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LABOR PROCESS THEORY IN EDUCATION: TEACHER RETENTION, TURNOVER, ATTENDANCE, AND OPTIMISM IN JEFFERSON COUNTY PUBLIC SCHOOLS

By

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B.A. University of California, Santa Barbara, 2014
M.A.T. University of Louisville, 2021

A Thesis
Submitted to the Faculty of the
College of Arts and Sciences of the University of Louisville
in Partial Fulfillment of the Requirements
for the Degree of

Master of Arts
in Sociology

Department of Sociology
University of Louisville
Louisville, Kentucky

May 2023

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A Thesis Approved on

April 21, 2023

by the following Thesis Committee

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DEDICATION

This thesis is dedicated to my family

Mr. Peterson Cruz San Luis

Mrs. Gina Mores San Luis

Ms. Madison Ellise San Luis

Mr. Gibbson Mores Puzon San Luis

and

Ms. Elsecia Mores

who have loved and accepted and supported all aspects of myself and aspirations in life

ACKNOWLEDGEMENTS

I would like to express my appreciation and gratitude to my thesis chair, Dr. Dave Roelfs, for his dedicated mentorship, his thoughtfulness, his patience, and his support, and his consistent motivation and reassurance. I would also like to thank my thesis methodologist, Dr. Bob Carini for encouraging and challenging me since my acceptance into this department. I am beyond grateful to my best friends, Jerusha and Phoebe, for being so kind, supportive, understanding, and uplifting in this endeavor and all others. I would also like to thank my partner, Aaron, for cheering me on and encouraging to me rest and reassuring me that I can do anything I set my mind to. To my family in California, I have never felt the distance between us and your love and support and I am so thankful for you. To my family here in Kentucky, thank you for your unrelenting support and for always making me feel at home.

ABSTRACT

LABOR PROCESS THEORY IN EDUCATION: TEACHER RETENTION, TURNOVER, ATTENDANCE, AND OPTIMISM IN JEFFERSON COUNTY PUBLIC SCHOOLS

Janessa Lea San Luis

April 21, 2023

Evaluating worker satisfaction, retention, and attrition is far from a ground-breaking concept. Labor process theory has been a lens through which workers' experiences have been studied and utilized in many workplaces. Schools are not exempt from this lens and others before me have slid them beneath the labor process lens, and I seek to add to that field of research. The teacher shortage issue is not a novel one by any stretch of the imagination, but with 45% of public schools having at least one teaching vacancy as of October 2022 (National Center for Education Statistics, 2022), there is just cause to revisit teachers as workers and how conditions in their workplace may be contributing to their absence.

By analyzing teachers' satisfaction, the nature of their work, how much control they have in their workplace, and the relationships they have with their administrators in Jefferson County Public Schools, I hope to shine new light on how teachers' working conditions have affected retention, turnover, attendance, and the optimism that their workplace can change for the better. Working conditions survey responses from over 120 schools in the district from the 2020 school year will be examined in this thesis. Gaining insight into these conditions can help explore more nuanced perspectives on teacher retention and attrition. Reconciling the teacher shortage can be aided by theory-driven research. Getting teachers into classrooms, encouraging them to stay, and empowering

them to provide enriching, equitable education to students is essential because “what we want and need is education pure and simple, and we shall make surer and faster progress when we devote ourselves to finding out just what education is and what conditions have to be satisfied in order that education may be a reality and not a name or slogan” (Dewey, 2015).

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INTRODUCTION

The motivation of this thesis is to use labor process theory to investigate what teachers are going through in their workplace and why teachers are leaving the profession. Teachers are leaving their posts mid-year, and the number of teacher position vacancies in the state of Kentucky is alarming. According to the Kentucky Educator Placement Service, Kentucky is currently down 11,000 teachers as of February 2023. In the last 30 days, there have been 223 high school teacher openings, 123 middle school teacher openings, and 240 elementary school openings. The National Education Association states that, "failing to address educator shortages has led to negative effects on students, schools, districts, and communities" (Pelika, 2022). The nature of education implies that teachers are responsible for helping foster our future. If there are not enough teachers to provide the support, guidance, and instruction that our future needs, the effects of their absence may not be fully understood until much later. By then, the damage will have already been done, if not exacerbated.

There have been initiatives to attract more prospective teachers into the classroom in the form of increased salaries and fast-tracked education and certification opportunities, but what happens to those teachers after they are hired and are in the classroom? Some Kentucky lawmakers believe that a pay bump may not be enough to acquire and keep teachers in schools, instead calling for other incentives like scholarships or loan forgiveness (Schreiner, 2023). However, even with measures like these already in place, teacher turnover is still high and not enough applicants are replacing them. Government initiatives have not been limited to enticing and retaining teachers - they have also served to create an environment ill-equipped to preserve, support, and empower

educators. Over the past few decades, these initiatives have seen elements of centralized policy but with decentralized accountability, such as performance targets, curriculum, and standardized tests (Carter and Stevenson, 2012). This direct exertion of control over teachers is no doubt an important factor to consider when evaluating what teachers are experiencing at work and how that contributes to making them feel compelled to leave. To contend with the struggle of school improvement, political parties have and can continue to further tighten their control of teachers' work (Troman, 2000). If policymakers continue overlooking teachers' views and perceptions of their work and how it has evolved and intensified and do not act with their perspectives in mind, the teacher shortage may not see a peaceful resolution anytime soon.

To echo previous researchers that have applied labor process theory to education before, "How are teachers being controlled currently, and what effect are the controls having on their work?" (Reid, 2003). How relevant are these effects to recent teacher retention and attrition rates, and how can these effects be analyzed to curb today's ever-growing vacancies in such an essential profession? These are questions that I seek to address with my thesis.

LITERATURE REVIEW

Labor Process Theory Overview

The foundation of this thesis is labor process theory and how it exists in public schools. Labor process theory is a Marxist theory of the organization of work and labor management under capitalism, first explored in *Capital*. It was the emergence of production for profit instead of need that contributed to jumpstarting the expansion of the theoretical lens of labor under capitalism and the observed evolution laborers underwent that served to undermine capitalism's influence on their labor. As summarized by Knights and Wilmott in *Labour Process Theory*, Marx observed an erosion of laborers' creative power in exchange for their labor capacity. Understanding work organization requires that it be viewed within the lens of the social structure of society at large (Adler, 2007). The relationship between workers, their labor, their managers, and the capital they are expected to produce (often in surplus) inherently evolved, as is evidenced by the numerous theorists that have elucidated, critiqued, and expanded upon Marx's view of the labor process. In this thesis, I focus on four core labor process concepts - work satisfaction, deskilling, autonomy over one's work, and the relationship between laborers and their managers.

Satisfaction

Work satisfaction can be defined as the level of fulfillment, contentment, or satisfaction a worker feels in regard to their job, the work they do, and the environment in which they work. This satisfaction can exist in a cognitive or more concrete sense. It is a worker's overall orientation to the "range of specific satisfactions and dissatisfactions that [they] experience with respect to the different dimensions of work" (Kalleberg,

1977). Just as management has evolved to adapt to capitalism, workers have had to adapt as well. Instead of being driven by passion for their craft or gratitude for the attention from management, workers have evolved to feeling a fear of being watched, actively monitored (Braverman, 1974). Changes the modern workplace has undergone has also led to heavier workloads, increased surveillance of work, and decrease in life-time employment (McCann et al, 2008). These changes can negatively affect work satisfaction, since larger workloads without pay that reflect that increase, being subject to an increased sense of scrutiny, and a lowered desire to stay at a job all have adverse effects on a worker's sense of contentment or fulfillment in their job. When utilizing an assembly line metaphor, the work can be seen as fragmented, and workers can be alienated from their work. Instead of being able to look at a pile of materials and watch and participate in the steps in its transformation into something else, assembly lines and the way tasks are separated into one-step processes create a distance between the worker and the work itself (Braverman, 1974). In this way, laborers can be reduced to a cog in the machine instead of an active participant in the creation process, which can be representative of the satisfaction labor process concept.

"Good work" can be determined by the stories and narratives spun about work to an audience outside of the work (Ezzy, 1997). Being able to tell stories about your job to people who are not actively working with you is a determining factor in whether the work can seem oppressive or otherwise. Job satisfaction is an "evaluative measure based on workers' perceptions of the overall goodness of their jobs and their judgments about the quality of their employment situations" (Kalleberg, 2011). As such, job satisfaction is a matter of subjectivity - not an objective evaluation. It is important to consider whether it

is possible for a worker to delude themselves into thinking they are engaging in good work. Since stories typically include two parties - the teller and the listener - they can be internalized or interpreted differently depending on their contexts. Can a listener determine whether a worker is willingly subjecting themselves to oppression in their workplace based on the stories they tell? If one's story does not register as indicative of "good work" to their audience, is it really good work? Workers' stories or lack thereof can reflect their level of work satisfaction.

Deskilling

Frederick Taylor was the first to describe the idea of deskilling, which is the degradation of the skill required to do a job. "Fragmenting jobs, reducing skill requirements, and replacing worker autonomy with management control" are but a few ways that deskilling can present itself within control and cost reduction imperatives in the workplace (Adler, 2007). Deskilling can be summarized by the following ideas: breaking down a job so it can be limited to a single task, laying the expectation on workers that they are unable to see the connection between the planning and doing of their task, suppressing a worker's activity so much that they are divorced from the preparation and organization of their work, minimizing the skill required to learn a job as well as the time to learn said skill, and the dissolution of the direct relationship workers have with their labor materials (Littler, 1978).

Management is heavily involved with the process of deskilling, since the goal is to maximize capital by maximizing the amount of labor they can extract from their workers with as little pay as possible. Workers were able to manage how their working days were spent since they were being paid by task, prior to the shift to time-based work.

Through careful observation and adapting to the demands of capitalist production, management was then able to note how workers' time was actually spent on the clock and help shift work compensation to the paid-by-time metric. If management knows how their worker's labor process works, then it makes it more difficult for workers to manipulate how their time is spent on the clock (Taylor, 1967). Management is then able to understand what it actually takes to complete their task, fire existing workers, then hire and train new workers at a lower rate -- deskilling in action.

Management can exert control over labor through deskilling and dividing the labor itself as well. If management has knowledge of how to accomplish a task, they can pay less experienced workers at lower rates and only teach them the basics of the task that need to be performed. This creates a new generation of workers with less skill for less pay, which makes it easier for management to monitor and control (Braverman, 1974). How these tasks are divided can also make it more difficult for the worker to have autonomy over their individual labor. Deskilling is more limited in lines of work that rely on more cognitive and mental labor than physical labor because it is dependent on transfer or knowledge from workers to management (Sewell, 2005). Work has evolved to require more cognitive skills than physical, which plays a role in how much deskilling can occur in an organization. In fact, cross-training may be avoided by management to avoid potential upskilling at an individual level while still deskilling at the organizational level (McCann et al, 2008). This comes into play particularly when it comes to higher middle management. Organizations can save money by hiring fewer people and letting their higher middle managers go in favor of giving lower-level workers a shot at doing

more complex work at a slightly higher rate, thereby decreasing the average level of skill in an organization.

Workplace and Labor Autonomy

Workplace and labor autonomy is the level of control a worker has over their work environment and the work they do - it is the level of freedom a worker has over completing their tasks in a way that they see is best. Work autonomy is a central component of underlying job quality according to Marx, which has also been called self-direction and task discretion, "the degree of initiative that employees can exercise over their immediate tasks" (Kalleberg, 2011). These tasks and the ability to complete them are defined by skill. Skill can have two identifiable dimensions - complexity and autonomy. It has been argued that "powerful forces encourage managers in capitalist firms to try to reduce both complexity and autonomy so as to ensure lower costs and greater control" (Adler, 2007). Workers being stripped of their sense of control over their work can negatively affect their sense of ownership and autonomy in their workplace. There is a push and pull between workers and managers in the modern form of work compensation in that management is seen as a manipulator, dismissive of worker autonomy while workers are left to construct their own dignity, meaning, and purpose in the workplace. In other words, workers have to actively try to exert control in their respective craft (Braverman, 1974). The manager controls what workers do, how they do what they do, and how time is spent working.

Prior to the switch of work compensation, management's perception of the control they held over their workers was immensely limited. Workers had sole control over all aspects of production; knowledge of their craft was only held by the workers themselves

(Taylor, 1967). This encapsulates the concept of workplace and labor autonomy. In more modern settings where cognitive labor is more prevalent as well as more difficult to track, there is a sense of indeterminacy - there is no present limit or knowledge of what a worker can do (Sewell, 2005). It is difficult for managers to monitor and have control over cognitive labor since it cannot be observed like physical labor. Organizational misbehavior or workplace deviance often present themselves as methods of control and resistance (Thompson and Smith, 2009). This serves to undermine the control that managers try to exert over their workers. New managerial control practices have emerged regardless to match the evolution of work and changes in occupational structures. Such practices include managerial attempts to shape workers' identities and revitalize worker commitment through panoptic surveillance and self-discipline (Thompson and van den Broek, 2010). External surveillance is not where the sense of control ends. Newer production systems have been able to successfully delegate responsibilities, but tasks are more closely and strictly controlled - namely in the form of peer surveillance or even self-management, which turns out to be mutual control between workers (Smith and Thompson, 1998).

Labor-Management Relationship

Labor-management relationships reflect the nature of the interactions between workers and their managers. Earlier perceptions of this relationship oversimplify the idea that workers are not aware of how in conflict they are in with management (Taylor, 1910). Management's goal is to get as much labor and production as they can out of their workers with as little resistance as possible, though it would serve management to not fall into the assumption that workers are pliable and docile (Burawoy, 2010). This was

demonstrated in the “Human Relations” approach to labor management in which experiments were conducted that formed the basis of the Hawthorne effect - in which mild adjustments to work conditions yielded an effect on worker productivity (Roethlisberger et al, 1956). Due to the gap created between productivity and compensation, “workers’ situations have worsened while many companies have prospered” (Kalleberg, 2011). Acceptable or even adequate levels of compensation for the amount of excess labor eked out of laborers has yet to even out, and management’s role in the inequity is likely not lost on their workers. With an assumed sense of antagonism in labor-management relationships, work that is oppressive or not is often tied up with work structure and agency (Ezzy, 1997). Maintaining a separation in the form of either power, status, and/or control can increase the chances of an oppressive relationship between workers and managers. Managers are in pursuit of a monopoly over all aspects - cognitive, mental, physical, etc. - over their employees’ work, this can reduce the perception of workers to that of automatons (Sewell, 2005). Antagonism would be inevitable in labor-management relationships such as these.

