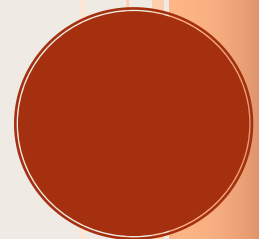**CLEF**

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WORKING PAPER SERIES

The Impact of Comprehensive Student Support on Crime

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The Impact of Comprehensive Student Support on Crime

Evidence from the Pathways to Education Program

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Abstract

This study finds substantial reductions to criminal activity from the introduction of a comprehensive high school support program for disadvantaged youth living in the largest public housing project in Toronto. The program, called Pathways to Education, bundles supports such as regular coaching, tutoring, group activities, free public transportation tickets and bursaries for postsecondary education. In this paper, we use a difference-in-differences approach that compares students living in public housing communities where the program was offered to those living in communities where the program was not offered over time. We find that eligibility for Pathways reduces the likelihood of being charged with a crime by 32 percent at its Regent Park location. This effect is driven by a reduction in charges for breaking and entering, theft, mischief, other traffic offenses and Youth Criminal Justice Act offenses.

JEL classification: I24, I26, I28, L31
Keywords: At-risk youth, education and crime, youth programs

1 Introduction

Growing up in a neighborhood with less economic opportunity is associated with lower education attainment, worse labour market outcomes and more negative interactions with the criminal justice system as an adolescent (Holzer et al., 2008). For instance, youth living in low-income neighborhoods in Toronto were at least twice as likely to be charged with a crime as youth living in more affluent areas in 2006 (Charron, 2011). At the individual level, being arrested or incarcerated as an adolescent may increase the likelihood of future arrests, lower human capital accumulation and earnings and lead to riskier health behaviors later in life (Aizer and Doyle Jr, 2015; Baert and Verhofstadt, 2015; Doherty et al., 2022; Grogger, 1995). At the aggregate level, growing up in a neighborhood with high levels of crime is associated with an increased likelihood of being arrested and charged with a crime (Bindler and Ketel, 2022; Damm and Dustmann, 2014). Neighborhoods with high levels of crime may also experience worse economic outcomes. Consequently, scalable interventions or programs that lower youth criminal activity have the potential for large social benefits, both for recipients and non-recipients.

In this paper, we study the effects of introducing a comprehensive support program for at-risk high school students in Toronto, Canada on criminal activity. The program, called Pathways to Education (or simply Pathways), comprises several supports, including regular coaching and tutoring, group activities, and financial assistance to all high school students in the at-risk neighborhoods in which Pathways operates. High school students are eligible to participate in Pathways if they live in a catchment area in which the program is operating. In order to participate in Pathways, students and their parents must register for the program each academic year. Pathways was initially introduced in 2001 in the Regent Park neighborhood of Toronto, one of the poorest communities in Canada that has historically faced high rates of crime and poverty. The program subsequently expanded into two additional communities in Toronto, Lawrence Heights and Rexdale in 2007 before

expanding to more than 20 locations across Canada during the past decade.[1]

We estimate the causal effect of eligibility for Pathways at its Toronto locations on long-run crime outcomes using a difference-in-differences (DD) methodology. Our analysis compares the outcomes of high school students eligible for Pathways because they live in a neighborhood where the program is operating to similar low-income students who are ineligible for the program, before and after its introduction. Two institutional features make the estimation of causal effects using a DD methodology ideal in our application. The first is that Pathways was phased-in for successive cohorts of high school students in the locations in which it operated. Specifically, only incoming Grade 9 high school students were eligible to sign-up for the program upon its introduction. The second important feature of our setting is that Pathways was introduced in communities in which all residents live in public housing. During the period we study, the wait list to move into a public housing unit was several years long (since the demand for public housing in Toronto far exceeds the supply of available units). This fact, combined with the small lead time between the announcement and actual introduction of Pathways implies that it is unlikely that students and their parents would have been able to sort into a community in which the program was operating during the period we study.

Using administrative data on high school enrollment from the Toronto District School Board (TDSB) linked to administrative records from youth and adult criminal courts in Canada between 2005-2019, we are able to track criminal activity from high school through early adulthood. By the end of our study period, the oldest cohort of TDSB students we observe are in their early thirties while the youngest cohort of students are in their mid-twenties. Our DD estimates suggest that eligibility for Pathways at the Regent Park location reduced the likelihood of ever being charged with a crime by 6 percentage points or 32 percent (relative to a pre-Pathways mean of 19 percent). We find that this result is mostly driven by a reduction in charges for "property crimes", such as breaking and entering, mischief and theft.

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[1]For an up-to-date list of the locations in which the Pathways program is operating, see https://www.pathwaystoeducation.ca/contact-us/.

Our results suggest that the decrease in the likelihood of ever being charged with a crime is largest (in absolute value) for female students and those whose high school enrollment records indicate that English is not the first language spoken at home. We also estimate the effect of eligibility for Pathways on the number of times an individual is charged and on their number of criminal convictions. While the coefficient estimates from these specifications also suggest a reduction in criminal activity, the standard errors are large and we are unable to reject a null effect. For the Lawrence Heights and Rexdale communities, we estimate that eligibility for Pathways had a small and statistically insignificant effect on crime outcomes. Our estimates are sufficiently precise to rule out reductions in crime larger than 3 percentage points in absolute value (or 12 percent) for the 2007 expansion sites.

Our paper contributes to a literature evaluating the effects of adolescent-age interventions on criminal behaviour. Adolescent-age interventions found to reduce criminality include mentoring programs (Rodriguez-Planas, 2017), charter schools (Dobbie and Fryer Jr, 2015; McEachin et al., 2020), assistance in moving to better neighbourhoods (for women) (Kling et al., 2005), access to school choice (Cullen et al., 2006; Deming, 2011), cognitive-behavioural therapy-based group activities (Heller et al., 2017), and summer employment programs (Modestino, 2019; Davis and Heller, 2020). Compared with these papers, our work evaluates a comprehensive program that combines multiple student supports that is available to all high school students in the communities where it is offered. Consequently, our paper presents evidence on the ability of a comprehensive and community-based program to impact crime outcomes.[2] We are also able to observe students eligible for Pathways and the comparison group into their early-thirties. Thus, a contribution of our paper is that we are able to estimate the long-run effects of a comprehensive student support program more than 10 years after individuals leave the program.

