

Teacher Turnover in FCPS

The information presented in this document was gathered and analyzed by the Office of Research and Strategic Improvement (ORSI) at the request of the assistant superintendent for Human Resources, Helen Nixon. The request was made by Dr. Nixon in support of the work being undertaken by the FCPS School Board's Human Resources Advisory Committee (HRAC). The committee's charge for the 2018-19 school year is three-fold: "understand current FCPS retention policies and collect information about the opportunities to increase retention in FCPS; identify what factors contribute to retention challenges; and identify practices that improve retention." In support of HRAC's work and charge, ORSI undertook the following three activities to report on in this document:

- Conducted a literature review to identify factors that educational research has associated with teacher retention (percentage of teachers who remain in their positions from one school year to the next) and turnover (percentage of teachers who leave their positions voluntarily from one school year to the next);
- Analyzed available FCPS data to understand turnover patterns in the Division, including predictors of FCPS turnover; and
- Crafted conclusions about factors FCPS can influence, either at schools or the Division as a whole, as well as about additional avenues for future investigation of teacher turnover in the Division.

Literature on Teacher Turnover

The literature on teacher retention and turnover consistently describes a few key reasons teachers choose to stay or leave positions at any given school. These reasons include both individual characteristics of the teachers themselves, as well as school-level factors related to the working environment and culture (including demographics of a school's student membership). Nationally, 16 percent of teachers leave teaching or transfer schools each year, which includes the 8 percent of teachers who transfer to other schools.

Individual Teacher Factors Related to Turnover

At the individual level, teacher demographics and qualifications of teachers themselves have been associated with whether teachers choose to remain in their positions.^{1,2,3} The literature is based on association of these factors to teacher turnover and have not been identified as causal factors. These factors include:

- Race/ethnicity (higher retention among minority teachers);
- Length of service (higher retention among teachers with greater tenure);

¹ Guarino, Santibanez, & Daley, 2006

² Cochran-Smith et al., 2010

³ Borman & Dowling, 2008.

- Teaching qualifications (higher retention among less qualified teachers, which is defined in various ways, such as attending lower quality preparation programs, possessing fewer or no academic rewards, and lower ratings of teaching quality etc.);
- Gender (higher retention among female teachers; conflicting studies existing on this factor).

In addition to the commonly cited individual-level factors associated with teacher retention and turnover, one study⁴ examined exit interviews from teachers and found that teachers frequently stated that they left because teaching was not what they expected, and were looking to pursue a different career, especially when this reason was coupled with a perception of low teacher salaries. Meta-analytic work on these individual-level factors,⁵ which examined the strength of the relations between these individual-level factors and the turnover outcomes, indicates the factors appear to equally contribute to teacher’s decisions to remain or leave their position.

School Factors Related to Turnover

Teacher retention and turnover patterns associated with school characteristics typically garner the greatest interest because they operate in relation to all teachers in a building and, thus, can have result in patterns of teacher turnover in a school. Research shows that teachers are more likely to leave schools with certain demographic makeups of the students. Specifically, research shows that being a higher poverty, higher minority school is related to greater turnover, but often not because of the demographic makeup of the students. Rather, schools with high-poverty, high-minority membership⁶ tend to be less organized, have leadership who are perceived as less effective, and have fewer resources, making working conditions less desirable. Moreover, research⁷ has established that while teacher turnover rates tend to be higher in urban, low-performing, and low socioeconomic status (SES) school districts, demographic characteristics, such as poverty or the percent of non-white students in a school, do not significantly predict teacher turnover rates at schools. While there has not been rigorous meta-analytic work on school-level factors that would support whether some factors have a stronger association than others, research has found greater teacher turnover is associated with the following:

- Ineffective leadership, including issues with discipline, accreditation/accountability, and organization;⁸
- Lack of mentorship from school leaders;⁹
- Lack of shared responsibility among staff;¹⁰
- No teacher influence over school policy;¹¹
- Lack of respect for student achievement;¹²
- Poor facilities;¹³

⁴ Podolski et al., 2017

⁵ Borman & Dowling, 2008

⁶ Simon & Johnson, 2013

⁷ https://learningpolicyinstitute.org/sites/default/files/product-files/Teacher_Turnover_REPORT.pdf

⁸ Boyd et al., 2011

⁹ Cowen & Winters, 2013

¹⁰ Knox & Anfara Jr., 2013

¹¹ Podolsky, Kini, Bishop, & Darling-Hammond, 2017

¹² Petty, Fitchett, & O’Connor, 2012

¹³ Boyd et al., 2011

- Safety issues;¹⁴
- High class sizes;¹⁵
- Lack of acknowledgement for teacher accomplishments.¹⁶

In reviewing the individual- and school-level factors associated with staying or leaving a teaching position, it should be noted that some factors might be uniformly seen as positive, while others may be universally seen as negative, making retention rates difficult to interpret. For example, while low rates of retention at a school related to ineffective leadership should spark concern, high rates of retention at a school related to keeping less qualified teachers should also be concerning. Thus, the retention rate itself is likely not revealing the full story.

Literature also highlights this concern about interpretation of retention rates. Specifically, the research¹⁷ indicates that while persistently high teacher turnover has negative impacts on school culture and student performance, turnover rates for an individual year or even several years in a row should be interpreted carefully. Higher teacher turnover rates are not inherently bad and lower teacher turnover rates are not inherently good for an individual year. For example, a new principal may be brought into a school to change instructional practices and increase student performance levels. The principal may be expected to closely monitor instructional practices and, thus, teachers who do not adjust to higher expectations may transfer from the school or leave the teaching profession entirely.

Approach to Studying Turnover in FCPS

Data from the 2016-17 school year were explored to determine what may contribute to teacher turnover rates observed in FCPS. The data from this year were chosen because they represented the most recent year of turnover data when employee engagement data were also available. The average turnover rate (without retirement) during SY 2016-17 in FCPS was 14 percent, while the average transfer rate was 6 percent. Both of these rates are below the national average (16 percent and 8 percent, respectively), indicating FCPS has less turnover and transfer than found in many other school divisions.

