What's Happening

Characteristics and career paths of North Carolina school leaders

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Key findings

This study examines the demographics, educational attainment, licenses, and career paths of North Carolina school leaders (assistant principals and principals) and the number of principals who entered and left the principal workforce from 2001/02 through 2012/13. It found that:

- Women constituted a majority of school leaders.
- The racial/ethnic makeup of school principals remained steady, with about 75 percent of them White.
- Master's degree was the most common highest level of educational attainment.
- A majority of school leaders did not stay in school leadership for the full 10 years examined.
- A majority of principals and assistant principals spent time as a classroom teacher before becoming a school leader.
- Leaders in rural schools were generally similar to leaders in nonrural schools in demographics, educational attainment, licenses, and career paths.

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This report is available on the Regional Educational Laboratory website at http://ies.ed.gov/ncee/edlabs.

Summary

Researchers have linked positive student outcomes, including student achievement, to high-quality school leadership (Grissom & Loeb, 2011; Osborne-Lampkin, Folsom, & Herrington, 2015). Due in part to this research, the North Carolina Department of Public Instruction and the North Carolina Principals and Assistant Principals' Association are interested in increasing the number of high-quality principals in North Carolina's educator workforce, particularly those leading rural schools. To support these efforts, the two groups and Regional Educational Laboratory (REL) Southeast collaborated on this study of North Carolina assistant principals and principals (referred to here as "school leaders").

North Carolina stakeholders requested information on the state's school leader workforce, including a description of the backgrounds and experiences of leaders in nonrural and rural schools. Attracting and retaining educators in rural areas—where school districts receive fewer applicants and have higher staff turnover rates—have become pervasive issues, both nationally and in the REL Southeast Region.

This report describes the demographics, educational attainment, licenses, and career paths of North Carolina school leaders from 2001/02 through 2012/13. The career path analysis focuses on retention and recruitment, two areas of particular interest to North Carolina stakeholders. The retention analysis describes the top-10 paths that assistant principals and principals took, beginning with their initial appointment as a school leader and over the next 10 years. The recruitment analysis describes the top-10 paths for assistant principals and principals during the 10 years before they took on their leadership roles.

The analysis of demographics, educational attainment, and licenses of North Carolina school leaders from 2001/02 through 2012/13 showed that:
- Women constituted a majority of school leaders, rising from 52–58 percent in 2001/02 to 58–63 percent in 2012/13.
- The racial/ethnic makeup of school principals remained steady, with about 75 percent of them White.
- Master's degree was the most common highest level of educational attainment, rising from 80 percent in 2001/02 to 87 percent in 2012/13 for assistant principals and from 64 percent to 78 percent for principals.
- As many as 29 percent of principals held a superintendent license, but the rate declined over the study period.
- Leaders in rural schools were generally similar to leaders in nonrural schools in demographics, educational attainment, and licenses.

The analysis of the career paths of school leaders found that:
- A majority of individuals who were school leaders at the beginning of the timeframe were not school leaders at the end, generally having moved into other positions or having left the system.
- A majority of assistant principals and principals spent time as a classroom teacher before becoming a school leader.
- There were no notable differences in the retention and recruitment paths of nonrural and rural school leaders before and after their leadership positions.

North Carolina stakeholders might consider findings from this study as they engage in discussions around enhancing the principal pool and the quality of school leaders.

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Why this study?

Researchers have linked positive student outcomes, including student achievement, to high-quality school leadership (Grissom & Loeb, 2011; Osborne-Lampkin et al., 2015). Due in part to this research, interest has increased at the federal and state levels in finding ways to improve the quality of school leaders. The North Carolina Department of Public Instruction and the North Carolina Principals and Assistant Principals' Association partnered with Regional Educational Laboratory (REL) Southeast to form the School Leadership in North Carolina Research Alliance. The alliance's goal is to use research to increase the number of high quality principals in North Carolina.

REL Southeast had previously examined the characteristics and career paths of Florida school leaders (Folsom, Osborne-Lampkin, & Herrington, 2014; Folsom, Osborne-Lampkin, & Herrington, 2015). After reviewing that work, members of the research alliance requested an analysis of the demographics, educational attainment, licenses, and professional backgrounds of North Carolina assistant principals and principals (referred to here as "school leaders"). The alliance members were especially interested in the characteristics and backgrounds of leaders in rural schools and whether they differ from those of their peers in nonrural schools.

This report provides information on the demographics, educational attainment, licenses, and career paths of North Carolina school leaders and on the number of principals who entered and left the principal workforce each year from 2001/02 through 2012/13

This report provides information on the demographics, educational attainment, licenses, and career paths of North Carolina school leaders. It also provides information on the number of principals who entered and left the principal workforce each year from 2001/02 through 2012/13, a topic of particular interest to North Carolina stakeholders. This information could be useful in enhancing retention and succession planning. For example, knowing how many school leaders leave the workforce can help district and state agencies better plan for future vacancies. Districts and state education agencies might also consider this information, along with performance data on school leaders, in creating targeted retention plans to keep the most effective school leaders in their districts and schools longer (George W. Bush Institute & American Institutes for Research, 2016).

Evidence suggests that recruiting and retaining educators in rural schools and districts present unique challenges. For example, rural schools face challenges recruiting educators because of characteristics specific to rural areas—including geographic isolation, access to school resources, and duties for educators outside the classroom (Rosenberg, Christianson, & Angus, 2015). As a result, developing targeted initiatives to attract and retain educators in rural areas—where districts receive fewer applications and have higher staff turnover—may be an even more nuanced process for states and districts. For example, stakeholders might consider the specific qualifications and experiences of school leaders to match them to rural schools' needs. Information from the retention analysis might also provide stakeholders with a better understanding of what might lure school leaders away from their leadership positions in rural schools.

What the study examined

This descriptive study has three main parts. The first describes the demographics, educational attainment, and licensures of individuals who were assistant principals or principals in North Carolina for at least one year from 2001/02 through 2012/13. The second describes the 10-year retention paths of school leaders after their initial appointment as

a school leader from 2001/02 through 2003/04. The third describes the 10-year recruitment paths as school leaders before their final appointment as a school leader from 2010/11 through 2012/13. In each of the three main parts the study also compares leaders in nonrural and rural schools. Specifically, this descriptive study addressed three research questions:

1. How did the gender and racial/ethnic composition, educational attainment, and licenses of North Carolina school leaders change from 2001/02 through 2012/13? Did these characteristics differ between leaders in nonrural and rural schools?

2. What were the 10-year retention paths of North Carolina school leaders after their initial appointment as an assistant principal or principal from 2001/02 through 2003/04? Did retention paths differ between nonrural and rural school leaders?

3. What were the 10-year retention paths of North Carolina school leaders before their final appointment as an assistant principal or principal in 2010/11 through 2012/13? Did recruitment paths differ between nonrural and rural school leaders?

See box 1 for definitions of key terms and box 2 for an overview of the study data and analysis.

Box 1. Key terms

This box briefly defines the most commonly used key terms in this report. Key terms are defined in more depth in appendix A.

Career path. The sequence of a school leader's distinct job categories, without regard to the amount of time spent in each job category. The retention path describes the 10-year sequence of school leaders' job categories after their initial appointment as a school leader from 2001/02 through 2003/04. The recruitment path describes the 10-year sequence of school leaders' job categories before their final appointment as a school leader from 2010/11 through 2012/13. Years when an individual did not hold a certified job within the North Carolina school system were treated as meaningful and given a job code of "not in North Carolina public schools."

Cohort. This study has two cohorts for longitudinal analyses (research questions 2 and 3), a retention cohort and a recruitment cohort. The retention cohort comprises all 6,443 individuals who were an assistant principal or principal for at least one year from 2001/02 through 2003/04. The analysis of this cohort follows individuals forward for up to 10 school years to see the series of positions they held thereafter (question 2). The recruitment cohort comprises all 4,152 individuals who were an assistant principal or principal for at least one year from 2010/11 through 2012/13 but were not in the retention cohort; individuals who were an assistant principal or principal 10 years earlier (and thus who were in the retention cohort) are excluded because analyzing them cannot shed light on their prior positions. The analysis of this cohort looks backward up to 10 school years to see the series of positions individuals held before their final appointment an assistant principal or principal (question 3).

Cross-sectional analysis. An observational analysis of the entire population under study at specific points in time.

(continued)

Box 1. Key terms *(continued)*

Educational attainment. The highest level of education a person has achieved. Pertinent to this study are master's, advanced, and doctoral degrees. The advanced degree designation is made by the university and state board and is typically a degree certification, 30 credit hours beyond the master's.

Job category. This study's broad job categories are related to the North Carolina Department of Public Instruction certified job positions (positions that require licensing). Job categories are administrative/systems support, instructional support, teacher, assistant principal, principal, and superintendent.

License. A document issued by the North Carolina Department of Public Instruction to professional public school employees indicating that they have met the minimum criteria for serving in a professional position. The licenses of primary interest in this report are the teacher, principal, and superintendent licenses. Individuals can hold more than one license. Assistant principals and principals must hold a principal license unless the local board of education accepts a provisional license in special circumstances.

Longitudinal analysis. An observational analysis of a specific cohort of individuals over a defined period of time.

Nonrural or rural school. Nonrural and rural school status is defined as the district urban-centric locale code in the Public School Universe databases.

Nonrural or rural school leader. Individuals in the recruitment and retention cohorts were defined as a nonrural or rural leader based on whether they spent a majority of their time as a school leader in a nonrural or rural school during the study period. The nonrural or rural classification decision was based on conversations with the members of the School Leadership in North Carolina Research Alliance who requested this analysis.

School leader. All assistant principals and principals identified by the Budget Object Code in the Certified Salary databases (see appendix B).

Box 2. Data and methods

This descriptive study used data provided by the North Carolina Department of Public Instruction, which maintains a statewide longitudinal data system on districts, schools, staff, and students. Data were obtained for every school leader from 2001/02 through 2012/13. This period was selected because it captures all relevant data available when the study was designed. There were 11,615 individuals who held a leadership position for at least one year from 2001/02 through 2012/13. The data for school leaders included information about their gender, race/ethnicity, educational attainment, licenses, certified job positions, position location, and urbanicity of the location.

The study consists of three analyses—one cross-sectional analysis and two longitudinal analyses.

The study team conducted a cross-sectional analysis of gender, race/ethnicity, educational attainment, and licenses of school leaders in each year from 2001/02 through 2012/13. Cross-tabulations were created to describe and compare the demographics, educational attainment, and educational licenses of school leaders of nonrural and rural schools each year from 2001/02 through 2012/13. A 5 percentage point difference was used as the threshold for

(continued)

Box 2. Data and methods *(continued)*

identifying and discussing substantive changes across time and between comparison groups. Differences of less than 5 percentage points are not highlighted.

Next, the study team conducted two longitudinal analyses. The first tracked the career paths of the retention cohort of 6,443 school leaders for 10 years forward from the first leadership position they held in 2001/02, 2002/03, or 2003/04. The second tracked the career paths of the recruitment cohort of 4,152 school leaders for 10 years backward from the last leadership position they held in 2010/11, 2011/12, or 2012/13. These longitudinal analyses were grounded in sequence analysis to uncover patterns in the sequence or order of events (Blanchard, Buhlmann, & Gauthier, 2014). The sequences were the order of job categories over the 10 years examined. For the retention cohort, paths were synchronized based on the first time an individual was an assistant principal or principal in 2001/02, 2002/03, or 2003/04; for the recruitment cohort, paths were synchronized based on the last time an individual was an assistant principal or principal in 2010/11, 2011/12, or 2012/13. Cross-tabulations and measures of central tendency and distribution were created to describe and compare the 10-year retention and recruitment paths of nonrural and rural assistant principals and principals.

For a detailed explanation of the data and analyses, see appendix B.

Changes in demographics, educational attainment, and licenses of North Carolina school leaders from 2001/02 through 2012/13

This section describes the findings related to the demographic characteristics, educational attainment, and licenses of North Carolina school leaders from 2001/02 through 2012/13 and compares these characteristics for school leaders in nonrural and rural schools.

A majority of North Carolina school leaders from 2001/02 through 2012/13 were women

During the timeframe of these analyses more than half of North Carolina school leaders were women, and the share increased over time among both assistant principals (from 58 percent to 63 percent) and principals (from 53 percent to 58 percent; figure 1). Higher percentages of assistant principals than principals were women. However, a substantial percentage of school leaders did not report their gender, so the reliability of these findings is limited (see the limitations section for further discussion).

The percentage of assistant principals and principals from 2001/02 through 2012/13 who were White was much higher than the percentage who were Black, and the percentage who were Black rose slightly for assistant principals but remained stable for principals

In the 12 years examined, most North Carolina school leaders were White (figure 2). The percentage of assistant principals who were White fell slightly (from 73 percent in 2001/02 to 66 percent 2012/13), while the percentage who were Black rose (from 26 percent to 31 percent). The percentage of principals who were White remained stable over the period, at around 75 percent. Correspondingly, the percentage of school leaders who were Black was higher among assistant principals (26–32 percent) than among principals (22–24 percent). However, a substantial percentage of school leaders did not report race/ethnicity, so the reliability of these findings is limited (see the limitations section for further discussion).