This paper also contributes to a broad set of papers that study educational interventions

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[2]The fact that we estimate the causal effect of eligibility for Pathways (i.e. an intent-to-treat effect), a program that all high school students are eligible for means that our estimates can be interpreted as the net effect of offering a scalable program alongside a traditional high-school curriculum.

aimed at improving the schooling and labor market outcomes of adolescents. This literature includes papers that study how providing access to charter schools (Cohodes and Parham, 2021), helping students and their families to move to better neighborhoods (Kling et al., 2005, 2007), offering comprehensive mentoring programs (Rodriguez-Planas, 2012) and allowing for school choice (Deming, 2011; Deming et al., 2014; Lavy, 2021) impacts adolescents. It also includes our own prior work that estimated the effect of Pathways on education attainment and labor market outcomes (Oreopoulos et al., 2017; Lavecchia et al., 2020). Our prior research finds that eligibility for Pathways increased high school graduation rates, attendance in postsecondary institutions (two-year colleges and four-year universities) and earnings in adulthood. The estimates we present here suggest that the Pathways program likely has net social benefits above and beyond the large fiscal returns implied by the increased tax revenue resulting from improved labor market outcomes.

The features of the Pathways program are similar to the Quantum Opportunity Program (QOP) for at-risk high school students and the Accelerated Study in Associate Programs (ASAP) for community college students. Both programs offer mentoring, academic support and help with life-skills. Rodriguez-Planas (2012, 2017) shows that the QOP program improves academic performance but has mixed impacts on labor market outcomes and risky behaviors. Weiss et al. (2019) show that the ASAP program improves community college graduation rates but do not study the impact of the program on crime outcomes. The improvements to crime outcomes due to Pathways that we document contribute to the research on the QOP and ASAP programs by showing that interventions that bundle multiple student supports can have positive impacts beyond academic achievement and labor market outcomes.[3]

The remainder of the article is organized as follows. Section 2 describes the Pathways program in more detail. Section 3 describes the data. Section 4 outlines our empirical

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[3]Another similar program whose short-term, but not long-term impacts have been studied is the StudentU program in Durham, North Carolina. Komisarow (2022) studies this program, which provides education, nutrition, and social support services to disadvantaged middle and high school students outside of the regular school day, and finds that the program improved academic performance and reduced student suspensions.

methodology. Section 5 presents and discusses our results. Section 6 concludes.

2   Features of the Pathways to Education Program

Pathways to Education (Pathways) is a non-profit organization that aims to improve the education attainment, labour market outcomes, and well-being of at-risk adolescents through a program that offers a comprehensive set of services delivered outside of school.[4]   The program is guided by the belief that supporting youth during their formative high school years in a holistic way can improve their financial and non-financial outcomes and lead to positive change in the community.

The Pathways program is organized through four complementary pillars: tailored student social supports, tutoring, mentoring, and financial support. Tailored student social support is offered by pairing each student with a student-parent support worker (SPSW) employed by Pathways. Each SPSW is assigned approximately 50 students every academic year. SPSWs meet one-on-one with each of their students at least twice a month to discuss the student's academic progress, home life, well-being, and any challenges they may be facing. Pathways establishes ties with local schools and these ties facilitate the sharing of information on students' school attendance and academic progress with SPSWs on a regular basis. As a student approaches graduation, their SPSW will help them prepare to apply for post-secondary school or for jobs. This support includes paying college or university application fees, helping students complete financial aid application forms, and helping with resume preparation for students entering the labour market.

Pathways students also receive academic support from a trained Pathways tutor. Pathways tutors typically conduct sessions in small groups (e.g. 3 or 4 students per tutor) for the core academic subjects (math, science, and English) four nights a week. Tutoring participation is mandatory two nights a week for students who fall below a certain GPA threshold. Students must also participate in group mentoring sessions in grades 9 and 10.

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[4]The discussion in this section borrows from Oreopoulos et al. (2017) and Lavecchia et al. (2020).

These sessions center around group activities aimed at building friendships among Pathways participants and improving students' social skills. Recent activities have included attending plays, learning martial arts, and participating in a community recycling program. Activities typically involve about 15 students and 3 volunteer mentors. Students still participate in these sessions in grades 11 and 12, but get more say in which activities they will participate in.

Beyond the social and academic features of the program, Pathways students also receive financial support. Immediate financial support comes in the form of free public transportation tickets and school supplies that are distributed during student-SPSW meetings. Longer-term financial support is offered through a trust fund set up for each participant. During our sample period, Pathways set aside $1,000 CAD for each year a student was registered in the program, up to a maximum of $4,000 (tax-free), that could be used toward tuition and other post-secondary expenses. This bursary covered approximately 15–20 percent (33 percent) of the tuition for one academic year at four-year universities (two-year colleges) in Ontario over the 2006–2014 period.

Pathways started operating in 2001 in the Regent Park community in downtown Toronto. Regent Park is home to approximately 7,500 residents living in subsidized housing and is one of Canada's poorest neighbourhoods.[5] From the 2001 census, 87 percent of family households living in Regent Park were below Statistics Canada's Low-Income Cut-Off (LICO), 56 percent of residents were single parents, and 59 percent of residents had no earnings. In 2001, only 30 percent of 20-to-24-year-olds had a university degree and 24 percent of the same age group did not complete high school (Oreopoulos et al., 2017). Through its multi-pronged assistance approach, Pathways makes a rigorous attempt at improving these statistics.

In September 2007, Pathways expanded to the communities of Lawrence Heights and Rexdale in Toronto. These communities are smaller than Regent Park (each of these communities is about one third of the size of Regent Park) and differ in terms of some neighbourhood

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[5]According to the 2016 census, the population of Regent Park increased to nearly 11,000 residents (City of Toronto, 2018)

characteristics, notably the fraction of residents that are immigrants to Canada (34 percent compared with 53 percent in Regent Park, see Online Appendix Table A2 in Lavecchia et al. (2020)). Over the last decade, Pathways has continued to expand and now operates in more than 20 communities across eight provinces in Canada, including four locations in Toronto.

In each of its communities, Pathways is available to all students living in the neighborhood catchment area and attending high school. Starting with its introduction in Regent Park in 2001, the Pathways program is phased in for successive cohorts of Grade 9 high school students. As we discuss below, this feature is important for evaluating the impact of the program. Pathways' administrators have developed ties with local elementary schools in order to help identify and recruit eligible students as they transition to high school. The program is voluntary and requires students and their parents to agree each year in writing to Pathways' conditions and high expectations. Oreopoulos et al. (2017) show that take-up of Pathways is impressive – often more than 85 percent of eligible students – likely due to a concentrated outreach effort by Pathways staff.