All analyses conducted were about schools, which means they focused on school-level predictors and turnover outcomes. Figure 1 provides the details on the specific factors that were available to measure factors identified by the literature.¹⁸ ORSI conducted separate regression analyses for elementary schools and middle/high schools because preliminary analyses indicated that these school levels were functioning differently. So, placing them into a single analysis would provide an appropriate model of factors impacting turnover and transfer. Analyses sought to understand if individual teacher factors, school demographics, and school culture (including teacher engagement) had an impact on teacher turnover or teacher transfer. Levels of teacher engagement at a school were operationalized in two ways: (a) using the overall engagement scale from the Employee Engagement Survey; and (b) using each of the six engagement drivers (shared values, leadership, communications, feedback and recognition, work environment, career

¹⁴ Boyd et al., 2011

¹⁵ Knox & Anfara Jr., 2013

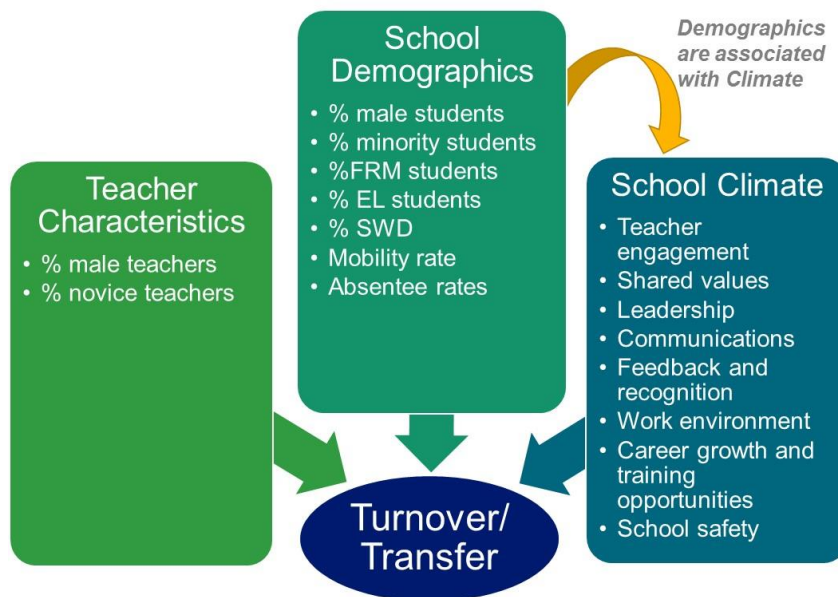
¹⁶ Petty, Fitchett, & O'Connor, 2012

¹⁷ Melinda Adnot & Thomas Dee & Veronica Katz & James Wyckoff, 2017. "Teacher Turnover, Teacher Quality, and Student Achievement in DCPS." Educational Evaluation and Policy Analysis, vol 39(1), pages 54-76.

¹⁸ At the time of the analysis, teacher preparation and average class size data aggregated for individual schools were not available.

growth and training opportunities) from the Employee Engagement Survey. Thus, two sets of regression analyses were run with one model relying on the overall engagement scale data and the other on the individual driver data as predictors of teacher turnover.

Figure 1: School-Level Turnover Analyses



Findings

The results from the regression analyses of which factors were significantly associated with teacher turnover and teacher transfer are presented in Table 1. "Yes" indicates that the variable significantly predicts teacher turnover. "No" indicates the variable does not predict teacher turnover. For the "Yes" variables, the sign that follows indicates whether the variable contributes to an increase (+) or decrease (-) in teacher turnover. (A third set of analyses examining turnover with retirement was also run and is available in the appendixes; results from that analysis did not differ from those presented here.)

As shown in Table 1:

- Few of the factors examined in this study were significantly related to teacher turnover or transfer.
- FCPS elementary and middle/high schools differ in the factors that were found to contribute to teacher turnover:
 - At the elementary school level, student mobility and percentage of novice teachers relate to higher teacher turnover, while overall engagement and the positive work environment driver relate to lower teacher turnover.
 - At the middle/high school level, the percentage of English learner (EL) students at a school relates to higher teacher turnover rates, while the percentage of male teachers related to lower teacher turnover rates.
- Factors found to contribute in FCPS were largely consistent for teacher turnover and transfer, with only the percentage of novice teachers dropping out as having a meaningful association when looking at teacher transfers from elementary schools.

Table 1: Which Factors Explain Turnover in FCPS Schools?

	Elementary Schools		Middle/High Schools	
	Turnover (without retirement)	Transfer to another FCPS school	Turnover (without retirement)	Transfer to another FCPS school
Percentage of male teachers	No	No	Yes (-)	Yes (-)
Novice teachers	Yes (+)	No	No	No
Percentage of male students	No	No	No	No
Percentage of minority students	No	No	No	No
Percentage of FRM students	No	No	No	No
Percentage of EL students	No	No	Yes (+)	Yes (+)
Percentage of Students with Disabilities	No	No	No	No
Student Mobility	Yes (+)	Yes (+)	No	No
Absentee Rate	No	No	No	No
Overall engagement	Yes (-)	Yes (-)	No	No
Shared values	No	No	No	No
Leadership	No	No	No	No
Communications	No	No	No	No
Feedback and recognition	No	No	No	No
Positive work environment	Yes (-)	Yes (-)	No	No
Career growth/Training opportunities	No	No	No	No
School safety (weapons violations)	No	No	No	No

Conclusions

The majority of teacher characteristics, school demographics, and school culture factors identified by research as related to teacher turnover in other school districts did not significantly predict teacher turnover and transfer in FCPS during the year investigated for this study. While engagement levels of teachers at a school do appear to have some impact on both teacher turnover and transfer, it may not be as significant as anticipated by research. This may be due, in part, to the relatively low levels of teacher turnover and transfer seen in FCPS when compared with other school divisions, which reflect different factors at play in the Division.

When looking for places where FCPS might intervene in support of lower levels of turnover, the significant association of overall engagement and the work environment driver to turnover and transfer at the elementary level open the possibility of improving in these areas. More specifically, the work environment driver includes such things as independence in work, mutual respect among staff, fairness, and staff morale, all of which can be impacted by school leadership.

