to the teacher. Coordinators also volunteered their time for school events, committees, and meetings. One coordinator indicated that she was on the attendance committee and could provide input on policies that supported New Heights’ goals, such as excused absences. Another attended the Academic Leadership Team meetings, at which the progress of individual students was discussed. As Vignette 2 demonstrates, integrating the coordinator within the school aided successful collaboration with teachers and showed students that their challenges were recognized and supported.

“ For the most part we have had overwhelming support. In fact, when the grant was ending the principals started weighing in here saying ‘You have to keep this program. You can’t make me run it.’ These people do such a good job. Central office got this one right.

New Heights staff

By and large, New Heights coordinators and program leadership reported that school administrators and teachers had been supportive of New Heights; they perceived the program as a valuable and free resource that required limited involvement of school staff. They welcomed the chance to improve students’ outcomes and reduce the stigma associated with teen pregnancy in schools. However, in a small number of schools, coordinators reported that teachers perceived New Heights as encouraging or coddling uncooperative or troublesome

students, and school administrators felt threatened by a central office program. Although this situation was an exception and not the norm, coordinators in these schools felt that the attitudes of the school staff made it much more difficult to advocate for their students: “There is a problem in DCPS around some schools that don’t want certain students in the building [and] they will find a way to get them out.”

Vignette 2: Collaborating with school staff

Brenna couldn't concentrate. She was sleepy, her palms felt sweaty, and she needed water. It was after lunch and the history class was only half-way through. Brenna was trying to review for her history quizzes but all she could think about was Lukas, her six-month-old son.

Lukas went to day care in the school building, but the last time she saw him was at drop-off, and he seemed crankier than usual. He hadn't slept much last night. The room she shared with her aunt was cold and he woke up every two hours crying. Maybe he was sick.

"Are you okay, Brenna?" Ms. Smith was her history teacher. She noticed Brenna starting to doze off. This had been happening a lot recently. Which was why Ms. Smith went to see Julia Carter at the New Heights office.

The New Heights classroom was located a floor below the main lobby. The classroom was large, clean, and brightly lit with sun streaming in through the windows. On one side of the room there was a kitchen area, with a stove and other appliances that were used for nutrition and cooking workshops. The walls were covered in information, ranging from the rules of the classroom and resources for the students to pictures from recent workshops and baby announcements.

"Hey Carla! How's Brenna doing this week?" Ms. Carter asked, inviting the teacher to sit down. Brenna had been in the program for about 11 months. Ms. Smith sat down with a sigh. "The girl is exhausted. She's missed two quizzes already. Grades are almost due. Do you know what's going on with her?"

"I know. I reminded her last week. But she had to move out," said Ms. Carter. Brenna used to live with her boyfriend Kevin who was the 18-year-old father of the baby. Ms. Carter had just finished helping Brenna file the child support paperwork. "She's at her aunt's now but it's not great. It's just a studio and it takes her an hour to get to school with the baby. I got her an appointment with Dani tomorrow." Dani Walsh wore two hats: school psychologist and housing specialist. "Are you able to give her some time to figure things out?" Ms. Carter cajoled the teacher not to give up on Brenna. "Just this week please? I'm meeting with her aunt too. And I'll talk to her again about the quizzes." Ms. Smith nodded. "Keep me posted."

Brenna decided to go by the New Heights office later that afternoon after picking Lukas up from day care. She always felt better when she talked to Ms. Carter. "Ms. Carter, can I have more diapers. I'm out now." Ms. Carter pulled down a pack of diapers from the closet. She noticed the bruises were almost gone but still visible under Brenna's sleeve. "You need anything else? Are you hungry? Tired?" Brenna shook her head.

Ms. Carter gave her a reassuring smile and handed Lukas a rattle. "Y'know, Ms. Smith stopped by today. I know it's hard but those history quizzes are important. If you pass history and gym, you can graduate in June. Wouldn't that be great for you and Lukas? You can finally go for that cosmetology certificate you wanted."

[Note: This vignette does not describe an actual day, but is an illustration based on the experiences of multiple participants and school-based coordinators. Sources for this vignette are program materials, observation notes, participants' case files, focus groups with youth, and staff interviews.]

Coordinators fostered motivation by offering safety and support

Coordinators reported that removing stigma and offering a safe space was key to building trust and strong relationships with students. Expectant and parenting students often faced constant judgment in their communities, in class, with their peers, or on their way to and from school. They were embarrassed, stressed, and overwhelmed. All coordinators emphasized that “Just letting the teens know that you understand what they are going through even without them having to verbalize it is a great relief to them.”

“ Our adolescents, especially those in crisis, need someone [a physical presence] when they need it. Adolescents do not plan out their emergencies and it is important to be here and to be responsive to them.

New Heights coordinator

Youth focus group participants uniformly experienced a safe and supportive program through their coordinators, who embodied the New Heights program. These students said they could go to their coordinators with any problem and the coordinators would help them. Several students shared the many times their coordinators had driven them home or to school, brought them food and other necessities, or took them to appointments. When one participant felt too nauseous to go to school, her coordinator came to her home with crackers and ginger ale. Without their New Heights coordinators to serve as their champions, participants felt it would be difficult to overcome the many challenges they faced, be they bureaucratic, academic, or personal. Students emphasized the closeness they felt to their coordinators, and said they often trusted them more than other adults in their lives. The students said the program felt like “home.” In rating the program on a scale of 1 to 5, focus group participants unanimously gave the program a 5, and many indicated that they would have rated it higher.

“ It is really difficult to try and parent and also do all your school work. There are times when I wanted to give up. You have to care for yourself, and it makes a big difference to know that there are people who care about you.

New Heights participant

Students discussed their reasons for participating in the program in focus group discussions. Many students said they were motivated to enroll in New Heights because they had heard it offered support to help them pursue goals they had previously not thought possible, such as becoming better parents, graduating from high school, and going to college. The program appeared very visible to students in the schools, so much so that in some cases even nonparenting students would attend

workshops and spend time in the coordinators’ offices. As discussed in Chapter IV, about 75 percent of the parenting students we identified in the study schools participated in the New Heights program, suggesting that New Heights reached a large majority of the eligible population.

Focus group participants discussed the ways in which New Heights motivated them to define their goals and make better decisions. For some, the program helped them understand the importance of having no more children while they were still in high school so that they could focus on completing school. Several former New Heights students said they probably would not

have graduated from high school without the help of the program, and most students who were graduating indicated that the program had helped them prepare to go to college. Participants credited the program with motivating them to overcome the challenges of a difficult, uncaring school environment and the challenges of being a parent while attending school. One important lesson that stuck with students was, “You can’t say you can’t do something unless you try.”

All focus group participants talked about specific ways the program had helped eliminate barriers to attending and participating in school, and how it had supported their academic progress. For example, most focus group participants said they had received some form of transportation assistance, whether it was through mass transit tokens provided by the program or, in a few cases, occasional rides to and from school provided by their coordinators. One participant had a scheduling conflict between her classes and her job, and her coordinator helped her to reschedule her classes in a way that enabled her to work and obtain the necessary credits. Many participants explained that their coordinators went to their classes when the students were failing or had bad grades; the coordinators helped them to speak with teachers to work out a plan for taking missed tests or completing assignments. One coordinator even went so far as to advocate, with the courts, for a sentence that would allow the student to remain in school (instead of going to jail).

Participants also felt that the information and skills provided through the workshops positively affected their lives. Workshops that helped them build parenting skills seemed to resonate most with youth. Students appreciated learning how to respond or react to their children when the children were upset, including learning strategies for managing their own stress and anger. Workshops on topics such as financial literacy, planning for the future, conflict resolution, and child support helped participants connect to important resources that reduced their anxiety and stress about managing schoolwork and parenting at the same time.

Considerations for further improvement

The program leaders, coordinators, and students we spoke to for this study uniformly remarked on the success of New Heights in delivering a high quality program that achieved its objectives. Still, many offered suggestions for how to improve the program to continue meeting its goals.

The content of the program could be expanded and improved upon in a number of ways. The program primarily served females. Staff suggested differentiating the program content and outreach efforts to better serve and retain fathers. The workshop content did not include some of the most sensitive topics that these young parents deal with, such as racial discord and discrimination, intimate partner and community violence, physical and mental abuse, trauma, and other mental health issues. Coordinators asserted that these issues interfere with students’ ability to achieve their academic and personal goals.

Coordinators indicated that they could be more effective in their roles if they had an improved electronic system for monitoring students’ participation in the New Heights offerings, and for overseeing students’ academic progress. They also suggested that a caseload-driven staffing formula might be useful to determine the number of staff needed in each school, in particular given the variance in school size.

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VI. CONCLUSION

This study closely examined New Heights, a DCPS PAF-funded program designed to help expectant and parenting students complete high school and improve self-sufficiency. Youth who attend DCPS are mostly African American and Hispanic, with teen birth rates 25 times that of their non-Hispanic white counterparts. The traditional public high schools are located in the city's highest poverty neighborhoods, where nearly 10 percent of the females in these schools are parenting. Research suggests that half of parenting females will drop out and not complete high school (Perper et al. 2010). This study was designed to assess whether New Heights was effective at improving school engagement, credit accumulation, and graduation rates.

Using the most rigorous design feasible, the study found the program is effective at improving academic outcomes. The expansion of New Heights in 2011 created a natural experiment. Just like in an experiment designed by researchers (which was not feasible for the study of this program after the 2011 expansion), we calculate the impacts of New Heights as the difference in outcomes between a treatment group and a comparison group. The treatment group in this experiment comprised parenting females in the study schools after New Heights expansion; parenting females attending the same schools before New Heights was available to them made up the primary comparison group. The group of nonparenting females in the same schools as the parenting females comprised a second comparison group. We subtracted any improvement in outcomes that we observed among nonparenting females over the same time period from the improvement that we observed among parenting females, resulting in our estimate of New Height's impact on parenting females.¹⁹

The expansion of New Heights led to significantly better outcomes among parenting females on measures of school engagement and credit accumulation. We also saw a marginally significant impact on graduation rates. Nearly three-quarters of the parenting females in the study schools attended New Heights, meaning the program succeeded in recruiting most of the parenting females in the schools. After adjusting the impacts for the proportion of the sample who attended the program (75 percent), the magnitude of the impacts increases by about 1.33. The New Heights program also produced substantively important impacts by nearly eliminating the gap in credits earned between parenting and nonparenting females, and cutting the gap in the semester graduation rate in half.

