



# Transitioning Teacher Talent: An Ethnoracial Descriptive Portrait of the Paraprofessional-to-Teacher Pipeline in New York City Public Schools

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Districts nationwide seek to diversify the educator workforce, yet pathways for paraprofessionals—typically more ethnoracially and linguistically diverse than the general teacher pipeline—remain understudied. Using administrative data from New York City Public Schools (NYCPS), this study examines paraprofessionals' demographic, transition, and exit patterns. Between 2016–17 and 2023–24, the paraprofessional workforce grew substantially, and more new teachers had prior paraprofessional experience. Those advancing to teaching were more ethnoracially diverse and less likely to leave teaching in NYCPS compared to other teachers, especially when teaching in the same school that they served as a paraprofessional. Findings underscore the need for targeted support to strengthen both the retention of paraprofessionals and their success as classroom teachers when transitioning to new school environments.

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### **Biographical Sketches**

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**Abstract**

Districts nationwide seek to diversify the educator workforce, yet pathways for paraprofessionals—typically more ethnoracially and linguistically diverse than the general teacher pipeline—remain understudied. Using administrative data from New York City Public Schools (NYCPS), this study examines paraprofessionals’ demographic, transition, and exit patterns. Between 2016–17 and 2023–24, the paraprofessional workforce grew substantially, and more new teachers had prior paraprofessional experience. Those advancing to teaching were more ethnoracially diverse and less likely to leave teaching in NYCPS compared to other teachers, especially when teaching in the same school that they served as a paraprofessional. Findings underscore the need for targeted support to strengthen both the retention of paraprofessionals and their success as classroom teachers when transitioning to new school environments.

*Keywords:* Staff Development, Career Development, Teacher Characteristics, Retention, Race, Ethnicity, Descriptive Analysis, Regression Analysis

## Introduction

Developing and sustaining a robust pipeline of high-quality teachers is a critical concern for education policymakers and practitioners, given the significant influence of teacher quality, retention, and diversity on student outcomes. Decades of research demonstrates teachers profoundly shape student learning, behavior, and long-term life trajectories (e.g., Chetty et al., 2014a, 2014b), and that a more demographically representative teaching workforce benefits both student achievement and school culture (Gershenson et al., 2021; Grissom et al., 2015; Redding, 2019). Yet, many districts—especially those serving large proportions of low-income students, students of color, and English language learners—continue to face persistent challenges in recruiting and retaining teachers (Sutcher et al., 2019). High teacher turnover and chronic shortages threaten school stability and disproportionately affect historically marginalized communities (Rodriguez & Redding, 2025; Ronfeldt et al., 2013; Sorensen & Ladd, 2020).

These challenges have placed renewed attention on the paraprofessional workforce—teaching assistants and aides who often reflect the linguistic and cultural diversity of the students they serve (e.g., Gist, 2022; Gist et al., 2022). Nationally, about 6% of public school teachers are Black, 9% are Hispanic, and 2% are Asian, compared with 15%, 29%, and 5% of students, respectively (National Center for Education Statistics, 2023, 2024). In contrast, paraprofessionals are considerably more racially and linguistically diverse, prompting longstanding arguments that they represent an untapped resource for diversifying the teaching workforce (Dandy, 1998; Genzok, 1997; Villegas & Clewell, 1998).

Despite the potential of paraprofessionals transitioning into full-time teaching roles, research remains limited on the factors influencing their transition and their subsequent retention (Camp et al., 2024; Theobald et al., 2025). Using administrative data from New York City Public

Schools (NYCPS), this study examines who advances from paraprofessional to teacher roles, which characteristics predict these transitions, and how prior paraprofessional experience relates to teacher retention—including whether these patterns vary by teacher ethnoracial background and whether teachers remain in the same school in which they previously served as paraprofessionals. Investigating these forms of heterogeneity is critical, as transitioning to a teaching role within the same school may entail distinct challenges, and teachers' ethnoracial backgrounds may correspond with different forms of support or obstacles they encounter in maintaining their positions. Elucidating these dynamics is essential for informing policies and practices that promote a stable, equitable, and diverse teacher workforce.

### **Prior Literature on Paraprofessionals**

Paraprofessionals play a crucial role in supporting instruction and serving students, particularly for those receiving special education services (Aurora & Farkas, 2023; Bisht et al., 2021; Fisher & Pleasants, 2012). Research has documented how paraprofessionals' responsibilities have expanded over time to include instructional and administrative tasks, including individualized and small-group instruction, clerical work, behavior management, and family communication (Giangreco et al., 2010; Patterson, 2006). Despite their importance, the role of paraprofessionals often remains ambiguously defined, with substantial autonomy but limited guidance (Giangreco et al., 2010; Mason et al., 2021).

Prior studies have examined paraprofessional effectiveness, management, and teacher supervision, including in special education settings where most paraprofessionals work (Bisht et al., 2021; Giangreco et al., 2010; Jones & Bender, 1993; Mason et al., 2021; Theobald et al., 2025; Walker & Smith, 2015). Jones and Bender (1993) found limited evidence that paraprofessional utilization improved student outcomes, noting that prior studies relied heavily

on educator perceptions rather than empirical evidence. A recent study by Kaler et al. (2026) investigated paraprofessional turnover in Washington State on student test scores and found no statistically significant effect, suggesting their impact may be limited. Bisht et al. (2021) highlighted disparities in professional development, evaluation, and job security as compared to teachers. Moreover, while teachers are expected to supervise paraprofessionals, they rarely receive formal preparation, echoing previous research calling for clearer supervisory structures and collaborative training (Giangreco et al., 2010; Mason et al., 2021; French, 2001).

### **Research on the Paraprofessional-to-Teacher Pipeline**

The literature on paraprofessionals' transitions into teaching is limited but growing. Using nationwide data from 1999–2019, Bisht et al. (2021) documented rapid growth in the U.S. paraprofessional workforce. During these years, the workforce more than doubled in size and was more racially diverse and older than teachers, though roughly three-quarters lacked a bachelor's degree.

State-level studies provide further insight into paraprofessionals' transitions into teaching. Camp et al. (2024) analyzed Arkansas data (2013–2014 to 2021–2022) and found that about 6% of paraprofessionals became teachers the following year, while nearly 20% left the system entirely. White paraprofessionals were twice as likely to transition as their Black or Hispanic peers, even after controlling for educational attainment. These findings suggest that the paraprofessional-to-teacher pipeline may not currently advance workforce diversity; however, the study does not address post-COVID-19 outcomes nor examine Asian paraprofessionals as a separate racial/ethnic group due to low sample size. Moreover, some individual characteristics, such as age and years in the role are not controlled for, which may contribute to the findings. Theobald et al. (2025) examined the ethnoracial background of paraprofessionals as compared to

special education teachers in Washington State and found that they were more ethnoracially diverse, though still predominantly White (80% vs. 90%), with lower salaries, less experience, and higher rates of attrition (8–11% pre-2010, peaking at 23% in 2021–22). Transitions into teaching roles increased modestly over time but remained below 3%, with transitions of non-White paraprofessionals more common in urban and suburban schools.

### **Contextual Factors Predicting Role Transition and Turnover**

A few studies have explored the factors shaping paraprofessional mobility. Kaler and Theobald (2026) explored the demographic and professional profiles of paraprofessionals in Washington State who left the workforce and found that, while there were high turnover rates particularly among men, that salary increases could improve future retention efforts. A separate study involving focus groups with 62 multilingual paraprofessionals across multiple states revealed the academic, financial, and bureaucratic barriers for paraprofessionals in becoming teachers, as well as racialized and linguistic discrimination during credentialing (Connally et al., 2017). A case study by Chopra et al. (2024) suggested that multiple-level supports, including flexible coursework, financial stipends, mentorship, and family accommodations, could facilitate smoother transitions.

Prior research underscores the valuable experience paraprofessionals gain through diverse responsibilities; yet, the paraprofessional-to-teacher pipeline remains poorly understood, with limited quantitative evidence on the factors predicting exit, transition, and retention. Existing studies largely describe workforce demographics and mobility patterns in limited contexts, but give less attention to predictors that facilitate or hinder successful role transitions and long-term stability. Understanding these dynamics is essential to strengthening both the diversity and durability of the teacher workforce.

### **The New York City Public Schools Context**

NYCPS, the largest and one of the most racially and linguistically diverse U.S. public school districts, provides a compelling context for understanding paraprofessional career pathways. In 2023–24, it served nearly one million students across 32 community school districts (CSDs) and a citywide specialized district (CSD 75) for students with moderate to severe disabilities. The student body was 42.2% Hispanic, 19.5% Black, 18.7% Asian, and 16.2% White; 73.5% were economically disadvantaged, 21.6% had an identified disability, and 16.3% were English Language Learners (New York City Public Schools, n.d.–a). Serving more students than the public education systems of 36 states (National Center for Education Statistics, 2022), NYCPS faces both substantial workforce needs and opportunities for innovative career pipelines.

NYCPS employs roughly 70,000 teachers and maintains a racially diverse teaching force, yet continues to experience shortages in key subjects and a persistent demographic gap between teachers and students (Rodriguez & Flack, In Press; Rodriguez et al., 2026). These shortages intensified following COVID-19, increasing reliance on substitutes and administrators to fill vacancies. In response, NYCPS prioritizes recruitment in high-need fields—including early childhood, bilingual/ESL, STEM, and special education—and invests in programs that enable paraprofessionals to earn teaching credentials and transition into full-time roles (New York City Public Schools, n.d.–b).

NYCPS offers multiple pathways for paraprofessionals to pursue teacher certification. Programs such as the Career Training Program (CTP) and Bilingual Pupil Services (BPS) provide tuition assistance, mentorship, and exam preparation through CUNY. Additional supports include the Educate to Liberate Paraprofessionals Grant at Medgar Evers College and the NYC Men Teach initiative, a collaboration between NYCPS, CUNY, and the Mayor’s Office

to diversify the teaching workforce. For paraprofessionals with bachelor's degrees, alternative certification routes—such as the NYC Teaching Collaborative, NYC Teaching Fellows, and Jose P. Graduate Scholarship Program—expand access to teaching roles in critical shortage areas.

With NYCPS preparing to meet a state-mandated class-size reduction by 2028, demand for qualified educators is expected to grow. Within this evolving policy landscape, the paraprofessional-to-teacher pathway offers particular promise for addressing staffing shortages while enhancing workforce diversity and stability across New York City schools.

### **Data**

This study draws on NYCPS administrative data, linking annual human resources, staffing, and school-level files to examine paraprofessionals' career trajectories and their transitions into and retention within teaching roles. The analytic dataset spans the 2016–17 through 2023–24 school years and includes all district-run schools, including CSD 75. Summary descriptives for paraprofessional and teacher samples are provided in Appendix Tables A.1 and A.2, including all characteristics used in analyses.

Individual-level records include demographic, educational, and employment information. Key covariates are race/ethnicity, age, gender, highest degree attained, total years of experience, and assignment to special or bilingual education roles.<sup>1</sup> Longitudinal employment histories identify transitions from paraprofessional to teacher roles, exits from NYCPS, and employment in CSD 75.

School-level data were merged from annual enrollment and staffing files to capture organizational and compositional features of each school-year, including grade configuration, career technical or transfer school status, total enrollment, pupil–teacher ratio, and attendance rate. Student-level aggregates include racial/ethnic and gender composition, and proportions of

students in poverty, in temporary housing, with non-English home languages, limited English proficiency, special education services, newly transferred, or retained in grade.

Staff composition and mobility measures include teacher racial/ethnic and gender composition, average years of experience, proportion holding advanced degrees, assignment to special or bilingual education roles, part-time or substitute status, prior-year departures, and current-year hires. Principal-level variables include race/ethnicity, gender, years of experience, and new assignment status.<sup>2</sup> Additional variables capture the number of assistant principals, guidance counselors, social workers, psychologists, and paraprofessionals. All models include year fixed effects to account for system-wide changes in staffing policies, economic conditions, and district initiatives.

### **Methods**

The main analyses proceed in two parts. First, we examine paraprofessionals' annual employment outcomes using multinomial logistic regression to model the relative risk of transitioning into a full-time teaching position or exiting NYCPS employment altogether with respect to remaining in a paraprofessional role. Second, we estimate binary logistic regression models among teachers to assess whether those with prior paraprofessional experience were more likely to leave teaching the following year compared with teachers without such experience. All models include the individual-, school-, and leadership-level covariates described above and adjust for year fixed effects. Standard errors are clustered at the school level to account for within-school correlation over time.