3   Data

We construct our dataset by merging administrative data from Toronto Community Housing (TCH), the Toronto District School Board (TDSB), and Statistics Canada's Integrated Criminal Court Survey (ICCS). In this section, we describe these data and the construction of key variables.[6]

The TDSB dataset provides us with information on all students that enrolled in a TDSB high school between September 2000 and September 2008. We also have enrollment data for the 1999 academic year for a small subset of students that lived in central Toronto before the amalgamation of the city with its suburbs in the late 1990s. Data from the 1999 Grade 9 cohort from the legacy Metro Toronto School Board provides us with an additional cohort of pre-Pathways students (albeit with a much smaller sample size) and is used to

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[6]For additional details about the TCH and TDSB data, see Online Appendix A of Lavecchia et al. (2020).

test the sensitivity of our baseline estimates. In addition to information on enrollment, the TDSB data also has information on academic outcomes (e.g. credit accumulation, graduation status) and demographic characteristics, including gender, age in Grade 9, immigrant status, a binary variable equal to one if English was the student's first language and equal to zero otherwise. Using information on credit accumulation, we construct a binary variable that is equal to one for students who accumulate at least 7 course credits in Grade 9 (the first year of high school) and zero otherwise. In the heterogeneity analysis in Section 5.2 below, we refer to those whose value of this variable is one as students with "good Grade 9 grades" and those whose value is zero as students with "bad Grade 9 grades". In Ontario during the period we study, completing high school within 4 years required that students complete 32 course credits or 8 per academic year. Thus, the good/bad Grade 9 grades variable captures whether course credit completion is "on schedule".

We identify students that are eligible for Pathways and our comparison groups using the residential address listed on students' TDSB enrollment forms. Together with the TCH dataset that includes the postal codes for all public housing communities in Toronto, we are able to determine whether a student lived in one of Pathways' catchment areas or any other public housing community in the city. Thus, our main dataset contains information on approximately 8,000 students who entered grade 9 in a TDSB high school between 2000 and 2008 and lived in one of 70 TCH public housing communities.

An important feature of our setting is that assignment to public housing communities in the 1990s and 2000s was similar to a lottery. This is because demand for public housing units far exceeded supply and offers to applicants were made on a first-come, first-serve basis. Although applicants were able to indicate which TCH communities they preferred, most applicants requested all TCH projects to increase the likelihood that they would be assigned a unit. During the period we study, wait times for a TCH unit were approximately five years (Toronto Social Housing Connections, 1998).[7] The extremely long wait times for

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[7]Exceptions to this first-come first-serve process were reserved for households that were exceptionally challenged, such as those facing domestic violence.

a unit ensure that a TCH resident's location was largely determined by the availability of units at the time they were at the top of the waiting list during the period we study. This fact greatly reduces the likelihood that families were able to select into communities where Pathways was operating.

We match the TDSB-TCH data to the ICCS for the 2005-2019 years. The ICCS database offers rich information on appearances, charges, and convictions in Canadian youth and adult criminal courts.[8] TDSB public housing students are matched to records in the ICCS using their first and last name and date of birth. Individuals not matched to any ICCS charges are coded as having no criminal charges during the 2005-2019 period.

When estimating the effect of Pathways for the Regent Park location, we restrict the sample to the 2000-2006 Grade 9 TDSB cohorts. This is because the Lawrence Heights and Rexdale communities are part of the comparison group before 2007. Similarly, to avoid comparing newly treated students to those whose treatment status switches earlier, we restrict our sample to the 2001-2008 Grade 9 cohorts when studying the Lawrence Heights and Rexdale communities. These sample restrictions lead to a sample of 5,840 students for the Regent Park analysis and 6,910 students for the Lawrence Heights and Rexdale analysis.[9]

Our analysis focuses on three "primary" dependent variables. The first is a binary variable equal to one if individual was ever charged with a crime (i.e. the individual had at least one criminal charge against them in our matched ICCS data up to 2019) and equal to zero otherwise. We also construct variables for the total number of charges and the total number of convictions an individual faced by 2019 to assess whether eligibility for Pathways impacts criminal activity on the intensive margin. We supplement the analysis of the effect of Pathways on these three primary dependent variables by considering the impact by type of crime. For this analysis, we categorize charges and convictions according to Statistics Canada's Common Offense Classification (COC). There are 32 COCs, including homicide,

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[8]Note that appeal courts, federal courts, the Supreme Court of Canada, and Ontario superior courts are not included in this database.

[9]Note that these sample size figures have been randomly rounded due to Statistics Canada confidentiality requirements.

attempted murder, robbery, breaking and entering, and sexual assault, among many others.

Because our dependent variables measure whether an individual has ever been charged with a crime and the number of charges and convictions and individual faces by 2019, it is important to note that the youth in our sample vary in age. For example, the first cohort of students eligible for Pathways in Regent Park in 2001 were mostly age 32 in 2019.[10] By contrast, the first cohort of students eligible to participate in Pathways in Lawrence Heights and Rexdale were 26, on average, in 2019.

4 Empirical Methodology

We estimate the effects of eligibility for Pathways on crime outcomes using a difference-in-differences approach.[11] Our analysis of, for example, the impact of Pathways at its Regent Park location compares the change in average outcomes of former TDSB students who lived in Regent Park and enrolled in high school before and after Pathways was introduced in 2001 to the outcomes of students from other public housing communities in Toronto over the same period.[12] Specifically, we estimate the following regression model:

$$y_{i(pc)} = \beta T_{pc} + \delta' X_{i(pc)} + e_p + e_c + e_{i(pc)}, \tag{1}$$

where the subscript i denotes individuals, p denotes housing projects, and c denotes cohorts (year entered grade 9). The term $y_{i(pc)}$ is a crime outcome (e.g. a binary variable capturing ever being charged with a crime) for individual i, T is a dummy variable indicating whether an individual is eligible for Pathways, and X is a vector of the individual's demographic characteristics (sex, age in grade 9, immigrant status, and a dummy for whether English is the primary language spoken at home). All specifications include housing project fixed effects (e_p) and cohort fixed effects (e_c). The coefficient of interest is β, the average

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[10]Most students enroll in high school at age 14, though in each cohort a few students start at 13 or 15.

[11]The discussion in this section borrows heavily from Section 3E of (Oreopoulos et al., 2017).

[12]Our analysis of the Rexdale and Lawrence Heights programs is analogous.

effect of being eligible to participate in Pathways. We explore whether Pathways generated similar effects when the program was initially introduced in Regent Park and when it was expanded by estimating program eligibility effects separately for Regent Park over the 2000–2006 period and for the two expansion sites in Rexdale and Lawrence Heights over the 2001–2008 period. Given the small sizes of Rexdale and Lawrence Heights, we combine the two sites and collectively refer to them as Rexdale/LH.