More than half of North Carolina school leaders were women, and the share increased over time among both assistant principals (from 58 percent to 63 percent) and principals (from 52 percent to 58 percent)

Figure 1. Women made up a high and slowly rising percentage of North Carolina school leaders, 2001/02–2012/13
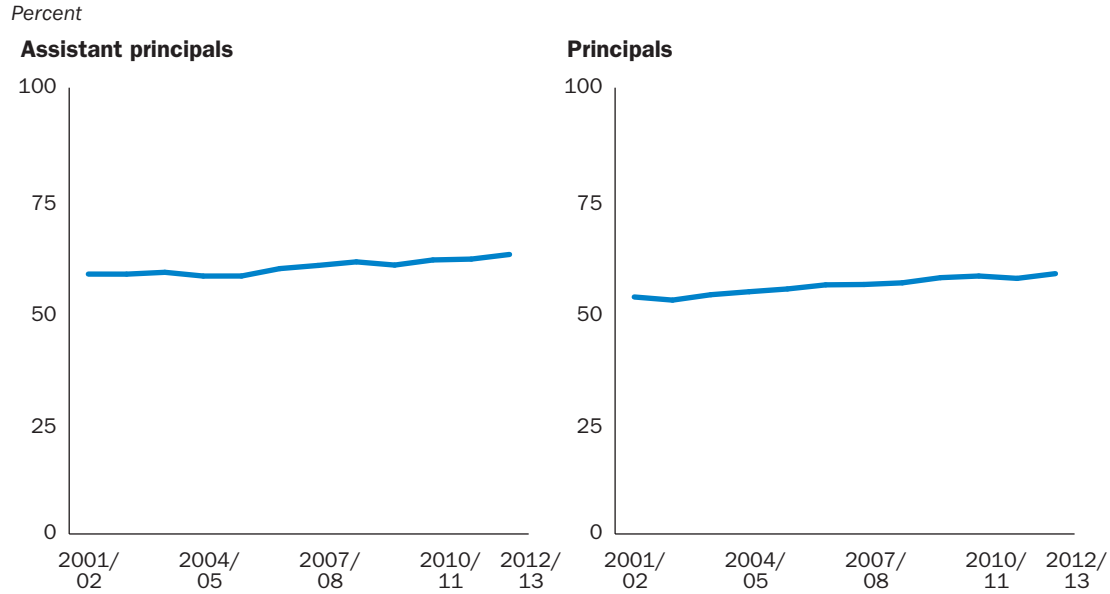
Percent

Assistant principals

Principals

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Figure 2. Most North Carolina school leaders were White, but the percentage of assistant principals who were Black increased, 2001/02–2012/13
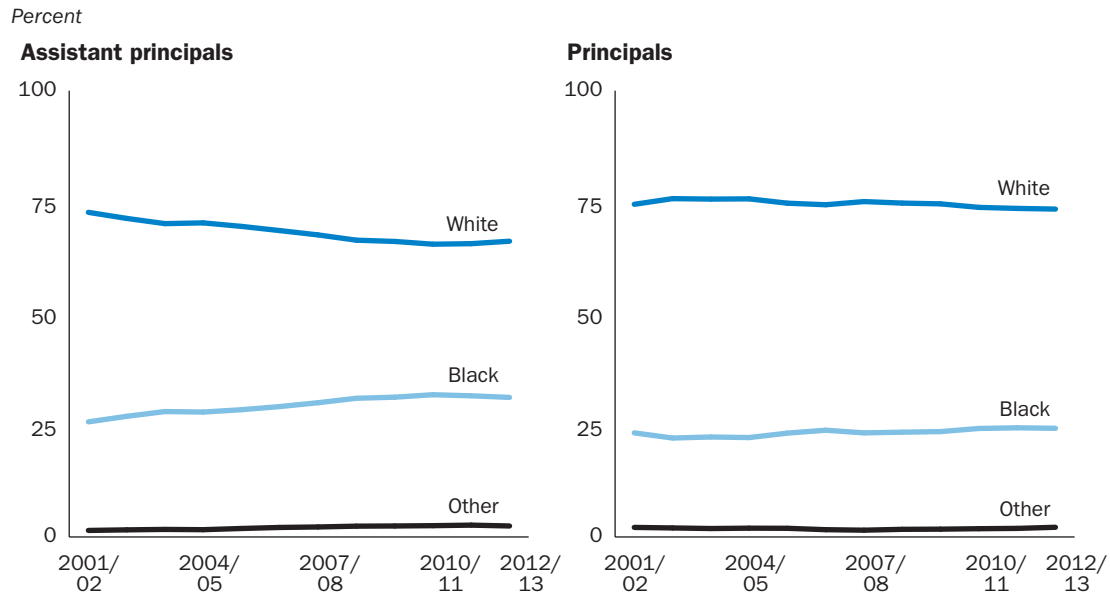
Percent

Assistant principals

Principals

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

For a large majority of North Carolina school leaders from 2001/02 through 2012/13 the highest level of academic achievement was a master's degree

The most common highest level of academic achievement among North Carolina school leaders from 2001/02 through 2012/13 was a master's degree (figure 3). The percentage with a master's degree increased over the study period from 80 percent to 87 percent for assistant principals and from 64 percent to 75 percent for principals. Simultaneously, the percentage of assistant principals and principals with an advanced degree fell. Across all years, principals were more likely than assistant principals to have an advanced degree and more likely to have a doctoral degree.

As many as 29 percent of principals held a superintendent license, but the rate declined over the study period

About 8–11 percent of assistant principals and 17–29 percent of principals held a superintendent license over 2001/02–2012/13 (figure 4). The percentage of principals with a superintendent license fell over the period from about 29 percent to 21 percent. Nearly all assistant principals (94–96 percent) and principals (96–99 percent) held a teacher license. Likewise, nearly all assistant principals (86–100 percent) and principals (98–100 percent) held a principal license.

A higher percentage of principals than of assistant principals held each of the three main licenses. The differences were smallest for teacher licenses and largest for superintendent licenses.

The percentage of North Carolina school leaders with a master's degree increased over the study period from 80 percent to 87 percent for assistant principals and from 64 percent to 75 percent for principals

Figure 3. The percentage of North Carolina school leaders with a master's degree increased, 2001/02–2012/13

Percent
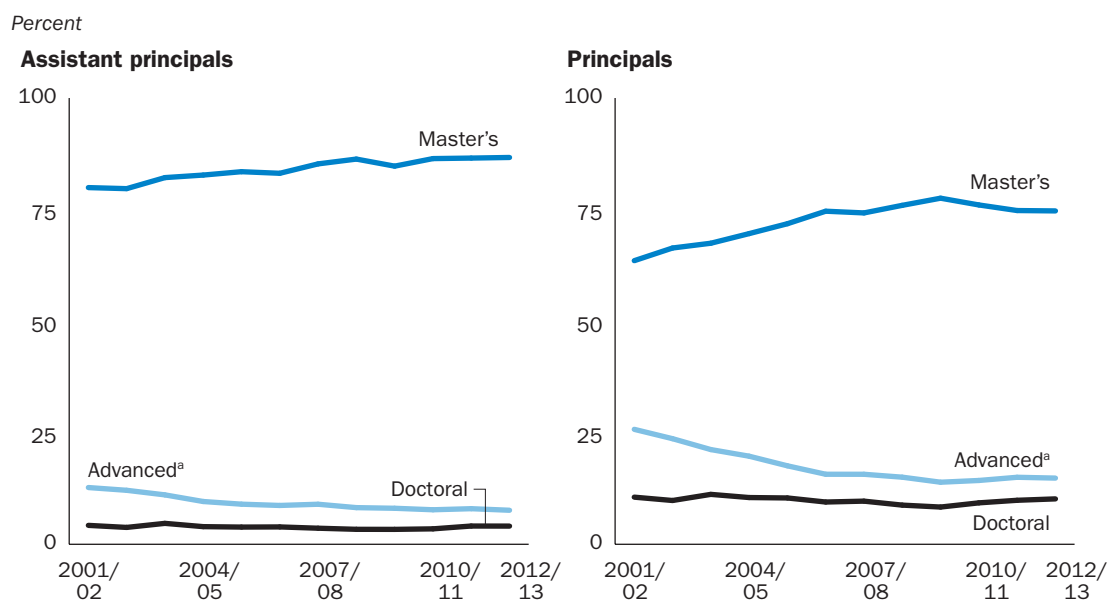
a. The advanced degree designation is made by the university and state board and is typically a degree certification, 30 credit hours beyond the master's.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

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Figure 4. By 2011/12 nearly all North Carolina school leaders held both a principal license and a teacher license
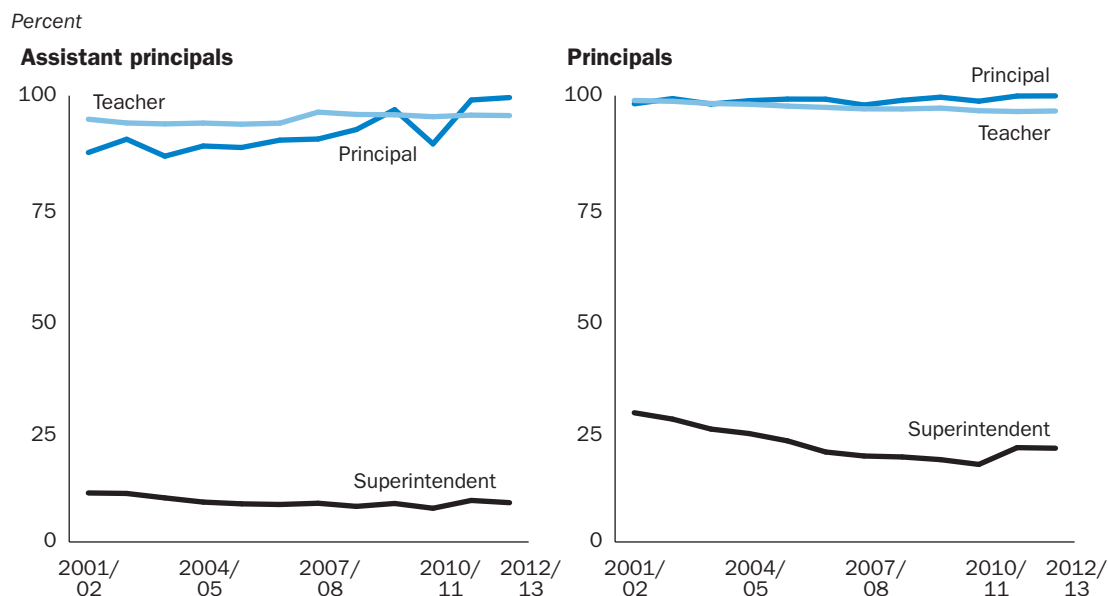
Percent

Assistant principals

Principals

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

There were no substantive differences between leaders in nonrural and rural schools

Leaders in rural schools were generally similar to leaders in nonrural schools in demographics, educational attainment, and licenses. While this question was a key motivation for the study, few differences were found between school leaders in nonrural and rural schools. For detailed findings on the demographics, educational attainment, and licenses of leaders in nonrural and rural schools, see appendix C.

About 8–11 percent of assistant principals and 17–29 percent of principals held a superintendent license over 2001/02–2012/13

Ten-year career paths of North Carolina school leaders

This section addresses the career paths of North Carolina school leaders, looking at retention and recruitment. The retention analyses describe the 10 most common retention paths of school leaders in the 10 years after their first observed leadership position between 2001/02 and 2003/04. The recruitment analyses describe the 10 most common recruitment paths of school leaders in the 10 years before their last observed leadership position between 2010/11 and 2012/13. Retention and recruitment paths describe the order of the positions held and the amount of time in those positions. Retention and recruitment are also compared for leaders in nonrural and rural schools.

The analyses do not attempt to describe the 10-year career paths for all of the school leaders for whom data were available. Rather, the purpose was to identify the most common paths for individuals who became school leaders, both after they became a school leader (retention) and before (recruitment). School leaders were divided into two cohorts to simulate following school leaders for up to 10 years after they took a leadership position and for up to 10 years leading up to their final position as a leader (see box 2). This approach is necessarily limited because it is not possible to know about leadership positions held before

2001/02 with the available data, but it provides the best approximation possible (see the limitations section for more details).

A majority of school leaders did not stay in school leadership for the full 10 years examined

By the end of the 10th year 16 percent of assistant principals were still assistant principals, and 28 percent had become principals, while 26 percent of principals were still principals, and 4 percent had become assistant principals (figure 5). However, the remaining nearly 57 percent of assistant principals and 70 percent of principals were no longer in school leadership. These percentages include 41 percent of assistant principals and 55 percent of principals who were no longer in North Carolina public schools.