To model paraprofessional career transitions, we estimate a multinomial model of following form:

$$\log\left(\frac{P(Y_{ist+1}=k)}{P(Y_{ist+1}=0)}\right) = \beta_{0k} + \beta_{1k}X_{ist} + \beta_{2k}S_{st} + \gamma_{tk} + \varepsilon_{ist,k}, \quad (1)$$

for each  $k \neq 0$ . Here,  $Y_{ist+1}$  denotes the employment outcome for paraprofessional  $i$  in school  $s$  during the following school year  $t+1$ , taking on values for remaining, transitioning to a teacher role, or exiting NYCPS (with “remaining” as the reference category  $k = 0$ ).<sup>3</sup> The vector  $X_{ist}$  represents paraprofessional-level characteristics such as race/ethnicity, gender, age, years of experience in the paraprofessional role in NYCPS, and employment within CSD 75.<sup>4</sup> The term  $S_{st}$  captures school-level demographic and compositional features, and  $\gamma_{tj}$  denotes year fixed effects. Standard errors are clustered at the school level to account for within-school correlation in unobserved characteristics over time.

To assess heterogeneity by ethnoracial background, we conduct subgroup analyses estimating separate multinomial models for Black and Hispanic paraprofessionals. This approach allows us to examine whether the factors associated with transitioning into teaching or exiting NYCPS differ across ethnoracial groups underrepresented in the teaching profession.<sup>5</sup> The estimated coefficients are converted to relative risk ratios for ease of interpretation, representing the relative risk of transitioning or exiting compared with remaining in the paraprofessional role.

To assess whether prior paraprofessional experience predicts teacher retention, we estimate a logistic regression of the form:

$$\log\left(\frac{P(Y_{ist+1}=1)}{1-P(Y_{ist+1}=1)}\right) = \alpha_{0j} + \alpha_1 \text{PriorPara}_i + \alpha_2 X_{ist} + \alpha_3 S_{st} + \gamma_t + \varepsilon_{ist}, \quad (2)$$

where  $Y_{ist+1} = 1$  indicates that teacher  $i$  left their teaching position by the following school year, and  $\text{PriorPara}_i$  is an indicator for whether the teacher previously served as a paraprofessional.

In an additional analysis, we disaggregate prior paraprofessional experience based on whether it

occurred in the same school where the teacher currently serves or in a different school. To explore heterogeneity by race/ethnicity, we interact these indicators with teacher race/ethnicity, allowing the association between prior paraprofessional experience and attrition to vary across groups. This approach helps assess whether entering teaching through the paraprofessional pipeline—and whether that entry occurred in the same or a different school—differentially predicts career persistence across ethnoracial groups.

Covariates, fixed effects, and clustered standard errors align with those used in model (1).<sup>6</sup> The estimated coefficients are reported as odds ratios, and average marginal effects are used to facilitate interpretation of differences in predicted probabilities of attrition between teachers with and without paraprofessional experience.

## **Results**

### **Trends in Paraprofessional Employment and Demographics**

Table 1 and Appendix Figures A1–A7 summarize three areas: paraprofessionals' transitions into teaching, differences between paraprofessional and teacher workforces, and how these patterns changed over time. About 7.4% of paraprofessionals employed between 2016–17 and 2023–24 became teachers, and 57.4% of them stayed in the same school. Among those who transitioned, 64.5% moved into special education roles, even though only about 30% of the teacher workforce teaches special education (Table A.2). Across all teachers, 2.7% previously worked as paraprofessionals, rising to 3.7% in the most recent year. The share of new teachers with paraprofessional experience increased steadily—from 0.2% in 2016–17 to 14.3% in 2023–24 (Appendix Figure A.1)—and was particularly high in CSD 75 and schools with combined grade configurations (Appendix Figure A.2). Paraprofessionals who exited and later

returned as teachers typically transitioned within a year and remained in teaching roles for just over two years on average.

Several differences emerge when comparing paraprofessionals and teachers. Paraprofessionals were less likely to be male (19% vs. 23%), slightly older on average (43.7 vs. 41.3 years), and had fewer years of experience (6.7 vs. 10 years). Nearly one-third worked in CSD 75, compared with under 10% of teachers, reflecting their concentration in special education. Those who later became teachers were younger (35.1 years) and had fewer years of paraprofessional experience (4.6 years). Appendix Figures A3–A7 show how these demographic and experience patterns changed over time.

Paraprofessionals were also more ethnoracially diverse and more closely aligned with NYCPS student demographics. While 53.5% of teachers were White, only 25% of paraprofessionals were; Black and Hispanic paraprofessionals made up 24.9% and 34.0% of the workforce, compared with 16.2% and 17.8% of teachers. Figure 1 plots (A) and (B) show a modest increase in the share of teachers of color (42.1% to 47.8%), while the share of paraprofessionals of color remained high and stable at 75%. Although overall diversity among paraprofessionals held steady, composition shifted slightly, with increases in Asian and other ethnoracial groups and small declines among Black and Hispanic individuals.

These patterns point to a potential pathway for diversifying the teacher workforce. Among paraprofessionals who became teachers, a majority were Black (22.5%) or Hispanic (27.8%), slightly above their representation in the overall paraprofessional workforce, while Asian paraprofessionals transitioned at lower rates (5% vs. 8%). Figure 1 plot (C) shows that the ethnoracial composition of transitioning paraprofessionals shifted over time, with rising shares identifying as Hispanic, Asian, or other ethnoracial backgrounds between 2016–17 and 2023–24.

### **Predictors of Paraprofessional Transition to Full-Time Teaching**

To identify which individual- and school-level factors predict paraprofessionals' transitions into teaching roles or exits from NYCPS, we estimate multinomial logistic regression models (Table 2). We first focus on predictors of transitions into full-time teaching. As Appendix Figure A.8 shows, the raw percentage of paraprofessionals who became teachers rose after the pandemic: transition rates doubled overall (1.3% in 2018–19 to 2.5% in 2020–21) and roughly tripled for Black, Hispanic, and other racially minoritized paraprofessionals. However, once individual and school characteristics are accounted for, these patterns shift. Table 2 column (1a) shows that Hispanic, Asian, and paraprofessionals of other ethn racial backgrounds have a lower relative risk of transitioning than White paraprofessionals: 17.1% lower for Hispanic ( $p < 0.01$ ), 26.8% lower for Asian ( $p < 0.01$ ), and 16.4% lower for other ethn racial groups ( $p < 0.05$ ). Black paraprofessionals show a 8.4% lower relative risk, though not statistically significant.

Age and experience also predict transition. Younger paraprofessionals are more likely to become teachers: each additional year of age corresponds to a 6.4% lower relative risk of transitioning ( $p < 0.001$ ). Paraprofessionals are more likely to transition into teaching roles the following year as their experience increased, with those having 2–3 years of experience are twice as likely, 4–10 years nearly four times as likely, and 11–20 years more than twice as likely to make the transition, highlighting mid-career staff as particularly poised for teaching roles. Among Black and Hispanic paraprofessionals (Table 2, columns 2a and 3a), older age is associated with a reduced likelihood of transitioning to teaching while additional experience is associated with an increased likelihood of transitioning, patterns similar to the overall sample though slightly smaller in magnitude for Black paraprofessionals.

Gender is also a significant predictor of transitioning into teaching. Overall, being male is associated with a 18.9% lower relative risk of transitioning ( $p < 0.001$ ). Among Black and Hispanic paraprofessionals, this gap is larger: Black males have a 43.3% lower relative risk ( $p < 0.001$ ) and Hispanic males a 21.1% ( $p < 0.01$ ) lower risk compared to women in their respective groups.

Because transition opportunities are shaped by school context, we also examine school-level predictors. Among all paraprofessionals, transitions are more likely in career and technical schools and in schools with higher shares of Black, Hispanic, and teachers from other racial/ethnic backgrounds. For Black paraprofessionals, transitions are more common in schools with higher shares of students in poverty and less likely to occur in larger schools. Additionally, Black paraprofessionals have a lower likelihood of transitioning in schools with higher percentages of newly transferred or retained students and in schools with higher percentages of female teachers, possibly reflecting organizational complexity or instability that limits advancement into teaching roles. Among Hispanic paraprofessionals, transitions are less likely in schools with a guidance counselor.

### **Predictors of Exit Patterns of Paraprofessionals**

Similar to transitions into teaching roles, Figure A.8 summarizes exit trends between 2016–17 and 2022–23, showing a pandemic-related dip followed by a sharp spike in 2020–21. Exit rates rose from 8.3% to 13.2% for paraprofessionals overall and are slightly more pronounced for Black paraprofessionals, whose rates increased from 8.8% to 14.1% between 2018–19 and 2020–21. Although exit rates declined after 2020–21, they remained above pre-pandemic levels across all groups. Figure A.9 further shows that this pattern is not unique to

paraprofessionals: teachers experienced a similar spike in exits during 2020–21 before rates fell in subsequent years.

Building on these descriptive trends, we next examined predictors of paraprofessionals' likelihood of exiting NYCPS—Table 2 columns (1b), (2b), and (3b). Relative to White paraprofessionals, Asian paraprofessionals have a 26.8% lower relative risk of exiting NYCPS ( $p < 0.001$ )—comparable to their risk of transitioning into a teaching role—and paraprofessionals of other ethnoracial backgrounds have a 8.5% lower relative risk of exiting compared to White paraprofessionals ( $p < 0.05$ ). In contrast, male paraprofessionals have an 19.3% higher relative risk of exiting ( $p < 0.001$ ), a pattern consistent among Black male paraprofessionals (16.3%,  $p < 0.001$ ) and Hispanic male paraprofessionals (18.6%,  $p < 0.001$ ), suggesting stable gender differences in exit rates across ethnoracial groups.

While age is associated with a lower likelihood of transitioning into teaching—Table 2 column (1a)—it significantly predicts increased risk of exit among paraprofessionals, both overall and in particular among Black and Hispanic subgroups. Years of experience, however, is associated with higher exit risk within the 2-3 year range or beyond 20 years among the general paraprofessional pool, but only for those with over 20 years among Black and Hispanic paraprofessionals.

School-level factors also influenced exit risk. A higher pupil–teacher ratio is associated with a lower relative risk of exiting in the following year—2.3% among all paraprofessionals ( $p < 0.01$ ) and 3.8% among Black paraprofessionals ( $p < 0.01$ ). For all paraprofessionals, exit risk is higher in schools with larger shares of Hispanic students or higher percentages of Black teachers, and lower in schools with more newly transferred students and higher student attendance rates. Additionally, greater paraprofessional staffing and the presence of multiple

social workers are linked to reduced exit risk, suggesting that robust staffing support may buffer against paraprofessional turnover.

For Black paraprofessionals, exit risk is higher in schools with higher student enrollment and more teachers from diverse racial/ethnic backgrounds, and lower in schools with higher share of students in temporary housing, higher attendance rates, more bilingual education teachers, and more paraprofessional staff—patterns that point to the stabilizing role of supportive instructional and staffing environments. Among Hispanic paraprofessionals, exit risk is lower in schools with higher percentages of newly transferred or retained students. Notably, some of these associations are counterintuitive and may reflect omitted variable bias, indicating that other unobserved school- or contextual factors may be influencing retention.

### **Exit Patterns of Teachers with Previous Paraprofessional Experience**

Teachers with prior paraprofessional experience exhibit lower exit rates than both teachers overall and the paraprofessional workforce (Appendix Figure A.9). These patterns persist after adjusting for observable individual- and school-level characteristics, as well as year-specific fluctuations in teacher exit patterns.

Table 3 reports logistic regression estimates (odds ratios) of the likelihood that teachers are no longer in a teaching role in NYCPS in the following year (i.e., either exiting the system or transitioning to a non-teaching role).<sup>7</sup> Column (1) shows that Black, Hispanic, Asian, and other racially minoritized teachers have lower odds of leaving compared to White teachers. Prior paraprofessional experience is associated with 41.6% lower odds of exiting ( $p < 0.001$ ), suggesting that teachers who enter through paraprofessional pathways are less likely to leave the teaching profession in NYCPS than their peers. Moreover, we find that the overall association of

prior paraprofessional experience does not meaningfully vary by teachers' race/ethnicity—Table 3 column (2).