Our results are unbiased estimates of the causal effect of eligibility for Pathways on crime outcomes if the parallel trends assumption holds in this setting. This assumption requires that outcomes in communities where Pathways was introduced (Regent Park, Lawrence Heights, Rexdale) would have followed the same trends, on average, as the outcomes in the Toronto public housing communities where the program was not introduced. For the Regent Park analysis, we conduct a sensitivity check that uses data from the 1999 legacy Metro Toronto School Board cohort to better examine pre-trends in order to assess the plausibility of the parallel trends assumption. In Oreopoulos et al. (2014), we use microdata from the 1991, 1996, 2001 and 2006 Canadian census and show that a more detailed set of individual and neighborhood characteristics (e.g. income, family structure) in Regent Park follow as similar path as in the control group communities. Together, these analyses suggest that the parallel trends assumption is plausible in our setting.

The inference for the estimates presented below is based on standard errors that are clustered by public housing community. Clustering in this way allows for the correlation of outcomes over time for students residing in the same public housing community, which is appropriate if students and young adults living in the same community face common shocks.[13]

For all the results discussed below, we report false discovery rate (FDR) q-values alongside the standard errors. Given that we report regression results for multiple regression specifications and for dozens of dependent variables, it is possible that we will reject the

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[13]Following Cameron and Miller (2015), with 70 housing projects (clusters) in the final data set, inference is based on the critical values of the t-distribution using 70 - 1 = 69 degrees of freedom.

null hypothesis of no statistically significant impact of Pathways by chance. We calculate the FDR q-values using the procedure outlined in and Stata code accompanying Anderson (2008). In particular, we store the p-values obtained from all regressions specifications based on our baseline sample (described above). Next, we apply the two-stage correction procedure described by Anderson (2008) and then find the smallest level q at which each estimate's null hypothesis would be rejected.

5 Results

5.1 Main Results

Figures 1-3 summarize our main result graphically. Figure 1 plots the normalized proportion of individuals charged with a crime by cohort (year entered grade 9) separately for students from Regent Park, Rexdale/LH, and other TCH communities. The figure is constructed by first regressing the binary "ever charged" variable on individual characteristics in the vector X_{ipc} (i.e. sex, age at the start of Grade 9, immigrant status, binary variable for English as a second language) and saving the residuals. We then aggregate the residuals and subtract the mean value of the residuals for the 2000 Grade 9 cohort from every other cohort. The first dashed line in the figure corresponds to the introduction of Pathways in September 2001 in Regent Park and the second dashed line corresponds to the introduction of Pathways in Rexdale/LH.

At least three things stand out in Figure 1. The first is that the likelihood of being charged with a crime drops substantially for students from Regent Park relative to similar students from the rest of Toronto after the introduction of Pathways. Starting with the 2001 Grade 9 cohort, the likelihood of being charged with a crime falls by 4-6 percentage points relative to the comparison group and remains stable for the rest of the sample period. Second, the fraction of students from Rexdale/LH ever charged with a crime evolves in a similar fashion as the fraction for students from other public housing communities. Finally,

the fraction of former TDSB students from Rexdale/LH ever charged with a crime evolves similarly as the fraction for other public housing after the introduction of Pathways at the expansion sites in 2007. Figures 2 and 3 are constructed in the same way as Figure 1; the only difference is that Figure 2 (resp. Figure 3) plots the normalized number of times an individual has been charged with (resp. convicted of) a crime.

Table 1 presents the coefficient estimates, standard errors and FDR q-values corresponding to the estimation of Equation 1. The estimate in column 3 of the top panel suggests that eligibility for Pathways at the Regent Park location reduces the likelihood of being charged with a crime by 6 percentage points. One way to put this estimate in context is to compare it to the pre-Pathways fraction of Regent Park students ever charged with a crime. Before the introduction of the program, 19 percent of youth living in Regent Park were ever charged with a crime. Compared with this statistic, the decline in the fraction of Regent Park students ever charged with a crime falls by 32 percent after the introduction of Pathways. Furthermore, the FDR-sharpened q-value of 0.03 suggests that our estimate of the effect of eligibility for Pathways on the likelihood of being charged is statistically significant, even after accounting for multiple hypothesis testing.

The estimates in column 5 and 7 of the top panel of Table 1 suggest that eligibility for Pathways reduces the average number of times an individual is charged with a crime by 0.37 and the number of criminal convictions by 0.11. However, both estimates are statistically indistinguishable from zero; the corresponding FDR-sharpened q-values are 0.56 and 0.51, respectively.

The bottom panel in Table 1 reports the results from the analysis of the impact of eligibility for Pathways at the Rexdale/LH locations on criminal activity. Our estimates suggest that there is no statistically detectible effect of Pathways on the crime outcomes we observe at the 2007 expansion locations. Furthermore, the relatively small standard errors rule out large reductions in crime. For instance, the estimates in column 3 of the bottom panel of Table 1 suggest that we can rule out reductions in the likelihood of being charged

13

larger than 3 percentage points or 12 percent of the pre-Pathways mean.

That the Rexdale/LH programs do not appear to generate the same benefits as the Regent Park program is consistent with our earlier work. In particular, the estimates presented in Oreopoulos et al. (2017) suggest that the impact of Pathways on high school graduation rates and enrollment in college is about one third as large in the Rexdale/LH communities as it is in Regent Park. Also, the estimates in Lavecchia et al. (2020) suggest that eligibility for Pathways has no statistically insignificant impact on earnings or employment in Rexdale/LH, though estimates for some sub-groups are larger.

5.2   Heterogeneity Analysis

To explore our main results further, we estimate the effect of eligibility for Pathways on the primary crime outcomes for various subgroups. Table 2 (resp. Table 3) reports the results from the estimation of Equation 1 for Regent Park (resp. Rexdale/LH), separately by sex, language spoken at home and by Grade 9 course credit accumulation. The first row in each table also reports the estimate for the full sample (i.e. the estimates from Table 1) as a benchmark.