The program coordinators and program leaders do what it takes to create a supportive and secure experience for students. The study also closely examined program implementation. We learned that the coordinators *are* the program and they have the autonomy to implement and integrate the core components as necessary. In other words, the coordinators are expected to do what it takes to support each student in making progress and graduating. Often this involves dealing with significant personal issues for the students, such as housing insecurity, transportation, child care, and the courts. Becoming so intricately involved in their students' lives can bring an overwhelming amount of work and stress, and the coordinators receive a great deal of support and guidance from one another and their managers. They also collaborate within their

¹⁹ This approach can account for the effects of other policy changes, assuming that (1) those improvements are due to other policy changes and (2) the impact of those other policy changes on parenting females is the same as on nonparenting females.

schools, offering teachers and administrators a free and valuable resource while in turn often receiving support and cooperation from teachers and administrators. Coordinators also draw upon the numerous community-based resources that are prevalent in Washington, D.C.

The current and past participants of New Heights we spoke with perceive their coordinator as providing a “home”, bringing security and support while helping them to imagine improved outcomes and fostering their own motivation to achieve those outcomes. Participants spoke about how the program has benefitted all aspects of their lives, including their academic progress and achievement. And with the support of their coordinators, they improved significantly academically, as demonstrated by this study.

Considerations for expansion and replication

In 2013, OAH awarded funds to a second cohort of PAF grantees to support expectant and parenting teens, and most of the grantees are engaging youth in high schools and implementing components of the New Heights model (Person et al. 2016). Among the 24 programs run by the 17 grantees, nearly all (20 programs) operate at least some components in high schools.²⁰ The most frequently implemented PAF program components are similar to New Heights: case management, referrals, group workshops, material resources, transportation, counseling, and flexible scheduling.

The prevalence of New Heights-like approaches across other programs around the country raises questions about the feasibility of expanding or replicating New Heights and achieving similar impacts. As we discovered, New Heights is a multifaceted *approach* comprising a small number of *core components* to be implemented by experienced, professional, dedicated *individuals* identified through a comprehensive hiring process and given a strong system of *support*. New Heights has outlined what the program looks for in a coordinator and how to ensure a good fit for each school, what coordinators do, and how to support them. New Heights has not scripted how coordinators should conduct their role on a daily basis. Successful expansion or replication might hinge on great hires—identifying the best coordinators for each particular school and then providing them with the support and resources that enabled the New Heights coordinators to do what it takes.

Ultimately, this study cannot fully address questions of replicability, just as it cannot identify whether New Heights was effective because of its approach, its staff, the schools, community resources, or an intricate interaction among all variables. Yet, this study does add the first piece of evidence from the PAF program on how comprehensive, multifaceted programs can improve academic outcomes for teen parents. Recent findings from other programs for parenting teens complement these results, showing that targeted interventions can reduce sexual risk behaviors and delay subsequent pregnancies. (Rotz et al. 2016; Covington et al. 2017, 2016). The knowledge gap on how to improve an array of outcomes for the highly vulnerable population of parenting teens is slowly being filled.

²⁰ Programs can operate in more than one setting.

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APPENDIX A

IMPLEMENTATION STUDY DATA SOURCES AND METHODS

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The study of New Heights implementation examined program delivery in the nine study schools in spring 2015, and included input from New Heights staff based at two original New Heights schools: Cardozo High School and Anacostia High School. The implementation study relied on the following data sources: (1) site visits, which consisted of key informant interviews, focus groups with youth, observations of program delivery, and review of select participant case files; (2) the New Heights program database; (3) a survey of New Heights school-based coordinators; and (4) New Heights program materials.

Site visits

A team of five site visitors conducted three site visits to Washington, D.C., to collect in-depth data on (1) the intended program design for New Heights, (2) the New Heights program as implemented in spring 2015, (3) staff and youth experience and perceptions of New Heights, and (4) lessons learned from program implementation. All site visits took place in spring and summer 2015, after the expansion of the New Heights program in 2011. During the site visits, Mathematica staff conducted several types of data collection:

Key informant interviews: Site visitors conducted in-person discussions with district leaders (n = 2), New Heights program staff (n = 3), school-based coordinators (n = 11), and representatives of several associated community-based providers (n = 12). Interviews focused on staff roles and backgrounds, the development and refinement of the New Heights model, staff training and support, youth needs and motivations, program implementation, and lessons learned.

Focus groups: To learn about youth's experience with New Heights and their perceptions of the program, Mathematica staff conducted four focus groups with a total of 29 current participants in three study schools, as well as program alumnae. Our selection of schools ensured variation across respondents but was also based on convenience to accommodate schedules of staff and youth. Of the three schools, one was an alternative high school and two were traditional high schools. Discussions with youth focused on (1) their decisions to participate in specific program activities, (2) their opinions about the activities in which they participated, (3) the aspects of the program they liked or would change, and (4) their participation in other similar programs.

Observations: Site visitors observed program delivery in three study schools and at the annual summer New Heights summit to deepen the site visitors' understanding of the program and delivery. We selected schools purposefully to reflect a mix of school cultures, experience with program delivery, and population needs; we also based our selections on the schedules of staff and site visitors. Two of the three schools were different from those selected for the focus groups, including one traditional high school where the program had been operating since its inception. Staff shadowed the school-based coordinator during a typical school day, which included observing educational workshops, individual interactions between youth and the New Heights coordinator, and meetings with school staff such as guidance counselors, registrars, and teachers. At the annual summit, staff observed educational workshops on relevant topics, student speakers, and discussions with community-based providers. Staff documented content and quality of interactions using a structured observation protocol.

Case file reviews: To provide the study team with deeper insights into participant and staff experiences with the program, site visitors requested and reviewed a small number (28) of case

files for typical program participants, reflecting on the specific needs and challenges reflected in the notes. For each study school, site visitors randomly selected two to three New Heights participants who had been “active” for at least 30 days from September 2011 to June 2015. These reviews offered site visitors a better understanding of the population being served, their backgrounds and experiences, types of assistance they required, and ways the program is aiming to address their needs. These reviews, along with the semi-structured interviews, focus groups, observations, and site visits, formed the basis for the vignettes in the implementation reports.

Analysis approach. Qualitative analysis of the interviews, focus groups with youth, and observation data involved an iterative process using thematic analysis and triangulation of data sources (Patton 2002²¹; Ritchie and Spencer 1994²²). Trained staff used a qualitative analysis software package, Atlas.ti, to facilitate organizing and synthesizing the qualitative data. First, we developed a coding scheme for the study, organized according to key research questions. Within each question, we defined codes for key themes and subtopics. Then, we applied the codes to passages in the interview, observation, and focus group notes. To ensure accurate and consistent coding, two research assistants first independently coded site visit data. Then two members of the site visit team reviewed the coded documents and reconciled any differences in coding. To address the research questions, we used the software to retrieve relevant passages and then examined the patterns of responses across respondents and identified emergent themes.

New Heights program database

We used administrative data from the DC Department of Human Services’ (DC DHS) New Heights database to analyze (1) the number of workshops offered by New Heights, by topic, in school year 2014–2015 and (2) the average workshop attendance rate for New Heights participants in school year 2014–2015. We limited both analyses to female New Heights participants in 9 of the 11 study schools. Two schools (Roosevelt STAY and Ballou STAY) were excluded from both workshop analyses because they were also excluded from the impact analyses.

Workshops offered: To calculate the number of workshops offered by topic, we used data from the DHS workshops table, which reports each workshop a school offers, including its topic, subtopic, date offered, and number of attendees. Workshops were tallied by topic and subtopic, and those with zero attendees were excluded from the analysis.

Workshop attendance: To calculate the average workshop attendance rate for New Heights participants, we used data from the DHS workshop attendance table, which reports each participant who attended a workshop, the school in which the workshop was offered, and the date of the workshop. We linked the workshop attendance table to the full New Heights participant list in order to incorporate youth who did not attend any workshops into the analysis. To calculate the attendance rate for each school, we divided the number of workshops each youth attended by the number of workshops offered at their school during the school year. We then

²¹ Patton, M. Q., & M. Q. Patton. *Qualitative research and evaluation methods*. Thousand Oaks, Calif: Sage Publications, 2002.

²² Ritchie, J. & L. Spencer. “Qualitative Data Analysis for Applied Policy Research.” In *Analyzing Qualitative Data*, edited by A. Bryman and R.G. Burgess (pp.173-194). London: Routledge, 1994.

averaged this attendance rate across all participants at the school. To calculate the attendance rate across all nine schools, we averaged the attendance rate across all participants at any school.

Survey of New Heights coordinators

Mathematica staff also administered a 30-minute survey in pencil-and-paper format to 11 New Heights school-based coordinators in June 2015. The survey was designed to capture targeted input on staff background, training, and program perceptions. We tabulated descriptive frequencies in Excel for reporting.

New Heights program materials

To describe the program model and its delivery in schools, Mathematica staff reviewed numerous documents and materials that New Heights provided. Examples of these include:

- New Heights manual for program managers (updated January 2015)
- Criteria for vetting and approving community-based providers for educational workshops
- Video of five-day preservice training of New Heights coordinators
- Brochures and descriptions of the New Heights program components
- Evaluation reports
- Meeting agendas and notes
- New Heights summit brochures and plans

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APPENDIX B

ADMINISTRATIVE DATA PREPARATION

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In this appendix, we provide an overview of the administrative data sources used to estimate the impacts of New Heights expansion, including a description of each data source, details on how we linked the data, and information on how we accounted for changes over time in administrative record keeping that affected some outcome variables. In addition, we describe how we formed our primary analytic sample and provide descriptive statistics for that sample.

Data sources

As described in Chapter III, the estimation of New Heights impacts relied on data from three administrative sources: (1) DC Public Schools (DCPS), (2) DC Department of Health (DC DOH), and (3) DC Department of Human Services (DC DHS). This section describes these data sources, our method of linking them, and changes to the way DC measured outcome variables over time.

Description of data sources

DCPS provided two data files containing student records. One file contained student demographic and outcome information; we used this to identify teens attending any DCPS high school from the fall semester of the 2007–2008 school year through the spring semester of the 2014–2015 school year. The second file from DCPS contained school admission and withdrawal records. We used this file to identify teens who were enrolled in a study school.