Other factors that significantly predicted teacher turnover in these analyses (such as student mobility, the percentage of EL students at a school, or the gender distribution of teachers) cannot be impacted by schools or school divisions. However, it is possible that the student mobility and percentage of EL student variables are tapping into the extent to which staff feel adequately prepared to serve these special populations. Intervention related to this possibility could mean providing professional development, coaching, mentoring and other growth opportunities to support teachers and increase their efficacy in instructing these special populations.

Lastly, this study points to future analyses that could be pursued to clarify whether other research-based factors, as teacher race/ethnicity or teacher preparation, have an impact of turnover and transfer rates in FCPS. Additionally, more detailed examination of the Employee Engagement survey (including additional years of data) could identify specific items that are more predictive of teacher turnover.

References

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Appendix – School Residuals based on SY 2016-17 Analyses

The following data are standardized residuals calculated by the regression equations for each individual school. This means that a predicted turnover rate was calculated based on the model used in the regression analyses. That predicted rate was then compared to the actual turnover rate observed for the school. Schools with negative residuals had actual turnover rates lower than their predicted value; in other words, the turnover rate was lower than expected based on the regression model. Schools with positive residuals had actual turnover rates higher than their predicted value; in other words, the turnover rate was higher than expected based on the regression model.

Absolute residuals of three or higher (highlighted below) identify schools that are outliers, meaning the model is not doing a good job of explaining the turnover at that school. Interpretation of whether being an outlier school is a good thing or not, should be handled with caution. In the table below all outlier schools have actual turnover rates higher than those predicted by the regression model.

The table is organized by school level (elementary, middle, high/secondary) and then sorted from low to high based on the residual listed in the first column, teacher turnover with retirement. The table is presented first based on Model 1 – Overall Engagement, then based on Model 2 – Engagement Drivers.

Model 1			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
Elementary Schools			
ARCHER ELEMENTARY	-1.86221	-1.90340	-1.85096
LEMON ROAD ELEMENTARY	-1.84066	-2.26847	-1.93961
GARFIELD ELEMENTARY	-1.67552	-1.78112	-2.13064
FLORIS ELEMENTARY	-1.63044	-1.46852	-1.09315
SPRINGFIELD ESTATES ELEMENTARY	-1.55557	-1.67679	-1.79672
HYBLA VALLEY ELEMENTARY	-1.52851	-1.91542	-0.87075
WASHINGTON MILL ELEMENTARY	-1.51877	-1.87101	-1.34953
SPRING HILL ELEMENTARY	-1.50624	-1.57271	-1.88647
CLEARVIEW ELEMENTARY	-1.50481	-1.54753	-1.34154
ROLLING VALLEY ELEMENTARY	-1.46318	-0.96950	-0.08810
CRESTWOOD ELEMENTARY	-1.38996	-1.13310	-0.26362
FORESTVILLE ELEMENTARY	-1.38441	-1.08005	-0.58111
DOGWOOD ELEMENTARY	-1.20495	-1.19363	-0.91135
NORTH SPRINGFIELD ELEMENTARY	-1.19428	-0.95740	-0.47215
PINE SPRING ELEMENTARY	-1.18483	-0.87369	-1.03162
MANTUA ELEMENTARY	-1.17337	-1.22999	-1.25752
GREENBRIAR EAST ELEMENTARY	-1.11055	-0.95324	-1.00502

Model 1			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
BROOKFIELD ELEMENTARY	-1.08489	-0.85326	-0.80042
WEYANOKE ELEMENTARY	-1.06692	-1.13264	-0.80570
DEER PARK ELEMENTARY	-1.05750	-0.82789	-0.76109
FREEDOM HILL ELEMENTARY	-1.04924	-1.10346	-0.75214
CENTREVILLE ELEMENTARY	-0.97770	-0.57315	-0.52109
OAK HILL ELEMENTARY	-0.91612	-0.64440	-1.12722
RAVENSWORTH ELEMENTARY	-0.81910	-1.57380	-0.94587
HUNTERS WOODS ELEMENTARY	-0.78782	-0.37862	-0.99033
ARMSTRONG ELEMENTARY	-0.78760	-0.64679	-0.09931
HAYFIELD ELEMENTARY	-0.78092	-0.55100	-0.24877
FRANCONIA ELEMENTARY	-0.74448	-0.68838	-0.20786
TIMBER LANE ELEMENTARY	-0.74132	-0.43114	0.78215
PROVIDENCE ELEMENTARY	-0.74009	-0.58351	-0.93324
OAKTON ELEMENTARY	-0.69104	-0.61160	-0.26293
NAVY ELEMENTARY	-0.67713	-0.69677	0.03404
HUTCHISON ELEMENTARY	-0.64996	-0.90637	-0.51101
LITTLE RUN ELEMENTARY	-0.64988	-0.33975	0.63233
LORTON STATION ELEMENTARY	-0.64860	-0.63312	-0.87305
COATES ELEMENTARY	-0.64580	-0.51631	-0.49261
CAMELOT ELEMENTARY	-0.59488	-0.90513	0.33946
CENTRE RIDGE ELEMENTARY	-0.59316	-0.19537	0.08892
BEECH TREE ELEMENTARY	-0.58854	-1.15379	-0.96046
HUNT VALLEY ELEMENTARY	-0.57552	-0.14775	0.78345
OAK VIEW ELEMENTARY	-0.56210	-0.38421	-0.52380
BAILEYS UPPER ELEMENTARY	-0.53870	-0.54213	-0.11105
LAKE ANNE ELEMENTARY	-0.50726	-0.04485	0.13565
GUNSTON ELEMENTARY	-0.49317	-0.41750	0.42045
KEENE MILL ELEMENTARY	-0.48938	-0.74928	-0.61143
MARSHALL ROAD ELEMENTARY	-0.47584	-1.24854	-1.31740
GLEN FOREST ELEMENTARY	-0.42419	-0.35474	-1.21237
WOODBURN ELEMENTARY	-0.40950	-0.29606	-0.99407
KENT GARDENS ELEMENTARY	-0.39772	-0.24129	-0.34530
WOODLEY HILLS ELEMENTARY	-0.34917	-0.48417	0.07061