The estimates in Table 2 suggest that eligibility for Pathways in Regent Park reduced the likelihood of being charged for most sub-groups. The estimated effects were especially large for female students (an 8-percentage point decline), students whose first language is not English (an 11-percentage point decline) and students who passed at least 7 out of 8 Grade 9 courses (a 10-percentage point decline). When interpreting the heterogeneity results for students with differing Grade 9 academic performance, it is important to keep in mind that the completion of course credits in Grade 9 may itself be impacted by eligibility for Pathways. Our estimates for the impact of Pathways on the number of criminal charges and convictions in Table 2 (i.e. the intensive margin) are mostly statistically insignificant. The one exception is for the subgroup of students whose first language is English. For this group, we estimate that eligibility for Pathways reduced the number of charges by 1.67 or

36 percent and the number of convictions by 0.61 or 51 percent.[14]

Table 3 reports estimates from the subgroup analysis for the introduction of Pathways at the Rexdale/LH locations. For all subgroups and for all three dependent variables, we are unable to reject the null hypothesis that eligibility for the program affects criminal activity after accounting for multiple hypothesis testing.[15] There are several reasons (ex-ante) why the introduction of Pathways may have been less successful in Rexdale/LH compared with Regent Park. One possibility is that Pathways' programming was initially designed to cater to the local needs of Regent Park and that modifications to the program's design might yield benefits at other locations. Another possibility is that the delivery of the Pathways program may differ across locations. While the features of the program offered in Rexdale/LH are the same as those offered in Regent Park, some the staff at the latter location were involved with the design and initial introduction of Pathways and may have been more effective in delivering the program. Our data do not allow us to quantify the relative importance of these two or other potential reasons for the difference in results across the three Pathways sites. Given that these null effects are similar for all subgroups, the analysis in the rest of the paper will focus on the introduction of Pathways in Regent Park.

We also investigate what types of criminal offenses drive the result for the reduction in charges reported in Table 1. Specifically, we estimate Equation 1 separately for each of 32 COCs defined by Statistics Canada. Table 4 reports the results. Our estimates suggest that the reduction in the likelihood of ever being charged is primarily driven by six types of offenses: theft, break and enter, mischief, "Other Criminal Code traffic" offenses (includes hit-and-runs and dangerous operation of a vehicle), Youth Criminal Justice Act offenses, and "residual federal statute" offenses. Perhaps reassuringly, these offenses are among the common offenses that adolescents and young adults are charged with. Furthermore, coefficient

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[14]In additional analyses not presented reported here, we estimate the effects of Regent Park Pathways eligibility on whether an individual was ever convicted of a crime. Our estimates are negative here, but imprecise, so we cannot rule out a null result.

[15]The one exception is the estimate for the number of criminal convictions among students whose first language is English where the coefficient estimate is marginally statistically significant (i.e. the FDR-sharpened q-value is 0.05).

estimates for all six aforementioned offenses are statistically significant even after accounting for multiple hypothesis testing.

5.3   Sensitivity Analysis

Our baseline sample of Grade 9 students enrolling in high school between September 2000 and September 2006 includes only one pre-Pathways cohort. This limitation of our data prevents us from examining the trends in criminal activity between youth and young adults from Regent Park with those from individuals living in other TCH locations prior to Pathways' introduction. To address this, we restrict our sample to students attending schools in the legacy Metro Toronto School Board, before the city's amalgamation of its suburbs. While the advantage of studying this subgroup is that we have information for an additional cohort of students, the disadvantage is that our sample size decreases from 5,840 students to approximately 1,200 students.[16]

Figure 4 plots the normalized fraction of students ever charged with a crime for Regent Park and the average other pre-agglomeration public housing communities' cohorts from 1999 to 2008. Reassuringly, the figure shows that there is no statistically significant difference between the trends in pre-2001 outcomes for the other TCH communities and Regent Park. Furthermore, the drop in the fraction of individuals ever charged with a crime corroborates the findings in Figure 1, especially for the first four cohorts that were eligible for the Pathways program (and who were ages 29-32 by 2019). For this sub-sample, the estimate of the effect of eligibility for Pathways on the likelihood of ever being charged with a crime is -0.04 (standard error 0.03). While this estimate is not statistically significant at conventional levels, the standard errors are more than 50 percent larger than the standard errors in the comparable specification reported in Table 1, row 1. We conclude that while imprecise, the estimate in this sensitivity check does not contradict the main results reported earlier.

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[16]The Rexdale/LH communities as well as most other TCH comparison groups are dropped in this analysis as they are not in the downtown area of Toronto where the legacy Metro Toronto School Board operated.

6   Conclusion

This paper highlights a comprehensive high-school student support program that greatly reduces eligible students' likelihood of being charged with a crime. The program, Pathways to Education, has now been shown to improve academic outcomes (Oreopoulos et al., 2017), labour market outcomes (Lavecchia et al., 2020), and crime-related outcomes, a trifecta few other interventions aimed at adolescents have achieved. Policy-makers should be encouraged by these results to develop similarly comprehensive programs in their localities. However, they should proceed with at least some caution given that Pathways' impacts seem to be much smaller at its Rexdale and Lawrence Heights sites. Exploring why the Regent Park Pathways program reduces crime and the Rexdale/LH programs do not is a crucial question for future research.

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Table 1: Estimated Effects of Eligibility for Pathways on Crime Outcomes

	Ever Charged		# of Charges		# of Convictions	
	Pre-Pathways mean	ITT	Pre-Pathways mean	ITT	Pre-Pathways mean	ITT
Regent Park	0.19	-0.06	2.31	-0.37	0.50	-0.11
		[0.02]***		[0.43]		[0.11]
		{0.03}		{0.56}		{0.51}
Rexdale/LH	0.24	0.01	3.28	0.40	0.50	0.09
		[0.02]		[0.49]		[0.09]
		{0.72}		{0.58}		{0.52}

[a] Columns 2, 4 and 6 report the pre-Pathways means, randomly rounded due to Statistics Canada confidentiality requirements. Columns 3, 5 and 7 report the corresponding estimated intent-to-treat (ITT) effect for eligible students living in Regent Park post-Pathways (students who enrolled in grade 9 in the 2001–2 to 2006–7 academic years) and the Lawrence Heights (LH) and Rexdale sites for the 2007–8 and 2008–9 academic years.

[b] All regressions include cohort (year) fixed effects, housing project fixed effects, and the following control variables: age (in grade 9), female, immigrant, and English as a second language.

[c] Numbers in square brackets are clustered standard errors; numbers in curly brackets are q-values.

[d] Standard errors are clustered at the housing project level, and inference is based on the critical values of the t-distribution with 70 - 1 = 69 degrees of freedom.

