

New Research in
Global Political Economy



Gabriel
Berlovitz

**Striking for the Common
Good:** Evaluating American
education strikes

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Striking for the Common Good:
Evaluating American education strikes

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Abstract

The re-emergence of massive strikes in the public education sector, predominantly in the more conservative, union-weak American South, has brought seismic change to the industry and its workers. Solving the puzzle as to why these strikes were so successful against massive obstacles could beget better methods for organizing strikes in a period when neo-liberal reforms threaten public services around the world. Furthermore, an understanding of why these strikes were successful can contribute to the contemporary discourse on the role of unions and different strategies in strikes. To explore this topic, this paper uses labor theory on communal involvement, power resources of unions, and organizing tactics, to guide analysis. This paper uses a regression analysis to evaluate the relationship between key strike statistics and the wage outcomes of the strike as a measure of strike success. To bring in relevant context and analyze broader theories, interviews are conducted with participants of key strikes. This paper finds that the participation percentage of the workforce, the power of the union involved, the duration, and the student-to-striker ratio have a strong relationship with the strike-wage outcome. Of these variables, the power of the union involved has the only negative relationship with the strike-wage outcome. Furthermore, the relationship between significant variables and the strategy employed in preparation for and during the strike, shows evidence of a relationship between alliances with the community and a strong strike-wage outcome. These findings have implications for theories of the power resources approach of unions and a host of theories related to strike costs and gains. I conclude that further research and data collection should be conducted to expand the explanatory value, applicability and quality of these regression results.

Abbreviations

BLS: Bureau of Labor Statistics
FMCS: Federal Mediation Conciliation Services
FTE: Full-Time-Equivalent
NCES: National Center for Education Statistics
OLS: Ordinary Least Squares (Regression)
PRA: Power Resources Approach

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1. Introduction

Education is under attack in the United States and around the world. Education strikes have surged in India, Mexico, Canada, Nigeria, the United Kingdom, and across South America. The list of education strikes around the world is continuing to grow by the day, yet few assessments have been made of the success of education strikes. The need to look at challenges and opportunities presented by education strikes is underscored by the global decline of education as a public good and what this means for students and democracy. In the U.S., this decline is significant, with education funding falling 4% between 2010 and 2014, and roughly half of all states spending less on students than they did before the 2008 recession. Funding shortfalls have left students with overcrowded classrooms, textbooks older than teachers, and unbearable schooling conditions (American Federation of Teachers, 2018). This deprived state of US education demands a resolution: a way to strike back at the forces undermining the full potential of students everywhere. This paper aims to understand the most effective strike methods that educators have chosen in order to challenge divestment in public education. An examination of the recent explosion of massive education strikes around the country, in locations speculated to be some of the most challenging political environments for educators, could shed light on the path forward. In Oklahoma alone, a state with one of the most repressive sets of labor laws in the US, educators won 50 million dollars in education funding and raises for educators through a massive statewide strike (Rosenfeld, 2019). New data, provided by these strikes, begs the question: why have these education strikes had varying degrees of success? Through answering this question, this paper intends to shed light on methods, tactics and circumstances that can allow rank-and-file educators in the U.S.—and around the world—to build education systems that support teachers, students, parents, and their respective communities.

To begin, this paper sets out to answer the question: why are some strikes more successful than others in terms of wage outcomes? The question is motivated by the decline in funding for public education and the effective response of educators to strike back. It also fills a major gap in academic strike literature, as there are currently no prominent studies that focus specifically on what accounts for the diversity of successful strike outcomes. In the process of answering this question, I evaluate the relevance of the “Whole Worker Organizing” approach (Mcalevey, 2016), the “Power Resources Approach” (Schmalz, Ludwig & Webster, 2018; Jenkins, 1983; Wright,