Since management can exert direct and indirect control over a worker’s environment and level of autonomy they have, the nature of this control can have a positive or adverse effect on the relationship between workers and their managers. Managers may feel the need to ensure the control of their workers’ labor to “maintain their status and privilege in the organization” (Jaros, 2000). Harry Braverman, in *Labor and Monopoly Capital,* observed a transition in how work was being compensated - from being paid to accomplish a task to being paid for time worked and how that time is used. The progression of how management exerts control over workers and how workers exist

and resist, implicitly or explicitly, in that sphere is influenced by its need to meet the demands and changes that capitalism called for. Managerial strategies have had to evolve in response to "market conditions and changing forms and the strength of worker resistance" (Knights and Wilmott, 1990). These strategies have advanced in such a way that workers have continuously met the challenges of antagonistic working conditions through labor organization and advocacy, which can create a vicious cycle of increased control and further increased pushback. Unions are one such example of resistance since they are an "important source of collective representation and over time their discourse has helped define what a worker is" (O'Doherty and Wilmott, 2009). Managerial responses have also included, "downward wage pressure, work simplification, intensification and reorganization, technological, relocation," and other methods to assure reduced costs of production with raised expectations to produce (Adler, 2007).

Applying Labor Process Theory to Public Schools

The scope of teachers' work has changed in a variety of ways. Since the 1990s, teachers' work has been documented as moving away from classroom instruction being their sole responsibility (Troman, 2000). Beyond just teaching, teachers are responsible for filling many roles at once. Activities of the faculty role had included: teaching, research, and service, with service implying "the provision of professional expertise to a particular client" (Dill, 1982). Clients, in this case, being students. The scope of a teacher's workday - as well as the emotional labor involved - now formally and expectedly extends out of regular working hours, contrary to their workday prior to the shift of labor structure across the country. Teachers were not only responsible for teaching content that aligned with established standards; they had to expand their

repertoire to emotional support and guidance as well. Changes in parents' work structures prompted changes in what schools had to do, what they had to change, and what new roles they had to fill. Both parents were likely employed and no longer staying at home the entire working day, which meant that kids would need a place to go during working hours - schools had taken on that role. Teaching as a job intensified in a number of ways: time constraints that can contribute to burnout or deskilling, chronic work overload, being subjected to prepackaged curriculum - all of which is driven by societal and bureaucratic pressure and control (Hargreaves, 1994). Teachers adjusted as well, shifting towards more involvement in and out of school as far as how their professional responsibilities evolved. This could have looked like anything from after school supervision, after school tutoring, being a sports coach, club advisor, etc. Parent involvement in schools and curriculum also prompted a change in teaching. Recent examples include parent interest groups protesting critical race theory or protesting LGBTQ+ books being present in school libraries (Izaguirre, 2023).

Polarization of employment systems as it pertains to job satisfaction, job security, earnings and wages, control over work activities and work environment, intrinsic rewards, and time at the group and individual level, as well as within the occupational structure as a whole are all ways in which the nature of work can be evaluated (Kalleberg, 2011). In schools, teachers' responsibilities are compartmentalized in a formal capacity (i.e., the job description, described job duties, earnings, insurance, etc.), but in reality they are much more widespread in an informal capacity. Teachers often wear many hats and fill in wherever they can as situations call for it, especially in the context of as an individual, part of a team, a department, and the school overall. Teachers

have the wherewithal to know where to slot in when needed - whether in direct instruction, behavior management, communication with parents or guardians, professional development requirements, etc. - exhibiting some measure of control over their work activities and environment.

Teacher Satisfaction

It is difficult to discern where schools fall in the spectrum of job satisfaction - very good, very bad, or perhaps in the ever-elusive middle? There are many factors that can impact where an individual may fall in this spectrum. Due to that reality, it is problematic to lump schools in either end. The student-teacher ratio, level of administrative support, and funding are just a few aspects that can impact job satisfaction within a school. However, this is in stark contrast to my perception of job security, which is positively polarized. There is a constant teacher shortage across several districts around the country - there is no shortage of openings to be filled. According to the National Center for Education Statistics, "18% of public schools had one teaching vacancy and 27 percent had multiple teaching vacancies." Now whether teachers are willing to remain in those positions is a separate matter entirely. While Jefferson County Public Schools (JCPS), the largest school district in the state of Kentucky, is an outlier in terms of earnings and wages due to the teachers' union's strength and history, schools by and large tend to be on the negative end of polarization in this case (National Education Association, 2019).

This brings in the issue of the burnout - one of my main motivations for pursuing this topic as my thesis. There are multiple sources of burnout: individual, organizational, and transactional factors. Individual factors include personality and experience,

organizational factors include schools' socioeconomic status, administrative support, and the nature of work demands, and transactional factors can include perceptions of organizational leadership, perceived support, teacher efficacy, and professional satisfaction (Chang, 2009). Work satisfaction can also be impacted by how much support teachers receive from their principal and other administrators. Satisfaction, job performance, and organizational commitment are likely to increase when they are motivated and supported by their administrators (Erturk, 2021).

JCPS teachers have in fact voiced and mobilized their sense of satisfaction and belonging by organizing in protest against the state legislature back in 2018/2019 with their sickouts (Watkins, 2019). The labor process itself within schools can be intensified or relaxed whether there is direct state involvement in a school (Accelerated Improvement School status). Marx's summary of the systematic division of labor can also relate to how staff can feel a sense of satisfaction or belonging in their workplace in that their day-to-day tasks and responsibilities can vary from being fulfilling to alienating depending on the level of division. The notion of surplus capital in education can be difficult to navigate considering how profits are not necessarily measured identically with the way in which businesses and corporations do. Though school systems can be viewed as being steered in the direction of being run similarly to a business, surplus can be viewed as funds that were not spent in schools and can instead be spent elsewhere (infrastructure, other social services, police, etc.) or funds that are streamlined away from schools and to other use instead.

Deskilling in the Teaching Profession

Alternative certification programs for teachers are an example of deskilling the profession of education. Oftentimes, prospective teachers are going to school full time to become teachers and earn their certification while also learning how to teach in the classroom in real time - a trial by fire method of on-the-job training. New teachers working in this level of unassisted isolation demonstrates a "slow and painful learning curve… which exacts a high price on new teachers, their students, and the entire school community" (Moir and Gless, 2001). It is no guarantee that prospective teachers have prior experience with children or teenagers prior to stepping into the classroom.

Professional development in education, as defined by the Kentucky Department of Education, is an approach to ongoing professional learning that centers continuous improvement and growth (McCollough, 2022). Marx described workers' control "over the productive process of labor [as] progressively eroded, 'the workers find themselves confronted by functions of the capital that lives in the capitalist,' and their experience of work is increasingly one in which 'the forms of their own social labor are utterly independent of the individual workers.'" This highlights the alienation that laborers can feel from their own work. Not having opportunities to advance in the workplace, having goals to work toward, and being deprived of access to supportive development options are all methods in which school-based staff can feel alienated from their work and, in essence, feel their professional development is stunted and not valued by their superiors. To combat this feeling of alienation, "the worker is neither impotent nor ineffectual. As a worker [they are] crippled; but as a wage-laborer, [they have] many opportunities for organizing to resist a system that subordinates the exercise of labor power to the demands of capital. The very structure of the capital-labor relationship presents the opportunity for

exploiting capital's dependence on labor" (Knights and Wilmott, 1997). It is in administrators' best interests to provide professional development opportunities to their staff because it makes them better fit to complete tasks and do the work necessary to keep a school running and running well. Stagnation is not sustainable - especially in a public school. Students are ever growing and changing, as is the nature of working in a school. If school-based staff are not offered opportunities to keep up with that change, then the output administrators, as well as the State, are expecting cannot be achieved.

Teacher Autonomy

Teachers are subject to the labor process, and this is evident in the level of control exerted upon them. The labor process of public school teachers is defined by the state instead of market competition, since their labor is sold to the state and they are subject to the surrender of creative capacity (Reid, 2003). Polarization in terms of control over work activities and the work environment tends to be good in a localized environment unless the environment is one in which intrinsic rewards are weaponized (Kalleberg, 2011). Intrinsic rewards typically play a more important role in schools than in other jobs where the rewards may just be a paycheck. However, those very rewards can be toxic if not compensated well. Sometimes, the only reason why teachers do not leave the profession - if every other aspect of work is negatively polarized - is that they do not want to let their students down. The development and maintenance of a workplace culture serves both managers and employees by creating a space for buy-in, togetherness, and a sense of all "being in it together." Managerial initiatives, such as total quality management, can be described as offering a "more interdependent workplace, with flatter structures and reduced hierarchy… the differences between capital and labor would be blurred and

alliances of self-interest developed" (Smith and Thompson, 1998). By inviting a more horizontal structure, the notion of oppression usually associated with management and supervision in a work setting can be muted or diminished. Teachers at schools with a more horizontal structure, inviting more ownership and autonomy when it comes to school-based decision making can feel an increased sense of workplace autonomy.

The worst example of negative polarization in schools would have to be teachers' relationships with time. The work done is not restricted to a typical 9-5 format. New organizational forms of working including the dissolving of institutional hierarchies, democratization of the workplace, and increasing flexibility are in fact new forms of control (Reid, 2003). This assumed and pressured sense of flexibility coincides with the negative polarization teachers experience in relation to time. Time is spent in and outside of the actual act of teaching by spending it on preparation, grading, lesson planning, standardized testing, meetings, after school programs, parent conferences, and numerous other responsibilities.

Teacher-Administrator/Superintendent/School Board Relations

With the labor shift in mind, administrators recognize that school staff are time-based workers, not necessarily task-based. As such, "pumping surplus value out of labor" presents itself in a school by having staff show up early for morning supervision, stay late for afternoon supervision, fill out paperwork and attend meetings during their planning periods, cover for other classes, etc. These are all such methods that reflect that pumping of surplus value. Marx had anticipated that "control over every aspect of work, experientially as well as technologically, will increasingly be determined by the priorities and demands of capital." This is certainly reflected in the way that administrators

delegate tasks, perform routine observations and evaluations, and potentially micro-manage the way staff members complete their work - no matter what form it may take. Like any manager or foreman, school administrators are responsible for ensuring that work is done efficiently and correctly, with "directing, superintending, and adjusting becomes one of the functions of capital" as their main task (Braverman, 1974).

In education, not every administrator or school board member has classroom experience even though they oversee educators at the micro and macro level. If they do have experience, odds are their experience may be outdated since the field and its standards move very quickly to meet the needs of students and demands of the state. After all, tacit knowledge still exists (Sewell, 2005). However, the proximity of their experience does not restrict them from being involved in direct and indirect management of educators and their work. Particularly in JCPS, middle and high school educators contractually work between 7:25 and 2:25, and that work can take many forms (instruction, planning, supervision, covering other classes) and be under varying levels of scrutiny by their administrators. Most school administrators have had extensive experience in the classroom, though they may be a bit removed from modern to cutting edge to developments in pedagogical approaches. With that experience, they can directly oversee anything from classrooms in general to one-on-one staff to student interactions. Braverman (1974) goes on to say that the "removal of all forms of control from the worker… is 'the ideal towards which management tends, and in pursuit of which it uses and shapes every productive innovation furnished by science.'" Either through micromanagement via school administrators or by the State itself, school-based staff can have their autonomy at work heavily restricted.

METHODS

Positionality

As a teacher in JCPS, I am in a unique position when researching this subject matter. It is an advantage because I have nuanced insight into how results from my data analysis can be evaluated or justified. I have firsthand experience with what it is like to be in a classroom and what it is like to interact with administrators as supervisors in my workplace, so I can come from a position of authority when offering explanations for certain results. However, that very advantage can also be a disadvantage. I have to ensure that I instinctively guard against any disaffirming statements and assume that I have an advanced sense of what outcomes may look like based on my work experience. Making sure I have a distance between my expectations and my actual results is crucial to assuring a lack of bias.

Unit of Analysis

Schools are the unit of analysis for this thesis, namely schools within the district of Jefferson County Public Schools (KY). This district was selected for analysis, not only because of my level of familiarity with the site as a teacher within it but because I am able to make informed choices as to which schools to include or omit and if any have unique features. There are 165 schools in this district, though only 131 schools are included in this analysis. Schools that are classified as alternative education schools, early childhood education facilities, and special education facilities are all omitted from the analysis due to the differences in certifications that employees would require in those schools in comparison to elementary, middle, and high schools. The omitted school types tend to be much smaller schools in both student and faculty numbers than those included.

Jefferson County Public Schools, hereafter referred to as JCPS, is also the largest school district in the state and almost 80% of all students in the city attend schools within it. Analyzing this district allows for a larger breadth of schools to analyze rather than any other district in the state. The names for each school included in the analysis are listed **Table 1 in the Appendix.**

Data Sources

Data on various attributes of JCPS schools for this thesis is obtained from three different sources: JCPS' Comprehensive School Survey, the Impact Kentucky Working Conditions Survey, (hereafter referred to as CSS and IKWCS) and JCPS data books. Data were gathered from the 2021-2022 school year since it is the most recent available data for each source.

The CSS is administered annually and anonymously to all school employees, parents, and students. Specifically, school certified employees' - teachers' - responses are the focus of this project. The survey aims to gather feedback regarding work climate and the school environment and use it to develop strategies and discussion that impact the future of the district. Each school's responses by percentage are publicly available, though schools' results are omitted if there are less than 5 responses, to ensure anonymity. JCPS notes that the survey can offer insight into staff members' feelings and perceptions of connectedness, curriculum, teaching, safety, and satisfaction (JCPS).

The IKWCS, formerly the TELL (Teaching, Empowering, Leading, and Learning) Survey, is administered anonymously by the Kentucky Department of Education. Similar to the CSS, this survey aims to collect feedback on certified educators' working conditions. The 2021-2022 survey is the sixth time this survey has

been administered, and it has been made available to over 43,000 educators across the state. Items on the survey concern professional learning, feedback and coaching, school leadership, relationships between faculty and administrators, school climate, resources, behavior management, educating students, and emotional well-being and sense of belonging (Panorama Education).