Four of the most common retention paths for assistant principals included becoming a principal. Over the 10 years after the first observed school leadership position of assistant principals between 2001/02 and 2003/04, 79 percent took one of the top-10 identified retention paths (table 1). Some 24 percent of assistant principals followed the most common retention path, which was to become a principal (path 1). About 23 percent left the North Carolina public school system (path 2), and 11 percent remained an assistant principal for the full 10 years (path 3). About 10 percent followed one of three other retention paths that involved becoming a principal but then moving into other positions or leaving (paths 4, 7, and 8). Another 10 percent of assistant principals followed one of the four remaining

By the end of the 10th year 16 percent of assistant principals were still assistant principals, and 28 percent had become principals, while 26 percent of principals were still principals, and 4 percent had become assistant principals

Figure 5. In the 10 years after becoming a North Carolina school leader most assistant principals either left the system or became principals, and most principals left the system, 2001/02–2012/13

Percent

Assistant principals (*n* = 4,011)   **Principals** (*n* = 2,432)

Legend:
- Superintendent
- Principal
- Assistant principal
- Administrative/systems support
- Instructional support
- Teacher
- Not in North Carolina public schools
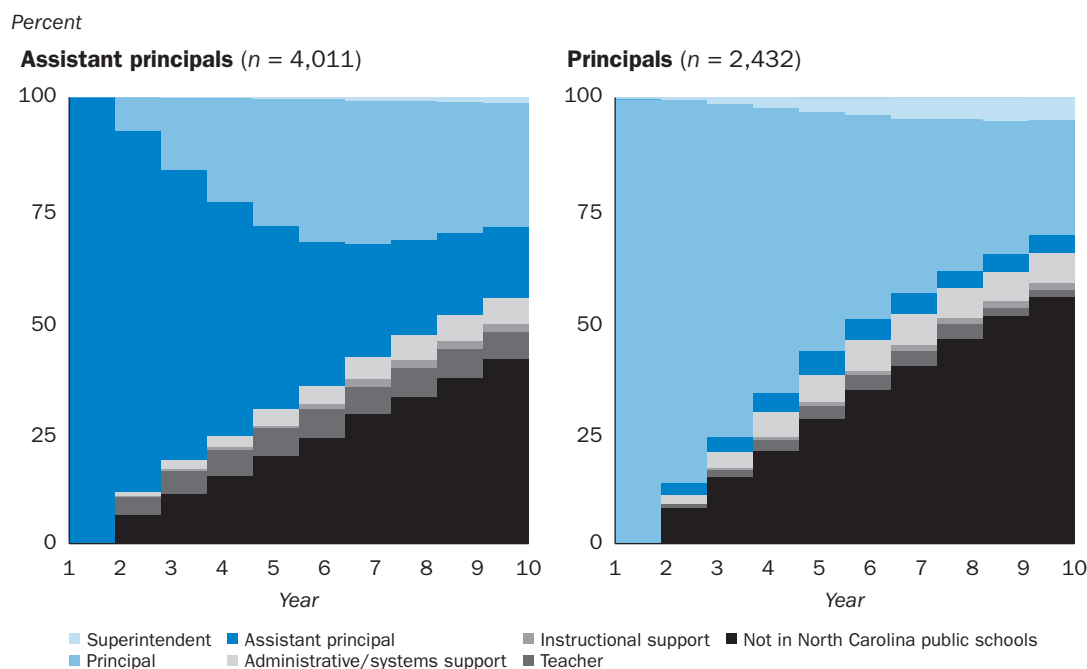
Note: The retention cohort comprises all 6,443 individuals who were an assistant principal or principal for at least one year from 2001/02 through 2003/04. The analysis follows them forward for up to 10 school years to see the series of positions they held thereafter.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Table 1. Three of the top-10 retention paths taken in the 10 years after becoming a North Carolina assistant principal involved remaining in a school leadership position for 10 years straight, 2001/02–2012/13

Path number	Path	Number	Percent
1	Assistant principal → Principal	971	24.2
2	Assistant principal → Not in North Carolina public schools	921	23.0
3	Assistant principal	451	11.2
4	Assistant principal → Principal → Not in North Carolina public schools	217	5.4
5	Assistant principal → Teacher	142	3.5
6	Assistant principal → Teacher → Not in North Carolina public schools	127	3.2
7	Assistant principal → Principal → Administrative/systems support	111	2.8
8	Assistant principal → Principal → Assistant principal	90	2.2
9	Assistant principal → Administrative/systems support	74	1.8
10	Assistant principal → Not in North Carolina public schools → Assistant principal → Not in North Carolina public schools	60	1.5
Paths 1–10		3,164	78.8
Other paths		847	21.2

Note: The assistant principal retention cohort comprises 4,011 individuals who were an assistant principal for at least one year from 2001/02 through 2003/04. The analysis follows them forward for up to 10 school years to see the series of positions they held thereafter.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

retention paths, which included returning to the classroom (paths 5 and 6), moving into administrative support (path 9), and moving into and out of the system (path 10).

In each of the top-10 retention paths for assistant principals the average time individuals stayed in each position varied substantially over the 10 years examined (figure 6). Two assistant principals who both became principals (path 1) may have spent different amounts of time in those positions. For example, in retention path 1 the average time as an assistant principal was 3.8 years and was followed by an average time of 6.2 years as a principal, but this path includes individuals who spent only 1 year as an assistant principal and 9 years as a principal as well as individuals who spent 9 years as an assistant principal and 1 year as a principal. In part this reflects the 10-year cutoff of the data; the variability might have been less pronounced had the full retention paths been analyzed rather than a 10-year snapshot. However, it is likely that different school leaders taking the same path will spend different amounts of time at different positions along that path. The standard deviation (the amount of variation around the mean) on this path is 2 years, which means that roughly 68 percent of individuals spent anywhere from 1.8 to 5.8 years as an assistant principal and 4.2 to 8.2 years as a principal; these ranges are quite broad considering that only 10 years were examined.

Most of the top-10 retention paths for principals ended with the principals no longer in the North Carolina public school system. Over the 10 years after becoming a principal between 2001/02 and 2003/04, 76 percent of principals took one of the top-10 identified retention paths (table 2). Six of the top-10 (including the most common path) ended with the principal no longer in the North Carolina public school system. About 46 percent of principals followed one of these six retention paths (1, 5, 6, 8, 9, and 10). About 21 percent

Over the 10 years after the first observed school leadership position of assistant principals between 2001/02 and 2003/04, 79 percent took one of the top-10 identified retention paths

Figure 6. The average time spent in each position in the 10 years after becoming a North Carolina assistant principal varied within and between the top-10 retention paths, 2001/02–2012/13
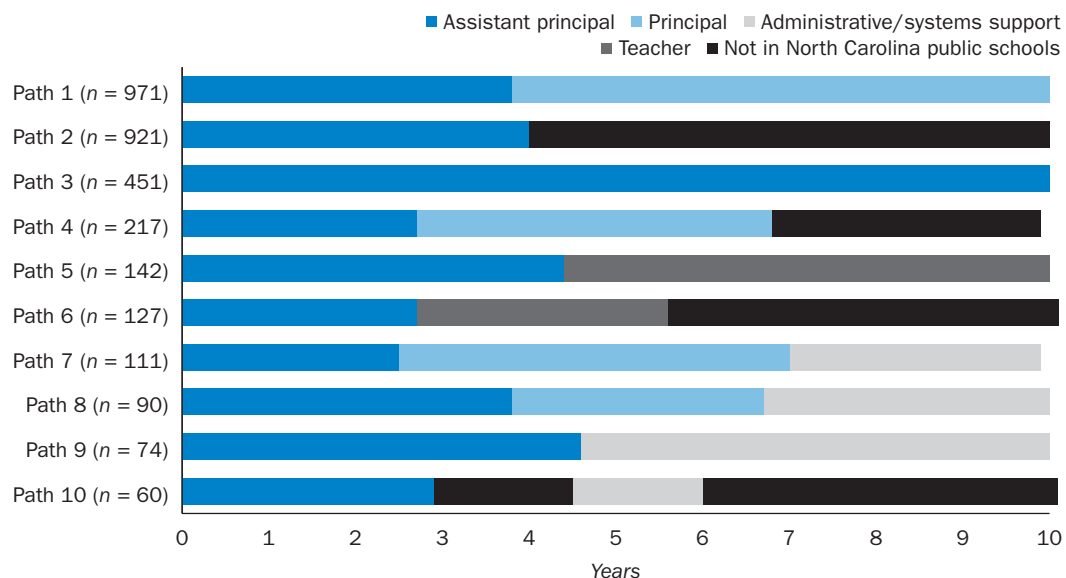
Note: The assistant principal retention cohort comprises 4,011 individuals who were an assistant principal for at least one year from 2001/02 through 2003/04. The analysis follows them forward for up to 10 school years to see the series of positions they held thereafter. A total of 847 assistant principals followed a path that was not in the top 10.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

remained a principal over the 10 years (path 2). About 3 percent of principals followed retention path 4, which led to a superintendent position. Almost 6 percent of principals followed one of three retention paths (6, 7, and 9) that involved time as an assistant principal. Seven percent of principals followed two retention paths (paths 3 and 5) that included time in administrative/systems support. About 1.4 percent of principals became teachers before leaving the system (path 10).

Similar to the findings for assistant principals, in each of the top-10 retention paths for principals the average time individuals stayed in each position varied substantially over the 10 years examined (figure 7). Principals following the same retention path did not necessarily spend the same amount of time in each step. For example, for path 7 the mean amount of time spent as a principal and as an assistant principal was 5 years (figure 7). However, rather than splitting the time equally between positions, it was more common for individuals to spend different lengths of time in positions. For example, path 4 includes individuals who may have spent one year as a principal and nine years as a superintendent or nine years as a principal and one year as a superintendent. This may be a function of the available data being limited to a 10-year snapshot.

Over the 10 years after becoming a principal between 2001/02 and 2003/04, 76 percent of principals took one of the top-10 identified retention paths

Table 2. Six of the top-10 retention paths taken in the 10 years after becoming a North Carolina principal ended with principals no longer in the state public school system, 2001/02–2012/13

Path number	Path	Number	Percent
1	Principal → Not in North Carolina public schools	885	36.4
2	Principal	499	20.5
3	Principal → Administrative/systems support	111	4.6
4	Principal → Superintendent	82	3.4
5	Principal → Administrative/systems support → Not in North Carolina public schools	66	2.7
6	Principal → Assistant principal → Not in North Carolina public schools	61	2.5
7	Principal → Assistant principal	45	1.9
8	Principal → Not in North Carolina public schools → Principal → Not in North Carolina public schools	37	1.5
9	Principal → Not in North Carolina public schools → Assistant principal → Not in North Carolina public schools	34	1.4
10	Principal → Teacher → Not in North Carolina public schools	34	1.4
Paths 1–10		1,854	76.3
Other paths		578	23.7

Note: The principal retention cohort comprises all 2,432 individuals who were a principal for at least one year from 2001/02 through 2003/04. The analysis follows them forward for up to 10 school years to see the series of positions they held thereafter.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Figure 7. The average time spent in each position in the 10 years after becoming a North Carolina principal varied within and between the top-10 retention paths, 2001/02–2012/13
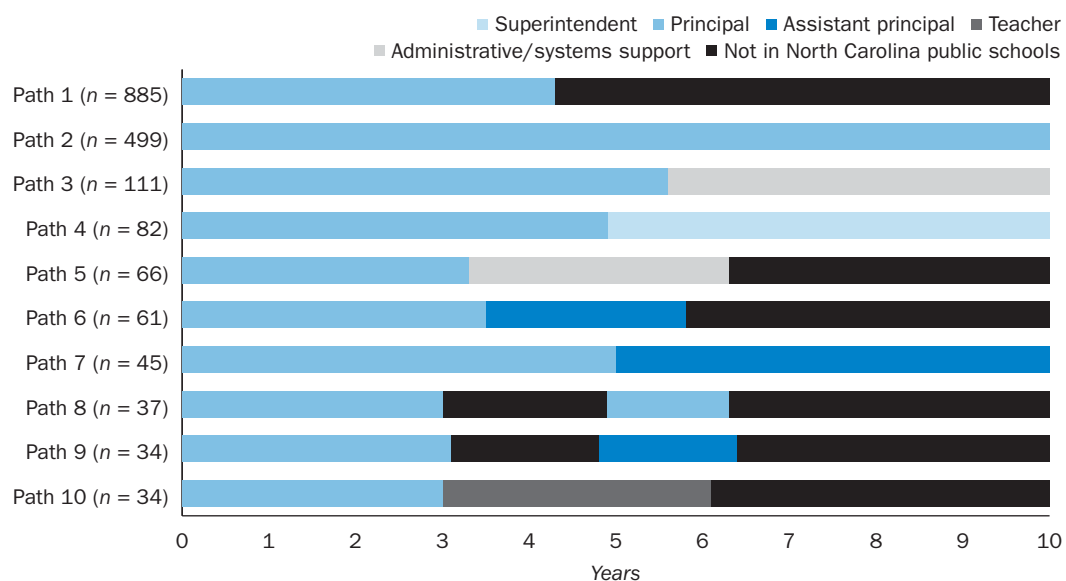
Note: The principal retention cohort comprises all 2,432 individuals who were a principal for at least one year from 2001/02 through 2003/04. The analysis follows them forward for up to 10 school years to see the series of positions they held thereafter. A total of 578 principals followed a path that was not in the top 10.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

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The majority of assistant principals and principals spent time as a classroom teacher before becoming a school leader

In the first of the 10 years examined (2001/02 and 2003/04) leading up to the last observed school leadership position, 65 percent of assistant principals were teachers and 33 percent were not in the North Carolina public school system (figure 8). And until the eighth year a majority of assistant principals were not yet in school leadership positions and were working in other educator positions in North Carolina public schools. Among principals 73 percent were teachers in the first year of the 10 years examined and 22 percent were not in the North Carolina public school system. By the fourth year a majority of principals were in school leadership positions either as assistant principals (44 percent) or principals (8 percent).

Almost all recruitment paths to becoming an assistant principal included time as a teacher. During the 10 years leading to the final position as an assistant principal between 2001/02 and 2012/13, 86 percent of assistant principals took one of the 10 most common recruitment paths (table 3). Nine of the top ten (all but path 4), taken by 80 percent of assistant principals, included time spent as a teacher. Two paths (3 and 7), taken by 11 percent of assistant principals, included time in instructional support between the time spent as a teacher and assistant principal. One path (10) included time as a principal, but this recruitment path was taken by only 1 percent of assistant principals.