School context, however, shapes differential attrition patterns among teachers with prior paraprofessional experience. Column (3) shows that teachers who transition into teaching roles in the same school where they previously served as paraprofessionals have 49.6% lower odds of leaving by the following school year ( $p < 0.001$ ). When we include an indicator for prior paraprofessional experience in the same school, the main coefficient for prior paraprofessional experience now reflects teachers working in a different school from where they served as a paraprofessional; this group is estimated to have 33.2% lower odds of exiting ( $p < 0.001$ ) compared to teachers with no paraprofessional experience. Notably, teachers who work in the same school where they previously served as paraprofessionals have a significantly lower probability of exiting teaching than those who work in a different school from where they previously served as a paraprofessional ( $p = 0.0098$ ).<sup>8</sup>

Finally, we examine how prior paraprofessional experience—both within the same school and in a different school—interacts with teachers' racial/ethnic backgrounds. Results appear in Table 3 column (4) and Figure 2, which shows predicted probabilities of leaving the teaching profession in NYCPS with covariates held at their means. The predicted probability of leaving teaching in NYCPS is approximately 39-47% lower for White teachers with paraprofessional experience and 56-75% lower for Asian teachers, relative to those without paraprofessional experience.<sup>9</sup> However, among White and Asian teachers, differences in exit probabilities based on whether paraprofessional experience was in the same versus a different school are not statistically significant. Among Black teachers, the predicted probability of leaving is approximately 35% lower for those with prior paraprofessional experience in a different school

and 59% lower for those with paraprofessional experience in the same school—this difference by school context is statistically significant ( $p = 0.020$ ). For Hispanic teachers and those of other racial/ethnic backgrounds, the predicted probability of leaving is significantly lower only among those with same-school paraprofessional experience (37% lower for Hispanic teachers and 67% for teachers of other ethnoracial backgrounds), with no statistically significant difference observed for those with experience in a different school. These patterns underscore that retention of teachers in the profession is jointly shaped by prior paraprofessional experience, school assignment, and racial/ethnic background.

### **Discussion**

This study examines the transition of paraprofessionals into teaching roles in NYCPS, the factors predicting these transitions, and the relationship between prior paraprofessional experience and teacher retention, with attention to heterogeneity by race/ethnicity and school assignment. Between 2016–17 and 2023–24, the share of teachers with prior paraprofessional experience increased steadily, with higher transition rates among Hispanic and Black paraprofessionals. While these findings differ from prior state-level studies (Camp et al., 2024; Theobald et al., 2025), we find that the higher transition rates are largely explained by differences in individual characteristics—particularly age. Because Black and Hispanic paraprofessionals tend to be younger, and younger paraprofessionals are more likely to move into teaching roles, these groups appear more likely to transition when age is not accounted for.

While previous research noted higher attrition among paraprofessionals compared to teachers (Theobald et al., 2025), we find that retention patterns among teachers with prior paraprofessional experience reveal important nuances. Prior experience is associated with substantially lower odds of leaving the teaching profession in NYCPS—this retention advantage

is more pronounced for those who transition in the same school, suggesting that continuity in school context plays a key role in promoting retention.

At the same time, important heterogeneity emerges across racial/ethnic groups. While White and Asian teachers benefit from prior paraprofessional experience regardless of school context, Black, Hispanic, and other racially minoritized teachers experience stronger retention benefits when that experience occurs within the same school. These findings underscore that, although paraprofessional pathways broadly support teacher retention, the extent of these benefits is shaped by the interaction of school context and racial/ethnic background. Because most paraprofessionals transition within the same school, these dynamics have broad implications for workforce stability.

School-level context also plays a critical role in both transitions and exits. Factors such as pupil-teacher ratio, student composition, and support staff significantly predict paraprofessional transitions and exits. Lower pupil-teacher ratios were associated with increased exit risk, possibly reflecting unobserved factors such as greater support in larger classrooms in the presence of multiple staff members. This finding is relevant in light of New York City's upcoming class size reduction law, underscoring the need to consider workforce dynamics when implementing structural reforms.

The study has several limitations. We do not incorporate school climate measures or classroom-level staffing patterns—such as the presence of multiple teachers or paraprofessionals—which may influence transitions and retention. Additionally, unobserved factors at the school or district level may contribute to selection into teaching roles and career decisions. Despite these limitations, the study provides robust evidence on how individual

characteristics, school context, and racial/ethnic background shape paraprofessional-to-teacher pathways.

### **Policy and Practice Implications**

The findings have several implications for education policy and practice. First, while many paraprofessionals may seek pathways into teaching, it is essential to acknowledge that not all paraprofessionals aspire to become teachers, and their continued presence is critical in supporting diverse student needs. As previous research has recommended (e.g., Genzuk, 1997; Gist, 2022; Gist et al., 2022), policies should facilitate transitions into teaching roles for those interested through scholarships, mentorship, and clear career pathways. Targeted recruitment strategies could also enhance workforce diversity, particularly for underrepresented groups such as Asian paraprofessionals. Programs such as NYC Men Teach—and its Asian American educator affinity group (AATEND)—offer potential frameworks for such efforts.

Second, retention strategies must address both paraprofessional and teacher workforce stability. Improving job satisfaction, career development opportunities, and workplace conditions can reduce attrition (e.g., Chopra et al., 2024; Connally et al., 2017). Our findings indicate that most paraprofessionals who transition remain in the same school and are less likely to exit than those who change schools, underscoring that continuity in school context may support smoother role transitions and stronger retention. At the same time, supports such as onboarding, mentoring, and leadership training remain important for successful transitions (Ernst-Slavit et al., 2022; Worthen et al., 2022).

Third, structural and contextual factors, such as class size, should be considered in policy design. Our analyses indicate that lower pupil-teacher ratios are associated with higher exit risk, suggesting that class size reductions could unintentionally affect retention and transitions without

additional supports. As NYCPS implements the class size reduction law, policymakers should consider how such changes intersect with workforce dynamics.

### **Future Research Directions**

Future research should investigate the long-term career trajectories of paraprofessionals, including those who remain in support roles. Mixed-method approaches could help clarify mechanisms underlying retention benefits- particularly same-school transitions- and variation across racial/ethnic groups. Additionally, examining the impact of paraprofessional and teacher workforce diversity and stability on student and schooling outcomes would help clarify broader benefits (Aurora & Farkas, 2022; Gregori et al., 2022; Jones et al., 2021). Finally, rigorous evaluations of programs supporting paraprofessional transitions will be critical for refining policies and practices to enhance both retention and workforce diversity.

### Notes

- 1 Information on degree attainment and on assignment to special or bilingual education roles is available for teachers but not for paraprofessionals.
- 2 We do not include principal degree attainment as a control variable, as all principals in the sample have credentials beyond a master's degree.
- 3 We exclude paraprofessionals who transitioned into non-teaching roles, as this group is small (387 individuals, or 0.24% of the analytic sample). Including them as a separate outcome caused model non-convergence. Sensitivity analyses collapsing these cases into the "exited NYCPS" category (interpreted as not remaining in the system as either a paraprofessional or teacher) yield qualitatively similar results, which are available upon request.
- 4 To address potential nonlinearity, years of experience is specified as a series of categorical indicators rather than a continuous variable for all regression models, with categories for less than 2 years of experience (excluded reference group), 2-3 years, 4-10 years, 11-20 years, and more than 20 years.
- 5 Subgroup analyses for Asian and other extremely underrepresented ethnoracial groups (i.e., non-White, non-Black, non-Hispanic) were not feasible, as small sample sizes and low transition rates for these subgroups resulted in model non-convergence.
- 6 Models for teacher departure from the teaching profession (equation 2) control for years of experience as a teacher in lieu of years of experience as a paraprofessional, which is similarly categorized to what we describe in note # 4. Models also control for bilingual

and/or special education assignment and degree attainment; comparable data were unavailable for paraprofessionals, so these factors are not included as covariates in analyses of the paraprofessional sample (equation 1).

- 7 Results of supplemental analyses modeling disaggregated turnover events—including leaving NYCPS, transitioning into a non-teaching role, and leaving the school in the following school year—are presented in appendix Table A.3. Overall, these results are qualitatively similar to those reported in the main analysis. Teachers with prior paraprofessional experience are less likely to exit NYCPS as well as their school compared to teachers without paraprofessional experience. Notably, the likelihood of leaving NYCPS is significantly lower for teachers whose paraprofessional experience was in the same school compared with those whose experience was in a different school ( $p = 0.0007$ ). In contrast, having prior paraprofessional experience is associated with an increased likelihood of transitioning to a non-teaching role compared with teachers without paraprofessional experience; this difference does not significantly vary based on whether the prior paraprofessional experience was in the same school or a different school from where the teacher currently serves.
- 8 p-value from a Wald test of equality of coefficients comparing same-school and different-school paraprofessional experience.
- 9 Calculations for interpretations of differences in predicted probabilities displayed in Figure 2 are provided in appendix Table A.4.

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**Table 1***Descriptives of Paraprofessional Sample and Reference Teacher Samples in NYCPS*

	Paraprofessionals		Teachers	
	Ever Employed 2016-17 to 2023-24	Ever Transitioned into Teaching Role	Ever Employed 2016-17 to 2023-24	Employed 2023-24
	(1)	(2)	(3)	(4)
Ethnoracial Background (%)				
<i>White</i>	25.0	22.5	53.5	52.2
<i>Black</i>	24.9	27.8	16.2	15.5
<i>Hispanic</i>	34.0	37.1	17.8	18.6
<i>Asian</i>	8.3	5.0	7.4	8.0
<i>Other race/ethnicity</i>	7.8	7.6	5.1	5.7
Male (%)	19.0	19.4	23.0	23.1
Age	43.7	35.1	41.3	42.9
Years of experience	6.7	4.6	10.0	12.1
Ever employed in district 75 (%)	32.8	35.0	9.3	10.0
Ever employed as teacher (%)	7.4	100.0	100.0	100.0
Ever employed as paraprofessional (%)	100.0	100.0	2.7	3.7
Ever served in para and teacher roles in same school (%)	4.4	57.4	1.5	2.0
N (unique obs.)	38,314	2,831	112,567	74,902

*Notes.* Paraprofessional sample includes paraprofessional staff employed between the 2016-17 and 2023-24 school years—column (1)—or those who

transitioned into a teaching role at any point in that time period—column (2). Reference teacher samples include teaching staff employed between the 2016-17

and 2023-24 school years—column (3)—and teaching staff employed in the 2023-24 school year—column (4).

**Table 2**

*Multinomial Logistic Regression Estimates Predicting Paraprofessional Transition by End of Following School Year*

	All		Black		Hispanic	
	Transitioned Teacher	Left NYCPS	Transitioned Teacher	Left NYCPS	Transitioned Teacher	Left NYCPS
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Ethnoracial Background [ <i>BASE</i> = <i>White</i> ]						
<i>Black</i>	0.916	0.996				
<i>Hispanic</i>	0.829**	0.963				
<i>Asian</i>	0.732**	0.732***				
<i>Other race/ethnicity</i>	0.836*	0.915*				
Male	0.811***	1.193***	0.567***	1.163***	0.789**	1.186***
Age	0.936***	1.005***	0.956***	1.006**	0.939***	1.006**
Years of experience [ <i>BASE</i> = < 2 years]						
2-3 years	2.027***	1.130**	1.893**	1.094	2.174***	1.022
4-10 years	3.720***	0.982	3.242***	0.966	3.675***	0.864*
11-20 years	2.299***	0.955	1.955*	0.756**	2.545***	0.738***
> 20 years	1.768	1.865***	1.986	1.292*	1.475	1.442**
Career Technical School	1.621*	1.030	1.655	0.967	1.573	1.113
Student enrollment	1.003	1.005	0.968*	1.026***	0.991	0.996
Pupil-teacher ratio	1.005	0.977**	1.038	0.962**	1.018	0.988
Pct. students Black	0.999	1.002	0.993	1.001	1.000	1.002
Pct. students Hispanic	1.001	1.003*	0.999	1.003	0.996	1.000
Pct. students Asian	0.999	1.002	0.998	1.001	0.995	0.999
Pct. students other racial/ethnic background	0.990	1.004	0.992	1.004	1.003	0.999
Pct. students in poverty	1.004	0.999	1.014*	0.999	1.003	0.999
Pct. students in temporary housing	0.994	0.998	0.990	0.992*	0.995	0.998
Pct. students newly transferred to school	0.991	0.994**	0.982*	0.995	0.995	0.991*
Average student attendance rate	0.937	0.536**	2.218	0.358**	0.728	0.723
Pct. students retained in grade level	0.995	0.997	0.989	0.999	0.991	0.995*
Pct. teachers female	0.993	0.997	0.984*	0.998	0.999	0.998

	All		Black		Hispanic	
	Transitioned Teacher	Left NYCPS	Transitioned Teacher	Left NYCPS	Transitioned Teacher	Left NYCPS
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Pct. teachers Black	1.005*	1.003**	1.004	1.005**	1.004	0.999
Pct. teachers Hispanic	1.007*	1.001	1.011	1.002	1.003	1.000
Pct. teachers Asian	1.006	1.004	1.003	1.011**	0.995	0.999
Pct. teachers other racial/ethnic background	1.019*	1.006	1.008	1.013*	1.020	0.998
Pct. teachers bilingual education	0.997	0.998	0.996	0.986*	0.999	1.000
Number of paraprofessional staff	0.999	0.999**	0.999	0.998***	0.999	0.999
School has one guidance counselor	0.873	0.989	1.177	1.092	0.732**	0.985
School has more than one social worker	1.053	0.932*	1.259	0.908	0.859	0.900*
Constant	0.034***	0.203***	0.014*	0.201*	0.044*	0.188*
Obs. (paraprofessional-year)	164,085		41,929		55,972	

*Notes.* Estimates expressed in Relative Risk Ratio (RRR) form. Standard errors clustered at school level (not shown). Estimates included in model but not shown

were not statistically significant, which include employment in community school district 75, school grade configuration; whether school was a transfer school; student gender composition; percent of students with non-English home language, with limited English proficiency, and receiving special education services; average years of experience of teaching staff; percent teaching staff with master’s or more advanced degree, assigned to special education, part-time/substitute, newly arrived to school, and left from school in prior academic year; principal gender, race/ethnicity, and years of experience; whether principal was new to school; and number of assistant principals and school psychologists. All models adjust for year fixed effects.