[e] * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Estimated Effects of Regent Park's Pathways Program on Crime Outcomes for Various Subgroups

	Ever Charged		# of Charges		# of Convictions	
Subgroup	Pre-Pathways mean	ITT	Pre-Pathways mean	ITT	Pre-Pathways mean	ITT
Full sample	0.19	-0.06	2.31	-0.37	0.50	-0.11
		[0.02]***		[0.43]		[0.11]
		{0.03}		{0.56}		{0.51}
Males	0.33	-0.05	3.78	-0.17	.	-0.09
		[0.03]		[0.78]		[0.20]
		{0.37}		{0.86}		{0.74}
Females	0.13	-0.08	0.50	-0.42	.	-0.05
		[0.02]***		[0.22]*		[0.04]
		{0.00}		{0.18}		{0.44}
English 1st language	0.40	0.05	4.60	-1.67	1.20	-0.61
		[0.03]**		[0.61]***		[0.14]***
		{0.17}		{0.05}		{0.00}
English not 1st language	0.25	-0.11	1.08	-0.06	0.17	0.05
		[0.02]***		[0.47]		[0.12]
		{0.00}		{0.91}		{0.78}
Good grade 9 grades	0.18	-0.10	1.00	0.25	0.27	0.08
		[0.02]***		[0.33]		[0.09]
		{0.00}		{0.63}		{0.56}
Bad grade 9 grades	0.33	0.00	4.50	-1.26	1.00	-0.43
		[0.04]		[0.93]		[0.28]
		{0.93}		{0.38}		{0.31}

[a] Columns 2, 4, and 6 report the Pre-Pathways means, randomly rounded due to Statistics Canada confidentiality requirements. Some means are suppressed by Statistics Canada for confidentiality reasons. Columns 3, 5, and 7 report the corresponding estimated intent to treat (ITT) effect for eligible students living in Regent Park post-Pathways (students who enrolled in grade 9 in the 2001–2 to 2006–7 academic years).

[b] All regressions include cohort (year) fixed effects, housing project fixed effects, and the following control variables: age (in grade 9), female, immigrant, and English as a second language.

[c] Numbers in square brackets are clustered standard errors; numbers in curly brackets are q-values.

[d] Standard errors are clustered at the housing project level, and inference is based on the critical values of the t-distribution with 70 - 1 = 69 degrees of freedom.

[e] * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Estimated Effects of Rexdale/LH's Pathways Program on Crime Outcomes for Various Subgroups

Subgroup	Ever Charged		# of Charges		# of Convictions	
	Pre-Pathways mean	ITT	Pre-Pathways mean	ITT	Pre-Pathways mean	ITT
Full sample	0.24	0.01	3.28	0.40	0.50	0.09
		[0.02]		[0.49]		[0.09]
		{0.72}		{0.58}		{0.52}
Males	0.37	0.03	5.74	1.07	1.00	0.17
		[0.02]		[0.81]		[0.17]
		{0.27}		{0.38}		{0.50}
Females	0.11	-0.02	0.85	-0.36	0.04	0.02
		[0.03]		[0.17]**		[0.03]
		{0.67}		{0.15}		{0.71}
English 1st language	0.26	0.05	3.41	1.23	0.48	0.29
		[0.02]**		[0.91]		[0.11]***
		{0.10}		{0.38}		{0.05}
English not 1st language	0.21	-0.03	2.93	-0.39	0.55	-0.14
		[0.03]		[0.31]		[0.08]*
		{0.54}		{0.41}		{0.25}
Good grade 9 grades	0.20	-0.01	2.56	0.01	0.37	0.04
		[0.01]		[0.41]		[0.06]
		{0.63}		{0.96}		{0.69}
Bad grade 9 grades	0.36	0.07	5.14	1.18	0.86	0.10
		[0.04]**		[1.18]		[0.25]
		{0.17}		{0.51}		{0.78}

[a] Columns 2, 4, and 6 report the Pre-Pathways means, randomly rounded due to Statistics Canada confidentiality requirements. Some means are suppressed by Statistics Canada for confidentiality reasons. Columns 3, 5, and 7 report the corresponding estimated intent to treat (ITT) effect for eligible students living in Rexdale or Lawrence Heights post-Pathways (students who enrolled in grade 9 in the 2007–8 to 2008–9 academic years).

[b] All regressions include cohort (year) fixed effects, housing project fixed effects, and the following control variables: age (in grade 9), female, immigrant, and English as a second language.

[c] Numbers in square brackets are clustered standard errors; numbers in curly brackets are q-values.

[d] Standard errors are clustered at the housing project level, and inference is based on the critical values of the t-distribution with 70 - 1 = 69 degrees of freedom.

[e] * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Estimated Effects of Regent Park's Pathways Program on Likelihood of Being Charged with Each Type of Crime

Panel A: COCs 1-4

Homicide	Attempted murder	Robbery	Sexual assault
-0.00	0.01	-0.01	0.01
[0.00]	[0.00]*	[0.01]	[0.00]**
{0.52}	{0.23}	{0.68}	{0.11}

Panel B: COCs 5-8

Other sexual offenses	Major assault	Common assault	Uttering threats
0.00	-0.01	-0.02	-0.02
[0.00]	[0.01]	[0.01]	[0.01]**
{0.68}	{0.44}	{0.36}	{0.12}

Panel C: COCs 9-12

Criminal harassment	Other crimes against persons	Motor vehicle theft	Theft
-0.00	0.00	0.01	-0.03
[0.00]	[0.00]	[0.01]	[0.01]**
{0.52}	{0.64}	{0.26}	{0.06}

Panel D: COCs 13-16

Break and enter	Fraud	Mischief	Possess stolen property
-0.04	0.02	-0.03	0.01
[0.00]***	[0.01]**	[0.01]***	[0.01]
{0.00}	{0.07}	{0.00}	{0.70}

Panel E: COCs 17-20

Other property crimes	Fail to appear	Breach of probation	Unlawfully at large
-0.01	0.01	-0.01	0.00
[0.01]	[0.01]	[0.01]	[0.00]
{0.42}	{0.52}	{0.42}	{0.92}

Panel F: COCs 21-24

Fail to comply with order	Other administration justice	Weapons	Prostitution
-0.03	-0.01	-0.00	0.00
[0.01]*	[0.01]	[0.01]	[0.00]***
{0.21}	{0.52}	{0.94}	{0.00}

Panel G: COCs 25-28

Disturbing the peace	Residual Criminal Code	Impaired driving	Other Criminal Code traffic
-0.00	-0.01	-0.00	-0.02
[0.00]	[0.01]	[0.00]	[0.01]***
{0.52}	{0.39}	{0.71}	{0.00}

Panel H: COCs 29-32

Drug possession	Other drug offences	Youth Criminal Justice Act/Young Offenders Act	Residual federal statutes
-0.02	0.02	-0.01	-0.00
[0.01]	[0.01]**	[0.00]**	[0.00]**
{0.38}	{0.13}	{0.06}	{0.08}

[a] The top row of each cell reports the estimated intent to treat (ITT) effect for eligible students living in Regent Park post-Pathways (students who enrolled in grade 9 in the 2001–2 to 2006–7 academic years).