JCPS allows public access to data sets pertaining to multiple facets via data books at the elementary, middle, and high school levels. Data books can be accessed through the Cascade Data portal (JCPS).

Labor Process Theory Concepts in Selected Data Sources

To best align key concepts of labor process theory with my research data, I have used Knight and Willmott's introduction to Labor Process Theory and Arne L. Kalleberg's polarization measures to code the JCPS Comprehensive School Survey and Impact Kentucky Working Conditions Survey question categories. Based on the nature and content of the questions and how they correspond to concepts discussed and analyzed in Labor Process Theory and what I am focusing on for my thesis, I have simplified the categories into the following codes: satisfaction/belonging, administration/management, and professional development.

The items associated with satisfaction and belonging discusses employee benefits and pay, supervisor feedback, communication, satisfaction in one's position and workplace, and feeling like they can recommend their job location to someone else. Administration and management items explored higher level leadership, supervisor level leadership, school-based decision making committee leadership, and the nature of how funding is managed. Lastly, professional development items related to opportunities to

advance in a job, how professional development is connected to academics, and whether the job provides adequate opportunities for personal and professional growth. Questions included in my data will be detailed in the Variables section.

Variables

Dependent Variables

I examined four different dependent variables for this thesis: teacher retention rate, teacher turnover rate, teacher attendance trend, and optimism. The first three variables are from the data book, and the optimism variable is taken from a survey item from the IKWCS. Relationships between the dependent variables and scales (satisfaction, deskilling, autonomy, and labor-management relationships) created based on labor process theory will be analyzed.

Retention rate. Retention rate is an interval/ratio variable, measuring the percentage of active, full-time teachers at a specific school that returned to the same school the next year. This measurement is included in the analysis because it is one of the major outcomes I want to analyze as far as applying labor process theory in schools. The goal is to examine the rate at which teachers are returning to their schools the following school year - by school - and how that is influenced by teacher satisfaction, labor-management relationships, deskilling, and workplace and labor autonomy. If teachers feel a high level of satisfaction with their work and their placement, one can assume that they will return to the same school the following year. Whereas, an antagonistic or negative relationship between teachers and administrators may lead to a school having a lower retention rate. Being made to feel obsolete or feel as if the skill required to do one's job has been diminished can also lead to a lower retention rate at a school. A high retention

rate at a school can then be assumed if teachers feel that they have more control over the intricacies of their work and environment.

Turnover rate. Turnover rate is an interval/ratio variable which measures that percentage of teachers that either transfer to a different school or leave the teaching profession altogether. This is essentially the inverse of retention rate, which makes it a sound outcome to examine in relation to the labor process theory scales. High teacher satisfaction would likely lead to a lower turnover rate at a school. If you are satisfied with your job, it may not make the most sense to leave it. Teachers that feel like they are not growing their skillset or actively improving in their job - feeling a sense of stagnancy - may contribute to no longer wanting to be in that position, which in this case may lead to a school having a higher turnover rate. Schools with healthy, supportive relationships between faculty and administrators may have lower turnover rates. Feeling less control and more oversight over one's work in a school can lead to a feeling of alienation from the work itself, which may lead to a higher turnover rate. Not feeling ownership over one's labor and environment can be an indicator of transferring to a different school in hopes of a different experience or perhaps making a career change.

Attendance rate. Teacher attendance rate is an interval/ratio variable which measures the percentage of active, full-time teachers not on long-term leave. Labor process is used to look at school attendance rates, and how satisfaction, deskilling, labor-management relationships, and autonomy can influence the rate at which teachers are actively in the building. The level of satisfaction teachers feel at work can influence how often they do or do not show up for work. Having the feeling of improving at your job and having access to development opportunities may increase a school's attendance rate.

Negative labor-management relationships can have a similarly negative effect on teachers' attendance. A sense of control over one's work and environment may influence them to consistently go to work.

Optimism. Optimism is the averaged response to a five level item on the IKWCS titled, "How optimistic are you that your school will improve in the future?" The possible responses to the item are Extremely, Quite, Somewhat, Slightly, and Not at All. Schools with a high percentage of "Extremely" responses may have high satisfaction, low instances of deskilling, positive labor-management relationships, and high rates of workplace and labor autonomy. Whereas, schools with a high percentage of "Not at All" responses may have lower satisfaction, higher rates of deskilling, negative labor-management relationships, and lower rates of workplace and labor autonomy.

Labor Process Variables

The four labor process concepts that are measured using a 1-5 scale are as follows: satisfaction, workplace and labor autonomy, deskilling, and labor-management relationship. Each scale is constructed using confirmatory factor analysis, a process that will be explained in detail later in this section. The scales are constructed from multiple items from both the CSS and IKWCS. Items from the CSS are measured on a 1-4 scale - Strongly Agree, Agree, Disagree, and Strongly Disagree. IKWCS items are measured on a 1-5 scale with responses varying depending on the item, but they are on a typical Likert scale. The average of each response to each item from both surveys is calculated and is ultimately used to create scales of each theoretical category listed above, which will also be detailed later in the methods section. The table below describes each of the items within each of the labor process scales.

Table 1. List of survey items within each labor process theory scale

Scale	Variable Label	Question Asked	Coding
Satisfaction			
	Positive working environment	"Overall, how positive is the working environment at your school?"	Not at all (1) – Extremely (5)
	Belong at your school	"Overall, how much do you feel like you belong at your school?"	Not at all (1) – Completely (5)
	Liking the staff at work	"I like the staff at work"	Strongly Disagree (1) – Strongly Agree (4)
	Part of JCPS community	"I feel like I am part of the JCPS community"	Strongly Disagree (1) – Strongly Agree (4)
	JCPS satisfaction	"I am very satisfied with JCPS"	Strongly Disagree (1) – Strongly Agree (4)
	Workplace /department satisfaction	"I am satisfied with my workplace/department"	Strongly Disagree (1) – Strongly Agree (4)
	Recommend to work for JCPS	"I would recommend JCPS as a good place to work"	Strongly Disagree (1) – Strongly Agree (4)
Workplace and Labor Autonomy			
	Trusted to teach	"To what extent are teachers trusted to teach in the way they think is best?"	Not at all (1) – Tremendous amount (5)
	School decision input	"When the school makes important decisions, how much input do teachers have?"	Almost none (1) – Tremendous amount (5)
	Assessment-informed instruction	"How often do teachers use assessment data to inform their instruction?"	Almost never (1) – Almost all the time (5)
	Crowded learning spaces	"At your school, how crowded do the learning spaces feel?"	Extremely (1) – Not at all (5)
	Effective at your job	"How effective do you feel at your job right now?"	Not at all (1) – Extremely (5)
Deskilling			
	Useful feedback	"How useful do you find the feedback you receive on your teaching?"	Not at all (1) – Extremely (5)
	Learn about teaching from leaders	"Overall, how much do you learn about teaching from the leaders at your school?"	Almost nothing (1) – Tremendous amount (5)
	Learn from evaluation	"How much do you learn from the teacher evaluation process at your school?"	Almost nothing (1) – Tremendous amount (5)
	Professional development for	"How much input do you have into individualizing your own	Almost nothing (1) – Tremendous

	student learning	professional development opportunities?"	amount (5)
	New strategies learned	"Through working at your school, how many new teaching strategies have you learned?"	Almost none (1) – A great number (5)
	School supports growth	"Overall, how supportive has your school been of your growth as a teacher?"	Not at all (1) – Extremely (5)
	Relevant professional development opportunities	"How relevant have your professional development opportunities been to the content you teach?"	Not at all (1) – Extremely (5)
	Valuable professional development opportunities	"At your school, how valuable are the available professional development opportunities?"	Not at all (1) – Extremely (5)
	Professional development input	"Professional learning in JCPS enhances teachers' abilities to improve student learning"	Strongly Disagree (1) – Strongly Agree (4)
	Differentiated professional learning	"Professional learning in JCPS is differentiated to meet the needs of the individual teachers"	Strongly Disagree (1) – Strongly Agree (4)
Labor-Management Relationship	Are school leaders friendly?	"How friendly are your school leaders toward you?"	Not at all (1) – Extremely (5)
	School leaders are respectful	"How respectful are your school leaders toward you?"	Not at all (1) – Extremely (5)
	Trust between school leaders and faculty	"How much trust exists between school leaders and faculty?"	Almost nothing (1) – Tremendous amount (5)
	School leaders treat faculty fairly	"How fairly does the school leadership treat faculty?"	Not at all (1) – Extremely (5)
	School leaders' support when facing challenges	"When you face challenges at work, how supportive are your school leaders?"	Not at all (1) – Extremely (5)
	How often feedback is received	"How often do you receive feedback on your teaching?"	Not at all (1) – Extremely (5)
	Positivity of school leaders' tone	"How positive is the tone that school leaders set for the culture of the school?"	Not at all (1) – Extremely (5)
	Teacher satisfaction is important to school leaders	"For your school leaders, how important is teacher satisfaction?"	Not at all (1) – Extremely (5)
	School leaders have school's best interest in mind	"How confident are you that your school leaders have the best interests of the school in mind?"	Not at all (1) – Extremely (5)
	School leaders' influence on teaching quality	"Overall, how positive is the influence of the school leaders on the quality of your teaching?"	Not at all (1) – Extremely (5)
	School leaders' responsiveness to	"How responsive are school leaders to your feedback?"	Not at all (1) – Extremely (5)

feedback		
Administrators support classroom management	"How well do school administrators support teachers' classroom management efforts?"	Not at all (1) – Extremely (5)
Receive adequate feedback from supervisor	"My supervisor gives me adequate feedback on my job performance"	Strongly Disagree (1) – Strongly Agree (4)

Other Deskilling Measures Two additional measures of deskilling are also included in the analyses, though they could not be included within the deskilling scale described above.

The number of National Board Certified (NBC) Teachers reflects the number of teachers that seek and are able to further their professional development and increase their rate of pay. In addition to the Kentucky Teaching Certificate, teachers can also pursue a National Board Certification. As per the National Board for Professional Teaching Standards website, benefits for pursuing and earning the certification can include opportunities outside of the classroom in administration or leadership, pay increase, and impactful professional development experiences. Schools with more NBC Teachers may imply that these teachers are more likely to stay in the field, which can lead to higher rates of retention at those schools. Investing the time, money, and energy to pursue an additional certification may be a waste of time for teachers that do not plan to stay in their positions. The change in number of NBC Teachers over time is calculated by subtracting the number of NBC Teachers in 2016 from the number of NBC Teachers in 2021, which yielded an interval/ratio variable.

The number of teachers that hold master's degrees or above is the last item considered for meeting the deskilling criteria. Teachers that are able to invest time to pursue higher education may have more access to leadership opportunities

within their schools with the skills and experience gained from pursuing those degrees. Also, teachers with more content-specific or content-relevant education are able to receive higher pay. There are ascending ranks in salary at the school-certified level. For example, three teachers that have two years of experience, but different levels of education can have salaries that vary by as much as $12,000 (JCPS). Beyond financial benefits, schools with more teachers that hold master's degrees or above may also indicate lower levels of deskilling at the organizational level. More increasingly skilled teachers at a school can decrease senses of obsoletion. Masters is an interval/ratio variable that measures the percentage of teachers that hold a master's degree or above. Schools that experienced a drop in the number of NBC Teachers or a drop in the number of teachers with a master's degree or higher may be characterized as schools that are undergoing deskilling.

Control Variables. I include the following three control variables in this analysis: school grade level, student-teacher ratio, and Title 1 status. School grade levels and the student-teacher ratio can be accessed in the corresponding school year's data book. Schools' Title 1 status is accessible on the district's data portal, organized by district, school, and school year.

Grade level. I included school grade level (i.e., elementary, middle, high, combo) because the working environment can differ greatly between the different grade levels, and I found it important to include deliberate points of comparison between the differing experiences cataloged at each school level. There are three schools that meet a unique criterion as it pertains to school level. J. Graham Brown School is a K-12 school, and Marion C. Moore and The Academy at Shawnee are both schools that house middle to

high school students. These three schools are designated as “combo” schools in the data. Grade level is coded into dummy variables with elementary as the reference category.

Student-teacher ratio. I included student-teacher ratio as a control variable because it can have a significant influence on a teacher’s work environment and how administrative support can come into play. Higher student-teacher ratios can lead to more chaotic learning and working environments. Behavior management can take over the majority of a teacher’s effort if there are more students in the room. Schools with higher student-teacher ratios may require more administrative support, and that support or lack thereof can influence teacher retention, turnover, attendance, and optimism. Student-teacher ratio is interval/ratio.

Title 1 status. Title 1 status is included as a control variable because Title 1 status can reflect a school’s environment, level of need, and areas of opportunity. Title 1 school status is the designation and allocation of funds specifically meant to implement research-based programs, instructional strategies, and resources to increase student achievement. This status specifically targets low-performing students in schools, and funds must be utilized in line with individual schools’ improvement plans. Title 1 status is coded into dummy variables to represent the different categories of Title 1 designation in JCPS. The categories include schools that do not have Title 1 designation, schools that have a Title 1 designation but do not have a program in place, and schools with Title 1 designation that also have a school-wide program in place (used as the reference category).

Weighting Variable. The number of teachers at each school is used as a weighting variable. The purpose of a weighting variable in this analysis is to ensure that schools’ survey results are not being misrepresented based on the number of responses collected

from each school. This is meant to account for differing school sizes - considering number of staff and faculty as well as students - and how it might skew any results. Elementary schools and high schools can have vastly different numbers of teachers, students, and administrators. Weighting by the number of teachers ensures that analysis is conducted equitably.

The number of teachers was designated as an importance weight, known as an "iweight" in STATA, for the analyses. An importance weight actually has no "formal statistical definition." It instead merely serves to show how important each observation is. While vague, it is the best fit for this analysis. It ensures that responses are being observed at the school level, not the individual teacher level. An alternative would have been to designate the number of teachers as a frequency weight, known as an "fweight" in STATA. An "fweight" shows duplicate observations and shows how many cases each case represents. It accounts for identical responses to items. While an "fweight" would have seemed to be an obvious choice for weighting, observations were changed from the school level to individual teachers' level when used. Cases increased from approximately 120 (representing the number of schools included in the analysis, give, or take schools that may be dropped depending on the analysis that is run) to over 5000 (representing the total number of respondents - each teacher's responses).

