Assistant Principal Mobility and its Relationship with Principal Turnover

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Author Note

Abstract

Assistant principals are important education personnel, both as essential members of school leadership teams and apprentice principals. However, empirical evidence on their career outcomes remains scarce. Using statewide administrative data from Tennessee and Missouri, we provide the first comprehensive analysis of AP mobility. While prior work focuses only on AP promotions into principal positions, we also account for APs who exit school leadership and transfer to a different school. We find yearly mobility rates of 25–28%, with 10% of APs leaving school leadership, 7.5% changing schools, and 7.5–10% becoming principals. We also document a strong relationship between AP mobility and principal turnover, where higher-performing APs are substantially more likely to replace their departing principal. Principal transitions also appear to increase the likelihood that APs exit school leadership and change schools, highlighting an additional cost of high rates of principal churn.

Assistant Principal Mobility and its Relationship with Principal Turnover

Introduction

Assistant principals (APs) play an important role in school leadership, often functioning as essential members of a school's leadership team and handling such wide-ranging activities as student discipline, school operations, and instructional improvement work (Barnett, Shoho, & Oleszewski, 2012; Glanz, 1994; Sun, 2012). Yet while researchers and policymakers have increasingly recognized the importance of staffing schools with strong leadership teams—particularly given high rates of principal turnover—our understanding of AP mobility remains limited. Specifically, no research to date has leveraged large-scale data to document the frequency of AP mobility nor investigated the conditions that predict persistence, exit, or advancement of individuals in AP positions.

Absent an empirical knowledge base, two competing definitions of the role may provide insight into potential AP career patterns. The first definition is that of AP as apprentice principal. This perspective defines the assistant principalship as a short-term "stepping stone" to the principalship. APs therefore spend only as much time in the role as necessary to obtain the qualifications and skills to become successful principals. Several school leadership models have embraced this definition of the AP role as part of a leadership "pipeline" in which the most qualified APs become principals (Browne-Ferrigno, 2003; Gates, Baird, Master, & Chavez-Herrerias, 2019). The apprenticeship view of the AP role is supported by work that finds that a majority of principals have served as APs (Bastian & Henry, 2015; Clark, Martorell, & Rockoff, 2009; Grissom, Bartanen, & Mitani, 2019).

The second definition of the AP role is that of full professional serving as second-in-command within a distributed model of school leadership. This perspective of the assistant principalship may explain the large number of individuals serving in the AP role, sometimes for many years, who do not become principals despite being qualified to do

so (Davis, Gooden, & Bowers, 2017; Marshall, Mitchell, Gross, & Scott, 1992). It is unclear whether the characteristics of these APs differ from their peers who ultimately advance to principal positions, although research on AP and principal hiring suggests that race and gender may be factors, in addition to school and district context (Bailes & Guthery, 2020; Fuller, Hollingworth, & An, 2016).

This paper addresses the lack of empirical work on AP career trajectories in two main ways. First, given the need for a descriptive understanding of the AP labor market, we describe overall patterns in mobility for the population of APs employed in Tennessee (2007–2019) and Missouri (1999–2016), and show how these patterns vary by AP and school characteristics. Importantly, while prior work has largely focused on movement into the principalship (e.g., Bailes & Guthery, 2020; Davis et al., 2017; Fuller et al., 2016), our analyses examine a full set of mobility behaviors, including exiting school leadership and moving to another school as an AP, in addition to becoming a principal. Accounting for these other outcomes matters; we find that AP mobility rates are higher than those for principals and teachers, but only one third of moves are into a principal role. Roughly 10% of APs in any given year—comprising 40% of mobility events—leave school administration. Ultimately, only 40–50% of APs we observe reach the principalship.[1]

The second part of our analysis examines the relationship between principal turnover and AP mobility. While principal turnover creates an opening for which the AP ostensibly is a prime candidate, districts may prefer to promote from outside the school. Principal turnover may also lead to higher probability of AP transfer or exit, similar to prior findings for teacher mobility (Bartanen, Grissom, & Rogers, 2019; Miller, 2013). In fact, we find that the probability of AP mobility doubles in the year of a principal transition. Roughly three-quarters of this increase is explained by APs replacing their departing principal in the same school, with the remainder split between APs leaving school administration and

[1] To limit the potential for downward bias from censoring, we limit this tabulation to APs whom we can observe for at least 10 years in the administrative data. This range is consistent with findings from Texas for APs, where 43% eventually reached the principalship (Bailes & Guthery, 2020).

transferring schools. However, the probability that an individual AP will replace their departing principal is only about 15-20%, suggesting that pipelines operate at a district level rather than a school level.[2]

Assistant Principal Mobility

Research on educator mobility has a robust literature base, but these studies have focused primarily on teachers and principals. The few studies that have examined AP mobility do so within the context of pipelines to the principalship (Clark et al., 2009; Davis et al., 2017; Myung, Loeb, & Horng, 2011a), where the AP position is conceptualized as a stepping stone or apprenticeship rather than a fully professionalized leadership role in schools. We start by synthesizing this prior work, then move to broaden the conceptualization of AP mobility beyond promotion, which frames the contribution of this study.

Pathway to the Principalship

Descriptive research on the career trajectories of personnel suggests that the most common pathway to the principalship is teacher to AP to principal (Folsom, Osborne-Lampkin, & Herrington, 2015; Fuller, Young, & Orr, 2007). Most principals have AP experience (Fuller, Young, Richardson, Pendola, & Winn, 2018) and suggest that this experience was an important part of their preparation for the principalship (Parylo, Zepeda, & Bengtson, 2013). Prior studies find that both the race and gender of school personnel are predictive of their promotion to the principalship. In particular, this work finds that women (Davis et al., 2017; Gates et al., 2006; Ringel, Gates, Chung, Brown, & Ghosh-Dastidar, 2004) and Black and Latinx educators (Bailes & Guthery, 2020; Davis et

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[2] This figure does not correspond exactly to the likelihood that a given principal opening will be filled by an AP from the same school, as some schools have multiple APs and some schools have no AP. Among all observed principal vacancies, 22% and 10% are filled by an AP from the same school in Tennessee and Missouri, respectively. Among schools that had at least one AP in the prior year, these rates are 33% and 33%.

al., 2017; Fuller, Hollingworth, & An, 2019) are less likely to advance to the principalship than their male and white colleagues.

Prior work also finds that the school contexts in which APs work shape the likelihood that APs advance along the pipeline. Davis et al. (2017) find that the proportion of economically disadvantaged students is negatively associated with advancement to the principalship, while personnel working in schools with higher proportions of students of color are more likely to advance. They also find that locale and school achievement level are significant predictors of advancement. Similarly, Bailes and Guthery (2020) find that school locale and enrollment size are predictive of AP promotion to the principalship.

Some qualitative studies have also examined the pipeline to the principalship to uncover the mechanisms that may drive people's decisions to pursue the principalship (Farley-Ripple, Raffel, & Welch, 2012; Myung et al., 2011a; Oliver, 2003; Parylo, Zepeda, & Bengtson, 2012; Parylo et al., 2013). Though these studies find a number of factors may push or pull APs into the principalship, a common thread among these studies is the importance of tapping. Sometimes the tapping occurs formally, but more often the tapping occurs because a principal or district administrator encourages someone to consider the principalship. The relationship between tapping and advancing along the pipeline suggests that tapping may be a useful method for encouraging people to consider school leadership, but prior research warns that tapping could cause districts to become a closed system that disincentivizes innovation.

Broadening the Scope of Assistant Principal Mobility

Although these studies provide some evidence of the factors related to AP mobility, they are limited in several ways. First, they only examine one type of career move: promotion. In particular, prior work is largely predicated on the notion that the AP role serves as a stepping stone to the principalship (Clark et al., 2009; Myung, Loeb, & Horng, 2011b). However, other work finds that APs can remain in their positions for many years

before receiving the opportunity to be a principal, and some even retire as APs without ever having served as a principal (Marshall et al., 1992). While promotion to the principalship is undoubtedly an important transition, the narrow focus on this outcome overlooks other types of mobility behavior. A key part of our analysis, then, is to broaden this picture by documenting the frequency of APs moving between schools and exiting school leadership positions, in addition to entering the principalship. Beyond potentially delaying (or even blocking) the pathway to a principal position, these non-promotion outcomes may have important implications for the stability of school leadership teams and, ultimately, student outcomes.

There are two additional limitations of prior work that we address. First, studies examining pathways to the principalship do not examine whether the promotions occurred in the same school or another school. If APs are primarily promoted to the principalship in the same schools they served in as an AP, this would suggest that those districts are engaged in succession planning. Second, the influence that principal mobility has on APs is largely ignored. Given a relatively fixed number of schools, a principal must transfer to a new school or leave the principalship for a position to open up for an AP. Moreover, we hypothesize that principal turnover may also influence the likelihood of AP transfers or exits given prior work on the effects of principal turnover on teacher mobility (e.g., Bartanen et al., 2019; Miller, 2013). We address this gap by explicitly examining the connection between principal turnover and AP mobility.