We used DC DOH vital statistics records to identify teens who gave birth in the District of Columbia. These data include birth date, mother’s name, and mother’s address as reported on the birth certificate. For the purpose of our analysis, DC DOH limited the data file to the 12,539 children born to mothers ages 14–19 in a D.C. hospital from January 1, 2003, through December 31, 2014. We included DC DOH data from four and a half years before the earliest observed DCPS record so that parenting females who gave birth before the earliest observed records in the DCPS data can be correctly identified as parents. Although it is possible for parenting females in DCPS to have given birth outside of a D.C. hospital—and for the birth to therefore be missing from DC DOH data—New Heights coordinators report that this would be a rare circumstance, as most parenting females received D.C. Medicaid and attended prenatal providers with admitting permission for D.C. hospitals only.

The DC DHS maintains the New Heights participation database on behalf of the program. These data include all of the 1,371 New Heights participants from the fall semester of the 2011–2012 school year through the spring semester of the 2014–2015 school year. We used these data to identify New Heights participants to estimate the impact of New Heights on participants. These data also include information used in the implementation analysis (see Appendix A).

The combined administrative data set enabled us to (1) identify parenting teens from DOH birth records, (2) identify which of those parenting teens were enrolled in a DCPS study school using DCPS records, (3) measure outcomes expected to be affected by New Heights, and (4) determine whether parenting teens in study schools participated in the New Heights program. The next section describes our method of constructing the combined administrative data set from the DCPS, DC DOH, and DC DHS data.

Linking data sources

Before we linked the DCPS student records with the DC DOH vital statistics records, we dropped from the sample students in the DCPS data whose birth dates fell outside of the observed range of birth dates in the DC DOH data. Additionally, before linking the DCPS records with the DC DOH vital records, we standardized key data elements for linkage across files. For example, date of birth was stored as a numeric variable and first and last name were stored as character variables with matching case and leading and trailing blanks and punctuation removed. Common abbreviations were standardized in home addresses, and zip codes were restricted to five digits. The DC DOH vital records data contained multiple records (rows in the data file) for the same person to indicate teens who gave birth multiple times. Before linking the records, we created an ID within the vital records data to identify all of an individual's records.

We used exact and approximate matching to link DC DOH data to student records. We conducted multiple rounds of matching, starting with strict matching criteria, performing the match, removing linked records for review, and then repeating the process with a less strict matching criteria. We manually reviewed a random sample of 25 percent of matched records from each round of matching to determine the quality of the match. We deemed the following three rounds of matching criteria to have high quality matches (93 percent or more of randomly sampled matches were correct):

1. Exact first name, exact last name or maiden name, and exact date of birth
2. Combination of approximate first name, approximate last or maiden name, exact date of birth, and exact address
3. Approximate first name, approximate last name, and exact date of birth

However, we rejected the following criteria due to low quality matches (34 percent or fewer of randomly sampled matches were incorrect):

1. Approximate last name and exact date of birth
2. Approximate maiden name and exact date of birth

We merged DCPS and DC DOH data into DC DHS data using the unique DCPS student identifier. Table B.1 summarizes the data elements in each data file used for linkage and analysis.

Table B.1. Data sources and key data elements for file linkage and analysis

Data source	Purpose	Data elements for file linkage	Data elements for analysis
DCPS			
Student records	Identify sample; obtain demographic records; obtain outcome information	DCPS student identifier Name Birth date Sex Home address	Covariates <ul style="list-style-type: none"> • Age • Race/ethnicity Outcomes <ul style="list-style-type: none"> • High school days attended • High school excused absences • High school unexcused absences • High school credits earned • High school graduation
School admissions and withdrawal records	Identify enrollment in a study school	DCPS student identifier	Enrollment in a study school
DC DOH			
Vital records	Identify teens who gave birth in D.C.	Name Maiden name Mother's birthdate Home address	Covariates <ul style="list-style-type: none"> • Measure of having given birth • Child's age
DC DHS			
New Heights participation records	Identify treatment group of New Heights participants	DCPS student identifier	Participation in New Heights program

Accounting for changes in record keeping and measurement

This evaluation examines the impact of New Heights on attendance, credits earned, and high school graduation of parenting females. Each of these outcome variables was created from DCPS data (Table B.1). Through examining the data and discussing them with DCPS staff, we identified some changes in the ways DCPS recorded and measured these outcomes over the eight years the records span.

DCPS changed the cutoff used in defining whether a student attended a day of school in the 2013–2014 school year. Previously, students who attended at least 60 percent of the day were counted as attending a full day. The new cutoff states that students must attend 80 percent of the day to be counted as attending a full day.

If this change affects parenting and nonparenting youth similarly, then our analysis will help adjust for the changes. However, this definitional change does have the potential to affect parenting youth differently from nonparenting youth, for example, if parenting youth were more likely to attend school for 60 to 80 percent of a day. Such a circumstance could lead to a negative bias in the estimate of New Heights' impact on attendance. However, we have concluded that this change does not significantly affect the credibility of our main findings because (1) it is a relatively nuanced definitional change, (2) our difference-in-difference estimation approach partially adjusts for this, and (3) a negative bias enhances the credibility of our positive impact finding.

Another change included the number of credits students could earn in a semester, which increased after the expansion of New Heights. DCPS staff speculate that reasons for this include better scheduling and higher graduation requirements. If the definition change affects parenting youth differently from nonparenting youth, then it could bias the estimate of New Heights' impact on number of credits earned. It is less clear whether this would be a positive or negative bias. However, our difference-in-difference estimation approach does partially adjust for this.

Analytic sample

We created our main analytic sample by imposing sample restrictions on the merged DCPS, DC DOH, and DC DHS data. In this section, we describe that process and provide descriptive statistics for our main analytic sample.

Creating the analytic sample

Drawing on the merged data, we created our analytic sample in six steps:

1. Excluding observations before fall semester 2007 and after spring semester 2015
2. Excluding male students
3. Excluding students not in a study school for at least one day between October 1 and May 1 of any year
4. Excluding students in semesters when they are on a special education certificate track or who are exchange students
5. Excluding students who are missing any outcomes data (this drops approximately 10 percent of the sample).
6. Including only the semesters in which a student is at least 17 years old (when calculating impacts on high school graduation)

Descriptive statistics for the analytic sample

Table B.2 shows the descriptive statistics for the main analytic sample used to estimate impacts on attendance outcomes. Students' age at the start of 9th grade declined more for parenting females than for nonparenting females after the expansion of New Heights, whereas the change in other demographic variables was similar between parenting and nonparenting females.

Table B.2. Demographics of study sample, pre-intervention

	Parent pre-intervention	Parent post-intervention	Nonparent pre-intervention	Nonparent post-intervention	Difference in differences
Age at start of 9th grade	14.94	14.81	14.53	14.50	-0.10***
White (percentage)	0.00	0.01	0.05	0.07	0.00
Black (percentage)	0.81	0.84	0.77	0.71	0.08
Hispanic (percentage)	0.18	0.15	0.15	0.18	-0.06
Asian (percentage)	0.01	0.00	0.02	0.03	-0.01
Multirace, American Indian (percentage)	0.00	0.00	0.01	0.01	-0.01
Number of students ^a	524	452	6,741	5,595	10,760

Source: DC DOH birth records, DCPS administrative data, and DC DHS New Heights participation database.

Note: Sample includes all students in a study school for at least one day before the 2011–2012 school year and at least one day in the 2011–2012 school year or later. The number of observations per outcome varies across outcomes due to missing data. For all outcomes for which more than 5 percent of observations are missing, we included an indicator for its missing status as a separate outcome. *p*-values are based on standard errors made robust to serial correlation within students. Statistical significance is based on a two-tailed t-test.

^a Refers to the number of *unique* students in the given period. Because students might be included in multiple periods, the total number of unique students, 10,760, is not the sum of unique students from each of the other columns.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

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APPENDIX C

**ANALYTIC METHODS OF IMPACT ANALYSIS AND RESULTS FROM
ALTERNATIVE MODELS**

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In this appendix, we describe the analytic methods used to estimate the impact of New Heights expansion on academic outcomes of parenting females. We also describe and present results from the sensitivity analyses we conducted to understand whether the main findings are dependent on sample construction, outcome specification, and analytic approaches.

Primary impact analysis method

To estimate the impact of New Heights on student outcomes, we used a regression model that compares parenting females before and after the expansion of New Heights. Because the difference in outcomes between these two groups captures the effect of New Heights as well as the effect of other changes in the school and district, we compared this difference to the difference between nonparenting females before and after the expansion of New Heights. This section discusses the regression model used to estimate the New Heights impact, the choice of covariates for which to control in that model, and our method of calculating standard errors for the impact estimate.

Regression model

To calculate the impact of New Heights, we first estimated a regression model that calculates the average outcome for parents and nonparents in each semester, adjusting for fixed school effects, age indicators,²³ race and ethnicity indicators, and an indicator for being over-age at the start of 9th grade. Second, we calculated the impact of New Heights as a difference-in-difference using the regression-adjusted average outcomes for parents and nonparents by semester. The regression model is

$$(1) \quad y_{ist} = \sum_z \alpha_z NP_{isz} + \sum_z \delta_z P_{isz} + \sum_{j=2}^{10} \gamma_j S_{ij} + X_{ist} \beta + \epsilon_{ist}$$

where i indexes student, s indexes school, and t index time, which is semester for the attendance and the semester graduation rate outcomes and year for credits earned. P_{isz} is an indicator equal to one when $t = z$ and student i in school s is observed as having given birth prior to time t , and NP_{isz} is an indicator equal to one for student i in school s when $t = z$ and student i is not observed as having given birth prior to time t . For example, if a student were observed in all semesters and became a parent in the fourth semester of the study period, Equation 1 in the second semester would be $y_{is2} = \alpha_2 + S_{ij} + X_{is2} \beta + \epsilon_{is2}$, whereas in the fourth semester it would be $y_{is4} = \delta_4 + S_{ij} + X_{is4} \beta + \epsilon_{is4}$. For any given student and semester, across terms in the summations over z , only one term will not equal zero. The summations over z include all semesters in the case of the attendance and the semester graduation rate outcomes, and all years in the case of credits earned. The variables S_{ij} are school indicators equal to one for student i if school s is equal to j , where we omit the indicator for $j = 1$, and X_{ist} is a set of

²³ As discussed below, age indicators include an indicator for being younger than 13, indicators for each year from 13 to 20, an indicator for being 21 or 22, and an indicator for being 23 or older. DC DOH data include only females ages 14 to 19 at the time they give birth, though these students might be observed in DCPS records at older or younger ages. Across all years, less than 2 percent of students are older than 19, and less than 1 percent of students are younger than 14.

constant and time-varying student-level covariates that does not include a constant. The variables α_z and δ_z are coefficients representing the regression-adjusted average outcome for nonparents and parents conditional on $X_{its} = 0$, respectively.