In the first of the 10 years examined (2001/02 and 2003/04) leading up to the last observed school leadership position, 65 percent of assistant principals and 73 percent of principals were teachers

Figure 8. A majority of North Carolina school leaders spent some time as a teacher in the 10 years before becoming a school leader, 2001/02–2012/13

Percent

Assistant principals (*n* = 2,796)

Principals (*n* = 1,356)

Legend: Superintendent, Principal, Assistant principal, Administrative/systems support, Instructional support, Teacher, Not in North Carolina public schools

Note: The recruitment cohort comprises all 4,152 individuals who were an assistant principal or principal for at least one year from 2010/11 through 2012/13 but were not in the retention cohort. The analysis of this cohort looks backward up to 10 school years to see the series of positions they held prior to becoming an assistant principal or principal.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Table 3. Nine of the top-10 recruitment paths taken in the 10 years included time as a teacher before becoming an assistant principal, 2001/02–2012/13

Path number	Path	Number	Percent
1	Teacher → Assistant principal	1,128	40.3
2	Not in North Carolina public schools → Teacher → Assistant principal	450	16.1
3	Teacher → Instructional support → Assistant principal	231	8.3
4	Not in North Carolina public schools → Assistant principal	166	5.9
5	Teacher → Not in North Carolina public schools → Assistant principal	142	5.1
6	Not in North Carolina public schools → Teacher → Not in North Carolina public schools → Assistant principal	108	3.9
7	Not in North Carolina public schools → Teacher → Instructional support → Assistant principal	75	2.7
8	Teacher → Not in North Carolina public schools → Teacher → Assistant principal	44	1.6
9	Teacher → Assistant principal → Teacher → Assistant principal	35	1.3
10	Teacher → Assistant principal → Principal → Assistant principal	32	1.1
Paths 1–10		2,411	86.3
Other paths		385	13.7

Note: The assistant principal recruitment cohort comprises all 2,796 individuals who were an assistant principal for at least one year from 2010/11 through 2012/13 but were not in the retention cohort. The analysis of this cohort looks backward up to 10 school years to see the series of positions they held prior to becoming an assistant principal or principal.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

In each of the top-10 recruitment paths for assistant principals the average amount of time individuals stayed in each position varied substantially within and across recruitment paths over the 10 years examined (figure 9). Thus, two assistant principals who followed the same recruitment path may have spent different lengths of time in the positions during the 10 years they were observed in this study. For example, on path 1, although on average individuals spent 5.3 years as a teacher before becoming an assistant principal, this recruitment path includes individuals who spent only 1 year as a teacher and 9 years as an assistant principal as well as individuals who spent 9 years as a teacher and 1 year as an assistant principal. However, it is possible that the amount of time would be less variable if the full recruitment paths were analyzed rather than a 10-year snapshot. The standard deviation (the amount of variation around the mean) on this recruitment path is 2.5 years, which means that roughly 68 percent of individuals spent anywhere from 2.8 to 7.8 years as a teacher and 2.2 to 7.2 years as an assistant principal, a wide range considering that only 10 years were examined.

During the 10 years leading to the final position as a principal between 2010/11 and 2012/13, 83 percent of principals took one of the 10 most common recruitment paths

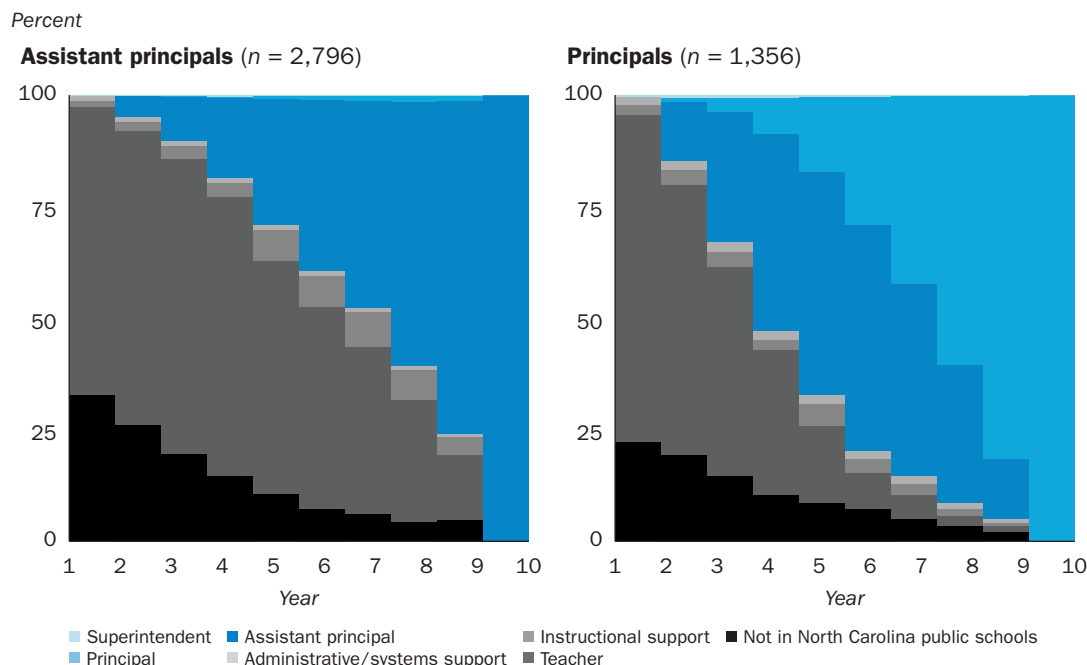*Most recruitment paths to becoming a principal included time as an assistant principal.* During the 10 years leading to the final observed position as a principal between 2010/11 and 2012/13, 83 percent of principals took one of the 10 most common recruitment paths (table 4). Seven of the top ten (paths 1, 2, 4, 5, 7, 9, and 10), taken by 72 percent of principals, included time as an assistant principal, and seven (paths 1, 4, 5, 6, 7, 8, and 10), taken by 68 percent of principals, included time as a teacher. Two recruitment paths (7 and 8), taken by 5 percent of principals, included time as instructional support staff, and two paths (2 and 3), taken by 14 percent of principals, suggest that these school leaders may have come from out of state or from a nonpublic institution and straight into a school leadership role.

Figure 9. The average time spent in each position in the 10 years before becoming a North Carolina assistant principal varied substantially within and across the top-10 recruitment paths, 2001/02–2012/13

Legend: Principal ■ Assistant principal ■ Instructional support ■ Teacher ■ Not in North Carolina public schools

Path 1 (*n* = 1,128)
Path 2 (*n* = 450)
Path 3 (*n* = 231)
Path 4 (*n* = 166)
Path 5 (*n* = 142)
Path 6 (*n* = 108)
Path 7 (*n* = 75)
Path 8 (*n* = 44)
Path 9 (*n* = 35)
Path 10 (*n* = 32)

Years (0–10)

Note: The assistant principal recruitment cohort comprises all 2,796 individuals who were an assistant principal for at least one year from 2010/11 through 2012/13 but were not in the retention cohort. The analysis of this cohort looks backward up to 10 school years to see the series of positions they held prior to becoming an assistant principal or principal. A total of 385 principals followed a path that was not in the top 10.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Table 4. Seven of the top-10 recruitment paths taken in the 10 years before becoming a North Carolina principal included time as an assistant principal, 2001/02–2012/13

Path number	Path	Number	Percent
1	Teacher → Assistant principal → Principal	670	49.4
2	Not in North Carolina public schools → Assistant principal → Principal	101	7.4
3	Not in North Carolina public schools → Principal	86	6.3
4	Teacher → Not in North Carolina public schools → Assistant principal → Principal	81	6.0
5	Not in North Carolina public schools → Teacher → Assistant principal → Principal	50	3.7
6	Teacher → Principal	48	3.5
7	Teacher → Instructional support → Assistant principal → Principal	47	3.5
8	Teacher → Instructional support → Principal	18	1.3
9	Instructional support → Assistant principal → Principal	14	1.0
10	Not in North Carolina public schools → Teacher → Not in North Carolina public schools → Assistant principal → Principal	11	0.8
Paths 1–10		1,126	82.9
Other paths		230	17.1

Note: The principal recruitment cohort comprises all 1,356 individuals who were a principal for at least one year from 2010/11 through 2012/13 but were not in the retention cohort. The analysis of this cohort looks backward up to 10 school years to see the series of positions they held prior to becoming an assistant principal or principal.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.
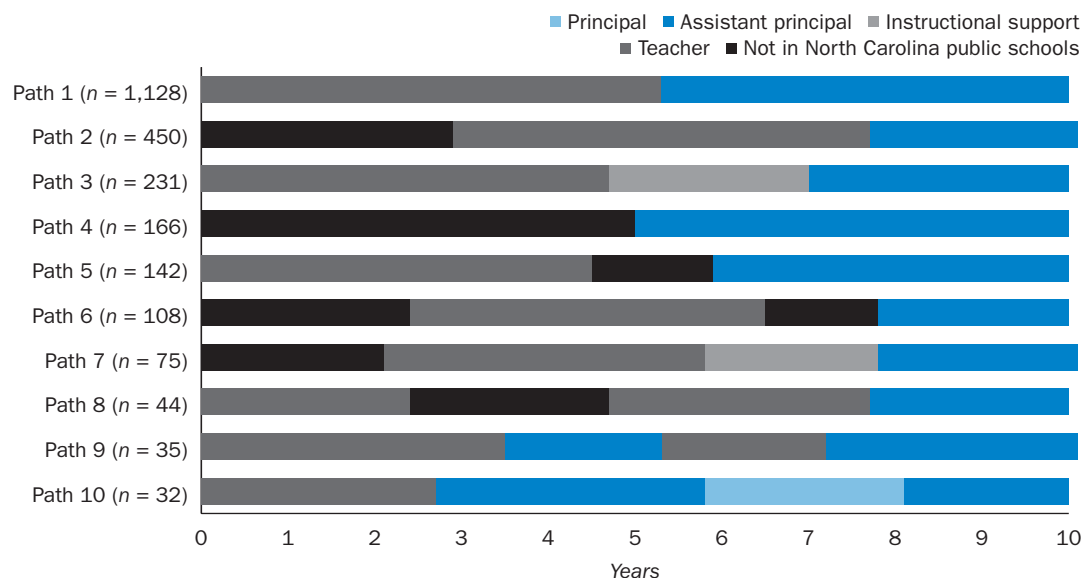
Similar to the findings for assistant principals, in each of the top-10 recruitment paths for principals the average time individuals stayed in each position varied substantially within and across paths over the 10 years examined (figure 10). For example, path 1 included individuals with 1–8 years of experience as a teacher, 1–8 years as an assistant principal, and 1–8 years as a principal. So, this recruitment path included individuals who spent a majority of the 10 years as a teacher and then moved to the assistant principal and principal ranks, as well as individuals who may have spent very little of the prior 10 years as a teacher before entering school leadership.

Leaders in nonrural and rural schools took similar career paths before and after their school leadership positions

Leaders in rural schools were generally similar to their peers in nonrural schools in their retention paths after holding a position as a school leader and in the recruitment paths they took to those positions. While this question was a key motivation for the study, few differences in career paths were found between nonrural and rural schools. For more details on how the career paths differed between leaders in nonrural and rural schools, see appendix C.

Leaders in rural schools were generally similar to their peers in nonrural schools in their retention paths after holding a position as a school leader and in the recruitment paths they took to those positions

Figure 10. The average time North Carolina principals spent in each position varied substantially within and across the top-10 recruitment paths, 2001/02–2012/13

Note: The principal recruitment cohort comprises all 1,356 individuals who were a principal for at least one year from 2010/11 through 2012/13 but were not in the retention cohort. The analysis of this cohort looks backward up to 10 school years to see the series of positions they held prior to becoming an assistant principal or principal. A total of 230 principals followed a path that was not in the top 10.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

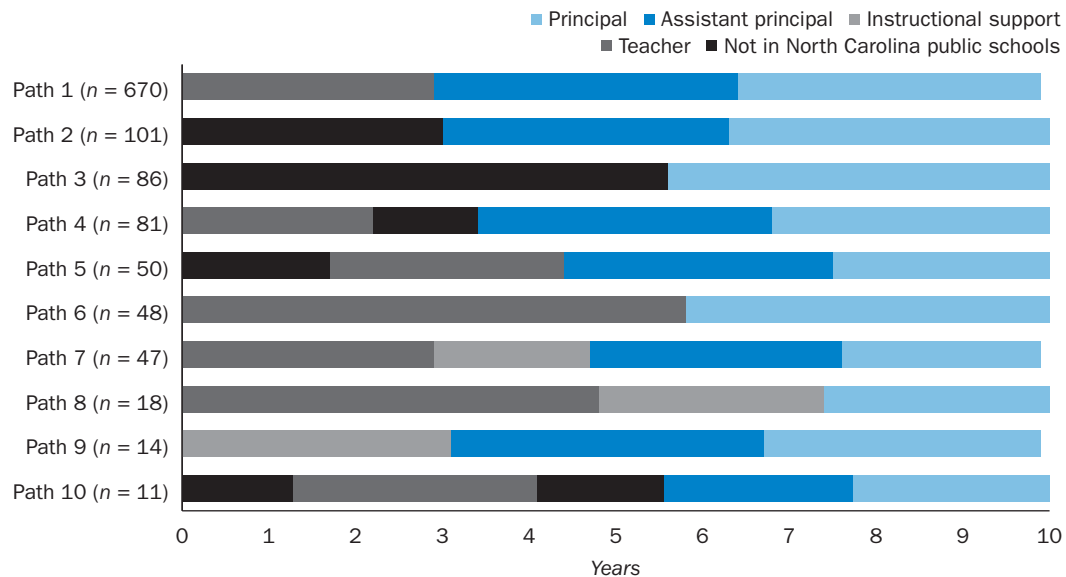## Implications of the study findings

Findings from this study create a better understanding of the principal workforce—its demographics, educational attainment, licenses, and career paths—by providing a descriptive context for North Carolina school leaders from 2001/02 through 2012/13. The results show that the demographic makeup of North Carolina's school leader workforce remained largely stable from 2001/02 through 2012/13, including that of school leaders in rural schools. And, by and large, leaders in nonrural and rural schools have earned the same degrees and held the same licenses.

This study also provides information on positions school leaders held before and after their leadership position. Knowing the number of school leaders who left the principal workforce, an area of particular interest to North Carolina stakeholders, could support efforts to improve retention and succession planning. For example, a better understanding of which school leaders are transitioning out each year could help district and state agencies plan for future vacancies. Findings on the career paths suggest that school leaders in rural schools and nonrural schools generally take the same career paths before and after becoming a school leader. Because there may be less consistency in how long school leaders stay in positions over the 10 years examined, follow-up analyses on full careers, from first entry to retirement, may provide clearer insights about how school leaders develop.

By and large, leaders in nonrural and rural schools have earned the same degrees and held the same licenses and generally take the same career paths before and after becoming a school leader

North Carolina stakeholders might further consider investigating whether certain factors are associated with principal effectiveness. For example, is time in a particular position, coupled with specific training experiences, related to higher quality school leadership?

Future research might also identify typologies/clusters of sequences with discrepancy analyses and link sequences with explanatory factors (see Pollock, Antcliff, & Ralphs, 2002). For example, while this study identified the 10 most common career paths before and after becoming a school leader, other career paths could be identified based on type of positions held, order of positions held, or time spent in certain positions. The career path types could be further analyzed to determine which principal characteristics predict the career path an individual takes. Or the career path types could be analyzed to determine whether such outcomes as principal effectiveness are associated with certain types of career paths.