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001.

**Table 3**

*Logistic Regression Estimates Predicting Teachers Leaving Teaching Role in NYCPS by End of Following School Year*

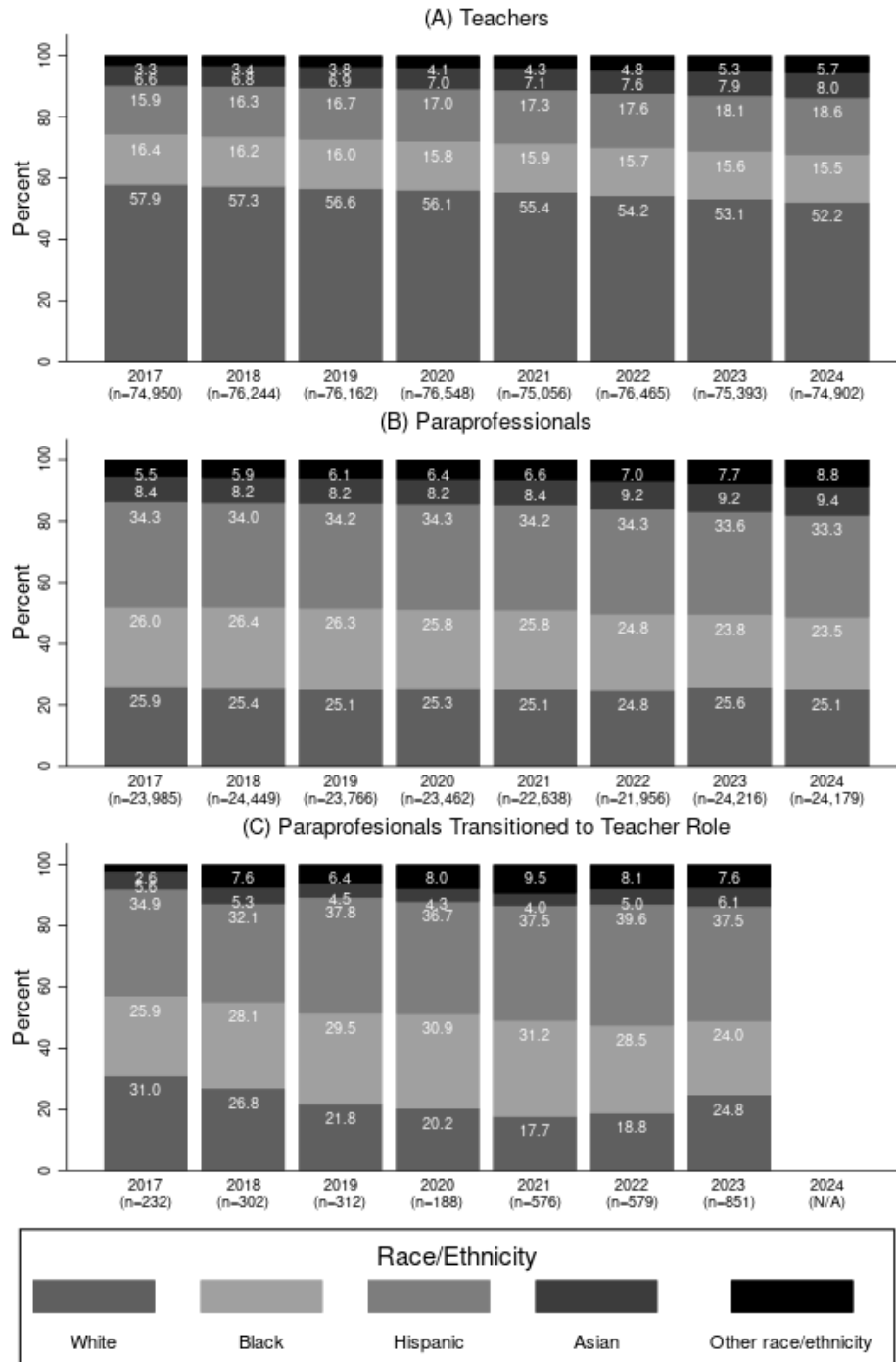
	(1)	(2)	(3)	(4)
Ethnoracial Background [BASE = White]				
Black	0.848*** (0.014)	0.849*** (0.014)	0.848*** (0.014)	0.850*** (0.014)
Hispanic	0.819*** (0.013)	0.815*** (0.013)	0.819*** (0.013)	0.815*** (0.013)
Asian	0.830*** (0.019)	0.832*** (0.020)	0.830*** (0.019)	0.832*** (0.020)
Other race/ethnicity	0.892*** (0.025)	0.894*** (0.025)	0.893*** (0.025)	0.894*** (0.025)
Prior para	0.584*** (0.032)	0.551*** (0.058)	0.668*** (0.047)	0.507*** (0.091)
Prior para in same school			0.504*** (0.043)	0.587*** (0.085)
Prior para X Black		0.937 (0.132)		1.244 (0.269)
Prior para X Hispanic		1.309 (0.180)		1.660* (0.342)
Prior para X Asian		0.615 (0.189)		0.834 (0.329)
Prior para X Other		0.923 (0.241)		1.456 (0.470)
Prior para in same school X Black				0.674 (0.150)
Prior para in same school X Hispanic				1.043 (0.218)
Prior para in same school X Asian				0.400 (0.217)
Prior para in same school X Other				0.525 (0.225)
Obs. (teacher-year)	530,818	530,818	530,818	530,818

*Notes.* Estimates expressed in Odds Ratio (OR) form. Standard errors clustered at school level shown in parentheses. Estimates included in model but not shown include teacher gender, degree attainment, years of experience, employment in community school district 75, assignment to special education and bilingual education teaching roles; school grade configuration; whether school was a career technical or transfer school; student enrollment; pupil-teacher ratio; student racial/ethnic and gender composition; percent of students in poverty, in temporary housing, with non-English home language, with limited English proficiency, receiving special education services, newly transferred to school, and retained in grade level; average student attendance rate; teacher racial/ethnic and gender composition; average years of experience of teaching staff; percent teaching staff with master's or more advanced degree, assigned to special and bilingual education roles, part-time/substitute, left from school in prior academic year, and newly arrived to school during academic year; principal race/ethnicity, gender, and years of experience; whether principal was new to school; number of assistant principals, guidance counselors, social workers, school psychologists, and paraprofessional staff in school. All models adjust for year fixed effects. "Para" = Paraprofessional.

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001.

**Figure 1**

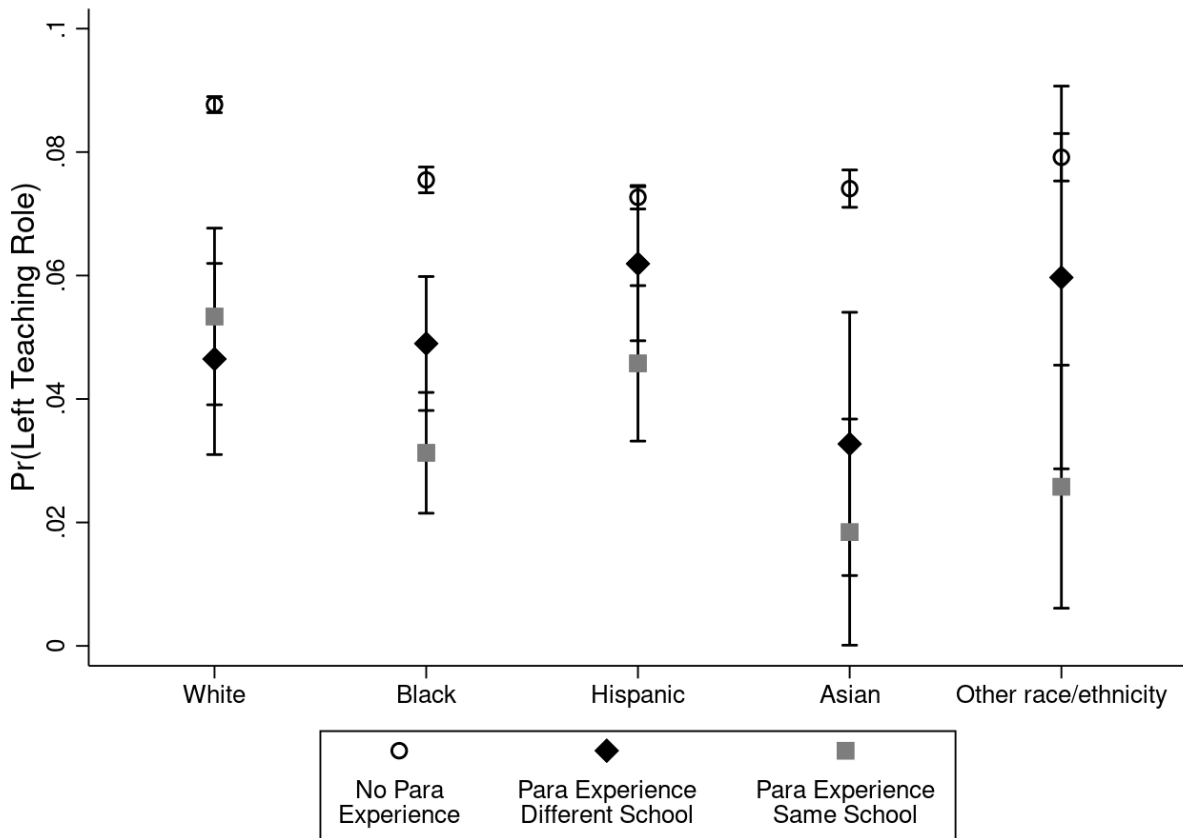
*Ethnoracial Composition of Paraprofessionals (Overall and Those Who Transitioned to Teacher Roles) and All Teachers in NYCPS, By School Year (2016-17 through 2023-24)*



*Note.* The 2024 data point is omitted for the sample of paraprofessionals who transitioned into teaching. Identifying transitions requires data from the subsequent school year (2025), which are not yet available.

**Figure 2**

*Predicted Probability of Teacher Leaving Teaching Role in NYCPS By End of Following School Year, By Ethnoracial Background and Prior Paraprofessional Experience in Different and Same School*



*Note.* 95% Confidence Intervals shown. Predicted probabilities generated with model estimates presented in Table 3 column 4 and covariates held at their mean value. “Para” = Paraprofessional.

