2022

Special Education Teacher Retention: The Importance of Teacher Working Conditions

Erica Ross
Virginia Commonwealth University

Special Education Teacher Retention: The Importance of Teacher Working Conditions

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

By

Erica Ross
Virginia Commonwealth University

Dissertation Chair:
Dr. Michael Broda
Associate Professor of Quantitative Methods and Statistics
Virginia Commonwealth University

Virginia Commonwealth University
Richmond, Virginia
15 November 2022

Acknowledgements

I would first like to thank the HCMS Exceptional Education team I had the privilege of working with and the amazing students I had the opportunity to teach. You all were the best part of teaching.

Next, I would like to thank the Virginia Commonwealth University School of Education community for being so supportive. Lauren and Christine, you both were my constant support through this process. I could not have gotten to this stage without you both. To the RAE track, Meghan and Jaime, I loved having coursework with you and going through this program together. Jenna, for organizing our writing groups and giving me the final push to get this done. Also, a huge thank you to so many School of Education faculty who I have had the privilege to work under and provided research opportunities that allowed me to grow as a researcher.

l especially would like to thank my dissertation chair, Dr. Broda. When I first started working with you, I never thought I would learn to love statistics. Thank you for being an amazing teacher, researcher, and for making such an impact on me through this program. I can't thank you enough! I would also like to thank my dissertation committee members: Dr. Lisa Abrams, Dr. Jesse Senechal, and Dr. Cassandra Willis for their support, time, and commitment. The feedback you all have given me has been invaluable and has helped me so much through not only this dissertation process, but throughout this program.

I would like to thank my family for your support. Mom, Dad, Rachel and Sarah, thank you for believing in me and supporting me throughout this program. I don't know what I would've done without being able to call you all regularly for support with life and school work. Your constant encouragement and help made this possible. And finally a huge thank you to Chuck, you have been unwavering in supporting me on this journey. I don't think either of those

knew what this would be like or where it would evolve and thank you for constantly believing in me and building me up, I could never have done this without you.

Table of Contents

List of Tables

List of Figures

Abstract

Teacher retention, or why teachers stay, is an important area of study considering the impact teacher attrition and turnover can have on student outcomes (Hirsch & Emerick, 2006). Teacher attrition and turnover are even more concerning for those that are special education teachers (SETs), and it is noted as a priority to address in the state of Virginia (Solenson et al., 2018). Through an adapted organizational theory lens, this study addresses the following aims: 1) Determine if there are differences in perceptions of teacher working conditions (TWCs) between special education teachers (SETs) and teachers of other content areas and 2) Examine the effect of teacher working conditions, particularly leadership support, on special education teacher's intent to stay at their school, move from their school, or leave teaching.

To address the research aims, a statewide dataset was used that captured perceptions of Teacher Working Conditions and their intention to remain at their school, move schools, or leave teaching the following year. Results indicate that there are differences in mean responses when comparing Virginia special education teachers and teachers that teach other content areas on their perception of TWCs. Multilevel, multinomial logistic regression found several teacher working conditions are associated with SET intentions to leave, move, or stay, even after controlling for teacher demographic and school level variables. Of the TWCs, perception of school leadership had the most significant association with intention to move schools while perception of teacher leadership and autonomy was most significant with intention to leave teaching. There were also several demographic variables as well as a school level variable that remained significantly associated with SET intention despite the inclusion of TWCs. Predicted probabilities of teacher demographics, intention, and including high and low perceptions of TWCs found that the perception of the TWC had a bidirectional effect and can either exacerbate

their intention to leave, or substantially decrease intention. The results of the current study offer practice, policy, and research implications for state policy, district/division leaders, school leaders, special education teachers, and future researchers.

Chapter 1: Introduction

School districts across the country are struggling to recruit and retain qualified teachers (Podolsky et al., 2017; Wushishi et al., 2014). Both attrition and turnover result in an inability to retain experienced teachers and provide coherent instruction. Teacher attrition, or teachers who leave their current school, negatively impacts student learning (Hirsch & Emerick, 2006). Policy has focused for decades on issues related to teacher shortages and attrition to address both capacity and commitment (Billingsley, 2004). Some issues creating concern of teacher capacity and commitment include increased student enrollment, changes in legislation regarding student to teacher ratios, and teacher turnover (Sutcher et al., 2016). In order to address these issues, research has found to build commitment, research should focus on teacher retention, or why teachers choose to stay at their school.

Attrition is particularly problematic in special education, where this field is already experiencing shortages in 49 states across the United States (National Coalition on Personnel Shortages in Special Education and Related Services, 2016). Both the shortage and attrition of special education teachers (SETs) impacts the quality of instruction and support students with special education services receive (Billingsley & Bettini, 2019). Special education attrition only exacerbates the shortage, forcing districts to hire SETs who are not qualified (Billingsley & Bettini, 2019).

One area of research showing promise is referred to as teacher working conditions (TWCs). Boe et al. (2008) suggested retention will not likely increase unless improvements to the organization and management of public schools are made and TWCs are a means of addressing the organizational aspect. TWCs, also referred to as student learning conditions (Hirsch & Emerick, 2006), center on the idea that teachers are empowered when provided a

supportive and trusting climate, and that empowerment will positively impact student learning (Hirsch & Emerick, 2006). TWCs are an aspect of school climate and culture contributing to teacher retention (Geiger & Pivovarova, 2018). TWCs vary, depending on the school system and individual school climate and culture.

Context of Study

The following section will provide an overview of factors impacting SET retention followed by a brief background of TWC literature and research informing this study's understanding of TWCs. This section concludes with a description of the context in Virginia and an explanation of how TWCs are being studied to understand teacher shortages and attrition in Virginia.

Factors Impacting Retention

A recent systematic review by Billingsley & Bettini (2019) synthesized the research on increasing attrition rates among SETs. Compared to teachers of other content areas, SETs are leaving the field more frequently (Carver-Thomas & Darling-Hammond, 2017: McLeskey & Billingsley, 2008). This is concerning considering a shortage of SETs; teachers who choose to enter the field need to be retained at a rate even higher than for general education teachers (Carver-Thomas & Darling-Hammond, 2017). Billingsley & Bettini's (2019) review found several salient factors associated with SET retention including "teacher preparation and qualifications, school characteristics, working conditions, teacher demographics and non-work factors" (Billingsley & Bettini, 2019, p. 697). Of the factors discussed, TWCs consistently had an association with retention and were a significant contributing factor toward teacher retention.

Although retention is a concern for all teachers, there are differences in the preparation and work of SETs compared to general education teachers (Billingsley & Bettini, 2019). Given

the work is different for SETs and general education teachers, this warrants a study of TWCs with a population of only SETs. Some examples of the differences in work include differences in organization, instructional demands, and collaboration with general education coworkers (McLaughlin, 2010; Scruggs et al., 2007). The differences in the work highlight the importance of understanding TWCs through a SET's lens.

TWCs

This study will primarily focus on three different papers regarding TWCs: Billingsley and Bettini (2019), Merrill (2021), and Johnson (1990). Each paper provided a different context to consider within TWCs as it either provided the guidance for the survey used (Johnson, 2006), provided a special education lens to TWCs (Billingsley & Bettini, 2019) or was used as a framework through which to view the survey and results to contribute toward future literature (Merrill, 2021). The current study used the Virginia Department of Education's (VDOE's) 2019 Teacher Working Conditions Survey. More details regarding the survey used in the current study will be discussed in the following paragraph and in the next section.

TWCs have primarily been studied through survey data, with two of the more popular being the School and Staffing Survey (SASS) and the North Carolina TWCs (NCTWC) Survey (Merrill, 2021). The survey used in this current study's framework was informed by other TWC surveys including the Teaching, Empowering, Leading, and Learning Survey (TELLS, currently the NCTWC survey) and the Five Essentials Survey as well as consideration toward the Virginia Department of Education's priorities and programs (Miller, 2020). Although Johnson's (2006) broad categories of TWCs framework was not discussed as a part of what informed the framework of the survey for this study, Miller (2020) provided an acknowledgement to Johnson's work in the background of Miller's report which is the only reference to a framework.

Researchers that have analyzed the SASS or NCTWC survey often use Johnson (2006) to establish constructs for a factor analysis to break down the working conditions (Shen et al., 2012; Yi, 2017). Johnson (1990, 2006) was identified as providing the only guidance on defining TWCs prior to Merrill (2021).

In Billingsley & Bettini's (2019) review, TWCs were the most frequently studied construct related to SET retention. Within those working conditions, "demands, social contexts, resources, financial compensation, and affective responses and coping strategies" (Billingsley & Betttini, 2019, p. 715) have been most explored. Although TWCs and retention have been studied frequently, it has not been as frequently studied in a large sample or with a comprehensive measure of TWCs.

Historically, TWCs are found to impact teacher retention (Hirsch & Emerick, 2007), with a specific focus on leadership support (Billingsley & Bettini, 2019). Leadership or administrative support has consistently been a relevant factor of TWCs when research has explored both job satisfaction and a teacher's intention to stay or leave their school (Shen et al, 2012). Administrative support has been defined as the "school's effectiveness in assisting teachers with issues such as student discipline, instructional methods, curriculum and adjusting to the school environment" (Borman & Dowling, 2008, p. 380). Support has been categorized into four areas regarding SETs: "emotional, environmental, instructional, and technical" (Willis, 2019, p. 4). Administrative support, and supportive working conditions in general, are extremely important to analyze with SETs. The job requirements of a SET make support from staff and administration even more relevant. SETs' roles require not only supporting students in learning curriculum, but also implementing interventions to address student needs (Bettini et al. 2017). Not only are SETs teaching, but they are implementing individualized education plans (IEP), incorporating

accommodations into coursework, leading IEP meetings, and collaborating with parents and school professionals in the building. Many of the decisions SETs make require leadership support and backing. Leadership support continues to be a key factor in studies of both general and SETs to facilitate retention (Billingsley, 2004; Ladd, 2011; Billingsley, McLeskey, et al., 2017; Conley & You, 2017).

Although there are elements of TWCs that are similar for general education teachers and SETs, there are also aspects of the role of the SET that create differences in the working conditions. In their recent review on SET retention, Billingsley and Bettini (2019) described the research studying TWCs for SETs as including demands, social contexts, resources, financial compensation, and affective responses and coping strategies. These categories are further broken down into caseload size and complexity, students' disability and behavior, students as a reason to stay, paperwork/nonteaching responsibilities, accountability and assessment, school culture, administrative support, collegial support and collaboration, autonomy, material resources, time, and financial compensation.

Merrill (2021) recently synthesized research related to TWCs and developed twelve constructs to encompass TWCs. Although Merrill's research did not differentiate between special and general education teachers, this work does establish a framework for studying working conditions. Merrill's review found prior research related to TWCs had no standard practice for studying TWCs nor a common definition. Many of Merrill's (2021) constructs are similar to the TWCs discussed in Billingsley and Bettini (2019), but some constructs cannot give the specificity to the role of a SET. Because their roles are different in the school building and their working conditions differ, it is important to analyze SETs as an independent population

from general education teachers to better understand the impact of TWCs on their intention to stay at their school, move from their school, or leave teaching.

TWCs and Turnover in Virginia

In 2017, Governor McAuliffe appointed a committee to examine teacher shortages and found teacher turnover was a key contributing factor to shortages (Advisory Committee on Teacher Shortages, 2017). This report also found turnover in Virginia was higher than the national average of 8% finding "average teacher turnover among the state's public schools was 10.2 percent between the 2015–16 and 2016–17 school years" (Sorenson et al,, 2018, p. 8). The need within special education is even more important. Based on data in 2015, the Virginia Department of Education (VDOE) ranked subject areas experiencing the most critical shortages, finding special education to be the most critical. Sorenson et al. (2018) found, based on the advisory committee report, that although the number of graduates with special education preparation increased, the state continues to report special education as an area of critical shortage. The high turnover has left school leaders and policymakers with the increased interest to understand different ways to reduce turnover given it is a contributing factor to shortages.

TWCs had not been explored in the Virginia context prior to 2019. However, legislation was aware of the literature from other states' working conditions surveys finding TWCs are correlated with teacher retention (Geiger & Pivovarova, 2018). Legislation also needed to address strategies to reduce turnover in the state. In 2018, the Virginia General Assembly established legislation to "evaluate teaching conditions and how those conditions impact retention and student outcomes" (Virginia Acts of Assembly, 2018, p. 1) to better understand teacher retention. This legislation established a partnership between the Virginia Department of Education and the University of Virginia to create and administer a biennial working conditions

survey of all licensed teachers and staff in Virginia public schools to evaluate TWCs. This survey, the 2019 Virginia TWCs Survey, will be used for the current study.

Miller (2020) examined descriptive results of the 2019 survey responses for all teachers across the state. They found teachers overall were mostly positive about TWCs. Teachers were most positive about the rigorous instruction they and their colleagues deliver to students and least positive about how student behavior was managed within their school. This study will further the work completed by Miller through analyzing the TWC constructs of the 2019 survey with only teachers who identify as teaching special education.

Theoretical Framework

Research focusing on TWCs applies organizational theory as a theoretical framework (Vagi & Pivovarova, 2016). Organizational theory allows for the examination of the relationship between the employee and the organization (Vagi & Pivovarova, 2016). Organization theory and the examination of the relationship between teachers and their schools provides a framework to analyze perceptions of the school structure through TWCs as well as other predictors related to the teacher.

More recently, organizational theory has focused on the levels of hierarchy within the organization, as well as the environment and relationships within the organization. Researchers who used organizational theory to study teacher mobility focused on how the characteristics of the school have influenced teachers' decisions to stay or leave their position. This overlaps with TWCs as TWCs are defined as "elements related to a teacher's ability to do their job", not related to compensation (Merrill, 2021, p.172). TWCs can be school specific and those elements that encompass TWCs can vary based on the individual, school, and division. I also draw from an adaptive framework of Bronfenbrenner's (1979) social ecological systems theory. Systems

theory has been described as a type of organizational theory that looks at interactions between systems (Friedman & Allen, 2014). Individual teachers operate in a system. They have individual characteristics, that functions in a school (organization), within a division, and within a state. This framework aligns with teacher working conditions given that teacher working conditions include actors and constructs. These interactions with actors can occur at both the individual and organizational level and vary across the system as well as in different schools. The constructs can also vary across schools.

Focusing on TWCs within the organizational structure of their school allows an analysis of the target population, SETs. Teachers and principals also acknowledge working conditions present in schools differently (Hirsch and Emerick, 2007). Prior research established TWCs are correlated with teacher retention, and a school that has a more stable workforce has a better school climate (Becker et al., 2021, Merrill, 2021).

Statement of the Current Problem

Since the passing of federal legislation in 1975 requiring free and appropriate public education for all students, the proportion of students requiring special education services has grown (Carver-Thomas & Darling-Hammond, 2019; U.S. Department of Education, National Center for Education Statistics, 2014). Although the need for SETs has consistently increased, SET shortages have been significant and persistent with higher turnover rates compared to most other categories of teachers (Carver-Thomas & Darling-Hammond, 2019).

TWCs are consistently a primary factor driving SET shortages and playing a key role in retention (McCleskey et al., 2004). As TWCs improve, rates of teacher turnover decrease (Boyd et al., 2011; Ingersoll & May, 2011; Johnson, et al., 2012; Ladd, 2011). Of the TWCs associated with and predicting retention, administrative/leadership support is consistently a relevant factor

(Becker et al., 2020; Shen et al., 2012). To improve TWCs, further research needs to be conducted to allow for changes to policy to improve SET retention.

Current SET retention needs have created a need to study SET retention and TWCs. Special education retention has historically not been a topic of significant research. Billingsley & Bettini (2019) found only 2.1 studies were published each year from 2004–2019. Of those studies, only one third incorporated a conceptual framework. Incorporating a framework allows researchers to extend each other's work in more intentional ways (Billingsley & Bettini, 2019). Research has also found a need to study TWCs under a cohesive definition. Until the recent work from Merrill (2021), there was no standard practice or definition to study TWCs.

Research has increased focus on developing SET teacher commitment in order to most effectively impact student outcomes. (Sindelar et al., 2010). Given the importance of teachers to student learning and recent policy initiatives, there is a call for research to focus on retention of teachers and their working conditions. Considering the recent passing of the Virginia General Assembly legislation to "evaluate teaching conditions and how those conditions impact retention and student outcomes" (Virginia Acts of Assembly, 2018) to better understand teacher retention, research can also contribute to improved strategies to address turnover in the state of Virginia.

Purpose Statement

The objective of this study is to explore how TWCs, particularly the perception of school leadership, may be associated with SETs' intent to stay at their school, move from their school, or leave teaching. Given the importance of leadership in special education, it is important to give more focused attention to this construct. This analysis includes the same working conditions that have been used in other analyses of this survey. More specifically the working conditions will include (a) teacher leadership and autonomy, (b) rigorous instruction, (c) instructional

environment, (d) school leadership, (e) managing student behavior, (f) professional growth opportunities, (g) engaged students and engaging families, and (h) feeling safe.

Research Questions

This study will address three main research questions regarding perceptions in the state of Virginia:

1) What differences exist in perceptions of TWCs between SETs and teachers of other content areas?
2) To what extent is the SET's intention to stay, leave, or move attributable to teacher and school levels? Is there a significant variation among schools in intent?
3) After controlling for teacher characteristics, how are SETs' perceptions of working conditions associated with their intentions to remain at their current school, leave teaching, or move from their school?
4) After controlling for teacher and school characteristics, to what extent do TWCs, particularly the SET level perception of school leadership, impact a teacher's intention to remain at their current school, leave teaching, or move from their school?

Brief Overview of Methodology

This study uses a multivariate, correlational research design with a sample of SETs across the state of Virginia. Data collection involved the use of the 2019 TWCs Survey from teachers across the state beginning January 7, 2019, and ending March 29, 2019, to gather teacher demographics, perceptions of TWCs, job satisfaction, and intention for the following school year (Miller, 2020) (see Appendix B).

This study will use this statewide secondary dataset to analyze relationships among the variables. This data set includes both teacher and school level data, making a multilevel model

(MLM) appropriate for the data analysis. MLM accounts for nesting and people working in the same building. This analysis would allow for an analysis of the Level 1 dependent variable retention and incorporating a Level 2 grouping variable of the schools. Following the null model that will determine the appropriateness of multilevel modeling, three additional models will be run that include additional predictors/covariates to answer the research questions.

The dependent variable of teacher retention is the teacher's intention for the following year. Literature has explored stayers, movers, and leavers; the research has shown that the important factor in student outcomes is teachers remaining at their school (Billingsley, & Bettini, 2019; Hirsch, & Emerick, 2007). For the purposes of this data, this variable will be transformed to a categorical variable: stayers, movers, and leavers. Although the outcome variable is not dichotomous, it still allows for the use of multinomial logistic regression to allow the researcher to determine the impact of variables on the risk ratio and predicted probabilities of teachers staying at their school, moving from their school, or leaving teaching.

This study will include Level 1 and Level 2 predictors. Prior research has explored teacher demographics as well as school level variables (e.g., the free and reduced lunch variable) to determine the impact of the socioeconomic status of the school and found these variables to have some predictive power and explain variance (Billingsley & Bettini, 2019; Geiger & Pivovarova, 2018; Gilmour & Wehby, 2019; Hirsch & Emerick, 2007). Level 1 predictors would include teacher demographics and perception of TWCs. Level 2 will incorporate school level variables. In line with previous research, I will include school level free and reduced lunch ratios. Of particular interest, given that this analysis would look at special education, I will also include the percentage of students who receive special education services as a Level 2 predictor. The results will be presented with risk ratios as well as predicted probabilities.

Definition of Key Terms

The following terms are key terms that are relevant to the current study:

Attrition

Attrition is defined as teachers leaving their position for any nonteaching reason (such as retirement), transfer to another building, or leaving the field altogether (Billingsley & Bettini, 2019).

Leaver

A *leaver* is a teacher who is planning to leave teaching the following year (i.e., retirement, career switch; Billingsley & Bettini, 2019).

Mover

A *mover* is a teacher who is planning to move from their school the following year (i.e., transferring or moving; Billingsley & Bettini, 2019).

Retention

Retention is defined as teachers remaining in their positions at the same school the following year (Boe, 2006). This type of retention is ideal as whenever a teacher leaves, no matter the reason, it can create a disruption in the continuity of the instructional programming (Ronfeldt, Loeb, & Wyckoff, 2013).

Special Education Teacher (SET)

A *SET* is a full-time teacher in grades K–12 who has been identified as someone who works with students who receive special education services.

Shortage

Teacher *shortage* is defined as unfilled positions or vacancies in a subject area (Aragon, 2016).

Stayer

A *stayer* is a teacher who is planning to remain at their school the following year (Billingsley & Bettini, 2019).

Teacher Working Conditions (TWCs).

TWCs are defined as elements related to a teacher's ability to do their job, not related to compensation (Merrill, 2021).

Turnover

Teacher *turnover* is defined as teachers who leave their current position to move to another school or leave the field (Carver-Thomas & Darling-Hammond, 2017).

Chapter 2: Review of Literature

The purpose of this study is to examine how teacher working conditions (TWCs), particularly perception of school leadership/leadership support, may be associated with special education teachers' (SETs') intent to stay at their school, move from their school, or leave teaching. This literature review has three components. The first section will discuss existing studies related to SET retention and predictors of SET retention. This section will also emphasize literature related to TWCs and leadership/administrative support. The first section will conclude with a summary and analysis of literature describing the impact of SET attrition and working conditions on students and student outcomes. The second section will describe the methodological considerations relevant to the current study and how this study contributes to research methodology. Finally, I will conclude the chapter by discussing how the theories studied in this research area and previously reviewed research findings inform the framework and hypotheses of the present study.

Special Education and General Teacher Retention

This section discusses TWCs as a predictor of teacher retention and attrition. First, the three different papers are reviewed and how they contribute to TWC literature. The three frameworks are then cross walked to compare alignment with the Virginia Department of Education (VDOE) TWC Survey (Miller, 2020).

Predictors of Retention: TWCs

TWCs are defined as "the nonpecuniary elements of the workplace that affect teaching" (Merrill, 2021, p. 172). When teacher retention is studied, TWCs are consistently identified as a key factor of teacher retention (Billingsley & Bettini, 2019; Merrill, 2021). To develop a framework and analyze how special education TWCs have been studied, I draw from two

systematic reviews of literature focusing on TWCs related to this study and one paper that represented the framework for this study's survey: Merrill (2021), Billingsley and Bettini (2019), and Johnson (2006). Johnson (2006) provided the guidance for the survey used (i.e., the VDOE TWC Survey), Billingsley & Bettini (2019) provided a special education lens to TWCs, and Merrill (2021) was used as a framework through which to view the survey and results to contribute toward future literature.

Although both reviews and the paper included TWCs, Billingsley and Bettini's (2019) review narrowed the population to SETs. This review encompassed SET retention with TWCs included as a factor of SET retention. Billingsley and Bettini (2019) sought studies conducted in the United States focusing on peer reviewed studies and gray literature from 2002–2017. I continued their review by also drawing from literature from 2018–2021, following their search terms.

Johnson (1990, 2006) was identified as providing the only guidance on defining TWCs prior to Merrill (2021). Johnson (2006) identified the following categories of TWCs: (a) physical features, (b) organizational features, (c) sociological features, (d) political features, (e) cultural features, and (f) educational features. More information regarding the TWC and their alignment with the survey used in the current study can be found in Table 1. This paper and the TWC categories were also acknowledged in the background section of the report analyzing the survey in the current study by the author who also developed the survey (Miller, 2020). Although this paper provided a framework often cited in TWC literature, this paper is rarely used as guidance to relate TWCs to teacher retention and is frequently referenced in the literature as a guidance of TWCs rather than as a framework considering it is not a peer-reviewed study (Merrill, 2021).

Table 1

TWCs and Descriptions

Johnson (1990) TWCs	Merrill (2021) TWCs	VDOE TWC Survey (2019) Is this construct included?	Billingsley and Bettini (2019) Special Education TWCs	VDOE TWC Survey (2019) Is this construct included?
Organizational Structures: The organizational structures that define teachers' formal positions and relationships with others in the school such as lines of authority, workload, autonomy, and supervisory arrangements.	*Leadership & Teacher Empowerment:* The role of leadership in the school and the degree to which teachers are empowered to make and have input in schoolwide and classroom decisions	*Yes,* Teacher Leadership and Autonomy	*Administrative Support:* The role of administration to provide and support a positive environment for SETs (i.e., inclusive culture, support special and general educators' collaboration, and ensure all teachers have resources to do their work effectively)	*Yes,* School Leadership
Sociological Features: The sociological features that shape how teachers experience their work, including their roles, status,			*Autonomy:* the extent to which the social context provides special educators latitude to make decisions about their work	*Yes,* Teacher Leadership and Autonomy

Johnson (1990) TWCs	Merrill (2021) TWCs	VDOE TWC Survey (2019) Is this construct included?	Billingsley and Bettini (2019) Special Education TWCs	VDOE TWC Survey (2019) Is this construct included?
and the characteristics of their students and peers	*Students:* Student interactions with learning (behavior, orientation to learning)	*Yes,* Engaged Students and Engaging Families and Managing Student Behavior	*Students as a reason to stay:* The students are a reason to remain in the field.	*Yes,* Engaged Students and Engaging Families and Managing Student Behavior
	Faculty: Colleagues a teacher interacts with and learns from at a school, as well components that describe the teaching position at a school	*No*	*Collegial Support and Collaboration:* The role of colleagues to enhance teachers' learning, provide emotional support for managing demands, and help teachers navigate schools' structures	*No*
Political Features: The political features of their organization, such as whether teachers have opportunities to participate in important decisions	*District, State, and National Actors:* Features of district, state, and national policy and leadership that affect teaching	*No*	*Accountability and Assessment:* The impact of policy (No Child Left Behind) to implement new reform measures for testing, assessment, and accountability for student performance.	*No*
	Parents & Community: The role of parents and the community in the	*Yes,* Engaged Students and		

Johnson (1990) TWCs	Merrill (2021) TWCs	VDOE TWC Survey (2019) Is this construct included?	Billingsley and Bettini (2019) Special Education TWCs	VDOE TWC Survey (2019) Is this construct included?
	school and in student learning	Engaging Families		
Cultural Features: The cultural features of the school as a work-place that influence teachers' interpretation of what they do and their commitment, such as values, traditions, and norms	*Orientation Climate:* The sociocultural orientation of a school	*Yes,* Rigorous Instruction	*School Culture:* the underlying social norms, values, and assumptions about schools, students, and about how teachers should act	*Yes,* Rigorous Instruction
Psychological Features: The psychological features of the environment that may sustain or deplete them personally, such as the meaningfulness of what they do day to day or the opportunities they find for learning and growth	*Professional Development:* Accessibility, quality, and substance of professional development activities	*Yes*, Professional Growth Opportunities		

Johnson (1990) TWCs	Merrill (2021) TWCs	VDOE TWC Survey (2019) Is this construct included?	Billingsley and Bettini (2019) Special Education TWCs	VDOE TWC Survey (2019) Is this construct included?
Educational Features: The educational features, such as curriculum and testing policies, that may enhance or constrain what teachers can teach.	*General & Instructional Resources:* Materials and resources available for instructional design and delivery	*Yes,* Instructional / Workspace Environment	*Material Resources:* Resources to support SETs teach foundational skills and provide support in learning state standards	*Yes,* Instructional / Workspace Environment
	Time: The ways in which teacher time is allocated during the school workday, either by leadership or the individual	*Yes*, Teacher Leadership and Autonomy	*Time:* Perceptions of the adequacy of their time.	*Yes,* Teacher Leadership and Autonomy
	School Features: School Features that affect teaching (e.g., class size and schedule)	*No*	*Paperwork/Nonteaching responsibilities:* Paperwork (i.e., managing IEPs, ensuring compliance with IDEA) and other nonteaching responsibilities.	*No*
			Caseload Size/Complexity: Overall number of students taught, how many students are on the teachers' caseload, as well as the complexity of the cases.	*No*

Johnson (1990) TWCs	Merrill (2021) TWCs	VDOE TWC Survey (2019) Is this construct included?	Billingsley and Bettini (2019) Special Education TWCs	VDOE TWC Survey (2019) Is this construct included?
			Students' Disability Category/Behavior: The disability category of the students taught	*No*
Physical Features: The physical features of buildings, equipment, and resources, which serve as a platform for teachers' work	Facilities: The physical features of the school campus (e.g., amenities; space)	*Yes,* Instructional Environment		
	Safety: General perceptions of safety and indicators of school order	*Yes,* Feel Safe		
			Teacher Pay: Perception of adequacy of teacher pay.	*No*

Merrill (2021) focused on developing a comprehensive definition of TWCs and defining their categories through reviewing the literature. Although this review included all teachers rather than just SETs, this was the first review to develop a comprehensive definition of TWCs as well as a complete review of all TWCs making it relevant to draw from to establish a framework. Merrill included studies conducted in the United States from 2002–2019 using the Education Resources Information Center, PsychInfo, Proquest, Education Full Text, and Academic Search Premier. Merrill specifically looked at studies including TWCs rather than other school staff such as principal working conditions. In Merrill's systematic review, she reviewed 81 studies to develop both a definition of TWCs but also comprehensive categories. Within this systematic review, TWCs were generally noted as elements related to the ability of a teacher to do their job. Table 1 summarizes the categories of TWCs developed by Merrill, along with definitions.