Data

This study uses longitudinal administrative data from two states: Tennessee and Missouri. Missouri data were obtained via a data request to the Department of Elementary and Secondary Education, while the Tennessee data were accessed through the Tennessee Education Research Alliance (TERA) with approval from the Tennessee Department of Education. Missouri personnel records were available from 1991 to 2016, while Tennessee

records spanned 2002 to 2019.[3] However, we restrict our analysis to begin in 1999 and

2007, respectively, due to the unavailability of student demographic data in earlier years.

Despite having fewer schools (roughly 1,800 vs. 2,300), Tennessee has substantially more

APs. As of 2019, Tennessee has 2,085 APs in 1,277 schools, compared to only 1,154 APs in

741 schools in Missouri as of 2016. In both states, we can observe basic demographic

information including years of experience, gender, race/ethnicity, educational attainment,

and salary. We can observe age only in Tennessee. Beginning in 2011, we can also access

principals' ratings of APs as part of Tennessee's educator evaluation system. For this

analysis, we use the average observation score as a measure of AP performance, which

comprises 50% of an AP's summative evaluation rating.[4]

Finally, we draw on school information contained in the Common Core of Data

(CCD), a repository of school-by-year information maintained by the National Center for

Education Statistics. We use information about student enrollment size, proportion of

Black students, proportion of Hispanic students, and the proportion of students eligible for

free- or reduced-price lunch, which serves as a measure of school poverty. We use NCES

designations for school level and locale type (urban, suburban, town/rural).[5] Appendix

Tables A1 and A2 show descriptive statistics for APs in Tennessee and Missouri.[6]

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[3] Personnel records for several large districts in Tennessee are incomplete for the 2017–18 school year, which leads to an inflated mobility rate for 2016–17. We choose to drop from the analysis APs in these districts for this year (2016–17) only.

[4] The large majority of districts evaluate administrators using a common rubric (TEAM) that contains indicators of leadership practice grouped (as of 2016–17) into 4 domains: Instructional Leadership for Continuous Improvement, Culture for Teaching and Learning, Professional Learning and Growth, and Resource Management. Roughly 90% of APs are rated by their own principal, with the remainder being APs in small districts where a district administrator (e.g., the superintendent) does the evaluations for APs and principals. For more information, see: https://team-tn.org/administrator-evaluation/.

[5] For the sake of parsimony, we collapse the sixteen urban-centric locale codes into these three groups: urban (11–13), suburban (21–23), town/rural (31–33 and 41–43).

[6] In both states, the percentage of Black APs (23% in TN and 16% MO) is greater than the percentage of Black teachers (13% and 6%), but there are substantially greater percentages of male APs (44% and 55%) relative to the percentage of male teachers (22% in both states). APs have an average of 18.3 (14.1) years of total experience in the state education system in Tennessee (Missouri). In Tennessee, the modal AP is between 40 and 49 years of age and only 10% of APs are 60 or older. In both states, two-thirds of APs have fewer than five years of total AP experience, and almost half of APs have been in their current school

Measuring Assistant Principal Mobility

Key to our analysis is measuring the mobility outcomes of APs. In each state, we can use yearly staff files to construct the job history of all K–12 public school educators. Similar to prior analyses of principals (e.g., Grissom & Bartanen, 2019), we examine AP mobility as both a binary and categorical outcome. Our binary measure of mobility takes a value of 1 if an AP in school s in year t is not an AP in school s in year $t+1$, and 0 otherwise. This binary outcome includes multiple mobility behaviors, which likely have different antecedents and implications for schools and AP career paths. Accordingly, we construct measures for more specific types of AP mobility: leaving school administration, moving as an AP to a different school, becoming the principal in the same school, and becoming the principal in a different school. Leavers include APs who exit the state education system or change to a role outside of school administration (e.g., teacher, counselor). Movers include those who transfer within the same district and across districts.[7]

Methods

Our research aims are both descriptive and explanatory in nature. The first part of our analysis provides descriptive information about AP mobility and how it varies by school context and AP characteristics. Here, we perform two sets of sub-analyses. First, we simply provide tabulations of AP mobility rates in both states, including disaggregations by three measures of school context: school level (elementary, middle, and high), school locale (urban, suburban, and town/rural), and school poverty (0–30%, 30–70%, and 70–100% students qualify for free/reduced price lunch). We also break down AP mobility rates according to whether the principal remains in the school. Second, we estimate linear probability models with school fixed effects that predict mobility outcomes.

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for less than two years. Unsurprisingly, APs tend to work in larger schools and are less likely to work in elementary schools.

[7] Appendix Tables A3 and A4 show mobility rates for these finer-grained outcomes. For the sake of parsimony, we choose to focus on the broader set of four mobility outcomes.

The second part of our analysis aims to understand the relationship between principal turnover and AP mobility. Here, we leverage within-school variation in principal turnover across years to estimate linear probability models of the following form:

$$\Pr(Mobility = 1)_{idst} = \beta PTurnover_{st} + \gamma_1 X_{it} + \gamma_2 S_{st} + \delta_s + \tau_{dt} + \epsilon_{idst} \tag{1}$$

where i, d, s, and t index individuals, districts, schools, and school years, respectively. The parameter of interest is β, which is the marginal increase in the probability of AP mobility in years where there is a principal transition. We estimate equation 1 for a binary indicator capturing all types of mobility as well for each individual mobility outcome.[8]

The key controls here are the fixed effects for school (δ_s) and district-by-year (τ_{dt}). School fixed effects account for any time-invariant school factors that are correlated with both AP mobility and principal turnover. For instance, certain schools may face persistently high rates of turnover among all staff due to neighborhood conditions or poor funding. District-by-year fixed effects are also important to account for time-varying district factors that simultaneously affect AP and principal mobility. For instance, a newly hired superintendent may choose to shuffle leadership teams within the district, which leads to a spike in both AP and principal turnover. We also control for AP characteristics (X_{it}) and time-varying school characteristics (S_{st}). AP characteristics include race/ethnicity, gender, salary, educational attainment, age (in Tennessee only), total experience in the state, and AP-specific experience. School characteristics include enrollment and the proportions of Black, Hispanic/Latino, and FRPL-eligible students. We cluster standard errors at the school level.

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[8] Because AP mobility is a categorical outcome, we considered estimating a discrete choice model such as multinomial logistic regression. However, these models rely on an assumption of the independence of irrelevant alternatives (IIA), which is likely violated here. As an example, we find evidence that becoming a principal in the same school and becoming a principal in a different school are substitutes. Additionally, we prefer linear probability models because they allow for the inclusion of high-dimensional fixed effects. Nonetheless, we show results from multinomial logistic regression models in Appendix Table A5, where promotion to the principalship is a single category that includes both same school and different school. The patterns are qualitatively similar to the results from our preferred models.

Event study results in Figure A1 show no evidence that AP mobility rates change in the years leading up to a principal transition. However, it is important to emphasize that our interpretation of β is fundamentally descriptive rather than causal. While there is reason to believe that a causal relationship exists between principal turnover and AP mobility, there still remain multiple interpretations of the estimated parameter, even conditional on the fixed effects described above. Most notably, we cannot rule out that AP mobility and principal turnover are jointly determined. As an example, consider a situation where a principal is demoted from their position and replaced by their AP. Here, the decision to demote the principal may itself be influenced by the availability of an alternative (the AP). Thus, it would be misleading to conclude that principal turnover *caused* the AP to become principal in the same school, as these decisions are likely made simultaneously. Relatedly, with respect to AP mobility, we cannot distinguish between the agency of APs versus district administrators. Nonetheless, we argue that this descriptive analysis provides important information about the career outcomes of APs and the importance of principal turnover as a mechanism in the AP labor market.

In addition to the *average* relationship between principal turnover and AP mobility, we further examine heterogeneity by AP and school characteristics, which provides insight into the potential mechanisms at play. First, we estimate our main model and include interactions between principal turnover and three contextual characteristics: school level, locale, and student poverty.[9]

Second, we consider different types of principal turnover events: exits, transfers, promotions, and demotions. Prior work demonstrates substantial differences among these types of principal turnover, both in terms of the effectiveness of the departing principal and the subsequent impacts on school outcomes (Bartanen et al., 2019; Grissom & Bartanen, 2019). We hypothesize that different types of principal turnover may also have varying

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[9] For each characteristic, we choose a base category (elementary, urban, and 30–70% FRPL) and include interactions for the other two categories.

implications for AP mobility. Here, we replace our binary indicator of principal turnover with indicators for each specific type of turnover event.

Third, we incorporate AP effectiveness by adding an interaction between an AP's average observation score and a binary indicator for principal turnover. For ease of interpretation, however, we report the predicted probabilities graphically using a logistic regression model. The results from linear probability models are similar and are shown in Appendix Table A7.

