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The Dynamics and Measurement of High School Homelessness and Achievement Disparities

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There is no national consensus on how school districts calculate high school achievement disparities between students who experience homelessness and those who do not. Using administrative student-level data from a mid-sized public school district in the Southern United States, we show that commonly used ways of defining which students are considered homeless can yield markedly different estimates of the homelessness-housed student high school graduation gap. The key distinctions among homelessness definitions relate to how to classify homeless students who become housed and how to consider students who transfer out of the district or drop out of school. Eliminating housing insecurity-related achievement disparities necessitates understanding the link between homelessness and educational achievement; how districts quantify homelessness affects measured gaps.

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The Dynamics and Measurement of High School Homelessness and Achievement Disparities

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Abstract: There is no national consensus on how school districts calculate high school achievement disparities between students who experience homelessness and those who do not. Using administrative student-level data from a mid-sized public school district in the Southern United States, we show that commonly used ways of defining which students are considered homeless can yield markedly different estimates of the homelessness-housed student high school graduation gap. The key distinctions among homelessness definitions relate to how to classify homeless students who become housed and how to consider students who transfer out of the district or drop out of school. Eliminating housing insecurity-related achievement disparities necessitates understanding the link between homelessness and educational achievement; how districts quantify homelessness affects measured gaps.

Keywords: homelessness, high school, achievement disparities

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Are students who experience homelessness less likely than their housed peers to graduate high school and attend college? How do estimates of these links change when using different commonly used ways to identify who is homelessness? Using administrative student-level data over 12 years from a mid-sized public school district in the Southern United States, referred to as the *District,* we examine the dynamic patterns of student housing insecurity and estimate graduation and college going disparities between students who experience homelessness and those that do not. Our secondary school and transition to college focus is distinct from much of the homelessness-academic outcomes literature that largely concentrates on test scores of primary and middle school students. These studies generally find that homeless students tend to score lower on standardized tests than do housed students (Cowen, 2017; De Gregorio et al., 2020; Obradović et al., 2009; Rafferty et al., 2004). A separate set of studies investigates college students and generally finds that homeless college students face significant barriers related to affording college, meeting basic needs, and receiving housing services (e.g., Broton & Goldrick-Rab, 2018; Crutchfield, 2018; GAO, 2016; Skobba et al., 2018).

We first document the dynamic nature of homelessness among high school students. Homelessness is not a stable characteristic; rather, students can move in and out of experiencing it. Studies of other measures of material insufficiency recognize such dynamics as important; for example, researchers have attempted to understand patterns and consequences for children's being more likely to live in households that transition in and out of food insecurity rather than have persistent food insecurity across their whole lifetime (e.g., Hamersma & Kim, 2015; Rank & Hirschl, 2009). Understanding students' dynamic and diverse homelessness experiences can be important to create supports for housing insecure high school students. Such dynamics also matter because they contribute to differences in how states and researchers "count" homeless students

and calculate achievement gaps between homeless and housed students. We show that common approaches to defining homelessness can yield widely different estimates of homelessness-housed high school graduation disparities. Such differences can impede across-state comparisons that contribute to targeted and efficient policymaking and have implications for funding since the federal government targets funds to districts that have the most homeless students and largest achievement gaps (Cunningham et al., 2010).

Background & Context

Students who experience homelessness can face educational challenges. Homeless students often double up—i.e., share housing with another household due to economic hardship or related reason—which can shape students' educational experiences and cause absences through issues like intra-household conflicts, child-rearing responsibilities, lack of study space, and competing demands (Hallett, 2012; Pavlakis, 2018). Homeless students are more likely to move residences and transfer schools, both of which can reduce scholastic engagement, hinder participation in extracurricular activities, or lead students to miss opportunities such as dual-enrollment classes and college counseling (GAO, 2016; Cowen, 2017). Further, homelessness is commonly accompanied by poverty and food insecurity which can negatively affect academics and limit students' ability to afford postsecondary expenses (e.g., GAO, 2016; Harvey, 2020; Heflin, Darolia, & Kukla-Acevedo, 2020; Michelmore & Dynarski, 2017; Pilkauskas et al., 2014; Miller, 2011).

Housing insecurity and homelessness are difficult to measure in part because it is complicated to disentangle the deleterious effects of homelessness from other factors related to poverty and material insufficiency. Moreover, housing security is best characterized as existing on a spectrum ranging from secure—where a student has access to fixed, regular, and suitable

housing—to insecure, where housing is less stable, more variable, and less adequate; homelessness occurs at the severe insecurity end. This range presents difficulty in pinpointing students' places on a multifaceted scale, especially with incomplete information. For example, districts (including the data we use from the *District*) often capture only a dichotomous measure of homelessness and do not observe circumstances such as rent burden and overcrowding.