Billingsley and Bettini (2019) identified 24 studies including at least one of the following working conditions: job demands, social contexts, resources, and financial compensation. These broad categories were broken down further and further details on their TWCs can be found in Table 1. A relevant difference between the two systematic reviews is Billingsley and Bettini, unlike Merrill (2021), found teacher salary to be considered an element of working conditions. Merrill argued pecuniary considerations are considered economic conditions rather than working conditions. They concluded pecuniary considerations do not impact a teacher's ability to teach and therefore are not considered a TWC. This study aligns with Merrill's interpretation and does not consider teacher salary a working condition.

Although names of constructs differed, the two reviews agreed on many working conditions. One of the biggest differences between the two is the focus and specificity of the job

demands of SETs in the Billingsley & Bettini (2019) review, versus the broader perspective taken by Merrill (2021). Billingsley & Bettini elaborate on the nuances of the job demands of an SET that differ from a general education teacher. Specifically, they reviewed studies that fell in the categories of (a) caseload size/complexity, (b) paperwork/nonteaching responsibilities, and (c) accountability and assessment. These categories would be considered to fall under Merrill's school features construct, but the specificity to SETs specific school features is lacking. Table 1 summarizes each of the definitions of the working conditions identified in the research and includes whether the analysis of the VDOE survey included the working conditions identified in the reviews and paper.

All SET TWCs align with TWCs Merrill (2021) identified. However, the TWCs Merrill identified are designed for all teachers, resulting in the framework being broader. Although, for example, three of the SET TWCs (i.e., paperwork/nonteaching responsibilities, caseload size/ complexity, and student's disability category/behavior) fall under "school features" in that they are features that affect teaching, the broad category of school features does not fully capture the specific school features of the working conditions of a SET. Both the SET TWCs and TWCs identified by Merrill also map on to TWCs Johnson (2006) found, however the TWC constructs identified by Johnson were even broader than those identified by Merrill.

The VDOE TWC also maps onto TWCs in both Merrill (2021) and Billingsley & Bettini's (2019) framework, but the VDOE survey (Miller, 2020) failed to capture all TWCs as well as some conditions that are specific to the role of a SET. Questions related to staff collegiality were included in the survey but were not included in the analysis established by Miller (2020) and are not present in later versions of the TWC survey, which is why this construct was not included in the analysis. Also, the VDOE survey did not include any questions

to capture any features of district/state policy or accountability practices and assessment (Miller, 2020). Finally, the VDOE survey did not include questions related to school features in the broader framework of Merrill or conditions that would be more specific to a SET.

TWCs: Administrative Support

Of the working conditions acknowledged in both reviews (i.e., Billingsley & Bettini, 2019 & Merrill, 2021) and the paper (i.e., Johnson, 2006), administrative support, or leadership and teacher support, is consistently a salient factor. Principal support is not only a working condition, but principals have the ability to create workplace conditions (Johnson, 2006). Principals create formal structures within their school and are in charge of the hiring process (Borman & Dowling, 2008; Liu et al., 2008). Leadership or administrative support often is found to be a significant factor even after accounting for both teacher demographic factors as well as school level factors. This section will further describe the research on TWCs by detailing studies incorporating administrative support, both in general education and special education populations.

Studying more general samples of teachers, both Ladd (2011) and Allensworth et al. (2009) explored teachers' perceptions of their working conditions through different TWC surveys. Ladd (2011) used the 2006 North Carolina Teacher Working Conditions (NCTWC) Survey to examine the relationship between teachers' perception of working conditions and their intent to stay or leave their school. Even with the addition of control variables that included school, district, and respondent level characteristics, school leadership continued to be a predictor of teachers choosing to leave their school. This study contributed to the literature by incorporating other variables associated with retention to determine the impact TWCs had while still controlling for those variables. Allensworth et al. (2009) developed a report regarding

Chicago public schools that highlighted teacher perception of working conditions. Within the broader category of TWCs, principal leadership, teacher collaboration, and student safety all influenced teacher retention. This analysis incorporated teacher and school demographic factors and although these factors did explain some variation in the analytic model, TWCs also contributed to explaining variation as well. This analysis speaks to the importance of not only working conditions, but specifically principal leadership. These results were also important; in 1 year, teaching stability rates of 80% were similar to the national trend of 84%. However, when the analysis was extended to 5 years, Allensworth et al. (2009) found Chicago public schools lost over half of their teachers. This study was strengthened by analyzing mobility over 5 years and using actual teacher retention data. Allensworth et al.'s (2009) study emphasizes the importance of capacity and analyzing retention from a longitudinal perspective, considering it drastically changed from 1 to 5 years.

The importance of leadership support was also found in research focusing specifically on SETs. Berry (2012) conducted a study examining the relationship between SET job commitment and support in rural areas. Their analysis included over 200 SETs across 33 states and found significant relationships between professional support, job commitment, and satisfaction. Importantly, this study did include other TWCs and also included a specific population of rural teachers and still found support to be a key factor. Conley and You (2017) also shared the importance of support, finding support to have a direct effect on teacher retention. Conley and You (2017) will be described further in a later section.

TWCs Studied Along With Other Factors of Retention

Research has also explored TWCs including other school and teacher characteristics. It is important to consider these studies because they examine the strength of association TWCs have

on retention with the inclusion of other factors. Principals, rather than just perception of leadership support, were analyzed in the following two studies along with other factors of retention. Grissom (2011) analyzed the 2003–2004 Schools and Staffing Survey (SASS) and the 2004–2005 Teacher Follow-up Survey and found principal effectiveness associated with a lower probability of teachers leaving. They also found ratings of effectiveness of principals are less positive in schools with a large number of disadvantaged students. The relationship between effectiveness ratings in schools with a larger number of disadvantaged students suggests the importance of including student socioeconomic status as an additional factor when analyzing TWCs and retention. Boyd et al. (2011) also analyzed principals and the relationship between teacher retention decisions of . They contributed to the research on the importance of principals through their findings that school administration has the greatest impact on teacher retention decisions of specifically 1st-year teachers compared to all other TWCs.

Other studies extended research related to TWCs by incorporating outcomes besides teacher retention (Burkhauser, 2017; Kraft et al., 2016). These studies are important to consider because teacher retention is not the only aspect of the school environment affected by TWCs. Kraft et al. (2016) acknowledged TWCs as school organizational contexts and identified four dimensions through a factor analysis on school climate using the NYC School Survey. This analysis identified leadership and professional development, high academic expectations for students, teacher relationships and collaboration, and school safety and order as the four dimensions. This survey analyzed the impact of organizational contexts on both teacher turnover and student achievement. Kraft et al. found leadership and professional development had the strongest relationship with decreased teacher turnover. This study also included student achievement data. This analysis identified (a) high academic expectations for students, and (b)

school safety and order had the strongest relationship with increased student achievement. Although this study contributed to the literature by analyzing school organization contexts with both turnover and student outcomes, the survey is missing several other TWCs that could offer more explanatory power to this model.

Burkhauser (2017) used 4 years of data from the NCTWC Survey to explore the relationship between teacher perceptions of their working conditions and their principal; meaning the teacher ratings of the school environment depended on who was leading the school. The Burkhauser study included principal fixed effects in the model to determine the variance explained by the principal on teacher ratings. Including principal fixed effects allowed them to compare principals with other principals not serving at the same school. This model relied on principal mobility and the analysis required variation in principals in at least one network school to compare effects. Burkhauser concluded principals are associated with teachers' perceptions of TWCs. The results also indicated improving principal quality also improves perceptions of TWCs. This study could be enhanced by including teacher retention along with perceptions of working conditions and principal support. Although a correlation exists between TWCs and retention, it does not fully explain retention and therefore claims about retention cannot be made without the inclusion of a measure of retention as a variable.

The aforementioned studies (i.e. Grissom 2011; Boyd et al. 2011; Burkhauser, 2017; Kraft et al., 2016) are important to acknowledge considering, despite the inclusion of other variables and constructs, TWCs are important factors in both retention and student outcomes. These studies also discussed the importance of leadership or leadership support as it relates to teacher turnover and retention even with the inclusion of other variables.

Special Education TWCs and Retention.

Several studies examined the relationship between TWCs and SET retention. As reviewed in Table 1, Billingsley & Bettini (2019) identified twelve constructs encompassing SET TWCs. Following their review as well as my own, 25 studies analyzing special education TWCs and retention were identified. Of the 25, only seven of these studies included a measure of working conditions with a large sample size. Several studies have focused on retention and TWCs in a large sample among a general teacher sample, with some examining overall ratings of TWCs and others focusing on specific dimensions of TWCs, but far fewer have focused solely on special education.

Gilmour and Wehby (2020) combined several data sources from 2009–2010, 2010–2011, and 2012–2013 in North Carolina that included public school teachers who taught students with disabilities (SWDs) in kindergarten through twelfth grade. Gilmour and Wehby then used multilevel modeling to examine associations between the average percentage of SWDs in teachers' classes and turnover. They used teacher level, classroom level, and school level data, using demographics of teachers, average characteristics of students in teachers' classes, percentage of students with specific disabilities in teachers' classes, certification of teachers, school characteristics, TWCs, and school fixed effects to "eliminate unmeasured time invariant school characteristics" (Gilmour & Wehby, 2020, p. 1049). TWCs were not the focus of this article but were studied and acknowledged as an important factor. The authors used TWCs as a mediator and discussed the association with TWCs decreasing turnover with the addition of classroom, teacher, and school characteristics. They also stated the importance of researching TWCs further within special education as TWCs can be analyzed to determine further supports of SETs.

Conley and You (2017) specifically analyzed SET perception of working conditions, teacher demographics, job satisfaction, commitment, and their relationships with intention to leave. They used structural equation modeling (SEM) to assess the plausibility of their conceptual model. They then used two models with job satisfaction and commitment as mediators. They found that administrative support and teacher team efficacy had significant direct and indirect effects on intention and were the most important for teachers. These results not only support the importance of analyzing TWCs with retention, but also that TWCs are often more significant factors than other variables associated with retention. Although Conley and You incorporated SEM, their overall measure of intention to stay or leave was a weak measure. The measure they used was not a categorical measure, but rather two Likert-scale items of agreement related to transferring or moving schools. Despite different methods of analyzing TWCs, leadership and administrative support continue to be a relevant factor for retention of both general education teachers and SETs.

Additional Predictors of SET Retention

Although separate from TWCs, it is important to consider other factors of retention when discussing TWCs given they are all in the same system. At the conclusion of this review, the conceptual framework will highlight the influences of different layers of systems and to an extent, how all factors of retention are related to a layer in the systems framework and therefore all have some influence on each other. Because the focus of this study is on SETs, this review will continue with briefly discussing three other factors of retention/attrition from Billingsley & Bettini's (2019) review: (a) preparation and qualifications, (b) school characteristics, and (c) demographic and nonwork factors. The current study will include some school characteristics as well as teacher demographic characteristics.

Preparation and Qualifications

SET preparation varies across the United States (Billingsley & Bettini, 2017). Billingsley and Bettinit (2019) shared some programs are longer and therefore more intensive (e.g., university programs) and others offer fewer requirements (e.g., alternative programs). Research on the impacts of SET preparation and teacher retention was limited. Billingsley and Bettini (2019) identified three studies focusing on this relationship although the small, unrepresentative populations of these studies do not allow conclusions to be drawn. Research has found preliminary support for higher quality preparation. Connelly and Graham (2008) found students who had less than 10 weeks of a student teaching experience had a higher probability of leaving or moving from their school. Edgar and Pair (2005) interviewed graduates from a 5-year teaching master's program and found 78% remained in the field of special education with 70% of SETs who remain having moved to other special education positions. This attrition rate is significantly better than the noted 2005 national average of 40–50%.

Induction, specifically mentoring, is another area that is often studied in retention. Although mentoring is often acknowledged as an important factor for new general education teachers' retention (Ingersoll & Strong, 2011), there is not as consistent evidence supporting this relationship for SETs (Billingsley & Bettini, 2019). Connelly and Graham (2009) found mentoring did not predict retention, but they also noted most teachers indicated they worked closely with their mentor, which limits variability and lowers power in the analysis. Studies have shown mentorship is valued by SETs, but this is an area of research that warrants further exploration (Gehrke & McCoy, 2007).

School Characteristics

School characteristics are often studied because teachers conduct their work in a school setting and every school operates differently and every school serves different students. TWCs are considered a school characteristic; however, other school characteristics impact teacher retention. Few studies in special education have examined student race/ethnicity or poverty and how student demographics such as race/ethnicity or poverty relate to teacher retention, but all found that teachers were more likely to leave if the school had more students living in poverty or had more students of color (Carver-Thomas & Darling-Hammond; Conley & You, 2017; Prater et al., 2007). For this study, percentage of students receiving free and reduced lunch will be used to capture socioeconomic status of the school.

Teacher Demographic Factors

Demographic factors are important to consider when research has shown the importance of students benefiting from having teachers who look like them (Redding, 2019). The population of SETs is significantly Whiter and more female than the population of students they teach (Billingsley & Bettini, 2019; Billingsley et al., 2017). Teacher demographic factors are widely explored in retention research, but not frequently explored in SET retention research (Billingsley & Bettini, 2019; Borman & Downing, 2008).

Age, gender, experience, and race/ethnicity are frequently explored teacher demographic variables related to retention. Research surrounding race/ethnicity and teacher retention has been inconsistent. Borman and Downing (2008) found White teachers were more likely to leave than non-White teachers. A nationally representative sample indicated teachers of color leave at higher rates than white teachers; however, when other teacher and student characteristics are controlled for (e.g., TWCs), race did not influence turnover (Carver-Thomas & Darling-Hammond, 2017). Although this has been studied in general education teacher populations, not

enough evidence existed to indicate if any of these results are also accurate for SETs. One study in special education research conducted by Billingsley (2007) found SETs who identified as European American left an urban school district at a rate of 80% in 1 schoolyear. Though other variables were not noted for this study, overall, teacher race/ethnicity is an area of research within special education that should be further explored.

Research regarding gender has found inconsistent associations across samples (Billingsley, 2004; Borman & Downing, 2008; Conley & You, 2017). Within SET research, Conley and You (2017) were the only researchers to incorporate a measure of gender and found male secondary education teachers had a higher intent to leave their school. The inconsistent research also could be due to the gender imbalance among SETs. A small sample would make an analysis challenging in that it would not give enough power for analysis.

Teacher age has also been studied in special education research. Conley and You (2017) found older secondary SETs were more likely to stay. Borman and Downing (2008) reported similar results in all content areas, finding older teachers more likely to stay than younger teachers. One study did limit age to 51 where retention odds decreased compared to those younger than 51 (Borman & Downing, 2008). Looking at age can also introduce bias given older teachers have made the commitment to stay.

Teacher experience is an important factor to consider, with attrition being higher for less experienced teachers (Guarrino et al., 2016). SETs with less experience are also found to move schools at higher rates than their general education peers (Boe et al., 2008). Despite inconsistent findings for gender and race/ethnicity, all demographic factors have not been thoroughly studied in special education research and should be considered in future research design. The current

study will contribute to research by including teacher demographic variables such as race/ethnicity, years of experience at their current school, and gender.

TWCs and Student Outcomes

When schools are experiencing persistent turnover, it not only disrupts the organizational culture of the school but can also have an impact on student achievement (Kraft et al., 2016; Ronfeldt et al., 2011). Teachers who teach for a few years and gain experience and find their role in the organizational structure of the school create an impact when they choose to leave that school. High turnover has a lasting effect, making it difficult for these schools to attract and develop teachers and leaving these schools with new and inexperienced teachers (Borman & Dowling, 2008; Ingersoll, 2001). Research indicated teachers often leave low-income schools to move to higher-income schools, leaving the schools most needing effective teachers having the most difficulty attracting them (Boyd et al., 2008; Leukens et al., 2004).

However, TWCs have been found to be an impactful factor in retention and account for otherwise unexplained relationships between retention and other variables (Johnson, et al. 2012; Kraft et al., 2016; Simon & Johnson, 2015). Johnson et al. (2012) analyzed statewide teacher data in Massachusetts that include a survey of TWCs, teacher career intentions, and student demographic and achievement data. Their findings indicated TWCs explain a significant portion of the relationship between student demographics and career intentions. Their results also found teachers with more positive perceptions of TWCs also tended to have higher rates of academic growth from their students, even in lower-income schools. Among the working conditions that were most impactful included principal leadership and collegial relationships. Kraft et al. (2016) identified four dimensions of school climate and sought to compare relationships of these dimensions with both turnover and student achievement. Among the four dimensions, Kraft et al.

found that leadership and professional development had the strongest relationship with decreased teacher turnover, whereas increased school safety and academic expectations had the strongest relationship with student achievement.

Methods of Investigating SET Retention and TWCs

Across special education and teacher retention literature, researchers have used several different methods to study both TWCs and teacher retention. The current study aligns with 25 studies analyzing SET retention and TWCs. For the purposes of this study, I will only focus on discussing studies using quantitative, survey-based methods. I will begin with discussing how teacher retention is measured with TWCs.

Studies used two different methods of analyzing SET retention with quantitative survey data. One method incorporated teachers completing a survey including working conditions survey questions as well as a question asking about teachers' immediate professional plans. This last question is often asked with the following or a variation of these response options: continue teaching at their current school; continue teaching in this division but leave this school; continue teaching in this state but leave this division; continue teaching in a state other than current state; continue working in education but pursue a non teaching position; leave education to retire; leave education to work in a non education field; and leave education for other reasons. Given the importance of teachers remaining at their school, this variable is often transformed into leavers and stayers. Other studies take a more nuanced approach of transforming this variable into leavers, stayers, and movers to better capture retention within the field as well as the school. However, based on the SET literature for this study, all quantitative studies have historically focused on stayers and leavers. Of the 25 studies exploring SET retention and TWCs, only five studies analyzed a teacher's intention to stay (Berry, 2012; Bettini, et al., 2017; Conley & You, 2017; Jones & Youngs, 2012; Jones et al., 2013). The current study aligns with the aforementioned studies' outcome in that both this study and the noted nine studies analyzed a teachers' intent to leave rather than whether a teacher actually remained or left.

The second method included studies using actual retention data of teachers. Few studies within special education analyzed actual retention and TWCs (Carver-Thomas & Darling-Hammond, 2017; Gilmour & Wehby, 2020). Studies analyzing actual retention and TWCs were able to capture a teacher identifier later gathering their retention data from the school district. Although few studies existed within special education research that included actual retention and TWCs, actual retention is an important outcome to continue to explore given it includes actual retention data. These data would allow for analyses of actual predictors of retention rather than intention (Billingsley & Bettini, 2019).

The retention variable is often used along with TWCs to analyze TWCs as a predictor of retention or intent (Berry, 2012; Bettini et al., 2017; Conley and & You, 2017; Gilmour & Wehby, 2020). Berry (2012) conducted both linear regressions and bivariate correlations to study sources of support, teacher characteristics, and teacher commitment. Using regression analysis allowed for evidence of an existing relationship between teacher support and commitment.

Both Bettini et al. (2017) and Conley and You (2017) used structural equation modeling to assess the plausibility of their models. Bettini et al. (2017) incorporated measures of burnout and found workload manageability predicted emotional exhaustion, which mediated a relationship between career intentions. They also found the relationship between workload manageability and career intentions was not significant, which enforced the importance of including all working conditions when analyzing TWCs and retention. Conley and You (2017) specifically analyzed SET perception of working conditions, teacher demographics, job satisfaction, commitment, and intention to leave (i.e., outcome). Bettini et al. found two workplace variables (i.e., administrative support and teacher team efficacy) had direct effects on

intention. Although only two workplace variables had direct effects on intention, all five variables influenced intentions to leave indirectly.

The retention variable can also be restructured to create a dichotomous variable allowing for a logistic regression (Gilmour & Wehby, 2020). Gilmour and Wehby fit a series of multilevel logistic models with TWCs functioning as a mediator. Although TWCs were not the focus of the study, Gilmour & Wehby (2020) found the inclusion of TWCs may mediate turnover for special education certified teachers. This study aligns with the methodological analysis of Gilmour & Wehby (2020), although TWCs will function as a primary predictor.

Theoretical Frameworks of Teacher Retention/Attrition

Of the 30 articles included in their review, Billingsley and Bettini (2019) identified only 10 articles referencing a specific theoretical or conceptual framework related to teacher attrition or retention. Many of the studies on teacher attrition were a part of a larger context of research focused on factors linked to teacher mobility, including policies and actions states and school districts can take to keep teachers working in their current positions. According to Vagi and Pivovarova (2017), most teacher attrition research that did include a theoretical framework applied one of three theoretical approaches: rational choice theory, self-efficacy theory, or organizational theory. Although rational choice theory and self-efficacy theory have been used in teacher attrition and retention, organizational theory had been solely used when studying TWCs. This literature review will focus on organizational theory because of the emphasis on TWCs within retention and attrition and aligning the TWCs included in the 2019 VDOE TWCs Survey with this theory.

Research focusing on TWCs applied organizational theory as a theoretical framework. Organizational theory allows for the examination of the relationship between the employee and

the organization; or in this case, the teacher and the school (Vagi & Pivovarova, 2016). Organizational theory provides a framework to analyze perceptions of the school structure through TWCs as well as other predictors related to the teacher.

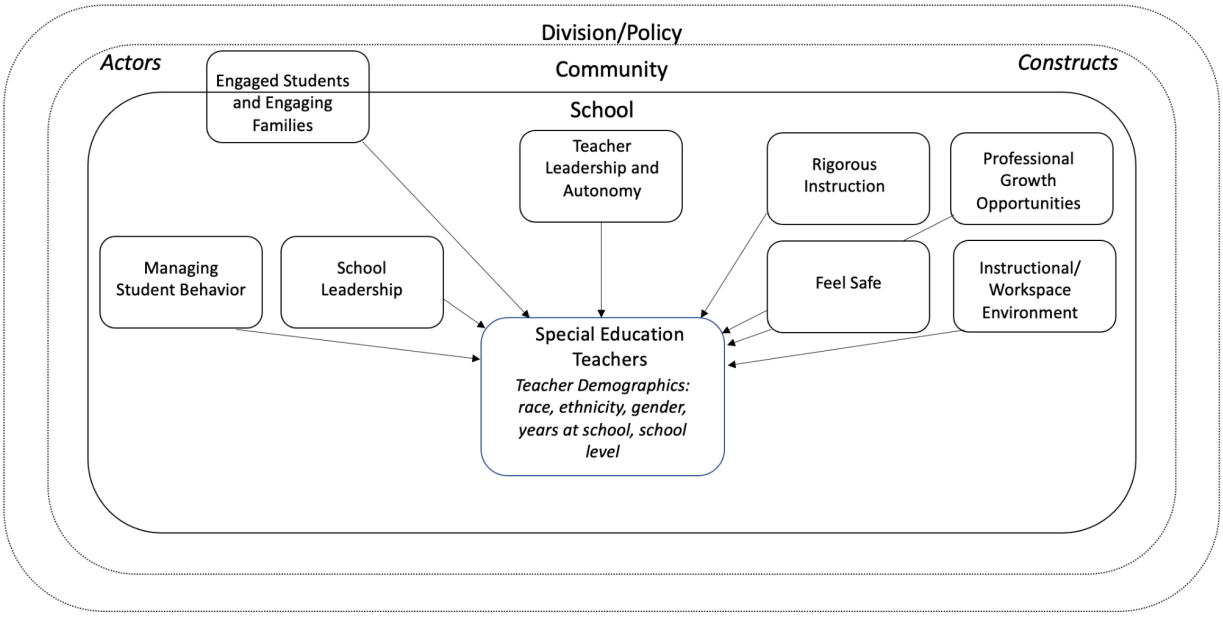
More recently, organizational theory has focused on the levels of hierarchy within the organization, as well as the environment and relationships within the organization. Researchers who used organizational theory to study teacher mobility focused on how the characteristics of the school have influenced teachers' decisions to stay or leave their position. Ingersoll and May (2012) purported schools and districts themselves must examine their processes because the organizational policies and procedures are what leads teachers to leave. Ladd (2011) and Geiger and Pivovarova (2018) reported similar findings and suggested school leadership within an organization is most predictive of favorable working conditions.