Statistical Methods

In order to prepare for creating scales for four labor process concepts (Labor-management Relationship Scale, Deskilling Scale, Workplace and Labor Autonomy Scale, Satisfaction Scale) each item within each scale needs to be converted into an average. For example, for the item "My supervisor gives me adequate feedback on my

job performance," the average of its 1-4 scaled responses is calculated then it becomes a new mean variable. Looking specifically at Pleasure Ridge Park High School's responses, the dataset gives the following quantities of teachers' responses: "Strongly Disagree" (n=5), "Disagree" (n=6), "Agree" (n=48), and "Strongly Agree" (n=19). From these totals, I calculated an average = Strongly Disagree*1 + Disagree*(2+1/3) + Agree*(3+2/3) + Strongly Agree*5)/(Strongly Disagree + Disagree + Agree + Strongly Agree). This averaging is completed for each item within each scale.

For items to be combined within a scale, they must all have the same range. Since the Comprehensive School Survey questions are on a 1-4 scale and the Impact Kentucky Working Condition Survey questions are on a 1-5 scale, CSS questions are recalculated to fit a 1-5 range. **Table 2 in the Appendix** details sample calculations of the CSS's items (originally with a 1-4 range) and how they are recalculated as items with a 1-5 range (to match the items from IKWCS).

Confirmatory factor analysis is used to analyze the internal reliability of the labor process concepts outlined above: satisfaction, workplace autonomy, deskilling, and labor-management relationships. I ran a confirmatory factor analysis on the items corresponding to each labor-process concept to determine the number of factors (a.k.a., latent variables) present and which items are related to each factor. While looking at each table, I was looking at factor loadings. While looking at the principal component analysis tables, I was specifically looking at eigenvalues. Factor loadings above 0.70 indicate strong factorial validity according to common heuristics. Eigenvalues of one or greater are also sought. The higher the eigenvalue, the higher the variance explained, and the lower likelihood of high collinearity in the data. Running the above analyses determines

whether the items I selected are suitable for combining into a scale. After the factor analyses, Cronbach's alpha was used to further evaluate the reliability of each scale. Alpha values of 0.5 and below are not acceptable. Alpha values of 0.5 to 0.8 are acceptable, but not optimal. Any alpha values above 0.8 are considered good. While using Cronbach's alpha, I also conducted an item analysis scale which evaluates the impact of overall scale reliability when each individual item, in turn, is removed from the scale. Once I know which items belong in each scale based on results from the factor analyses and Cronbach's alpha, scales will be constructed by averaging the items belonging to each scale.

Models will be created using ordinary least squares regression to analyze the relationship between the labor process scales and each dependent variable I selected - teacher retention rate, teacher turnover rate, teacher attendance trend, and optimism. Each dependent variable will be analyzed in a separate model, with each model undergoing a series of robustness checks. Robustness checks include a multicollinearity check to assess how correlated independent variables are within each model, a non-linearity check to evaluate direct relationships between independent and dependent variables in each model, an outlier check to examine the presence of potentially large residuals in my data, checking that the regression residuals are normally distributed, and checks for under- and over-specification to focus on creating a parsimonious model for each dependent variable.

Multicollinearity is the level of variation in an independent variable that can be explained by the other independent variables. Variation inflation factors (VIFs) are examined to check for collinearity problems. The values are the quotient of one divided

by tolerance statistics. VIF values above five represent moderate issues with collinearity; VIF values above 10 indicate strong issues. The presence of multicollinearity can make it difficult to interpret coefficients in a regression and create challenges when trying to determine which independent variables are actually statistically significant.

Non-linearity is the presence of a non-linear pattern in the association between each independent variable and a dependent variable. I checked for non-linearity by utilizing studentized deviance residuals (residuals divided by their estimated standard deviation) from an initial regression model. Lowess scatterplots are then constructed, using these residuals, for each interval/ratio variable and visually examined to see how closely the data points follow a linear pattern. I also searched for non-linearity using Box-Tidwell tests (Malloy et al).

Outliers were assessed by comparing studentized deviance residuals to critical values. The critical value is determined using a probability calculation that includes the Bonferroni correction. If the absolute value of a residual exceeds the critical value, this indicates that a school is an outlier.

In ordinary least squares regression, residuals are assumed to be normally distributed. Non-normality checks are necessary to ensure that this assumption is met. Non-normality is checked by first examining a quantile plot - also known as Q-Q plot - for each model to see if data points follow a 45 degree line. A formal test can also be performed to check for non-normality as well, using the Box-Cox procedure. This test generates a value theta that can be used (as an exponent) to transform dependent variables to correct for non-normality. If the value of theta is significantly different from one, then non-normality is present.

A parsimonious model is defined as a model that has had non-significant or extraneous independent variables removed. A parsimonious model implies a simpler model with simpler explanations, with additional variables (complexity) being included in the model only if they make a definitive improvement in explanatory power. Under-specification is the inability to identify predictors for the dependent variable and is examined using model fit statistics (pseudo-R^2) to determine whether more items are necessary. Pseudo-R^2 values below 0.1 are considered weak, values that range between 0.1-0.3 are considered acceptable for exploratory work, values that range between 0.3-0.5 have moderate predictive power, and values that range between 0.6-0.8 indicate a strong predictive power. Anything above 0.8 would be considered ideal but is nearly impossible for social science data. Over-specification is having non-significant variables in a model which can lead to either overlooking or perhaps suppressing what is actually pertinent to the model. Backwards selection is used to identify variables that might be removed from a model. Using this method, non-significant variables are removed one by one in order of descending p-values, starting with the highest, until all remaining variables have p-values of 0.10 or below.

Descriptive Statistics

Table 2 below shows descriptive statistics for the four dependent variables in the analyses. The average teacher retention rate across every school in the data is 92.01% with a standard deviation of 6.16. The school with the lowest retention rate of 62.2% is McFerran Preparatory Academy, an elementary school, which indicates that only a third of teachers employed at McFerran returned from the previous school year. Eight schools in JCPS have a retention rate of 100%: Barret Traditional Middle, Crosby Middle, Bowen

Elementary, Byck Elementary, Hite Elementary, Maupin Elementary, Wellington Elementary, and J. Graham Brown School. This shows that every teacher at those eight schools stayed at their school from the previous year. The average teacher turnover rate is 18.97% with a standard deviation of 10.11. There are two schools with the lowest turnover rate of 0%: Bloom Elementary and Kenwood Elementary. Teachers did not leave those schools to transfer to others or leave the profession that year. Two schools shared the highest turnover rate percentage of 45.2%: Byck and Engelhard Elementary. The average attendance rate across all schools in the data is 93.82% with a standard deviation of 1.03. The school with the lowest attendance rate of 90.29% is Kennedy Montessori Elementary, and the school with the highest attendance rate of 95.85% is Wilt Elementary. The last dependent variable, feeling optimistic that one's school will improve, is based on a 1-5 scaled item. One corresponds with the most negative answer, and 5 corresponds with the most positive answer. The average response across all the schools is 3.60, which is about middle of the road (Somewhat). The standard deviation is .57. The school with the lowest average response rate to the Optimism variable (2.12) is Blake Elementary. Kenwood Elementary has the highest average response rate to that item (4.71).

Table 2. Descriptive Statistics of Dependent Variables

Variables	Mean	Standard Deviation
Retention rate	92.01	6.16
Turnover rate	18.97	10.11
Attendance rate	93.82	1.03
Optimism that school will improve	3.60	0.57

Table 3 below reports descriptive statistics for the three control variables in the analyses. Out of 133 schools, three schools (2.29%) are classified as combo grade level,

88 schools (67.18%) are elementary schools, 18 schools (13.74%) are classified as middle, and there are 22 high schools (16.79%). Since the list of schools is largely composed of elementary schools, they are used as the reference variable. Title 1 schools with schoolwide programs - the reference variable for Title 1 status - make up 73.28% of schools in the data, 96 schools specifically. 26 schools (19.85%) are Title 1 schools but have no program in place. Nine schools in the data do not have Title 1 status. The average student-teacher ratio is 14.77 with a standard deviation of 2.48.

Table 3. Descriptive Statistics of Control Variables

Variables	Mean	Standard Deviation	Frequency	Percent	Cumulative
School level – combo*	0.02	0.15	3	2.29	2.29
School level – elementary	0.67	0.47	88	67.18	69.47
School level – middle	0.16	0.38	18	13.74	83.21
School level – high	0.13	0.35		16.79	100.00
Title 1 status – schoolwide program*	0.73	0.44	96	73.28	73.28
Title 1 status – no program	0.19	0.40	26	19.85	19.85
Title 1 status - not	0.06	0.25	9	6.87	100.00
Student-teacher ratio	14.77	2.48			

Table 4 below reports descriptive statistics for the items used to assess the four labor process concepts in the analyses.

Table 4. Descriptive Statistics of Independent Variables

Labor Process Concept	Variables	Mean	Standard Deviation
Satisfaction	Positive working environment	3.41	0.57
	"I like the staff at work"	4.28	0.31
	Part of the JCPS community	3.77	0.33
	JCPS satisfaction	3.36	0.36
	Belong at your school	3.83	0.37
	Workplace/department satisfaction	3.81	0.48
	Recommend to work for JCPS	3.54	0.42
Workplace and Labor Autonomy	Trusted to teach	3.66	0.47
	School decision input	3.31	0.50
	Assessment-informed instruction	4.25	0.33

	Crowded learning spaces	3.02	0.57
	Effective at your job	3.52	0.35
Deskilling	Change in number of NBC teachers	5.34	1.73
	Percentage of teachers with master's degrees or above	0.82	0.10
	Useful feedback	3.50	0.42
	Learn about teaching from leaders	3.35	0.50
	Learn from evaluation	3.18	0.43
	Professional development for student learning	3.60	0.32
	Differentiated professional learning	3.33	0.36
	Valuable professional development opportunities	3.38	0.44
	Professional development input	3.35	0.41
	New strategies learned	3.68	0.42
	School supports growth	3.76	0.46
	Relevant professional development opportunities	3.35	0.44
Labor-Management Relationship	Receive adequate feedback from supervisor	3.89	0.49
	How often feedback is received	3.38	0.47
	Positivity of school leaders' tone	3.74	0.52
	Are school leaders friendly?	4.09	0.40
	Teacher satisfaction is important to school leaders	3.63	0.53
	School leaders have school's best interest in mind	4.00	0.50
	School leaders' influence on teaching quality	3.66	0.52
	Trust between school leaders and faculty	3.51	0.58
	School leaders' support when facing challenges	3.80	0.50
	School leaders' responsiveness to feedback	3.49	0.51
	School leaders are respectful	4.16	0.37
	School leaders treat faculty fairly	3.83	0.44
	Administrators support classroom management	3.50	0.52

Satisfaction. There are seven items grouped with the Satisfaction labor process concept: The average response to the positive environment variable (Overall, how positive is the working environment at your school?) is 3.41 with a standard deviation of 0.57. This indicates that the average response to this item lies between Somewhat and Slightly. The "I like the staff at work" variable has an average response of 4.28 with a standard

deviation of 0.31. The most common response ranges between Strongly Agree and Agree. 3.77 is the average response to the part of the JCPS community variable (I feel like I am part of the JCPS community) with a standard deviation of 0.33, which indicates that most schools had responses range between Strongly Agree and Agree. JCPS satisfaction (I am very satisfied with JCPS) has an average response of 3.36 with a standard deviation of 0.36, which indicates that schools likely have mostly Agree responses. The belong at your school variable (Overall, how much do you feel that you belong at your school) has an average response of 3.83 with a 0.37 standard deviation, mostly Somewhat to Quite a bit responses. The average response, 3.81, of the workplace/department satisfaction variable (I am satisfied with my workplace/department) has a standard deviation of 0.48. Average responses likely lean mostly toward Strongly Agree. The last item within this labor process concept is the recommend to work for JCPS variable (I would recommend JCPS as a good place to work), which has an average of 3.54 with a standard deviation of 0.42. Responses to this item likely fall in between Strongly Agree and Agree.

Workplace and Labor Autonomy. Within the autonomy grouping, there are five items: The trusted to teach variable (To what extent are teachers trusted to teach in the way they think is best?) has an average response rate 3.66 with a standard deviation of 0.47. Average answers to this item likely fall between Quite a bit and Somewhat. 3.31 is the average response to the school decision input variable (When the school makes important decisions, how much input do teachers have?) with a standard deviation of 0.50. The most common response is likely Some. The assessment-informed instruction variable (How often do teachers use assessment data to inform their instruction?) has an average

response of 4.25 with a standard deviation of 0.33, which indicates average responses to this item in the data to be between Almost all the time and Frequently. 3.02 is the average response for the crowded learning spaces variable (At your school, how crowded do the learning spaces feel?) with a standard deviation of 0.57. The most common response is Somewhat. The last variable, effective at your job (How effective do you feel at your job right now?), has an average response of 3.52 with a standard deviation of 0.35. The most common responses based on that average must range between Quite and Somewhat.

Deskilling. There are twelve items within the deskilling labor process concept: The first two variables in this list are not from either survey and are instead gathered from JCPS data book information. Change in NBC teachers, the variable that represents the change in NBC teachers from 2016 to 2021, has an average of 5.34 with a standard deviation of 1.73. This means that the number of teachers that acquired a National Board Certification increased, on average, by five teachers across the list of teachers. The number of teachers with a Master's degree or above had an average of 0.82, with a standard deviation of 0.10. Each of the subsequent variables has an average response between 3 and 4, which means that each variable had responses that mostly ranged between Somewhat and Slightly if they are variables taken from the IKWCS. The useful feedback variable (How useful do you find the feedback you receive on your teaching?) has an average of 3.50 with a standard deviation of 0.42. 3.35 is the average for the learn about teaching from leaders variable (Overall, how much do you learn about teaching from the leaders at your school?) with a standard deviation of 0.50. The learn from evaluation variable (How much do you learn from the teacher evaluation process at your school?) has an average response of 3.18 with a standard deviation of 0.43. The following two variables are taken

from the CSS, both of which have average responses between 3 and 4 (Agree and Strongly Agree). The professional development for student learning variable (Professional Learning in JCPS enhances teachers' abilities to improve student learning has an average response of 3.60 with a standard deviation of 0.32. The differentiated professional learning variable (Professional learning in JCPS is differentiated to meet the needs of the individual teachers) has an average response rate of 3.33 with a standard deviation of 0.36. 3.38 is the average response rate of the valuable professional development opportunities variable (At your school, how valuable are the available professional development opportunities?) with a standard deviation of 0.44. The professional development input variable (How much input do you have into individualizing your own professional development opportunities?) has an average response rate of 3.35 with a standard deviation of 0.41. The new strategies learned variable (Through working at your school, how many new strategies have you learned?) has an average response rate of 3.68 with a standard deviation of 0.42. 3.76 is the average response rate for the school supports growth variable (Overall, how supportive has your school been with your growth as a teacher?) with a standard deviation of 0.46. The last variable under deskilling is relevant professional development opportunities (How relevant have your professional development opportunities been to the content you teach?) has an average response of 3.35 with a standard deviation of 0.44.