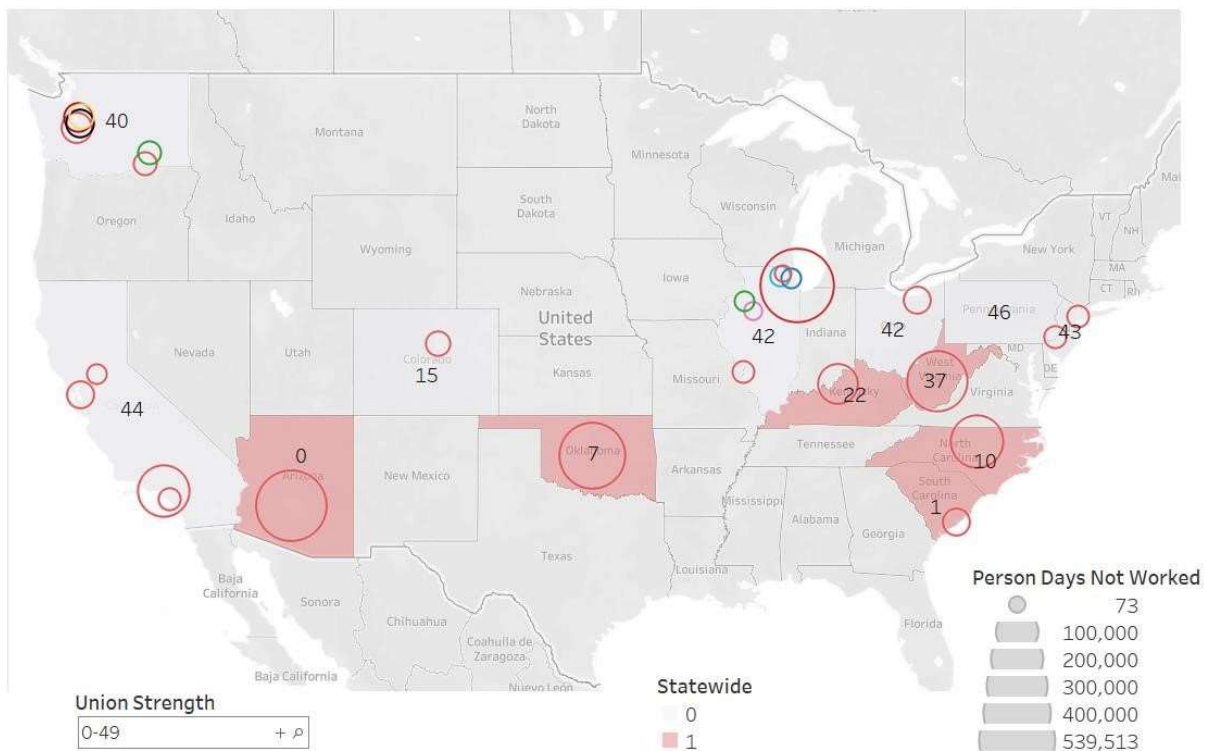
2000), and several theories relating to social movement unionism and strike outcomes. I hypothesize that the power resources available to unions, and the strategies that incorporate workers and the community to put pressure on employers, positively relate to strike-wage outcomes. Since most literature is limited on the subject, focused exclusively on a qualitative or quantitative methodology, and not inclusive of a broad array of relevant theories, I evaluate the research question through a mixed methods approach: regression analysis, alongside interviews to provide context. Through quantitative regression analysis, this paper accurately measures the relationship between power resources available to workers and the strike-wage outcome. Through attention to specific strike cases and interviews with participants involved, the anecdotal effectiveness of strike strategies can be evaluated in relation to the strike-wage outcome. Before testing the hypothesis and answering the research question, I begin with a brief history of education and strikes in the United States. I then review relevant literature to explore the gap in strike success theory. From this point, theories used to evaluate strike success are outlined, followed by a description of how these theories are evaluated methodologically. I then evaluate the results of my regression analysis and interviews.