For our difference-in-difference estimator, we estimated the average outcome before the expansion for nonparenting females as the weighted average of α_z for z preceding the semester of New Heights expansion, and the average outcome after the expansion for nonparenting females as the weighted average of α_z for z following the semester of New Heights expansion. We estimated the average outcome among parenting females before and after the expansion in a similar manner, using δ_z in place of α_z . We used as weights the number of parenting females in each semester for both the parenting and nonparenting averages, and in a sensitivity analyses we weighted each semester equally. Our difference-in-difference estimator is equal to

$$(2) \quad \hat{d} = \left(\sum_{z \geq t^*} w_z \hat{\delta}_z - \sum_{z < t^*} w_z \hat{\delta}_z \right) - \left(\sum_{z \geq t^*} w_z \hat{\alpha}_z - \sum_{z < t^*} w_z \hat{\alpha}_z \right)$$

where w_z is the semester-specific weight for attendance and the semester graduation rate outcomes and a year-specific weight for credits outcomes, and w_z has been normalized to sum to one in both the pre-expansion and post-expansion periods.

Equation 1 is a general model, allowing the average outcome to vary in any way for parents and nonparents in each period. The difference-in-difference estimator in Equation 2 imposes the restriction that the difference between eligible and ineligible students is constant both before the expansion and (although potentially different) after the expansion.

The standard error of the impact estimate, \hat{d} , reflects the covariance among the α and δ coefficients. The unit of analysis in this study is at the student-semester level (that is, there are multiple observations for each student across semesters). The covariance matrix of the regression coefficients accounts for the clustering of multiple observations across time within each student using the Huber-White sandwich estimator.

Choice of covariates to include in the model

Changes in student demographics that occur at the same time as the New Heights expansion could lead to a biased estimate of the effect of New Heights expansion if (1) we do not control for the covariates, (2) that change differentially affects eligible parents, and (3) the affected student demographics are correlated with student outcomes (see Appendix B for a description of demographic changes occurring after the expansion of New Heights). For example, if there is a trend toward students becoming parents at a later age, and if older students tend to have worse attendance rates, then this change in the age of parents could bias our estimate if we do not control for it. Additionally, if student-level covariates explain variation in the outcome, we can make our estimates more precise by controlling for these covariates.

To control for possible changes in demographics and to improve the precision of our estimates, we included in the regression model several covariates that could be correlated with

outcomes. These include age indicators (younger than 13, ages 13 through 20, age 21 or 22, and 23 or older);²⁴ race and ethnicity indicators; and an indicator for being over-age at 9th grade.

To create the indicator for being over-age at 9th grade, we used a student's age in her first observed semester in a DCPS school, regardless of whether it was a study school, and inferred the student's age in the fall semester of 9th grade assuming a normal age progression. For example, if a student is first observed in a DCPS school in the fall semester of her junior year, we calculated the student's age in the fall semester of 9th grade as her first observed age, minus two years. The indicator is 1 if the inferred age in the fall semester of 9th grade is greater than 15. The indicator for being over-age in 9th grade was missing for some students in our analysis. Individuals were not excluded from the analysis if they were missing these data. Instead, we accounted for missing data using dummy variable adjustment, replacing missing values with the average among nonmissing values and including in the regression an indicator for whether the original value of the covariate was missing.

Hypothesis testing

We tested the hypothesis that the true impact is zero against a two-sided alternative. We reported statistical significance at three levels: 0.01, 0.05, and 0.10. We adjusted *p*-values for multiple hypothesis testing within outcome domains using the Bonferroni adjustment of dividing the threshold for statistical significance by the number of outcome measures in the domain. The domains are attendance (measured by the number of excused and unexcused absences per semester and by the number of days attended per semester), credit accumulation (measured by the number of credits earned per year), and the semester graduation (measured by the proportion of students age 17 or older who graduate each year). Only the first domain has multiple outcome measures; thus, this is the only domain for which we applied an adjustment.

Sensitivity analyses

Although we selected methodological approaches that we believe are most appropriate for this study, alternative approaches could also be regarded as appropriate. We conducted sensitivity analyses to assess how findings would change if we used alternative, but still arguably appropriate, approaches to address a range of issues. The issues we examined are: (1) how to account for clustering, (2) how to determine program eligibility, (3) which students to include in the analysis, (4) which covariates to include in our regression models, and (5) how much weight to assign to each semester.

We summarize results from analyses based on alternative methodological approaches in Table C.1. The estimated impact of New Heights expansion on unexcused absences per semester, excused absences per semester, days attended per semester, and credits earned per year are robust to alternative specifications. Consistent with the fact that our primary impact estimate for the semester graduation rate was marginally significant, estimated impacts for this outcome are

²⁴ As noted above, DC DOH data include only females ages 14 to 19, though these students might be observed in DCPS records at older or younger ages. Across all years, less than 2 percent of students are older than 19, and less than 1 percent of students are younger than 14.

significant for only 8 of 22 alternative specifications. In the remainder of this section, we provide details on the results from each alternative approach.

Table C.1. Proportion of sensitivity analyses in which results are the same

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits earned per year	Semester graduation rate ^a (percentage)
Main analysis results	-4.54***	1.35**	3.43***	1.06***	0.03*
Accounting for clustering	5 of 7	3 of 7	4 of 7	7 of 7	3 of 7
Alternative definitions of program eligibility	3 of 3	3 of 3	3 of 3	3 of 3	1 of 3
Composition of the analytic sample	6 of 6	4 of 6	6 of 6	6 of 6	2 of 6
Analyses including black students only	3 of 3	3 of 3	2 of 3	3 of 3	0 of 3
Alternative sets of covariates	2 of 2	2 of 2	2 of 2	2 of 2	2 of 2
Alternative method of weighting semesters	1 of 1	0 of 1	1 of 1	1 of 1	0 of 1
Total	20 of 22	15 of 22	18 of 22	22 of 22	8 of 22

Note: We consider the results to be the same if the impact estimate is significant at the .10 level or lower. *p*-values are based on standard errors made robust to serial correlation within students. Statistical significance is based on a two-tailed *t*-test.

^a The semester graduation rate is the proportion of students who graduate each semester. The analysis is restricted to students who are at least 17 years old each semester. The semester graduation rate is a marginal measure of graduation, whereas the more commonly used cohort graduation rate is a cumulative measure. The semester graduation rate is lower than the cohort graduation rate.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

Accounting for clustering

We conducted seven sensitivity analyses involving alternative approaches to accounting for clustering. Three of the approaches used the Huber-White approach but with a different level of clustering (school, semester, or school-by-semester). The other four approaches estimated a mixed-effects model with random intercepts at different levels of clustering (student, school, semester, or school-by-semester). For models that included semester or school-by-semester random intercepts, we estimated the following modified version of equation (1):

$$(3) \quad y_{ist} = \alpha + \gamma_1 P_{ist} + \gamma_2 Post_t + \gamma_3 Post_t P_{ist} + X_{ist} \beta + \xi_{ist},$$

Where $Post_t$ is an indicator variable equal to one if t is equal to or greater than the semester of New Heights expansion, and all other variables are as defined above. In this model, the coefficient of interest is γ_3 , which is the difference-in-difference estimate.

Findings from these analyses are reported in Table C.2. We see that the impact on unexcused absences remains significant in five of the seven alternative approaches to accounting for clustering; the impact on excused absences remains significant in three of seven; the impact on days attended remains significant for four of seven; the impact on credits is significant for all seven analyses; and the impact on the semester graduation rate is significant at the 5 percent level in one of seven, and is marginally significant in an additional two specifications.

Table C.2. New Heights impacts under alternative approaches to calculating standard errors

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits earned per year	Semester graduation rate ^a (percentage)	Sample size
Main analysis results School fixed effects, standard errors clustered at student level	-4.54***	1.35**	3.43***	1.06***	0.03*	10,760
Standard errors clustered at school level ^b	-4.54	1.35**	3.43	1.06**	0.03	10,760
Standard errors clustered at the semester level ^b	-4.54***	1.35***	3.43***	1.06***	0.03***	10,760
Standard errors clustered at the school-by-semester level ^b	-4.54***	1.35	3.43**	1.06***	0.03*	10,760
Mixed effects models						
School fixed effects, student random effects	-6.61***	0.79	7.29***	1.30***	0.03*	10,760
School random effects ^c	-4.54	1.35**	3.43	1.06**	0.03	10,760
School fixed effects, semester random effects	-4.52***	1.35	3.41***	1.06***	0.03	10,760
School fixed effects, semester-by-school random effects	-3.42**	1.54	2.39	0.65***	0.01	10,760

Source: DCPS administrative data; DC DOH administrative data.

Note: All regressions, unless otherwise noted, include time period fixed effects (year for credits earned per year, and semester for all other outcomes); age indicators; race and ethnicity indicators; and an indicator for being over-age when entering 9th grade. *P*-values are based on standard errors made robust to serial correlation within students, unless otherwise noted. Statistical significance is based on a two-tailed *t*-test. Statistical significance within the three outcomes in the attendance domain, unexcused absences, excused absences, and days attended are based on *p*-values that are adjusted for multiple comparisons using a Bonferroni adjustment.

^a The semester graduation rate is the proportion of students who graduate each semester. The analysis is restricted to students who are at least 17 years old each semester. The semester graduation rate is a marginal measure of graduation, whereas the more commonly used cohort graduation rate is a cumulative measure. The semester graduation rate is lower than the cohort graduation rate.

^b Changing the level of clustering affects only how the standard errors are calculated, whereas the point estimate is algebraically unchanged.

^c Modeling school effects as fixed or random has no effect on the point estimate (to two decimal places) due to the large size of schools (Wooldridge 2010²⁵).

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

²⁵ Wooldridge, Jeffrey M. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press, 2010.