Labor-Management Relationships. There are thirteen variables within this labor concept: The receive adequate feedback from supervisor variable (My supervisor gives me adequate feedback on my job performance) has an average response rate of 3.89 with a standard deviation of 0.49, which indicates that most schools have responses that lean

toward Strongly Agree. 3.38 is the average response for the how often feedback is received variable (How often do you receive feedback on your teaching?) with a standard deviation of 0.47. Sometimes is likely the most answered response based on this. The positivity of school leaders' tone variable (How positive is the tone that school leaders set for the culture of the school?) has an average response of 3.74 with a standard deviation of 0.56. This shows that the most answered responses range between Quite and Somewhat positive. Are school leaders friendly? variable (How friendly are your school leaders toward you?) has an average response of 4.09 with a standard deviation of 0.40. The most common response is likely Quite. 3.63 is the average response for the teacher satisfaction is important to school leaders variable (For your school leaders, how important is teacher satisfaction?) with a standard deviation of 0.53. The most common response to this item likely ranges between Quite and Somewhat. The school leaders have school's best interests in mind variable (How confident are you that your school leaders have the best interests of the school in mind?) has an average response of 4.00 with a standard deviation of 0.50. Most responses to this item were likely Quite. 3.66 is the average response to the school leaders' influence on teaching quality variable (Overall, how positive is the influence of the school leaders on the quality of your teaching?) with a standard deviation of 0.52. The most common responses are likely to range between Quite and Somewhat. The trust between school leaders and faculty variable (How much trust exists between school leaders and faculty?) has an average of 3.51 with a standard deviation of 0.58, meaning the most common responses to this item likely range between Quite a bit and Some. The school leaders' support when facing challenges variable (When you face challenges at work, how supportive are your school leaders?) has an

average of 3.80 with a standard deviation of 0.50, which shows that the most common response to this question lies between Quite and Somewhat. 3.49 is the average response for the school leaders' responsiveness to feedback variable (How responsive are your school leaders to feedback?) with a standard deviation of 0.51. This indicates that the most common response ranges between Quite and Somewhat as well. The school leaders are respectful variable (How respectful are your school leaders toward you?) has an average response of 4.16 with a standard deviation of 0.37, indicating that the most common response is Quite. The school leadership treats faculty fairly variable (How fairly does the school leadership treat faculty?) has an average response of 3.83 with a standard deviation of 0.44. Most likely, the most common responses range between Quite and Somewhat. The last variable within this labor process concept, administrators support classroom management (How well do school administrators support teachers' classroom management efforts?), has an average response rate of 3.50 with a standard deviation of 0.52, indicating that the most common responses are Quite and Somewhat.

RESULTS

Confirmatory Factor Analysis Results and Cronbach's Alpha

Confirmatory Factor Analyses were run on each labor process concept grouping. The results for these analyses can be found in **Tables 3-6 in the Appendix**. In Table 5 below, I present the results for the confirmatory factor analysis for the seven items related to workplace satisfaction. The positive working environment variable had an eigenvalue of 5.37, indicating a higher level of variance within the variable. All other eigenvalues in this analysis were below 1, indicating a lower level of variance. Each variable has factor loadings above 0.70 (loadings ranging from 0.80 to 0.90), which definitively justifies the variables being loaded onto a single factor. This is further supported by the much lower factor loadings on the second factor, as well as Cronbach's alpha. The overall Cronbach's alpha value is 0.93 and, as is evidenced by the columns showing alpha values if an item were to be removed, it would decrease if any of the items were removed. The alpha value indicates that this scale is reliable. The common heuristic for a comparative fit index (CFI) value that indicates a good fit is anything 0.95. This factor analysis generated a CFI of 1.00, which indicates a good model fit.

Table 5. Satisfaction Confirmatory Factor Analysis with Cronbach's Alpha

	Factor	1	2	3	Comparative Fit Index
	Eigenvalue	5.37	0.82	0.26	1.000
Cronbach's Alpha if item is removed	Variable			Factor Loadings	
0.91	Positive working environment	0.88	-0.40	0.05	

0.92	"I like the staff at work"	0.77	0.04	-0.34
0.92	Part of the JCPS community	0.79	0.34	0.00
0.92	JCPS satisfaction	0.77	0.32	0.21
0.92	Belong at your school	0.83	-0.32	0.03
0.91	Workplace/department satisfaction	0.88	0.08	-0.22
0.93	Recommend to work for JCPS	0.78	0.42	0.13

Overall Cronbach's Alpha = 0.93

In Table 6 below, I present the results for the confirmatory factor analysis for the five items related to workplace autonomy. The trusted to teach variable is the only variable with an eigenvalue above 1 (2.37). The crowded learning spaces variable had the lowest factor loading in this analysis (-0.32), which indicates a weaker factorial validity. Whereas, the rest of the variables have factor loadings between 0.68 and 0.80, indicating strong factorial validity. Due to the lower factor loadings on the second factor (-0.17 to 0.32), this gives a worthy confirmation for a single factor on which the variables validly load. Variables loaded onto only one factor in this analysis, with factor loadings that range between -0.32 and 0.80. Cronbach's alpha is within acceptable range at 0.76, but it would increase the reliability of the scale to remove the crowded learning spaces variable since the alpha value increases to 0.84 with its removal. It is also important to note that the crowded spaces variable is arranged in reverse order – 1 indicates that learning spaces are not crowded, and 5 indicates that learning spaces are not crowded. The CFI generated from this is 1.00, which indicates a good model fit.

Table 6. Workplace Autonomy Confirmatory Factor Analysis with Cronbach's Alpha

	Factor	1	2	Comparative Fit

				Index
	Eigenvalue	2.37	0.25	1.00
Cronbach's Alpha if item is removed	Variable		Factor Loadings	
0.71	Trusted to teach	0.68	0.29	
0.66	School decision input	0.80	0.14	
0.69	Assessment-informed instruction	0.74	-0.18	
0.84	Crowded learning spaces	-0.32	0.32	
0.68	Effective at your job	0.78	-0.10	

Overall Cronbach's Alpha Value = 0.76

In Table 7 below, I present the results for the confirmatory factor analysis for the ten items related to deskilling. Two factors have eigenvalues above 1 (7.44 and 1.03), which indicates a higher level of variance explained. Six factors were generated with this analysis, though the first factor is the only one with significant factor loadings. All variables except for change in number of NBC teachers and the percentage of teachers with master's degrees or above, professional development for student learning, and differentiated professional learning have factor loadings above 0.70, showing strong factorial validity (0.83 to 0.94). The variables professional development for student learning and differentiated professional learning have acceptable factor loadings (0.62 and 0.63). The generated CFI is 1.00, which is an indicator of good model fit.

The variables pertaining to change in number of NBC teachers and the percentage of teachers with master's degrees or above will be removed from the deskilling scale due to their low factor loadings, but they will still be used in analysis. Variables representing professional development for student learning and differentiated professional learning are

still within the acceptable range on the first and the second factor. What this can signify will be later explored in the Discussion section. The overall Cronbach's value on this group of variables is 0.97, which indicates strong scale reliability. If professional development for student learning or differentiated professional learning are removed from the scale, the alpha value marginally increases. On the other hand, the alpha values do not change if any other variable is removed from the scale.

Table 7. Deskilling Confirmatory Factor Analysis with Cronbach's Alpha

	Factor	1	2	Comparative Fit Index
	Eigenvalue	7.44	1.03	1.00
Cronbach's Alpha if item is removed	Variable		Factor Loadings	
0.96	Percent change in number of NBC teachers	-0.05	0.03	
0.96	Percentage of teachers with master's degrees or above	0.19	-0.09	
0.96	Useful feedback	0.94	-0.16	
0.97	Learn about teaching from leaders	0.93	-0.13	
0.97	Learn from evaluation	0.92	-0.12	
0.97	Professional development for student learning	0.62	0.67	
0.97	Differentiated professional learning	0.63	0.64	
0.96	Valuable professional development opportunities	0.93	0.00	
0.96	Professional development input	0.83	-0.17	
0.96	New strategies learned	0.89	-0.10	

0.96	School supports growth	0.92	-0.29
0.96	Relevant professional development opportunities	0.92	0.05

Overall Cronbach's Alpha Value = 0.97

In Table 8 below, I present the results for the confirmatory factor analysis for the thirteen items related to labor-management relationships. The first factor has an eigenvalue of 11.14, exceedingly higher than the common heuristic for acceptable eigenvalues (1 or higher) and indicates higher variance explained. Eight factors were generated within this analysis, though there are only strong factor loadings on the first factor and an eigenvalue over 1. All factor loadings are within the strong factorial validity range as well. The receive adequate variable had a factor loading of 0.71, and the school leaders' influence on teaching quality variable had the strongest factor loading of 0.98 These factor loadings confirm that strong factorial validity and that each of these variables belong on a single factor together, with a high level of variance explained. The overall Cronbach's alpha value is 0.99, which indicates strong scale reliability. Using item analysis, the alpha value only marginally changes (0.98) with the removal of items from the scale. The 1.00 CFI indicates that this model is a good fit.

Table 8. Labor-Management Relationships Confirmatory Factor Analysis with Cronbach's Alpha

	Factor	1	2	Comparative Fit Index
	Eigenvalue	11.14	0.33	1.00
Cronbach's Alpha if item is removed	Variable		Factor Loadings	
0.99	Receive adequate feedback from	0.71	0.20	

	supervisor		
0.99	How often feedback is received	0.78	0.25
0.98	Positivity of school leaders' tone	0.96	-0.08
0.98	Are school leaders friendly?	0.94	-0.22
0.98	Teacher satisfaction is important to school leaders	0.95	-0.08
0.98	School leaders have school's best interest in mind	0.96	0.02
0.98	School leaders' influence on teaching quality	0.98	0.07
0.98	Trust between school leaders and faculty	0.96	-0.04
0.98	School leaders' support when facing challenges	0.97	0.10
0.98	School leaders' responsiveness to feedback	0.96	0.05
0.98	School leaders are respectful	0.94	-0.23
0.98	School leaders treat faculty fairly	0.95	-0.18
0.98	Administrators support classroom management	0.88	0.24

Overall Cronbach's Alpha Value = 0.99

Table 9 below summarizes how each of the independent variables are measured within the regression models.

Table 9. Independent Variable Measurements

Variable Label	Measurement
Percent change in NBC teachers	Interval/ratio
Percent of teachers with master's degrees or above	Interval/ratio

Grade level	Multinomial Reference – elementary Dummy – combo, middle, high
Title 1 status	Multinomial Reference – Title 1 with schoolwide program Dummy – Title 1 with no program, not title 1
Student to teacher ratio	Interval/ratio
Satisfaction scale	Interval/ratio 1 (low satisfaction) – 5 (high satisfaction)
Workplace autonomy scale	Interval/ratio 1 (low sense of autonomy) – 5 (high sense of autonomy)
Deskilling scale	Interval/ratio 1 (low levels of deskilling) – 5 (high levels of deskilling)
Labor-management relationships scale	Interval/ratio 1 (negative labor-management relationship) – 5 (positive labor-management relationship)

Robustness Checks

Tables, figures, and explanations for robustness checks can be found in the Appendix. **Table 3 in the Appendix** details the Variance Inflation Factors used to check for Multicollinearity. This check showed there is no multicollinearity issue. **Table 4 in the Appendix** shows the minimum and maximum studentized deviance residuals to check for outliers. Since the critical value is not exceeded, there is no outlier issue. **Figures 1, 2, 4, 6, 7, 8, and 10 in the Appendix** show the Lowess plots to check for non-linearity. These results indicated that Polynomial Regression is needed to correct for non-linearity for the satisfaction scale and autonomy scale in the teacher retention analysis, student-teacher ratio in the teacher turnover rate analysis, and the satisfaction and labor-management relationships scales for the teacher attendance rate analysis. **Figure 3, 5, 9, and 11 in the Appendix** show the Quantile plots to check for non-normality. These revealed slight issues with non-normality, but these were resolved using Jackknife standard errors.

Ordinary Least Square Regression Results with Prediction Models

Teacher Retention Rate

In Table 10 below I report regression results for the first dependent variable: teacher retention rate. In the full model, the percentage of teachers with master's degrees or above, satisfaction scale, and workplace and labor autonomy scale variables are all statistically significant with a 95% confidence interval. The teacher retention rate increases by 24.21 for each 1% increase in the number of teachers with a master's degree or higher. The calculated Pseudo R-squared value for this model is 0.12 which indicates a moderate model fit. In the parsimonious model, the masters variable is still statistically significant and high schools are as well at a 95% confidence interval. The retention rate increases by 21.94 for each 1% increase in the number of teachers with master's degrees or above. The retention rate in high schools is 3.27 higher than retention in elementary schools.