Finally, policymakers and state education agencies in other states can use the analytic methods applied in this study to examine the principal workforce in their state. REL Southeast, for example, conducted a principal workforce study to inform Florida policymakers and state education leaders about the characteristics of its school leaders (Folsom et al., 2015). The Florida Department of Education used findings from that study, along with findings from other REL Southeast reports, to inform discussions and provide technical guidance to university- and district-based principal training programs. REL Southeast also developed a companion guide to describe how administrative databases with personnel data can be used to address similar questions (Folsom et al., 2014). States and districts might be interested in using these combined resources to replicate this study in other states and in different school settings (such as charter and virtual schools, as in Folsom et al., 2015).

Limitations of the study

The study findings relate solely to data for the 2001/02–2012/13 school years. They do not provide information about school leaders after 2012/13, about individuals who were not school leaders after 2000/01, or about activities before 2001/02. As is common in longitudinal analyses, the career paths and time spent on each path are 10-year snapshots, not entire careers.

The career path analyses here follow a school leader into and after holding a leadership position. It is possible that the school leaders in these analyses held leadership positions before 2001/02, which were not observed in the data. For the recruitment cohort a school leader who had a leadership position before 2001/02 might have left it and then became a school leader again during the observed timeframe. For the retention cohort a school leader might previously have had a leadership position, so the position as a school leader in 2001/02 was not the first. Both possibilities are reflected by the career paths described in this report, but such paths could have been undercounted because they could not be observed. Additionally, the analyses do not account for the 9 percent of individuals (see appendix B) who were not school leaders between 2001/02 and 2003/04 (and so were excluded from the retention cohort) or between 2010/11 and 2012/13 (and so were excluded from the recruitment cohort).

Because this was a purely descriptive study, the study team did not impute missing data. Caution is urged in interpreting the findings on gender and race/ethnicity, particularly in the early years, since missing data could skew the findings and inflate the differences

Moreover, there are substantial missing data, particularly in the analyses of early years. For example, in 2001/02 gender was not reported for 48 percent of school leaders, but by 2011 less than 10 percent of gender data were missing (see table B3 in appendix B). The patterns were similar for race/ethnicity. Because this was a purely descriptive study, the study team did not impute missing data. Caution is thus urged in interpreting the findings on gender and race/ethnicity, particularly in the early years, since missing data could skew the findings and inflate the differences. For example, based on the available data for 2001/02, the study reports that 58 percent of assistant principals were women. But 48 percent of assistant principals did not report gender, so the assumption that 58 percent of assistant principals were women is accurate only if the gender split is the same among those with missing data. For example, if only 50 percent of those not reporting gender were women, the true percentage of women would be 55 percent rather than the 58 percent reported. In short, while the data in this report are the most accurate available, trends from earlier years in the study period may be influenced by missing data.

Last, the analyses for the study were based on alliance member requests and so are limited to the characteristics they specified.

Appendix A. Key terms

This appendix provides more details and examples for the key terms and concepts in this report.

Cohort

A group of people who share a common characteristic or experience in a defined period. This study has two cohorts:
- *Retention cohort,* which includes any individual who was a principal or assistant principal for at least one year in 2001/02, 2002/03, or 2003/04. This cohort was followed forward for 10 years from the first time individuals were a school leader in 2001/02, 2002/03, or 2003/04.
- *Recruitment cohort,* which includes any individual who was a principal or assistant principal for at least one year in 2010/11, 2011/12, or 2012/13 but was not in the retention cohort (see below). This cohort was followed backward for 10 years from the last time individuals were a school leader in 2010/11, 2011/12, or 2012/13.

Cross-sectional analysis

An observational analysis of data on the entire population under study at specific points in time. In this report, research question 1 is addressed using cross-sectional analysis to describe the demographics, educational attainment, and licenses of all principals and assistant principals in North Carolina in each year from 2001/02 through 2012/13.

Educational attainment

The highest level of education based on the education level code in the Licensure-Education databases for each year an individual was a school leader in the North Carolina Department of Public Instruction. Codes include bachelors, master's, advanced, and doctoral. The advanced degree designation is made by the university and state board and is typically a degree certification, 30 credit hours beyond the master's.

Job category

For each year an individual was employed in a position that requires a license (such as teacher, principal, or superintendent) in the North Carolina Department of Public Instruction, the primary position (based on the proportion of time over a school year that an individual was in that position) was aligned with one of the following job categories based on the budget object code in the Certified Salary databases:
- *Administrative/systems support* includes positions such as director/supervisor of staff members, finance officer, and administrative support services staff. An administrator/systems support person meets the employment and licensing criteria for the specific administrative assignment and is employed by a local education agency to work in administrative positions in the North Carolina public school system. Administrators may be based in a school or central (district) office.
- *Assistant principal* includes both teaching and nonteaching assistant principals, as well as assistant principal interns. An assistant principal holds a principal's license and is designated by a local board of education as the next in line of authority to

the school principal. Under special circumstances a local board of education may employ an assistant principal with a provisional license.

- *Instructional support* includes individuals performing duties such as social services, health services, psychological services, attendance counseling, technology coordination, or other school-based specialist positions. Instructional support positions may occur within a school or within the district. Individuals must hold an appropriate license for the area of assignment.
- *Principal* includes individuals classified as a principal of a public school or headmaster of a charter school. A school must have 100 or more students or seven or more full-time teachers to have a principal. It also includes building principals—individuals who serve as a principal in small schools (those with fewer than seven but more than two full-time teachers). A principal must hold a principal's license; no provisional licenses are allowed for principals.
- *Superintendent* includes both district superintendent and associate superintendent and is appointed by the local board of education to serve as the chief education authority of a school system.
- *Teacher* is an individual designated to carry out the duties and responsibilities of the instructional process in the school and holds a license appropriate to the area of assignment.

Years when an individual did not hold a certified job within the North Carolina public school system were treated as meaningful and given a job code of "not in North Carolina public schools."

License

Educators in North Carolina hold a Standard Professional Educator's License, a "document issued by the Department to professional public school employees that indicates that they have met the minimum criteria for serving in a professional position" (North Carolina Administrative Code 16.01A.0101 (2)). For each year that an individual was a school leader in the North Carolina Department of Public Instruction, licenses are identified by the license type code in the License Area databases. Codes pertinent to this study include teacher, principal, and superintendent. Individuals can hold more than one license (for example, teacher and principal). Principals and assistant principals must hold a principal license unless the local board of education accepts a provisional license in special circumstances. Superintendents must hold a superintendent license, principal license, and curriculum instructional specialist (supervisor) license (classified as teacher license in this study).

Longitudinal analysis

An observational analysis of a specific cohort of individuals over a defined period of time. Research questions 2 and 3 use longitudinal analysis to describe the career paths of the retention and recruitment cohorts. Longitudinal analysis may be prospective, following a cohort forward from a specific point in time, or retrospective, following a cohort backward from a specific point in time.

Nonrural or rural school leader

For the career path analysis, individuals in the retention and recruitment cohorts were defined as a nonrural or rural school leader based on whether the majority of their time as a school leader during the study period was spent in a nonrural or rural school. For example, if an individual spent 10 years in North Carolina public schools with 5 of those years as a school leader and 3 of those years as a school leader in a rural school, the individual would be designated as a rural school leader. If an individual's time was spent exactly half in nonrural schools and half in rural schools, the designation would be based on the most recent location. For example, if an individual had been in North Carolina public schools for five years with four years as a school leader, and the first two years as a school leader were in rural schools and the second two years in nonrural schools, the individual would be designated as a nonrural school leader. The decision on how to classify school leaders as nonrural or rural was based on conversations with the alliance members requesting this analysis.

Nonrural or rural school

Nonrural and rural school status was defined as the district urban-centric locale code in the Public School Universe databases (U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, 2016). For the cross-sectional analysis nonrural and rural comparisons were based on an individual's location during a given school year. For example, an individual who was an assistant principal of a nonrural school in 2001/02–2005/06 and a principal of a rural school in 2006/07–2012/13 was designated as a nonrural assistant principal from 2001/02 through 2005/06 and as a rural principal from 2006/07 through 2012/13.

Appendix B. Data and methods

This appendix describes the data sources and details of the analysis.

Data

This descriptive study used data provided by the North Carolina Department of Public Instruction, which maintains a statewide longitudinal data system about districts, schools, staff, and students. Data were obtained for every school leader (principals and assistant principals) from 2001/02 through 2012/13. This period was selected because it captures all relevant data available when the study was designed. This study includes 11,615 unique individuals who held a school leadership position for at least one year from 2001/02 through 2012/13. The total number of unique individuals who served as a principal or assistant principal during the time analyzed was determined by the number of unique identifiers used to link all datasets together across years. The number of assistant principals and assistant principals varied across years (table B1).

Five datasets for each year from 2001/02 through 2012/13 were obtained by special request from the North Carolina Department of Public Instruction. For each year that an individual held a certified job within the North Carolina Department of Public Instruction, gender, race/ethnicity, educational attainment, licenses, job category, job location, and urbanicity of the job were reported. The specific variables analyzed and original datasets and variables are listed in table B2.

Each dataset for each year was systematically cleaned and coded to create meaningful variables. The urban-centric locale codes were classified into either nonrural or rural. The teacher ethnicity codes were classified into Black, White, and Other. For each individual there were multiple education-level codes, one for each degree, so as part of the cleaning process, the highest level had to be ascertained each year. As a license was not mutually exclusive (individuals could hold multiple licenses), a series of dichotomous variables (teacher, principal, superintendent) were created to capture each license type. The budget

Table B1. Number of principals and assistant principals by year, 2001/02–2012/13

Year	Assistant principal	Principal
2001/02	2,842	2,311
2002/03	2,879	2,303
2003/04	2,988	2,352
2004/05	3,078	2,396
2005/06	3,161	2,485
2006/07	3,263	2,555
2007/08	3,171	2,575
2008/09	3,136	2,620
2009/10	2,968	2,624
2010/11	2,954	2,671
2011/12	2,891	2,678
2012/13	2,851	2,447

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Table B2. Datasets and information provided

Variable	Original dataset	Original variable
Certified job category	Certified-salary	Budget object code
School urbanicity	Public school universe	Urban-centric locale code
Gender	School activity report personnel	Teacher sex
Race/ethnicity	School activity report personnel	Teacher ethnicity
Educational attainment	License-education	Education level code
License	License area	License type code

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

object codes associated with each certified job position in the Certified Salary Dataset were recoded to represent teacher, instructional support, administrative/systems support, assistant principal, principal, or superintendent. Once all datasets were cleaned and coded, they were merged into a single master file for that particular dataset (for example, demographics or license), and then into a single large dataset with all study variables for all school leaders across all years.

It was important to identify the primary certified job position for each year in cases where an individual may have switched positions within the school year (example, assistant principal to principal) or held dual positions (example, a classroom teacher for 50 percent of the day and instructional support for 50 percent of the day). If an individual changed position over the course of the year, the primary position was based on where the most amount of time was spent across the year. For example, if an individual spent three months as a teacher and nine months as an assistant principal, the primary position was assistant principal. If the amount of time spent in positions was the same (for example, six months as an assistant principal and six months as a principal), the primary position was the most recent position. If an individual held two positions simultaneously throughout the year and spent an equal amount of time in each position, the primary position was the one considered higher based on educational and certification qualifications and salary rates as reported in the Certified Salary Dataset. For example, if an individual was a classroom teacher for 50 percent of the day and a reading coach (classified as instructional support) for 50 percent of the day, the primary position was instructional support. The location (school or district) of the primary certified job was reported each year and was matched with school urbanicity.

Up to 12 years of data were available for school leaders; data were unavailable for years that an individual was not employed in a certified job within the North Carolina Department of Public Instruction. No procedures were used for handling missing demographic, education, or license data. The percentage of individuals with missing data on gender, race/ethnicity, educational attainment, or licenses in each year is reported in table B3.

Analysis

This descriptive study has three main parts:
- Cross-sectional analysis of gender, race/ethnicity, educational attainment, and licenses of school leaders in each year from 2001/02 through 2012/13.
- 10-year longitudinal analysis that tracked individuals for 10 years forward from the first school leadership position they held in 2001/02, 2002/03, or 2003/04.

Table B3. Percentage of individuals with missing data by variable by year, 2001/02–2012/13

Variable	2001/ 02	2002/ 03	2003/ 04	2004/ 05	2005/ 06	2006/ 07	2007/ 08	2008/ 09	2009/ 10	2010/ 11	2011/ 12	2012/ 13
Gender	48.0	43.7	38.3	33.4	28.6	23.9	19.0	15.1	12.0	8.9	5.3	0.2
Race/ ethnicity	48.2	44.0	38.5	33.6	28.9	24.2	19.2	15.4	12.2	9.1	5.5	0.4
Educational attainment	1.6	2.0	1.7	1.7	1.8	1.8	0.1	0.1	0.1	0.1	0.2	0.1
Licensing	0.8	1.0	1.0	1.0	0.9	0.9	0.1	0.1	0.1	0.2	0.1	0.1

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

- 10-year longitudinal analysis that tracked individuals for 10 years backward from the last school leadership position they held in 2009/10, 2010/11, or 2012/13.

The cross-sectional analysis is described first, and then the longitudinal analyses of the retention and recruitment cohorts are described.

Cross-sectional analyses. The first part addressed the broader question of the demographics, educational attainment, and licenses of North Carolina school leaders from 2001/02 through 2012/13. For this component all 11,615 individuals were included. Designation as an assistant principal or principal and as nonrural or rural was based on the individual's position in any given year. For example, an individual who was an assistant principal of a nonrural school in 2001/02–2005/06 and a principal of a rural school in 2006/07–2012/13 was designated as a nonrural assistant principal from 2001/02 through 2005/06 and a rural principal from 2006/07 through 2012/13.