Results

Describing Average Rates of Assistant Principal Mobility

We begin by examining yearly mobility rates for the population of APs in Tennessee and Missouri. The top row of Table 1 shows mobility rates across all school types, followed by the numbers disaggregated by school context. In any given year, roughly one-quarter of APs (24.5% in TN and 28.0% in MO) will experience some type of mobility, a rate that eclipses principals or teachers. Purely from the standpoint of stability in school leadership, these high mobility rates are worrisome. Insofar as APs play important roles as members of the leadership team, the high rate of churn could have negative impacts on school performance, as has been shown for turnover among teachers (Ronfeldt, Loeb, & Wyckoff, 2013) and principals (Bartanen et al., 2019; Miller, 2013). Given that the AP role is typically regarded as a stepping stone to the principalship, we might expect higher mobility rates among APs as they fill principal vacancies. We observe that 7.5% and 10% of APs move into the principalship each year in Tennessee and Missouri, respectively. APs in both states are more likely to become principals in a different school than their current school.

Somewhat surprising is that movement into principal positions accounts for only one-third of AP mobility events. Descriptively, an AP in any given year is as likely or more likely to exit from school leadership than become a principal. Approximately 10% of APs in either state will exit from a leadership role each year; however, Appendix Tables A3 and

A4 show that few of these individuals are exiting the education system entirely. More often they are returning to teaching or moving to positions outside of (formal) school leadership. Further, these exits from leadership appear permanent, as more than 80% of these individuals never return to school leadership and fewer than 10% eventually become principals.[10] Among APs whom we can observe for at least ten years, 57% in Tennessee and 48% in Missouri never reach the principalship.

Turning to school level, we find relatively higher rates of AP mobility in elementary and middle schools, which is driven both by higher transfer rates and movement into the principalship (particularly in Missouri). The probability that an AP moves into a principal position decreases with school level, perhaps reflecting the fact that there are proportionally more APs in middle/high schools and thus more competition for principal vacancies. AP mobility is also substantially higher in urban schools, again driven primarily by movers and, to a lesser extent, taking a principal position in a different school. Urban APs in Missouri also leave at substantially higher rates than their counterparts in suburban or town/rural schools. Interestingly, APs in town/rural schools are the most likely to become principals in the same school, which could reflect fewer outside options on both the supply (number of viable candidates for principal positions) and demand side (number of vacancies).

The starkest differences in AP mobility rates are between high-poverty (70–100% FRPL) and low-poverty (0–30% FRPL) schools. In Tennessee, APs turn over at a rate of 33% per year in high-poverty schools, compared to 21% in low-poverty schools. The difference in Missouri is even larger—45% versus 22%. Put simply, high-poverty schools face substantially greater rates of leadership churn than low-poverty schools. Given higher rates of principal turnover in high-poverty schools (Grissom et al., 2019), one potential

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[10] To mitigate the influence of right-censoring, we produce these tabulations using the years 2007–2011 in Tennessee and 1999–2009 in Missouri. Among APs who leave school leadership in these years, 84% and 81% are never observed returning to a school leadership position in future years in Tennessee and Missouri, respectively. The percentages observed ultimately becoming a principal are 7.4% and 10.8%, respectively.

explanation is that AP mobility rates are simply higher because APs are filling these vacancies. While APs in high-poverty schools are indeed somewhat more likely to enter the principalship, this does little to explain their higher mobility rates. Instead, the disparities are driven by substantially higher rates of leaving school administration and changing schools. In Missouri, APs in high-poverty schools change schools at nearly three times the rate of APs in low-poverty schools (16% vs. 6%) and are twice as likely to leave school administration (16% vs. 8%). The patterns are similar in Tennessee, though not quite as stark. High-poverty APs change schools at double the rate of low-poverty APs (13% vs. 7%) and are roughly 50% more likely to leave administration (11% vs. 7%).

The bottom of Table 1 shows AP mobility rates conditional on principal turnover. Here, we observe a clear association between principal turnover and AP mobility. In years where the school experiences a principal turnover event, AP mobility rates jump to roughly 50%, with some variation based on the type of principal turnover. Clearly, one reason to expect a rise in AP mobility during a principal transition is that the AP fills the opening—this increase is effectively mechanical. In both states, the probability that a given AP fills the vacancy left by their departing principal is 15–20%. However, we also find that APs' rates of leaving administration and transferring schools are higher in the year of a principal transition. In particular, APs are more likely to leave administration when their principal is demoted or exits the state education system, and more likely to transfer schools when their principal also transfers. Promotions appear the least disruptive—the increase in AP mobility is almost completely driven by moves into the principalship.

Linear Probability Models of Assistant Principal Mobility

Table 2 shows baseline estimates from linear probability models with school fixed effects that predict AP mobility as a function of AP characteristics.[11] We find no evidence that Black or male APs are more likely to leave their positions in Tennessee. In Missouri,

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[11] We also show results in Appendix Table A6 that further disaggregate leavers and movers.

male APs are slightly more likely to leave school administration and move across schools, and there is some suggestive evidence that Black APs are more likely to become a principal in a different school but less likely to become a principal in the same school. Higher-paid APs are less likely to exit school administration, particularly in Tennessee, and are also more likely to enter the principalship in both states, though the magnitudes of these associations are small.

In both states, APs with an Ed.S. or doctorate are more likely to leave school administration.[12] Educational attainment is also linked to promotion into the principalship; relative to the base rates in Tennessee and Missouri, respectively, APs with a doctorate are 65% and 45% more likely to become a principal in a different school. Interestingly, however, we find no evidence of an advantage for becoming principal in the same school.

Controlling for experience, older APs are substantially more likely to leave school leadership, but less likely to change schools or move to a principal position. Comparing columns 4 and 5, this negative age gradient is larger for becoming a principal in a different school, suggesting a particular preference for a younger principal when promoting from outside the school. While we cannot observe age in Missouri, total experience in the state education system serves as a rough proxy, and we observe similar patterns.

Turning to AP-specific experience, we find that more experienced APs are substantially more likely to be mobile in both states. Compared to those in their first or second year, for instance, APs with at least five years of experience are 9 percentage points (pp) more likely to be mobile—driven by exits and movement into the principalship. This pattern is consistent with the notion that the AP role is a stepping stone—those aspiring to the principalship gain experience for the purposes of promotion and are unlikely to stay in the role long term.

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[12] Appendix Table A6 shows that this is mainly driven by moves to other non-teaching positions in the school system.

AP Mobility and Principal Turnover

As discussed from the outset, there is strong reason to believe that AP mobility outcomes are related to principal turnover, which is supported by raw tabulations in Table 1. Figure 1 shows the coefficient estimates and 95% confidence intervals for a binary indicator of principal turnover from the model described by equation 1. The probability of AP mobility is roughly 20 pp higher in the year of a principal turnover event. In other words, an AP is twice as likely to move from their position when their principal leaves the school. Figure 1 also shows that three-quarters of this increase is explained by APs filling the principal vacancy in the same school. However, there are also meaningful increases in the probability of exiting school administration (2–3 pp) and moving to an AP position in another school (3–5 pp). There is also a decrease in the probability that an AP becomes principal in a different school. While this may seem counterintuitive, it likely reflects a substitution effect whereby some APs filling the vacancy in their school would have been promoted to the principalship (in another school) had their principal stayed.

Heterogeneity by School Context

Next, we consider heterogeneity in the relationship between principal turnover and AP mobility. Table 4 shows estimates for the main effect of principal turnover and the interaction terms.[13] The clearest pattern across both states is that the tendency for APs to succeed the departing principal is substantially smaller in middle and high schools. However, this is strictly a function of the number of APs in the school; the probability that any given AP succeeds the departing principal is reduced when there are multiple APs.[14] By contrast, same-school succession is more common in town/rural schools[15], presumably

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[13] For each category, we choose a reference category such that the main effect corresponds to the marginal effect of principal turnover for a medium-poverty elementary school in an urban area.

[14] Describe untabulated analysis about what happens when you include an interaction between principal turnover and the number of APs in the school.

[15] This relationship persists even when we account for the number of APs in the school.

because they have a smaller pool of school leadership candidates from which to fill the vacancy. Town/rural APs are also less likely to transfer to another school following a principal turnover event, mirroring the pattern in Table 1 that shows their baseline transfer rates are much lower than urban schools.

Turning to poverty level, the results vary somewhat across states. In Tennessee, the marginal effect of principal turnover on AP transfers is twice as large in high-poverty schools (70–100% FRPL) as compared to medium- (30–70% FRPL) or low-poverty (0–30% FRPL) schools. We find a similar pattern in Missouri, but the interaction term is not statistically significant at conventional levels. APs in high-poverty schools are relatively less likely to replace the departing principal in their school, particularly in Missouri.

Differences by Type of Principal Turnover

Table 3 shows substantial heterogeneity in AP mobility according to the type of principal turnover, though there are also differences between Tennessee and Missouri. In Tennessee, principal demotions are associated with the largest increase in the probability of AP mobility (26 pp), but the AP is comparatively less likely to replace the departing principal. Instead, the higher AP mobility rate is explained by a 7 pp increase in the probability of exiting school administration and 5 pp increase in the probability of transferring. By contrast, principal promotions are associated only with an increased likelihood that the AP fills the new opening (and the corresponding decrease in becoming a principal in a different school). These patterns largely hold in Missouri, though there is no clear evidence of increased exits or transfers in case of principal demotions.