1.1 Motivation: A brief history of strikes in the education sector

The frequency of strikes in US education has nearly doubled in the last decade. Since 1993, there have been 159 education strikes in the U.S., roughly 100 of which have occurred since the 2008 recession (Bureau of Labor Statistics [BLS], 2020). The enormous increase in the number of strike incidents alone merits study, but the increase in the scale of strikes poses a more significant research demand. In 2012, the composition of education work stoppages also changed, with strikes growing in the level of worker participation, due to a higher frequency of education workers in large metropolitan areas on strike. Several notable strikes in this time period took place in Chicago (2012, 2016, 2019), Detroit (2016), Seattle (2015), and the whole state of Washington (2015). Following the success of these cases, the data shows that the trend in education strikes shifts towards larger work stoppages encompassing the whole state. This trend begins with West Virginia in 2018, and expands to Arizona, Oklahoma, North Carolina, South Carolina, Kentucky, Colorado, and Oregon. Simultaneously, a range of small to large metropolitan areas continue to strike, with the largest events occurring in Oakland, Chicago, Los Angeles, and Denver (see Figure

1). Strikes outside of these areas, about half of the data, are typically in smaller metropolitan or rural areas, with a large portion of these cases concentrated in Illinois. All in all, between 1993 and 2008, there were 203 total working days lost due to strikes, an average of 10.7 workdays lost per year, and 25,503 workers on strike per year. Following 2008, there were 598 total working days lost, or 54.4 days lost per year on average, and 87,961 workers on strike per year (BLS, 2020). The massive increase in days lost and workers participating in education strikes is a phenomenon that motivates this study to investigate why educators were so successful in organizing strikes. The massive increase in the number of strikes provides adequate data to better analyze this phenomenon. Furthermore, the location of these strikes represents another phenomenon that motivates this paper (see Figure 1).

Figure 1:



Curiously, many of these strikes have found success despite significant opposition. With the introduction of open shop policies (see Janus vs AFSCME) in 2018, anti-labor state and locally elected officials, a perceived anti-labor public, a less than favorable national political environment, and limited or non-existent unions in the workplace, many commentators were baffled by the

success of these strikes. Of the strikes I sampled, a handful achieved no wage gain, the majority received a wage gain above the average educators' raise (Camera, 2020), and just one lost wage gains due to the strike (see Appendix I for database). The fact that most of these strikes were successful in raising wages, despite significant opposition, motivates the question: why are some education strikes more successful than others? Through investigation of this phenomenon, workers may learn from their peers about better ways to win the hard fights with employers. As labor unions continue a long period of decline, how to win, once again, is arguably the most important question to answer for their survival.

2. Literature Review

The available scholarship on the topic of strike actions is predominantly focused on two areas: what causes strikes to occur (Rees, 1952; Hicks, 1932; Ashenfelter & Johnson, 1969) and what the outcome of strikes is (Card & Olson, 1995; Ley and Wines, 1984; Jimenez-Martin, 2006; Currie and Ferrie, 2000, Stengos & Swindisky, 1990). While the conditions that lead to a strike are certainly relevant to this study, the latter literature on factors that affect the outcome of a strike is more relevant here, so I primarily review this area of the research. Within this literature, there is a major deficit in studies that address why strikes are successful. Even fewer studies have analyzed this question from a mixed method or quantitative lens. This study, therefore, seeks to address this gap.