**APPENDIX A**

Supplemental Table and Figures

**Table A.1***Summary Statistics of Pooled Paraprofessional Sample*

	All	White	Black	Hispanic	Asian	Other
Ethnoracial Background (%)						
<i>White</i>	25.3	100.0	--	--	--	--
<i>Black</i>	25.6	--	100.0	--	--	--
<i>Hispanic</i>	34.1	--	--	100.0	--	--
<i>Asian</i>	8.5	--	--	--	100.0	--
<i>Other race/ethnicity</i>	6.4	--	--	--	--	100.0
Male (%)	17.9	12.6	23.1	17.1	17.2	22.3
Age	45.8	47.9	45.1	44.2	50.6	42.9
Years of experience	7.8	7.7	7.9	7.8	8.6	6.0
Employed in community school district 75 (%)	33.1	27.1	39.6	33.8	28.4	33.6
School Grade Configuration (%)						
<i>K-5</i>	39.3	42.2	34.8	40.4	41.4	37.8
<i>6-8</i>	9.4	11.1	8.5	8.7	9.7	9.6
<i>9-12</i>	11.2	9.7	11.6	11.3	13.4	12.0
<i>K-8</i>	15.7	15.9	16.9	15.1	14.4	15.2
<i>K-12</i>	18.8	16.3	22.0	18.4	17.2	20.1
<i>6-12</i>	5.6	4.7	6.3	6.2	3.9	5.3
Career technical school (%)	1.0	0.6	1.4	0.9	1.2	1.2
Transfer school (%)	0.1	0.1	0.2	0.1	0.1	0.1
Student enrollment	7.0	8.7	5.7	6.4	8.3	6.8
Pupil-teacher ratio	10.3	11.2	9.5	10.0	11.2	10.2
Percent students female	41.0	42.5	39.4	40.9	42.2	40.7
Percent students Black	27.0	16.9	41.7	24.7	19.8	28.6
Percent students Hispanic	41.2	31.9	36.3	53.0	36.6	40.5
Percent students Asian	13.4	18.4	9.0	9.8	26.3	14.2
Percent students other race/ethnicity	2.6	2.7	2.9	2.2	2.7	2.7
Percent students in poverty	75.4	66.6	78.8	79.6	73.9	76.0
Percent students in temporary housing	9.9	5.6	11.5	12.4	8.1	10.1
Percent students non-English household	34.5	34.2	27.5	37.5	44.3	34.4
Percent students limited English proficiency	18.2	15.6	16.2	20.8	21.9	18.1
Percent student special education	47.2	42.3	52.4	48.2	41.4	47.5
Percent students newly transferred to school	11.1	9.6	12.6	11.3	10.1	11.4
Average student attendance rate	0.9	0.9	0.9	0.9	0.9	0.9
Percent students retained grade level	7.9	6.5	9.2	8.2	7.5	7.4
Percent teachers female	81.4	83.7	80.1	80.7	81.9	80.9
Percent teachers Black	16.3	7.0	27.0	15.9	12.0	17.8
Percent teachers Hispanic	15.9	10.1	14.4	21.9	13.3	15.5
Percent teachers Asian	6.1	5.1	5.8	6.1	9.4	6.5
Percent teachers other race/ethnicity	4.0	3.7	4.3	4.0	4.0	4.2
Percent teachers w/ masters degree	7.8	5.9	8.6	8.6	6.9	8.1
Percent teachers w/ more than masters	84.0	87.1	82.2	82.9	85.2	83.6
Average teacher years of experience	11.3	11.9	11.2	10.9	11.7	11.1
Percent teachers part-time/substitute	1.0	0.7	1.2	1.2	0.9	1.0
Percent teachers are special education teachers	49.5	46.3	53.6	49.9	44.8	49.3
Percent teachers are bilingual teachers	2.4	1.2	1.8	3.8	2.3	2.3
Percent teachers left school in prior year	11.0	8.9	12.1	11.9	10.1	11.2

	All	White	Black	Hispanic	Asian	Other
Percent new teachers arrived to school	12.8	11.1	13.7	13.6	11.6	13.4
Percent principals female	69.6	68.1	71.8	68.9	70.0	69.8
Percent principals Black	24.3	10.8	41.5	21.7	20.4	27.3
Percent principals Hispanic	16.4	9.7	13.2	24.3	14.0	16.5
Percent principals Asian	2.1	1.8	1.4	2.2	4.3	3.0
Percent principals other race/ethnicity	1.0	1.0	1.1	0.9	0.8	0.9
Average principal years of experience	7.7	7.8	7.6	7.6	7.9	7.6
Percent principals new to school	5.0	4.4	5.8	4.9	4.5	5.1
Number of paraprofessionals	58.6	58.7	59.7	59.3	52.7	57.7
Number of principals (%)						
<i>None</i>	1.6	1.8	1.2	1.7	1.6	2.0
<i>One</i>	96.6	96.0	97.0	96.9	96.5	96.0
<i>More than one</i>	1.8	2.1	1.7	1.4	2.0	2.0
Number of assistant principals (%)						
<i>None</i>	3.2	2.0	4.0	3.5	2.5	3.4
<i>One</i>	21.1	18.2	24.4	21.0	19.7	22.2
<i>More than one</i>	75.7	79.8	71.5	75.5	77.7	74.4
Number of guidance counselors (%)						
<i>None</i>	17.0	15.6	18.7	17.6	13.1	18.1
<i>One</i>	38.3	35.1	40.4	39.3	37.4	38.5
<i>More than one</i>	44.7	49.3	40.9	43.0	49.5	43.4
Number of school psychologists (%)						
<i>None</i>	20.9	18.4	22.2	21.2	20.9	23.8
<i>One</i>	49.8	53.8	46.9	48.3	53.7	49.0
<i>More than one</i>	29.2	27.8	30.9	30.5	25.4	27.2
Number of social workers (%)						
<i>None</i>	30.3	28.6	31.6	29.5	32.5	32.4
<i>One</i>	49.1	52.1	47.9	47.8	50.0	48.1
<i>More than one</i>	20.6	19.3	20.5	22.7	17.5	19.5
Observations ( <i>para-year</i> )	164,472	41,636	42,049	56,138	14,052	10,597

**Table A.2***Summary Statistics of Pooled Teacher Sample*

	All	White	Black	Hispanic	Asian	Other
Ethnoracial Background (%)						
<i>White</i>	55.8	100.0	--	--	--	--
<i>Black</i>	15.9	--	100.0	--	--	--
<i>Hispanic</i>	17.0	--	--	100.0	--	--
<i>Asian</i>	7.1	--	--	--	100.0	--
<i>Other race/ethnicity</i>	4.1	--	--	--	--	100.0
Male (%)	22.6	23.6	20.7	20.6	22.8	24.6
Age	42.1	41.7	45.8	41.4	39.9	39.4
Years of experience	11.3	11.6	12.6	10.8	9.6	8.2
Employed in community school district 75 (%)	8.4	8.4	9.4	7.5	6.8	9.8
Highest Degree Attained (%)						
<i>Bachelors</i>	7.5	6.8	8.0	8.8	8.5	9.1
<i>Master's degree</i>	8.9	6.8	10.3	12.9	9.9	13.4
<i>More than master's degree</i>	83.6	86.5	81.7	78.3	81.6	77.5
Bilingual teacher (%)	2.6	0.4	0.3	12.0	3.6	1.7
Special education teacher (%)	32.3	31.9	36.6	31.4	24.0	38.6
Ever paraprofessional (%)	1.3	0.5	2.2	2.6	1.0	2.0
Ever paraprofessional in same school (%)	0.7	0.3	1.1	1.4	0.4	1.1
School Grade Configuration (%)						
<i>K-5</i>	38.7	40.4	34.3	40.6	35.1	31.1
<i>6-8</i>	15.0	14.7	17.8	14.3	13.0	15.4
<i>9-12</i>	22.9	21.5	22.9	22.0	31.8	28.8
<i>K-8</i>	12.4	12.8	12.0	12.5	10.0	12.1
<i>K-12</i>	5.2	5.6	5.0	4.4	4.5	5.5
<i>6-12</i>	5.8	5.0	8.0	6.1	5.7	7.1
Career technical school (%)	2.8	2.4	3.7	2.6	3.4	3.5
Transfer school (%)	1.2	1.0	1.6	1.2	1.8	1.7
Student enrollment	8.8	9.5	6.5	7.9	10.3	9.0
Pupil-teacher ratio	12.9	13.1	12.3	12.5	13.7	12.8
Percent students female	46.8	47.0	46.1	46.8	47.0	46.5
Percent students Black	23.4	18.9	42.7	20.9	19.1	25.3
Percent students Hispanic	43.1	40.4	40.0	56.9	38.8	42.6
Percent students Asian	16.2	18.9	8.1	11.0	26.3	15.8
Percent students other race/ethnicity	2.5	2.6	2.4	2.0	2.6	2.5
Percent students in poverty	73.3	69.6	80.0	79.4	72.2	74.2
Percent students in temporary housing	10.3	8.6	13.3	13.4	9.2	10.4
Percent student non-English household	40.9	41.3	31.6	45.7	48.0	41.0
Percent students limited English proficiency	16.5	15.7	13.7	20.6	18.7	16.3
Percent student special education	26.2	25.7	28.6	26.4	23.1	27.5
Percent students newly transferred to school	9.6	9.1	11.5	10.1	8.8	9.6
Average student attendance rate	0.9	0.9	0.9	0.9	0.9	0.9
Percent students retained grade level	5.7	5.2	6.9	6.0	6.0	6.3
Percent teachers female	77.3	78.4	75.4	76.9	75.1	75.1
Percent teachers Black	15.9	11.2	34.2	15.4	13.0	16.7
Percent teachers Hispanic	16.9	14.2	16.4	27.2	15.0	16.5

	All	White	Black	Hispanic	Asian	Other
Percent teachers Asian	7.1	6.8	5.8	6.3	14.6	7.5
Percent teachers other race/ethnicity	4.1	3.8	4.3	4.0	4.3	6.5
Percent teachers w/ masters degree	8.5	7.7	10.0	9.7	8.5	9.3
Percent teachers w/ more than masters	84.0	85.2	81.7	82.4	83.8	83.1
Average teacher years of experience	11.4	11.6	11.6	11.1	11.2	11.1
Percent teachers part-time/substitute	1.1	0.9	1.4	1.2	1.0	1.1
Percent teachers are special education teachers	32.1	32.1	33.6	31.9	28.4	32.6
Percent teachers are bilingual teachers	2.6	2.0	2.0	5.3	3.1	2.3
Percent teachers left school in prior year	11.8	10.9	13.7	12.7	11.6	12.2
Percent new teachers arrived to school	13.6	12.8	15.1	14.3	13.8	14.4
Percent principals female	65.4	65.2	66.8	65.9	64.3	63.2
Percent principals Black	22.0	15.5	48.3	20.3	18.0	22.9
Percent principals Hispanic	18.4	16.0	15.1	30.3	16.6	17.5
Percent principals Asian	3.4	3.1	2.2	2.9	8.5	3.8
Percent principals other race/ethnicity	1.6	1.5	1.7	1.4	1.8	1.6
Average principal years of experience	8.0	8.1	7.8	7.9	8.0	8.0
Percent principals new to school	5.4	5.0	6.5	5.4	5.6	5.5
Number of paraprofessionals	22.0	23.6	19.6	20.0	19.0	22.9
Number of principals (%)						
<i>None</i>	1.6	1.6	1.6	1.7	2.0	1.8
<i>One</i>	96.5	96.6	96.5	96.7	95.9	96.1
<i>More than one</i>	1.8	1.8	1.9	1.6	2.2	2.1
Number of assistant principals (%)						
<i>None</i>	3.5	2.9	5.0	3.8	3.7	3.8
<i>One</i>	24.6	22.9	32.3	24.0	23.1	23.6
<i>More than one</i>	71.9	74.2	62.7	72.2	73.2	72.6
Number of guidance counselors (%)						
<i>None</i>	11.5	12.0	11.0	10.6	11.1	10.6
<i>One</i>	37.7	36.8	43.9	38.1	32.3	34.9
<i>More than one</i>	50.8	51.3	45.1	51.2	56.6	54.6
Number of school psychologists (%)						
<i>None</i>	30.8	28.1	36.2	32.4	34.2	33.9
<i>One</i>	54.1	55.8	51.5	52.3	52.6	50.2
<i>More than one</i>	15.1	16.1	12.3	15.3	13.2	15.9
Number of social workers (%)						
<i>None</i>	30.3	29.7	33.1	29.8	30.3	29.5
<i>One</i>	50.1	51.0	48.9	48.4	50.1	49.4
<i>More than one</i>	19.6	19.3	18.0	21.8	19.6	21.1
Observations ( <i>teacher-year</i> )	530,818	296,262	84,619	90,120	37,892	21,925

**Table A.3***Logistic Regression Estimates Predicting Alternative Disaggregated Teacher Turnover**Outcomes: Left NYCPS, Transitioned to Non-Teaching Role, Left School by End of Following School Year*

	Left Teaching	Left NYCPS	Transitioned	Left School
	Role in NYCPS		Non-Teaching	
	(1)	(2)	(3)	(4)
Prior para ( $\alpha_{1,1}$ )	0.668*** (0.047)	0.631*** (0.046)	2.221*** (0.517)	0.771*** (0.042)
Prior para in same school ( $\alpha_{1,2}$ )	0.504*** (0.043)	0.413*** (0.042)	2.560*** (0.476)	0.699*** (0.043)
Obs. (teacher-year)	530,818	530,818	530,818	530,818
Wald test p-value: $\alpha_{1,1} = \alpha_{1,2}$	0.0098	0.0007	0.6270	0.2227

*Notes.* Estimates expressed in Odds Ratio (OR) form. Standard errors clustered at school level shown in parentheses. Estimates included in model but not shown include teacher race/ethnicity, gender, degree attainment, years of experience, employment in community school district 75, assignment to special education and bilingual education teaching roles; school grade configuration; whether school was a career technical or transfer school; student enrollment; pupil-teacher ratio; student racial/ethnic and gender composition; percent of students in poverty, in temporary housing, with non-English home language, with limited English proficiency, receiving special education services, newly transferred to school, and retained in grade level; average student attendance rate; teacher racial/ethnic and gender composition; average years of experience of teaching staff; percent teaching staff with master's or more advanced degree, assigned to special and bilingual education roles, part-time/substitute, left from school in prior academic year, and newly arrived to school during academic year; principal race/ethnicity, gender, and years of experience; whether principal was new to school; number of assistant principals, guidance counselors, social workers, school psychologists, and paraprofessional staff in school. All models adjust for year fixed effects. "Para" = Paraprofessional.