As we found in Table 1, principal transfers are associated with a substantial increase in the probability of AP transfers. One obvious explanation for this pattern is that the leadership team moves together to a different school. In fact, we do find evidence of this; when a principal and AP both transferred in the same year, they moved to the same school in 42% of cases in Tennessee and 44% of cases in Missouri. Finally, in both states we

observe that when principals exit the state system, there are increases in the probability of
APs leaving school leadership and changing schools, in addition to replacing the outgoing
principal.[16]

Accounting for AP Effectiveness

The final part of our analysis incorporates AP effectiveness—as measured by
rubric-based evaluations of APs performed by their principals—into our models of AP
mobility. Figure 2 shows the predicted probabilities of AP mobility outcomes as function of
AP observation scores and principal turnover. The top plot shows that the relationship
between AP observation scores and AP mobility depends strongly on whether the principal
remains in the school. In years when the principal stays, higher-scoring APs are
substantially more likely to remain in their positions. The bottom plots show that this
pattern is driven by low-scoring APs leaving school leadership or transferring to another
school.

When a principal leaves their position, we find a U-shaped pattern with respect to
AP observation scores. The change in this relationship is explained by the increased
likelihood of higher-scoring APs to replace their departing principal. At the low end of AP
observation scores, the predicted probability that the AP replaces the principal is close to
zero and increases to roughly 25% for APs scoring between 4 and 5. For leaves and moves,
the predicted probabilities increase when the principal leaves but there is no evidence of an
interaction with AP observation scores. Finally, we find that higher-scoring APs are more
likely to become the principal in a different school, but this does not appear to vary by
principal turnover.

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[16] One challenge with interpreting principal exits is that they likely encompass a wider range of situations
than transfers, promotions, or demotions. For instance, exits include highly experienced, effective
principals that are retiring and low-performing principals who leave the education system.

Discussion and Conclusion

Despite growing recognition of the important role assistant principals can play in school improvement, no studies have explicitly documented their career pathways on a large scale. Drawing on statewide longitudinal data from Tennessee and Missouri, this paper provides, to our knowledge, the first comprehensive analysis of assistant principal mobility. While prior work has largely focused on the transition from AP to principal, we consider the full set of AP career behavior, including leaving school administration and moving to a different school as an AP. We also differentiate promotions to the principalship in the same school versus a different school. Finally, we examine the role of principal turnover in shaping AP mobility outcomes.

We uncover a number of important patterns. First, we show that AP mobility rates are high, easily surpassing that of teachers or principals. Despite strong recent emphasis on the assistant principalship as an important waypoint in the school leadership pipeline, the bulk of this turnover cannot be attributed to AP promotions to the principalship. Ten percent of APs leave the school leadership pipeline each year, and 50-60% of individuals who become APs in our data never become principals.

Thus, the AP role is clearly more than a path to the principalship. The heterogeneity we observe in AP career pathways suggests that researchers should broaden their conception of the AP role beyond a stepping stone along the school leadership pipeline. However, our findings neither confirm nor deny that the AP role is fully professionalized. High rates of AP mobility coupled with the variation in career outcomes suggest that the AP role is in fact *not* yet fully professionalized nor fully integrated into evolving district models of school leadership.

We also find a strong association between AP mobility and principal turnover. APs whose principals leave their position are roughly twice as likely to leave their positions. As one might expect, much of this movement is explained by APs becoming the new principal in their school. Nevertheless, among schools that have at least one AP, the probability that

a principal vacancy is filled by an AP from the same school is only 33%. In Tennessee, we do find evidence that these same-school promotions are concentrated among APs with higher effectiveness ratings, which suggests that districts are behaving strategically to promote high-quality candidates—a core tenet of recent initiatives to establish principal pipelines (Gates et al., 2019). However, we also find evidence that principal turnover increases the likelihood that APs exit school leadership or change schools, suggesting that the fate of APs may in part be tied to that of their principal. These findings further highlight the potential discordance between models of school leadership that position the AP role primarily as one of training and the emergence of egalitarian "leadership teams" in which the responsibility (and blame) for a school's outcomes is shared by the principal and assistant principal. Given inherent variation in principal effectiveness within any school district, future research should continue to examine the extent to which labor market and performance outcomes for APs are related to the effectiveness of their principals.

As our primary aim was to provide a descriptive look at AP mobility, our results highlight a number of avenues for future work. Ultimately, we cannot make claims about how much AP mobility is desirable. From research on principal mobility, we can extrapolate that high levels of AP mobility may produce undesirable effects for schools. The high rates of annual AP churn we observe in high-poverty schools—33% (Tennessee) and 45% (Missouri)—are particularly worrisome in this regard, as these schools already face other organizational challenges. On the other hand, the exit of individuals who are less effective or who feel less satisfied in the role may be positive in that they can be replaced by stronger candidates. More research is needed, then, to understand how the high rates of AP mobility we observe affect short- and long-term school outcomes across varying school contexts.

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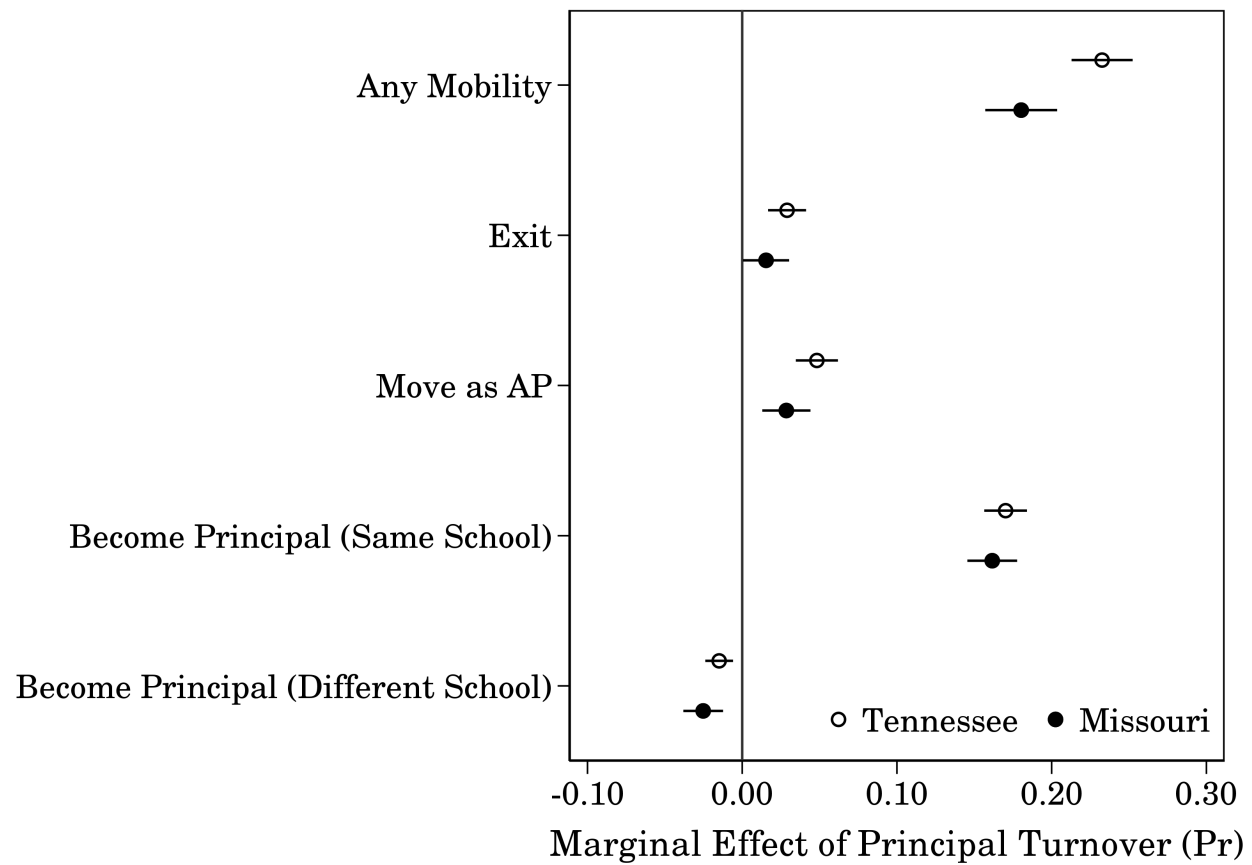
Figure 1. Principal Turnover and Assistant Principal Mobility