I also draw from an adaptive framework of Brofenbrenner's (1979) social ecological systems theory. Systems theory has been described as a type of organizational theory looking at interactions between systems (Friedman & Allen, 2014). Brofenbrenner's model is made of five layers: the microsystem, mesosystem, exosystem, macrosystem, and chronosystem. This model describes that all individuals exist within a nested context composed of microsystem, mesosystem, exosystem, macrosystem, and chronosystem influences. Researchers in different research backgrounds have adapted Brofenbrenner's model to best fit the subsystems within their area of research. An adaptation of Brofenbrenner's model, this study will draw from Zavelevsky & Lishchinsky (2020) and the following layers of their teacher systems: individual/intrapersonal, interpersonal, organizational/institutional, community, and division/policy (Zavelevsky & Lishchinsky, 2020). This study adapts this model further to align with the framework presented in Merrill's (2021) categories of TWCs as well as the VDOE TWCs. Merrill (2021)

acknowledged two broad categories of TWCs: constructs and actors. Actors involve people with whom the teacher interacts who create the condition; constructs are items impacting their teaching condition. Figure 1 represents the VDOE TWCs Survey mapped onto the adapted model while also incorporating Merrill's (2021) delineation of TWCs as actors and constructs. The individual/intrapersonal layer consists of knowledge, skills, and motivation of the individual. The 2019 TWC Survey includes teacher demographic variables that capture this including teacher race, ethnicity, gender, years of experience at their school, and school level. The following two layers are captured within the SET's school. The interpersonal layer describes an individual's relationship with others. The organizational/institutional layer includes the rules and regulations of organizations. The 2019 TWCs Survey includes these layers through the TWC constructs. It should be noted gaps exist in these two layers from a TWC standpoint. The study survey did not touch on every TWC construct Merrill (2021) included in her framework. Also, some SET TWCs are not included, speaking to the SET lens from Billingsley & Bettini's (2019) framework. Table 1 delineates the crosswalk across all three TWC frameworks and where this survey aligns. The next layer includes the community layer that describes community resources promoting social norms. This study survey includes questions regarding engagement of families in the construct "engaged students and engaging families," which can incorporate a community perspective. Finally, the layers are all encompassed by policy, including local, state, and federal policies. The VDOE 2019 TWCs Survey did not incorporate any questions regarding policy or regarding the division or state. Although the survey did not include specific questions, it is important to acknowledge this layer considering division and state policy potentially impact different TWCs. However, the questions in the survey were framed from a school level perspective, which is why they are included at the school level.

Figure 1

The 2019 Virginia TWCs Survey From a Systems Theory Lens



Adapted from Zavelevsky & Lishchinsky's (2020) model

Organizational theory provides a necessary lens to analyze TWCs. Ingersoll (2001) described prior research related to employee turnover drawing from the sociology of organizations. To understand turnover, Ingersoll identified three key pieces to this research: (a) the link between turnover and organizational effectiveness; (b) turnover must be analyzed at the organization level; and (c) the working conditions of the organization must be examined. This study incorporates this framework by analyzing the TWCs of SETs at the organizational level of the school in which they are employed.

In line with this framework, the current study will investigate the following research questions:

1) What differences exist in perceptions of TWCs between SETs and teachers of other content areas?
2) To what extent is the SET's intention to stay, leave, or move attributable to teacher and school levels? Is there a significant variation among schools in intent?
3) After controlling for teacher characteristics, how are SETs' perceptions of working conditions associated with their intentions to remain at their current school, leave teaching, or move from their school?
4) After controlling for teacher and school characteristics, to what extent do TWCs, particularly the SET level perception of school leadership, impact a teacher's intention to remain at their current school, leave teaching, or move from their school?

In response to the research questions, I hypothesize the following:

1) I hypothesize perceptions of TWCs will differ significantly between SETs and teachers of other content areas.
2) In line with previous research (Gilmour & Wehby, 2020), I hypothesize a significant variation among schools in intent to stay or leave their school.
3) I hypothesize after controlling for teacher gender, experience, and race/ethnicity, some TWCs will remain associated with teacher intention. I also hypothesize leadership support will explain the most variation across the working conditions.
4) I hypothesize after controlling for teacher characteristics, percentage of students receiving free and reduced lunch, and percentage of students at the school with a disability, leadership support will remain associated with teacher intention.

Literature Review Summary

Teacher retention, or why teachers stay, is an important area of study considering the impact teacher attrition and turnover can have on student outcomes (Hirsch & Emerick, 2006). Teacher attrition and turnover are even more concerning for those that are special education teachers (SETs), and it is especially noted as a priority in the state of Virginia (Solenson et al., 2018). There have been several factors that impact SET retention but an area of research that is consistently significant and can address retention efforts is teacher working conditions (TWCs).

Studies that have analyzed TWCs and retention find that even when including other factors of retention, TWCs remain the most important, significant factors (Boyd et al. 2011; Burkhauser, 2017; Conley & You, 2017; Grissom 2011; Kraft et al., 2016). Of the TWCs, leadership/ administrative support consistently is one of the most important factors. There is however, limited research studying SET retention and all TWCs in a large sample, quantitative analysis. SET research also lacks a theoretical framework when studying TWCs and retention. This study applies organizational theory along with Merrill's (2021) framework of TWCs with the VDOE TWC Survey to conduct a quantitative analysis with a large sample. Although the survey did not capture the specificity of all SET TWCs, the crosswalk of research on TWCs found that while broad, several of SET TWCs were captured in the VDOE TWC Survey.

The following chapter will discuss the methodology planned to analyze the differences in perceptions of TWCs between SETs and teachers of other content areas as well as the association teacher demographics, TWCs, and school level variables have with teacher intention to stay at their school, move from their school, or leave teaching.

Chapter 3: Methodology

This chapter describes the methodology I plan to employ to address the research questions of this study. This study is guided by the following research aims: 1) Determine if there are differences in perceptions of teacher working conditions (TWCs) between special education teachers (SETs) and teachers of other content areas and 2) Examine the effect of teacher working conditions, particularly leadership support, on special education teacher's intent to stay at their school, move from their school, or leave teaching. In this chapter, I describe the research design, sampling procedures, measures, and data analysis approaches to address the research questions of this study.

Research Design

A multivariate, correlational research design will be utilized for the current study. A multivariate approach allows for a more complete and detailed description of a phenomenon; in this case SET retention (Meyers et al., 2016). This design allows for an analysis of a large sample of special education teachers (SETs) as well as SETs across a variety of contexts. When considering teacher retention, it is important to consider teachers that have many contexts. A multivariate approach allows retention to be predicted with more context. As reviewed in the literature, there are a variety of different contexts that contribute to a SETs intent to stay at their school, move from their school, or leave teaching. Through this approach, I can take into consideration not only SETs' perception of Teacher Working Conditions, but also SET demographics and school level variables to reasonably predict SET intent to stay at their school, move schools, or leave teaching.

Participants and Other Sources of Data

Survey Response Rate

The 2019 Virginia Teacher Working Conditions Survey was administered across the state of Virginia with each school division being required to participate. The sample is representative of K-12 classroom instructors whose "primary job responsibility is interacting with students in classroom settings" (Miller, 2020, p.1). This survey was designed as a policy response to investigate "school-level teaching conditions and the impact such conditions have on teacher retention" (Virginia Acts of Assembly, 2018 Special Session 1§2.1-50.134H). Miller (2020) developed a report that outlines division, school, and teacher response rates. The sampling frame for this survey includes 1,678 schools nested within 133 divisions. All divisions had at least one school participate with sixty percent of divisions having one hundred percent of schools participating. Schools were asked to have at least an eighty percent response rate, and thirty seven percent of schools met this goal. Teachers had a sixty two percent response rate with 54,207 responses. This is an appropriate data set and sample, given the response rate is higher than the average response rate of studies that gather data at the individual and organizational level (Barach & Holtum, 2008). This data also includes descriptive data of teachers, measures of perceptions of working conditions, and a measure of retention.

Survey Background

The 2019 Virginia Teacher Working Conditions Survey was administered beginning January 7, 2019, and ending March 29, 2021. There were two versions of this survey: one created for staff whose "primary job responsibility is interacting with students external to the classroom settings and who hold a state professional license, such as a Collegiate Professional License, a Postgraduate Professional License, or a Pupil Personnel Services License" (Miller, 2020, p. 1); the second created for classroom instructors whose "primary job responsibility is

interacting with students in classroom settings" (Miller, 2020, p. 1). This analysis will pull from the latter and focus solely on the survey for classroom instructors.

The Virginia Department of Education (VDOE) instructed principals to select a three-week window for their teachers to complete the survey. Teachers completed this survey anonymously through a school-specific password for the online survey. It is important to note that while schools were required to participate, teacher participation was voluntary (Miller, 2020).

Another secondary data source was also used from the Virginia Department of Education (VDOE). The dataset used for the current study includes a fall membership report from 2018. The VDOE collects data annually regarding the number of students enrolled in each public school in the state of Virginia. Every school submits student data to the VDOE, and this data is kept in an online system on the VDOE website. This data is publicly available on their website and includes school level demographic data of all public schools in the state of Virginia. This is appropriate given the need for school level (Level 2) data to control for school level factors as well as align with the theoretical framework. It includes the following variables: school name, division number, total student population, race/ethnicity populations, special education populations, English-language learner populations, and percentage of free and reduced lunch. For this analysis, school name, division number, total student population, percentage of students receiving free and reduced lunch, and percentage of students who receive special education services are included.

Definition of the Sample

This survey was only administered to teachers whose primary job responsibility is interacting with students in classroom settings. Teaching position was used from the 2019

Virginia Teacher Working Conditions Survey to identify the population of this study. This variable describes the teaching assignment of the teacher. This categorical variable allows teachers to identify all subjects they are teaching this year. For each position, they are given the option to select “Yes” or “No” to indicate if they are teaching that subject that year. This variable will be used to identify the population of this study. For the purpose of this analysis, anyone who selected “Special education” was used to capture anyone who identifies as a special education teacher for a total sample of 12,128.

Measures/Instrumentation

The 2019 Virginia Teacher Working Conditions survey was created through a partnership with both the University of Virginia and the Virginia Department of Education (VDOE) to meet the goal of VDOE’s efforts to systematically measure “school climate and working conditions, provide targeted technical assistance to schools to improve their school climate and working conditions concerns, and incorporate school climate metrics into Virginia's school accountability system in order to help VDOE gain a better understanding of how school climate is related to student education outcomes” (Miller, 2020, p. 1). This survey was also developed in response to legislation in the general assembly mandating a teacher working conditions survey to “evaluate school-level teaching conditions and the impact such conditions have on teacher retention and student achievement” (Virginia Acts of Assembly, 2018 Special Session 1§2.1-50.134H). The VDOE TWCs Survey was first administered in the spring of 2019 with the aim of readministering every two years online.

Survey Design

I draw here from a report Miller (2020) wrote discussing the background of the 2019 TWC survey as well as survey participation. This survey’s framework was informed by other

TWC surveys including the Teaching, Empowering, Leading, and Learning Survey (TELLS) and the Five Essentials Survey as well as consideration toward the VDOE's priorities and programs (Miller, 2020, p. 2). The TELLS was first developed in the North Carolina Governor's Office in 2002 which later became the NCTWC Survey. The TELLS survey includes the following core constructs: Time, Facilities and Resources, Community Support and Involvement, Managing Student Conduct, Teacher Leadership, School Leadership, Professional Development, and Instructional Practices and Support (NTC, 2016). Twelve states are currently using or basing surveys off of the TELLS (NTC, 2016). The survey used in this study incorporated aspects of all of these constructs. While it was not discussed as a part of what informed the framework, there is an acknowledgment in the background of Johnson (2006), who was the first to provide a list of broad categories and brief description of each TWC (Merrill, 2021). This is noted in other research as the only guidance of a framework of components of TWCs (Merrill, 2021). Although validity information is not reported, the acknowledgement of consulting other TWC surveys can help establish construct validity. Table 1 includes a crosswalk of the current study's survey TWC constructs along with the Johnson (2006) and Merrill (2021) TWCs frameworks.

The documentation, survey instrument, and published findings were consulted finding the survey includes eighty five questions grouped around working conditions, demographics, and overall summary questions. The 2019 Virginia Teacher Working Conditions Survey included the following TWCs: 1) Teacher Leadership; 2) Autonomy; 3) Staff Collegiality; 4) Instructional Practices; 5) Academic Environment; 6) Instructional Environment; 7) School Leadership; 8) Teacher Evaluation; 9) Professional Development; 10) Demands on Teacher's Time; 11) Managing Student Behavior; 12) New Teacher Support; 13) Relationships with Parents and Guardians; 14) Concerns about Safety and 15) Prevalence of Bullying. See Table 2 for more

information on each construct. These constructs were then collapsed based on factor analyses to include 1) Teacher Leadership and Autonomy; 2) Rigorous Instruction; 3) Instructional Environment; 4) School Leadership; 5) Managing Student Behavior; 6) Professional Growth Opportunities; 7) Engaged Students and Engaging Families; and 8) Feeling Safe.

Procedures

Johnston's (2017) guidance on data collection procedures for secondary data analysis will be used for this study. Since secondary data analysis is a flexible approach, there are steps in this analysis process. Johnston states the first step as developing the research question. This is followed by either developing a survey or utilizing data that already exists to address the research questions.

The current study is using previously collected data to address the research questions. In this case, the aforementioned VDOE Teacher Working Conditions Survey was selected as an existing data source due to the representative sample, inclusion of demographic information, and access to school wide data through the VDOE that can be incorporated into this analysis. Once the dataset is selected, the next step is to evaluate the dataset before it is actually used (Johnston, 2017). Johnston (2017) suggests the following steps in evaluating the data to ensure congruence, quality, and appropriateness for the research questions: "(a) what was the purpose of this study; (b) who was responsible for collecting the information; c) what information was actually collected; (d) when was the information collected; (e) how was the information obtained; and (f) how consistent is the information obtained from one source with information available from other sources" (Stewart & Kamins, 1993 as cited in Johnston, 2017, p. 623). For this study, I consulted with documentation written by the primary investigators, obtained documentation on the collection of the data, and found any information found in publication. Records were

obtained through published works of the primary investigators as well as work done by the Metropolitan Education Research Consortium (Becker et al., 2021). The purpose of the primary investigation and creation of this survey was to meet the legislation of the General Assembly to "evaluate teaching conditions and how those conditions impact retention and student outcomes" (Virginia Acts of Assembly, 2018 Special Session 1, §2.1- 50.134H).

Constructs and Variables

The included variables from the 2019 Virginia Teacher Working Conditions Survey and the VDOE school demographic data cover the research questions as well as the theoretical framework. The following constructs will be used from the survey that align with organizational and systems theory: Teacher Working Conditions, Teacher demographic and non-work factors. The school demographic data will also be used to address the organizational level of systems theory and incorporate level 2 variables.

Teacher Level Variables.

In the current study, the teacher level variables include Teacher Working Conditions and demographic information.

Teacher Working Conditions.

The following measures are present from the survey: 1) Teacher Leadership; 2) Autonomy; 3) Staff Collegiality; 4) Instructional Practices; 5) Academic Environment; 6) Instructional Environment; 7) School Leadership; 8) Teacher Evaluation; 9) Professional Development; 10) Demands on Teacher's Time; 11) Managing Student Behavior; 12) New Teacher Support; 13) Relationships with Parents and Guardians; 14) Concerns about Safety and 15) Prevalence of Bullying. Each measure except for "New Teacher Supports" is a continuous variable and consists of three to nine questions. Each measure is collected through a six point

likert scale of the sample member's perception of each construct with higher values indicating higher agreement. New Teacher Support is a categorical variable with answer choices “Yes”, “No”, and “Don’t Know”. For this study, New Teacher Support and Prevalence of Bullying will not be incorporated due to the misalignment with Merrill’s (2021) conceptualization of TWCs. Table 3 provides information on each measure’s item number, alpha level, and an example item. Miller (2020) reports that through both exploratory and confirmatory factor analysis (CFA), they identified nine measures that individual survey measures loaded on (Table 3). With the newly developed nine measures, Cronbach Reliability Alphas were all above the 0.7 threshold for sufficient reliability as well as factor loadings for all items demonstrated construct validity exceeding the 0.3 threshold. This study also confirmed the work by Miller (2020) with a CFA for this study’s target population and found that the constructs were aligned. For analysis purposes, this study will align with Miller (2020) and use the following constructs: 1) Teacher Leadership and Autonomy; 2) Rigorous Instruction; 3) Instructional Environment; 4) School Leadership; 5) Managing Student Behavior; 6) Professional Growth Opportunities; 7) Engaged Students and Engaging Families; and 8) Feeling Safe. Prevalence of Bullying was not included due to a misalignment with the framework.

Table 2

Working Conditions Sections in the Teacher Working Conditions Survey

Measure	Number of Items	Sample Item
Teacher Leadership	4	Teachers are relied upon to make decisions about educational issues.
Teacher Autonomy	6	I am free to be creative in my teaching approach.
Staff Collegiality	5	Teachers and other adults at this school trust one another.

Instructional Practices	5	Teachers and other adults at this school encourage students to provide constructive feedback to others.
Academic Environment	6	Teachers and other adults at this school provide students the support they need to succeed.
Instructional Environment	4	My school provides me with sufficient access to appropriate instructional materials.
School Leadership	9	I trust this school's administrators to do what they say they will do.
Teacher Evaluation	3	Teachers receive feedback that can help them improve their teaching.
Professional Development	5	Professional development enhances teachers' abilities to improve student learning.
Demands on Teachers' Time	4	Teachers have time available to collaborate with colleagues.
Managing Student Behavior	8	Teachers and other adults at this school consistently enforce rules for student behavior.
New Teacher Support	4	Formally assigned a mentor
Relationships with Parents and Guardians	5	This school does a good job of encouraging parent/guardian involvement.
Concerns about Safety	3	I am treated with respect by students at this school.
Prevalence of Bullying	5	Bullying is a problem at this school.

Participants were given likert scale response choices to all the above constructs except for New Teacher Support.

Table 3

Teacher Working Conditions Constructs from Factor Analysis of Teacher Working Condition Survey conducted by UVA (Miller, 2020)

Measure	Number of Items	α	Factor Loadings	Sample Item

Teacher Leadership and Autonomy	10	0.913	0.618-0.851	Teachers are relied upon to make decisions about educational issues.
Rigorous Instruction	6	0.903	0.725-0.860	Teachers and other adults at this school encourage students to provide constructive feedback to others.
Instructional / Workspace Environment	3	0.734	0.686-0.873	Teachers and other adults at this school provide students the support they need to succeed.
School Leadership	11	0.961	0.880-0.966	I trust this school's administrators to do what they say they will do.
Professional Growth Opportunities	6	0.904	0.704-0.883	Professional development enhances teachers' abilities to improve student learning.
Managing Student Behavior	6	0.931	0.816-0.910	Teachers and other adults at this school consistently enforce rules for student behavior.
Engaging Students and Families	8	0.890	0.667-0.824	This school does a good job of encouraging parent/guardian involvement.
Feel Safe	2	0.847	N/A	I am treated with respect by students at this school.
Prevalence of Bullying	5	0.911	0.831-0.888	Bullying is a problem at this school.

Race/ Ethnicity.

Race/ Ethnicity was provided through dichotomous race/ethnicity choices allowing participants to select all that apply. The designations included in the 2019 Virginia Teacher

Working Conditions Survey and the current study are: (a) American Indian or Alaskan Native; (b) Asian; (c) Black or African American; (d) Native Hawaiian or Pacific Islander; (e) White; (f) Other Race. For the current study, if participants selected more than one race they are categorized as "More Than One Racial Identity". There is also a separate dichotomous question regarding whether the participant's ethnic background is Hispanic or Latino ("Latino is the word used in the survey, not the preferred with a response choice of "Yes" or "No". This will be captured as a separate variable.

Gender.

This variable is categorical and refers to the gender identity of the participant and was provided by the teacher. The study offers a selection of either "Male" or "Female".

Teaching Experience.

This categorical variable refers to the number of years of teaching experience the teacher has at their current school as of the 2018-19 school year. The participants are given four ranges of choices that would include their teaching experience. The four answer choices include "1-3 years", "4-10 years", "11-20 years", and "More than 20 years".

Grade Level.

This categorical variable allows teachers to check all that apply in reference to what grades they are teaching this year. Teachers can mark all that apply from PK-12. For the analysis, this categorical variable is further grouped and transformed into "Elementary", "Middle", "High School" and "More than one Grade Level" for teachers that teach in two or more of the categories (i.e. Elementary and Middle).

Dependent Variable: Immediate Professional Plans.

This categorical variable refers to the immediate professional plans of the participant for the 2018-2019 school year. The participants are given eight choices to indicate what their professional plans are. The eight choices include “Continue teaching at my current school”, “Continue teaching in this division but leave this school”, “Continue teaching in this state but leave this division”, “Continue teaching in a state other than Virginia”, “Continue working in education but pursue a non-teaching position”, “Leave education to retire”, “Leave education to work in a non-education field”, and “Leave education for other reasons”. For modeling purposes, this variable is transformed into three categories: special education teachers who stay at their school, move from their school, or leave teaching. See below for more details.

School Level Variables

Percent of Free and Reduced Lunch.

This continuous variable refers to percent of students who receive free and reduced lunch at a school for the 2018-2019 school year. The Free and Reduced Lunch variable is often used as an indicator of a student’s socioeconomic status (Harwell & LeBeau, 2010). This variable is represented as a proportion of students who receive free or reduced lunch at each school.

Percent of Students who Receive Special Education Services.

This continuous variable captures the percent of students who receive special education services at a school for the 2018-2019 school year.

Data Analysis

The following section includes an overview of the data cleaning and primary data analyses for the current study. To answer the research questions, the primary data analysis includes RQ1) t-tests and Mann-U Whitney test to address whether SETs and teachers of other content areas differ in their perception of teacher working conditions (TWCs), RQ2) a

multilevel, multinomial logistic regression analysis of the null model, RQ3) a multilevel, multinomial logistic regression analysis including teacher demographics and teacher working conditions, RQ4) a multilevel, multinomial logistic regression analysis including teacher demographics, teacher working conditions, and school level variables. All data analyses were conducted using R (R Core Team, 2021) and RStudio (RStudio Team, 2020), and STATA 14 (StataCorp, 2015) unless otherwise noted.

Data Cleaning and Preliminary Analysis

Transforming Variables

The current data includes the variable, “Teacher Position” which allows the population of this study to be identified. Using the “dplyr” package in RStudio, I filtered only those that designated “special education” as one of their teaching positions to analyze only special education teachers in this study (Wickham et al., 2022). The variable, “Grade Level” was recategorized to account for teachers that may teach multiple grade levels as well as to capture the grade level as “Elementary”, “Middle”, “High School”, or “More than one Grade Level”. The variable, “Immediate Profession Plans" functions as the dependent variable of teacher retention. This indicates the teacher’s intention for the following year. Literature has explored stayers, movers, and leavers, with the research showing the important factor in student outcomes is teachers remaining at their school (Billingsley, B., & Bettini, E., 2019; Hirsch, E., & Emerick, S., 2007). Although teachers may not leave the field, it is impactful to students as well as the organizational structure of the school if teachers move to a different school. For the purpose of this data, this variable would be transformed to a categorical variable, “Stayers”, “Movers” and “Leavers”. Stayers would include those that chose “Continue Teaching at my Current School”. “Movers” include responses such as “Continue teaching in this division but leave this school”

and Leavers would include response options related to leaving teaching (i.e. “Continue working in education but pursue a non-teaching position”; “Leave education for other reasons”). Since the outcome variable is now categorical, and won’t conform to a normal distribution, it allows for the use of multinomial logistic regression (or a generalized linear mixed model) to allow the researcher to determine the impact of variables on the risk and risk ratio of teachers staying at their school, moving from their school, or leaving teaching.

Factor Analysis

In the review of published findings, (Miller, 2020) identified new measures of the survey through both an exploratory (EFA) and a confirmatory factor analysis (CFA). This was the first administration of the Teacher Working Conditions survey and allowed for a measure of the observed measures and latent variables. I ran a CFA for the population of the current study and found that the variables were aligned with those that were established in the Miller (2020) findings. This analysis informed the variables that I used to address the research questions. The “lavaan” package was used to conduct the confirmatory analysis and also allowed for the teacher working conditions constructs to be standardized (Rosseel, 2012).

Descriptive Statistics and Further Reliability Measures

I first ran frequency tables and cross-tabulations to get a better understanding of all variables coding patterns and the profiles of missing data for each variable in the analysis. Following this step, I ran descriptive statistics for all variables included in the analysis using the “table1” package (Yoshida et al., 2022). This includes frequencies, means, medians and standard deviations of each variable. As recommended by Garson (2020) and Hox (2010), the teacher working conditions were standardized. This allows the variables to be easier to interpret and therefore more valuable. The “lavaan” package was used to standardize the teacher working

conditions (Rosseel, 2012). Cronbach's alpha is a common measure of the reliability of an instrument (Tavakol & Dennick, 2011). Cronbach's alpha and Omega was also reported for each teacher working condition. Descriptive statistics and reliability measures for all variables can be found in Table 7 and 8.

Primary Analysis

To answer the research questions, the primary data analyses will include a Mann-Whitney U analyses and a multilevel, multinomial logistic regression analysis with three models also found in Table 4: (RQ1) analyzes differences in perception of teacher working conditions between special education teachers and teachers of other content areas the (RQ2): null model to predict the intention to stay of special education teachers; (RQ3): Model 1 predicts the intention of special education teachers to either move schools or leave teaching with the addition of Teacher Descriptives; (RQ4): Model 2 predicts the intention of special education teachers to either move schools or leave teaching with the addition of Teacher Demographics and TWC Variables; and Model 3 builds on this with the addition of school variables. The research questions and planned analysis can be found in Table 4. Each model incorporates different factors that are found in research to impact special education teacher retention with the emphasis being on TWCs (Billingsley & Bettini, 2019).

Table 4

Research Questions and Analysis Plan

Research Questions	Analysis
What are the differences in perceptions of Teacher Working Conditions between special education teachers and teachers of other content areas?	Mann-Whitney U test

To what extent is the special education teacher's intention to stay, leave, or move attributable to teacher and school levels? Is there a significant variation among schools in intent?	Multilevel, Multinomial Logistic Regression Analysis; Model 1: the null model predicts the intention to stay of special education teachers
After controlling for teacher characteristics, how are special education teachers' perceptions of working conditions associated with their intentions to remain at their current school, leave teaching, or move from their school?	Multilevel, Multinomial Logistic Regression Analysis; Model 2: addition of teacher characteristics to predict the intention to stay of special education teachers Multilevel, Multinomial Logistic Regression Analysis; Model 3: addition of teacher working conditions to predict the intention to stay of special education teachers
After controlling for teacher and school characteristics, to what extent do teacher working conditions, particularly the special education teacher level perception of school leadership, impact a teacher's intention to remain at their current school, leave teaching, or move from their school?	Multilevel, Multinomial Logistic Regression Analysis; Model 4: addition of school level variables to predict the intention to stay of special education teachers

This statewide dataset includes both teacher and school level data, making a multi-level model (MLM) appropriate. As with systems theory, a multi-level model allows for variables from different systems or in this case, levels. To better understand why a multi-level model would be the best fit, I pull from the text of David Garson (2020). MLM is appropriate whenever there is clustering of the outcome variable by a categorical variable (Garson, 2020). In this case, clustering of retention by school building. This would allow for an analysis of the Level 1 dependent variable retention and incorporating a Level 2 grouping variable of the schools while allowing for the inclusion of other predictor variables. MLM adjusts for this by including an error term that is shared by everyone in the cluster (Garson, 2020). Using MLM, I will use three models based on the research questions and the predictors/covariates.

Incorporating multinomial logistic regression extends MLM to use a generalized linear mixed model (GLMM). GLMM allows for a multilevel analysis when the outcome is categorical

and unordered. This statistical approach is used to predict placement in a category or determine the probability of category placement (Starkweather & Moske). “Generalized”, in GLMM refers to multilevel models that are adapted to handle non-continuous outcomes. In this case, the retention variable consisted of three unordered categories of “stayers”, “movers” and “leavers”. This statistical approach used the logit link function in STATA 14 within a generalized structural equation modeling framework. For all models, the “gsem” function in STATA was used. This analysis included a null model, then three models that include predictors related to teacher retention using a hierarchical model building process (Hox, 2002). Each model will include the prior variables, with the addition of other variables that impact retention. The aim is that with the addition of predictors, the goodness of fit of the model will improve. Goodness of fit was assessed through Akaike Information Criterion (AIC), (Schwarz’s) Bayesian Information Criterion (BIC), and Likelihood Ratio Test (LRT). Four different nested models were fitted.