Model 1			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
VIRGINIA RUN ELEMENTARY	-0.33791	-0.05074	-0.64033
GRAHAM ROAD ELEMENTARY	-0.32179	-0.22187	0.28490
HOLLIN MEADOWS ELEMENTARY	-0.31845	-0.40194	-1.18497
MOSBY WOODS ELEMENTARY	-0.31009	-0.79246	-0.38558
DRANESVILLE ELEMENTARY	-0.27423	-0.32921	0.04522
SANGSTER ELEMENTARY	-0.26366	0.09200	1.19757
LAUREL HILL ELEMENTARY	-0.25812	-0.59138	-0.25213
WOODLAWN ELEMENTARY	-0.23740	0.05119	-0.42244
BAILEYS ELEMENTARY	-0.22494	-0.12290	0.52154
FOX MILL ELEMENTARY	-0.21895	0.03107	0.35474
SLEEPY HOLLOW ELEMENTARY	-0.20819	0.13856	0.22481
WAPLES MILL ELEMENTARY	-0.18181	0.06302	0.21899
STRATFORD LANDING ELEMENTARY	-0.17998	-0.22479	-0.41907
LYNBROOK ELEMENTARY	-0.16070	-0.16379	0.05351
BRADDOCK ELEMENTARY	-0.14730	-0.21605	-0.10817
ORANGE HUNT ELEMENTARY	-0.10094	-0.28089	-1.36687
TERRASET ELEMENTARY	-0.06473	-0.08539	-0.73330
WAKEFIELD FOREST ELEMENTARY	-0.05696	0.28674	-0.66183
HALLEY ELEMENTARY	-0.05075	0.00972	-0.00929
CLERMONT ELEMENTARY	-0.04160	0.27822	0.00752
MOUNT EAGLE ELEMENTARY	-0.03525	-0.59928	-0.89283
SUNRISE VALLEY ELEMENTARY	-0.03229	-0.05864	-0.82529
BELLE VIEW ELEMENTARY	-0.02763	-0.01780	0.87563
VIENNA ELEMENTARY	-0.00324	0.40618	0.40845
POWELL ELEMENTARY	0.02125	0.30645	-0.61052
KINGS PARK ELEMENTARY	0.03705	0.51704	-0.18534
CHERRY RUN ELEMENTARY	0.05725	0.55152	0.80597
WESTGATE ELEMENTARY	0.07677	0.14498	0.36169
MCNAIR ELEMENTARY	0.11527	0.12076	0.64382
COLVIN RUN ELEMENTARY	0.14828	0.21582	-0.45657
FORT BELVOIR PRIMARY SCHOOL	0.15758	-0.14344	-0.14795
WHITE OAKS ELEMENTARY	0.16268	0.65457	0.45045
FAIRVIEW ELEMENTARY	0.16272	0.44707	0.35570

Model 1			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
MASON CREST ELEMENTARY	0.16452	0.20797	-0.08997
FORT HUNT ELEMENTARY	0.16853	-0.08825	0.10186
LEES CORNER ELEMENTARY	0.17125	0.49037	0.36063
LANE ELEMENTARY	0.18446	0.03449	0.04327
WESTLAWN ELEMENTARY	0.18486	-0.08600	-0.12909
WESTBRIAR ELEMENTARY	0.18962	0.09675	0.96072
EAGLE VIEW ELEMENTARY	0.20140	0.32561	-0.65922
WAYNEWOOD ELEMENTARY	0.23722	0.06465	0.78798
TERRA CENTRE ELEMENTARY	0.25852	0.49547	1.29248
ISLAND CREEK ELEMENTARY	0.26189	0.11620	-0.14182
CANTERBURY WOODS ELEMENTARY	0.26256	-0.01908	-0.37902
BELVEDERE ELEMENTARY	0.31205	0.46724	1.03267
KINGS GLEN ELEMENTARY	0.32601	-0.38814	0.92062
CUB RUN ELEMENTARY	0.35248	0.79105	0.13590
FLINT HILL ELEMENTARY	0.37998	-0.75155	-0.06110
FAIRFAX VILLA ELEMENTARY	0.38592	0.16282	0.22878
BULL RUN ELEMENTARY	0.39181	0.79243	0.79211
WEST SPRINGFIELD ELEMENTARY	0.39825	0.67737	-1.24129
OLDE CREEK ELEMENTARY	0.42328	0.33855	-0.12910
COLUMBIA ELEMENTARY	0.45992	0.63417	0.16449
DANIELS RUN ELEMENTARY	0.50985	0.90787	1.23558
SHREVEWOOD ELEMENTARY	0.52523	0.28607	0.38159
RIVERSIDE ELEMENTARY	0.53411	0.26576	0.16216
HAYCOCK ELEMENTARY	0.54402	0.35671	0.55910
PARKLAWN ELEMENTARY	0.55567	0.59574	1.13263
CROSSFIELD ELEMENTARY	0.55592	0.75756	1.57242
STENWOOD ELEMENTARY	0.55691	0.40898	0.76983
UNION MILL ELEMENTARY	0.58167	0.74146	-0.15034
FORESTDALE ELEMENTARY	0.59786	-0.02144	-0.09822
CUNNINGHAM PARK ELEMENTARY	0.59907	1.20713	0.38706
FORT BELVOIR UPPER SCHOOL	0.60772	0.41230	-0.59637
BREN MAR PARK ELEMENTARY	0.60988	1.09870	0.72094