Notes: Plot shows coefficient estimates and 95% confidence intervals from linear probability models for a binary indicator of principal turnover. The y-axis shows the specific AP mobility outcome (dependent variable) for each estimate. Models are estimated separately by state according to the specification shown in equation 1.
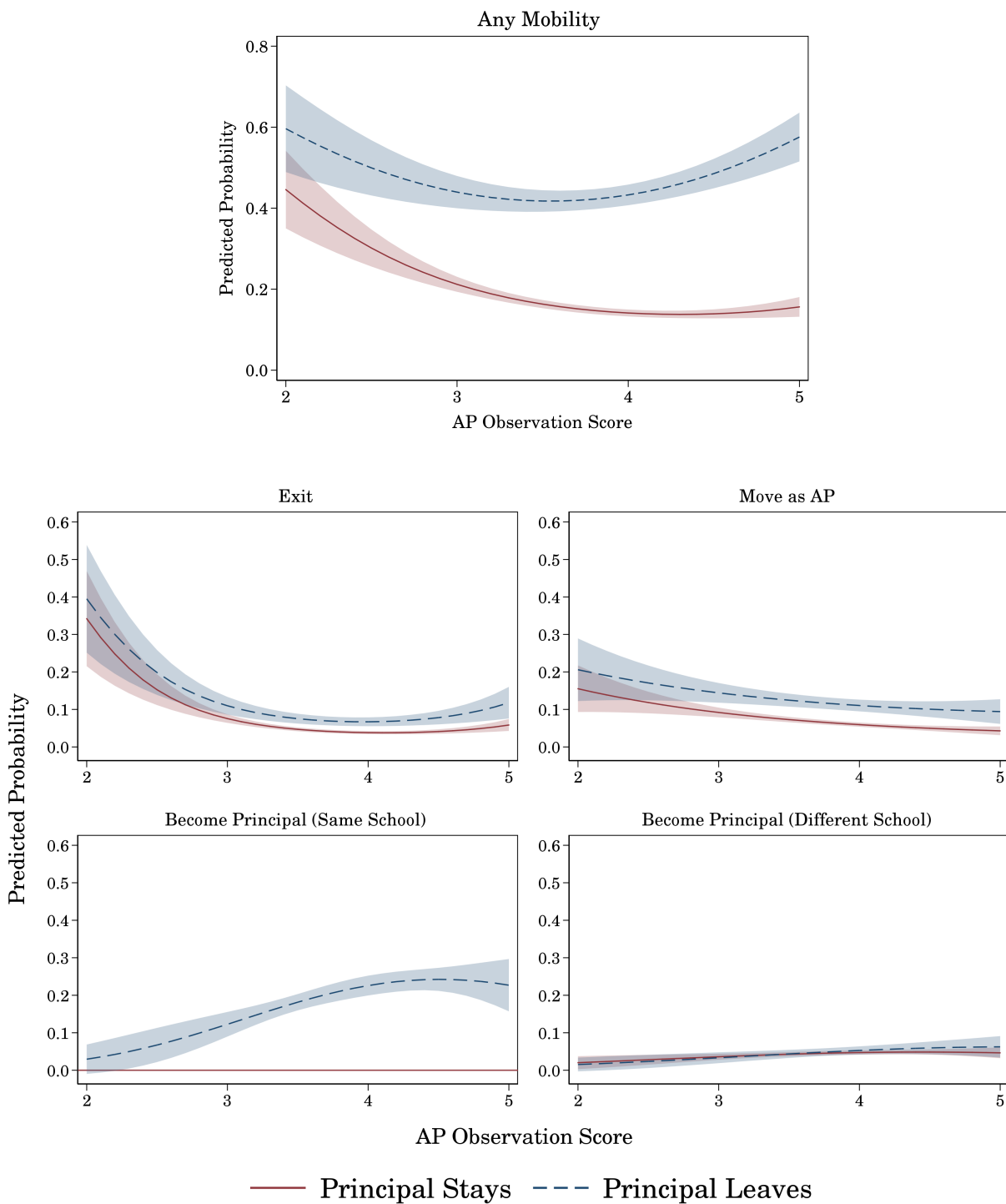
Figure 2. Heterogeneity in the Relationship between Principal Turnover and AP Mobility by AP Effectiveness

Notes: Plots show predicted probabilities from logistic regression models for the binary outcome listed above the plot. Shaded regions are 95% confidence intervals. The exact specification includes the full set of AP and school characteristics, a binary indicator for principal turnover, AP observation scores (entered as a quadratic), and the interaction between principal turnover and AP observation scores. In each plot, the x-axis shows the range of mean observation scores ($M = 3.87, SD = 0.57$) and there are two lines corresponding to whether the principal stays or leaves. For "Become Principal (Same School)", the model only includes observations where the principal leaves. The sample includes Tennessee APs from 2011–12 to 2017–18. Linear probability models that include school fixed effects, district-by-year fixed effects, and AP observation scores entered non-parametrically are shown in Appendix Table A7.

Table 1
Assistant Principal Yearly Mobility Rates in Tennessee and Missouri (%)

| | Tennessee | | | Become Principal | | Missouri | | | Become Principal | |
	Any Mobility	Leave	Move	Same School	Different School	Any Mobility	Leave	Move	Same School	Different School
All Schools	24.5	9.5	7.4	2.9	4.6	28.0	10.0	7.7	3.4	6.8
School Level										
Elementary	27.6	9.7	8.3	4.1	5.4	38.1	11.2	11.9	4.3	10.8
Middle	26.4	9.6	9.6	2.6	4.7	29.3	9.5	9.0	3.9	7.0
High	20.3	9.0	5.4	2.0	3.8	22.1	9.5	4.9	2.7	4.9
School Locale										
Urban	29.1	9.5	11.7	2.0	6.0	35.1	13.2	11.3	2.8	7.8
Suburban	22.1	8.1	7.6	2.6	3.7	24.9	9.1	7.3	2.4	6.1
Town/Rural	22.5	10.1	4.8	3.6	4.1	27.4	9.1	5.9	5.3	7.1
School Poverty										
0–30% FRPL	20.7	7.4	6.6	2.1	4.6	22.3	8.1	5.9	2.6	5.8
30–70% FRPL	22.5	9.5	5.7	3.2	4.1	29.8	10.5	7.7	4.4	7.1
70–100% FRPL	32.7	11.1	13.0	2.7	5.9	44.7	16.1	15.8	3.0	9.8
Principal Turnover										
Stay	19.6	8.7	6.3	0.0	4.5	22.4	9.1	6.8	0.0	6.5
Exit	47.0	13.7	10.1	18.8	4.3	46.2	14.6	9.8	14.6	7.3
Move	51.1	10.0	20.9	14.6	5.6	57.9	13.4	19.2	16.2	9.1
Promoted	39.0	10.0	7.2	19.1	2.7	46.0	10.1	6.1	20.8	9.0
Demoted	53.1	18.4	12.5	16.2	6.0	51.5	15.1	13.7	16.4	6.2

Notes: In each state, the "any mobility" column shows the sum of the four mutually exclusive and exhaustive mobility outcomes. "Leave" includes APs who exit the state education system, return to a teaching position, or move to a non-teaching position outside of formal school administration, such as counselor. "Move" includes APs who change schools but remain an AP. FRPL = percentage of students qualifying for free or reduced-price lunch.

Table 2

AP Characteristics and AP Mobility

	Tennessee					Missouri				
				Become Principal					Become Principal	
	Any (1)	Leave (2)	Move (3)	Same Sch (4)	Diff Sch (5)	Any (6)	Leave (7)	Move (8)	Same Sch (9)	Diff Sch (10)
Black	0.002	-0.004	0.005	0.001	0.000	0.032	0.004	0.015	-0.011*	0.024**
	(0.013)	(0.009)	(0.009)	(0.005)	(0.007)	(0.021)	(0.013)	(0.015)	(0.007)	(0.012)
Male	0.006	0.003	0.001	0.001	0.001	0.028***	0.011	0.018***	-0.004	0.003
	(0.008)	(0.006)	(0.005)	(0.004)	(0.004)	(0.010)	(0.006)	(0.006)	(0.004)	(0.006)
Black x Male	0.007	-0.004	0.010	-0.003	0.004	0.001	-0.006	0.006	0.002	-0.001
	(0.019)	(0.012)	(0.012)	(0.006)	(0.010)	(0.026)	(0.020)	(0.018)	(0.008)	(0.016)
Salary (log)	-0.324***	-0.361***	-0.019	0.025**	0.032**	-0.089*	-0.105***	-0.101***	0.086***	0.032
	(0.033)	(0.031)	(0.016)	(0.010)	(0.013)	(0.048)	(0.040)	(0.030)	(0.020)	(0.026)
Has Ed.S.	0.014	0.014**	0.007	-0.004	-0.003	0.020*	0.018**	0.001	-0.002	0.003
	(0.009)	(0.006)	(0.006)	(0.004)	(0.005)	(0.012)	(0.008)	(0.007)	(0.006)	(0.007)
Has Doctorate	0.076***	0.038***	0.006	-0.001	0.032***	0.038**	0.020	-0.006	-0.005	0.030***
	(0.015)	(0.010)	(0.010)	(0.005)	(0.009)	(0.018)	(0.012)	(0.010)	(0.007)	(0.011)
Age 40–49	-0.005	0.022***	-0.015**	-0.001	-0.011**					
	(0.009)	(0.006)	(0.006)	(0.004)	(0.005)					
Age 50–59	-0.009	0.036***	-0.013	-0.012**	-0.020***					
	(0.013)	(0.008)	(0.009)	(0.005)	(0.007)					
Age 60+	0.020	0.132***	-0.034***	-0.027***	-0.051***					
	(0.018)	(0.013)	(0.010)	(0.006)	(0.008)					
<10 Years State Exp	-0.016	-0.005	-0.003	-0.007	-0.001	0.017	0.003	0.002	-0.001	0.013**
	(0.012)	(0.007)	(0.008)	(0.004)	(0.006)	(0.010)	(0.007)	(0.006)	(0.005)	(0.006)
25+ Years State Exp	0.013	0.036***	-0.019***	0.003	-0.006	0.049***	0.128***	-0.024***	-0.018***	-0.038***
	(0.012)	(0.009)	(0.007)	(0.005)	(0.006)	(0.014)	(0.011)	(0.007)	(0.005)	(0.007)
2–4 Years AP Exp	0.076***	0.020***	0.003	0.023***	0.031***	0.071***	0.013**	0.010*	0.013***	0.035***
	(0.008)	(0.005)	(0.005)	(0.004)	(0.004)	(0.010)	(0.006)	(0.006)	(0.004)	(0.006)
5+ Years AP Exp	0.091***	0.045***	0.002	0.022***	0.021***	0.090***	0.044***	0.013*	0.010*	0.023***
	(0.010)	(0.007)	(0.006)	(0.004)	(0.005)	(0.012)	(0.009)	(0.008)	(0.006)	(0.007)
N	21172	21172	21172	21172	21172	15553	15553	15553	15553	15553
R^2	0.140	0.140	0.149	0.131	0.103	0.173	0.147	0.192	0.121	0.146