Null Model

The null model includes only the grouping variable as the determinant of the intercept of the dependent variable. In this case, the Level 2 grouping variable is the school and the dependent variable is the special education teacher’s intent to stay at their school, move from their school, or leave teaching. The null model will also be used to see if there is any need for multilevel modeling rather than another form of regression. GLMM models must use an approximation for likelihood. Using the intraclass correlation coefficient, the null model found that multilevel modeling is warranted.

Model 1

The first model includes the null model with addition of the following teacher descriptives: teaching experience, race, grade level, and gender. The other predictors aside from

TWCs are important as well to consider for a multilevel model. Using a multilevel model requires both Level 1 and Level 2 predictors. Level 1 variables such as teaching experience, race, and gender have been used to better understand special education teacher retention (Billingsley, B., & Bettini, E., 2019; Gilmour, 2019; Geiger & Pivovarova, 2018; Hirsch, E., & Emerick, S., 2007).

Model 2

Following the hierarchical approach, Model 2 includes Model 1 with the addition of the Teacher Working Conditions measures: 1) Teacher Leadership and Autonomy; 2) Rigorous Instruction; 3) Instructional Environment; 4) School Leadership; 5) Managing Student Behavior; 6) Professional Growth Opportunities; 7) Engaged Students and Engaging Families; and 8) Feeling Safe.

Model 3

Model 3 builds on Model 2 by including Level 2 variables such as the free and reduced lunch variables as well as percent of students in the school who receive exceptional education services. School level variables have also been researched related to special education teacher retention (Billingsley, B., & Bettini, E., 2019; Gilmour, 2019). The free and reduced lunch variable is often used to determine the impact of the socioeconomic status of the school and found these variables to have some predictive power and explain variance (Billingsley, B., & Bettini, E., 2019; Gilmour, 2019; Geiger & Pivovarova, 2018; Hirsch, E., & Emerick, S., 2007). It is important to consider using those as covariates and pulling other state data to access school level variables.

Following the final model, predicted probabilities were calculated for the estimated risk of leaving teaching and the estimated risk of moving schools. Using predicted probabilities

following logistic regression is a common interpretation technique and allows for incorporating multiple variables (Muller & MacLehose, 2014). Predicted probabilities are often easier to interpret, given that the results fall between 0 (0% risk of leaving/moving) and 1 (100% risk of leaving/moving). Predicted probabilities are calculated by first analyzing the combination of teacher demographics that increase the risks of the two outcomes. Teacher working conditions that lower the risk are then incorporated. Predicted probabilities of high and low perceptions of that teacher working condition are calculated in congruence with the teacher demographics to better understand the impact of the perception of the teacher working condition.

Assumptions

Following the development of the three models, the final model was assessed for assumptions. Assumptions for multilevel, multinomial logistic regression include linearity, no outliers, independence, and no multicollinearity (Garson, 2020). In order to test for linearity and multicollinearity, a regression model was run for each outcome. Three regressions were run, for the stayers, leavers, and movers outcome. Linearity and correct model specification were assessed through the Stata command "linktest". A violation of this assumption would be if the model was non-linear. Multicollinearity was assessed by checking the Variance Inflation Factor (VIF) of all the variables for each model.

Conclusion

This chapter explained the research design, participants and sampling, data collection, and data analysis that are used in the current study. The current study contributes to SET retention literature by using a multivariate, correlational research design to investigate associations between SET demographic variables, TWCs, school level variables and intention. Chapter 4 reviews the results of the study.

Chapter 4: Results

Chapter Four contains the results from the preliminary (i.e. factor analysis and descriptive statistics) and primary analyses. First, I will describe the preliminary analyses. Then I will detail the primary analyses along with their tests of assumptions to include (RQ1) eight Mann-Whitney U analyses and (RQ2,3, and 4) a multilevel, multinomial logistic regression with model-predicted probabilities. The purpose of this study is to explore how special education teacher working conditions, particularly leadership support, may be associated with special education teachers' intent to stay at their school, move from their school, or leave teaching.

The research questions for the current study, that guided the analyses, are:

(RQ1) What are the differences in perceptions of Teacher Working Conditions between special education teachers and teachers of other content areas?

(RQ2) To what extent is the special education teacher's intention to stay, leave, or move attributable to teacher and school levels? Is there a significant variation among schools in intent?

(RQ3) After controlling for teacher characteristics, how are special education teachers' perceptions of working conditions associated with their intentions to remain at their current school, leave teaching, or move from their school?

(RQ4) After controlling for teacher and school characteristics, to what extent do teacher working conditions, particularly the special education teacher level perception of school leadership, impact a teacher's intention to remain at their current school, leave teaching, or move from their school?

Preliminary Analysis

Missing Data

Missing values were first explored through cross tabulation and summary statistics. The original data set had 54,943 observations. Given that identifying this study's population of interest required teachers to answer their content area, 4,394 participants did not answer this question and these observations were removed from the analysis leaving 50,549 observations. All 50,549 observations were used to answer RQ1, but to answer RQ2, 3, and 4 only observations where teachers identified as teaching special education were used. That left 12,128 observations. The data from the Teacher Working Conditions survey did not have any missing data once the study population was identified. The secondary data from the 2019 Virginia Department of Education fall membership report that was merged with the aforementioned data included the following variables that had missing data (e.g., missing) at approximately 5% or less, which is a proposed acceptable percentage of missing value to not address (Garson, 2020): percent of students receiving exceptional education services (139 cases missing, 1.15%) and percent of students free and reduced lunch (160 cases missing, 1.32%).

Reliability and Confirmatory Factor Analysis

Teacher Working Condition items were assigned to different constructs based on the previous results reported by the University of Virginia and Virginia Department of Education. Reliability of each construct was assessed through Cronbach's alpha and McDonald's omega values and then further strengthened through a confirmatory factor analysis. All alpha and omega values were above the 0.7 threshold for sufficient reliability (see Table 5).

Table 5

Reliability and Factor Analysis of Teacher Working Conditions

	# of Items	Alpha (α)	Omega	Standardized CFA Factor Loadings

Teacher Leadership and Autonomy	10	0.91	0.93	0.554-0.849
Rigorous Instruction	6	0.90	0.92	0.671- 0.832
Instructional Environment	3	0.74	0.76	0.523- 0.828
School Leadership	10	0.96	0.97	0.778-0.896
Managing Student Behavior	6	0.93	0.95	0.769-0.905
Professional Growth Opportunities	6	0.91	0.92	0.641- 0.857
Engaged Students and Engaging Families	8	0.89	0.93	0.600-0.770
Feeling Safe	2	-	-	0.816-0.917

To further assess the factor structure and psychometric properties of the Teacher Working Conditions measure, I estimated two correlated factor models based on the factor structure the University of Virginia team had previously identified. In the first model, I ran a correlated factors model, in which a set of latent variables are allowed to be correlated with each other. The standardized covariance estimates serve as a type of correlation between the latent variables. Model fit was examined using both the root mean square error of approximation (RMSEA) and the comparative fit and Tucker- Lewis indices. This model approached an adequate fit ($\chi 2(1246) = 147028.765$, CFI = 0.897, TLI= 0.891, RMSEA = 0.048, SRMR = 0.059). I further examined the model through examining modification indices. This analysis indicates the change in chi-square if an additional parameter were included in the model. The modification indices identified error variances between items that would improve the fit of the model. I incorporated the error variance between three sets of items that had the greatest impact on the fit. The three sets of items are either worded similarly or are associated with a similar topic. The first set captures

teacher evaluations, the second focuses on schools promoting parental involvement, and the last set captures student learning. This allows for conceptual justification for incorporating this error variance in the model. The second model was the same as the first with the addition of the three sets of items accounting for the error of the items. This eight factor model ($\chi 2(1243) = 127133.558$, CFI = 0.910, RMSEA = 0.045, SRMR = 0.056) demonstrated adequate model fit according to the guidelines of Hu and Bentler (1999) using robust estimates. This indicates that within this study's population, Teacher Working Conditions can be analyzed as an eight factor structure with these eight subscales being allowed to correlate. All items for each factor are within the acceptable range of above 0.4. Further details regarding model fit can be found in Table 6.

Table 6

Model Fit Statistics for Factor Structure of Teacher Working Condition Responses

*x*2	df	AIC	BIC	CFI	TLI	RMSEA	SRMR
127133.558	1243	6567446.994	6568639.138	0.910	0.904	0.045	0.056

Descriptive Statistics

Descriptive statistics provide summary measures of central tendency about the variables of interest from the special education teacher population, other content areas, as well as the overall population. This includes mean, median, a minimum and maximum of all Teacher Working Conditions after the confirmatory factor analysis and standardizing the constructs (see Table 7). A total of 24.00% of the population are special education teachers and 76.00% teach other content areas. Frequencies and percentages of teacher demographic variables included in the research questions for both special education teachers and teachers of other content areas are found in Table 8. Table 9 includes mean scores for each individual question included in the

survey. The Confirmatory Factor Analysis did not find any items that contributed more significantly than others for each TWC.

Table 7

Descriptive Statistics of Teacher Working Condition Factors by Content

	Special Education Teacher (N=12128)	Other Content Area (N=38421)	Overall (N=50549)
Teacher Leadership & Autonomy			
Mean (SD)	-0.023 (1.04)	0.007 (1.02)	0.000 (1.020)
Median [Min, Max]	0.163 [-3.540, 1.660]	0.190 [-3.570, 1.660]	0.183 [-3.570, 1.660]
Rigorous Instruction			
Mean (SD)	0.005 (0.623)	-0.002 (0.622)	0.000 (0.622)
Median [Min, Max]	0.071 [-3.250, 1.000]	0.067 [-3.270, 0.994]	0.068 [-3.270, 1.000]
Instructional Environment			
Mean (SD)	-0.037 (0.904)	0.012 (0.866)	0.000 (0.875)
Median [Min, Max]	0.127 [-3.590, 1.240]	0.154 [-3.640, 1.260]	0.148 [-3.640, 1.260]
School Leadership			
Mean (SD)	0.0169 (1.100)	-0.005 (1.090)	0.000 (1.090)
Median [Min, Max]	0.243 [-3.940, 1.430]	0.220 [-3.930, 1.450]	0.225 [-3.940, 1.450]
Managing Student Behavior			
Mean (SD)	0.026 (1.110)	-0.008 (1.090)	0.000 (1.100)
Median [Min, Max]	0.222 [-3.150, 1.790]	0.176 [-3.170, 1.800]	0.185 [-3.170, 1.800]
Professional Growth Opportunities			
Mean (SD)	0.012 (0.903)	-0.004 (0.900)	-0.000 (0.901)

Median [Min, Max]	0.126 [-3.000, 1.590]	0.117 [-3.020, 1.580]	0.119 [-3.020, 1.590]
Engaged Students & Engaging Families			
Mean (SD)	0.008 (0.870)	-0.003 (0.868)	0.000 (0.869)
Median [Min, Max]	0.097 [-3.440, 1.770]	0.090 [-3.550, 1.770]	0.091 [-3.550, 1.770]
Feeling Safe			
Mean (SD)	0.007 (0.941)	-0.002 (0.939)	0.000 (0.940)
Median [Min, Max]	0.146 [-3.480, 1.200]	0.143 [-3.520, 1.190]	0.144 [-3.502, 1.200]

Table 8

Teacher Demographic Variables Percentage and Frequencies

	Special Education Teacher (N=12128)	**Other Content Area (N=38421)**	**Overall (N=50549)**
Gender			
Male	1467 (12.1%)	7871 (20.5%)	9338 (18.5%)
Female	10661 (87.9%)	30550 (79.5%)	41211 (81.5%)
Race			
Asian	199 (1.6%)	631 (1.6%)	830 (1.6%)
Black/African American	1258 (10.4%)	3115 (8.1%)	4373 (8.7%)
Native Hawaiian/Pacific Islander	14 (0.1%)	60 (0.2%)	74 (0.1%)
Indian/ Alaskan Native	30 (0.2%)	81 (0.2%)	111 (0.2%)
Other	475 (3.9%)	1480 (3.9%)	1955 (3.9%)
White	10152 (83.7%)	33054 (86.0%)	43206 (85.5%)
Hispanic or Latino			
No	11798 (97.3%)	37140 (96.7%)	48938 (96.8%)

Yes	330 (2.7%)	1281 (3.3%)	1611 (3.2%)
Years Worked at School			
1-3 Years	4622 (38.1%)	13681 (35.6%)	18303 (36.2%)
4-10 Years	3982 (32.8%)	12338 (32.1%)	16320 (32.3%)
11-20 Years	2627 (21.7%)	8887 (23.1%)	11514 (22.8%)
Over 20 Years	897 (7.4%)	3515 (9.1%)	4412 (8.7%)
Grade Level Taught			
Elementary	6515 (53.7%)	17339 (45.1%)	23854 (47.2%)
High	2682 (22.1%)	11806 (30.7%)	14488 (28.7%)
Middle	2306 (19.0%)	7520 (19.6%)	9826 (19.4%)
More than 1 Grade Level	625 (5.2%)	1756 (4.6%)	2381 (4.7%)
Retention Outcome			
Leaver	988 (8.1%)	2879 (7.5%)	3867 (7.7%)
Stayer	9846 (81.2%)	32004 (83.3%)	41850 (82.8%)
Mover	1294 (10.7%)	3538 (9.2%)	4832 (9.6%)

Table 9

Descriptive Statistics of Individual Teacher Working Condition Items

Item	Mean (SD)
Teachers are trusted to make sound professional decisions about instruction.	4.593 (1.273)
Teachers are relied upon to make decisions about educational issues.	4.322 (1.287)
Teachers engage in collaborative problem solving in this school.	4.709 (1.134)
Teachers are effective leaders in this school.	4.799 (1.082)
I am free to be creative in my teaching approach.	4.748 (1.232)
I control how I use my scheduled class time.	4.575 (1.298)
I set the grading and student assessment practices in my classroom.	4.417 (1.301)

Current policies convey confidence in my ability to do well at my job.	4.381 (1.297)
My role as an educator is respected under current policies.	4.444 (1.330)
I feel that policy directives are improving our education system.	3.854 (1.338)
I feel respected by teachers and other adults at this school.	4.845 (1.116)
Teachers and other adults at this school support one another to meet the needs of all students.	4.778 (1.110)
Teachers and other adults at this school trust one another.	4.489 (1.187)
Teachers and other adults at this school collaborate to make this school run effectively.	4.718 (1.129)
Teachers and other adults at this school have taught me things that have helped me do my job better.	5.102 (0.946)
Teachers and other adults at this school expect students to use facts and evidence to support their ideas.	4.983 (0.816)
Teachers and other adults at this school want students to think about different ways to solve problems.	5.001 (0.885)
Teachers and other adults at this school encourage students to provide constructive feedback to others.	4.674 (0.980)
Teachers and other adults at this school encourage students to share their ideas about what they are studying in class.	4.916 (0.884)
Teachers and other adults at this school often connect what students are learning to life outside the classroom.	4.796 (0.938)
Teachers and other adults at this school expect students to succeed.	5.226 (0.814)
Teachers and other adults at this school provide students the support they need to succeed.	4.955 (0.942)
Teachers and other adults at this school feel responsible to help all students achieve their full potential.	5.030 (0.956)
Students come to school ready to learn.	3.860 (1.206)
Students willingly participate in classroom lessons.	4.427 (1.071)
Students put forth the effort required to learn the material.	3.933 (1.196)
The physical environment of my classroom supports my teaching and my students' learning.	4.775 (1.197)
I have adequate space to work productively.	4.704 (1.276)
My school provides me with sufficient access to appropriate instructional materials.	4.662 (1.183)
I have the support I need to incorporate technology into my instruction.	4.707 (1.233)
I feel respected by this school's administrators.	4.839 (1.326)
I feel comfortable raising issues and concerns that are important to me with school administrators.	4.506 (1.462)

I trust this school's administration to do what they say they will do.	4.563 (1.384)
This school's administrators support the professional development of staff.	4.984 (1.110)
This school's administrators support teachers' efforts to maintain discipline in the classrooms.	4.384 (1.453)
This school's administrators communicate a clear vision for this school.	4.756 (1.263)
Teachers and other staff have a shared vision for this school.	4.674 (1.123)
This school's administrators understand how children learn.	4.781 (1.191)
This school's administrators set high expectations for all students.	4.875 (1.178)
Teacher performance is assessed objectively.	4.715 (1.171)
Teachers receive feedback that can help them improve their teaching.	4.622 (1.213)
The procedures for teacher evaluation are consistent.	4.693 (1.229)
Sufficient resources are available for professional development in my school.	4.439 (1.183)
Professional development is differentiated to meet the individual needs of teachers.	3.951 (1.392)
Follow-up is provided after professional development activities to give teachers additional support.	4.039 (1.294)
Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.	4.352 (1.224)
Professional development enhances teachers' abilities to improve student learning.	4.448 (1.184)
Class sizes are reasonable such that teachers have the time available to meet the needs of all students.	3.876 (1.456)
Teachers have time available to collaborate with colleagues.	3.960 (1.401)
The non-instructional time provided for teachers in my school is sufficient.	3.607 (1.530)
Teachers have sufficient instructional time to meet the needs of all students.	4.076 (1.345)
Students know how this school defines inappropriate behavior.	4.364 (1.357)
Students know there are consequences for breaking school rules.	4.195 (1.449)
Teachers and other adults at this school consistently enforce rules for student behavior.	4.088 (1.413)
When students are accused of doing something wrong, they get a chance to explain.	5.043 (0.797)
Students are acknowledged for positive behavior.	5.006 (0.971)
There are supports to help a student who consistently misbehaves develop positive behavior.	4.170 (1.373)
We use data to evaluate and, if needed, adjust this school's student conduct policies.	4.271 (1.352)
This school's rules for student behavior are effective.	3.971 (1.426)
New teachers are formally assigned a mentor.	1.077 (0.410)
New teachers are provided a reduced workload.	0.765 (0.921)

New teachers are provided release time to observe other teachers.	1.060 (0.803)
New teachers are provided formal time to meet with mentor during school hours.	0.977 (0.809)
Teachers and other adults provide useful information to parents and guardians to support their children's learning at home.	4.824 (0.925)
Teachers and other adults help parents and guardians teach healthy social and emotional skills.	4.261 (1.213)
This school maintains clear, two-way communication with parents and guardians.	4.860 (0.954)
This school does a good job of encouraging parent/guardian involvement.	4.810 (1.036)
Parents and guardians help their children achieve the educational goals of the school, both academic and behavioral.	3.882 (1.251)
I am treated with respect by students at this school.	4.581 (1.224)
I feel safe at this school.	4.942 (1.085)
I feel there is adequate security in this school.	4.504 (1.356)
Bullying is a problem at this school.	2.993 (1.266)
Students at this school are bullied about their race or ethnicity.	2.430 (1.134)
Students at this school are bullied about their clothing or physical appearance.	2.889 (1.304)
Students at this school are bullied about their sexual orientation.	2.369 (1.192)
Students at this school are bullied about their disability.	2.506 (1.232)
Overall, my school is a good place to work and learn.	4.807 (1.251)

Primary Analysis

Research Question 1

RQ1 addresses whether SETs and teachers of other content areas differ in their perception of teacher working conditions (TWCs). An independent samples *t*-test was originally chosen to determine if there were significant statistical differences between special education teachers (SETs) and teachers of other content areas for all TWCs. I first assessed the assumptions of a *t*-test and the TWCs did not have a normal distribution as indicated by the Kolmogorov–Smirnov equality-of-distributions test. Given that the data failed this assumption, a Mann-Whitney *U* test was used to identify differences between the two populations. The analysis

identified four TWCs where the means of SETs and other content areas were significantly different (Table 10). These TWCs include Teacher Leadership and Autonomy (p =0.010), Instructional Environment (p= 0.000), School Leadership (0.008), and Managing Student Behavior (p=0.000). While perception of Teacher Leadership and Autonomy and Instructional Environment for SETs had lower means than for teachers of other content areas, Managing Student Behavior and School Leadership were higher for SETs than those of other contents.

Table 10

Differences between Special Education Teachers and Other Content Area Teachers on Teacher Working Conditions

	Special Education Teachers		**Other Content Area Teachers**		***z***	***p***	***Cohen's D***
	M	*SD*	*M*	*SD*			
Teacher Leadership and Autonomy	-0.022	1.040	0.007	1.020	-2.583	0.010	0.029
Rigorous Instruction	0.005	0.623	-0.002	0.622	1.402	0.161	0.012
Instructional Environment	-0.037	0.904	0.012	0.866	-4.438	0.000	0.056
School Leadership	0.017	1.100	-0.005	1.090	2.645	0.008	0.020
Managing Student Behavior	0.026	1.110	-0.008	1.090	3.728	0.000	0.032
Professional Growth	0.012	0.903	-0.004	0.900	1.512	0.131	0.018
Engaged Students and Engaging Family	0.008	0.870	-0.002	0.868	1.203	0.229	0.012
Feeling Safe	0.007	0.941	-0.002	0.939	1.227	0.220	0.010

Research Questions 2, 3, and 4

Research questions 2, 3, and 4 address the teacher intention models with variables that include both the teacher and school levels. To best address the outcome, a multilevel,

multinomial logistic regression analysis was fit to assess the factors associated with special education teachers' (SET) intention to leave education and move from their school. In this study, in the multivariable multilevel multinomial regression analysis, both individual level and school level variables were found to be associated with both intention to leave teaching and move from their school. Table 11 outlines the results.

Table 11

Multilevel, Multinomial Logistic Regression Results for Models 1-3

Characteristics	**Null Model**	**Model 1**		**Model 2**		**Model 3**	
		Teacher Demographics		Teacher Demographics and Teacher Working Conditions		Teacher Demographics, Teacher Working Conditions, and School Level Variables	
		Leaving Teaching	Moving Schools	Leaving Teaching	Moving Schools	Leaving Teaching	Moving Schools
		RRR (95% CI)	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)
Gender							
	Male	1.20	1.20	1.32	1.43	1.29	1.42
		(0.99, 1.46)	(0.99, 1.45)	(1.09, 1.62)**	(1.17, 1.75)***	(1.06, 1.59)*	(1.16, 1.74)***
	Female	1.00	1.00	1.00	1.00	1.00	1.00
Race							
	Asian	0.32	0.83	0.42	1.24	0.42	1.25
		(0.13, 0.78)*	(0.50, 1.37)	(0.17, 1.04)	(0.72, 2.11)	(0.17, 1.04)	(0.73, 2.13)
	Black	1.82	1.22	2.00	1.38	2.02	1.28

	(1.51, 2.19)***	(1.00, 1.49)	(1.65, 2.42)***	(1.12, 1.71)**	(1.65, 2.46)***	(1.03, 1.59)*
Hawaiian	1.05	2.45	1.14	2.31	1.35	3.00
	(0.13, 8.41)	(0.61, 9.81)	(0.13, 9.67)	(0.48, 11.02)	(0.16, 11.66)	(0.60, 14.88)
Indian Alaskan Native	2.15	2.43	1.92	1.85	1.44	1.67
	(0.72, 6.42)	(0.90, 6.52)	(0.62, 5.95)	(0.60, 5.66)	(0.41, 5.13)	(0.55, 5.12)
Other	2.03	2.14	1.65	1.46	1.60	1.41
	(1.50, 2.74)***	(1.62, 2.84)***	(1.23, 2.25)***	(1.08, 1.97)*	(1.17, 2.20)**	(1.04, 1.91)*
White	1.00	1.00	1.00	1.00	1.00	1.00
Ethnicity: Hispanic or Latino						
Yes	0.90	0.88	0.92	0.88	0.96	0.92
	(0.59, 1.37)	(0.61, 1.29)	(0.60, 1.40)	(0.59, 1.32)	(0.63, 1.46)	(0.64, 1.37)
No	1.00	1.00	1.00	1.00	1.00	1.00
Years Worked at School						
1-3 years	1.00	1.00	1.00	1.00	1.00	1.00
4-10 years	1.20	0.96	1.02	0.77	1.00	0.77
	(1.02, 1.41)*	(0.83, 1.10)	(0.87, 1.21)		(0.85, 1.19)	

				(0.66, 0.90)***		(0.66, 0.90)***
11-20 years	1.41	0.64	1.20	0.51	1.20	0.51
	(1.18, 1.70)***	(0.54, 0.76)***	(1.00, 1.44)*	(0.42, 0.62)***	(1.00, 1.43)	(0.43, 0.62)***
20+ years	1.32	0.32	1.18	0.27	1.17	0.27
	(1.03, 1.70)*	(0.22, 0.45)***	(0.91, 1.52)	(0.18, 0.38)***	(0.90, 1.51)	(0.18, 0.38)***
Grade Level Taught						
Elementary	1.00	1.00	1.00	1.00	1.00	1.00
Middle	1.27	1.19	1.24	0.99	1.23	1.06
	(1.06, 1.52)**	(0.98, 1.43)	(1.03, 1.50)*	(0.82, 1.20)	(1.02, 1.49)*	(0.88, 1.28)
High	1.33	0.88	1.17	0.59	1.15	0.64
	(1.12, 1.59)***	(0.72, 1.07)	(0.98, 1.41)	(0.48, 0.72)***	(0.96, 1.39)	(0.52, 0.79)***
More than One	0.91	0.93	1.02	0.95	1.03	1.07
	(0.06, 0.08)	(0.70, 1.26)	(0.73, 1.44)	(0.69, 1.31)	(0.73, 1.47)	(0.78, 1.47)
Teacher Working Conditions						

Teacher Leadership and Autonomy	0.68	0.76	0.69	0.75
	(0.61, 0.76)***	(0.68, 0.84)***	(0.62, 0.77)***	(0.68, 0.84)***
Rigorous Instruction	1.22	1.14	1.20	1.11
	(1.04, 1.43)*	(0.98, 1.31)	(1.02, 1.41)*	(0.96, 1.29)
Instructional Environment	0.95	0.92	0.95	0.91
	(0.86, 1.04)	(0.84, 1.00)	(0.86, 1.04)	(0.83, 0.99)*
School Leadership	0.84	0.43	0.84	0.44
	(0.74, 0.95)**	(0.38, 0.48)***	(0.74, 0.95)**	(0.39, 0.49)***
Managing Student Behavior	1.16	1.17	1.16	1.13
	(1.02, 1.31)*	(1.04, 1.31)**	(1.03, 1.32)*	(1.00, 1.27)*
Professional Growth Opportunities	0.88	1.21	0.87	1.19
	(0.77, 1.00)*	(1.07, 1.37)**	(0.77, 0.99)*	(1.05, 1.34)**
Engaged Students and Engaging Families	0.81	0.81	0.80	0.88
	(0.69, 0.96)*	(0.69, 0.95)**	(0.67, 0.95)**	(0.74, 1.04)
Feeling Safe	0.86	0.83	0.87	0.83

	(0.78, 0.95)**	(0.76, 0.91)***	(0.79, 0.96)**	(0.76, 0.91)***
School Level Variables				
% of Students receiving Ex Ed services			1.31	0.21
			(0.38, 4.44)	(0.04, 1.15)
% of Students ED			0.93	2.29
			(0.63, 1.37)	(1.56, 3.37)***

*Notes. * = p≤0.05, ** = p≤0.01, *** = p≤0.00*

Research Question 2

Research Question 2 addresses the estimate of the unconditional model to test whether multilevel modeling is needed for further analysis (Garson, 2020). For special education teacher retention, the unconditional model indicates that multilevel modeling is appropriate. The intraclass correlation coefficient (ICC), calculated with level 1 variance fixed and then pi squared divided by three, confirms the proportion of total variation in SET retention that is accounted for by school differences. For this model, the ICC is 0.05, indicating 5% of the total variability in SET retention is accounted for by differences between schools.