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001.

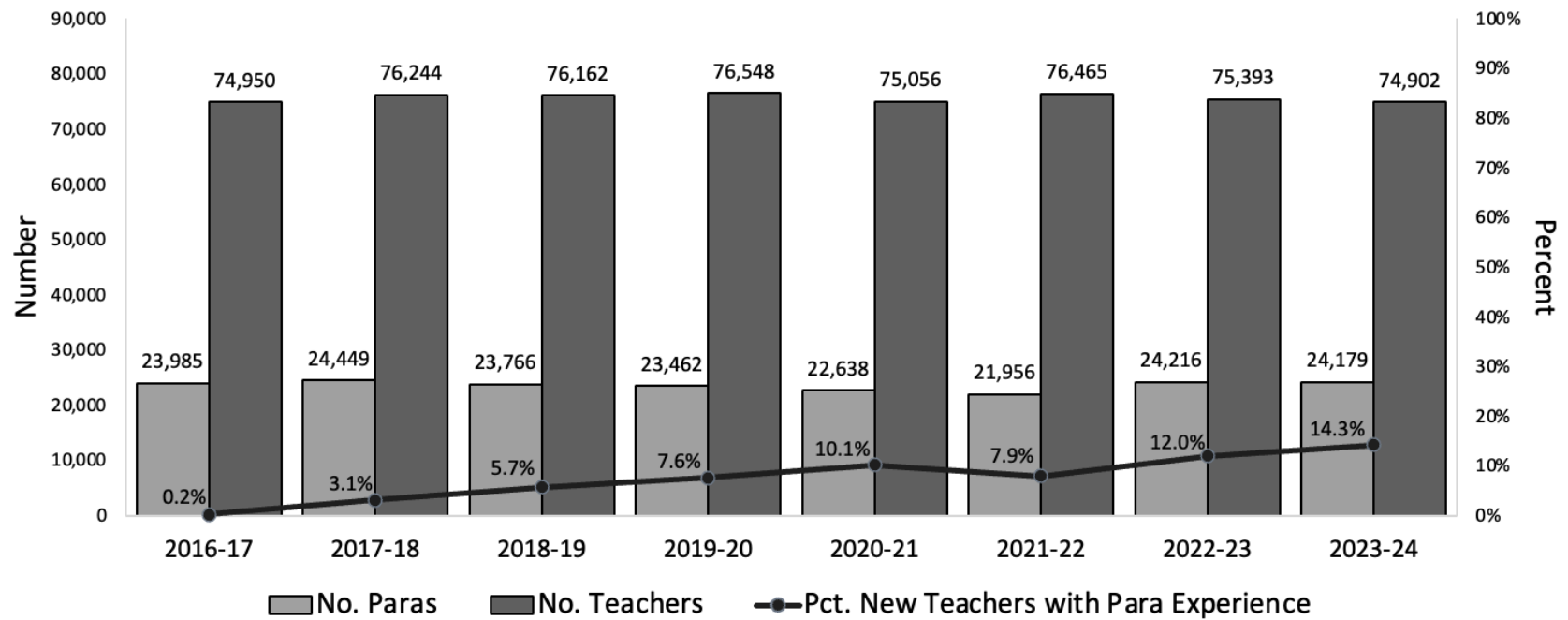
**Table A.4***Calculation of Relative Differences in Predicted Exit from Teaching in NYCPS Displayed in Figure 2*

Group	Predicted Probability of Leaving Teaching in NYCPS (Shown in Figure 2)	Within-Group <i>Relative</i> Difference Compared to Not Having Paraprofessional Experience
<i>White Teachers</i>		
No paraprofessional experience	0.088	
Paraprofessional experience in different school	0.046	46.99
Paraprofession experience in same school	0.053	39.14
<i>Black Teachers</i>		
No paraprofessional experience	0.075	
Paraprofessional experience in different school	0.049	35.11
Paraprofession experience in same school	0.031	58.57
<i>Hispanic Teachers</i>		
No paraprofessional experience	0.073	
Paraprofessional experience in different school	0.062	n.s.
Paraprofession experience in same school	0.046	37.03
<i>Asian Teachers</i>		
No paraprofessional experience	0.074	
Paraprofessional experience in different school	0.033	55.83
Paraprofession experience in same school	0.018	75.12
<i>Teachers of Other Ethnoracial Backgrounds</i>		
No paraprofessional experience	0.079	
Paraprofessional experience in different school	0.060	n.s.
Paraprofession experience in same school	0.026	67.41

*Notes.* Relative differences are based on calculated relative risk (RR), defined as the ratio of the outcome in the group of interest to the reference group (no paraprofessional experience). Values of  $RR > 1$  indicate a higher risk, expressed as a percentage increase  $(RR - 1) \times 100$ . Values of  $RR < 1$  indicate a lower risk, expressed as a percentage decrease  $(1 - RR) \times 100$ . Cells labeled “n.s.” indicate that the relative difference was not statistically significant at the 95% confidence level.

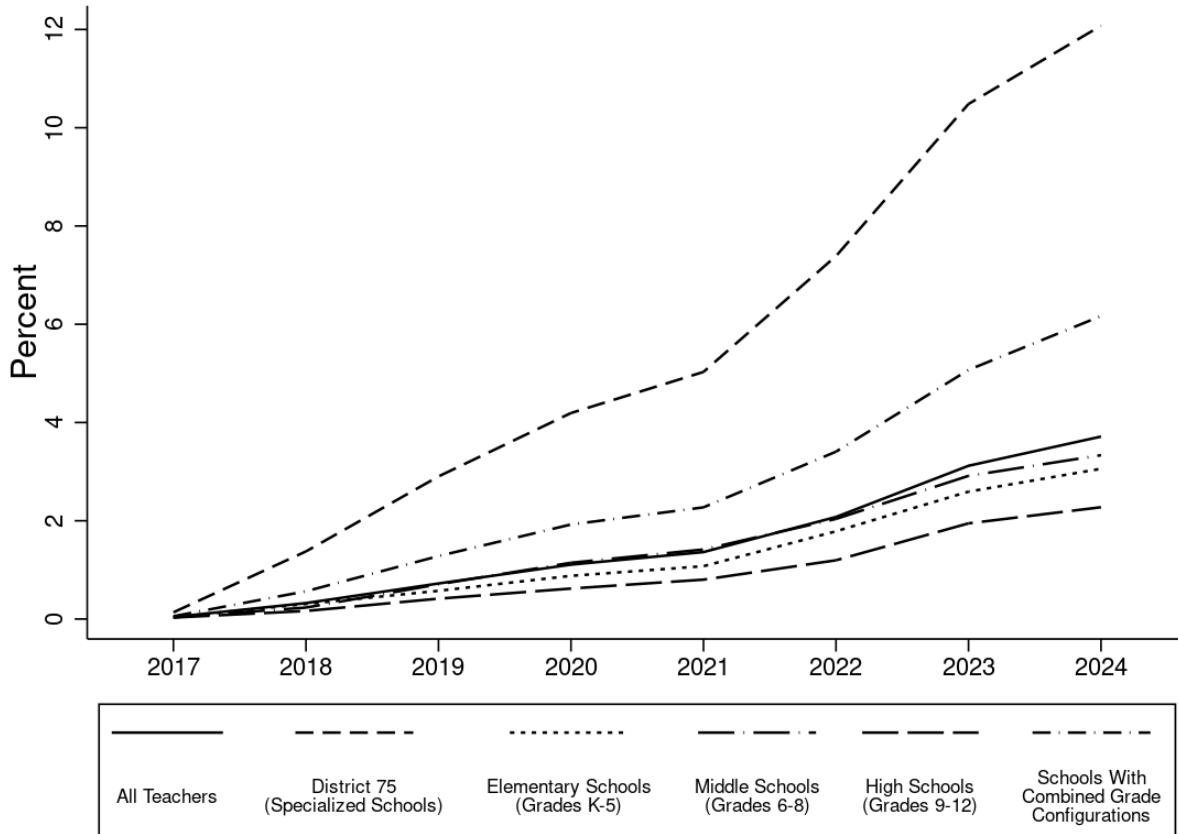
**Figure A.1**

*Number of Paraprofessionals and Teachers and Percent of New Teachers with Paraprofessional Experience in NYCPS, By School Year (2016-17 through 2023-24)*



**Figure A.2**

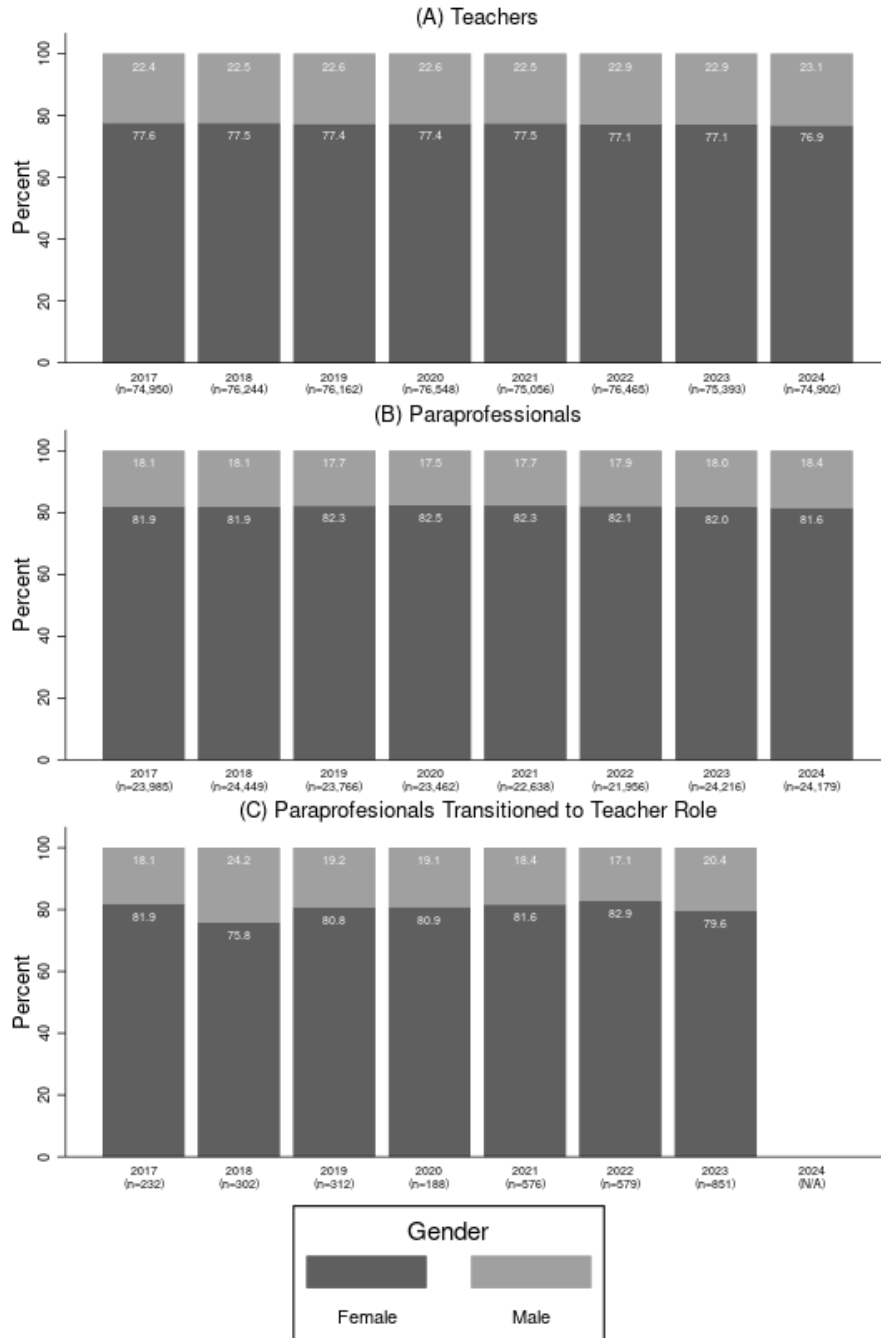
*Percent of Teachers With Prior Paraprofessional Experience (All of NYCPS, District 75, and By School Level), By School Year (2016-17 through 2023-24)*



*Note.* Schools with combined grade configurations include schools that serve grades K-8, K-12, and 6-8.