Early contemporary theorists, who analyze strike outcomes, focus on the following aspects: legal environments (Currie and Ferrie, 2000); the impact of wage spillover effects and labor market conditions (Auld *et al.*, 1981); the effect of the year in which specific events and pre-strike offers occur (Ley and Wines, 1984); the strike's duration (Jimenez-Martin, 2006); the effect of strikes on union membership outcomes (Hodder *et al.*, 2016); the fraction of employees on strike or the log of total strike participants, the location of the strike, and the fraction of female employees on strike (Card & Olson, pg. 31, 1995). These studies are useful methodological guides to gathering variables for my study, but ultimately have major shortcomings that justify the relevance of this paper. Currie and Ferrie, as well as Card and Olson, both look at private sector strikes from the 1880s, which limits the relevance of such studies to the factors that make strikes effective in today's education labor market. The study by Auld *et al.* (1981) is useful in showing that

unemployment and the spillover of wage standards in other industries are not associated with the wage settlement of strikes, but it is confined to 1966-1975 in Canada, and does not include public sector workers. In most of these studies, strikes and the workforce were predominantly based in the manufacturing and private sector, whereas today's strikes are made up of a growing number of public service workers. The quantitative focus of these studies helps to provide a theoretical launch point for the methodology of this study, but the lack of relevant literature that specifically addresses my research question, regarding contemporary strike outcomes, further highlights the need for this paper.

Studies that analyze the factors that lead to the success of strikes within a modern context or within the field of the public service sector help to outline the research gap this paper aims to fill. Ley and Wines' analysis of Minnesota teachers specifically offers more insight into what makes strikes successful in education. They ultimately conclude that public funding and supportive political action by the state were associated with stronger strike-wage outcomes (Ley & Wines, pg. 64, 1984). Their analysis demonstrates the potential value of specifically analyzing education strikes. Additionally, Jimenez-Martin contributes a quantitative study of Spanish strikes and finds that a strike duration of more than twenty days has a negative association with wage outcomes. Furthermore, he finds evidence that striking in general has a wage premium of 0.33 percent (Jimenez-Martin, 2006). The Jimenez-Martin study is also methodologically useful for this paper but has limits in that its scope is focused on Spain, and it does not consider the tactical choices made by strikers during strikes. Card & Olson's study of what makes strikes successful and what determines their wage outcomes, using data from the 1880s, is the most significant contribution to the literature (1995). Their work provides the basic theoretical model for this study and prompted the use of wage outcomes as an indicator of success. Nonetheless, it does not incorporate strategic choices or approach the subject from a mixed method lens. In fact, none of the above-mentioned studies have a particular focus on the use of specific strategies employed by strikers during strikes. Nor do they home in on the issue of what makes strikes successful. In his evaluation of the state of strike research, Franzosi summarizes: "quantitative strike research has failed to incorporate economic and organizational/political models and micro and macro models within unified theoretical frameworks" (pg. 359, 1989). In other words, quantitative strike research is not holistic or inclusive of broader qualitative approaches to strike analysis. This not only justifies the use of a quantitative approach to determine what makes strikes successful, but also underscores the

importance of qualitative research that specifically focuses on strategies and tactics that could influence successful strike outcomes.

Existing qualitative literature contributes key insights into which tactics, strategies, circumstances, and resource mobilization, influence strike outcomes. However, notable gaps regarding the success factors of strikes are apparent, given an overwhelming focus of the literature on: the strategies that generally make organizing campaigns successful (Kelly and Badigannavar, 2005; Mcalevey, 2016; Hyman, 1994; Bronfenbrenner, 2003; Juravich, 2006); the types of union structures that create specific labor outcomes (Ganz, 2000); the financial position and power structure of the target employer (Luders, 2012; Mcalevey, 2016); and which power resources unions can utilize to achieve their goals (Schmalz *et al.* 2018; Jenkins 1983; Olin Wright 2000). These authors provide a useful framework to evaluate strike outcomes through the lens of union strategy, organization, and power resource availability. However, like the quantitative literature, their lack of focus on strikes and strike outcomes leaves a research gap, which this study aims to address. While available research on what makes a strike successful is somewhat limited, there are qualitative theorists who provide the steppingstone from which to develop new approaches to evaluating the organization and outcomes of strikes.