Notes: Results are from linear probability models where the binary outcome is defined by the column header. Models include AP characteristics, school fixed effects, time-varying school demographics, and year fixed effects. Standard errors clustered by school shown in parentheses. The four types of principal turnover are mutually exclusive and exhaustive.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3

AP Mobility and Different Types of Principal Turnover

	Tennessee					Missouri				
				Become Principal					Become Principal	
	Any (1)	Leave (2)	Move (3)	Same Sch (4)	Diff Sch (5)	Any (6)	Leave (7)	Move (8)	Same Sch (9)	Diff Sch (10)
Principal Exit	0.237***	0.032***	0.035***	0.182***	-0.012*	0.168***	0.019*	0.024**	0.146***	-0.021**
	(0.016)	(0.010)	(0.010)	(0.012)	(0.007)	(0.017)	(0.011)	(0.012)	(0.011)	(0.009)
Principal Transfer	0.234***	-0.004	0.097***	0.157***	-0.016*	0.234***	0.021	0.091***	0.171***	-0.049***
	(0.020)	(0.011)	(0.016)	(0.013)	(0.010)	(0.024)	(0.017)	(0.019)	(0.017)	(0.014)
Principal Promoted	0.184***	0.016	0.006	0.190***	-0.028***	0.174***	-0.001	-0.009	0.187***	-0.003
	(0.023)	(0.013)	(0.013)	(0.016)	(0.009)	(0.022)	(0.013)	(0.013)	(0.016)	(0.012)
Principal Demoted	0.259***	0.066***	0.050***	0.152***	-0.008	0.136***	0.009	0.023	0.139***	-0.036**
	(0.019)	(0.014)	(0.013)	(0.012)	(0.010)	(0.027)	(0.019)	(0.020)	(0.017)	(0.014)
N	20903	20903	20903	20903	20903	14553	14553	14553	14553	14553
R^2	0.237	0.201	0.187	0.290	0.149	0.339	0.263	0.303	0.392	0.263

Notes: Results are from linear probability models where the binary outcome is defined by the column header. Models include AP characteristics, school fixed effects, time-varying school demographics, and district-by-year fixed effects. Standard errors clustered by school shown in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4

Heterogeneity in the Relationship between Principal Turnover and AP Mobility by School Context

	Tennessee					Missouri				
				Become Principal					Become Principal	
	Any (1)	Leave (2)	Move (3)	Same Sch (4)	Diff Sch (5)	Any (6)	Leave (7)	Move (8)	Same Sch (9)	Diff Sch (10)
Principal Turnover	0.216***	-0.007	0.054***	0.212***	-0.043***	0.235***	0.052**	0.031	0.217***	-0.066***
	(0.029)	(0.018)	(0.020)	(0.019)	(0.014)	(0.035)	(0.025)	(0.026)	(0.023)	(0.020)
School Level										
x Elementary (reference)										
x Middle	-0.048*	0.006	0.040**	-0.103***	0.008	-0.014	-0.011	0.014	-0.041*	0.025
	(0.026)	(0.017)	(0.019)	(0.018)	(0.013)	(0.031)	(0.020)	(0.021)	(0.021)	(0.019)
x High	-0.084***	0.027*	-0.009	-0.127***	0.024**	-0.074**	-0.016	0.021	-0.125***	0.045**
	(0.024)	(0.015)	(0.016)	(0.016)	(0.012)	(0.030)	(0.020)	(0.021)	(0.020)	(0.018)
School Locale										
x Urban (reference)										
x Suburban	0.033	-0.001	-0.013	0.046**	0.001	-0.017	-0.013	-0.027	0.005	0.018
	(0.030)	(0.020)	(0.022)	(0.020)	(0.013)	(0.030)	(0.023)	(0.023)	(0.019)	(0.018)
x Town/Rural	0.075***	0.031*	-0.061***	0.090***	0.015	0.033	-0.017	-0.042*	0.089***	0.004
	(0.026)	(0.017)	(0.017)	(0.016)	(0.011)	(0.032)	(0.023)	(0.023)	(0.022)	(0.020)
School Poverty										
x 0–30% FRPL	-0.019	0.004	0.006	-0.047**	0.018	-0.040	-0.030*	-0.002	-0.012	0.004
	(0.030)	(0.018)	(0.018)	(0.019)	(0.013)	(0.027)	(0.018)	(0.017)	(0.017)	(0.014)
x 30–70% FRPL (reference)										
x 70–100% FRPL	0.086***	0.037*	0.064***	-0.036**	0.021*	-0.042	-0.021	0.043	-0.090***	0.026
	(0.029)	(0.020)	(0.020)	(0.017)	(0.013)	(0.038)	(0.027)	(0.030)	(0.022)	(0.022)
N	20884	20884	20884	20884	20884	14550	14550	14550	14550	14550
R^2	0.239	0.200	0.190	0.310	0.149	0.340	0.264	0.302	0.408	0.263

Notes: Results are from linear probability models where the binary outcome is defined by the column header. Models include school fixed effects, time-varying school demographics, and district-by-year fixed effects. Standard errors clustered by school shown in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix
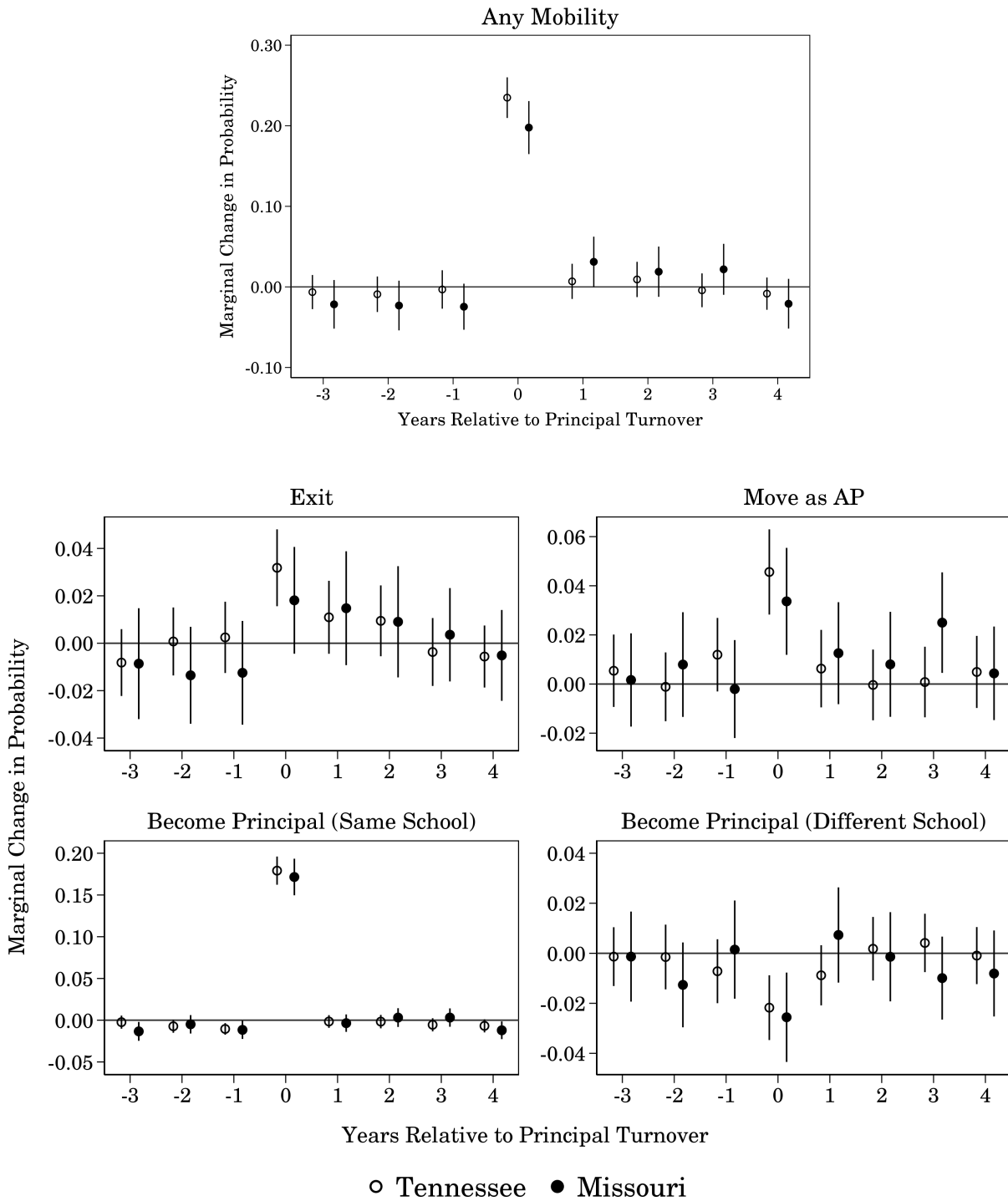
Figure A1. Event Study of the Relationship between Principal Turnover and AP Mobility