**Figure A.3**

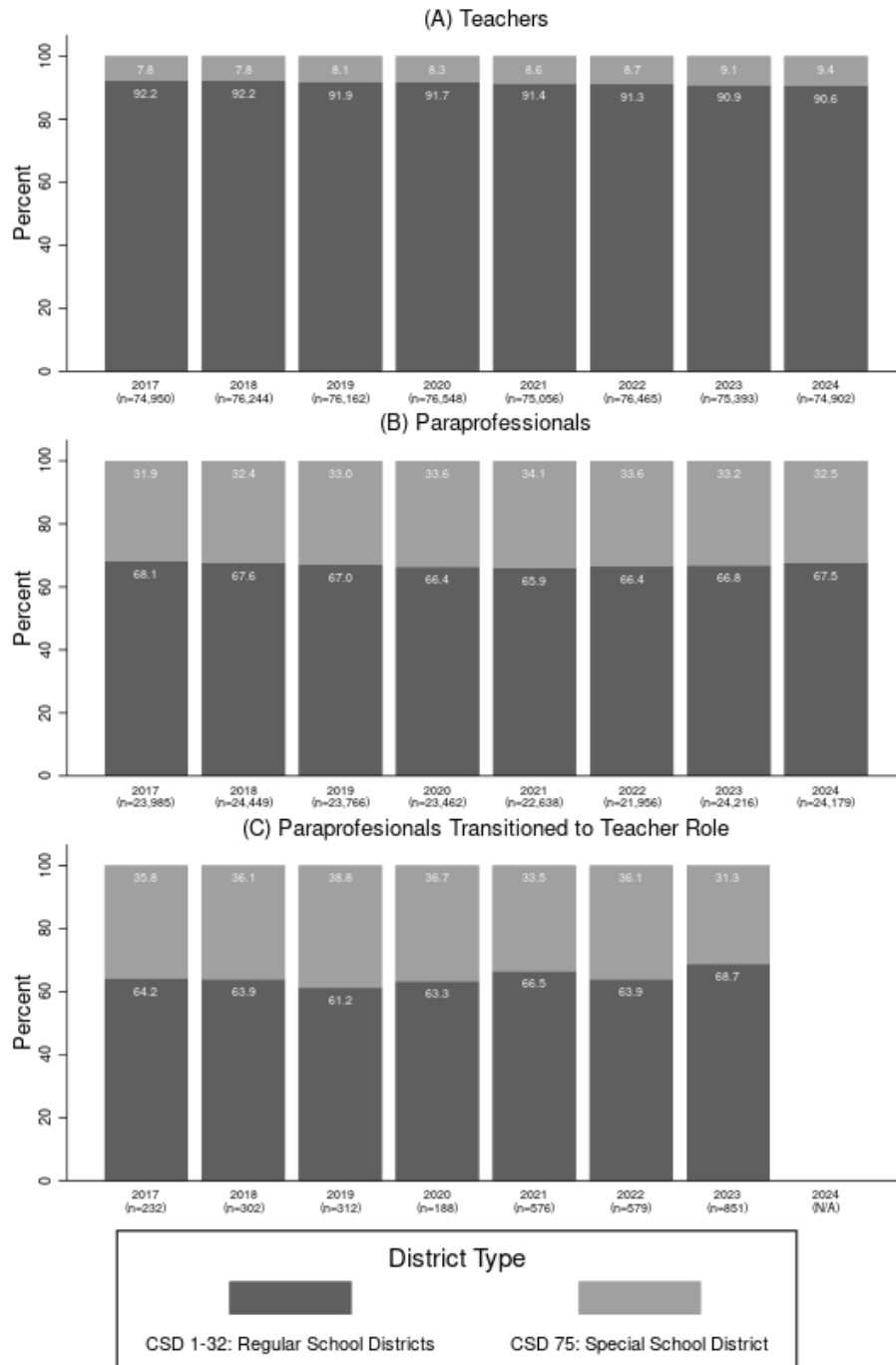
*Percent of Paraprofessionals (Overall and Those Who Transitioned to Teacher Roles) and All Teachers in NYCPS, By Gender and School Year (2016-17 through 2023-24)*



*Note.* The 2024 data point is omitted for the sample of paraprofessionals who transitioned into teaching. Identifying transitions requires data from the subsequent school year (2025), which are not yet available.

**Figure A.4**

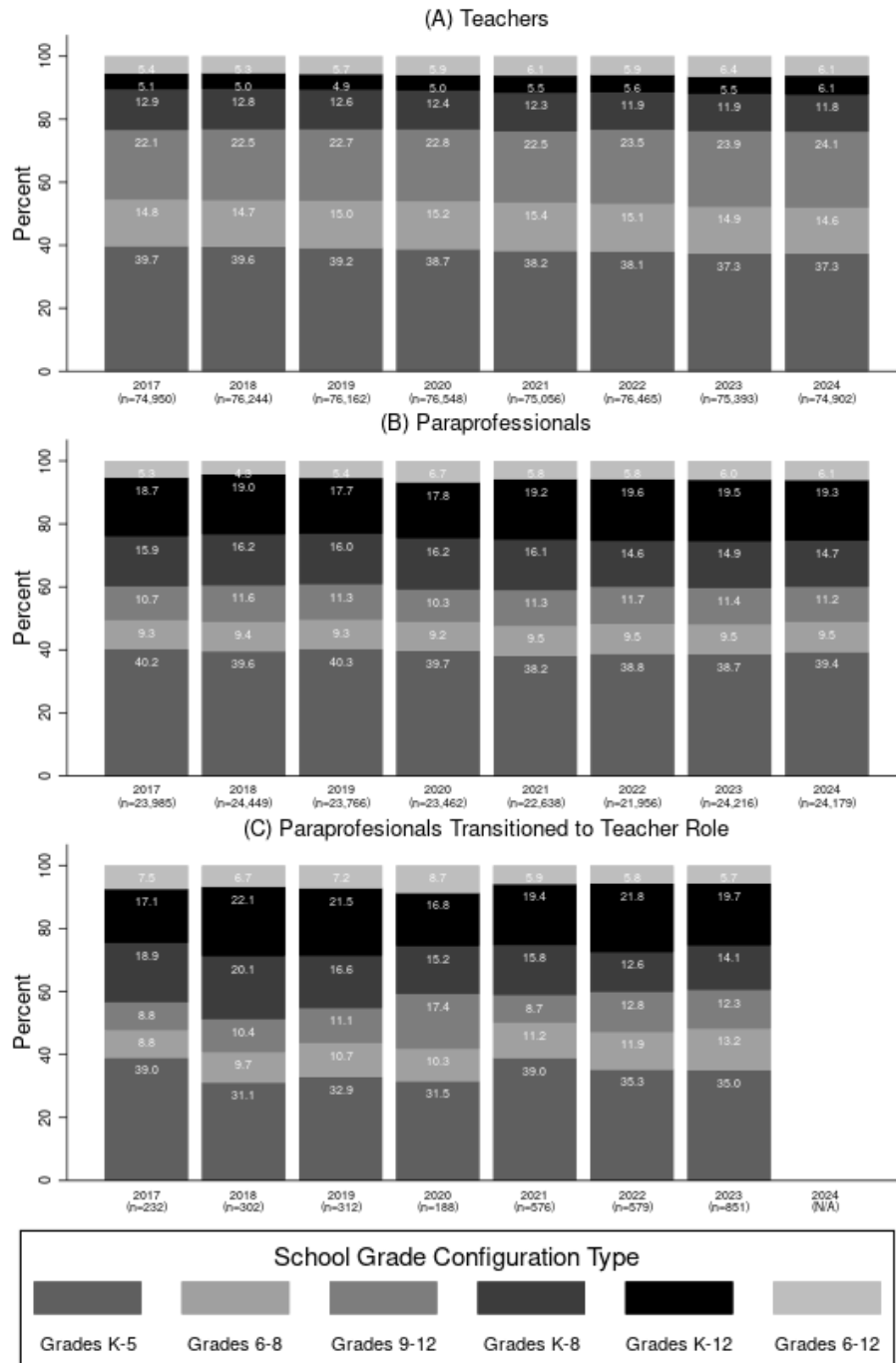
*Percent of Paraprofessionals (Overall and Those Who Transitioned to Teacher Roles) and All Teachers in NYCPS, By Regular School Districts 1-32 and Specialized School District 75 and School Year (2016-17 through 2023-24)*



*Note.* The 2024 data point is omitted for the sample of paraprofessionals who transitioned into teaching. Identifying transitions requires data from the subsequent school year (2025), which are not yet available.

**Figure A.5**

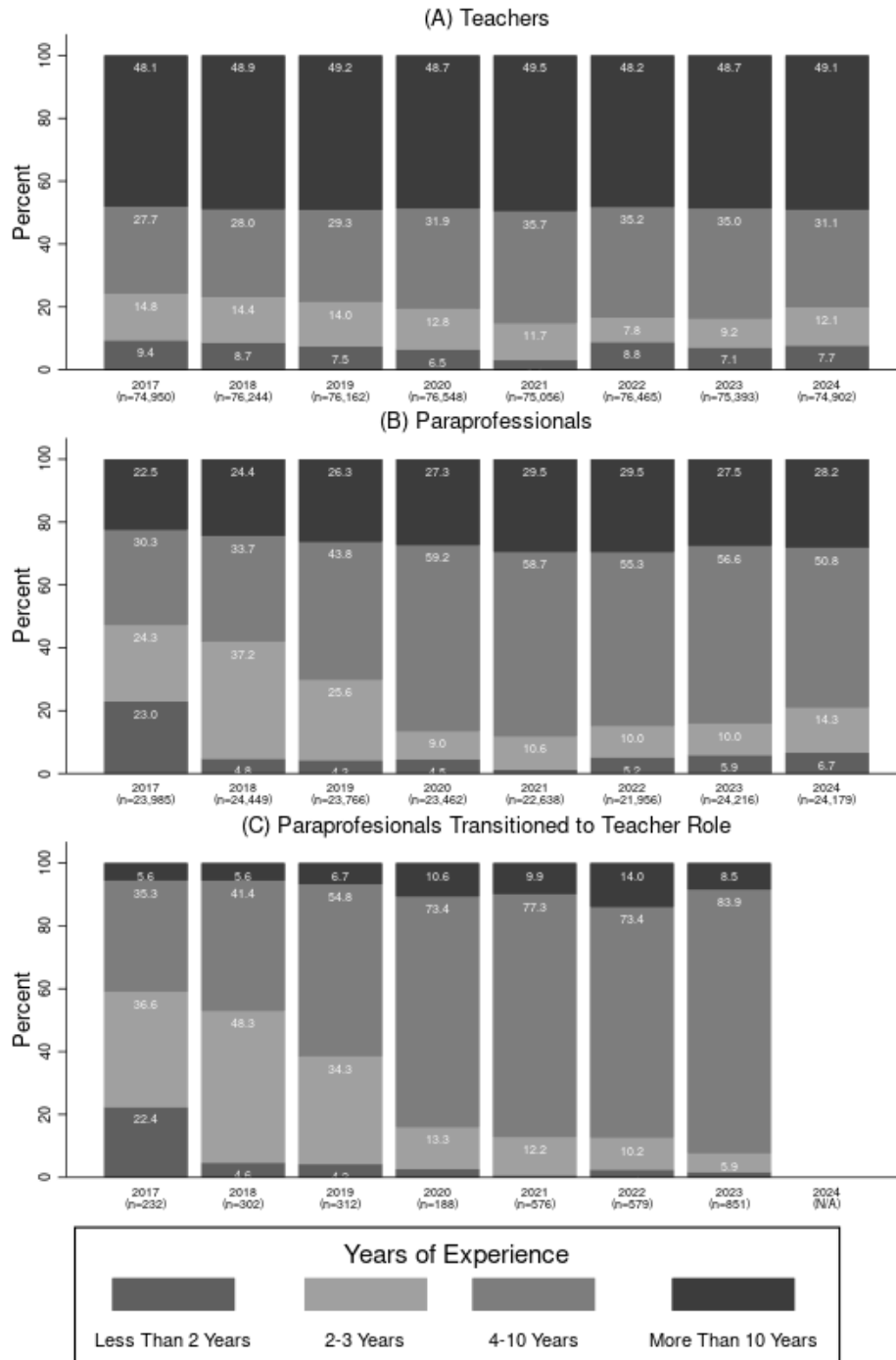
*Percent of Paraprofessionals (Overall and Those Who Transitioned to Teacher Roles) and All Teachers in NYCPS, By School Grade Configuration Type and School Year (2016-17 through 2023-24)*



*Note.* The 2024 data point is omitted for the sample of paraprofessionals who transitioned into teaching. Identifying transitions requires data from the subsequent school year (2025), which are not yet available.