[b] All regressions include cohort (year) fixed effects, housing project fixed effects, and the following control variables: age (in grade 9), female, immigrant, and English as a second language.

[c] Numbers in square brackets are clustered standard errors; numbers in curly brackets are q-values.

[d] Standard errors are clustered at the housing project level, and inference is based on the critical values of the t-distribution with 70 - 1 = 69 degrees of freedom.

[e] * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 1: Normalized Fraction of Individuals Ever Charged with a Crime by Cohort and Housing Project
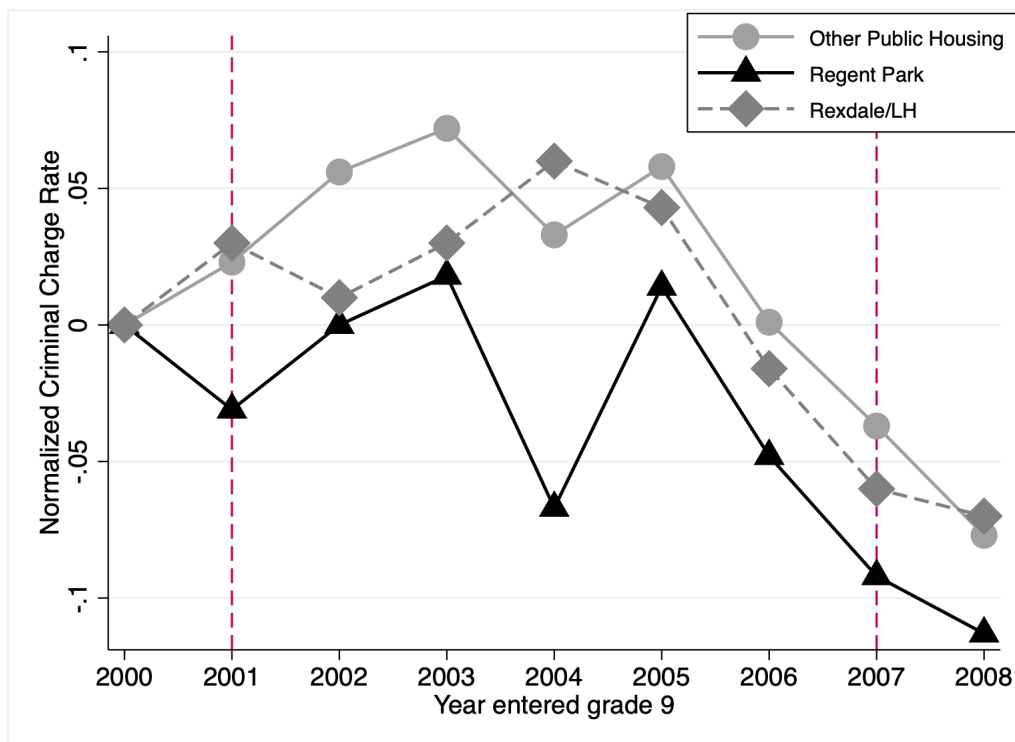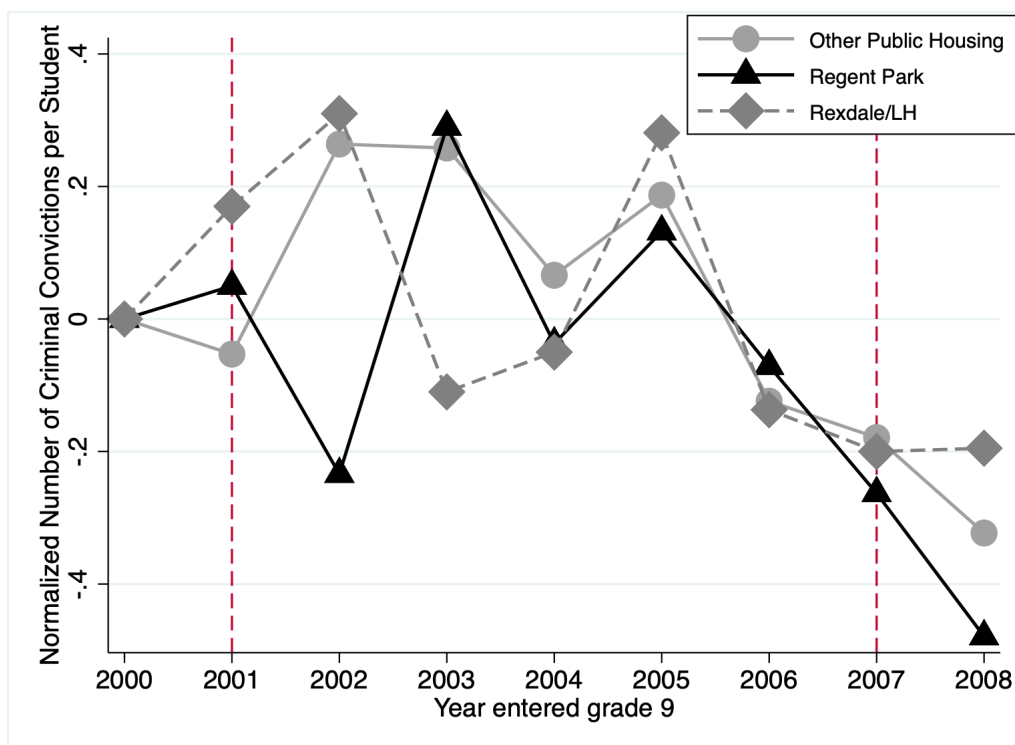

Note: This figure plots the normalized fraction of individuals ever charged with a crime by year entered Grade 9 for students from Regent Park, Rexdale/Lawrence Heights and Other Public Housing. The figure is constructed by regressing a binary variable equal to one if an individual was ever charged with a crime and zero otherwise on demographic characteristics and then saving the residuals from the regression. The residuals are then aggregated by neighbourhood and year entered Grade 9 and normalized relative to the values for the 2000 Grade 9 cohort. The first vertical dashed line indicates the cohort that was first eligible for Pathways at its Regent Park location. The second dashed line indicates the first cohort that was eligible for Pathways at its Rexdale and Lawrence Heights locations.