Model 1			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
LAUREL RIDGE ELEMENTARY	0.62944	0.75635	0.35174
GREENBRIAR WEST ELEMENTARY	0.65271	0.74179	-0.79484
WILLOW SPRINGS ELEMENTARY	0.66135	0.79672	0.47658
ALDRIN ELEMENTARY	0.67621	0.64076	0.47972
WOLFTRAP ELEMENTARY	0.78770	0.48656	-0.11563
HERNDON ELEMENTARY	0.83172	0.81435	0.94378
GROVETON ELEMENTARY	0.84927	1.04634	0.80691
BUCKNELL ELEMENTARY	0.89565	0.95696	-0.00225
SHERMAN ELEMENTARY	0.90728	0.70530	-0.27221
LONDON TOWNE ELEMENTARY	0.94365	0.75601	1.99223
CARDINAL FOREST ELEMENTARY	0.99165	0.79806	0.09736
FAIRHILL ELEMENTARY	1.01078	0.76777	1.67696
BUSH HILL ELEMENTARY	1.13792	0.68248	-0.22595
POPLAR TREE ELEMENTARY	1.25133	0.96608	-0.23988
CHURCHILL ROAD ELEMENTARY	1.27279	0.71450	0.30582
CHESTERBROOK ELEMENTARY	1.39312	1.26566	1.47117
CAMERON ELEMENTARY	1.53018	1.86717	2.26502
ROSE HILL ELEMENTARY	1.64950	1.69978	0.87977
SILVERBROOK ELEMENTARY	1.70166	1.45550	0.49881
BONNIE BRAE ELEMENTARY	1.71387	1.05249	1.03192
GREAT FALLS ELEMENTARY	1.82454	0.75961	2.08654
FOREST EDGE ELEMENTARY	1.90738	2.29278	0.88080
SARATOGA ELEMENTARY	2.22957	2.04626	0.95521
MOUNT VERNON WOODS ELEMENTARY	2.50615	2.33383	3.62260
NEWINGTON FOREST ELEMENTARY	2.80939	2.08936	1.18936
ANNANDALE TERRACE ELEMENTARY	5.10433	5.36658	5.05446
Middle Schools			
HUGHES MIDDLE	-1.53045	-1.49429	-0.41605
KEY MIDDLE	-1.51223	-1.01997	-0.80046
KEY CENTER	-1.35123	-1.18152	-0.79973
LIBERTY MIDDLE	-1.28780	-0.71282	-0.98114

Model 1			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
KILMER MIDDLE	-0.84771	-1.06812	-0.98929
LONGFELLOW MIDDLE	-0.82851	-1.01796	-1.53213
CARSON MIDDLE	-0.69844	-0.12219	0.17455
FRANKLIN MIDDLE	-0.67886	-0.25159	-0.00880
LANIER MIDDLE	-0.60824	-1.35632	-0.84719
FROST MIDDLE	-0.50514	-0.60896	-0.37109
IRVING MIDDLE	-0.42747	0.09781	-0.28772
HOLMES MIDDLE	-0.26943	0.14938	1.01760
POE MIDDLE	-0.20294	0.00499	-0.58182
ROCKY RUN MIDDLE	-0.11267	0.46734	0.30728
TWAIN MIDDLE	0.03480	-0.79980	-1.15753
KILMER CENTER	0.54402	-0.63057	-0.40692
COOPER MIDDLE	0.64098	0.23265	-0.08390
WHITMAN MIDDLE	0.78634	1.00185	2.85866
STONE MIDDLE	0.89523	0.22546	0.19627
SANDBURG MIDDLE	0.95896	1.18772	0.20804
JACKSON MIDDLE	1.25713	0.04577	0.65335
THOREAU MIDDLE	1.47146	1.73148	0.31207
GLASGOW MIDDLE	1.78969	2.25096	2.02311
HERNDON MIDDLE	2.25220	2.42286	-0.11804
SOUTH COUNTY MIDDLE	2.47667	3.00126	2.24339
High and Secondary Schools			
FALLS CHURCH HIGH	-2.11166	-2.38598	-1.66778
MCLEAN HIGH	-1.72439	-0.95363	-0.76617
HERNDON HIGH	-0.78538	-0.50332	0.42869
EDISON HIGH	-0.55798	-0.45350	0.04509
LEE HIGH	-0.45086	-0.40664	-0.91890
MOUNT VERNON HIGH	-0.43621	-0.40541	-0.56027
WOODSON HIGH	-0.42641	-0.19758	0.35359

Model 1			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
STUART HIGH ¹⁹	-0.37817	-0.00719	-1.69981
ROBINSON SECONDARY	-0.34885	-0.29447	-0.59265
MARSHALL HIGH	-0.34660	0.03304	0.21079
WESTFIELD HIGH	-0.25521	-0.13827	-0.22851
SOUTH LAKES HIGH	-0.17556	-0.08536	-0.16962
MADISON HIGH	-0.16207	0.11712	-0.51262
JEFFERSON SCI TECH HIGH	-0.15149	-0.38209	-0.56394
LANGLEY HIGH	0.09050	0.10992	1.05359
OAKTON HIGH	0.11530	0.45176	0.28185
LAKE BRADDOCK SECONDARY	0.18673	-0.36665	-0.30262
CHANTILLY HIGH	0.19384	-0.26975	-0.50127
WEST POTOMAC HIGH	0.23949	0.07223	-0.85532
WEST SPRINGFIELD HIGH	0.30275	-0.12418	1.26301
CENTREVILLE HIGH	0.42767	0.24931	0.24934
SOUTH COUNTY HIGH	0.67912	0.55720	0.61696
FAIRFAX HIGH	0.68942	0.35045	0.31217
BRYANT ALTERNATIVE HIGH	0.78622	1.36982	2.32343
ANNANDALE HIGH	0.87651	0.06820	0.27140
HAYFIELD SECONDARY	1.47695	1.03952	1.31707

¹⁹ In SY 2018-19, Stuart High School was renamed Justice High School. The data in this appendix use the name Stuart High School as they were gathered prior to the name change.