**Figure A.6**

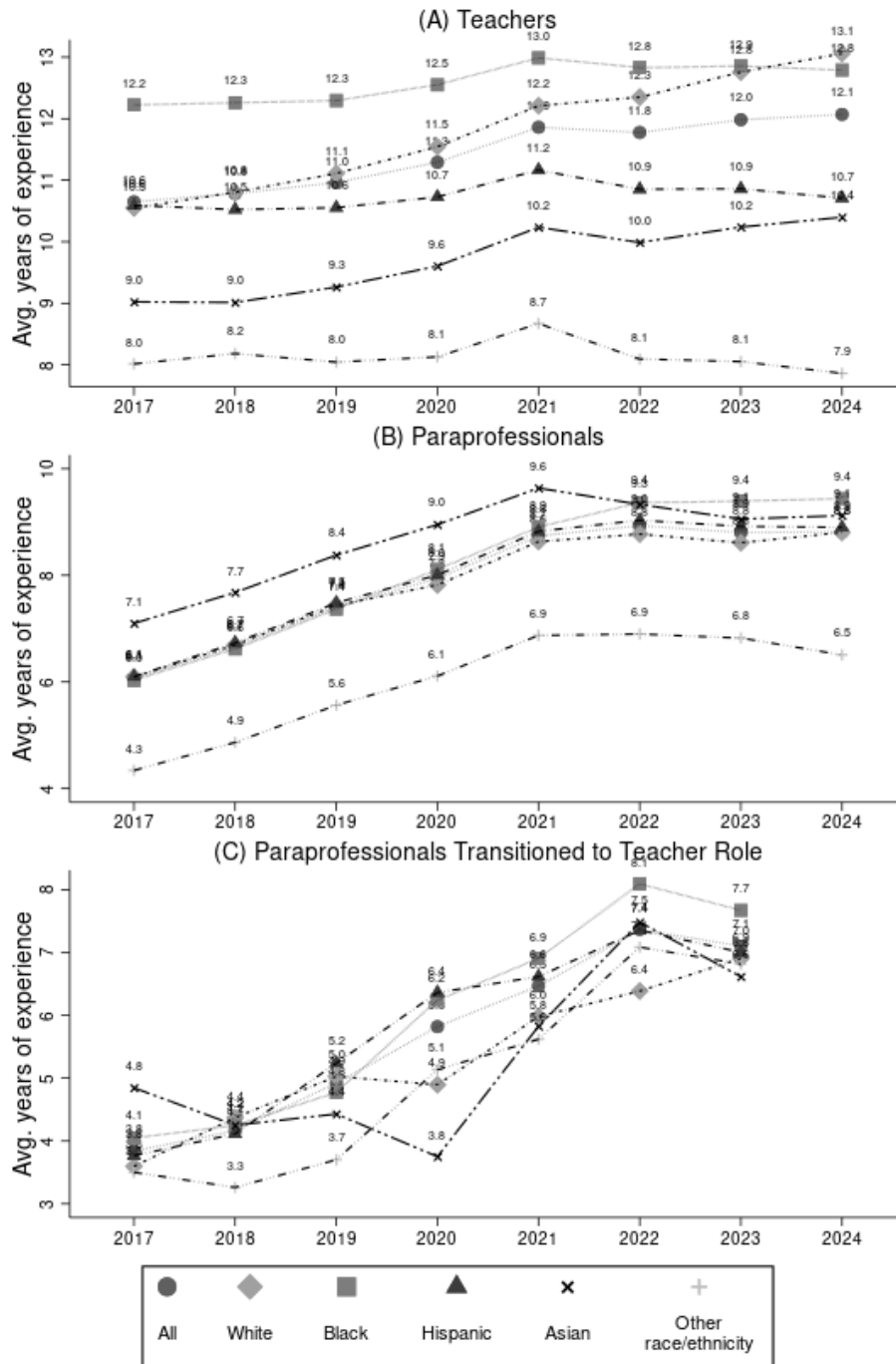
*Percent of Paraprofessionals (Overall and Those Who Transitioned to Teacher Roles) and All Teachers in NYCPS, By Years of Experience and School Year (2016-17 through 2023-24)*



*Note.* The 2024 data point is omitted for the sample of paraprofessionals who transitioned into teaching. Identifying transitions requires data from the subsequent school year (2025), which are not yet available.

**Figure A.7**

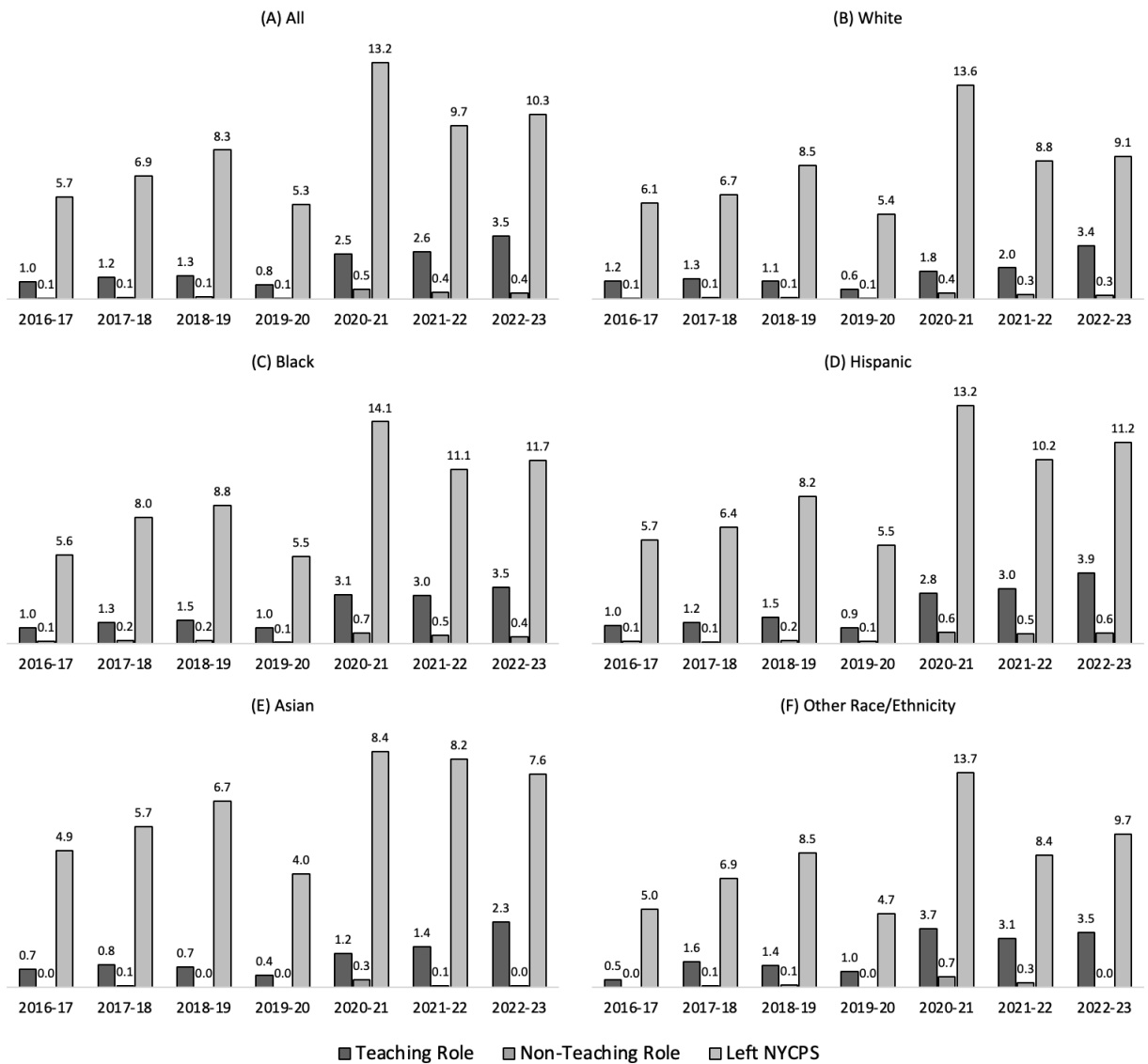
*Average Years of Experience Among Paraprofessionals (Overall and Those Who Transitioned to Teacher Roles) and All Teachers in NYCPS, Overall and By Ethnoracial Background and School Year (2016-17 through 2023-24)*



*Note.* The 2024 data point is omitted for the sample of paraprofessionals who transitioned into teaching. Identifying transitions requires data from the subsequent school year (2025), which are not yet available.

**Figure A.8**

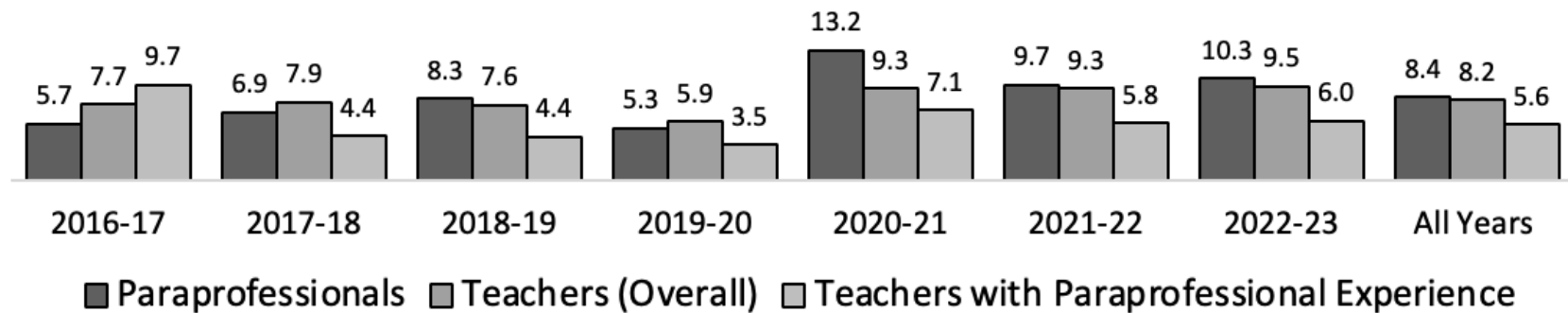
*Percent of Paraprofessionals Who Transitioned to Teaching Role, Other Non-Teaching Role, and Left NYCPS by End of Following School Year (2016-17 through 2022-23)*



*Note.* The 2024 data point is omitted. Identifying transition and turnover requires data from the subsequent school year (2025), which are not yet available.

**Figure A.9**

*Percent of Paraprofessionals and Teachers (Overall and With Paraprofessional Experience) Who Left NYCPS by End of Following School Year, By School Year (2016-17 through 2022-23)*



*Note.* The 2024 data point is omitted. Identifying transition and turnover requires data from the subsequent school year (2025), which are not yet available.