***Significantly different from zero at the .01 level.

Alternative definitions of program eligibility

In our primary impact analysis, we considered a student to have become eligible for receiving services for New Heights after having given birth, and we included pregnant students in the nonparenting group. However, New Heights services are also offered to pregnant students (Chapter III). We therefore conducted sensitivity analyses that estimate the effect of New Heights expansion on students who have passed the first, second, and third trimester of pregnancy. The impacts on unexcused absences per semester, excused absences per semester, and credits earned per year remain significant in each of these three analyses (Table C.3). The impact on days attended is significant among parents past the second and third trimester of pregnancy and is marginally significant among parents past their first trimester of pregnancy. The impact on the semester graduation rate is marginally significant among students who have passed their third trimester of pregnancy and is not significant after the first and second trimester of pregnancy.

Table C.3. New Heights impacts under alternative definitions of New Heights eligibility

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits earned per year	Semester graduation rate ^a (percentage)	Sample size
Main analysis results	-4.54***	1.35**	3.43***	1.06***	0.03*	10,760
First trimester of pregnancy	-3.54***	1.48***	2.12*	0.93***	0.02	10,760
Second trimester of pregnancy	-3.95***	1.47***	2.60**	1.03***	0.02	10,760
Third trimester of pregnancy	-4.64***	1.46**	3.19**	1.07***	0.03*	10,760

Source: DCPS administrative data; DC DOH administrative data.

Note: All regressions include year fixed effects, semester fixed effects, age indicators, race and ethnicity indicators, and an indicator for being over-age when entering 9th grade. *P*-values are based on standard errors made robust to serial correlation within students. Statistical significance is based on a two-tailed *t*-test. Statistical significance within the three outcomes in the attendance domain, unexcused absences, excused absences, and days attended, are based on *p*-values that are adjusted for multiple comparisons using a Bonferroni adjustment

^a The semester graduation rate is the proportion of students who graduate each semester. The analysis is restricted to students who are at least 17 years old each semester. The semester graduation rate is a marginal measure of graduation, whereas the more commonly used cohort graduation rate is a cumulative measure. The semester graduation rate is lower than the cohort graduation rate.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

Composition of the analytic sample

In our primary analysis, we included eight semesters before the New Heights expansion (fall 2007 through spring 2011) and eight semesters after the New Heights expansion (fall 2011 through spring 2015). Although this definition enables us to better capture impacts from New Heights that arise slowly over time, it may be that students in earlier semesters are less

comparable to those in later semesters. It is also theoretically possible that after the program became established and widely known, the existence of the New Heights program could have affected some students' decision to become pregnant. We therefore estimated New Heights impacts restricting the sample to four semesters before and after the expansion of New Heights (fall 2009 through spring 2013), and we also estimated New Heights impacts restricting the sample to two semesters before and after the expansion of New Heights (fall 2010 through spring 2012).

In each of these restricted samples, the impact on unexcused absences per semester, excused absences per semester, and credits earned per year remains significant (Table C.4). The impact on days attended per semester is significant when we include four semesters before and after the expansion of New Heights and is marginally significant when we include two semesters before and after the expansion. In each of these samples, the impact on the semester graduation rate is not significant.

Table C.4. New Heights impacts under alternative sample restrictions

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits earned per year	Semester graduation rate ^a (percentage)	Sample size
Main analysis results	-4.54***	1.35**	3.43***	1.06***	0.03*	10,760
Restricted number of semesters						
Four semesters	-5.61***	1.92**	4.53***	0.62**	0.00	6,552
Two semesters	-5.81***	2.90***	3.98*	0.62**	0.03	4,410
Main analysis sample and STAY schools	-4.17***	0.57	4.31***	0.94***	0.01	11,582
Alternative definitions of study-school attendance						
In study school for 7 days	-4.52***	1.34**	3.41**	1.06***	0.03*	10,751
In study school for 30 days	-4.48***	1.33**	3.40**	1.06***	0.03*	10,714
Spring semesters only	-5.90***	0.10	5.53***	1.06***	0.04	10,696

Source: DCPS administrative data; DC DOH administrative data.

Note: All regressions, unless otherwise noted, include year fixed effects, semester fixed effects, age indicators, race and ethnicity indicators, and an indicator for being over-age when entering 9th grade. *P*-values are based on standard errors made robust to serial correlation within students, unless otherwise noted. Statistical significance is based on a two-tailed *t*-test. Statistical significance within the three outcomes in the attendance domain, unexcused absences, excused absences, and days attended, are based on *p*-values that are adjusted for multiple comparisons using a Bonferroni adjustment.

^a The semester graduation rate is the proportion of students who graduate each semester. The analysis is restricted to students who are at least 17 years old each semester. The semester graduation rate is a marginal measure of graduation, whereas the more commonly used cohort graduation rate is a cumulative measure. The semester graduation rate is lower than the cohort graduation rate.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

The analytic sample for our primary impact analysis excludes two alternative schools that were part of the New Heights expansion, Ballou STAY and Roosevelt STAY. We did this because the impact of New Heights may be different for students in alternative schools, and thus including them in our main analysis may result in impacts that are less generalizable to traditional schools. The estimated impact of New Heights on students in our primary sample and in STAY schools results in a somewhat smaller impact on unexcused absences—4.2 fewer unexcused absences per semester compared to 4.5—and somewhat larger impacts on days attended—4.3 days per semester compared to 3.4 (Table C.4). The impacts on excused absences per semester and the semester graduation rate are not significant when we include STAY schools, whereas the impact on credits earned per year is similar to our primary impact estimate.

Our primary analysis considers a student to have attended a study school if the student was in a study school for at least one day from October 1 through May 1 of the school year. If a significant proportion of students attended a study school for a very short period, including them in the analysis might have biased our estimates down due to their limited exposure to New Heights. We therefore estimated the impact of New Heights including only students who were in a study school for at least 7 days, as well as by including only students who were in a study school for at least 30 days. As indicated by the sample size of 9 students and 46 students, respectively, very few students in our primary sample were in a study school for such short periods of time (Table C.4). The estimated impacts of New Heights based on these restricted samples are similar to our primary impact estimates.

Although our primary analysis includes both the fall and spring semesters for the attendance and semester graduation rate outcomes, it may be that schools more accurately track graduation in the spring semesters, when most graduations occur. We therefore conducted a sensitivity analysis restricting the sample to only spring semesters, which, for simplicity, we conducted for each outcome. The estimated impacts on unexcused absences per semester, days attended per semester, and credits earned per year remain significant, while the impact on excused absences per semester and the semester graduation rate are not significant (Table C.4).

Analyses including black students only

The racial composition of students in study schools changed differentially for parenting and nonparenting females over the study period. Although this change was not statistically significant, the proportion of students who are black increased among parenting females and decreased among nonparenting females (Appendix B, Table B.2). We controlled for race and ethnicity in our primary analysis, but it may be that the effect of other covariates, such as the indicator for being over-age in 9th grade, has an interactive effect with race. We therefore estimated the impacts of New Heights restricting the sample to only parenting and nonparenting females who are black. Among this alternative sample, the impact of New Heights remains significant for each attendance outcome and for credits earned per year, and the impact on each of these outcomes is larger than those in our primary impact analysis.

We additionally estimated impacts among black students using the alternative model in Equation 3, which allows for semester and school-by-semester random effects. Under this model and both of these types of random effects, the impact on unexcused absences per semester and credits earned per year among black parenting females is significant, whereas the impact on

excused absences per semester is significant using school-by-semester random effects and marginally significant using semester random effects (Table C.5). The impact on days attended is significant only using semester random effects, whereas the impact on the semester graduation rate is not significant in either specification.

Table C.5. New Heights impacts among black students only

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits earned per year	Semester graduation rate ^a (percentage)	Sample size
Main analysis results	-4.54***	1.35**	3.43***	1.06***	0.03*	10,760
Black students only, main analysis approach	-5.23***	1.86***	3.52**	1.11***	0.03	8,257
Black students only, school fixed effects, semester random effects	-5.21***	1.88*	3.50***	1.11***	0.03	8,257
Black students only, school fixed effects, semester-by-school random effects	-3.83***	2.00**	2.19	0.76***	0.01	8,257

Source: DCPS administrative data; DC DOH administrative data.

Note: All regressions include year fixed effects, semester fixed effects, age indicators, race and ethnicity indicators, and an indicator for being over age when entering 9th grade. *P*-values are based on standard errors made robust to serial correlation within students, unless otherwise noted. Statistical significance is based on a two-tailed *t*-test. Statistical significance within the three outcomes in the attendance domain, unexcused absences, excused absences, and days attended, are based on *p*-values that are adjusted for multiple comparisons using a Bonferroni adjustment.

^a The semester graduation rate is the proportion of students who graduate each semester. The analysis is restricted to students who are at least 17 years old each semester. The semester graduation rate is a marginal measure of graduation, whereas the more commonly used cohort graduation rate is a cumulative measure. The semester graduation rate is lower than the cohort graduation rate.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

Alternative sets of covariates

Unbiased estimation of the New Heights impact requires that we control for any student characteristics that change differentially after New Heights expansion for parenting and nonparenting females, and which are correlated with outcomes. In our primary analysis, we controlled for school fixed effects, age indicators, race and ethnicity indicators, and an indicator for being over-age in 9th grade. We tested the robustness of our results to the choice of covariates by estimating impacts using only school fixed effects, and using school fixed effects and age indicators. The impacts of New Heights on each of the attendance outcomes, as well as on credits earned per year, are similar to our primary results using each of these alternatives, although the impact on excused absences per semester is marginally significant when only controlling for school fixed effects (Table C.6). The impact on the semester graduation rate is larger and significant using both alternative sets of covariates.

Table C.6. New Heights impacts controlling for alternative sets of covariates

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits earned per year	Semester graduation rate ^a (percentage)	Sample size
Main analysis results	-4.54***	1.35**	3.43***	1.06***	0.03*	10,760
School fixed effects only	-4.66***	1.30*	3.66***	1.05***	0.05***	10,760
School fixed effects, age strata indicators	-4.73***	1.34**	3.74***	1.11***	0.05***	10,760

Source: DCPS administrative data; DC DOH administrative data.

Note: All regressions, unless otherwise noted, include year fixed effects, semester fixed effects, age indicators, race and ethnicity indicators, and an indicator for being over age when entering 9th grade. *P*-values are based on standard errors made robust to serial correlation within students, unless otherwise noted. Statistical significance is based on a two-tailed *t*-test. Statistical significance within the three outcomes in the attendance domain, unexcused absences, excused absences, and days attended, are based on *p*-values that are adjusted for multiple comparisons using a Bonferroni adjustment.