Table 10. Ordinary Least Squares Regression Results for Teacher Retention Rate

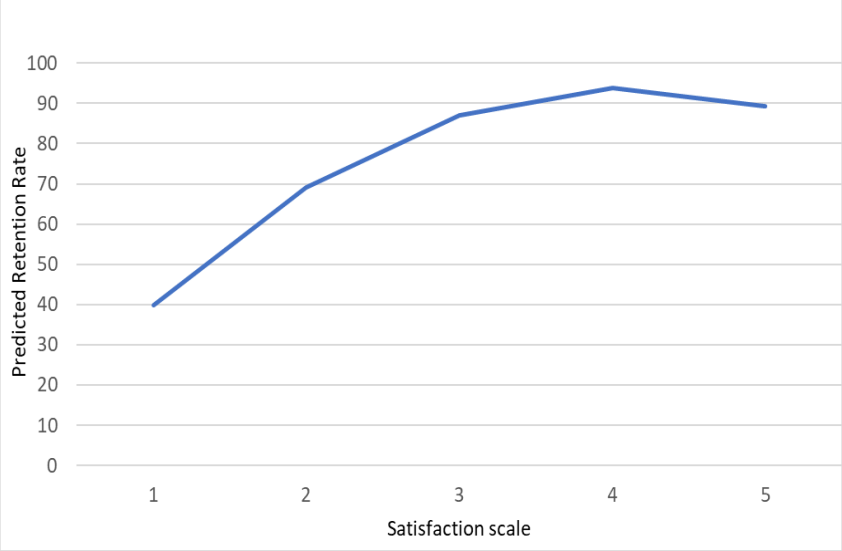
Pseudo R-squared = 0.12	Full Model		Parsimonious model	
	Coefficient	P-value	Coefficient	P-value
Change in number of NBC teachers	0.46	0.15	…	…
Percentage of teachers with master's degrees or above	24.21	0.00*	21.94	0.00*
School grade level	…	…	…	…
Combo	-2.62	0.50	0.64	0.88
Middle	2.78	0.13	2.60	0.19
High	2.15	0.14	3.27	0.04*
Elementary (reference)	…	…	…	…

Title 1 status	…	…	…	…
No program	-0.39	0.73	…	…
Not Title 1	1.56	0.41	…	…
Schoolwide program (reference)	…	…	…	…
Student-teacher ratio	-0.02	0.92	…	…
Satisfaction scale	…	…	…	…
Main effect	89.30	0.013*	46.04	0.109
Squared effect	-11.25	0.015*	-5.62	0.124
Workplace and Labor Autonomy scale	…	…	…	…
Main effect	-68.13	0.007*	…	…
Squared effect	14.57	0.006*	…	…
Deskilling scale	-5.24	0.117	…	…
Labor-Management Relationships scale	2.24	0.376	…	…
Constant	-17.92	0.717	-0.57	0.99

** indicates statistical significance at a 95% confidence interval
… indicates variable is not included in parsimonious model

In Figure 1 below, I show the relationship between predicted teacher retention rate and the satisfaction scale. The predicted retention rate based on the satisfaction scale shows that the retention rate increases as satisfaction increases but comes to a peak at the second highest level of satisfaction then plateaus. Based on this visual, teachers tend to stay at their schools for an additional year when their satisfaction is high. For example, when teacher satisfaction is as low as possible (level 1), the approximate teacher retention rate is 40%. When teacher satisfaction is just shy of the highest level (level 4), the teacher retention rate is 93.71% and decreases to 89.21% when teacher satisfaction peaks (level 5).

Figure 1. Prediction Model of Teacher Retention Rate by Satisfaction Scale



Turnover Rate

In Table 11 below I report regression results for the second dependent variable: turnover rate. In the full model, the percentage of teachers with master's degrees or above and student-teacher ratio variables are both statistically significant (0.01 and 0.05, respectively). The average turnover rate decreases by 32.68 for each 1% increase in teachers with a master's degree or above. The calculated Pseudo R-squared for this model is 0.11 indicates a moderate fit. In the parsimonious model, the percentage of teachers with master's degrees or above and student-teacher ratio variables are both statistically significant (0.00 and 0.01, respectively). The average teacher turnover rate decreases by 33.33 for each 1% increase in teachers with master's degrees or above.

Table 11. Ordinary Least Squares Regression Results for Turnover Rate

Pseudo R-squared = 0.11	Full Model		Parsimonious Model	
	Coefficient	P-value	Coefficient	P-value

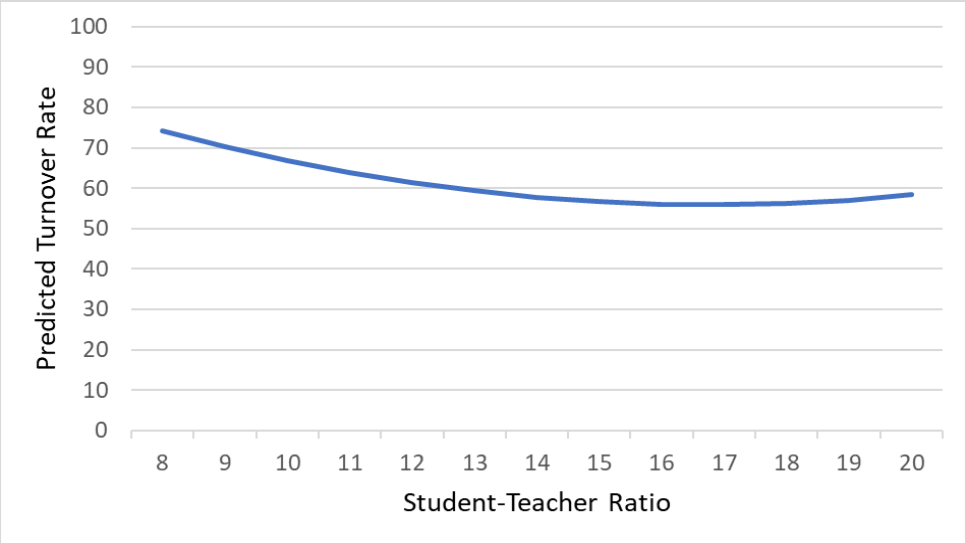
Change in number of NBC teachers	-.399	0.30	…	…
Percentage of teachers with master's degrees or above	-32.68	0.01*	-33.33	0.00*
School grade level	…	…	…	…
Combo	6.16	0.58	…	…
Middle	0.60	0.83	…	…
High	2.04	0.43	…	…
Elementary (reference)	…	…	…	…
Title 1 status	…	…	…	…
No program	-0.25	0.9	…	…
Not Title 1	-3.07	0.39	…	…
Schoolwide program (reference)	…	…	…	…
Student-teacher ratio	…	…	…	…
Main effect	-7.56	0.05*	-7.98	0.00*
Squared effect	0.22	0.08	0.24	0.01*
Satisfaction scale	-9.73	0.08	-2.95	0.17
Workplace and Labor Autonomy Scale	-0.85	0.89	…	…
Deskilling scale	0.47	0.94	…	…
Labor-Management Relationships scale	6.85	0.13	…	…
Constant	120.46	0.00	122.95	0.00

* indicates statistical significance at a 95% confidence level
… indicates variable is not included in parsimonious model

The relationship between predicted teacher turnover rate and student-teacher ratio is shown in the figure below. The predicted teacher turnover rate based on the student-teacher ratio steadily decreases as said ratio increases but levels out toward the highest student-teacher ratio. Based on this visual, the likelihood that a teacher will stay at their

school for another year decreases if their class sizes are too large. When the student-teacher ratio is as low as possible (8:1), the teacher turnover rate is 74.29%. When the student-teacher ratio is at its highest level (20:1), the teacher retention rate is 58.32% - an almost 16% difference.

Figure 2. Prediction Model of Teacher Turnover Rate by Student-Teacher Ratio



Teacher Attendance Rate

In Table 12 below I report regression results for the third dependent variable: teacher attendance rate. In the full model, the percentage of teachers with master's degrees or above ($p = 0.05$), student-teacher ratio ($p = 0.01$), satisfaction scale ($p = 0.00$), and labor-management relationships scale ($p = 0.01$) variables are all statistically significant. The average teacher attendance rate decreases by 21.64 for each 1% increase in teachers with master's degrees or above. The average teacher attendance rate increases by 0.11 for each 1% increase in student-teacher ratio. The calculated Pseudo R-squared for this model is 0.16 indicates a moderate fit. In the parsimonious model, student-teacher ratio, satisfaction scale, and labor-management relationship scale variables are

statistically significant as well. The average teacher attendance rate increases by 0.15 for each 1% increase in student-teacher ratio.

Table 12. Ordinary Least Squares Regression Results for Teacher Attendance Rate

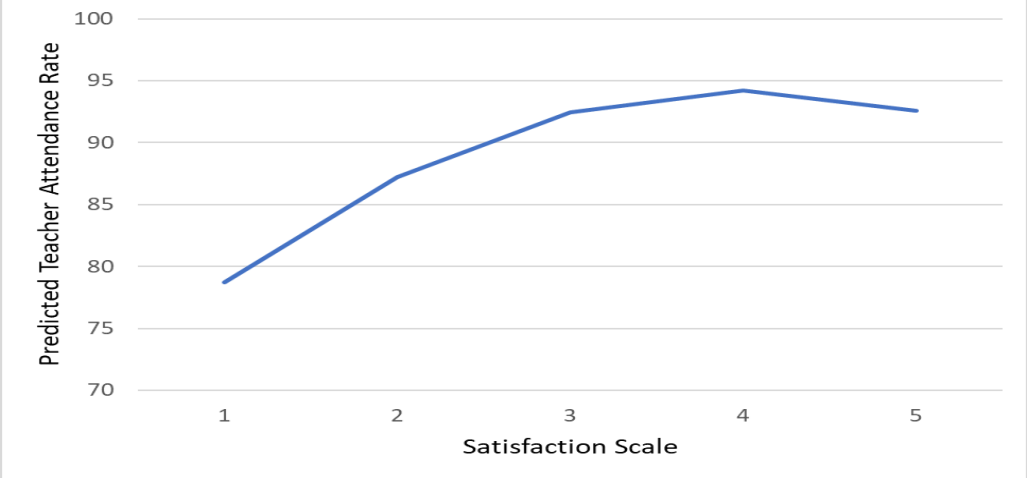
Pseudo R-squared = 0.16	Full Model		Parsimonious Model	
	Coefficient	P-value	Coefficient	P-value
Change in number of NBC teachers	0.01	0.824	…	…
Percentage of teachers with master's degrees or above	…	…	…	…
Main effect	-21.64	0.05*	…	…
Squared effect	12.96	0.07*	…	…
School grade level	…	…	…	…
Combo	0.33	0.74	…	…
Middle	0.35	0.184	…	…
High	0.19	0.50	…	…
Elementary (reference)	…	…	…	…
Title 1 status	…	…	…	…
No program	0.25	0.42	…	…
Not Title 1	0.07	0.89	…	…
Schoolwide program (reference)	…	…	…	…
Student-teacher ratio	0.11	0.01*	0.15	0.00*
Satisfaction scale	…	…	…	…
Main effect	20.88	0.00*	13.63	0.02*
Squared effect	-2.64	0.00*	-1.69	0.03*
Workplace and Labor Autonomy Scale	-0.06	0.92	…	…
Deskilling scale	0.43	0.49	…	…
Labor-Management Relationships	…	…	…	…

scale				
Main effect	-10.54	0.01*	-8.80	0.01*
Squared effect	1.342	0.02*	1.15	0.02*
Constant	79.08	0.000	81.23	0.00

* indicates statistical significance at a 95% confidence level
… indicates variable is not included in parsimonious model.

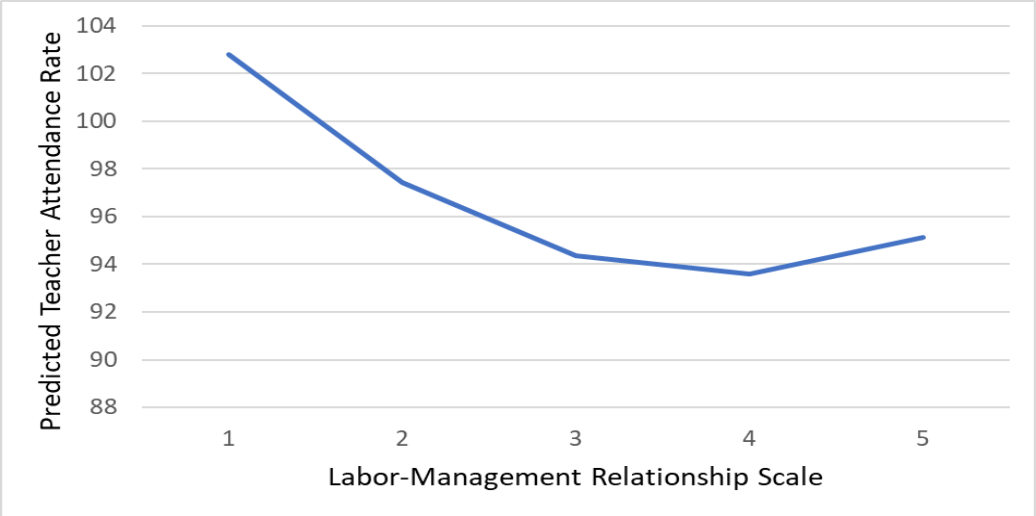
The relationships between the satisfaction scale and labor-management relationships scale and the predicted teacher attendance rate are shown in figures 3 and 4 below. The predicted teacher attendance rate based on the satisfaction scale increases as satisfaction increases, but plateaus and even decreases once it reaches its peak at the second highest level of satisfaction (level 4). Based on this visual, teachers tend to attend work more consistently and not miss as many days when their satisfaction is high. For example, when the satisfaction level is as low as possible (level 1), the teacher attendance rate is 78.70%. When teacher satisfaction is at the second highest level (level 4), the teacher attendance rate is 94.21% then decreases a bit to 92.61% when teacher satisfaction is at its highest level (level 5).

Figure 3. Prediction Model of Teacher Attendance Rate by Satisfaction



The predicted teacher attendance rate based on the labor-management relationships scale starts high when the relationships between faculty and administrators are at its lowest (level 1). Attendance rate then steadily decreases until it bottoms out at the second highest level of labor-management relationships (level 4) then increases slightly at the highest level of faculty and administration relations (level 5). Based on the figure above, teachers tend to not miss work when their relationships with their management are not positive. However, teachers may miss more days of work (either based on comfort or the lack of the expectation of serious repercussions for missing work) if their relationships with their administrators are more positive. For example, when the relationships between faculty and administration are as low as possible (level 1), the teacher attendance rate is 102.81%. When those labor-management relationships are at the second highest level (level 4), the teacher attendance rate is 93.60% then increases a bit to 95.12% when the nature of faculty and administration relationships are at their highest level (level 5).