We focus on the temporal aspect of homelessness in this paper, which further impedes districts' ability to consistently measure homelessness (Aviles de Bradley, 2011; Hallett, 2012). Students can cross into and out of what is considered homelessness repeatedly, which is one reason scholars and practitioners characterize homelessness as an experience rather than a permanent condition (O'Flaherty, 2019). Students experiencing homelessness commonly transition back to being housed, although the barriers faced during homelessness—e.g., lack of resources and instability—often persist. The US Department of Education (ED) recognizes this phenomenon, requiring districts to continue providing services for the entire school year even if a homeless student becomes housed (NCHE, 2020).

This dynamism contributes to a lack of clear consensus on how to measure homelessness in high school. Consider three different definitions of homelessness based on common state practices (Low et al., 2017; NCHE, 2020) illustrated in Table 1. Students in categories A, B, C, and D completed all four years of high school, whereas students in categories E, F, and G dropped out before 12th grade. First, consider the *Ever Homeless* definition, which includes students who districts identify as homeless at any point in high school. In the table, this means that the graduation of students in categories A, B, C, E, and F are compared against students considered housed in categories D and G. Next, consider the *District*'s definition, *Last Status*, which is based on the final observed status of students, including those who dropped out. In this definition, graduation

of students in categories A, B, and E is compared against students considered housed in categories C, D, F, and G. In other words, students who were housed in 12th grade, but homeless in a prior grade (category C) are considered homeless in the *Ever Homeless* definition but considered housed in the *Last Status* definition. Similarly, students who dropped out before 12th grade, whose last status was housed, but were homeless at some point earlier in high school (category F), are considered homeless in the *Ever Homeless* definition but considered housed in the *Last Status* definition. Finally, consider the *12th Grade Status* definition – in this scenario, students who drop out before 12th grade are not included in the sample (categories E, F, and G). Relative to *Last Status* and *12th Grade Status*, *Ever Homeless* is the most inclusive in which students count as homeless.

Dynamics of High School Homelessness

Our analysis sample includes all roughly 21,300 students who entered 9th grade in the *District* from the 2007-08 to 2013-14 academic years and follows students for six years. About 2.1% of students in our sample are identified as being homeless at some point in their high school careers, which is close to national estimates of 2.3% of high school students experiencing homelessness in a given year (NCES, 2017). After 12th grade, we observe whether students graduated or enrolled in a postsecondary institution based on a National Student Clearinghouse match.

In Figure 1, we display the dynamics of high school homelessness among the 2.1% of students in our data experiencing homelessness at some point during high school. Starting at the far left of the graph is students' 9th grade status: by construction, every student is either homeless (46%) or housed (54%) to start the year. From the start of 9th to the start of 10th, 11th, and 12th grades (moving from left to right on the graph), students can belong in one of four mutually exclusive categories: continued to the next grade and is housed, continued to the next grade and is

homeless, dropped out, or transferred to another district. For these latter two categories, conceivably a student could return to school or transfer back in, but we never observe these actions in our data. For students that repeat grades (33% of ever homeless students), we use the last observed housing status.

Roughly half of the students experiencing homelessness each year become housed the following year. Homeless students who do not become housed the next grade have about an equal likelihood of still experiencing homelessness the next year, dropping out of school, or transferring to another district. Among students who experience homelessness in high school and stay in school for four years, only <1% of students are homeless all four years in high school, 3% are homeless 3 years, 16% are homeless 2 years, and 81% are homeless 1 year. Among those with two years of observed homelessness in high school, 89% experience in consecutive years, while 11% have a break of at least a year between recorded homelessness. Homeless students drop out or transfer at a higher rate than housed students. About 38% of the students that experience homelessness at some point in grades 9-11 drop out or transfer before 12th grade, as compared to about 17% of always housed students.

These observed dynamics of homelessness demonstrate the fluctuation in housing circumstances students experience as they transition in and out of observed homelessness over time in high school. Resultingly, how districts measure and consider previous experiences of homelessness can change which students count as homeless and the supports for which students qualify. For example, under the McKinney Vento Act, the federal government requires districts to provide homeless students resources such as transportation, expedited enrollment, tutoring, assistance with participating in school programs, and other academic supports and social services (Cunningham, et al., 2010).