^a The semester graduation rate is the proportion of students who graduate each semester. The analysis is restricted to students who are at least 17 years old each semester. The semester graduation rate is a marginal measure of graduation, whereas the more commonly used cohort graduation rate is a cumulative measure. The semester graduation rate is lower than the cohort graduation rate.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

Alternative method of weighting semesters

Our primary impact estimates are based on the difference between the post-pre difference for parenting females and the post-pre difference for non-parenting females. The pre-expansion averages weight semesters by the proportion of parents in the pre-expansion period who are observed in that semester, whereas the post-expansion averages weight semesters by the proportion of parents in the post-expansion period who are observed in that semester. To test the robustness of this approach, we also calculated impacts by weighting semesters equally. Under this approach, the impact on unexcused absences per semester and credits earned per year remain significant (Table C.7). The impact on days attended per semester is marginally significant, whereas the impacts on excused absences per semester and the semester graduation rate are not significant.

Table C.7. New Heights impacts under alternative weighting of semesters

	Unexcused absences per semester	Excused absences per semester	Days attended per semester	Credits earned per semester	Semester graduation rate ^a (percentage)	Sample size
Main analysis results	-4.54***	1.35**	3.43***	1.06***	0.03*	10,760
Weighting semesters equally	-3.70***	1.23	2.85*	1.03***	0.02	10,760

Source: DCPS administrative data; DC DOH administrative data.

Note: All regressions, unless otherwise noted, include year fixed effects, semester fixed effects, age indicators, race and ethnicity indicators, and an indicator for being over age when entering 9th grade. *P*-values are based on standard errors made robust to serial correlation within students. Statistical significance is based on a two-tailed *t*-test. Statistical significance within the three outcomes in the attendance domain, unexcused absences, excused absences, and days attended, are based on *p*-values that are adjusted for multiple comparisons using a Bonferroni adjustment

^a The semester graduation rate is the proportion of students who graduate each semester. The analysis is restricted to students who are at least 17 years old each semester. The semester graduation rate is a marginal measure of graduation, whereas the more commonly used cohort graduation rate is a cumulative measure. The semester graduation rate is lower than the cohort graduation rate.

*Significantly different from zero at the .10 level.

**Significantly different from zero at the .05 level.

***Significantly different from zero at the .01 level.

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APPENDIX D

SUPPLEMENTAL ANALYSES

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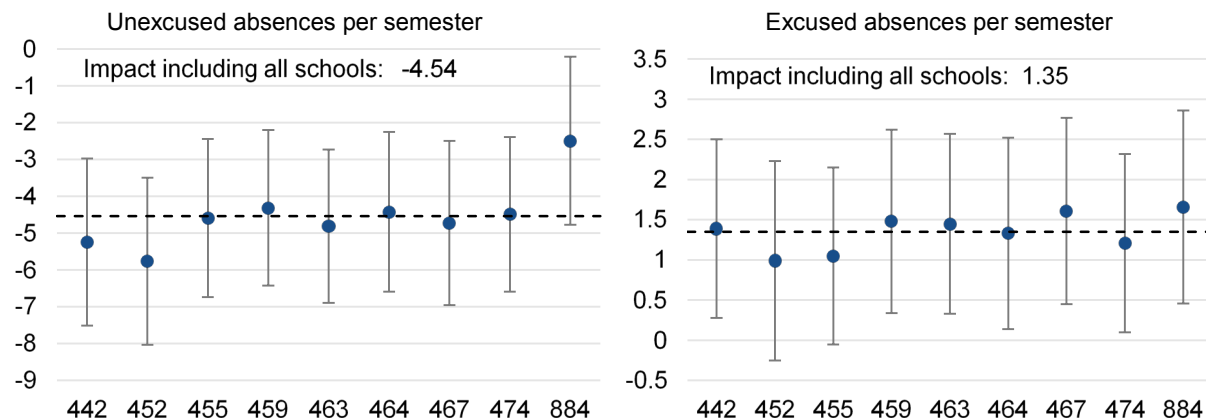
In this appendix, we present the results of three supplemental analyses. First, we examine whether a single school drives our main impact estimates. We conducted those analyses by replicating our primary analysis methods but excluding each school in turn. Second, we present a graphical analysis to assess whether our benchmark analytic approach is a reasonable fit to the data and whether the impacts we estimated are visible in the data. Third, we present evidence on the degree to which parents who participated in New Heights closed the pre-expansion gap between parenting and nonparenting females. Although this analysis does not capture the causal impact of New Heights participation, it does describe how New Heights participants have closed the gap between parenting and nonparenting female students.

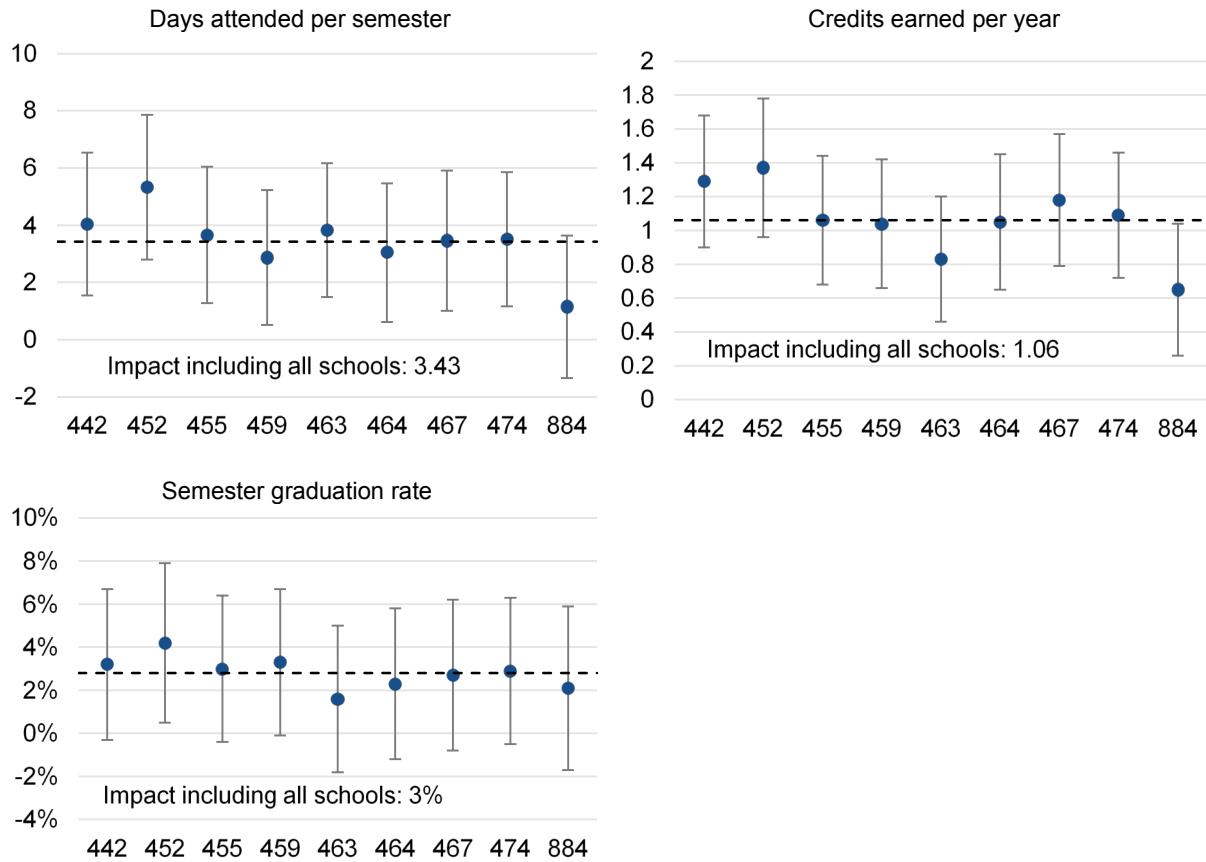
Impacts excluding schools

The estimated impact of New Heights expansion produced by our main analytic method is an average impact across all study schools. It is possible that one or a few schools are driving the positive impact of New Heights expansion. To determine whether this is the case, we estimated the impact of New Heights using our main analysis method while excluding each school in turn. We present the results from this analysis in Figure D.1.

The estimated impact of New Heights expansion on unexcused absences remains negative and significant across all models that exclude one school. The impact on excused absences is positive across all models, and is significant at the 5 percent level in 8 of the 10 models. The impact on days attended per semester is also positive in each model, and is significant at the 5 percent level in 9 of the 10 models. The impact on credits earned per year is positive across models, and is significant at the 5 percent level in each. Although the impact on the semester graduation rate is positive in each model—reflecting the marginal significance of the impact of New Heights on the semester graduation rate across all schools—it is significant in only one of 10 models. There is no school that causes the estimated impact to change sign when we exclude that school from the analysis, and impacts remain significant across 37 of 40 models that exclude one school for the attendance and credits earned per year outcomes. We therefore conclude that no one school is driving the estimated impacts of New Heights expansion on attendance and credits earned per year, while evidence of an impact on semester graduation rates remains marginal.