Research Question 3

Research Question 3 addresses the inclusion of teacher level variables to examine the effects that teacher level variables have on SET retention. After estimating the unconditional model, I estimated the effects that Level 1 predictors would have on SET retention intentions. Model 1 includes teacher demographic variables while Model 2 builds on Model 1 through incorporating the Teacher Working Conditions. Both models can be found in Table 10. In Model 2, there were several teacher demographic variables and teacher working conditions that were associated with both intention to leave teaching as well as the intention to move schools. Including TWCs into the model greatly improved model fit statistics with AIC values improving from 14530.57 to 12864.39 or reducing by 78%. (Table 12).

Factors associated with intention to leave teaching: Teacher Demographics and TWCs.

Special Education teacher gender, race, years worked at school, grade level, and working conditions were associated with the intention to leave teaching. Being a male SET was associated with a 32% higher risk (RRR = 1.32, 95% CI: 1.09, 1.62) of intending to leave

teaching while controlling for all other teacher demographic characteristics and TWCs. A SET's racial identity was a significant factor as well. SETs that identified as Black/African American or other racial identity had a 100% (RRR =2.00, 95% CI; 1.65, 2.42) and 65% higher risk (RRR = 1.65, 95% CI; 1.23, 2.25) of intending to leave teaching, respectively. Grade level was also a significant factor with those that teach middle school having a 24% high risk (RRR = 1.24, 95% CI; 1.03, 1.50). Years worked at school was also significant, with SETs teaching in the 11-20 year category having a 20% higher risk (RRR = 1.20, 95% CI; 1.00, 1.44) of leaving teaching compared to those teaching 1-3 years. Among all TWCs, there were several that were associated with the risk of leaving teaching. Some TWCs were associated with a higher risk, while some were associated with a lower risk. Perception of teacher leadership and autonomy, school leadership, professional growth opportunities, engaged students and engaging families, and feeling safe were all associated with a lower risk. For a one-unit increase in perception of teacher leadership and autonomy, SETs had a 32% lower risk (RRR = 0.68, 95% CI; 0.61, 0.76) of leaving teaching and SETs that had a one-unit increase in school leadership had a 16% lower risk (RRR=0.84, 95% CI; 0.74, 0.95). For a one-unit increase in each of the following TWCs, professional growth opportunities was associated with a 12% (RRR = 0.88, 95% CI; 0.77, 1.00) lower risk, engaged students and engaging families was associated with a 19% (RRR = 0.81, 95% CI; 0.69, 0.96) lower risk, and feeling safe was associated with a 14% (RRR = 0.86, 95% CI; 0.78, 0.95) lower risk of leaving teaching. Two TWCs were associated with a higher risk. For a one-unit increase in rigorous instruction and managing student behavior, SETs had a 22% (RRR= 1.22, 95%CI; 1.04, 1.43) and 16% (RRR=1.16, 95%CI; 1.02, 1.31) higher risk of leaving teaching, respectively.

Factors associated with intention to move schools: Teacher Demographics and TWCs.

SET gender, race, years worked at school, grade level, and working conditions were all associated with the intention to move schools. Being a male SET was associated with a 43% (RRR =1.43, 95%CI; 1.17, 1.75) higher risk of intending to move schools. Racial identity was significant as well regarding moving schools. Identifying as Black/African American or other racial identity was associated with a 38% (RRR =1.38, 95%CI; 1.12, 1.71) and a 46% (RRR =1.46, 95%CI; 1.08, 1.97) higher risk of intending to move schools, respectively. The years spent working at a school was a significant variable as well. SETs that worked 4-10 (RRR =0.77, 95%CI;0.66, 0.90), 10-20 (RRR =0.51, 95%CI;0.42, 0.62), or 20+ years (RRR =0.27, 95%CI;0.18, 0.38) had a 23%, 49%, and 73% lower risk of moving schools than those that taught 1-3 years while accounting for all other factors in the model. Grade level taught was also associated with moving schools, with SETs that teach high school having a 41% (RRR =0.59, 95% CI;0.48, 0.72) lower risk than the reference category of elementary school SETs.

There were several TWCs that were associated with moving schools. Teacher leadership and autonomy, school leadership, engaged students and engaging families, and feeling safe were all associated with a lower risk of moving schools. For a one-unit increase in perception of teacher leadership and autonomy, SETs had a 24% lower risk (RRR = 0.76, 95%CI; 0.68, 0.84) of moving schools and SETs that had a one-unit increase in school leadership had a 57% lower risk (RRR=0.43, 95%CI;0.38, 0.48). For a one-unit increase in each of the following TWCs, engaged students and engaging families was associated with a 19% (RRR = 0.81., 95%CI;0.69, 0.95) lower risk, and feeling safe was associated with a 17 % (RRR = 0.83, 95%CI; 0.76, 0.91) lower risk of moving schools. Two TWCs were associated with a higher risk. For a one-unit

increase in managing student behavior and professional growth opportunities, SETs had a 17% (RRR= 1.17, 95%CI;1.04, 1.31) and 21% (RRR=1.21, 95%CI;1.07, 1.37) higher risk of moving schools.

Research Question 4

Model 3 (Table 10) builds on the previous models by including the Level 2 predictors of percent of students receiving free and reduced lunch as well as percent of students receiving special education services in their school. The inclusion of school level variables also improved the overall model fit with AIC improving from 12864.39 to 12694.16 (73% reduction).

Factors associated with intention to leave teaching: Teacher Demographics, TWCs, and School Level Variables.

SET gender, race, grade level, and working conditions were associated with the intention to leave teaching. Being a male special education teacher was associated with a 29% higher risk (RRR =1.29, 95% CI; 1.06, 1.59) of intending to leave teaching while controlling for all other variables in the model. Racial identity was a significant factor as well. SETs that identified as Black/African American or Other had 102% (RRR =2.02, 95% CI; 1.65, 2.46) and 60% (RRR =1.60, 95% CI; 1.17, 2.20) higher risks of intending to leave education as compared to SETs that identified as White while controlling for all other factors in the model. The grade level taught was also associated with intention to leave. SETs who teach middle school are associated with a 23% higher risk (RRR=1.23, 95% CI; 1.02, 1.49) of intending to leave teaching. Teacher Working Conditions had several significant factors associated with intending to leave teaching while controlling for teacher demographic and school level variables. For a one-unit increase in teacher leadership and autonomy, SETs had a 31% lower risk (RRR=0.69, 95% CI; 0.62, 0.77) of leaving teaching. School leadership was associated with a lower risk as well. For a one-unit

increase in perception of school leadership, SETs had a 16% lower risk (RRR=0.84, 95% CI; 0.74, 0.95) of intending to leave teaching. A one-unit increase of perceptions of professional growth opportunities (RRR=0.87, 95% CI; 0.77, 0.99), engaged students and engaging families (RRR=0.80,95% CI;0.67, 0.95), and feeling safe (RRR=0.87, 95% CI; 0.79, 0.96) are associated with a 13%, 20%, and 13% lower risk of intending to leave teaching, respectively. Some teacher working conditions were associated with a higher risk as well. SETs had a 20% (RRR=1.20, 95% CI;1.02, 1.41) and 16% (RRR=1.16, 95% CI;1.03, 1.32) higher risk of leaving teaching for a one-unit increase in perception of rigorous instruction and managing student behavior.

Factors associated with intention to move from their school: Teacher Demographics, TWCs, and School Level Variables.

Special Education teacher (SET) gender, race, years worked at school, grade level, working conditions, and % of students receiving free and reduced lunch were associated with the intention to move from their school. Being a male SET was associated with a 42% (RRR=1.42, 95% CI; 1.16, 1.74) higher risk of moving schools compared to females. Racial identity was a significant factor as well. SETs that identified as Black/African American had a 28% (RRR=1.28, 95% CI; 1.03, 1.59) higher risk or other had a 41% (RRR=1.41, 95% CI; 1.04, 1.91) higher risk of moving from their school compared to SETs that identified as White. The number of years that SETs worked at their school was associated with intention to move from their school as well. SETs that worked 4-10 years (RRR=0.77, 95% CI;0.66, 0.90), 11-20 years (RRR=0.51, 95% CI;0.43, 0.62), or more than 20 years (RRR=0.27, 95% CI; 0.18, 0.38) all had a lower risk of intending to move from their school compared to SETs that had worked at the school for 1-3 years. Grade level also has associations with intention to move from their school. SETs that teach in high school had a 36% (RRR=0.64, 95% CI;0.52, 0.79) lower risk of moving

from their school compared to SETs at the elementary level. Several TWCs were associated with a SETs' intention to move from their school. A one-unit increase in teacher leadership and autonomy (RRR=0.75, 95% CI;0.68, 0.84) as well as perception of school leadership (RRR=0.44, 95% CI;0.39, 0.49) were associated with a 25% and 66% lower risk of moving from their school. Perception of the instructional environment as well as feeling safe were also associated with a lower risk of moving. A one-unit increase in the instructional environment (RRR=0.91, 95% CI;0.83, 0.99) as well as feeling safe (RRR=0.83, 95% CI;0.76, 0.91) were associated with a 9% and 17% lower risk of moving from their school. Managing student behavior and professional growth opportunities were both associated with a higher risk of SETs moving from their school. A one-unit increase in perception of managing student behavior as well as professional growth opportunities were associated with a 13% (RRR=1.13, 95% CI;1.00, 1.27) and 19% (RRR=1.19, 95% CI;1.05, 1.34) higher risk of moving from their school. A school-level variable is also associated with teachers moving their school. A one-unit increase in the percent of students who receive free and reduced lunch is associated with a 129% higher risk of SETs moving from their school.

Table 12

Model Fit Statistics

Parameter	Null Model	Model 1	Model 2	Model 3
School ID Variance	0.164	.1165764	.0353076	.0435559
Intraclass Correlation Coefficient	0.05			
Percent Reduction in Variance from Null Model	Reference	28.9%	78.5%	73.4%
Log-Likelihood	-7349.79	-7235.283	-6386.197	-6297.078

Akaike's information criteria	14707.58	14530.57	12864.39	12694.16
Bayesian information criteria	14737.20	14752.66	13204.94	13063.63

Assumptions

The four assumptions of multinomial logistic regression include linearity, no regression outliers, independence of residuals, and no multicollinearity. Histograms were run for each variable and found no significant outliers. Each data point is independent, meaning that each data point does not depend on another. In order to test for linearity and multicollinearity, a regression model was run for each outcome. Three regressions were run, for the stayers, leavers, and movers outcome. Linearity and correct model specification were assessed through the Stata command "linktest". A violation of this assumption would be if the model was non-linear. This assumption is violated, indicating that a variable may need to be transformed. However, specification of a model should primarily be ground in theoretical considerations rather than methodological ones (Springer, 1997). Multicollinearity was assessed by checking the Variance Inflation Factor (VIF) of all the variables for each model. All variables except two were below 5 indicating that multicollinearity is not present. The two variables that were above 5, perception of school leadership and engaged students and engaging families, were still below 6 which is within the threshold indicating no multicollinearity.

Predicted Probabilities of Significant Variables

Following the development of the final model, I calculated predicted probabilities to interpret multiple, significant variables regarding intention to leave teaching or move schools. I first chose to analyze significant factors at the demographic level that increased the risk of moving or leaving and determined predicted probabilities of intention with those combined variables. Then, I incorporated significant teacher working conditions that lowered the risk of

leaving teaching or moving schools to determine if these teacher working conditions had an impact on the probability of leaving or moving. For example, the results would analyze if a high perception of school leadership lowered the probability and a low perception increased the probability of leaving or moving.

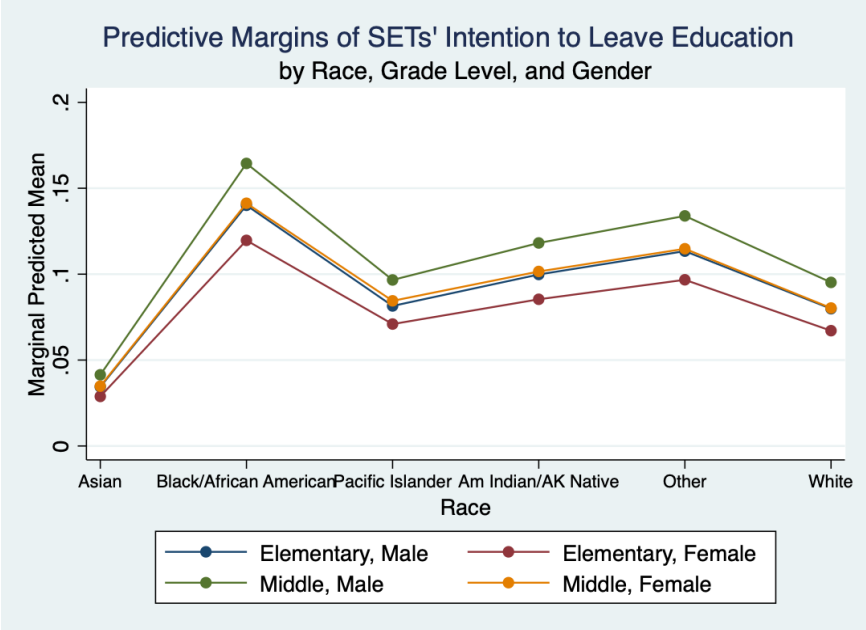
Factors associated with Intention to Leave Teaching.

Significant Teacher Demographics.

Identifying as Black/African American or the racial category of "Other", a Male, and teaching middle school were all significant demographic factors that were associated with an SETs' intention to leave teaching. I calculated predicted probabilities of the significant teacher demographics as well as the reference category for each significant teacher demographic while also incorporating average perception TWCs, percent free and reduced lunch, and percent of students who receive special education services. Figure 2 shows the predicted probabilities of these significant factors. The group that had the highest predictive probability (16.4%) of leaving education were SETs that taught middle school, identified as Black/African American and Male with average TWCs. All male teachers that taught middle school had the highest probability of leaving across all racial identities.

Figure 2

Predictive Probabilities of SETs' Intention to Leave Education by Significant Teacher Demographic Factors



Significant Teacher Demographics and TWCs.

Teacher Leadership and Autonomy, School Leadership, Engaged Students and Engaging Families, as well as Feeling Safe were Teacher Working Condition factors that were significant factors associated with lowering the risk of the intention to leave the field of teaching. I explored predictive probabilities of significant teacher demographic variables that increased the risk of leaving with high and low perceptions of the TWCs. I chose to further explore only TWCs that lowered the risk to explore the impact of high and low perceptions of these TWCs on teacher demographics that had an increased risk. Predicted probabilities of SETs leaving their school and their high and low perceptions of the TWCs are found in Table 13 for middle school SETs that identify as male, Black/African American, and Other racial identity. In the Table, "Low Perception" is an SET that has a standardized score of the TWC ranging from negative five to negative three. "High Perception" is an SET that has a standardized score of the TWC ranging

from three to five. Figure 3-6 also shows the predictive probabilities of SETs intention to leave their school based on their perception of the TWC. Teacher Leadership and Autonomy had the highest and lowest predicted probability indicating that SETs that had significant teacher demographics related to the risk of leaving had an increased or decreased probability of leaving based on their perception. For example, SETs that teach middle school, identified as Black/African American, and had a low perception of teacher leadership and autonomy had a predicted probability of 0.32-0.45 of leaving teaching, an increase from 0.16 where all TWCs were held at an average score. However, teachers of the same population that had a high perception of teacher leadership and autonomy had a predicted probability of 0.03-0.07 of leaving teaching.

Table 13

Predicted Probabilities of Middle School SETs Leaving Teaching by Teacher Demographics and Perception of Teacher Working Conditions

TWC	Teacher Demographics	Low Perception	High Perception
Teacher Leadership and Autonomy	Middle School, Black/African American SET	0.32-0.45	0.03-0.07
	Middle School, Other Race SET	0.27-0.38	0.03- 0.05
School Leadership	Middle School, Black/African American SET	0.06-0.13	0.10-0.13
	Middle School, Other Race SET	0.04-0.10	0.08-0.11
Engaged Students and Engaging Families	Middle School, Black/African American SET	0.25-0.33	0.07-0.10
	Middle School, Other Race SET	0.21-0.28	0.05-0.08

Feeling Safe	Middle School, Black/African American SET	0.21-0.24	0.10-0.13
	Middle School, Other Race SET	0.17-0.19	0.08-0.10

Figure 3

Predictive Probabilities of Middle School SETs by Significant Teacher Demographics and Perception of Teacher Leadership and Autonomy

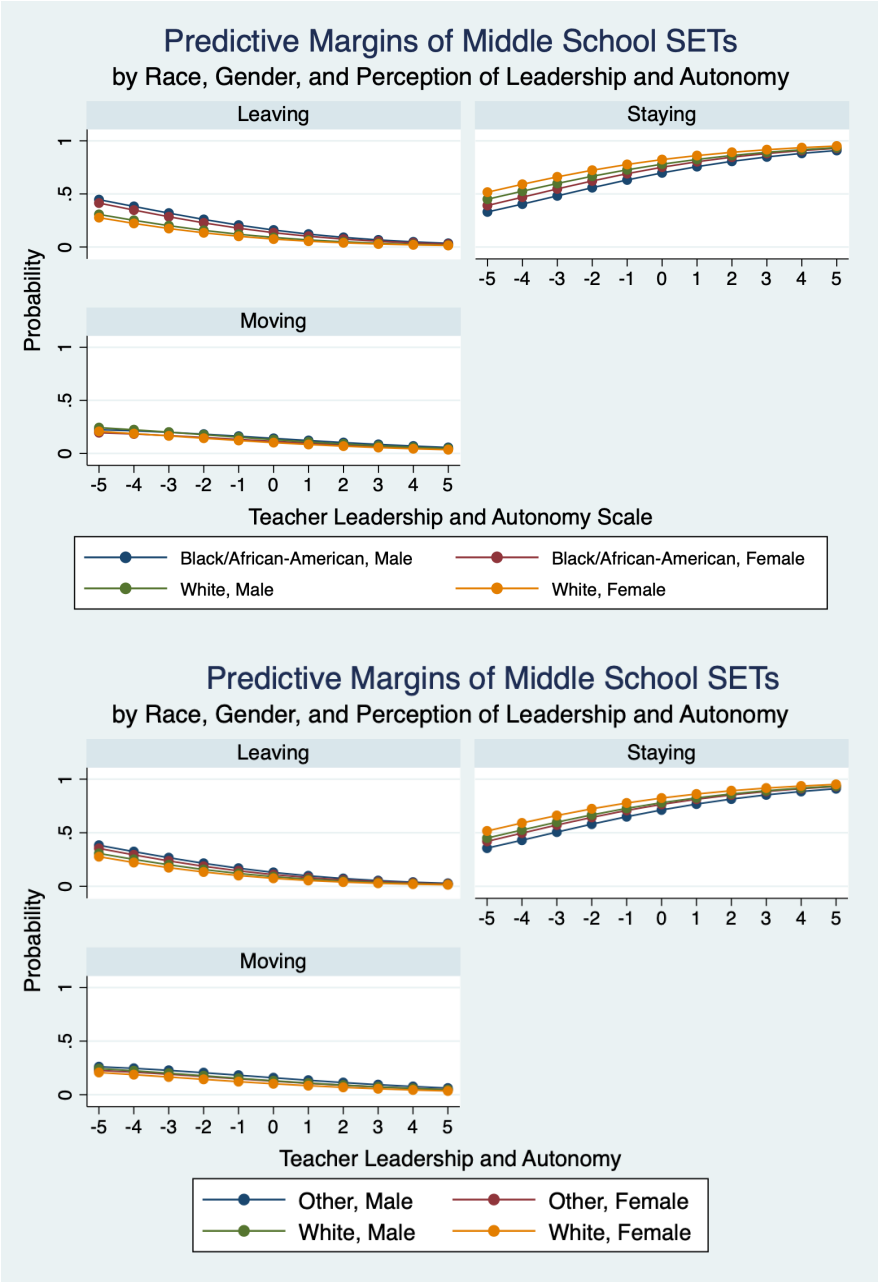


Figure 4

Predictive Probabilities of Middle School SETs by Significant Teacher Demographics and Perception of School Leadership

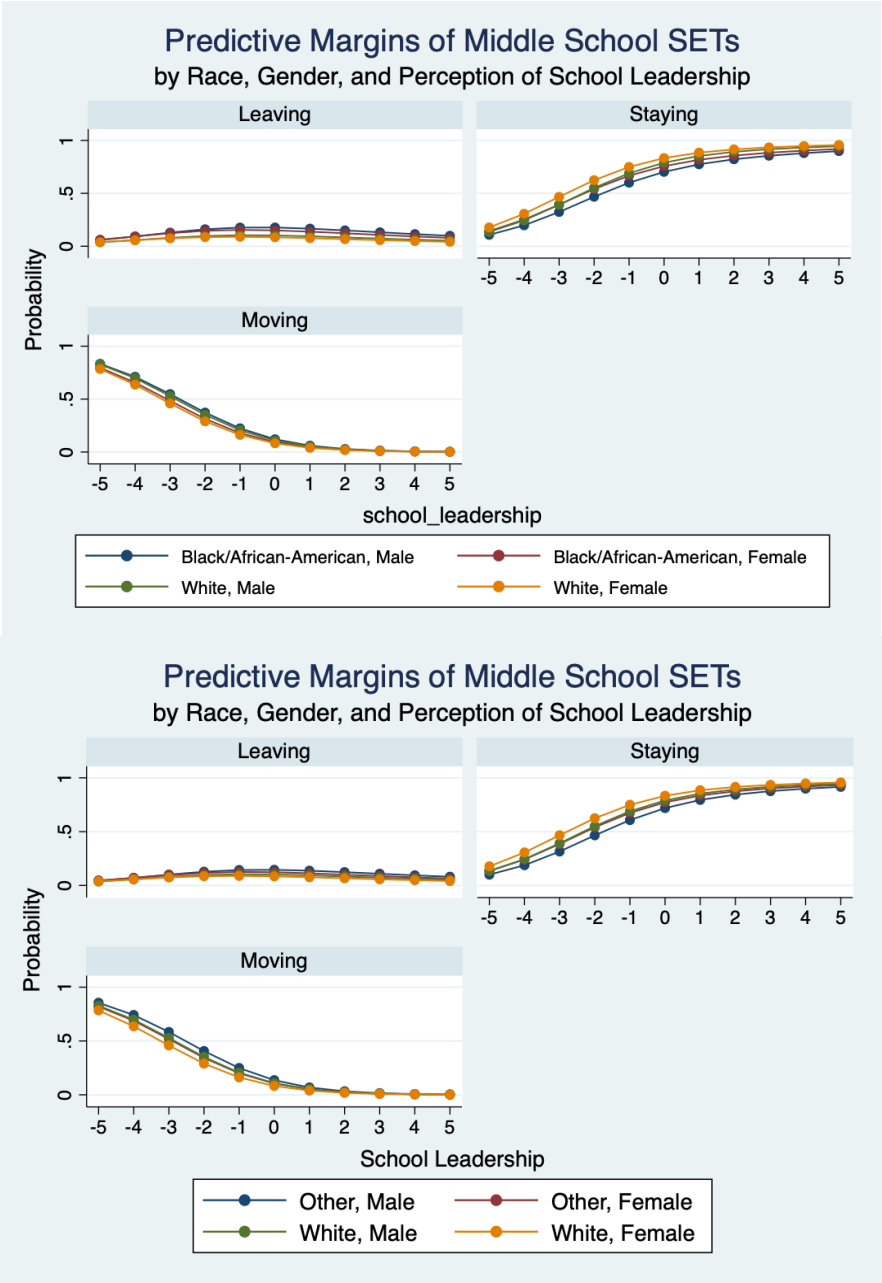


Figure 5

Predictive Probabilities of Middle School SETs by Significant Teacher Demographics and Perception of Engaged Students and Engaging Families