Homelessness, High School Graduation, and College Going

We next consider how using the different ways to measure homelessness result in different estimates of the links between homelessness and high school graduation or college going within six years of starting high school. We separately estimate these outcomes, *Y*, for each student *i* as a linear function of homelessness, *H*:

$$Y_i = \alpha + \gamma H_i + \eta X_i + \varepsilon_i$$

Here, we use the three definitions described in Table 1 and estimate separate regressions for each definition. In some specifications, we control for observed student 9th grade characteristics in the *X*-vector: sex (male/female/other), race/ethnicity (Black/Asian/Hispanic/American Indian/Native Hawaiian/White/Multiple/Other), school attended, school year first enrolled in 9th grade, and zip code of the students' residence; we also include indicators for whether in high school the student ever qualified for free/reduced-price lunch, had an individual education plan, was identified as an English language learner, or was identified as gifted/talented. Our results should not be interpreted as estimates the effect of homelessness on outcomes; rather, they are useful to illustrate how homelessness definition differences affect estimates of homelessness-housed achievement disparities, while conditioning on factors that districts can reasonably collect. We exclude students who transfer out of the district from our analysis in this section and consider students who drop out as not graduating. Using a logit yields similar results that are available upon request.

We display estimates of the unconditional relationship between homelessness in high school and graduation in the topmost row of Figure 2, with bars showing 95% confidence intervals. The magnitude of the homelessness-housed graduation rate gap differs markedly depending on how homelessness is defined. Students considered homeless under the *Last Status* definition (triangle marker) have graduation rates that are 32 percentage points lower than their housed peers;

Ever Homeless students (circle marker) have graduation rates that are 17 percentage points lower, and *12th Grade Status* (square marker) students have graduation rates 4 percentage points lower (this last estimate is not statistically different than zero). These results mean that homeless student graduation rates are about 61%, 80%, and 96% of the housed student graduation rates for the *Last Status*, *Ever Homeless,* and *12th Grade Status* definitions, respectively. Complicating the interpretation of the magnitude across scenarios is that the composition, and thus graduation rate, of the comparison group differs under each definition (recall Table 1). Graduation estimates conditional on observed covariates are in the second row of the figure. Students experiencing homelessness in high school still have lower graduation rates than housed students, although the conditional gaps narrow, ranging from 2-26 percentage points.

In the bottom half of Figure 2, we present results from estimates of enrolling in college within six years after entering high school. In these estimates, we only include students who graduated high school. Estimated parameters are similar across scenarios. In the unconditional estimates in the third row, students who experience homelessness in high school enroll in college at a rate of about 20-24 percentage points lower than housed students. In estimates accounting for student characteristics (bottom row), the gap again narrows; students experiencing homelessness in high school enroll in college at a rate 5-9 percentage points lower than housed peers. In the *Last Status* and *12th Grade Status* scenarios, the 95% confidence interval includes zero.

Conclusion

Homeless students are less likely to graduate high school than consistently housing secure students. Yet, estimates of the magnitude of the disparity differ greatly depending on various commonly used definitions of which students "count" as homeless: our estimates range from a 4-32 percentage points in unconditional comparisons and 2-26 percentage points when taking into

account student characteristics that districts commonly record. The use of multiple definitions of homelessness complicates comparisons of homelessness-housed educational gaps across states and districts, impeding a full understanding of the homelessness problem across states and hindering research and practice that can help identify solutions and policies to support housing insecure students.

One way to calculate graduation disparities is to compare homeless students in 12th grade to housed students in 12th grade. This approach likely understates the severity of homelessness in districts because it does not consider students who drop out prior to 12th grade and homeless students are more likely to drop out than housed students. In the *District,* this approach misses about 75% of students who experienced homelessness and results in the smallest graduation gap.

Considering two other common, but more comprehensive ways to define homelessness illustrates a tradeoff between targeting students most at risk for not graduating from high school and being inclusive. The key distinction between these two definitions relates to how to consider students who were homeless but become housed: these students are considered homeless in an *Ever Homeless* approach but housed when recognizing *Last Status*. For this reason, *Ever Homeless* counts the most students as homeless. This can be important because homeless students can continue to face other forms of material insufficiency and stressors after they become housed, and not being homeless is not equivalent to being housing secure. The ED requires districts to continue providing services (e.g., transportation, academic assistance) to rehoused homeless students for the remainder of a school year in recognition of these challenges, but these supports do not persist in subsequent years.