Figure D.1. Sensitivity of impacts to excluding each study school





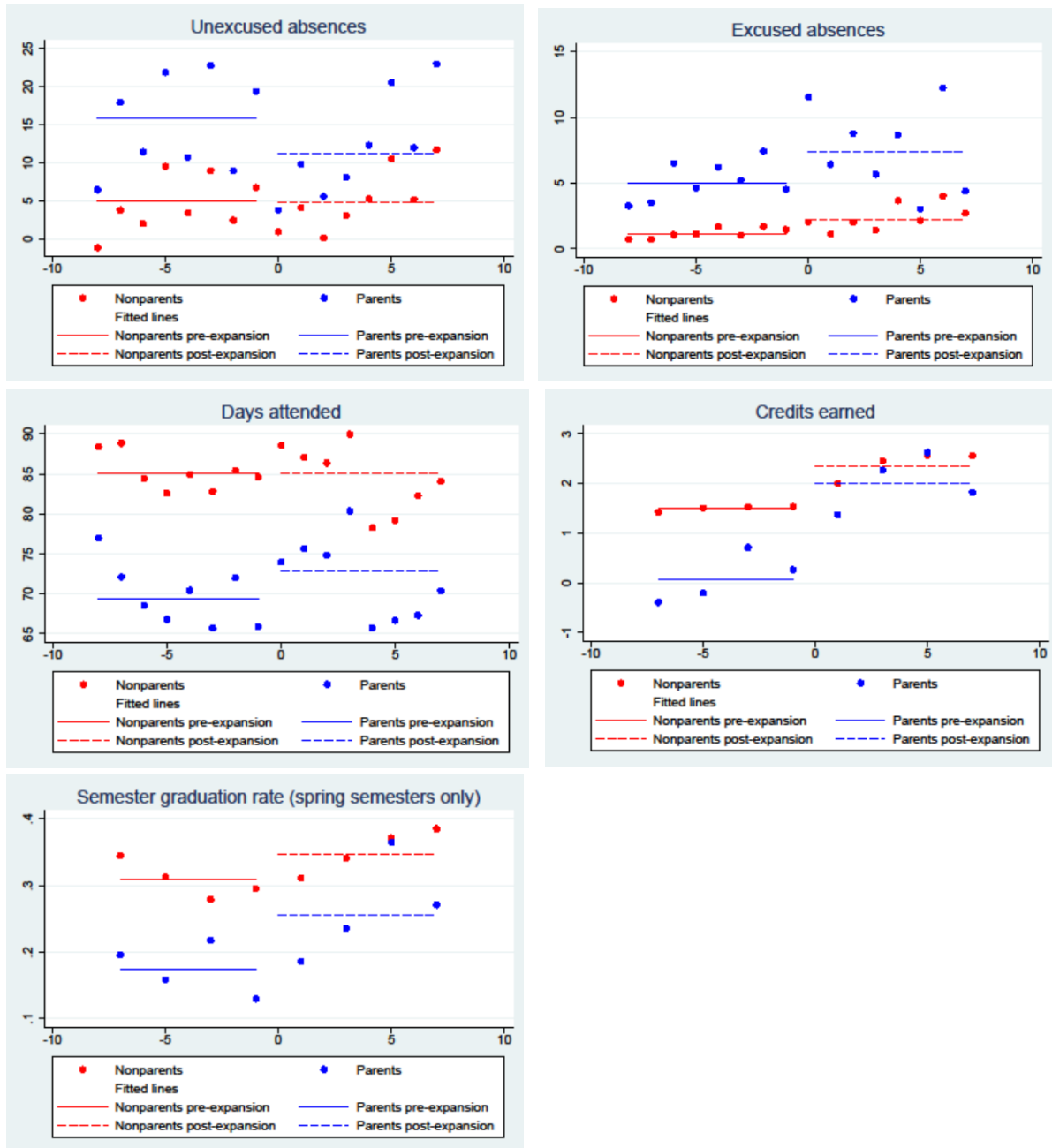
Source: DCPS administrative data; DOH administrative data.

Note: The dashed horizontal line represents the impact including all schools. Each impact is calculated using all study schools except for the one indicated on the horizontal axis. For example, the impact corresponding to school 884 is the impact calculated when school 884 is excluded from the analysis. Regressions include semester fixed effects, school fixed effects, race and ethnicity indicators, and an indicator for being over-age when entering 9th grade. Error bars indicate 95 percent confidence bounds, where standard errors are made robust to serial correlation within students.

Graphical analysis

As described in the main text, we used a difference-in-difference approach to estimate impacts, comparing the change in outcomes for parenting females before and after New Heights expansion to the change in outcomes for nonparenting females. We illustrate this approach in Figure D.2, where blue represents parenting females and red represents nonparenting females. Each dot in the figure represents the (regression-adjusted) average outcome of parenting or nonparenting females in each semester (or year). The four horizontal lines show the weighted average of those dots for parenting and nonparenting females, before and after New Heights expansion. In each plot in this figure, the narrowing (or widening, in the case of excused absences) of the gap between the red and blue lines after the expansion of New Heights, which occurs at $t = 0$, represents the impact of New Heights. All the impacts reported in the main text are visible in these figures.

Figure D.2. Pre- and post-expansion averages, by semester and parental status



Source: DCPS administrative data; DOH administrative data.

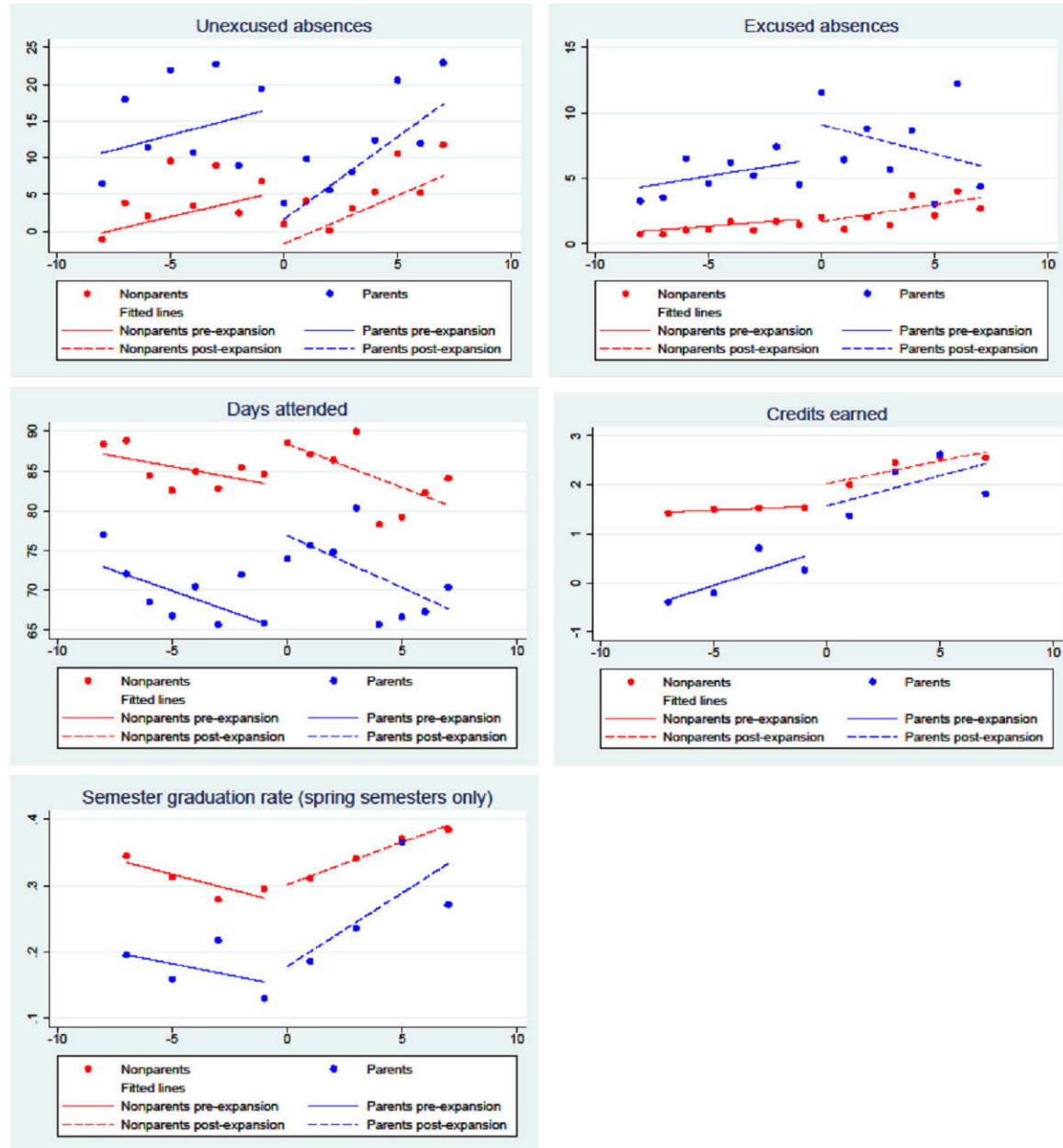
Note: All regressions include age indicators, race and ethnicity indicators, and an indicator for being over-age when entering 9th grade.

An alternative approach to estimating impacts in this study could be to model the relationship between outcomes and time, both before and after New Heights expansion (instead of calculating simple averages). We illustrate this approach in Figure D.3, where we fit four lines corresponding to parents (blue) and nonparents (red), before and after New Heights expansion. Before New Heights expansion, the lines for parents and nonparents are approximately parallel

(that is, they have similar slopes), which suggests that nonparents are a reasonable comparison group for these outcomes.

We ultimately rejected this approach to estimating impacts because (1) there are not enough time points to credibly assess what functional form we should use to model the relationship between outcomes and time and (2) the presence of outliers can significantly distort the regression line. In short, we believe the simple difference-in-difference approach used in our main analysis is most appropriate in this context.

Figure D.3. Modeling pre- and post-expansion trends



Source: DCPS administrative data; DOH administrative data.

Note: All regressions include age indicators, race and ethnicity indicators, and an indicator for being over-age when entering 9th grade.

Comparing outcomes of program participants and nonparticipants

Although our primary analyses examine the impact of the offer of New Heights participation, we would logically expect the impact of the offer to be the result of program participation. However, this might not be the case if other policy changes or demographic shifts were affecting all parenting youth, including those who do not participate in New Heights. We therefore conducted a diagnostic descriptive analysis comparing the post-expansion outcomes of participants to parenting nonparticipants and to pre-expansion parents and nonparents. If New Heights genuinely has positive effects, we would expect to see better outcomes for New Heights participants than for parenting nonparticipants. We caution that this is just a diagnostic analysis, not an attempt to estimate the impact of New Heights participation.

We calculated the average outcomes for nonparents and parents before New Heights expansion and the outcomes of nonparents, parents participating in New Heights, and parents not participating in New Heights after the expansion. We report these averages in Figures D.4–D.8. For every outcome, New Heights participants fare better in the post-expansion years than parenting females before the expansion and they fare better than parenting females who do not participate in New Heights after the expansion. These findings suggest that it is appropriate to attribute the impacts described in Table 2 of the main text to the New Heights program (rather than some other factor affecting all parenting females). Specifically:

- **Unexcused absences.** New Heights participants had fewer unexcused absences (18 absences) than parenting nonparticipants (23 absences). New Heights participants also had fewer unexcused absences than parenting females before expansion (24 absences).
- **Excused absences.** New Heights participants had more excused absences (9 absences) than parenting nonparticipants (5 absences). New Heights participants also had more excused absences than parenting females before expansion (6 absences).
- **Days attended per semester.** New Heights participants attended more days of school (62 days) than parenting nonparticipants (59 days). New Heights participants also attended more days of school than parenting females before expansion (58 days).
- **Credits earned per year.** New Heights participants earned more credits (6.7 credits) than parenting nonparticipants (5.5 credits). New Heights participants also earned more credits than parenting females before expansion (4.5 credits).
- **Semester graduation rate.** New Heights participants had a higher semester graduation rate (20 percent) than parenting nonparticipants (16 percent). New Heights participants also had a higher semester graduation rate than parenting females before expansion (16 percent).