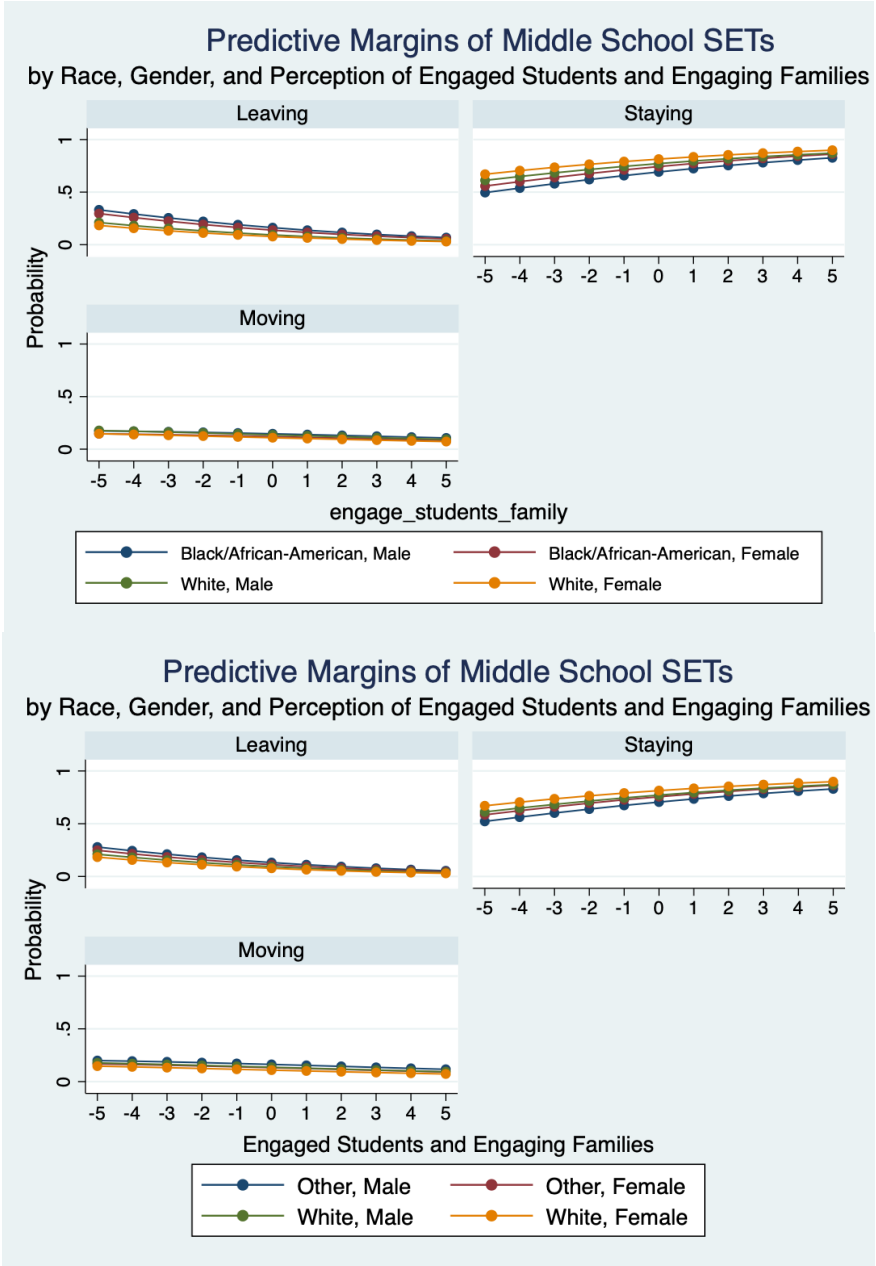
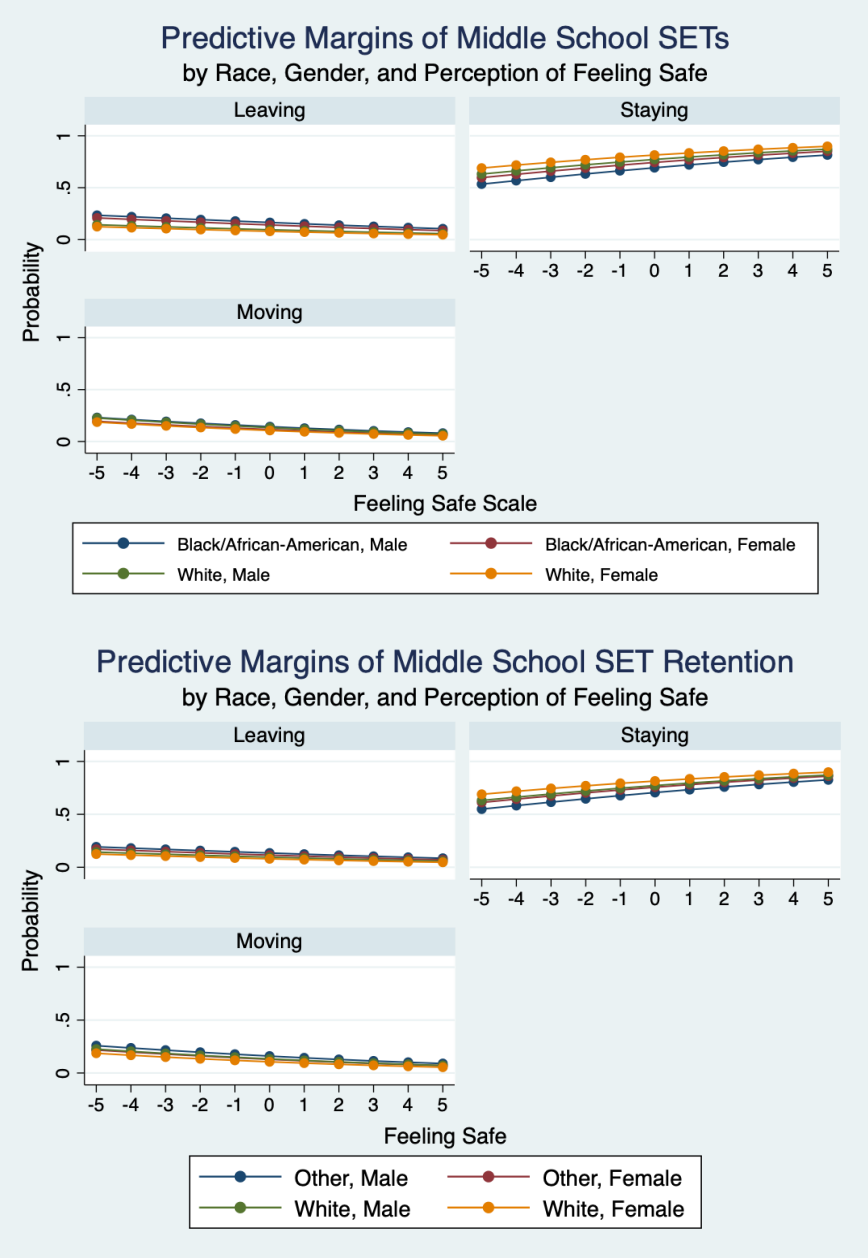


Figure 6

Predictive Probabilities of Middle School SETs by Significant Teacher Demographics and Perception of Feeling Safe

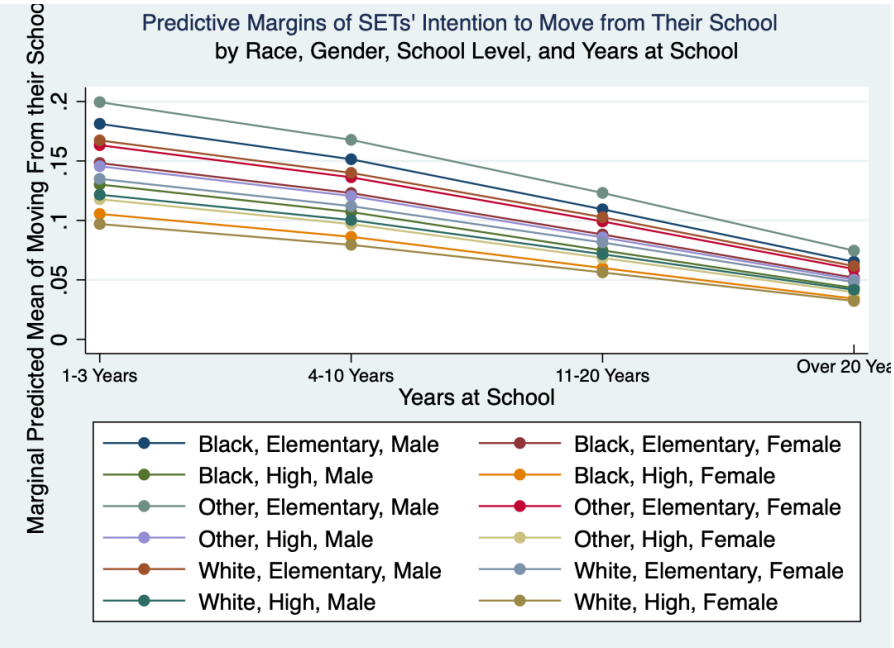


Factors associated with intention to move from their School.

Identifying as Black/African American or the racial category of "Other", a Male, years teaching at the school, and teaching high school were all significant factors that were associated with an SETs' intention to move schools while controlling for all other predictors. I calculated predicted probabilities of the significant teacher demographics as well as the reference category for each significant teacher demographic. Figure 7 shows the predicted probabilities of these significant factors. The group that had the highest predictive probability of moving schools were SETs that taught elementary school, identified as other racial identity, male, and taught at the school 1-3 years. All teachers that taught elementary school had the highest probability of leaving across all racial identities and years teaching at the school.

Figure 7

Predictive Probabilities of SETs' Intention to Move from their School by Significant Teacher Demographic Factors



Teacher Leadership and Autonomy, School Leadership, Instructional Environment, and Feeling Safe were Teacher Working Condition factors that were significant factors associated

with a lower risk of intention to move from their school. I explored predictive probabilities of significant teacher demographic variables that were associated with a higher risk of moving schools along with high and low perceptions of the TWCs. Predicted probabilities of SETs moving from their school and their high and low perceptions of the TWCs are found in Table 14 for elementary school SETs that identify as male, 1-3 of teaching experience at their school, Black/African American, and Other. In the Table, "Low Perception" is an SET that has a standardized score of the TWC ranging from negative five to negative three. "High Perception" is an SET that has a standardized score of the TWC ranging from three to five. Figures 9-11 also shows the predictive probabilities of SETs intention to leave their school based on their perception of the TWC. Perception of school leadership had the highest predicted probability of moving schools (0.63-0.90) if SETs that had demographic factors that increased their risk of moving had a low perception of their school leadership. However, for those same populations, if those SETs had a high perception of school leadership, their intention to move was almost mitigated with a predicted probability of 0.00-0.02. Perception of teacher leadership and autonomy, instructional environment, and feeling safe were also affected by high and low perceptions, but not to the extent of school leadership.

Table 14

Significant Teacher Demographics and Perception of TWCs

TWC	SET Demographics	Low Perception	High Perception
Teacher Leadership and Autonomy	Elementary School, Black, Male, 1-3 Years of Experience	0.25-0.29	0.07-0.10
	Elementary School, Other, Male, 1-3 Years of Experience	0.28-0.33	0.07-0.11

	High School, Black, Male, 1-3 Years of Experience	0.18-0.20	0.05-0.07
	High School, Other, Male, 1-3 Years of Experience	0.20-0.24	0.05-0.08
School Leadership	Elementary School, Black, Male, 1-3 Years of Experience	0.63-0.88	0.00-0.02
	Elementary, Other, Male, 1-3 Years of Experience	0.66-0.90	0.00-0.02
	High School, Black, Male, 1-3 Years of Experience	0.52-0.82	0.00-0.01
	High School, Other, Male, 1-3 Years of Experience	0.55-0.85	0.00-0.01
Instructional Environment	Elementary School, Black, Male, 1-3 Years of Experience	0.21-0.23	0.13-0.15
	Elementary, Other, Male, 1-3 Years of Experience	0.23-0.26	0.15-0.17
	High School, Black, Male, 1-3 Years of Experience	0.15-0.17	0.09-0.11
	High School, Other, Male, 1-3 Years of Experience	0.17-0.19	0.11-0.12
Feeling Safe	Elementary School, Black, Male, 1-3 Years of Experience	0.24-0.28	0.10-0.13
	Elementary, Other, Male, 1-3 Years of Experience	0.26-0.31	0.11-0.14
	High School, Black, Male, 1-3 Years of Experience	0.17-0.21	0.07-0.09
	High School, Other, Male, 1-3 Years of Experience	0.19-0.23	0.08-0.10

Figure 8

Predictive Probabilities of Elementary School SETs by Significant Teacher Demographics and Perception of Teacher Leadership and Autonomy

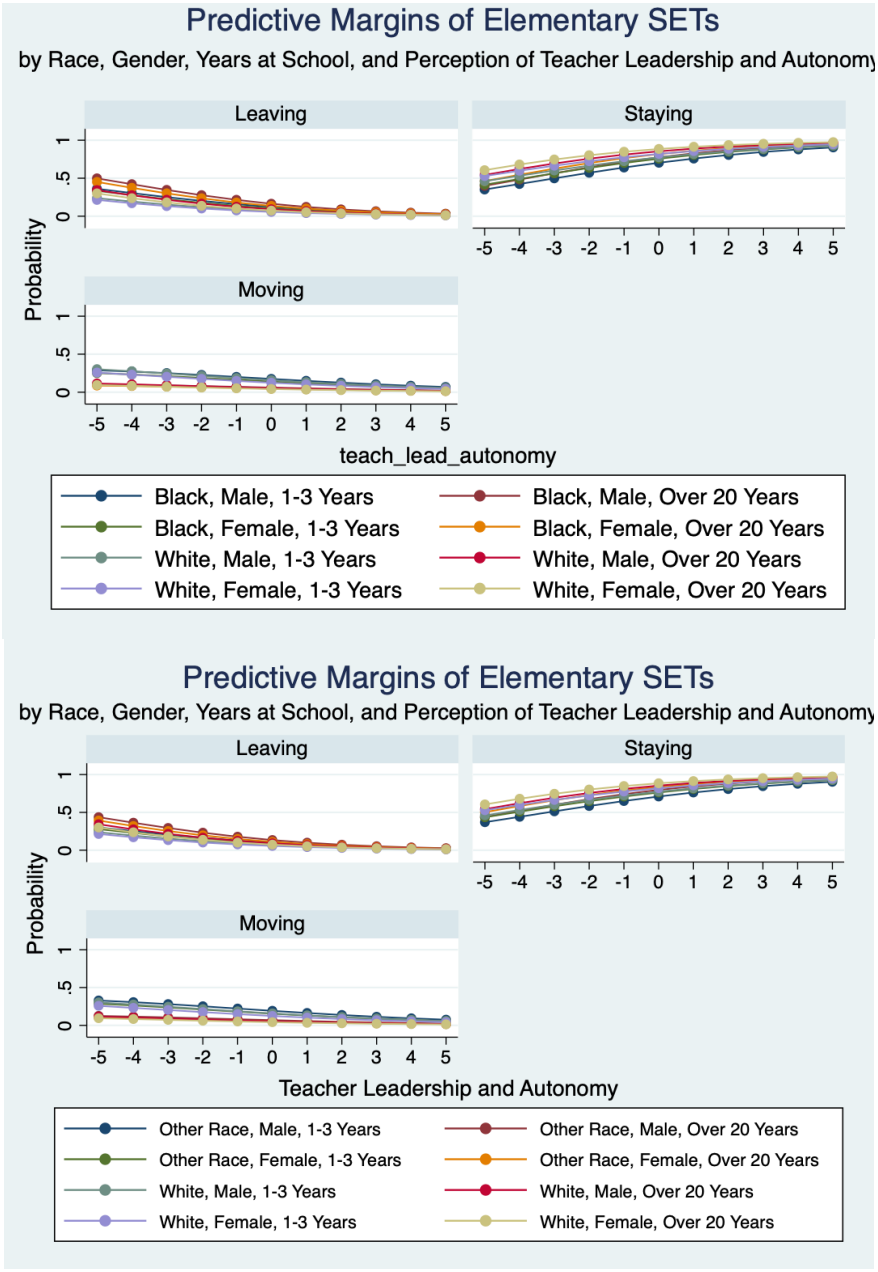
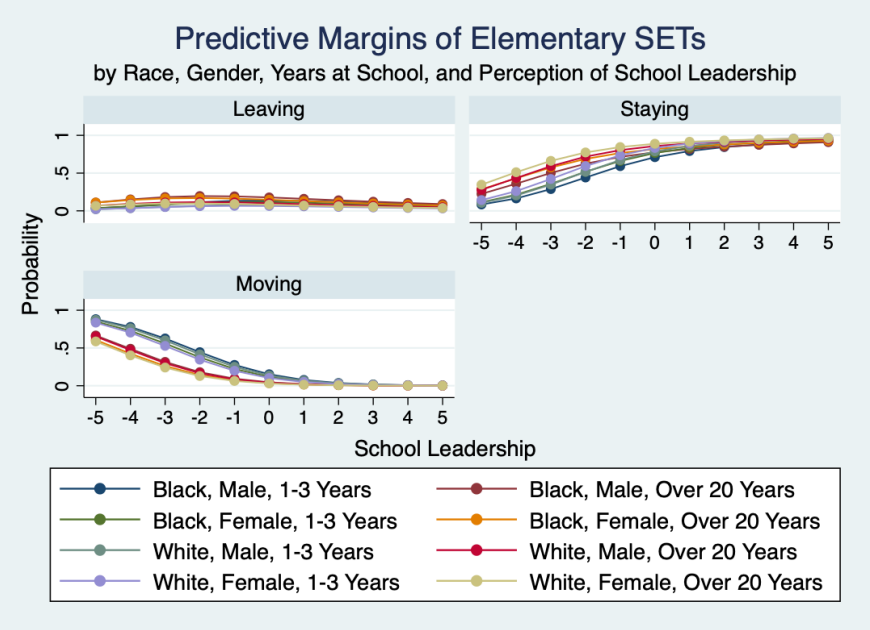


Figure 9

Predictive Probabilities of Elementary School SETs by Significant Teacher Demographics and Perception of School Leadership



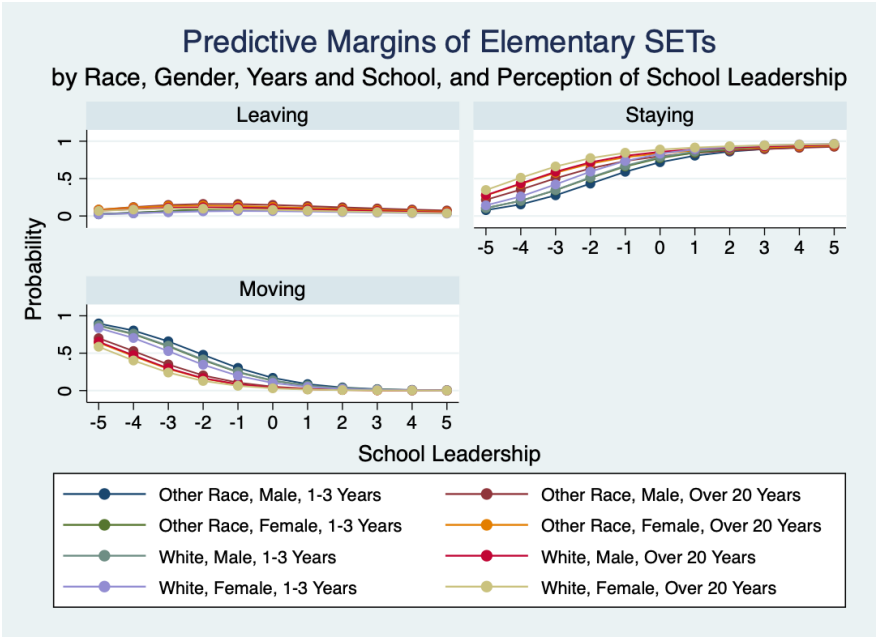


Figure 10

Predictive Probabilities of Elementary School SETs by Significant Teacher Demographics and Perception of Instructional Environment

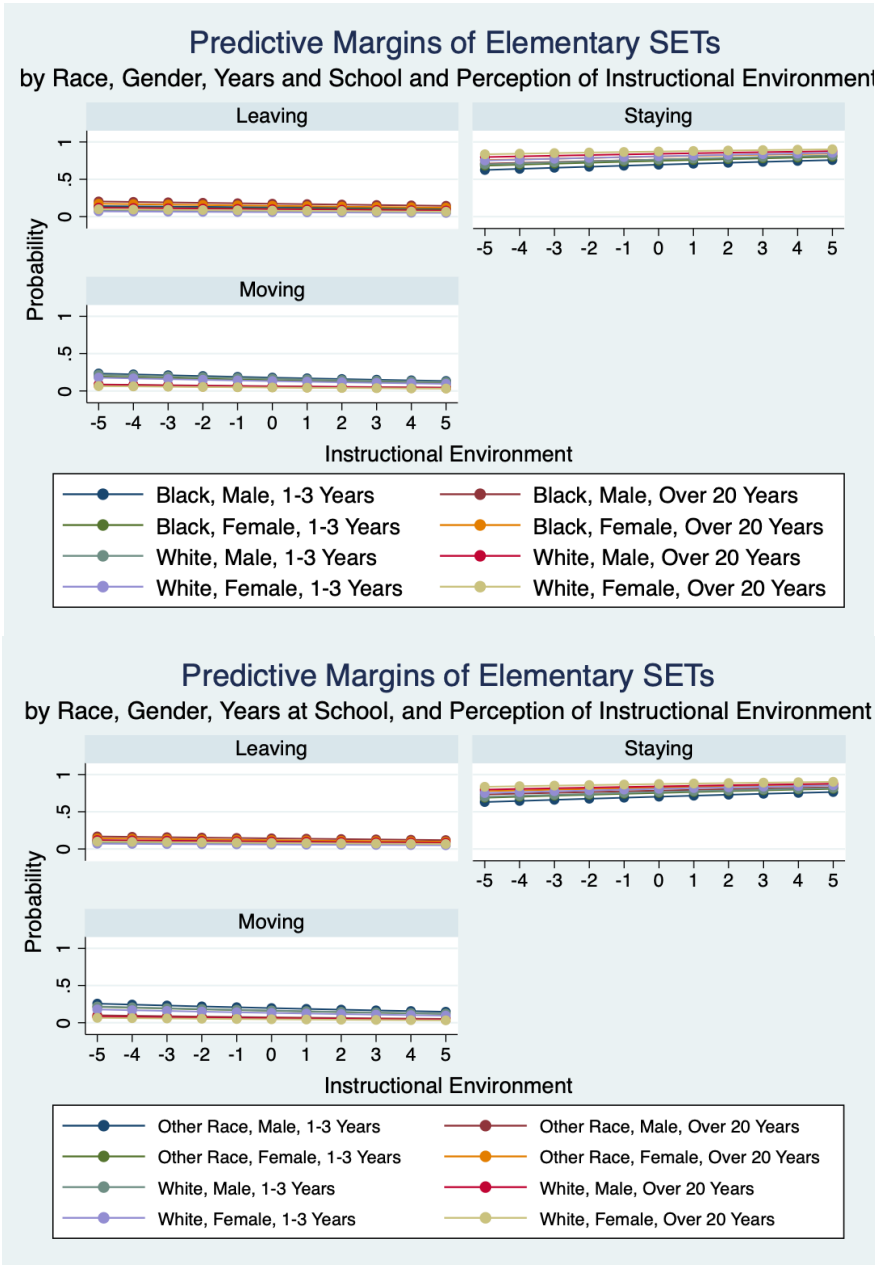
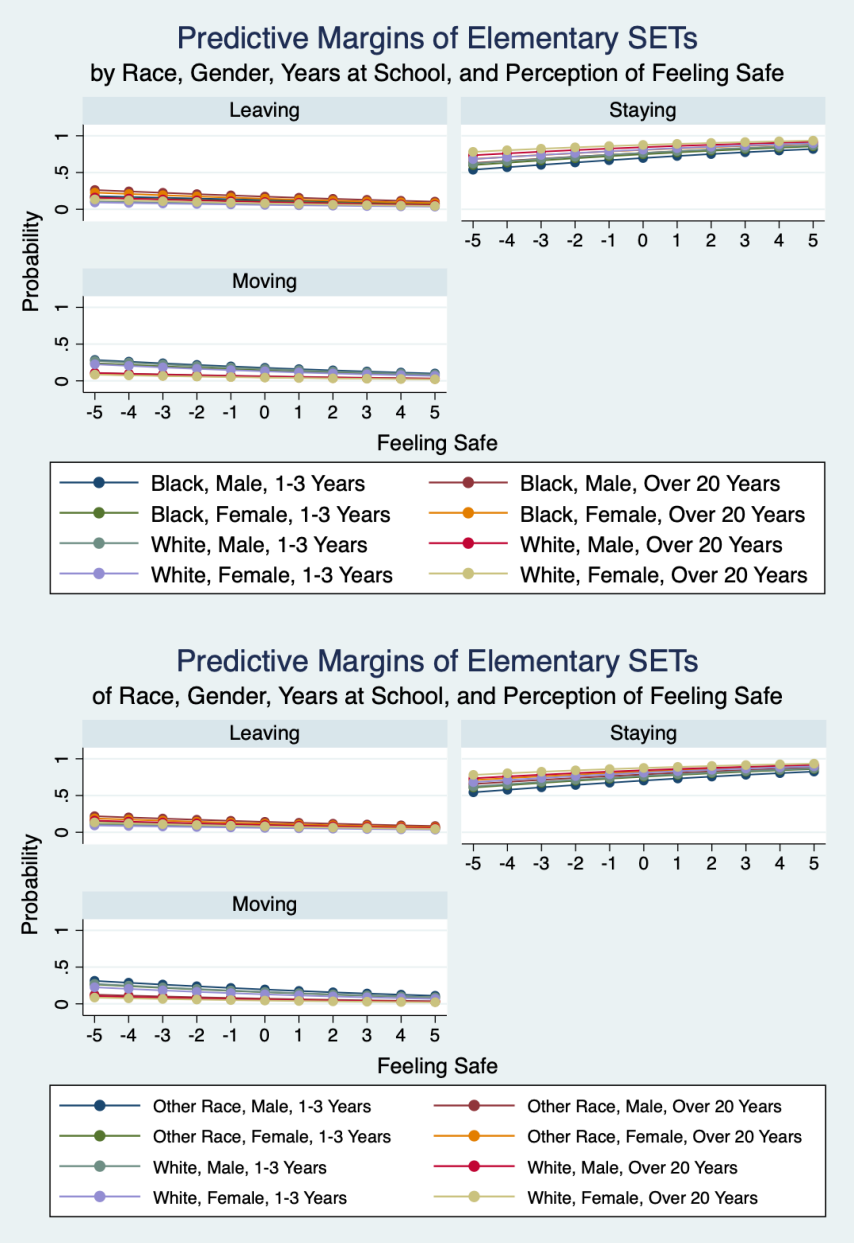


Figure 11

Predictive Probabilities of Elementary School SETs by Significant Teacher Demographics and Perception of Feeling Safe



Chapter 4: Conclusion

Within the previous chapter, the results of several statistical analyses were presented in congruence with the research questions. Results from Research Question 1 indicate that there are differences in mean responses when comparing Virginia special education teachers and teachers that teach other content areas on their perception of teacher working conditions (TWCs). Teacher Leadership and Autonomy and Instructional Environment for SETs had significantly lower means compared to teachers of other content areas, while Managing Student Behavior and School Leadership were higher for SETs than for those in other contents. Results of research question 2 indicate that there is 5% variability in retention between schools leaving 95% of variability in retention at the teacher level. This confirmed that multilevel modeling was the most appropriate analysis to account for both school and teacher level variability. Research question 3 results confirm the hypothesis that teacher working conditions are associated with SET intentions to leave, move, or stay, even after controlling for teacher demographic variables. Several demographic variables remained significantly associated with SET intention despite the inclusion of TWCs. Results from research question 4 confirmed the initial hypothesis, although the results were found to be more complex than previously assumed. SET perception of school leadership was associated with intention, but not necessarily to the degree of other TWCs depending on the outcome. Perception of teacher leadership and autonomy had the lowest risk ratio for SET intention to leave teaching. School leadership had the lowest significant risk ratio for moving schools indicating that it lowered the risk for SETs. High and low perceptions of teacher leadership and autonomy and school leadership were analyzed with teacher demographics that had significant, increased risk ratios of leaving and moving. For school leadership, although the significant teacher demographics increased the risk of moving schools, if SETs had a high

perception of school leadership, it decreased the probability of moving schools. If they had a low perception, it increased the probability of moving. The same pattern was identified for perception of teacher leadership and autonomy. For teacher leadership and autonomy, although the significant teacher demographics increased the risk of leaving teaching, if SETs had a high perception of teacher leadership and autonomy, it decreased the probability of leaving teaching. However, if they had a low perception, it increased the probability of leaving teaching.

Chapter V: Discussion

In Chapter 5, the findings described in the previous chapter will be discussed and connected with literature previously reviewed and other relevant literature. This discussion begins with a brief overview of the study's purpose and methodology and continues with specific details about how the results fit into the extant literature. Lastly, the implications of the results, limitations of the study, recommendations for future research, and concluding thoughts are discussed.

Overview of the Study

The purpose of this study was to examine how teacher working conditions, particularly leadership support, may be associated with special education teachers' intent to stay at their school, move from their school, or leave teaching. Teacher demographics (gender, race, ethnicity, years teaching at their school, and grade level taught), teacher working conditions, and school level variables (percent of students receiving free or reduced lunch and percent of students identified as receiving special education services) were also investigated as predictors of staying, leaving teaching, or moving from their school. These outcomes were assessed using a statewide dataset of special education teachers in 2019 and their perception of teacher working conditions (TWCs) as well as their intention for the following school year.