For the cross-sectional analyses cross-tabulations were created to describe and compare the demographics, educational attainment, and educational licenses of assistant principals and principals of nonrural and rural schools each year from 2001/02 through 2012/13.

Longitudinal analyses. The second part addressed the 10-year retention paths of North Carolina school leaders. The third part addressed the 10-year recruitment paths of North Carolina school leaders. For these analyses two cohorts of school leaders—a retention cohort and a recruitment cohort—were drawn from the pool of all 11,615 individuals.

The two cohorts were created by first identifying and flagging all individuals who were school leaders in 2001/02, 2002/03, and/or 2003/04 as "starters." There were 6,443 starters in the dataset. Then, all individuals who were school leaders in 2010/11, 2011/12, and/or 2012/13 were flagged as "enders." There were 6,830 such individuals. Because a person could be in both groups, some individuals had one flag, some had two, and some were not in either group (table B4).

- A total of 7,917 had one flag (either starter or ender):
  - 3,765 for starter only.
  - 4,152 for ender only.
- A total of 2,678 had two flags (both starter and ender).
- The remaining 1,023 had no flags (short term, not identified as starters or enders).

Table B4. Individuals flagged as a starter or ender for retention and recruitment cohorts, 2001/02–2012/13

Category	Starter	Ender	Both starter and ender	Neither starter nor ender
Retention cohort	3,765	0	2,678	0
Recruitment cohort	0	4,152	0	0
Total	3,765	4,152	2,678	1,023

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

The retention cohort (n = 6,443) included any individual who was a school leader at some point in 2001/02, 2002/03, or 2003/04. That is, the cohort included all individuals flagged as a starter and those flagged as both a starter and an ender (see table B4). The three-year time period to identify school leaders was selected since it maximized the length of time and number of individuals that the study could cover. For the retention path analysis, school leader designation as an assistant principal or principal is based on an individual's first school leadership position (assistant principal or principal) in 2001/02, 2002/03, or 2003/04.

The recruitment cohort (n = 4,152) included any individual who was a school leader at some point in 2010/11, 2011/12, or 2012/13 but excluded any individuals who were part of the retention analysis cohort. That is, it included individuals flagged as an ender but who were not also starters (see table B4). For these individuals there were no available data on the position held before their first observed school leadership position during 2001/02—2003/04. For the recruitment path analysis, school leader designation as an assistant principal or principal is based on their last school leadership position (assistant principal or principal) in 2010/11, 2011/12, or 2012/13.

The recruitment cohort analysis excluded individuals who were part of the retention cohort analysis. This decision was made because the purpose of the recruitment cohort analyses was to identify the career paths that individuals took into school leadership. The purpose of the retention cohort analyses was to identify the career paths that individuals took once they were in school leadership. Thus, the career paths of individuals in the retention cohort could not provide information about recruitment into school leadership since they were already in school leadership.

Analyses of career paths were grounded in basic sequence analysis techniques (Blanchard et al., 2015) using R's package TraMineR package (Gabadinho, Ritschard, Muller, & Studer, 2011). Career paths were defined as the sequence of ordered distinct states where the states' duration is ignored, referred to as "distinct-successive-state representations" in sequence analysis (Studer & Ritschard, 2016). That is, career paths were defined as the sequence of distinct job categories where the amount of time spent in each job category is ignored.

Years when an individual did not hold a certified job in the North Carolina school system were treated as meaningful and given a job code of "not in North Carolina public schools." Therefore, the career path analysis had no missing data. Including years with no data as meaningful years (that is, not in North Carolina public schools) helps address censoring

of data. It also distinguishes between sequences where only one position is held for the entire 10 years examined and sequences where only one position is held for a short time before the school leader exits the system (Billari, 2001). For example, the career path of an individual who was a principal for all 10 years is treated differently from the career path of an individual who was a principal for 5 years before leaving the North Carolina public schools.

To conduct the career path analyses, the study team had to define common start and end points for the analyses. Career paths were synchronized through endogenous synchronization (Colombi & Paye, 2014). For the retention cohort career paths were synchronized based on the first time an individual was an assistant principal or principal in 2001/02, 2002/03, or 2003/04; for the recruitment cohort career paths were synchronized based on the last time an individual was an assistant principal or principal in 2010/11, 2011/12, or 2012/13. While synchronizing the data in this way does not eliminate issues of unknown data before or after the years examined, it creates consistent boundaries.

Although the issue of right and left censoring still exists due to the limitations of the dataset, systematically defining cohorts and synchronizing individual career paths as meaningful helps address some of the problems associated with censoring of data. Indeed, the data are censored because they represent only 2001/02 and 2012/13; what happened to school leaders before or after that timeframe is not included in the analysis. The purpose of the retention cohort analysis was to find out what happens within the 10 years of being an assistant principal or principal; however, the question focuses only on the last part of the career path, so right censoring is less of a concern. Likewise, the purpose of the recruitment cohort analysis was to find out what happened in the 10 years leading up to their final school leadership position, which includes the first time an individual was an assistant principal or principal in 2010/11, 2011/12, or 2012/13. Therefore, the research question focuses only on the first part of the career path, so left censoring is less of a concern.

Cross-tabulations and measures of central tendency and distribution were created to describe and compare the 10-year retention and recruitment paths of nonrural and rural assistant principals and principals.

Appendix C. Findings comparing school leaders in nonrural and rural schools

This appendix provides the findings of the differences between school leaders in nonrural and rural schools for each of the three main components of the study:
- Gender, race/ethnicity, educational attainment, and licenses (research question 1).
- The 10-year retention paths of school leaders after their initial position as an assistant principal or principal from 2001/02 through 2003/04 (research question 2).
- The 10-year recruitment paths of school leaders leading into their final position as an assistant principal or principal from 2010/11 through 2012/13 (research question 3).

Nonrural and rural schools were equally led by women; the gap in the percentage of women in the principal ranks in nonrural and rural schools closed by end of the review period

Throughout the study period the percentage of female assistant principals was equal in nonrural and rural schools (figure C1). While the principals in nonrural schools were more likely to be women than were the principals in rural schools at the start of the study period, the gap steadily narrowed and disappeared by the end of the 12-year period examined.

While the percentage of school leaders who were White was higher in rural schools, the percentage of school leaders who were Black was higher in nonrural schools

The percentage of assistant principals who were White was lower in nonrural schools than in rural schools across all years examined (figure C2). The percentage of principals who were Black was higher in nonrural schools (29–32 percent) than in rural schools

Figure C1. The percentage of female assistant principals was equal in nonrural schools and rural schools, while the percentage of female principals increased in rural schools, 2001/02–2012/13
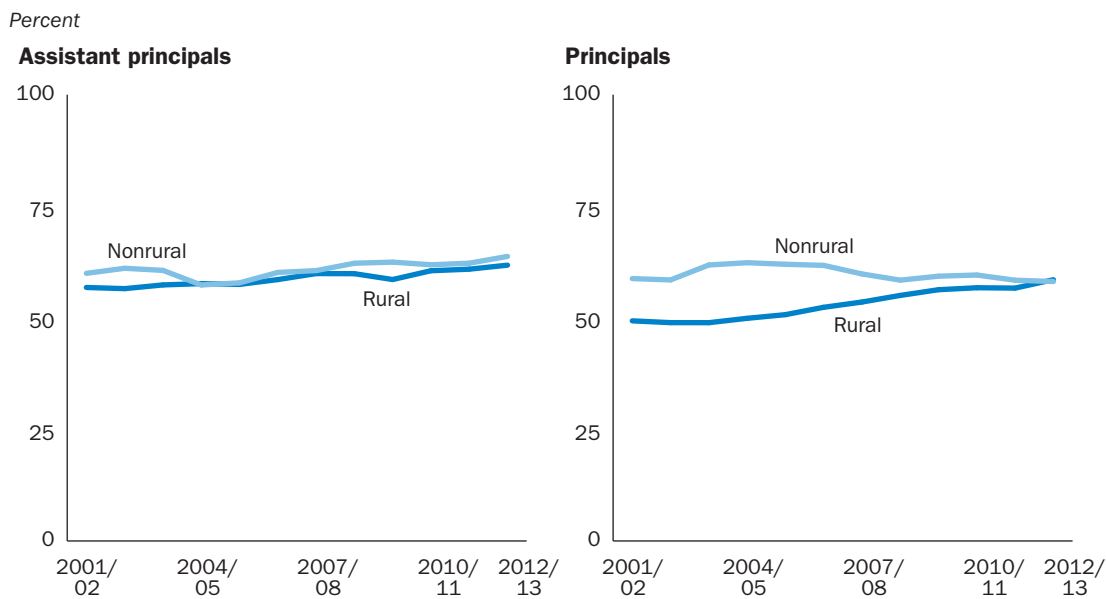
Percent

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Figure C2. The percentages of school leaders who were White were higher in rural schools, and the percentages of school leaders who were Black were higher in nonrural schools, 2001/02–2012/13
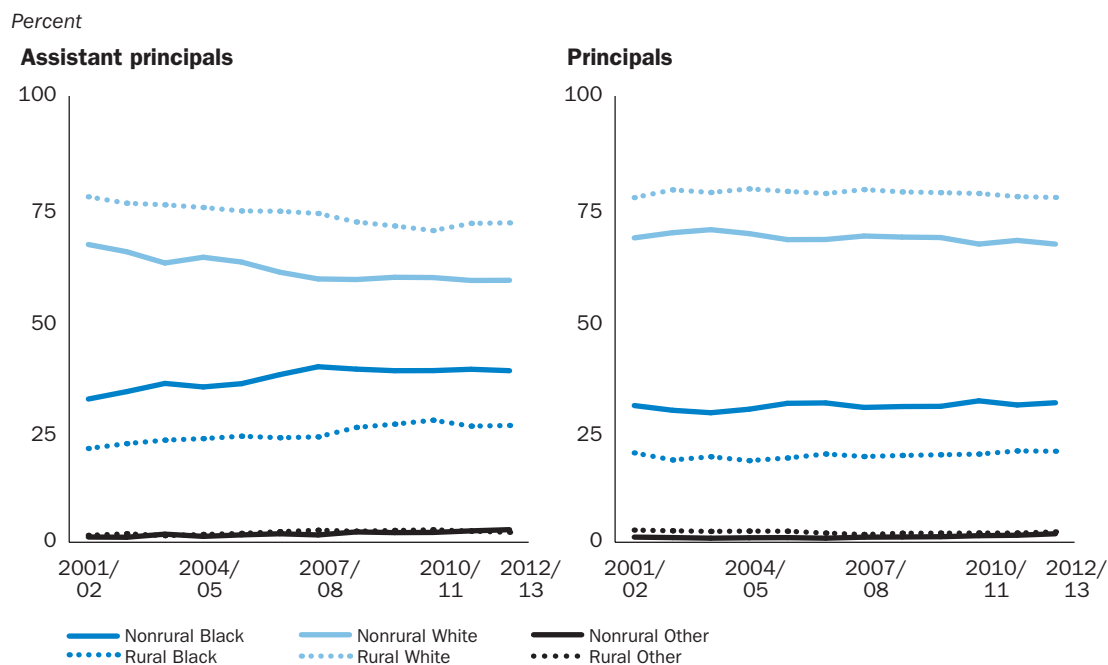
Percent

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

(18–20 percent), and the percentage of principals who were White was lower in nonrural schools (67–70 percent) than in rural schools (77–79 percent).

Leaders in nonrural and rural schools did not differ in educational attainment

Levels of educational attainment did not differ for assistant principals in nonrural schools and rural schools (figure C3), which parallels the findings in the main text for these school leaders all together. Among principals, only in 2011/12 was there a difference in the percentage of individuals with a master's degree, when the percentage was higher in rural schools than in nonrural schools. Among principals, only in 2001/02 was there a difference in the percentage of individuals with an advanced degree, when the percentage was higher among leaders in rural schools than nonrural schools.

The percentage of school leaders who held certain types of licenses did not differ in nonrural and rural schools

There was no difference in the percentage of nonrural and rural school leaders who held a particular license (figure C4).