Yet, our findings also suggest that while homeless students who transition to housed are likely to face greater challenges than always housed peers, these homeless-to-housed students are

potentially better poised to graduate than peers whose last observed status is homeless. These findings echo those of Cassidy (2020), who finds that homeless students' academic achievement can rebound after becoming rehoused. In this way, the *Last Status* definition may be best suited to identify those at most risk of severe negative academic outcomes, even though it is more restrictive than an approach that counts students that ever experience homelessness.

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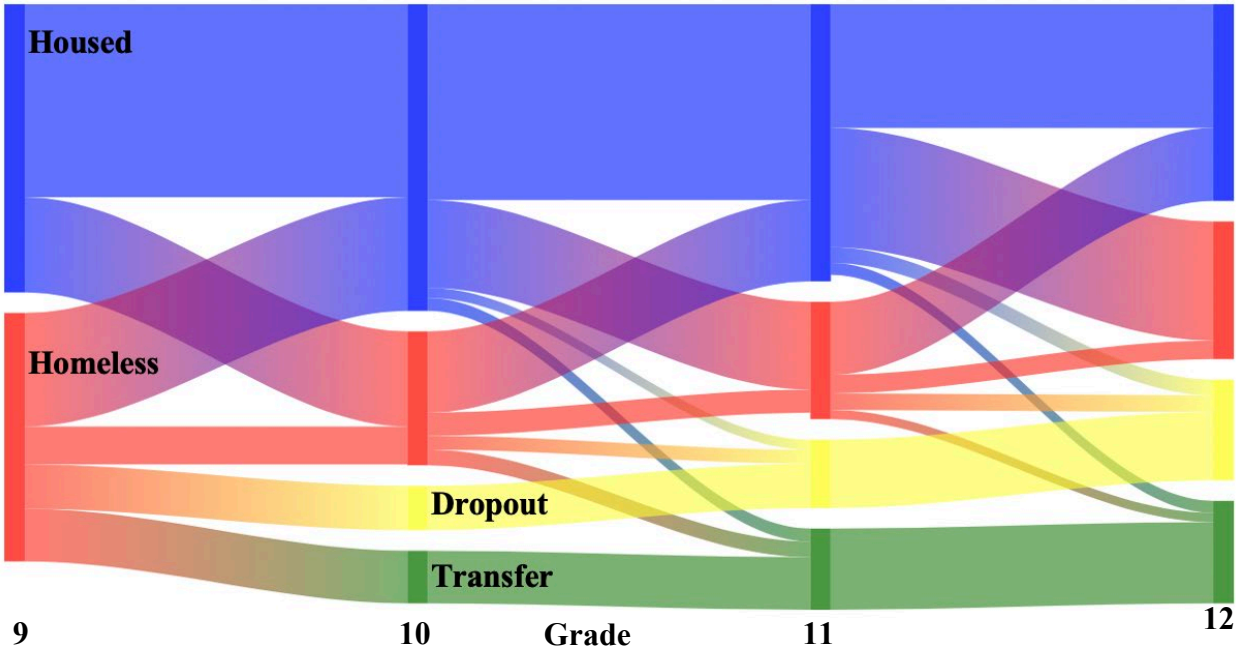
Table 1
Student Housing Status and Measuring Homelessness

Group	12th Grade Status	Ever Homeless pre-12th	Last Observed pre-12th Status	***Ever Homeless***	***Last Status***	***12th Grade Status***
A	Homeless	Yes	n/a	Homeless	Homeless	Homeless
B	Homeless	No	n/a	Homeless	Homeless	Homeless
C	Housed	Yes	n/a	Homeless	Housed	Housed
D	Housed	No	n/a	Housed	Housed	Housed
E	Not Enrolled	Yes	Homeless	Homeless	Homeless	Not in sample
F	Not Enrolled	Yes	Housed	Homeless	Housed	Not in sample
G	Not Enrolled	No	Housed	Housed	Housed	Not in sample
Homeless Student Graduation Rate				66%	51%	93%
Housed Student Graduation Rate				83%	83%	97%
Homeless Student College Going Rate				43%	47%	45%
Housed Student College Going Rate				67%	67%	67%