Discussion of Findings and Connection with Relevant Literature

Research Question 1

Research Question 1 asked, "What are the differences in perceptions of Teacher Working Conditions between special education teachers and teachers of other content areas?" The results of the Mann-Whitney U test indicated differences in perceptions of TWCs between special education teachers and teachers of other content areas. Perceptions were significantly different

between the two groups for four of the TWCs. The perception of Teacher Leadership and Autonomy and Instructional Environment for special education teachers (SETs) had lower means than for teachers of other content areas, while Managing Student Behavior and School Leadership were higher for SETs than those of other contents. Although research has not explicitly explored different perceptions of TWCs, prior literature has identified the differences in job roles which could result in different perceptions (Billingsley & Bettini, 2019; Sledge & Pazey, 2013). These different perceptions indicate it is important to examine SETs and working conditions separately from other content areas, as these differences could impact perceptions of TWCs.

Research Question 2

Research Question 2 asked "To what extent is the special education teacher's intention to stay, leave, or move attributable to teacher and school levels? Is there a significant variation among schools in intent?" The results revealed that there is significant variation at the school level in intent, suggesting there are factors at the school level that are contributing to SETs' intent decisions. In line with organizational theory, there is a focus on not only levels of hierarchy within the organization, but also the environment within the organization, which varies between schools (Vagi & Pivovarova, 2016). While research related to SETs and school level variables is limited, studies have examined student race/ethnicity or poverty and how it relates to teacher retention. Results showed that teachers were more likely to leave if the school had more students living in poverty or had more students of color meaning that school level variables do in fact, explain some of the variability (Carver-Thomas & Darling-Hammond, 2017; Conley & You, 2017; Prater et al., 2007). This finding supports the concept that the environment within an

organization impacts teacher intention, and these results suggested there is variation from school to school.

Research Question 3-4

Research Question 3 asked "After controlling for teacher characteristics, how are special education teachers' perceptions of working conditions associated with their intentions to remain at their current school, leave teaching, or move from their school?" This research question was addressed by model 2 and builds on the previous model by including the teacher demographics in addition to TWCs. The results indicated different associations between the teacher demographics and TWCs depending on the outcome. Teacher demographics and the connections to literature while TWCs will primarily be discussed in Research Question 4 (included below).

Leaving Teaching

There were several teacher demographics that remained significant after including TWCs in the model. Identifying as male, Black/African American or Other racial identity, teaching middle school, or teaching 11-20 years at their school increased the risk of leaving teaching. Very few studies in SET research include gender or race/ethnicity as a variable in their analysis, and currently do not have enough support as a predictor in SET research (Billingsley & Bettini, 2019). However, the current results found that being male was a significant factor for leaving teaching. This finding supports a prior study conducted with the SASS indicating male, secondary teachers had a higher intent of leaving (Conley & You, 2017). Although race/ethnicity has not been included amongst research within SETs, Carver-Thomas & Darling-Hammond (2017) found in a nationally representative group of all teachers, teachers of color left at higher rates than white teachers. The results of this study, which found that teachers that identified as Black/African American or Other racial identity had an increased risk of leaving teaching

support this finding among a nationally representative group of teachers. These results are especially alarming when considering that the population of SETs is more white and female than the population of students that are identified as having a disability (Billingsley & Bettini, 2019).

Teaching middle school was also identified as increasing the risk of leaving. Few studies have considered grade level in SET research, but one study showed higher attrition in secondary schools which supports the results of this study (Borman & Dowling, 2008). The current study also analyzed the years that a SET has worked at the school they were currently teaching, finding those who have taught in that school for 11-20 years had a higher risk of leaving. This is different from what is traditionally analyzed in retention research. Typically, years of experience in general is analyzed or SET age, rather than specifically years of experience at that school, is analyzed. The current results did not necessarily support current research. Previous work showed that SETs with less experience were more likely to leave (Billingsley & Bettini, 2019) and this analysis identified those teaching 11-20 years at their school as having a higher risk. However, studies that have analyzed intent categorized intent as a dichotomous variable, "Stayers" and "Leavers". This analysis further clarified leaving as either leaving teaching or moving schools which could explain the difference in results given that this outcome is more nuanced.

Several TWCs were identified in this model that bidirectionally impacted the risk of leaving teaching. The TWCs and the connection to literature is discussed in more detail in Research Question 4 considering that is the final model which controls for all variables and indicates associations while controlling for all potential variables in the analysis.

Moving Schools

Teachers leaving the field is problematic, but teachers moving schools is equally concerning. The loss of a teacher from the building impacts the organization structure of the

school and decreases organizational knowledge (Jackson, 2012). Thus, an important factor to consider in examining student outcomes is teachers remaining at their school (Billingsley, B., & Bettini, E., 2019; Hirsch, E., & Emerick, S., 2007). Results related to moving schools are more difficult to connect to literature given that prior SET research has not analyzed a large dataset that differentiates between moving and leaving.

Several of the teacher demographics that were associated with leaving were also associated with moving from their school. Identifying as male, Black/African American or other racial identity increased the risk of moving schools. However, there were several variables that mitigated the risk of moving schools in comparison to the reference population. Teaching high school decreased the risk, compared to teaching elementary, and teaching 4-10, 11-20, or 20+ years at their school decreased the risk, compared to SETs that taught at their school 1-3 years.

As with leaving teaching, identifying as Black/African American or other racial identity increased the risk of moving schools. These results differed from leaving schools, and results showed that elementary school SETs had a higher risk of moving and SETs that taught 1-3 years at their school also had the highest risk of moving. These results support current literature that found teachers with less experience are more likely to leave (Billingsley & Bettini, 2019).

There were several TWCs that were associated with moving schools. The results of TWCs will be discussed in more detail in Research Question 4 because this is the final model, controls for all variables and indicates associations while controlling for all potential variables in the analysis.

Research Question 4

Research Question 4 asked “After controlling for teacher and school characteristics, to what extent do teacher working conditions, particularly the special education teacher level

perception of leadership support, impact a teacher's intention to remain at their current school, leave teaching, or move from their school?" Research Question 4 expanded on previous research by also incorporating school level variables related to special education teachers or variables that have been shown to impact retention. This model includes prior teacher demographics, teacher working conditions, as well as two school level variables: percent of students receiving exceptional education services and percent of students receiving free and reduced lunch. Results indicated different associations between teacher demographics, teacher working conditions (TWCs), and school level variables depending on the outcome.

Leaving Teaching

Controlling for all other variables, there were several significant teacher demographics that both increased and decreased the risk of leaving teaching. Several of the significant variables in the prior model remained significant and were also associated with an increased risk of leaving. Identifying as male, Black/African American or Other racial identity, and teaching middle school remained associated with the intention to leave teaching after controlling for school level variables.

Perception of teacher leadership and autonomy, school leadership, professional growth opportunities, engaged students and engaging families, and feeling safe lowered the risk of leaving teaching. Of the TWCs that lowered the risk, teacher leadership and autonomy had the greatest association. Teacher autonomy refers to the level of freedom a teacher has, or the degree of ownership they have in both classroom and school decisions (Greenlee & Brown, 2009). Ingersoll (2001) noted that having a high degree of control within their school impacts why teachers choose to remain at their school. Carver-Thomas and Darling-Hammond's (2017) report, they found 6% of SETs cited autonomy as their reason for leaving. Within current SET

research, Conley and You (2017) also analyzed autonomy and intent, and did not find that these variables significantly predicted intent. The results of this study differ from Conley and You's study, though the discrepancy may be due to their population being limited to secondary SETs. Further, this discrepancy may also highlight the importance of differentiating between moving schools and leaving teaching when predicting intent, as this nuanced lens may capture teachers' experience better.

Perception of school leadership also significantly lowered the risk of intent to leave teaching. Prior research has found that school leadership was a consistent predictor of intent to stay for both SET and general education populations (Billingsley, 2004; Conley & You, 2017). This finding supports organizational theory. Ingersoll and May (2012) purport that schools must examine their processes since the organizational policies and procedures are what leads teachers to leave, and school administrators are instrumental in the organizational procedures of a school.

The following TWCs were found to lower the risk but have not been explored frequently in SET research. There are few studies examining professional growth opportunities, although Cancio et al. (2013) found that perception of administrative support of professional growth was higher for those SETs that intended to stay. The TWC engaged students and engaging families was found to lower the risk of intending to leave teaching. While this area has not been examined in detail in SET research, existing research found students as a key factor for why SETs choose to stay. Prather-Jones (2011) conducted a qualitative study and found that the teachers felt called to do their jobs and cited the students to describe their commitment. Perception of feeling safe also reduced the risk of intending to leave teaching. Boyd et al. (2006) found that schools that struggle to keep a safe school environment have difficulty retaining teachers. The TWC feeling safe and SET intention have not been explored, but studies in general education research support

the findings. Given that these TWCs lower the risk of leaving teaching, they should be further explored to more deeply understand how schools can improve in these areas to improve retention for SETs.

The two TWCs that increased the risk of intending to leave schools were perceptions of rigorous instruction and managing student behavior. Although the current study did not specify the specific disabilities of students the SETs work with, prior research has found that SETs that serve students with emotional-behavioral disorders are more likely to leave (Billingsley & Bettini, 2019; Gilmour & Webby, 2020). Rigorous instruction has not been explored in SET research. This construct captured perceptions of teachers encouraging students using evidence, thinking critically, as well as feeling responsible for students to reach their full potential. Instruction in general for SETs is complexified by the additional responsibilities required to meet the needs of students (i.e. IEP data and goals, accommodations, collaborating with general education teachers). The perception of rigorous instruction and increased risk may be related to the additional responsibilities SETs have regarding instruction as well as being held to the same accountability standards as general education teachers (i.e.SOL testing). This is an area of research that needs to be further explored.

Predicted probabilities were then analyzed using the final model to determine probabilities of factors in combination of leaving schools. This analysis allowed for the exploration of how perceptions of TWCs that lowered the risk of leaving impacted the risk of leaving for teachers that had demographic characteristics that increased the risk.

Predicted probabilities were first run analyzing significant teacher demographic variables that increased the risk of leaving while holding all other predictors constant or at their mean. Comparison groups were also included by incorporating the reference category for these

demographic variables. Identifying as Black/African American or the racial category of "other", male, and teaching middle school were all significant demographic factors that were associated with an SETs' intention to leave teaching so those variables were analyzed together and compared with the reference categories. The group that had the highest predictive probability (16.4%) of leaving education were SETs that taught middle school, identified as Black/African American and male. All male teachers that taught middle school had the highest probability of leaving across all racial identities.

Two TWCs (perception of school leadership and teacher leadership and autonomy) are commonly found in SET literature to lower the risk of leaving. The effects these TWCs have on the predictive probabilities of SETs that were most at risk of leaving (SETs that taught middle school, identified as Black/African American or "Other" racial identity, and male) were examined. This exploratory analysis allowed for the assessment of both high and low perceptions of the TWC. Findings revealed that the TWC with the greatest impact on the probability of leaving was teacher leadership and autonomy. For SETs that taught middle school, identified as Black/African American and male, and had a low perception of teacher leadership and autonomy, the predicted probability of intending to leave ranged from 0.32-0.45. However, for those who had a high perception of teacher leadership and autonomy, the predicted probability of intending to leave was 0.03-0.07. These results indicate that regardless of teacher demographic factors, perception of teacher leadership and autonomy has a bidirectional effect and can either exacerbate their intention to leave, or substantially decrease intention.

The second TWC (perception of school leadership) that lowered the risk of leaving was explored along with SETs that taught middle school, identified as Black/African American and male. Given the rich literature examining the relationship between perception of leadership or

administrative support and intention to stay, it was expected that the inclusion of this TWC would improve predicted probabilities. However, for SETs that taught middle school, identified as Black/African American and male, and had a low perception of school leadership, the predicted probability of intending to leave ranged from 0.06-0.13. For those that had a high perception, the predicted probability was 0.10-0.13. This indicates that regardless of level of perception, the perception of school leadership does not greatly impact intention to leave for SETs with demographics that increase the risk of leaving when holding all other variables at their mean.

Moving Schools

After controlling for all other variables, there were several significant teacher demographics that affected the risk of moving schools. Several of the significant variables in the prior model remained associated with an increased risk of moving. Identifying as male, Black/African American, or Other racial identity increased the risk of moving schools. However, there were several variables that decreased the risk of moving schools in comparison to the reference population. Teaching high school decreased the risk compared with teaching elementary, and teaching 4-10, 11-20, or 20+ years at their school decreased the risk compared with SETs that taught at their school 1-3 years.

There were several TWCs that were associated with moving schools. Perception of teacher leadership and autonomy, school leadership, engaged students and engaging families, and feeling safe were all associated with a lower risk of moving schools. Perception of school leadership lowered the risk of moving schools more than any of the other TWCs. This result differed from leaving teaching, and found that school leadership had less of an association with leaving teaching than it does with moving schools. This finding supports organizational theory,

and the relationships between the SET and the school. Schools all have different organizational structures with different school leaders who determine and guide what these organizational structures look like. The current results support this idea, as SETs were more likely to move schools due to school leaders to find a new organizational structure that best suits their needs than they would to leave the field of teaching. Teacher leadership and autonomy was also associated with moving schools, but to a lesser degree than leaving teaching. Prior research has discussed the value of teacher leadership and autonomy, but the results of this analysis do not necessarily align with the limited research in the SET field. As discussed previously, studies have not differentiated between moving and leaving as an outcome, and there is limited research in the SET field, which may explain why results vary.

Engaged students and engaging families and feeling safe have not been explored thoroughly in SET research. Both of these TWCs can vary from school to school, supporting the concept that SETs having positive perceptions of these constructs would lower their risk of moving schools. As discussed with leaving, students are cited as a reason SETs may choose to stay (Billingsley & Bettini, 2019).

Two TWCs were associated with a higher risk of moving: managing student behavior and professional growth opportunities. As mentioned in the previous section, managing student behavior could increase the risk depending on the student population that the SET works with. Future research should include the primary population SETs serve to better understand the role of the SET and the association of specific student populations with intention or their perception of TWCs. The results of professional growth opportunities also differ from the limited research that exists in SET research regarding perception of professional growth opportunities and intention. This construct needs to be studied in more detail. Professional development

opportunities or autonomy in professional development are often determined by the school, district, or state, which vary across settings and schools, making it difficult to quantify SETs' perception across settings. Professional development opportunities are also challenging for SETs. Not only could they benefit from or require professional development in core content, but they would also in areas that are specific to the role of an SET, such as data collection or writing individual education plans (IEPs).

Percent of students receiving free or reduced lunch was a significant predictor that increased the risk of SETs moving schools. In line with current research, all found that teachers were more likely to leave if the school had more students living in poverty or had more students of color (Carver-Thomas & Darling-Hammond, 2017; Conley & You, 2017; Prater et al., 2007)

Predicted probabilities were then analyzed to determine probabilities of factors in combination of moving schools. This analysis explored how perceptions of TWCs that lowered the risk of moving impacted teacher demographics that increased the risk. While controlling for all other predictors, identifying as Black/African American or the racial category of "Other", being male, years teaching at the school, and teaching high school were all significant factors that were associated with a SET's intention to move schools while controlling for all other predictors. The predicted probabilities of the significant teacher demographics as well as the reference category for each significant teacher demographic were calculated. The group that had the highest predictive probability of moving schools were SETs that taught elementary school, identified as Other racial identity, male, and taught at the school 1-3 years (20.0%). All teachers that taught elementary school had the highest probability of leaving across all racial identities and years teaching at the school.

The impact of perceptions of teacher leadership and autonomy and school leadership was evaluated. The TWC that had the greatest impact on the probability of moving schools was school leadership. The predicted probability of intending to move schools ranged from 0.66-0.90 for SETs that taught elementary school, identified as other racial identity, were male, taught at the school 1-3 years, and had a low perception of school leadership. For the same population but had a high perception of school leadership, the predicted probability of intending to move schools ranged from 0.00-0.02. Perception of school leadership either greatly increased the probability of moving schools or almost negated the probability if the perception was high despite analyzing a population that has compounding demographics associated with a risk of moving.

Teacher leadership and autonomy was also a significant TWC that lowered the risk of moving schools. For SETs that taught elementary school, identified as other racial identity, male, taught at the school 1-3 years, and had a low perception of teacher leadership and autonomy, the probability of moving schools ranged from 0.25-0.29. For the same population, but with a high perception of school leadership, the predicted probability of intending to move schools ranged from 0.07-0.10. While the perception of teacher leadership and autonomy was not as impactful as school leadership, teacher leadership and autonomy did impact the risk of moving schools depending on having high or low perception.

These outcomes are supported by organizational theory, as this theory allows for analysis of the relationships between the teacher and the school. Accordingly, the aforementioned predicted probabilities examine teacher demographic variables and incorporate perceptions of school structure and organization, providing support for the utility of applying organizational theory in research. Because probabilities decreased when SETs had a high perception of both of

TWCs, these results also suggest that if efforts are made at schools to improve these TWCs, retention rates of SETs will improve.

Practical Implications

Teacher Working Conditions have been established as a key factor in retention of SETs (Billingsley & Bettini, 2019). The results of this study provide further evidence of the importance of Teacher Working Conditions for SET retention and attrition. This analysis also adds to the literature by differentiating between moving schools and leaving teaching when discussing factors related to retention and attrition. Accordingly, these findings highlight the importance of considering SETs' retention and attrition factors separately from other contents given differences in perception of TWCs from teachers of other content areas.

The results suggest that perception of school leadership lowers the risk of intending to move schools as well as the risk of leaving teaching. There are several steps school leaders can take to improve the overall perception of school leadership. Currently, the Professional Standards for Education Leaders (PSEL) does not include specific standards related to providing supportive working conditions or anything specific to SETs. The standards currently state "Effective Leaders develop workplace conditions for teachers and other professional staff that promote effective professional development, practice, and student learning" (NPBEA, 2015, p. 15). However, there are not specific guidelines as to how to develop good workplace conditions. The following recommendations could be incorporated in the PSEL to offer more specific guidelines related to TWCs for SETs.

A key piece school leaders can incorporate is supporting SETs in other TWCs. School leaders are considered "the gatekeepers" of perceptions of other TWCs because they make decisions for their school that impact all other TWCs. School leaders should provide teachers with

opportunities to engage in discussions about school development and definition of its organizational development and increase participation in school decision making. This can be accomplished by partnering with SETs to determine school behavior management policy or the multi-tiered system of support the school implements. Leaders should also be collaborative regarding SETs' job demands. The results found SETs had lower perception of the instructional environment than other content teachers. Leaders could consider monitoring demands of SETs and redistribute demands that are able to be redistributed if demands increase.

Teacher leadership and autonomy was also a significant factor in lowering risk for both moving and leaving their school, and there are several things school leaders can do to increase support. For example, school leaders can build autonomy by increasing teacher decision-making and input about their professional development and professional development goals (Worth & Van de Brande, 2020). SETs also need autonomy in their time because their responsibilities are different from general education teachers. Albrecht (2009) found that SETs that had appropriate time to complete their paperwork were more likely to intend to stay. It is also important to consider the association between perception of teacher leadership and autonomy and leaving teaching or moving schools given that the level of perception either increases or decreases the risk. After analyzing teacher demographics that were found significantly increased the risk of leaving, perceptions of teacher leadership and autonomy either magnified the risk or decreased it depending on the SETs' perception. Taking steps to increase autonomy and improve perception of teacher leadership within schools can act as a protective factor for SETs who are already at risk for leaving based on teacher demographics and promote teacher retention.

Policy Implications

The results of this study are timely given the current teacher shortage crisis and the recent Executive Directive issued by the Virginia Governor targeting teacher shortage (Exec. Order 3, 2022). The policy implications of this study must be examined in relation to SETs choosing to leave teaching and move schools, as different variables are associated with risk for each outcome. The policy implications are addressed 1) through policy regarding teacher working conditions, 2) a discussion of support for SETs, particularly those that identify within teacher demographics the analysis found significant as well as school level variables, and 3) use of acquiring data to make data driven decisions.

Increased perception of teacher leadership and autonomy lowered the risk of both leaving teaching and moving schools, but the decrease was greater among those leaving teaching. Teacher autonomy is the degree of ownership they have in both classroom and school decisions (Greenlee & Brown, 2009). From a policy perspective, it is important to consider state level accountability (i.e. Standards of Learning) and the effects on the autonomy of teachers in general, as well as SETs. Ruff (2019) developed a report describing Virginia's accountability policy through standardized testing and found Virginia had a "top-down policy model of standardized testing" that inhibits both resources and opportunities for transforming policy at local school levels (p.23). Aside from teachers being required to align to teach the standards associated with the test, schools that fail the Standards of Learning (SOLs) must submit improvement plans to meet accreditation (Virginia Department of Education, 2018). These plans often include more stringent requirements of teachers and further restrict teacher autonomy. This highlights the shift in state policy, which aligned with federal policies such as No Child Left Behind and then followed by the Every Student Succeeds Act. As all teachers are held accountable through SOLs, SETs are also accountable for ensuring that students with disabilities

meet grade level standards (McLaughlin, 2010). This accountability is important to note given that SETs have the additional responsibility of addressing not only instruction, but accommodations to allow students to complete work at their instructional level. Although local school divisions do not have control over state accreditation requirements, local policy can support teacher autonomy. School divisions have implemented "increasing school autonomy" as a reform strategy (Dillon, 2011). Divisions that have followed this reform strategy considered autonomy of all schools, high and low performing, through giving choice in "textbook adoption, budget allocation, scheduling, professional development, and curriculum" (Dillon, 2011, p. 7). Considering this, policy makers could consider revising current policy regarding accountability procedures for schools that are not meeting accreditation or consider policy that would reflect different accountability procedures for SETs. The results of the current study also provide support for the importance of discussing a local division policy perspective because some of the variability in the model was explained by the school level.

School divisions and states also can best support SETs by investing in developing a model of what effective leadership looks like for SETs (Billingsley & Bettini, 2019). These strategies can include learning about a SET's work or providing collective accountability and responsibility for students with disabilities in schools. Given the collaboration that naturally occurs between school leadership and SETs, legislation could consider requiring that at least one administrator in the building be licensed in special education. This would ensure that at least one administrator had an understanding of the job role and requirements of an SET and could provide appropriate support to collaborate.

The current study highlights the importance of providing support for certain demographics of SETs. The findings of the current study indicate that SETs who identify as

male, Black/African American or other racial identity, and teach middle school have a higher risk of leaving teaching. These findings will allow school divisions to increase awareness that these demographics have a higher relative risk of leaving, so support can be put in place. Legislation can require supports such as assigning mentors or supporting the SET in their induction (Billingsley & Bettini, 2019).

In order to determine what populations may be most at risk within their individual school division, policy makers could require divisions to consider using these data to inform them about their schools and perceptions of TWCs. This can help identify populations that may be most at risk of leaving or moving. Legislation should also consider requiring that the data acquired at the state level should include variables that clearly define job roles and also gather data that actually connects to retention rather than just intent to better capture true retention outcomes. Given the impact that school leaders have on SETs moving schools, divisions should also consider using school, student and teacher level data to identify and retain effective principals.

Research Implications

This research emphasizes the importance of analyzing SET working conditions and their association with retention and attrition. This study expands previous work that has analyzed SET attrition and retention as simply "stayers" and "leavers" by using a multinomial outcome of "stayers", "movers", and "leavers". This analysis allowed for interpretation of how variables associated with retention and attrition may be associated differently by further breaking down the "leavers" variable into "movers" and "leavers". The results found different results for those that identified as leavers and movers, with different teacher demographics, TWCs, and school level variables being associated depending on the outcome which supports the new categorization.

This study also stresses the importance of using more specificity in how these topics are discussed by being specific to the experiences of SETs. The results indicated different perceptions of TWCs between SETs and teachers of other content areas. Given that perceptions are different, research around TWCs should analyze SETs separately to better understand the SET perception of the TWC and how the condition either reduces or exacerbates attrition. While results indicate differences in perceptions between teachers of other contents and SETs, there currently is not research that specifically highlights the differences between the roles. Qualitative analyses that are ground in theory would allow for a richer understanding of each TWC and what that TWC is like for a SET as well as how it is different compared to teachers of other content areas. A longitudinal study that analyzed actual retention would also allow for a deeper understanding of how perceptions of TWCs may change over time and how those changes may impact retention and attrition.

Future Directions

There are several different directions that the findings of this dissertation can be further studied. For instance, future research may consider replicating this research design but with more recent data. A version of this survey was administered in 2021 which would better capture perceptions of teacher working conditions following the pandemic and other more recent state policy. Although the special education identifier is a limitation of the 2021 survey, this design would still be beneficial to analyze other content areas. Within this design, researchers should also consider analyzing intention from a multinomial perspective of “Stayers”, “Movers”, and “Leavers” in other content areas as well. These results could vary across content areas. This will provide more nuanced results regarding other content areas about teacher demographics, teacher

working conditions, and school level variables in order for state policy, school divisions, and schools to make decisions to best support their teachers.

This survey was also created with the purpose of "evaluate(ing) teaching conditions and how those conditions impact retention and student outcomes" (Virginia Acts of Assembly, 2018 Special Session 1, §2.1- 50.134H). This purpose can be explored by connecting teacher working conditions with student level outcomes. State level agencies that participate in developing this survey could consider including teacher identifiers in order to connect teacher survey data and student outcome data in order to research the impact of conditions on student outcomes.

Additionally, work surrounding teacher working conditions should study special education teachers separately from other content areas. There are several teacher working conditions that are associated with bidirectional association with risk that have not been researched in depth. Qualitative work could provide rich data to better understand teacher working conditions and intent. Billingsley and Bettini (2019) discuss that qualitative research "can add value if it is used to build stronger theory" (p. 733). Future research can elaborate understandings of teacher working conditions that have not been heavily researched but are associated with an increased or decreased risk of intention.

Related, not only is it important to consider special education teachers separately from other contents, there is also a need to further analyze teacher demographic factors within special education attrition and retention. In a recent review of literature Billingsley & Bettini (2019) found that there is an overall lack of research surrounding teacher demographics. They suggest further research regarding male special education teachers, their service delivery model, and/or pathways special education teachers pursue to enter their career.

Limitations

While this study does contribute to the growing literature surrounding special education teachers, teacher working conditions, attrition and retention, this dissertation study does have limitations. The data used for this study is a secondary data set which comes with limitations. First, the variable used to determine the population is a self-reported variable. Teachers were given the opportunity to select any subject they are teaching that year, so teachers may select "special education" and may not necessarily be special education teachers. This data was also not collected to specifically answer the research questions (Johnston, 2014). The survey was designed for all teachers and some of the survey may have been designed differently if just the special education population was used. I also was not able to participate in the data collection. Although there is a large sample included in this analysis, there are schools that are missing that did not participate and will not be reflected in the data.

While this study is timely, this dataset was also collected in 2019, prior to the pandemic where all teachers' working conditions were affected. Although this study gives perspective as to the associations of teacher working conditions, these perceptions have likely shifted given the impact of the pandemic.

The analysis has limitations as well. Schools and education research are inherently multi-level considering that teachers are nested within schools. However, multilevel modeling (MLM) as an analysis has limitations. The first limitation MLM has is that it can't handle data dependency in the within-level predictors (Chang & Kwok, 2022). MLM is also unable to handle measurement error and construct a latent factor, although measurement error was accounted for through computing a composite score from each scale for each of the TWC factors.