Figure C3. Educational attainment was similar among leaders in nonrural and rural schools, 2001/02–2012/13
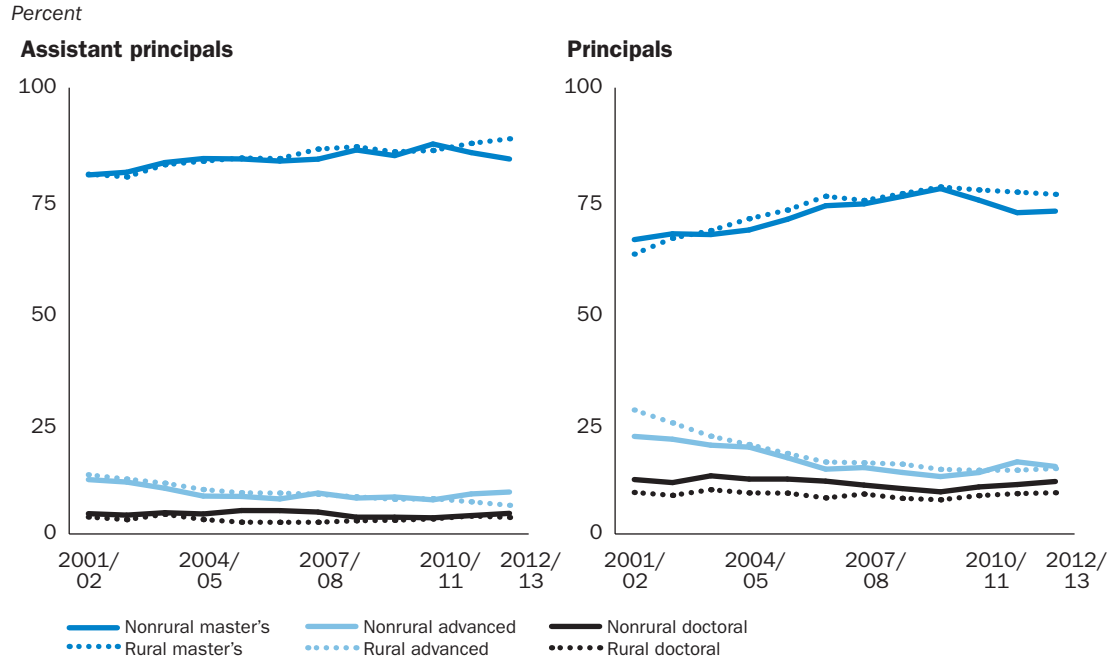
Percent

Assistant principals

Principals

Nonrural master's
Rural master's

Nonrural advanced
Rural advanced

Nonrural doctoral
Rural doctoral

Figure C4. Leaders in nonrural and rural schools were equally likely to hold teacher, principal, and superintendent licenses, 2001/02–2012/13
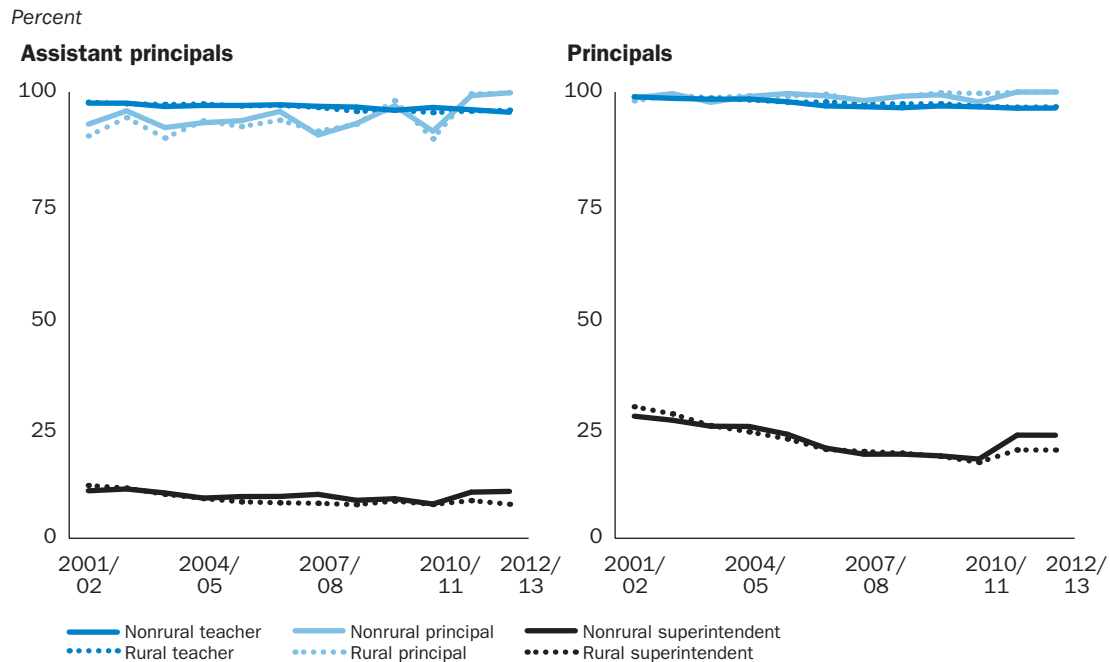
Percent

Assistant principals

Principals

Nonrural teacher
Rural teacher

Nonrural principal
Rural principal

Nonrural superintendent
Rural superintendent

This section compares the 10-year retention paths for rural school leaders and their nonrural counterparts.

The top-10 retention paths for nonrural assistant principals were similar to the top-10 paths for rural assistant principals. Only one top-10 retention path for nonrural assistant principals was not a top-10 path for rural assistant principals (path 10); likewise, only one top-10 path (path 5) for rural assistant principals did not have a matching top-10 path among nonrural assistant principals (table C1). The nonrural assistant principal retention path not matched by the retention path for the rural counterparts (assistant principal to administrative/systems support to not in North Carolina public schools) accounted for only 2 percent of nonrural assistant principals. However, this path is not substantively different from the assistant principal to administrative/systems support path, which is a common path for both nonrural and rural assistant principals. The rural assistant principal retention path not matched by the retention path for the nonrural counterparts (assistant principal to principal to administrative/systems support) accounted for only 4 percent of rural assistant principals. The top-4 most common retention paths were the same for nonrural and rural assistant principals; however, the rank order was reversed for the top-2 paths.

The average amount of time spent in each position within retention paths was similar for nonrural and rural assistant principals (figure C5). For example, the largest mean difference

Table C1. Nonrural and rural assistant principals had 9 top-10 retention paths in common, 2001/02–2012/13

Path	Nonrural assistant principal paths			Rural assistant principal paths		
	Path number	Number	Percent	Path number	Number	Percent
Assistant principal → Not in North Carolina public schools	1	475	26.6	2	446	20.1
Assistant principal → Principal	2	367	20.5	1	604	27.2
Assistant principal	3	245	13.7	3	206	9.3
Assistant principal → Principal → Not in North Carolina public schools	4	83	4.6	4	134	6.0
Assistant principal → Teacher	5	61	3.4	6	81	3.6
Assistant principal → Teacher → Not in North Carolina public schools	6	59	3.3	7	68	3.1
Assistant principal → Administrative/systems support	7	42	2.3	9	32	1.4
Assistant principal → Principal → Assistant principal	8	38	2.1	8	52	2.3
Assistant principal → Not in North Carolina public schools → Assistant principal → Not in North Carolina public schools	9	34	1.9	10	26	1.2
Assistant principal → Administrative/systems support → Not in North Carolina public schools	10	32	1.8	na	na	na
Assistant principal → Principal → Adminstrative/systems support	na	na	na	5	86	3.9

na is not applicable because there is no matching path in the top 10.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Figure C5. Mean time spent in each position in nonrural and rural assistant principals' 10-year retention paths, 2001/02–2012/13
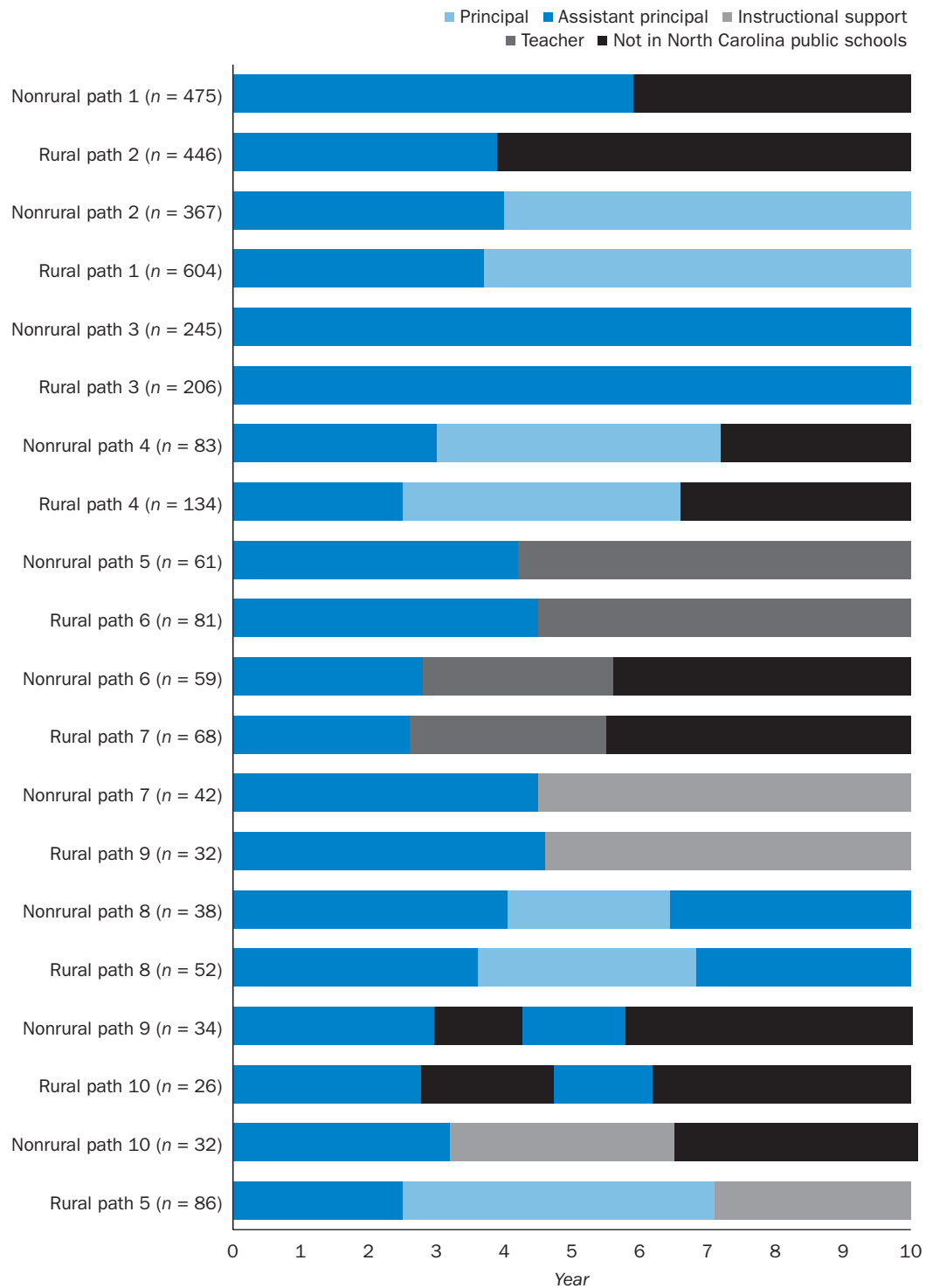
Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

in time spent as an assistant principal was in the assistant principal to principal to assistant principal path. For school leaders on this retention path the average amount of time spent as an assistant principal for nonrural school leaders was 7.6 years, and the average amount of time spent as an assistant principal for rural school leaders was 6.8 years.

The top-10 retention paths for nonrural principals were similar to the top-10 paths for rural principals. Only two top-10 retention paths (8 and 9) for nonrural principals were not among the top-10 paths for rural principals; likewise, only two top-10 paths (7 and 10) for rural principals did not have a matching top-10 path for nonrural principals (table C2). The two unmatched retention paths for nonrural principals (principal to administrative/ systems support to principal, and principal to not in North Carolina public schools to principal) accounted for only 3 percent of nonrural principals. Both of these paths ultimately led from principal back to principal with some time spent either out of North Carolina public schools or in administrative/systems support. The two unmatched retention paths for rural principals (principal to not in North Carolina public schools to assistant principal to not in North Carolina public schools, and principal to teacher to not in North Carolina public schools) accounted for only 3 percent of rural principals. Of the two unmatched retention paths for rural principals, only one (path 10) was unique to rural principals; the principal to teacher to not in North Carolina public schools was the only path that included time as a teacher among the top-10 paths for nonrural and rural principals. The top-3 most common retention paths were the same for both nonrural and rural principals.

Table C2. Nonrural and rural principals had 8 top-10 retention paths in common, 2001/02–2012/13

Path	Nonrural principal paths			Rural principal paths		
	Path number	Number	Percent	Path number	Number	Percent
Principal → Not in North Carolina public schools	1	321	34.7	1	446	20.1
Principal	2	200	21.6	2	604	27.2
Principal → Administrative/systems support	3	32	3.5	3	206	9.3
Principal → Administrative/systems support → Not in North Carolina public schools	4	29	3.1	6	134	6.0
Principal → Superintendent	5	28	3.0	4	81	3.6
Principal → Assistant principal	6	23	2.5	9	68	3.1
Principal → Assistant principal → Not in North Carolina public schools	7	22	2.4	5	32	1.4
Principal → Administrative/systems support → Principal	8	16	1.7	na	na	na
Principal → Not in North Carolina public schools → Principal	9	14	1.5	na	na	na
Principal → Not in North Carolina public schools → Principal → Not in North Carolina public schools	10	14	1.5	8	23	1.5
Principal → Not in North Carolina public schools → Assistant principal → Not in North Carolina public schools	na	na	na	7	23	1.5
Principal → Teacher → Not in North Carolina public schools	na	na	na	10	22	1.5

na is not applicable because there is no matching path in the top 10.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

The average amount of time spent in each position within retention paths was similar for nonrural and rural principals (figure C6). For example, the largest mean difference in time


Figure C6. Mean time spent in each position in nonrural and rural principals' 10-year retention paths, 2001/02–2012/13

Legend: Superintendent ■ Principal ■ Assistant principal ■ Teacher ■ Instructional support ■ Not in North Carolina public schools

Categories (top to bottom):
Nonrural path 1 (n = 321)
Rural path 1 (n = 564)
Nonrural path 2 (n = 200)
Rural path 2 (n = 299)
Nonrural path 3 (n = 32)
Rural path 3 (n = 79)
Nonrural path 4 (n = 29)
Rural path 6 (n = 37)
Nonrural path 5 (n = 28)
Rural path 4 (n = 54)
Nonrural path 6 (n = 23)
Rural path 9 (n = 22)
Nonrural path 7 (n = 22)
Rural path 5 (n = 39)
Nonrural path 8 (n = 16)
Nonrural path 9 (n = 14)
Nonrural path 10 (n = 14)
Rural path 8 (n = 23)
Rural path 7 (n = 23)
Rural path 10 (n = 22)

X-axis: 0 1 2 3 4 5 6 7 8 9 10
Year

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

spent as a principal was in the principal to superintendent path. For school leaders on this path the average amount of time spent as a principal for nonrural school leaders was 5.8 years, and the average amount of time spent as a principal for rural school leaders was 4.4 years.

Recruitment paths were generally similar for nonrural and rural school leaders

The comparisons of the 10-year recruitment paths for three cohorts of nonrural and rural school leaders in North Carolina are addressed below.