Notes: Plots show coefficient estimates and 95% confidence intervals for indicator variables denoting time since a principal transition. Because schools can have multiple transitions within the 8-year window, the indicators are not mutually exclusive. Models include AP characteristics, school fixed effects, time-varying school characteristics, and district-by-year fixed effects. Standard errors are clustered by school.

Table A1

Descriptive Statistics for Tennessee Assistant Principals

	N	Mean	SD	Min	Max
AP Characteristics					
Black	24822	0.23			
Other Race	24822	0.01			
Male	24575	0.44			
Salary ($1,000s)	24304	66.8	12.8	32.3	96.6
Years of Experience in State	24605	18.3	9.0	0	60
Has Ed.S.	24631	0.31			
Has Doctorate	24631	0.08			
Age <40	24470	0.28			
Age 40–49	24470	0.37			
Age 50–59	24470	0.25			
Age 60+	24470	0.10			
0–1 Years AP Exp	24848	0.32			
2–4 Years AP Exp	24848	0.34			
5+ Years AP Exp	24848	0.34			
0–1 Years in School	24848	0.45			
2–4 Years in School	24848	0.32			
5+ Years in School	24848	0.23			
Average Observation Score	14043	3.87	0.57	1.00	5.00
School Characteristics					
Enrollment (100s)	24816	9.57	5.17	0.12	33.07
Prop Black Stu	24767	0.26	0.29	0.00	1.00
Prop Hisp Stu	24767	0.07	0.09	0.00	0.76
Prop FRPL Stu	24767	0.50	0.25	0.00	1.00
Elementary School	24727	0.34			
Middle School	24727	0.23			
High School	24727	0.38			
Other Level School	24727	0.04			
Urban School	24727	0.32			
Suburban School	24727	0.19			
Town/Rural School	24727	0.49			

Table A2

Descriptive Statistics for Missouri Assistant Principals

	N	Mean	SD	Min	Max
AP Characteristics					
Black	17858	0.16			
Other Race	17858	0.01			
Male	17858	0.55			
Salary ($1,000s)	17858	72.2	16.0	39.0	112.0
Years of Experience in State	16743	14.1	7.7	0	52
Has Ed.S.	17855	0.17			
Has Doctorate	17855	0.07			
0–1 Years AP Exp	17858	0.36			
2–4 Years AP Exp	17858	0.31			
5+ Years AP Exp	17858	0.33			
0–1 Years in School	17858	0.46			
2–4 Years in School	17858	0.28			
5+ Years in School	17858	0.25			
School Characteristics					
Enrollment (100s)	17811	9.54	5.34	0.24	28.82
Prop Black Stu	17811	0.23	0.30	0.00	1.00
Prop Hisp Stu	17811	0.04	0.07	0.00	0.93
Prop FRPL Stu	17634	0.37	0.25	0.00	1.00
Elementary School	17854	0.22			
Middle School	17854	0.28			
High School	17854	0.47			
Other Level School	17854	0.03			
Urban School	17854	0.22			
Suburban School	17854	0.45			
Town/Rural School	17854	0.33			

Table A3

Assistant Principal Mobility Rates in Tennessee (%)

	All	Leave as AP			Move as AP		Become Principal	
		Exit System	Teacher	Other Job	Same District	Different District	Same School	Different School
All Schools	24.5	3.6	3.0	2.9	6.7	0.7	2.9	4.6
School Level								
Elementary	27.6	3.6	3.0	3.1	7.8	0.5	4.1	5.4
Middle	26.4	3.4	3.5	2.6	8.7	0.9	2.6	4.7
High	20.3	3.7	2.5	2.9	4.6	0.8	2.0	3.8
School Locale								
Urban	29.1	3.9	3.0	2.6	10.9	0.7	2.0	6.0
Suburban	22.1	3.7	2.0	2.3	6.9	0.8	2.6	3.7
Town/Rural	22.5	3.4	3.3	3.3	4.0	0.7	3.6	4.1
School Poverty								
0–30% FRPL	20.7	3.7	1.6	2.1	5.8	0.8	2.1	4.6
30–70% FRPL	22.5	3.5	3.0	3.0	5.0	0.7	3.2	4.1
70–100% FRPL	32.7	3.8	4.0	3.3	12.2	0.8	2.7	5.9
Principal Turnover								
Stay	19.6	3.3	2.7	2.7	5.7	0.7	0.0	4.5
Exit	47.0	6.2	4.0	3.6	9.0	1.1	18.8	4.3
Move	51.1	3.2	2.9	3.9	19.8	1.1	14.6	5.6
Promoted	39.0	3.4	3.4	3.2	6.7	0.5	19.1	2.7
Demoted	53.1	6.2	6.8	5.4	11.2	1.3	16.2	6.0

Table A4

Assistant Principal Mobility Rates in Missouri (%)

	All	Leave as AP			Move as AP		Become Principal	
		Exit System	Teacher	Other Job	Same District	Different District	Same School	Different School
All Schools	28.0	4.8	2.4	2.8	6.0	1.7	3.4	6.8
School Level								
Elementary	38.1	5.0	3.4	2.8	10.7	1.1	4.3	10.8
Middle	29.3	4.4	2.6	2.5	7.6	1.4	3.9	7.0
High	22.1	4.8	1.6	3.1	2.8	2.1	2.7	4.9
School Locale								
Urban	35.1	6.6	4.1	2.5	9.8	1.5	2.8	7.8
Suburban	24.9	4.9	1.7	2.5	5.6	1.8	2.4	6.1
Town/Rural	27.4	3.4	2.1	3.5	4.0	1.9	5.3	7.1
School Poverty								
0–30% FRPL	22.3	4.0	1.4	2.7	4.3	1.6	2.6	5.8
30–70% FRPL	29.8	5.0	2.5	3.0	5.8	1.9	4.4	7.1
70–100% FRPL	44.7	7.4	5.9	2.7	14.1	1.7	3.0	9.8
Principal Turnover								
Stay	22.4	4.3	2.1	2.7	5.3	1.5	0.0	6.5
Exit	46.2	8.1	3.2	3.2	7.6	2.2	14.6	7.3
Move	57.9	6.6	3.9	2.9	16.0	3.2	16.2	9.1
Promoted	46.0	3.9	2.5	3.8	3.8	2.3	20.8	9.0
Demoted	51.5	6.8	5.4	2.9	9.5	4.1	16.4	6.2