Figure D.4. Unexcused absences for parents and nonparents before and after New Heights expansion

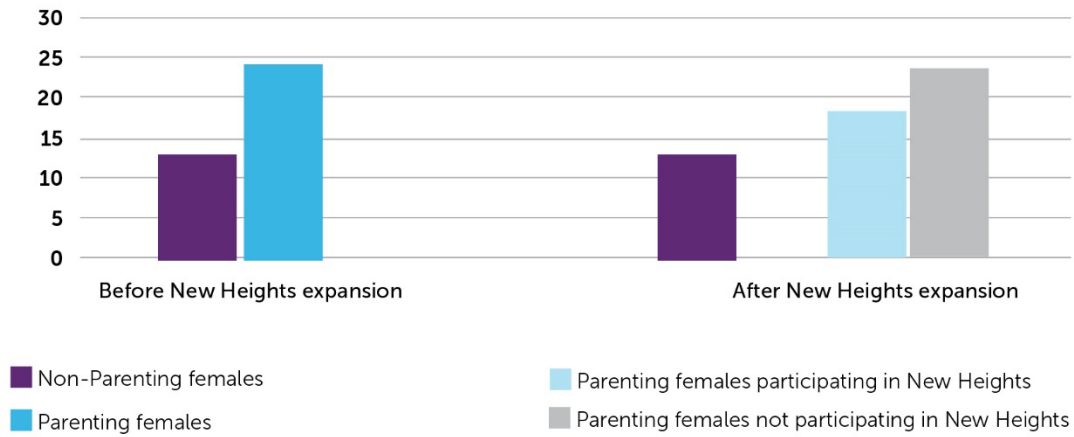


Figure D.5. Excused absences for parents and nonparents before and after New Heights expansion

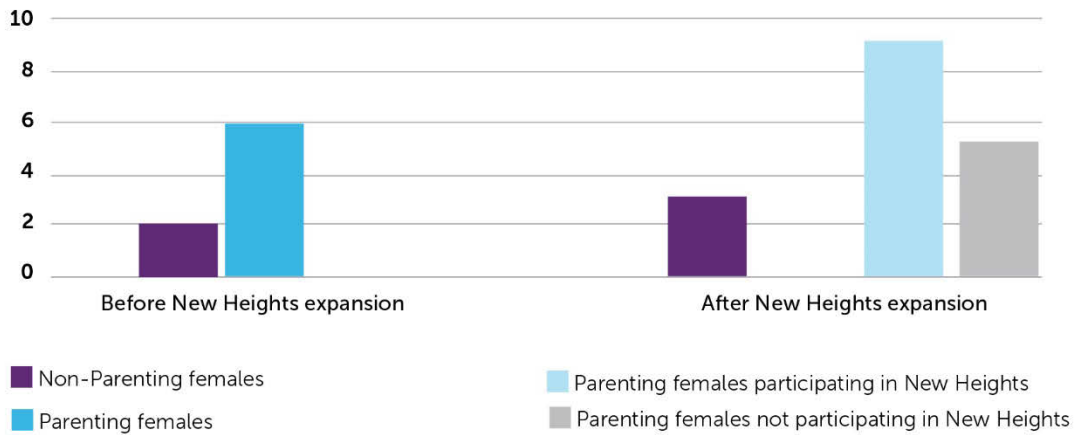


Figure D.6. Days of school attended per semester for parents and nonparents before and after New Heights expansion

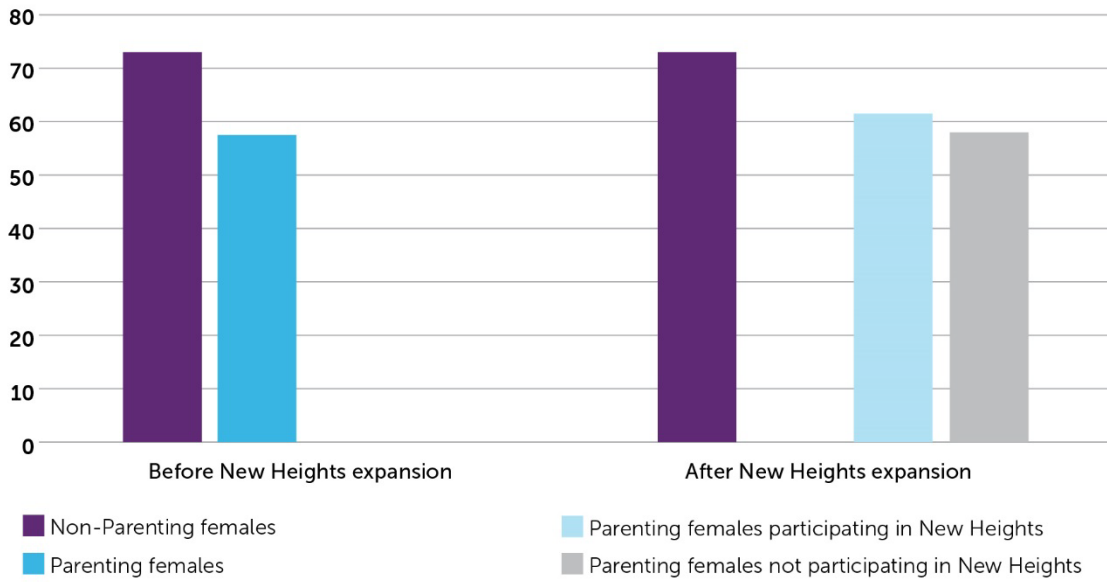


Figure D.7. Credits earned per year for parents and nonparents before and after New Heights expansion

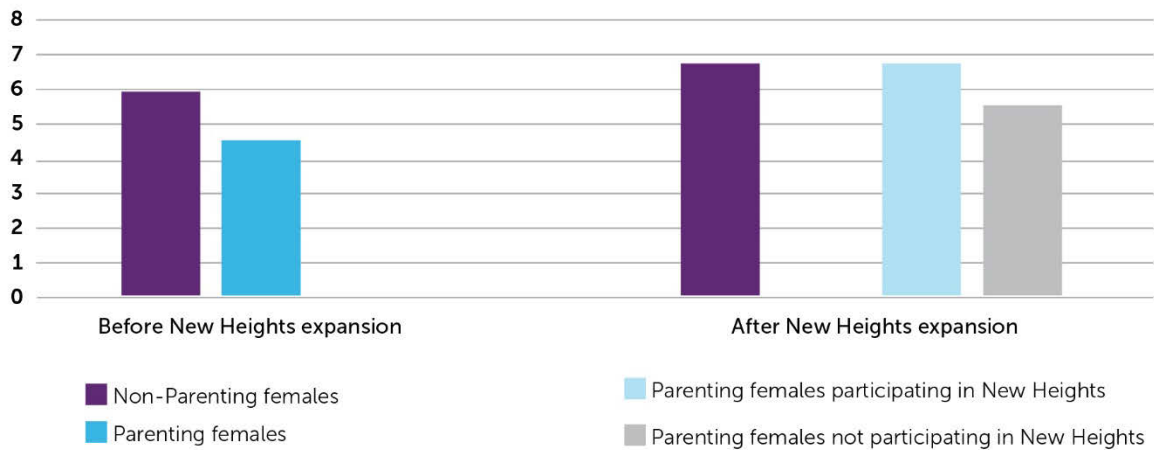
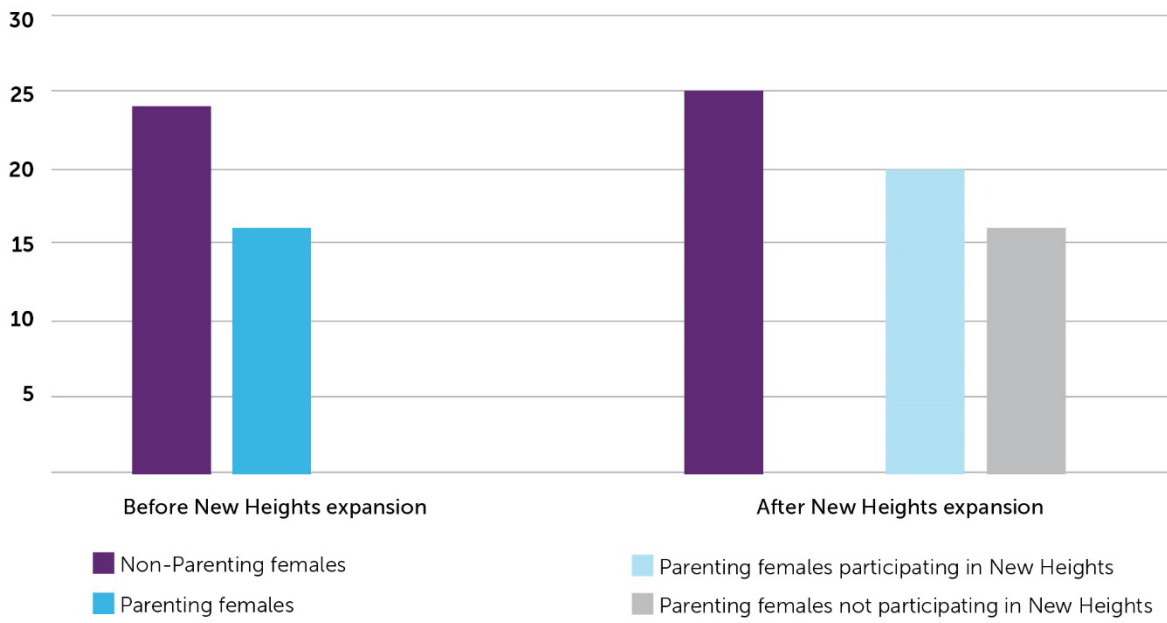


Figure D.8. Semester graduation rates for parents and nonparents before and after New Heights expansion



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