Model 2			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
Elementary Schools			
ARCHER ELEMENTARY	-1.86911	-1.90944	-1.80459
LEMON ROAD ELEMENTARY	-1.91410	-2.33671	-1.99651
GARFIELD ELEMENTARY	-1.91388	-2.03653	-2.32313
FLORIS ELEMENTARY	-1.37283	-1.18437	-0.80308
SPRINGFIELD ESTATES ELEMENTARY	-1.05627	-1.12702	-1.23113
HYBLA VALLEY ELEMENTARY	-1.60027	-1.97790	-0.89379
WASHINGTON MILL ELEMENTARY	-1.93737	-2.34241	-1.79384
SPRING HILL ELEMENTARY	-1.40353	-1.47796	-1.75607
CLEARVIEW ELEMENTARY	-1.38206	-1.41891	-1.20276
ROLLING VALLEY ELEMENTARY	-1.21238	-0.71495	0.21406
CRESTWOOD ELEMENTARY	-1.27534	-1.00651	-0.10169
FORESTVILLE ELEMENTARY	-1.13325	-0.80735	-0.29224
DOGWOOD ELEMENTARY	-1.40449	-1.42423	-1.08342
NORTH SPRINGFIELD ELEMENTARY	-0.93539	-0.71505	-0.19800
PINE SPRING ELEMENTARY	-0.98447	-0.69420	-0.81695
MANTUA ELEMENTARY	-0.99311	-1.05648	-1.06847
GREENBRIAR EAST ELEMENTARY	-0.98990	-0.82719	-0.84667
BROOKFIELD ELEMENTARY	-1.13792	-0.90079	-0.83561
WEYANOKE ELEMENTARY	-1.04726	-1.14578	-0.76344
DEER PARK ELEMENTARY	-0.89791	-0.66786	-0.55688
FREEDOM HILL ELEMENTARY	-0.92351	-0.96358	-0.57386
CENTREVILLE ELEMENTARY	-1.11608	-0.72017	-0.62973
OAK HILL ELEMENTARY	-0.63540	-0.34899	-0.80152
RAVENSWORTH ELEMENTARY	-0.73324	-1.54091	-0.84424
HUNTERS WOODS ELEMENTARY	-0.96508	-0.56455	-1.15945
ARMSTRONG ELEMENTARY	-0.67882	-0.52031	0.01177
HAYFIELD ELEMENTARY	-1.04113	-0.81627	-0.49186
FRANCONIA ELEMENTARY	-0.82977	-0.75939	-0.28290
TIMBER LANE ELEMENTARY	-0.90791	-0.60490	0.67124
PROVIDENCE ELEMENTARY	-0.64609	-0.49911	-0.87204

Model 2			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
OAKTON ELEMENTARY	-0.53264	-0.43903	-0.05752
NAVY ELEMENTARY	-0.40784	-0.40722	0.31392
HUTCHISON ELEMENTARY	-0.64825	-0.92280	-0.52616
LITTLE RUN ELEMENTARY	-0.71682	-0.40071	0.61851
LORTON STATION ELEMENTARY	-1.05819	-1.03972	-1.27118
COATES ELEMENTARY	-0.40765	-0.27993	-0.25343
CAMELOT ELEMENTARY	-0.44751	-0.72503	0.53709
CENTRE RIDGE ELEMENTARY	-0.63971	-0.25249	0.04901
BEECH TREE ELEMENTARY	-0.58825	-1.17947	-0.98728
HUNT VALLEY ELEMENTARY	-0.44269	-0.00677	0.95429
OAK VIEW ELEMENTARY	-0.45381	-0.27680	-0.40904
BAILEYS UPPER ELEMENTARY	-0.99485	-0.99375	-0.53417
LAKE ANNE ELEMENTARY	-0.25035	0.21695	0.39708
GUNSTON ELEMENTARY	-0.77656	-0.73375	0.15854
KEENE MILL ELEMENTARY	-0.52501	-0.76872	-0.64300
MARSHALL ROAD ELEMENTARY	-0.19500	-0.97690	-1.05513
GLEN FOREST ELEMENTARY	-0.40592	-0.31722	-1.20790
WOODBURN ELEMENTARY	-0.30843	-0.16462	-0.88073
KENT GARDENS ELEMENTARY	-0.20942	-0.01076	-0.12079
WOODLEY HILLS ELEMENTARY	-0.53794	-0.69687	-0.10058
VIRGINIA RUN ELEMENTARY	-0.62439	-0.34771	-0.94652
GRAHAM ROAD ELEMENTARY	-0.38365	-0.27242	0.22432
HOLLIN MEADOWS ELEMENTARY	-0.23937	-0.31538	-1.13003
MOSBY WOODS ELEMENTARY	0.24963	-0.20325	0.16586
DRANESVILLE ELEMENTARY	-0.32492	-0.40646	-0.02460
SANGSTER ELEMENTARY	-0.56487	-0.22554	0.91090
LAUREL HILL ELEMENTARY	-0.24841	-0.56582	-0.21635
WOODLAWN ELEMENTARY	-0.15104	0.13867	-0.37312
BAILEYS ELEMENTARY	-0.14595	-0.02557	0.59536
FOX MILL ELEMENTARY	-0.13514	0.09796	0.43693
SLEEPY HOLLOW ELEMENTARY	-0.13219	0.23129	0.33548
WAPLES MILL ELEMENTARY	-0.02886	0.18755	0.37273
STRATFORD LANDING ELEMENTARY	-0.27288	-0.30284	-0.48308

Model 2			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
LYNBROOK ELEMENTARY	-0.23333	-0.24760	-0.03856
BRADDOCK ELEMENTARY	-0.29860	-0.36850	-0.26568
ORANGE HUNT ELEMENTARY	-0.30604	-0.50367	-1.58298
TERRASET ELEMENTARY	-0.31853	-0.36022	-1.02666
WAKEFIELD FOREST ELEMENTARY	-0.23372	0.10819	-0.86448
HALLEY ELEMENTARY	-0.04371	0.02921	0.03858
CLERMONT ELEMENTARY	-0.07665	0.24906	-0.04420
MOUNT EAGLE ELEMENTARY	-0.06905	-0.65356	-0.98885
SUNRISE VALLEY ELEMENTARY	0.32007	0.31536	-0.49139
BELLE VIEW ELEMENTARY	-0.05252	-0.04252	0.88279
VIENNA ELEMENTARY	0.34114	0.77574	0.76051
POWELL ELEMENTARY	0.28800	0.58753	-0.34014
KINGS PARK ELEMENTARY	-0.55199	-0.11400	-0.80460
CHERRY RUN ELEMENTARY	-0.05978	0.42932	0.71686
WESTGATE ELEMENTARY	0.27127	0.36615	0.53509
MCNAIR ELEMENTARY	0.29993	0.32062	0.82559
COLVIN RUN ELEMENTARY	0.49597	0.58968	-0.12837
FORT BELVOIR PRIMARY SCHOOL	0.36063	0.04489	0.04404
WHITE OAKS ELEMENTARY	-0.07216	0.41905	0.26155
FAIRVIEW ELEMENTARY	-0.01087	0.28744	0.21407
MASON CREST ELEMENTARY	0.59047	0.67894	0.30535
FORT HUNT ELEMENTARY	0.22831	0.00948	0.20231
LEES CORNER ELEMENTARY	0.38127	0.69226	0.54606
LANE ELEMENTARY	-0.23060	-0.39590	-0.40632
WESTLAWN ELEMENTARY	0.01823	-0.26317	-0.33952
WESTBRIAR ELEMENTARY	-0.29344	-0.40968	0.48189
EAGLE VIEW ELEMENTARY	0.41751	0.53427	-0.50924
WAYNEWOOD ELEMENTARY	0.37881	0.20114	0.94682
TERRA CENTRE ELEMENTARY	0.14303	0.39551	1.21911
ISLAND CREEK ELEMENTARY	0.14708	0.00868	-0.28215
CANTERBURY WOODS ELEMENTARY	0.32108	0.04586	-0.34275
BELVEDERE ELEMENTARY	0.14661	0.31298	0.88890