The top-10 recruitment paths for nonrural and rural assistant principals were the same. The top-10 paths accounted for 78 percent of nonrural assistant principals and 87 percent of rural assistant principals. The top path (teacher to assistant principal) accounted for 32 percent of nonrural assistant principals and 44 percent of rural assistant principals (table C3). This finding suggests that the path to the assistant principalship may be more direct for rural school leaders than for nonrural school leaders and that there may be more flexibility in the paths to assistant principal positions in nonrural schools than in rural schools.

The average amount of time spent in each position within paths was similar between nonrural and rural assistant principals (figure C7). For example, the largest mean difference in time spent as an assistant principal was in the teacher to principal to assistant principal

Table C3. The top-10 recruitment paths of nonrural and rural assistant principals were the same, 2001/02–2012/13

Path	Nonrural assistant principal paths			Rural assistant principal paths		
	Path number	Number	Percent	Path number	Number	Percent
Teacher → Assistant principal	1	382	31.9	1	746	44.0
Not in North Carolina teacher → Assistant principal	2	172	14.4	2	278	16.4
Teacher → Instructional support → Assistant principal	3	106	8.8	3	125	7.4
Not in North Carolina public schools → Assistant principal	4	81	6.8	4	85	5.0
Teacher → Not in North Carolina public schools → Assistant principal	5	64	5.3	5	78	4.6
Not in North Carolina public schools → Teacher → Not in North Carolina public schools → Assistant principal	6	50	4.2	6	58	3.4
Not in North Carolina public schools → Teacher → Instructional support → Assistant principal	7	32	2.7	7	43	2.5
Teacher → Not in North Carolina public schools → Teacher → Assistant principal	8	21	1.8	8	23	1.4
Teacher → Assistant principal → Teacher → Assistant principal	9	13	1.1	9	22	1.3
Teacher → Assistant principal → Principal → Assistant principal	10	11	0.9	10	21	1.2

na is not applicable because there is no matching path in the top 10.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

Figure C7. Mean time spent in each position in nonrural and rural assistant principals' recruitment paths, 2001/02–2012/13
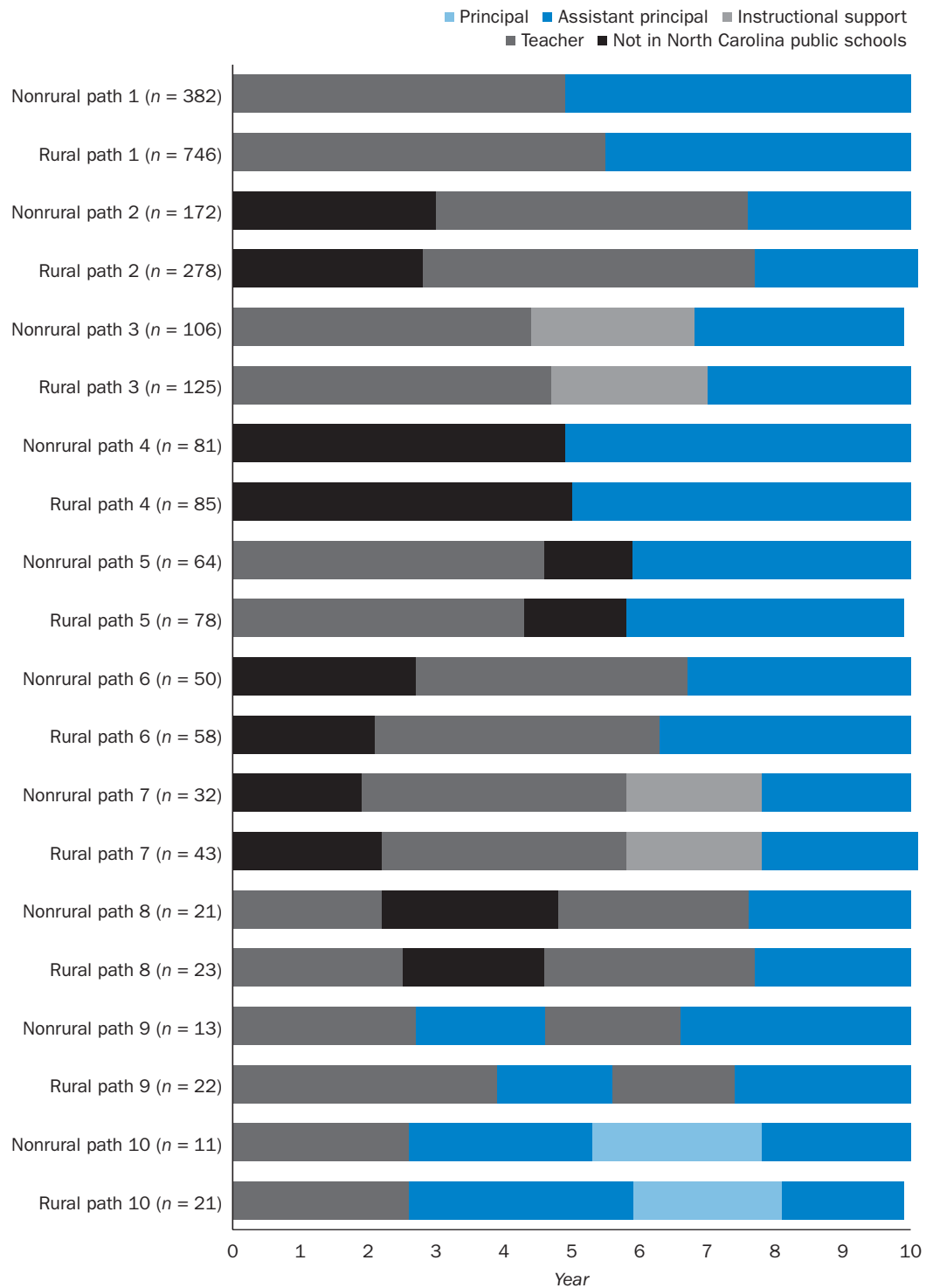
Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

path. For school leaders on this path the average amount of time spent as an assistant principal was 5.1 years for nonrural leaders and 4.5 years for rural school leaders.

The top-10 recruitment paths were similar for nonrural principals and for rural principals. The top-7 most common paths were the same for nonrural and rural principals, though their rank order differed (table C4). Together, these top-7 paths accounted for 78 percent of nonrural principals and 81 percent of rural principals. Only two top-10 paths (9 and 10) for nonrural principals were not top-10 paths for rural principals; likewise, only two top-10 paths (8 and 10) for rural principals were not among the top-10 paths for nonrural principals. The two rural principal paths unmatched among nonrural principals (administrative/systems support to principal, and not in North Carolina public schools to teacher to not in North Carolina public schools to principal) accounted for only 2 percent of nonrural principals. The administrative/systems support to principal path (9) was the only top-10 path among all principal paths to include administrative systems support. The other unmatched path (10) was a derivation of the teacher to principal path that was one of the top-10 paths for both nonrural and rural school leaders.

The two nonrural principal paths unmatched among rural principals (teacher to instructional support to principal, and not in North Carolina public schools to teacher to not

Table C4. The paths that nonrural and rural principals took were similar, though the rank orders differed slightly, 2001/02–2012/13

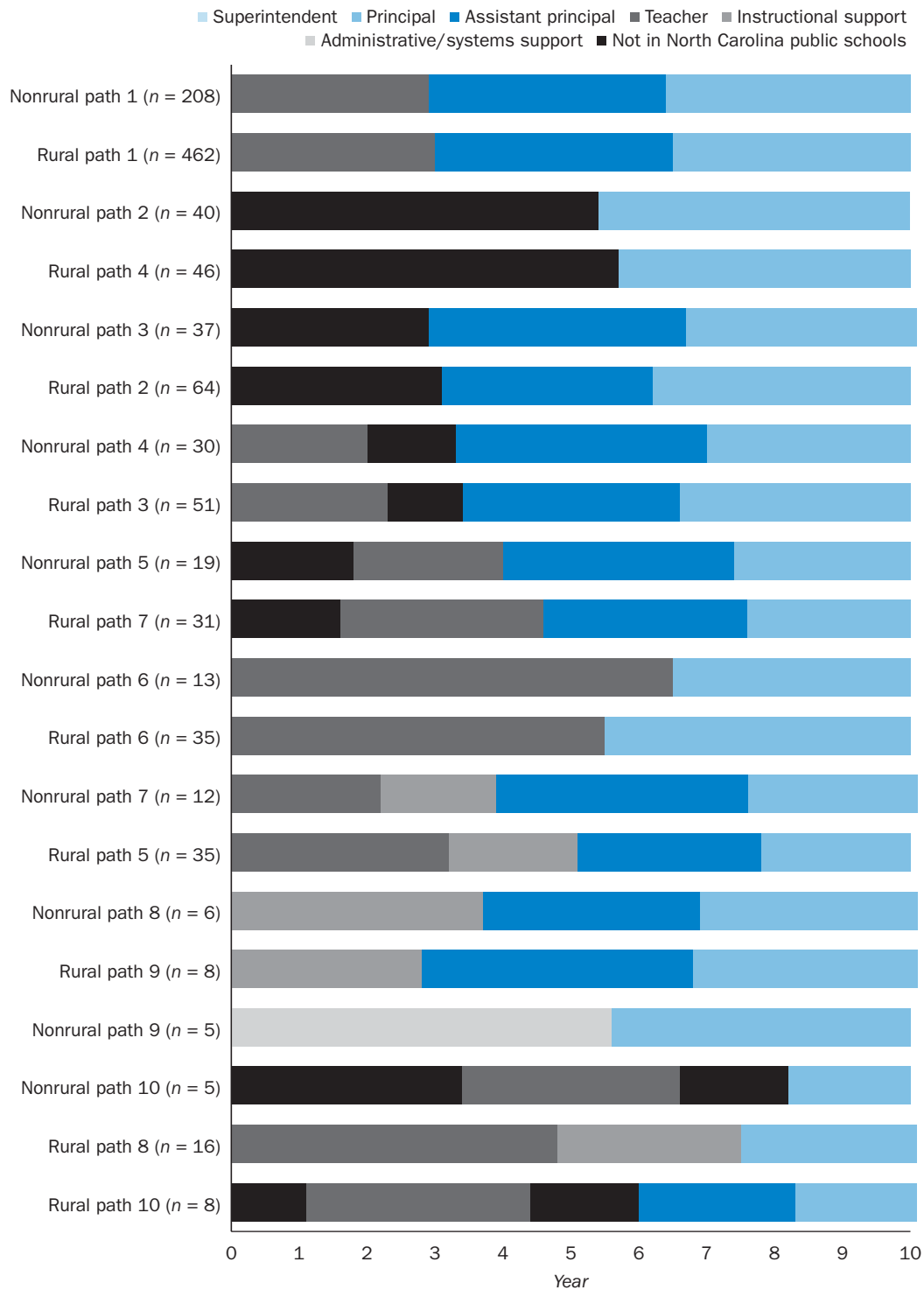| Path	Nonrural principal paths			Rural principal paths		
	Path number	Number	Percent	Path number	Number	Percent
Teacher → Assistant principal → Principal	1	208	44.9	1	462	51.7
Not in North Carolina public schools → Principal	2	40	8.6	4	46	5.2
Not in North Carolina public schools → Assistant principal → Principal	3	37	8.0	2	64	7.2
Teacher → Not in North Carolina public schools → Assistant principal → Principal	4	30	6.5	3	51	5.7
Not in North Carolina public schools → Teacher → Assistant principal → Principal	5	19	4.1	7	31	3.5
Teacher → Principal	6	13	2.8	6	35	3.9
Teacher → Instructional support → Assistant principal → Principal	7	12	2.6	5	35	3.9
Instructional support → Assistant principal → Principal	8	6	1.3	9	8	0.9
Administrative/systems support → Principal	9	5	1.1	na	na	na
Not in North Carolina public schools → Teacher → Not in North Carolina public → Principal	10	5	1.1	na	na	na
Not in North Carolina public schools → Teacher → Not in North Carolina public → Assistant principal → Principal	na	na	na	8	16	1.8
Not in North Carolina public schools → Teacher → Not in North Carolina public → Assistant principal → Principal	na	na	na	10	8	0.9

na is not applicable because there is no matching path in the top 10.

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

in North Carolina public schools to assistant principal to principal) accounted for only 3 percent of rural principals. Of the two unmatched paths for rural principals, one (8) was somewhat unique to rural principals; the teacher to instructional support to principal was the only path that went directly from instructional support to principal among the top-10 paths for both groups. The other unmatched path (10) for rural principals was a derivation of the teacher to assistant principal to principal path.

The average amount of time spent in each position within paths was similar between non-rural and rural principals (figure C8). For example, the largest mean difference in time spent as a principal was in the teacher to principal path. For school leaders on this path, the average amount of time spent as a principal for nonrural school leaders was 3.5 years, and the average amount of time spent as a principal for rural school leaders was 4.5 years.

Figure C8. Mean time spent in each position in nonrural and rural principals' recruitment paths, 2001/02–2012/13

Legend: ■ Superintendent ■ Principal ■ Assistant principal ■ Teacher ■ Instructional support ■ Administrative/systems support ■ Not in North Carolina public schools

Categories (top to bottom):
Nonrural path 1 (*n* = 208)
Rural path 1 (*n* = 462)
Nonrural path 2 (*n* = 40)
Rural path 4 (*n* = 46)
Nonrural path 3 (*n* = 37)
Rural path 2 (*n* = 64)
Nonrural path 4 (*n* = 30)
Rural path 3 (*n* = 51)
Nonrural path 5 (*n* = 19)
Rural path 7 (*n* = 31)
Nonrural path 6 (*n* = 13)
Rural path 6 (*n* = 35)
Nonrural path 7 (*n* = 12)
Rural path 5 (*n* = 35)
Nonrural path 8 (*n* = 6)
Rural path 9 (*n* = 8)
Nonrural path 9 (*n* = 5)
Nonrural path 10 (*n* = 5)
Rural path 8 (*n* = 16)
Rural path 10 (*n* = 8)

X-axis: *Year* (0 to 10)

Source: Authors' analysis of data obtained by special request from the North Carolina Department of Public Instruction.

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