Figure 2: Normalized Number of Criminal Charges by Cohort and Housing Project
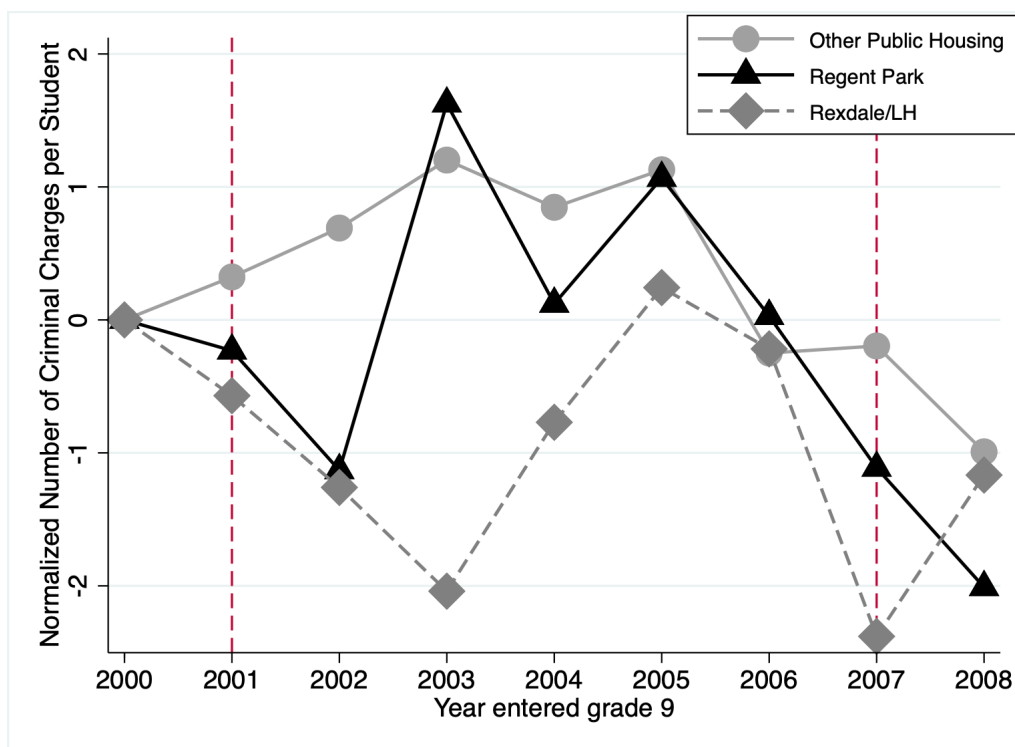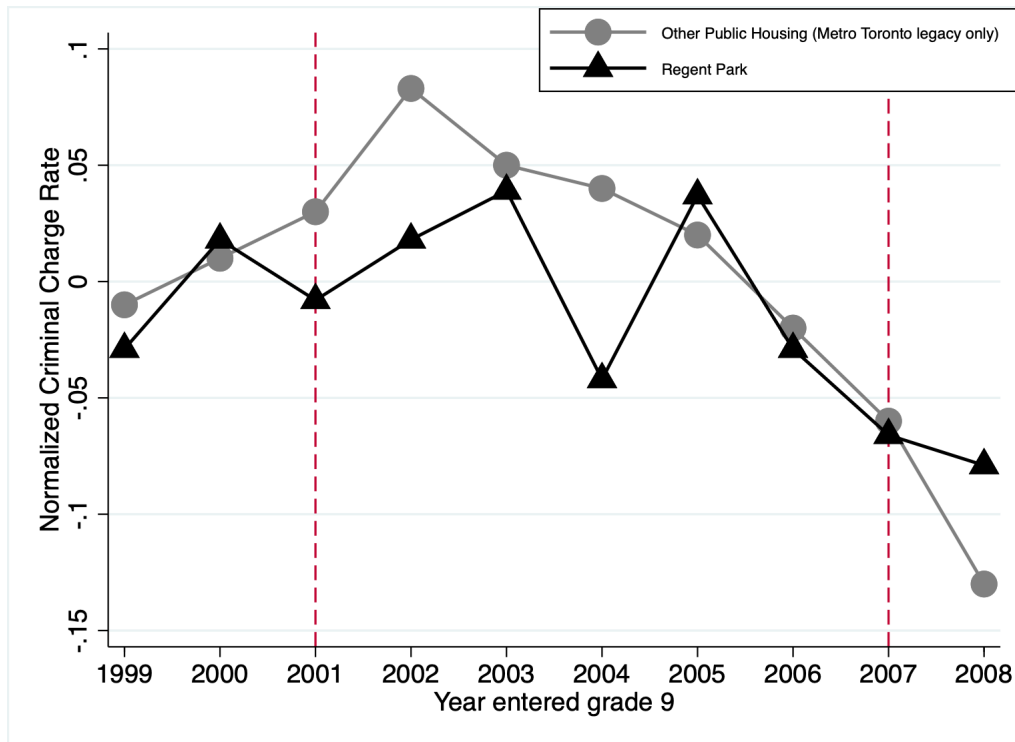

Note: This figure plots the normalized number of times an individual has been charged by year entered Grade 9 for students from Regent Park, Rexdale/Lawrence Heights and Other Public Housing. The figure is constructed by regressing the number of times an individual has been charged on demographic characteristics and then saving the residuals from the regression. The residuals are then aggregated by neighbourhood and year entered Grade 9 and normalized relative to the values for the 2000 Grade 9 cohort. The first vertical dashed line indicates the cohort that was first eligible for Pathways at its Regent Park location. The second dashed line indicates the first cohort that was eligible for Pathways at its Rexdale and Lawrence Heights locations.

Figure 3: Normalized Number of Criminal Convictions by Cohort and Housing Project

Note: This figure plots the normalized number of times an individual has been convicted of a criminal offense by year entered Grade 9 for students from Regent Park, Rexdale/Lawrence Heights and Other Public Housing. The figure is constructed by regressing the number of times an individual has been convicted on demographic characteristics and then saving the residuals from the regression. The residuals are then aggregated by neighbourhood and year entered Grade 9 and normalized relative to the values for the 2000 Grade 9 cohort. The first vertical dashed line indicates the cohort that was first eligible for Pathways at its Regent Park location. The second dashed line indicates the first cohort that was eligible for Pathways at its Rexdale and Lawrence Heights locations.

Figure 4: Normalized Fraction of Individuals Ever Charged with a Crime by Cohort and Housing Project Among 1999-2008 Grade 9 Students

Note: This figure plots the normalized fraction of individuals ever charged with a crime among 1999–2008 grade 9 students from Regent Park and other public housing projects in pre-agglomeration Toronto. This graph shows the criminal charge rate for students living in Toronto public housing who entered grade 9 between the 1999-2000 and 2008-9 academic years, normalized around the group mean rate between the 1999 and 2000 cohorts.