Model 2			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
KINGS GLEN ELEMENTARY	0.16988	-0.59774	0.75842
CUB RUN ELEMENTARY	0.39157	0.85091	0.20986
FLINT HILL ELEMENTARY	0.70276	-0.46325	0.27550
FAIRFAX VILLA ELEMENTARY	-0.68209	-0.97511	-0.83770
BULL RUN ELEMENTARY	0.56709	0.94843	0.93721
WEST SPRINGFIELD ELEMENTARY	0.53091	0.83589	-1.16172
OLDE CREEK ELEMENTARY	0.58247	0.51674	0.02684
COLUMBIA ELEMENTARY	0.46081	0.64167	0.09923
DANIELS RUN ELEMENTARY	0.50650	0.90424	1.22271
SHREVEWOOD ELEMENTARY	0.39700	0.15627	0.29806
RIVERSIDE ELEMENTARY	0.40884	0.16589	0.03724
HAYCOCK ELEMENTARY	0.62204	0.46333	0.62420
PARKLAWN ELEMENTARY	0.67280	0.77217	1.34335
CROSSFIELD ELEMENTARY	0.43210	0.61155	1.43636
STENWOOD ELEMENTARY	0.75529	0.61060	0.90980
UNION MILL ELEMENTARY	0.84766	1.02928	0.09835
FORESTDALE ELEMENTARY	0.69061	0.06766	-0.03625
CUNNINGHAM PARK ELEMENTARY	0.51355	1.11426	0.30102
FORT BELVOIR UPPER SCHOOL	0.87841	0.73895	-0.36176
BREN MAR PARK ELEMENTARY	0.61155	1.10260	0.73261
LAUREL RIDGE ELEMENTARY	0.33162	0.44501	0.02608
GREENBRIAR WEST ELEMENTARY	0.35706	0.43133	-1.14897
WILLOW SPRINGS ELEMENTARY	0.72598	0.89513	0.53026
ALDRIN ELEMENTARY	0.94741	0.90204	0.71629
WOLFTRAP ELEMENTARY	1.13032	0.86098	0.16305
HERNDON ELEMENTARY	0.60740	0.56502	0.70029
GROVETON ELEMENTARY	0.55238	0.74393	0.47086
BUCKNELL ELEMENTARY	0.84240	0.87507	-0.11985
SHERMAN ELEMENTARY	1.05737	0.91356	-0.17261
LONDON TOWNE ELEMENTARY	0.47421	0.24831	1.54551
CARDINAL FOREST ELEMENTARY	0.76159	0.54434	-0.16093
FAIRHILL ELEMENTARY	1.39204	1.19921	2.09488
BUSH HILL ELEMENTARY	1.02218	0.55064	-0.38867

Model 2			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
aPOPLAR TREE ELEMENTARY	1.32460	1.01459	-0.24158
CHURCHILL ROAD ELEMENTARY	1.46518	0.91754	0.46197
CHESTERBROOK ELEMENTARY	1.65367	1.57681	1.76709
CAMERON ELEMENTARY	1.46561	1.79815	2.25907
ROSE HILL ELEMENTARY	1.29438	1.36145	0.49343
SILVERBROOK ELEMENTARY	1.24164	0.92347	-0.08279
BONNIE BRAE ELEMENTARY	1.41760	0.71348	0.69552
GREAT FALLS ELEMENTARY	1.68778	0.56855	1.92936
FOREST EDGE ELEMENTARY	1.46575	1.84676	0.41863
SARATOGA ELEMENTARY	1.95691	1.76177	0.60055
MOUNT VERNON WOODS ELEMENTARY	2.66267	2.51324	3.81353
NEWINGTON FOREST ELEMENTARY	3.15751	2.40857	1.50507
ANNANDALE TERRACE ELEMENTARY	5.13329	5.37912	5.07438
Middle Schools			
HUGHES MIDDLE	-1.53045	-1.49429	-0.41605
KEY MIDDLE	-1.51223	-1.01997	-0.80046
KEY CENTER	-1.35123	-1.18152	-0.79973
LIBERTY MIDDLE	-1.28780	-0.71282	-0.98114
KILMER MIDDLE	-0.84771	-1.06812	-0.98929
LONGFELLOW MIDDLE	-0.82851	-1.01796	-1.53213
CARSON MIDDLE	-0.69844	-0.12219	0.17455
FRANKLIN MIDDLE	-0.67886	-0.25159	-0.00880
LANIER MIDDLE	-0.60824	-1.35632	-0.84719
FROST MIDDLE	-0.50514	-0.60896	-0.37109
IRVING MIDDLE	-0.42747	0.09781	-0.28772
HOLMES MIDDLE	-0.26943	0.14938	1.01760
POE MIDDLE	-0.20294	0.00499	-0.58182
ROCKY RUN MIDDLE	-0.11267	0.46734	0.30728
TWAIN MIDDLE	0.03480	-0.79980	-1.15753
KILMER CENTER	0.54402	-0.63057	-0.40692
COOPER MIDDLE	0.64098	0.23265	-0.08390