Figure 4. Prediction Model of Teacher Attendance Rate by Labor-Management Relationships Scale



Optimism

In Table 13 below I report regression results for the fourth dependent variable: optimism. In the full model, the satisfaction scale (p = 0.03), the workplace and labor autonomy scale (p = 0.00) and labor-management relationships scale (p = 0.00) variables are statistically significant. The average optimism that one's school will improve increases by 2.43 for each 1% increase in teacher satisfaction, and it will increase by 0.45 for each 1% increase in workplace and labor autonomy. Optimism will also increase by 0.36 for each 1% increase in the level of labor-management relationships. The calculated Pseudo R-squared for this model is 0.50 indicates an excellent fit. In the parsimonious model, the same three variables from the full model are statistically significant as well. Optimism will increase by 0.56 for each 1% increase in teacher satisfaction. The average optimism that one's school will improve increases by 0.58 for each 1% increase in workplace and labor autonomy, and it will also increase by 0.41 for each 1% increase in the level of labor-management relationships.

Table 13. Ordinary Least Squares Regression Results for Optimism

Pseudo R-squared = 0.50	Full Model		Parsimonious Model	
	Coefficient	P-value	Coefficient	P-value
Change in number of NBC teachers	-0.02	0.25	…	…
Percentage of teachers with master's degrees or above	0.29	0.27	…	…
School grade level	…	…	…	…
Combo	-0.13	0.07	…	…
Middle	-0.11	0.19	…	…
High	-0.17	0.06	…	…

Elementary (reference)	…	…	…	…
Title 1 status				
No program	0.02	0.77	…	…
Not Title 1	0.03	0.76	…	…
Schoolwide program (reference)	…	…	…	…
Student-teacher ratio	0.00	0.99	…	…
Satisfaction scale	2.43	0.03*	0.56	0.00*
Workplace and Labor Autonomy Scale	0.45	0.00*	0.58	0.00*
Deskilling scale	0.11	0.54	…	…
Labor-Management Relationships scale	0.36	0.00*	0.41	0.00*
Constant	-4.63	0.02	-1.35	0.00

* indicates statistical significance at a 95% confidence level
… indicates variable is not included in parsimonious model.

LIMITATIONS

Non-linearity was corrected using Polynomial Regression instead of the Box-Tidwell correction since it had originally generated inflated exponents and coefficients in all models. Polynomial regression requires retaining the non-linear variable while also including a squared version of the non-linear variable. In this way, the coefficients are not interpreted directly - interpretation is instead done use graphs.

Pseudo R-squared had to be calculated by hand for each model, and model fit was good enough to suggest there were no egregious violations that signified under-specification. All created scales were considered to be theoretically important variables when checking for over-specification to identify which variables would be reinstated in the parsimonious model after utilizing the backwards selection technique. Each model has mild violations of normality, with only one dependent variable requiring transformation, but the model fit for each is in fact better without a Box-Cox correction. The Box-Cox correction had inflated the coefficients and R-squared, which made results subject to questionable interpretation. To correct for this, Jackknife standard errors were used instead of Robust Standard errors to account for non-normality.

How the number of National Board Certified teachers changed over time, the number of teachers at each school that hold a master's degree or above both had very low factor loadings, less than 0.19. As a result, the factor analysis indicated that neither of those items truly represent deskilling. However, they both loaded heavily onto a second factor away from the other items within the analysis. This makes sense since it can reflect the replacement of higher qualified staff with lower qualified staff in schools. Due to this, the items that represent how the number of National Board Certified teachers changed

over time and the number of teachers at each school that hold a master's degree or above were not to be included in the deskilling scale or factor and will instead be included in the model as separate deskilling measures. Retention and turnover rate being included as separate dependent variables is intentional. Retention rate marks the rate at which teachers remain in their position and school placement. Turnover rate reflects the rate at which teachers leave their position, leave their school placement, or leave the profession altogether. In the JCPS data portal, retention rate and turnover rate are reported as separate measures in separate Excel spreadsheets. My justification for using both rates as dependent variables instead of choosing one or the other is to ensure that placement is acknowledged as important. The school that teachers work at makes a difference in whether they stay in a job or the likelihood of them leaving their school for another one. Retention only measures how many teachers stay in their specific workplace. I wanted to make sure all job movements were covered even if it meant some potential overlap.

In my analysis, there is a tension between my unit of analysis (schools) and the desire to talk about people (teachers). Teacher-level data is not readily available. My focus is to talk about schools as workplaces and teachers as laborers within those workplaces. I would be remiss to not acknowledge the possibility of the presence of an ecological fallacy, where patterns at the school level may differ from teacher level patterns. Some results may ring true when looking at schools overall but not when analyzing individual teachers' experiences.

I reran full regression models for each dependent variable to determine whether the utilization of the number of teachers as a weighted variable made a difference or affected the pattern of significant and non-significant variables. I ran full regression

models, rerunning the models without the weighted variable, and rerunning one last time with the number of teachers as a control variable. Surprisingly, the cases did not change across any of the regression models run for any of the dependent variables - the number of cases was 122 for each model. Coefficients shifted slightly with each change. For the retention, attendance rate, and optimism dependent variables, the same variables were statistically significant in each regression variation. The only difference was in the turnover rate dependent variable. In the original full turnover rate regression model and with the model with the weighted variable removed, the student to teacher ratio and percentage of teachers with a master's degree or above were statistically significant. When the number of teachers was added as a control variable, the turnover rate regression model showed that the number of teachers, grade level, student to teacher ratio, and percentage of teachers with a master's degree or above were all statistically significant. This indicates a significant shift in how the number of teachers variable affects my analysis of turnover rate.

DISCUSSION

Retention

The level of education teachers had in a school, school grade level, and overall satisfaction had a significant effect on teacher retention rate according to my results. Teachers' level of education has a direct connection to their salary - the more educated they are and the longer they stay in the profession, the more they are paid. Also, based on regression results, high schools had a higher retention rate than elementary schools. It is difficult to apply the assembly line metaphor to teachers in schools in that it is a challenge to create a sense of creative separation between teachers and their labor (Taylor, 1967). With the exception of exerting control over curriculum, teachers' primary labor material is essentially their students, and it is near impossible to divorce the two. High schools tend to have more teachers than elementary schools, so that can lead to less direct administrator interference due to the sheer amount of employees that need to be overseen. Tasks in the teaching profession cannot be separated into a one-step process to create distance between teachers and their students (Braverman, 1974). Also, high school teachers may have more than one prep, meaning they have more than one type of class to teach though they are more likely than not to be all within the same subject. Elementary school teachers, however, have to teach all subjects, differentiated by grade.

When teacher satisfaction at a school is high, they tend to have higher retention rates. Although retention tends to peak right before the highest level of satisfaction is reached. Burnout, or the avoidance of it, can affect retention since it has a direct relationship with work satisfaction (Hargreaves, 1994). Teachers that are burnt out likely have higher rates of dissatisfaction with their work. Some factors of burnout may even be

out of teacher control, such as their school's socioeconomic status or the level of support they receive from administrators when it comes to classroom management or behavioral intervention (Chang, 2009). Essentially, logic serves that if someone is satisfied in their work situation, they are more likely to remain.

Turnover

Teacher education level and student-teacher ratio both had significant impacts on teacher turnover rate, based on my results. Turnover rate decreases considerably when schools have more highly educated teachers. This can be indicative of upskilling, since the skill to do the job is not degraded but upgraded instead. Also, teachers with more education may also be more experienced. Prospective and newer teachers tend to not stay in the profession as long as more seasoned teachers since they may become disillusioned with the job or unable to withstand the trial-by-fire methods of on-the-job teacher training.

Though, based on the prediction model, the result of the student-teacher ratio's effect on teacher turnover is not surprising. When class sizes are larger, teachers are less likely to leave their post based on Figure 2. Looking at the original data collected, the two schools with the highest student-teacher ratio (20:1) Meyzeek Middle School and Louisville Male High School, had turnover rates of 23.3% and 7.3%, respectively. Whereas Young Elementary had the lowest student-teacher ratio (8:1), with a turnover rate of 41.7%. Managing larger class sizes with the expectation of getting through the same amount of material can be a more demanding task when compared to doing so with smaller class sizes. With more students to manage comes more opportunities for

disruptive behavior. More disruptive behavior requires more classroom management, intervention, and less time for content and enrichment.

Attendance

The number of teachers with master's degrees or higher, student-teacher ratio, level of teacher satisfaction, and the nature of labor-management relationships within a school all had significant effects on teacher attendance rate, according to my results. Teacher attendance rate increased when class sizes were larger. This can be attributed to a teacher's sense of duty to show up for their students, much akin to the sense of intrinsic motivation or rewards that teachers can get from their work (Kalleberg, 2011). Not wanting to leave their larger class sizes to a substitute or to another teacher - since larger class sizes likely lead to a higher need of behavior management - may be a reason for why those teachers want to make sure they show up to work as often as possible.

When it comes to teacher satisfaction and attendance rate, higher satisfaction tends to lead to higher attendance. When teachers are satisfied with their work, they are more likely to show up to do it. Going to work because they want to instead of feeling like they need to can be indicative of high satisfaction and, in turn, high attendance rate. High satisfaction can imply low burnout. If teachers are driven by the passion of teaching and have little hindrances in the way of being able to enjoy that passion, their attendance is likely to reflect that. Teachers that obtain intrinsic rewards from their work, subjective evaluations of their jobs, have higher job satisfaction (Kalleberg, 2011).

Positive labor-management relationships imply higher attendance rates based on my results, but only to a point. Attendance rate tends to top out before reaching the highest level of labor-management relationships. If relations are friendly, then teachers

may feel that they are more supported and that school or their position will not be in jeopardy if they take a day off. It can also imply a level of trust between teachers and their administrators that would make teachers feel more comfortable with not having to show up to work every day because they may feel that they have their administrators' support. Conversely, attendance rates are high when the labor-management relationships are low, even oppressive. When administrators are tyrannical or exhibit a high level of scrutiny or judgment or lay unfair expectations and dole out unfair punishments on teachers, it can definitely point to antagonistic relationships between them and teachers. That being said, teachers may not want to miss work at all if they know that their relationship with their supervisor is not a friendly one - missing work may have negative repercussions, or perhaps the pressure of coming to work or you are "letting down the team" can urge teachers to not miss work, which could consequently lead to higher teacher burnout. Negative labor-management relationships in schools can also be reflected in work structure and teacher agency (Ezzy, 1995). If teachers feel like they are under constant scrutiny or have to exist under the thumb of their administrators, having low attendance could potentially increase the oppressive nature of their relationship since their absences could have negative consequences, lasting or otherwise.

Optimism

Teachers' sense of hope that their school will improve in the future is positively affected by both the satisfaction scale and the labor-management relationships scale. Feeling like their school will improve and continue getting better instead of stagnating or even degenerating is a positive measure that is linked to how satisfied teachers feel with their work and placement and how they feel about the people managing them. Schools

with teachers with higher rates of satisfaction tend to have more administrative support and positive perceptions of organizational leadership (Chang, 2009). With strong, dependable leadership, schools' likelihood of improvement assuredly rises. Administrators are inward and outward facing entities of schools and can be indentured in their placements. Being the "face" of the school and having a non-antagonistic relationship with the people that work beneath them can give their teachers a sense of hope that their school is moving in the right direction. Teachers' subjective well-being, integration, and identification with the organization are positively influenced by supportive administrators (Erturk, 2021).

CONCLUSION

It is both comforting and bracing to observe theory validating my experience as a teacher in this district. As far as the application of the labor process goes to what is happening to schools within JCPS, it appears that the broader outlines of control associated with the foundational theory of this thesis have been confirmed. Out of the scales I created, satisfaction and labor-management relationships carried the most weight and significance when looking across all the dependent variables. Satisfaction was demonstrated to have a significant effect on retention, attendance, and optimism, but did not register as significant for turnover. The labor-management relationship scale conformed to labor process theory expectations, showing statistical significance on teacher attendance rate and optimism. This suggests that the antagonism within relationships between teachers and their administrators - or lack thereof - has an effect on whether teachers show up for work and if they believe that conditions at their workplace will improve. This matches how these labor process concepts can also be applied in the teaching profession as well and not just the workplace at large.

Surprisingly, the deskilling scale and the workplace and labor autonomy scale did not show a statistical significance on teacher retention, turnover, attendance, or optimism. This may suggest deskilling and autonomy in the teaching profession may not have the same effects as in the workforce at large. I do believe that further research into this particular avenue would be useful. The autonomy scale may not be significant in the teaching profession because teachers do in fact have a level of control in their workplace that other professions do not. There is no sales or production quota to meet, there is no parallel to direct surveillance on their work within their classroom like other professions

may have. Oftentimes, as long as teachers are constructing curriculum that are adhering to state standards and are treating students with equitable compassion and are not actively struggling in the classroom they are left alone to complete their work in the way they see fit with little intervention. Another look at deskilling in the teaching profession may yield results different from mine, especially when looking at the emergence of alternative certification programs and other district initiatives to get prospective teachers into classrooms. Perhaps looking at other school districts and broadening the scope of the study would find a significance that my more focused angle did not.