Conclusion

The field of special education continues to suffer from shortages nationally with special education teachers (SETs) leaving the field at a high rate (Carver-Thomas & Darling-Hammond, 2017). This study provides encouraging results regarding SET working conditions and the association with their intention to stay at their school, move from their school, or leave teaching. Although these results reflect data from 2019, they are also timely given nationwide teacher shortages and the recent teacher shortage referendum addressing teacher shortages in Virginia schools (Commonwealth of Virginia Executive Department, 2022).

Teacher working conditions are an important consideration when school systems and schools are determining when and where to invest their time and money to address retention and attrition. While several working conditions lowered the risk of leaving and moving, results of this study indicate perception of school leadership and teacher leadership and autonomy are the most effective at decreasing risk of attrition. High perceptions of teacher leadership and autonomy lowered the risk of both leaving teaching and moving schools while high perceptions of school leadership were incredibly impactful lowering risk for moving schools. Through policy change to increase autonomy as well as implement effective leadership models, SETs can be better supported to not only keep them in their building and contributing to their school's organizational structure, but also keep them in the field.

References

Albrecht, S. F., Johns, B. H., Mounstevens, J., & Olorunda, O. (2009). Working conditions as risk or resiliency factors for teachers of students with emotional and behavioral disabilities. *Psychology in the Schools*, *46*, 1006–1022. doi:10.1002/ pits.20440

Balfour, C. Y. (2001). Impact of certification status on the administrative support needs of novice special education teachers (Unpublished doctoral dissertation). George Mason University, Fairfax, VA.

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations*, *61*(8), 1139–1160. https://doi.org/10.1177/0018726708094863

Bates D, Mächler M, Bolker B, Walker S (2015). "Fitting Linear Mixed-Effects Models Using lme4." *Journal of Statistical Software*, 67(1), 1–48. doi: 10.18637/jss.v067.i01.

Becker, J., Robnolt, V., Dye, K., & Ross, E. (2021). Will they Stay or Will they Go? Analysis of the VDOE Working Conditions Survey. Richmond, VA: Metropolitan Educational Research Consortium

Becker, R. A., Chambers, J. M. and Wilks, A. R. (1988) *The New S Language*. Wadsworth & Brooks/Cole.

Berry, A. B. (2012). The relationship of perceived support to satisfaction and commit- ment for special education teachers in rural areas. *Rural Special Education Quarterly*, *31*(1), 3–14. doi:10.1177/875687051203100102

Billingsley, B. S. (2004). Special Education Teacher Retention and Attrition: A Critical Analysis of the Research Literature. *The Journal of Special Education*, *38*(1), 39–55. https://doi.org/10.1177/00224669040380010401

Billingsley, B. S. (2004). Promoting Teacher Quality and Retention in Special Education. *Journal of Learning Disabilities*, *37*(5), 370–376. https://doi.org/10.1177/00222194040370050101

Billingsley, B., & Bettini, E. (2019). Special Education Teacher Attrition and Retention: A Review of the Literature. *Review of Educational Research*, *89*(5), 697–744. https://doi.org/10.3102/0034654319862495

Billingsley, B., Carlson, E., & Klein, S. (2004). The Working Conditions and Induction Support of Early Career Special Educators. *Exceptional Children*, *70*(3), 333- 347. https://doi.org/10.1177/001440290407000305

Billingsley, B., McLeskey, J., & Crockett, J. B. (2017). *Principal leadership: Moving toward inclusive and high-achieving schools for students with disabilities* (Document No. IC-8). Gainesville: University of Florida.

Boe, E., Cook, L. H., & Sunderland, R. J. (2008). Teacher Turnover: Examining Exit Attrition, Teaching Area Transfer, and School Migration. Retrieved from https://repository.upenn.edu/gse_pubs/184

Bolker, B., Robinson, D., Menne, D., Gabry, J., Buerkner, P., Hua, C., Petry, W., Wiley, J., Kennedy, P., Szöcs, E., Patil, I. (2020). "broom.mixed: Tidying Methods for Mixed Models".http://github.com/bbolker/broom.mixed

Borman, G. D., & Dowling, N. M. (2008). Teacher Attrition and Retention: A Meta-Analytic and Narrative Review of the Research. *Review of Educational Research*, *78*(3), 367–409. https://doi.org/10.3102/0034654308321455

Boyd, D., Grossman, P., Ing, M., Lankford, H., Loeb, S., & Wyckoff, J. (2011). The Influence of School Administrators on Teacher Retention Decisions. *American Educational Research Journal*, *48*(2), 303–333. https://doi.org/10.3102/0002831210380788

Boyd D., Grossman P., Lankford H., Loeb S., Wyckoff J. (2006). How changes in entry requirements alter the teacher workforce and affect student achievement. *Education Finance and Policy*, 1, 176–216.

Boyd, D., Lankford, H., Loeb, S., Rockoff, J., & Wyckoff, J. (2008). The narrowing gap in New York City teacher qualifications and its implications for student achievement in high-poverty schools. *Journal of Policy Analysis and Management, 27*(4), 793-818.

Bronfenbrenner, U. (1979). *The Ecology of Human Development*. Cambridge, MA: Harvard University Press.

Brown, T. A., & Moore, M. T. (2012). Confirmatory factor analysis. In R. H. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 361–379). The Guilford Press.

Burkhauser, S. (2017). How Much Do School Principals Matter When It Comes to Teacher Working Conditions? *Educational Evaluation and Policy Analysis*, *39*(1), 126–145. https://doi.org/10.3102/0162373716668028

Carver-Thomas, D. & Darling-Hammond, L. (2017). *Teacher turnover: Why it matters and what we can do about it.* Palo Alto, CA: Learning Policy Institute.

Carver-Thomas, D., & Darling-Hammond, L. (2019). The trouble with teacher turnover: How teacher attrition affects students and schools. *Education Policy Analysis Archives, 27*(36). http://dx.doi.org/10.14507/epaa.27.3699

Conley, S., & You, S. (2017). Key influences on special education teachers' intentions to leave: The effects of administrative support and teacher team efficacy in a mediational model. *Educational Management Administration & Leadership*, *45*(3), 521–540. https://doi.org/10.1177/1741143215608859

Dillon, E. (2011). *The Road to Autonomy: Can Schools, Districts, and Central Offices Find Their Way?* Retrieved from https://static.newamerica.org/attachments/10109-the-road-to-autonomy/The%20Road%20to%20Autonomy.41e6e6834a6f46b5a515f726d3c2e72d.pdf

Executive Directive Order No. 3 (2022). https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/ed/ED-3---Addressing-Teacher-Shortages-in-Virginia-Schools.pdf

Friedman, B. D., & Allen, K. M. (2011). Systems theory. Essentials of Clinical Social Work (Ed. 1, ch. 1), 3-20. doi: 10.13140/2.1.1132.9281.

Garson, G.D. *Multilevel Modeling: Applications in STATA , IBM SPSS , SAS , R, & HLMTM*, 1st ed.; SAGE Publications, Inc.: Los Angeles, LA, USA, 2019; ISBN 978-1-5443-1929-2.

Geiger, T., & Pivovarova, M. (2018). The effects of working conditions on teacher retention. *Teachers and Teaching: Theory and Practice*, *24*(6), 604-625. https://doi.org/10.1080/13540602.2018.1457524

Gilmour, A. F., & Wehby, J. H. (2020). The association between teaching students with disabilities and teacher turnover. *Journal of Educational Psychology, 112*(5), 1042–1060. https://doi.org/10.1037/edu0000394

Grissom, J.A. (2011). Can Good Principals Keep Teachers in Disadvantaged Schools? Linking Principal Effectiveness to Teacher Satisfaction and Turnover in Hard-to-Staff Environments. *Teachers College Record: The Voice of Scholarship in Education, 113*, 2552 - 2585.

Harwell, M., & LeBeau, B. (2010). Student Eligibility for a Free Lunch as an SES Measure in Education Research. *Educational Researcher*, *39*(2), 120–131. https://doi.org/10.3102/0013189X10362578

Hirsch, E.M., & Emerick, S. (2007). Teacher Working Conditions Are Student Learning Conditions: A Report on the 2006 North Carolina Teacher Working Conditions Survey.

House, J. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley.

Hox, J. (2002). *Multilevel analysis techniques and applications.* Lawrence Erlbaum Associates Publishers.

Hox, J. J. (2010). Multilevel analysis: Techniques and applications *(2nd ed.). Routledge/Taylor & Francis Group.*

Ingersoll, R. (2001). Teacher Turnover and Teacher Shortages: An Organizational Analysis. Retrieved from https://repository.upenn.edu/gse_pubs/94

Ingersoll, R.M. and May, H. (2011). Recruitment, Retention and the Minority Teacher Shortage. *Consortium for Policy Research in Education.* CPRE Research Report #RR-69. Retrieved from https://repository.upenn.edu/gse_pubs/226

Johnson, S. M. (1990). Teachers at Work. New York: Basic Books.

Johnson, S. M. (2006). The workplace matters: Teacher quality, retention and effectiveness. *NEA.* Research Best Practices Working Paper.

Johnson SM, Kraft MA, Papay JP. (2012). How context matters in high-need schools: The effects of teachers' working conditions on their professional satisfaction and their students' achievement. *Teachers College Record. 114* (10) :1-39.

Johnston, M. (2017). Secondary Data Analysis: A Method of which the Time Has Come.*Qualitative And Quantitative Methods In Libraries, 3*(3), 619-626. Retrieved from http://www.qqml-journal.net/index.php/qqml/article/view/169

Jones, N. D., & Youngs, P. (2012). Attitudes and affect: Daily emotions and their association with the commitment and burnout of beginning teachers. *Teachers College Record*, *114*, 1–36.

Jones, N. D., Youngs, P., & Frank, K. A. (2013). The role of school-based colleagues in shaping the commitment of novice special and general educations. *Exceptional Children*, *79*, 1–19. doi:10.1177/001440291307900303

Kane, E., Hoff, N., Cathcart, A., Heifner, A., Palmon, S., Peterson, R. (2016). *School Climate and Culture*. Barkley Center, University of Nebraska. Retrieved from: https://k12engagement.unl.edu/strategy-briefs/School%20Climate%20&%20Culture%202-6-16_1.pdf

Koller M (2016). "robustlmm: An R Package for Robust Estimation of Linear Mixed-Effects Models." Journal of Statistical Software, 75(6), 1–24. doi: 10.18637/jss.

Kraft, M. A., Marinell, W. H., & Shen-Wei Yee, D. (2016). School Organizational Contexts, Teacher Turnover, and Student Achievement: Evidence From Panel Data. *American Educational Research Journal*, *53*(5), 1411–1449. https://doi.org/10.3102/0002831216667478

Ladd, H. F. (2011). Teachers' Perceptions of Their Working Conditions: How Predictive of Planned and Actual Teacher Movement? *Educational Evaluation and Policy Analysis*, *33*(2), 235–261. https://doi.org/10.3102/0162373711398128

Liu, X. S., & Ramsey, J. (2008). Teachers' job satisfaction: Analyses of the teacher follow-up survey in the United States for 2000-2001. *Teaching and Teacher Education, 24,* 1173-1184. doi:10.1016/j.tate.2006.11.010

Luekens, M. T. (2004). Teacher Attrition and Mobility: Results from the Teacher Follow-up Survey, 2000-01. United States: National Center for Education Statistics.

McLaughlin, M. (2010). Evolving interpretations of educational equity and students with disabilities. *Exceptional Children*, *76*, 265–278. doi:10.1177/001440291007 600302

McLeskey, J., & Billingsley, B. S. (2008). How Does the Quality and Stability of the Teaching Force Influence the Research-to-Practice Gap? Remedial and Special Education, 29(5), 293–305. https://doi.org/10.1177/0741932507312010

McLeskey, J., Tyler, N. C., & Flippin, S. S. (2004). The Supply of and Demand for Special Education Teachers. The Journal of Special Education, 38(1), 5–21. https://doi.org/10.1177/00224669040380010201

Merrill, B. C. (2021). Configuring a Construct Definition of Teacher Working Conditions in the United States: A Systematic Narrative Review of Researcher Concepts. *Review of Educational Research*, *91*(2), 163–203. https://doi.org/10.3102/0034654320985611

Meyers, L. S., Guarino, A. J., & Gamst, G. C. (2016). Applied Multivariate Research: Design and Interpretation. United States: SAGE Publications.

Miller, L. (2020). 2019 Virginia Working Conditions Survey: Descriptive Analysis of Statewide Patterns. *EdPolicy Works.* Retrieved from: https://education.virginia.edu/sites/default/files/uploads/epw/2019%20Virginia%20Working%20Conditions%20Survey.pdf

National Center for Education Statistics. (2016). *Preparing and credentialing the nation's teachers: The Secretary's 10th report on teacher quality* (U.S. Department of Education, Office of Postsecondary Education). Retrieved from https://title2. ed.gov/Public/TitleIIReport16.pdf

National Coalition on Personnel Shortages in Special Education and Related Services. (2016). Retrieved from https://specialedshortages.org/

National Policy Board for Educational Administration (2015). Professional Standards for Educational Leaders 2015. Reston, VA: Author.

Podolsky, A., Kini, T., Bishop, J., & Darling-Hammond, L. (2017). Sticky schools: How to find and keep teachers in the classroom. *Phi Delta Kappan*, *98*(8), 19–25. https://doi.org/10.1177/0031721717708290

Ronfeldt, M., Loeb, S., & Wyckoff, J. (2013). How Teacher Turnover Harms Student Achievement. *American Educational Research Journal*, *50*(1), 4–36. https://doi.org/10.3102/0002831212463813

Rosseel, Y (2012). "lavaan: An R Package for Structural Equation Modeling." *Journal of Statistical Software*, 48(2), 1–36. doi: 10.18637/jss.v048.i02.

R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/.

RStudio Team (2020). RStudio: Integrated Development for R. RStudio, PBC, Boston, MA URL http://www.rstudio.com/.

Ruff, R. R. (2019). State-level autonomy in the era of accountability: A comparative analysis of Virginia and Nebraska education policy through No Child Left Behind. *Education Policy Analysis Archives, 27*(6). http://dx.doi.org/10.14507/epaa.27.4013

Scruggs, T. E., Mastropieri, M. A., & McDuffie, K. A. (2007). Co-teaching in inclusive classrooms: A metasynthesis of qualitative research, *Exceptional Children*, *74*, 392– 416 doi:10.1177/001440290707300401

Shen, J., Leslie, J. M., Spybrook, J. K., & Ma, X. (2012). Are Principal Background and School Processes Related to Teacher Job Satisfaction? A Multilevel Study Using Schools and Staffing Survey 2003-04. *American Educational Research Journal*, *49*(2), 200–230. https://doi.org/10.3102/0002831211419949

Simon, N.S. and Johnson, S.M. (2015) Teacher Turnover in High-Poverty Schools: What We Know and Can Do. Teachers College Record, 117, 1-36.

Sindelar, P. T., Brownell, M. T., & Billingsley, B. (2010). Special Education Teacher Education Research: Current Status and Future Directions. *Teacher Education and Special Education*, *33*(1), 8–24. https://doi.org/10.1177/0888406409358593

Sorenson, L., Frank, J., Gais, T., & Sun, H. (2018). *Virginia is for teachers? An Analysis of the State's Teacher Demand and Supply*. Rockefeller Institute of Government. Retrieved from https://rockinst.org/wp-content/uploads/2018/11/11-19-18-Virginia-Supply-and-Demand-Report.pdf

StataCorp. 2015. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP.

Stewart, D. W., & Kamins, M. A. (1993). Secondary Research: Information Sources and Methods. Newbury Park, CA: Sage.

Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016). *A coming crisis in teaching? Teacher supply, demand, and shortages in the U.S.* Palo Alto, CA: Learning Policy Institute.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, *2*, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Vagi, R., & Pivovarova, M. (2016). Theorizing teacher mobility": a critical review of literature. Teachers and Teaching Theory and Practice.

Van Buuren S, Groothuis-Oudshoorn K (2011). "mice: Multivariate Imputation by Chained Equations in R." *Journal of Statistical Software*, 45(3), 1-67. doi: 10.18637/jss.v045.i03.

Virginia Acts of Assembly, 2018 Special Session 1, §2.1- 50.134H

Virginia Department of Education (2018). *In Brief: School Accreditation.* VDOE :: Standards of Accreditation. Retrieved from https://doe.virginia.gov/boe/accreditation/school-accred.pdf

Wickham H (2016). ggplot2: Elegant Graphics for Data Analysis. Springer-Verlag New York.

Wickham H, François R, Henry L, Müller K (2022). *dplyr: A Grammar of Data Manipulation*. https://dplyr.tidyverse.org, https://github.com/tidyverse/dplyr.

Wilis, C. (2019). *Examining the Relationship of Administrative Support on Early Career Special Education Teachers' Retention Decisions.* (Unpublished doctoral dissertation). Virginia Commonwealth University, Richmond, VA.

Worth, J. and Van den Brande, J. (2020) *Teacher autonomy: how does it relate to job satisfaction and retention?* Slough: NFER.

Wushishi, A.A., Fooi, F.S., Basri, R., & Baki, R. (2014). A Qualitative Study on the Effects of Teacher Attrition. *International Journal of Education and Literacy Studies, 2*, 11-16.

Zavelevsky, E., & Lishchinsky, O.S. (2020). An ecological perspective of teacher retention: An emergent model. *Teaching and Teacher Education, 88*, 102965.

Appendix A

2019 Virginia Working Conditions Survey
Teacher Version

This is a review copy, not for circulation or use. The actual survey is online with formatting for easier reading. Questions are grouped around working conditions topics (in **BOLD CAPS** *below). These topics do not appear in the online survey.*

Instructions for Teachers:

This survey is being given to teachers whose primary job responsibility is interacting with students in classroom settings. All teachers are asked to complete the survey regardless of the grade level of the students with whom they teach or interact. The purpose of the survey is to help schools create and maintain positive working conditions for professionals working in Virginia's public schools.

Your individual answers to the survey are anonymous, which means that no one will know how you answered. It is important that you submit only one completed survey for each school at which you work.

The survey should take about 15-20 minutes to complete.

In order to access the online survey, you must enter the unique password for the teacher survey which was assigned to your school. Your principal, or your principal's designee, will have this password for you. All teachers at the same school will have the same password, so you will not be identified by this password. It is important that you submit only one completed survey for each school at which you work. The researchers for this survey are obligated to protect your identity.

What is your password for taking this survey? _____

1. Are you a teacher in this school? [NOTE: If "No" is selected, the respondent will be redirected to the staff version of the Virginia Working Conditions Survey.]

   ○ Yes

   ○ No

1. PROFESSIONALISM

A. TEACHER LEADERSHIP

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	trongly Agree
2. Teachers are trusted to make sound professional decisions about instruction.						
3. Teachers are relied upon to make decisions about educational issues.						
4. Teachers engage in collaborative problem solving in this school.						
5. Teachers are effective leaders in this school.						

B. TEACHER AUTONOMY

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	trongly Agree
6. I am free to be creative in my teaching approach.						
7. I control how I use my scheduled class time.						
8. I set the grading and student assessment practices in my classroom.						
9. Current policies convey confidence in my ability to do well at my job.						
10. My role as an educator is respected under current policies.						
11. I feel that policy directives are improving our education system.						

C. Staff Collegiality

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	)isagree	ome what Disagree	ome what Agree	gree	trongly Agree
12. I feel respected by teachers and other adults at this school.	○	○	○	○	○	○
13. Teachers and other adults at this school support one another to meet the needs of all students.	○	○	○	○	○	○
14. Teachers and other adults at this school trust one another.	○	○	○	○	○	○
15. Teachers and other adults at this school collaborate to make this school run effectively.	○	○	○	○	○	○
16. Teachers and other adults at this school have taught me things that have helped me do my job better.	○	○	○	○	○	○

2. TEACHING, INSTRUCTION, AND STUDENT SUPPORT

A. INSTRUCTIONAL PRACTICES

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	trongly Agree
17. Teachers and other adults at this school expect students to use facts and evidence to support their ideas.	○	○	○	○	○	○
18. Teachers and other adults at this school want students to think about different ways to solve problems.	○	○	○	○	○	○
19. Teachers and other adults at this school encourage students to provide constructive feedback to others.	○	○	○	○	○	○
20. Teachers and other adults at this school encourage students to share their ideas about what they are studying in class.	○	○	○	○	○	○
21. Teachers and other adults at this school often connect what students are learning to life outside the classroom.	○	○	○	○	○	○

B. ACADEMIC ENVIRONMENT

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	Disagree	Somewhat Disagree	omewhat Agree	Agree	trongly Agree
22. Teachers and other adults at this school expect students to succeed.	○	○	○	○	○	○

23. Teachers and other adults at this school provide students the support they need to succeed.						
24. Teachers and other adults at this school feel responsible to help all students achieve their full potential.						
25. Students come to school ready to learn.						
26. Students willingly participate in classroom lessons.						
27. Students put forth the effort required to learn the material.						

C. Instructional Environment

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	)isagree	ome what Disagree	ome what Agree	gree	trongly Agree
28. The physical environment of my classroom supports my teaching and my students' learning.						
29. I have adequate space to work productively.						
30. My school provides me with sufficient access to appropriate instructional materials.						
31. I have the support I need to incorporate technology into my instruction.						

3. School and Community Supports

A. School Leadership

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	)isagree	Somewhat Disagree	Somewhat Agree	Agree	trongly Agree
32. I feel respected by this school's administrators.						
33. I feel comfortable raising issues and concerns that are important to me with school administrators.						
34. I trust this school's administrators to do what they say they will do.						
35. This school's administrators support the professional development of staff.						
36. This school's administrators support teachers' efforts to maintain discipline in the classrooms.						
37. This school's administrators communicate a clear vision for this school.						
38. Teachers and other staff have a shared vision for this school.						
39. This school's administrators understand how children learn.						
40. This school's administrators set high expectations for all students.						

B. Teacher Evaluation

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	)isagree	ome what Disagree	ome what Agree	gree	trongly Agree
41. I feel respected by this school's administrators.	○	○	○	○	○	○
42. I feel comfortable raising issues and concerns that are important to me with school administrators.	○	○	○	○	○	○
43. I trust this school's administrators to do what they say they will do.	○	○	○	○	○	○

C. Professional Development

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	)isagree	ome what Disagree	ome what Agree	gree	trongly Agree
44. Sufficient resources are available for professional development in my school.	○	○	○	○	○	○
45. Professional development is differentiated to meet the individual needs of teachers.	○	○	○	○	○	○
46. Follow-up is provided after professional development activities to give teachers additional support.	○	○	○	○	○	○
47. Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.	○	○	○	○	○	○
48. Professional development enhances teachers' abilities to improve student learning.	○	○	○	○	○	○

D. Demands on Teachers' Time

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	Disagree	omewhat Disagree	omewhat Agree	Agree	trongly Agree
49. Class sizes are reasonable such that teachers have the time available to meet the needs of all students.	○	○	○	○	○	○
50. Teachers have time available to collaborate with colleagues.	○	○	○	○	○	○
51. The non-instructional time provided for teachers in my school is sufficient.	○	○	○	○	○	○
52. Teachers have sufficient instructional time to meet the needs of all students.	○	○	○	○	○	○

E. Managing Student Behavior

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	Disagree	omewhat Disagree	omewhat Agree	Agree	trongly Agree
53. Students know how this school defines inappropriate behavior.	○	○	○	○	○	○
54. Students know there are consequences for breaking school rules.	○	○	○	○	○	○
55. Teachers and other adults at this school consistently enforce rules for student behavior.	○	○	○	○	○	○
56. When students are accused of doing something wrong, they get a chance to explain.	○	○	○	○	○	○

57. Students are acknowledged for positive behavior.						
58. There are supports to help a student who consistently misbehaves develop positive behavior.						
59. We use data to evaluate and, if needed, adjust this school's student conduct policies.						
60. This school's rules for student behavior are effective.						

F. New Teacher Support

Indicate whether new teachers are provided the following supports at your school. *Mark one response per line.*

	Yes	No	Do not know
61. Formally assigned a mentor			
62. Reduced workload			
63. Release time to observe other teachers			
64. Formal time to meet with mentor during school hours			

G. Relationships with Parents/Guardians

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	trongly Agree
65. Teachers and other adults provide useful information to parents and guardians to support their children's learning at home.	○	○	○	○	○	○
66. Teachers and other adults help parents and guardians teach healthy social and emotional skills.	○	○	○	○	○	○
67. This school maintains clear, two-way communication with parents and guardians.	○	○	○	○	○	○
68. This school does a good job of encouraging parent/guardian involvement.	○	○	○	○	○	○
69. Parents and guardians help their children achieve the educational goals of the school, both academic and behavioral.	○	○	○	○	○	○

4. Safety

A. Concerns about Safety

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	trongly Agree
70. I am treated with respect by students at this school.	○	○	○	○	○	○
71. I feel safe at this school.	○	○	○	○	○	○

72. I feel there is adequate security in this school.	○	○	○	○	○	○

B. PREVALENCE OF BULLYING

What is bullying? **Bullying means any aggressive and unwanted behavior that is intended to harm, intimidate, or humiliate the victim; involves a real or perceived power imbalance between the aggressor or aggressors and victim; and is repeated over time or causes severe emotional trauma. 'Bullying' includes cyber bullying. 'Bullying' does not include ordinary teasing, horseplay, argument, or peer conflict.**

How strongly do you agree or disagree with the following statements about this school? *Mark one response per line.*

	trongly Disagree	isagree	omewhat Disagree	omewhat Agree	gree	trongly Agree
73. Bullying is a problem at this school.	○	○	○	○	○	○
74. Students at this school are bullied about their race or ethnicity.	○	○	○	○	○	○
75. Students at this school are bullied about their clothing or physical appearance.	○	○	○	○	○	○
76. Students at this school are bullied about their sexual orientation.	○	○	○	○	○	○
77. Students at this school are bullied about their disability.	○	○	○	○	○	○

5. SUMMARY

78. Overall, my school is a good place to work and learn.

- ○ Strongly Disagree
- ○ Disagree
- ○ Somewhat Disagree
- ○ Somewhat Agree
- ○ Agree

- Strongly Agree

79. Which of the following best describes your immediate professional plans?

- Continue teaching at my current school
- Continue teaching in this division but leave this school
- Continue teaching in this state but leave this division
- Continue teaching in a state other than Virginia
- Continue working in education but pursue a non-teaching position
- Leave education to retire
- Leave education to work in a non-education field
- Leave education for other reasons

6. DEMOGRAPHICS

80. Are you male or female? *Mark one.*

- Male
- Female

81. What is the best description of your race? *If you are multi-racial, mark all that apply.*

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Pacific Islander
- White
- Other Race

82. Is your ethnic background Hispanic or Latino? *Mark one.*

- Yes
- No

83. Which subjects are you teaching this year? *Mark one response per line.*

	Yes	No
Bilingual/English language learners/English as a Second Language		
Career and technical education		
Early childhood education		
Elementary education		
English Language Arts		
Fine Arts (e.g., art, dance, music, theatre)		
Foreign language		
Health/physical education		
History/social studies/civics/geography		
Mathematics		
Science		
Special education		
Other		

84. Which grades are you teaching this year? *Mark all that apply.*

PK K 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th

85. How many years have you worked at this school? *Mark one.*

1-3 years 4-10 years 11-20 years More than 20 years

86. Have you already submitted a completed 2019 Virginia Working Conditions Survey for this school?

- No, this will be the first 2019 survey I will submit for this school.
- Yes, I have already submitted a 2019 survey for this school.