Model 2			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
WHITMAN MIDDLE	0.78634	1.00185	2.85866
STONE MIDDLE	0.89523	0.22546	0.19627
SANDBURG MIDDLE	0.95896	1.18772	0.20804
JACKSON MIDDLE	1.25713	0.04577	0.65335
THOREAU MIDDLE	1.47146	1.73148	0.31207
GLASGOW MIDDLE	1.78969	2.25096	2.02311
HERNDON MIDDLE	2.25220	2.42286	-0.11804
SOUTH COUNTY MIDDLE	2.47667	3.00126	2.24339
High and Secondary Schools			
FALLS CHURCH HIGH	-2.11166	-2.38598	-1.66778
MCLEAN HIGH	-1.72439	-0.95363	-0.76617
HERNDON HIGH	-0.78538	-0.50332	0.42869
EDISON HIGH	-0.55798	-0.45350	0.04509
LEE HIGH	-0.45086	-0.40664	-0.91890
MOUNT VERNON HIGH	-0.43621	-0.40541	-0.56027
WOODSON HIGH	-0.42641	-0.19758	0.35359
STUART HIGH ²⁰	-0.37817	-0.00719	-1.69981
ROBINSON SECONDARY	-0.34885	-0.29447	-0.59265
MARSHALL HIGH	-0.34660	0.03304	0.21079
WESTFIELD HIGH	-0.25521	-0.13827	-0.22851
SOUTH LAKES HIGH	-0.17556	-0.08536	-0.16962
MADISON HIGH	-0.16207	0.11712	-0.51262
JEFFERSON SCI TECH HIGH	-0.15149	-0.38209	-0.56394
LANGLEY HIGH	0.09050	0.10992	1.05359
OAKTON HIGH	0.11530	0.45176	0.28185
LAKE BRADDOCK SECONDARY	0.18673	-0.36665	-0.30262
CHANTILLY HIGH	0.19384	-0.26975	-0.50127
WEST POTOMAC HIGH	0.23949	0.07223	-0.85532

²⁰ In SY 2018-19, Stuart High School was renamed Justice High School. The data in this appendix use the name Stuart High School as they were gathered prior to the name change.

Model 2			
School Name	Standardized Residual Teacher Turnover Rate with Retirement	Standardized Residual Teacher Turnover Rate without Retirement	Standardized Residual Teacher Transfer Rate
WEST SPRINGFIELD HIGH	0.30275	-0.12418	1.26301
CENTREVILLE HIGH	0.42767	0.24931	0.24934
SOUTH COUNTY HIGH	0.67912	0.55720	0.61696
FAIRFAX HIGH	0.68942	0.35045	0.31217
BRYANT ALTERNATIVE HIGH	0.78622	1.36982	2.32343
ANNANDALE HIGH	0.87651	0.06820	0.27140
HAYFIELD SECONDARY	1.47695	1.03952	1.31707

Regression Coefficients and R-squared values

Table B-1
Model 1 for Elementary Schools

Controlled / Predictors		Dependent	Turnover	Turnover without retirement	Transferred
Block 1	Gender (male students)		excluded	excluded	excluded
	Race/Ethnicity (minority students)		excluded	excluded	excluded
	FRM students		excluded	excluded	excluded
	EL students		excluded	excluded	excluded
	Special Ed students		excluded	excluded	excluded
	Mobility		0.201***	0.196***	0.245***
	Absent		excluded	excluded	excluded
	Weapons violation		excluded	excluded	excluded
Block 2	Gender (male teachers)		excluded	excluded	excluded
	Novice teachers		excluded	0.165***	excluded
	Overall engagement		-0.327***	-0.345***	-0.357***
	R squared		0.160***	0.212***	0.205***

Table B-2
Model 1 for Middle and High School Schools

Controlled / Predictors		Dependent	Turnover	Turnover without retirement	Transferred
Block 1	Gender (male students)		excluded	excluded	excluded
	Race/ethnicity(minority students)		excluded	excluded	excluded
	FRM students		excluded	excluded	excluded
	EL students		0.419***	0.497***	0.537***
	Special Ed students		excluded	excluded	excluded
	Mobility		excluded	excluded	excluded
	Absent		excluded	excluded	excluded
	Weapons violation		excluded	excluded	excluded
Block 2	Gender (male teachers)		-0.418***	-0.366***	-0.238***
	Novice teachers		excluded	excluded	excluded
	Overall engagement		excluded	excluded	excluded
	R squared		0.378***	0.411***	0.366***

Table B-3
Model 2 for Elementary Schools

Controlled / Predictors		Dependent	Turnover	Turnover without retirement	Transferred
Block 1	Gender (male students)		excluded	excluded	excluded
	Race/ethnicity(minority students)		excluded	excluded	excluded
	FRM students		excluded	excluded	excluded
	EL students		excluded	excluded	excluded
	Special Ed students		excluded	excluded	excluded
	Mobility		0.118	0.152	0.163*
	Absent		excluded	excluded	excluded
	Weapons violation		excluded	excluded	excluded
Block 2	Gender (male teachers)		excluded	excluded	excluded
	Novice teachers		excluded	excluded	excluded
	Shared values		excluded	excluded	excluded
	Leadership		excluded	excluded	excluded
	Communications		excluded	excluded	excluded
	Feedback and recognition		excluded	excluded	excluded
	Work environment		-0.415***	-0.433***	-0.422***
	Career growth/Training opportunities		excluded	excluded	excluded
R squared			0.213***	0.247***	0.242***

Table B-4
Model 2 for Middle and High Schools

Controlled / Predictors		Dependent	Turnover	Turnover without retirement	Transferred
Block 1	Gender (male students)		excluded	excluded	excluded
	Race/ethnicity(minority students)		excluded	excluded	excluded
	FRM students		excluded	excluded	excluded
	EL students		0.419***	0.497***	0.537***
	Special Ed students		excluded	excluded	excluded
	Mobility		excluded	excluded	excluded
	Absent		excluded	excluded	excluded
	Weapons violation		excluded	excluded	excluded
Block 2	Gender (male teachers)		-0.418***	-0.366***	-0.238***
	Novice teachers		excluded	excluded	excluded
	Shared values		excluded	excluded	excluded
	Leadership		excluded	excluded	excluded
	Communications		excluded	excluded	excluded

	Feedback and recognition	excluded	excluded	excluded
	Work environment	excluded	excluded	excluded
	Career growth/Training opportunities	excluded	excluded	excluded
	R squared	0.378***	0.411***	0.366***