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APPENDIX

Table 1. List of included Jefferson County Public Schools

Grade Level	School Name	
High Schools	Atherton	Iroquois
	Ballard	Jeffersontown
	Butler Traditional	Louisville Male
	Central High Magnet Career Academy	Pleasure Ridge Park
	Doss	Seneca
	duPont Manual	Southern
	Eastern	Valley
	Fern Creek	Waggener
		Western
Middle Schools	Barret	Meyzeek
	Carrithers	Newburg
	Conway	Noe
	Crosby	Olmsted North
	Farnsley	Olmsted South
	Frost	Ramsey
	Highland	Stuart Academy
	Jefferson County Traditional	Thomas Jefferson
	Johnson Traditional	Western Middle School for the Arts
	Kammerer	Westport
	Knight	
	Lassiter	
Elementary Schools	Alex R Kennedy	Kerrick
	Atkinson Academy	King
	Auburndale	Klondike Lane
	Audubon Traditional	Laukhuf
	Bates	Layne
	Blake	Lincoln Performing Arts
	Bloom	Lowe
	Blue Lick	Luhr
	Bowen	Maupin
	Brandeis	McFerran Preparatory Academy
	Breckinridge/Franklin	Medora
	Byck	Middletown
	Camp Taylor	Mill Creek
	Cane Run	Minors Lane
	Carter Traditional	Norton Commons
	Chancey	Norton
	Chenoweth	Okolona
	Cochran	Portland
	Cochrane	Price

	Coleridge Taylor	Rangeland
	Montessori	Rutherford
	Coral Ridge	Sanders
	Crums Lane	Schaffner Traditional
	Dixie	Semple
	Dunn	Shacklette
	Eisenhower	Shelby Traditional
	Engelhard	Slaughter
	Fairdale Elementary	Smyrna
	Farmer	St. Matthews
	Fern Creek Elementary	Stonestreet
	Field	Stopher
	Foster Traditional	Trunnell
	Academy	Tully
	Frayser	Watterson
	Goldsmith	Wellington
	Greathouse/Shryock	Wheatley
	Traditional	Wheeler
	Greenwood	Wilder
	Gutermuth	Wilkerson
	Hartstren	Wilt
	Hawthorne	Young
	Hazelwood	Zachary Taylor
	Hite	
	Indian Trail	
	Jacob	
	Jeffersontown Elementary	
	Johnsontown Road	
	Kennedy Montesssori	
	Kenwood	
Combo Schools	J. Graham Brown School	
	Marion C. Moore School	
	The Academy at Shawnee	

Table 2. Scale Calculations

Original Value on 1-4 scale	New value on 1-5 scale
1	1
1.5	1.7

2	2.4
2.5	3.1
3	3.8
3.5	4.5
4	5

Table 3. Variance Inflation Factors - Multicollinearity Check

Variable	VIF
Deskilling scale	8.70
Labor-Management Relationship scale	6.17
Satisfaction Scale	6.02
Workplace and Labor Autonomy scale	4.46
School level - high	2.29
Student-teacher ratio	2.00
Title 1 status - no program	1.92
Percentage of teachers with master's degrees or above	1.63
School level - middle	1.60
Title 1 status - not	1.41
School level - combo	1.31
Change in number of NBC teachers over time	1.04
Mean VIF	3.21

Multicollinearity was not present in any of the models, based on the variance inflation factors (VIFs) produced.

Table 4. Minimum and Maximum Studentized Deviance Residuals

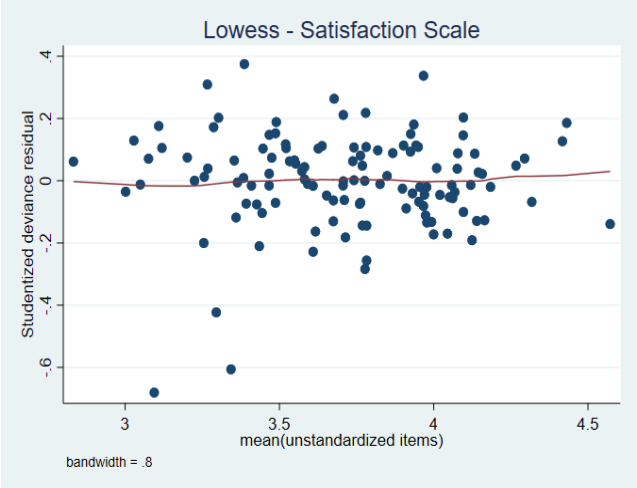
Minimum	Maximum
-.3025017	.4482794

Critical Value = 3.6472

The minimum and maximum studentized deviance residuals indicate that there are no outliers in the models to correct.

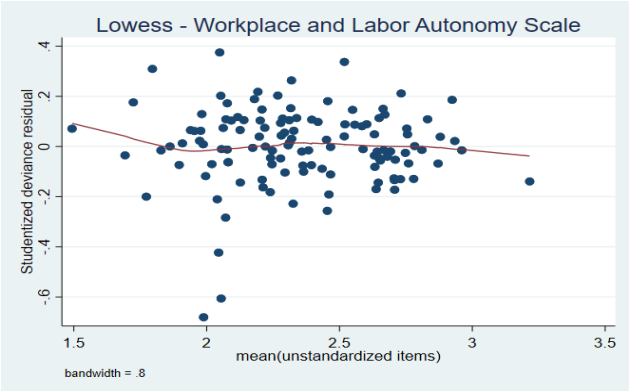
Teacher Retention Rate

Figure 1. Lowess Plot for Satisfaction Scale - Non-linearity Check



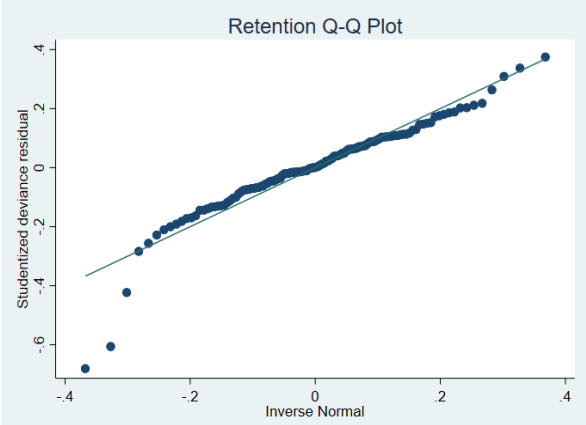
The scatter plot against the studentized deviance residuals with the Lowess fit line above indicates that the Satisfaction scale variable is linear.

Figure 2. Lowess Plot for Workplace and Labor Autonomy Scale - Non-linearity Check



The scatter plot against the studentized deviance residuals with the Lowess fit line above indicates that the Workplace and Labor Autonomy scale variable is mostly linear, but with an upward bend near the beginning. Correcting for non-linearity may be needed here.

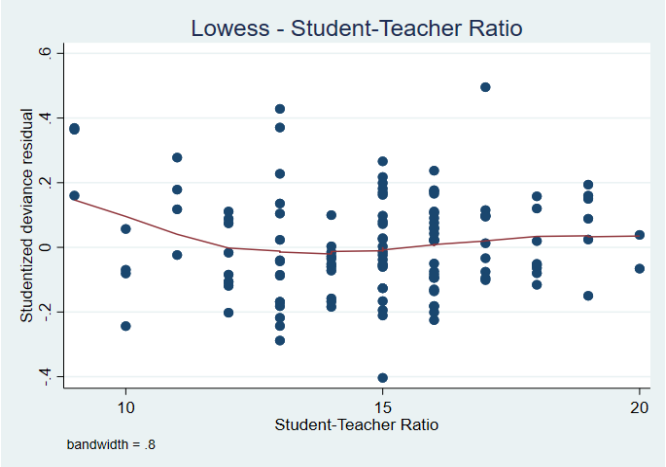
Figure 3. Retention Quantile-Quantile (Q-Q) Plot - Non-Normality Check



Based on the Q-Q plot above, most studentized deviance residuals adhere to the 45-degree line but there are values at the beginning and the end that deviate. This indicates the possible presence of non-normality in Retention and the possible need for corrective action.

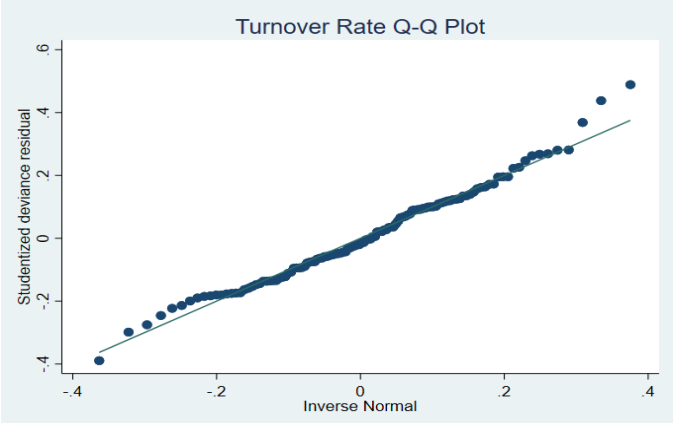
Teacher Turnover Rate

Figure 4. Lowess Plot for Student-Teacher Ratio - Non-Linearity Check



The Lowess fit line above indicates that the student-teacher ratio variable is mostly linear, aside from a slight upward bend toward the beginning of the line. Slight non-linearity may be present and may need to be adjusted.

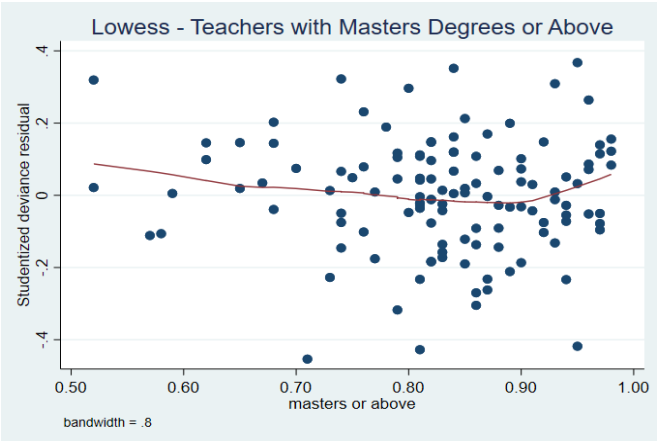
Figure 5. Turnover Q-Q Plot



Based on the Q-Q plot above, most studentized deviance residuals adhere to the 45-degree line but there are values at the beginning and the end that deviate. This indicates the possible presence of non-normality in Turnover Rate and the possible need for transformation of the dependent variable.

Teacher Attendance Rate

Figure 6. Lowess Plot for Teachers with master's Degrees or Above - Non-linearity Check

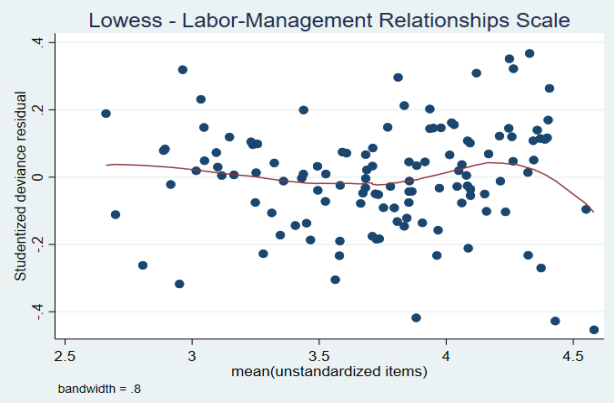


The Lowess fit line above indicates that the masters variable is mostly linear, aside from a slight upward bend toward the end of the line. Slight non-linearity may be present and may need to be adjusted.

Figure 7. Lowess Plot for Satisfaction Scale - Non-linearity Check

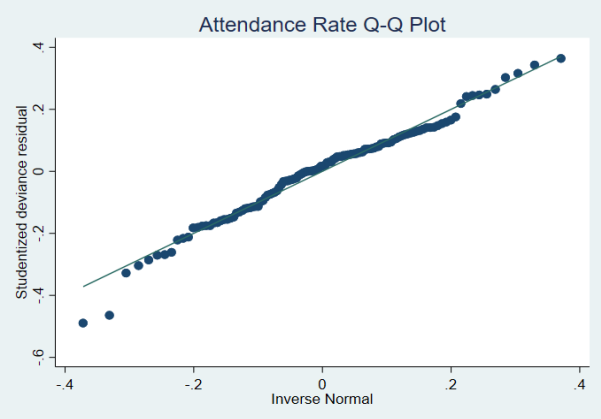
The Lowess fit line above indicates that the satisfaction scale variable when analyzed with the teacher attendance rate variable is non-linear and will need to be corrected.

Figure 8. Lowess Plot for Labor-Management Relationships Scale - Non-linearity Check



The Lowess fit line above indicates that the Labor-Management Relationships scale variable is mostly linear, aside from a slight downward bend toward the end of the line. Slight non-linearity may be present and may need to be adjusted.

Figure 9. Attendance Q-Q Plot



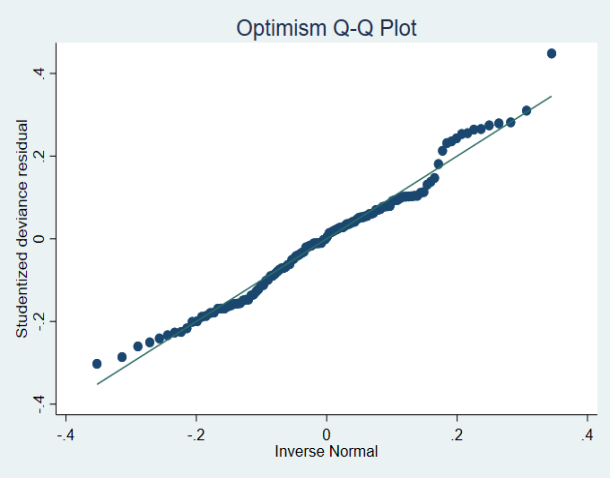
Based on the Q-Q plot above, most studentized deviance residuals adhere to the 45-degree line but there are some values that deviate, particularly at the ends. This indicates the possible presence of non-normality in Attendance Rate and the possible need for transformation of the dependent variable to correct for non-normality.

Optimism

Figure 10. Lowess Plot for Satisfaction Scale - Non-linearity Check

The Lowess fit line above indicates that the satisfaction scale variable when analyzed with the teacher attendance rate variable is non-linear and will need to be corrected.

Figure 11. Optimism Q-Q Plot



Based on the Q-Q plot above, most studentized deviance residuals adhere to the 45-degree line but there are some values that deviate, especially at either end. This indicates the possible presence of non-normality in Optimism and the possible need for transformation of the dependent variable to correct for non-normality.

The only dependent variable that needed to be modified for this procedure due to having a 0 value in its data was the turnover rate variable.

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2010-2014	Bachelor of Arts, English University of California, Santa Barbara

PROFESSIONAL EXPERIENCE

2019-Current	Teacher, Jefferson County Public Schools Certified English, Grades 5-9
2017-2019	Substitute Teacher, Oldham County Public Schools
2016-2018	Pre-kindergarten Teacher, Kayfield Academy

RESEARCH INTERESTS

- Quantitative Methods
- Sociology of Labor
- Organizational Theory
- Sociology of Public Health
- Sociology of Leisure
- Sociology of Death and Dying