Table A5

Multinomial Logistic Regression Results

	Tennessee			Missouri		
	Leave Admin	Move Schools	Become Prin	Leave Admin	Move Schools	Become Prin
Principal Turnover	2.29***	3.13***	7.87***	2.10***	2.41***	5.95***
	(0.15)	(0.21)	(0.47)	(0.15)	(0.18)	(0.36)
AP Characteristics						
Black	0.88	1.00	0.92	1.00	1.28*	1.16
	(0.08)	(0.10)	(0.08)	(0.12)	(0.17)	(0.15)
Male	1.00	0.96	1.04	1.04	1.13	1.08
	(0.06)	(0.07)	(0.07)	(0.07)	(0.09)	(0.07)
Black x Male	1.06	1.35***	1.04	1.14	1.03	0.93
	(0.14)	(0.16)	(0.15)	(0.19)	(0.16)	(0.16)
Salary (log)	0.09***	1.09	1.09	0.31***	0.81	0.89
	(0.02)	(0.22)	(0.22)	(0.07)	(0.21)	(0.20)
Has Ed.S.	1.03	1.15**	1.03	1.11	1.11	1.07
	(0.07)	(0.08)	(0.07)	(0.09)	(0.10)	(0.09)
Has Doctorate	1.52***	1.28**	1.63***	1.46***	0.89	1.58***
	(0.16)	(0.14)	(0.18)	(0.17)	(0.14)	(0.20)
Age 40–49	1.14*	0.84**	0.88*			
	(0.09)	(0.06)	(0.06)			
Age 50–59	1.38***	0.91	0.71***			
	(0.13)	(0.09)	(0.07)			
Age 60+	2.58***	0.55***	0.26***			
	(0.30)	(0.09)	(0.05)			
<10 Years State Exp	1.10	1.05	1.02	1.10	1.26***	1.22***
	(0.09)	(0.08)	(0.09)	(0.08)	(0.09)	(0.08)
25+ Years State Exp	1.37***	0.71***	0.83*	2.72***	0.73***	0.54***
	(0.12)	(0.07)	(0.09)	(0.21)	(0.08)	(0.07)
2–4 Years AP Exp	1.01	0.92	1.62***	0.92	1.01	1.29***
	(0.07)	(0.06)	(0.11)	(0.07)	(0.08)	(0.09)
5+ Years AP Exp	1.04	0.69***	1.05	1.12	0.88	0.93
	(0.08)	(0.06)	(0.09)	(0.09)	(0.08)	(0.09)
School Characteristics						
Enrollment (100s)	0.98*	0.98*	0.97***	0.97***	0.95***	0.92***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prop Black Stu	2.36***	2.14***	1.20	1.48**	1.53*	0.53***
	(0.35)	(0.36)	(0.19)	(0.25)	(0.35)	(0.10)
Prop Hisp Stu	1.84*	1.44	2.18**	1.85	2.75*	0.78
	(0.64)	(0.50)	(0.75)	(0.77)	(1.49)	(0.34)
Prop FRPL Stu	0.93	1.14	1.05	1.59**	1.22	1.34
	(0.14)	(0.20)	(0.17)	(0.31)	(0.28)	(0.25)
Middle School	1.03	1.03	0.69***	0.80***	0.69***	0.61***
	(0.07)	(0.08)	(0.05)	(0.07)	(0.07)	(0.05)
High School	1.00	0.69***	0.65***	0.91	0.51***	0.61***
	(0.08)	(0.06)	(0.05)	(0.08)	(0.06)	(0.05)
Other Level School	1.22	0.86	0.80*	1.06	0.83	0.68**
	(0.15)	(0.14)	(0.10)	(0.22)	(0.19)	(0.11)
Suburban School	0.99	0.87	0.82*	1.03	0.94	0.87
	(0.09)	(0.09)	(0.08)	(0.10)	(0.11)	(0.08)
Town/Rural School	0.89	0.54***	0.96	0.87	0.69***	0.88
	(0.07)	(0.05)	(0.08)	(0.09)	(0.09)	(0.09)
N		21141			15553	

Notes: Coefficients are relative risk ratios, where the base category is no mobility. Standard errors clustered by school shown in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A6

Predicting AP Mobility Using Finer-Grained Categories

	Tennessee					Missouri				
	Exit (1)	Teacher (2)	Other Job (3)	Same Dist (4)	Diff Dist (5)	Exit (6)	Teacher (7)	Other Job (8)	Same Dist (9)	Diff Dist (10)
AP Characteristics										
Black	-0.002	0.002	-0.005	0.007	-0.002	0.001	0.006	-0.002	0.015	-0.000
	(0.005)	(0.005)	(0.005)	(0.009)	(0.003)	(0.009)	(0.008)	(0.007)	(0.013)	(0.007)
Male	0.004	0.010***	-0.011***	0.003	-0.001	0.003	0.008**	-0.001	0.012**	0.006**
	(0.003)	(0.004)	(0.004)	(0.005)	(0.002)	(0.004)	(0.003)	(0.004)	(0.005)	(0.003)
Black x Male	0.000	-0.001	-0.003	0.002	0.008*	-0.006	0.004	-0.004	0.013	-0.007
	(0.007)	(0.009)	(0.007)	(0.012)	(0.004)	(0.012)	(0.014)	(0.009)	(0.017)	(0.009)
Salary (log)	-0.193***	-0.129***	-0.040**	-0.001	-0.018**	-0.003	-0.090***	-0.013	-0.075***	-0.026*
	(0.022)	(0.017)	(0.017)	(0.014)	(0.009)	(0.027)	(0.020)	(0.026)	(0.028)	(0.014)
Has Ed.S.	0.008**	0.004	0.002	0.002	0.005**	0.012**	-0.004	0.011*	0.001	0.000
	(0.004)	(0.004)	(0.004)	(0.006)	(0.002)	(0.005)	(0.004)	(0.006)	(0.006)	(0.004)
Has Doctorate	0.015***	0.002	0.021***	-0.001	0.007*	0.003	-0.002	0.020**	-0.007	0.001
	(0.006)	(0.005)	(0.007)	(0.009)	(0.004)	(0.009)	(0.005)	(0.008)	(0.009)	(0.005)
Age 40–49	0.002	0.016***	0.004	-0.014**	-0.001					
	(0.003)	(0.004)	(0.004)	(0.006)	(0.002)					
Age 50–59	0.007*	0.023***	0.005	-0.013	-0.000					
	(0.004)	(0.005)	(0.005)	(0.008)	(0.003)					
Age 60+	0.109***	0.016**	0.008	-0.031***	-0.003					
	(0.010)	(0.007)	(0.007)	(0.009)	(0.004)					
<10 Years State Exp	-0.001	-0.011**	0.007	-0.001	-0.001	0.019***	-0.013***	-0.002	-0.004	0.006*
	(0.004)	(0.005)	(0.005)	(0.007)	(0.003)	(0.004)	(0.003)	(0.004)	(0.005)	(0.004)
25+ Years State Exp	0.034***	-0.006	0.007	-0.014**	-0.006**	0.126***	0.000	0.002	-0.015**	-0.008***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.003)	(0.010)	(0.005)	(0.007)	(0.007)	(0.003)
2–4 Years AP Exp	0.016***	-0.001	0.005	0.000	0.003	0.007*	0.001	0.004	0.011**	-0.000
	(0.003)	(0.004)	(0.003)	(0.005)	(0.002)	(0.004)	(0.003)	(0.004)	(0.005)	(0.003)
5+ Years AP Exp	0.030***	0.006	0.010**	-0.001	0.003	0.032***	0.007	0.006	0.017**	-0.004
	(0.004)	(0.005)	(0.004)	(0.006)	(0.002)	(0.006)	(0.005)	(0.006)	(0.007)	(0.004)
N	21172	21172	21172	21172	21172	15553	15553	15553	15553	15553
R^2	0.135	0.125	0.111	0.159	0.081	0.139	0.181	0.110	0.221	0.096

Notes: Results are from linear probability models where the binary outcome is defined by the column header. Models include AP characteristics, school fixed effects, time-varying school demographics, and year fixed effects. Standard errors clustered by school shown in parentheses. "Exit" are APs who exit the state education system. "Teacher" are APs who move to a teaching position. "Other Job" are APs who move to a job position that is neither teaching nor formal school administration. "Same dist" are APs who remain an AP but transfer to a school in the same district. "Diff dist" are transfers to a different district. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table A7

Heterogeneity in the Effect of Principal Turnover by AP Observation Scores

				Become Principal	
	Any (1)	Leave (2)	Move (3)	Same Sch (4)	Diff Sch (5)
Principal Turnover	0.232***	0.034***	0.036***	0.185***	-0.024***
	(0.019)	(0.011)	(0.012)	(0.013)	(0.008)
AP Obs 1.00–3.00	0.125***	0.121***	0.045**	-0.000	-0.042***
	(0.025)	(0.019)	(0.019)	(0.005)	(0.010)
AP Obs 3.01–4.00 (reference)					
AP Obs 4.01–5.00	0.002	-0.011*	-0.009	0.006*	0.016**
	(0.012)	(0.007)	(0.008)	(0.003)	(0.006)
Principal Turnover x AP Obs 1.00–3.00	-0.101*	-0.038	0.013	-0.113***	0.037
	(0.053)	(0.032)	(0.035)	(0.024)	(0.024)
Principal Turnover x AP Obs 3.01–4.00 (reference)					
Principal Turnover x AP Obs 4.01–5.00	0.063**	-0.016	0.010	0.042**	0.026*
	(0.029)	(0.015)	(0.018)	(0.021)	(0.014)
N	11278	11278	11278	11278	11278
R^2	0.281	0.221	0.230	0.352	0.203

Notes: Results are from linear probability models where the binary outcome is defined by the column header. Models include AP characteristics, school fixed effects, time-varying school demographics, and district-by-year fixed effects. Standard errors clustered by school shown in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.