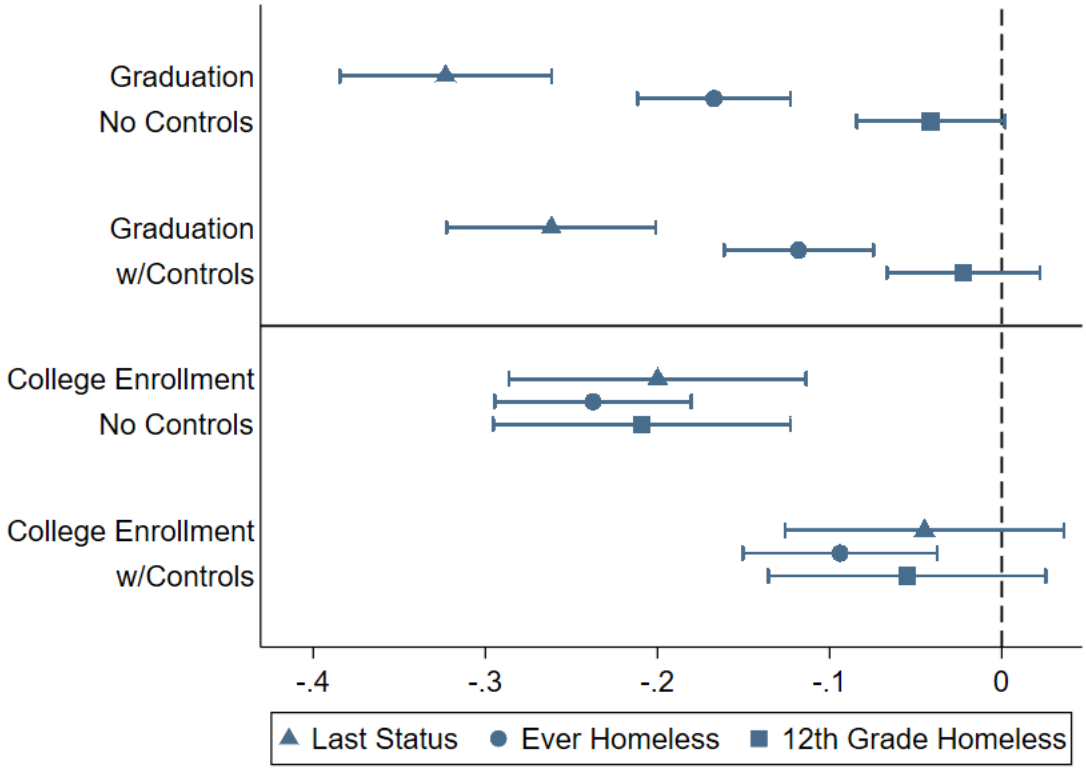
Note: We shade grey categories of students that are identified differently across definitions.

Figure 1
Dynamics of High School Homelessness among Students Homeless in High School



Notes: Figure shows the dynamics of homelessness for students observed in 9th grade in the *District* and experience homelessness at some point in grades 9-12. Every student in 9th grade is either homeless or housed. Size of bars is weighted by the proportion of students fitting the categories. Moving from left to right shows the share of students going into other categories between the two nodes. Blue nodes are students that are housed that grade; red nodes are students that are homeless that grade. Yellow and green nodes are for students that drop out or transfer, respectively, at some point between the grade before and that grade.

Figure 2
Estimates of Homelessness-Housed Gaps in High School Graduation and College Enrollment



Notes: Graph shows relationships between high school homelessness and high school graduation/college enrollment. Each line shows the relationship from a different estimation. Markers show the relationship with experiencing homelessness in that grade relative to students observed that grade not experiencing homelessness. Bars show 95% confidence intervals for robust standard errors for each respective marker. The outcome for the top panel is graduating from high school and for the bottom panel is enrolling in college within two years of leaving high school, taking a value of 1 if enrollment is observed and 0 otherwise. Controls include observed student 9th grade characteristics: sex (male/female/other), race/ethnicity (Black/Asian/Hispanic/American Indian/Native Hawaiian/White/Multiple/Other), school attended, school year the student entered 9th grade, and zip code of the students' listed residence. We also create four variables for whether the student in high school ever qualified for free or reduced-price lunch, had an individual education plan, identified as an English language learner, and identified as gifted and talented. Observations are student level for students observed in 9th grade and did not transfer to another school district during high school. Estimations for college enrollment further limit the sample to students observed graduating from high school. The number of observations are as follows: Graduation, Ever Homeless/Last Status – 21,319; Graduation, 12th Grade Homelessness – 17,750; College enrollment, Ever Homeless/Last Status – 17,590; College enrollment, 12 Grade Homelessness – 17,200. The number of observations are the same for both estimations with and without controls.