A crucial contribution to the literature on strikes is Jörg Nowak's book, *Mass Strikes and Social Movements*, published in 2019. It puts forward non-Eurocentric theories and emphasizes the importance of communal non-workplace-based relations in analyzing strikes. Since a major focus of this paper is to produce academic insights that are useful to all workers, Nowak's observation that, "only a theory of strikes that goes beyond a focus on trade unions and the workplace will be able to grasp the forms of labour conflict that affect the majority of the world" (pg. 3, 2019), points to another gap in strike literature. This contribution is important because, even in the service-based public economy of the Global North, the Eurocentric model of collective bargaining, formal union representation, and an income distribution focus of organizational goals, is far from the reality for most workers. Many education organizations assessed in this study lack formal union representation or even the legal capability to collectively negotiate, which more closely parallels workplace struggles in the Global South. The shift in workplace dynamics in the Global North signals a deviation of strike theory from the more traditional, union-based strike literature put forward by early authors such as Card & Olson and Jimenez-Martin. Furthermore, a focus on

spatial relations between capital and labor emphasizes that: “if any specific relation exists between capital and labor is embedded in a multiplicity of class relations and non-class relations, then all these will also have an effect on the types of organization of strikers” (Nowak, pg. 26, 2018). This means that when workplaces are entrenched within a community, the class relations present will impact the types, and possibly the success, of a given strike. The focus on the location of the workplace and its impact on strike formation inspired this study to use theories that consider the spatial dimensions, and the communal and class relations at play in the sample of strikes assessed below. Nowak’s work also informs methodological aspects of the qualitative portion of this paper.

Another crucial motivation behind this paper’s examination of what makes a strike successful is the work of Joe Burns (2012), *Reviving the Strike: How working people can regain power and transform America*. Burns argues that the labor movement has been in decline and will continue to be until it brings back the utilization of the militant, indefinite, production-halting strike (Loc 2502, 2012). He notes that unions have replaced the strike with weak tactics based on misaligned goals such as the use of one-day strikes, sick-outs, social unionism, legislative actions, corporate campaigns (Ch 4, 2012), and a shift in priority toward the organizing of new members (Ch 5, 2012). While an evaluation of these tactics is beyond the scope of this paper, the critical focus on different types of strikes and their outcomes provides a justification for evaluating contemporary strikes. Other authors on strike success come to similar conclusions on the importance of halting production, but add that the orientation of government actors, the location of workers and their willingness to engage with the community, and the financial constraints of the employer, are also key indicators of success (Stillerman, 2003). Like Nowak, Stillerman’s approach provides further justification for reviewing how location and communal ties relate to strike success. These qualitative approaches in the field of strike success merit an investigation from a mixed method perspective. The contemporary phenomenon of education strikes presents a variety of useful examples that allow for a robust quantitative analysis in tandem with a qualitative comparison.

Research gaps in the methodology and theory regarding what makes strikes successful justify the relevance of this paper. However, the reasons for which education is a suitable case study in analyzing the factors that lead to a successful strike should be explained further. The specific focus on education is inspired by the resurgence of large-scale, strike-based labor movement actions that became more frequent after 2008. The focus on education is also motivated by: the need to limit

the scope of this paper; its relevance to the contemporary labor movement; and the homogeneity of workplace circumstances that exists in the education sector in the U.S.. The recent advent of teachers strikes provides data that, prior to 2008, was not available in a large enough sector-specific format to evaluate it quantitatively. Additionally, a focus on the public sector provides access to budgetary and demographic information that is not always available in the private sphere. Moreover, the factors that contribute to the success of strikes within the education sector are useful for labor organizers, trade union members, workers, and leaders, to better understand their own work. Finally, by focusing on a somewhat homogeneously structured industry, this paper can review the factors of strike success separately from the structural or institutional dynamics that may muddle the results of past quantitative studies which assess the successful strikes from an economy-wide perspective (see Card & Olson 1995; Auld *et al.* 1981 for examples). As such, focusing on the education sector can provide a useful and theoretically important contribution to the literature. Overall, based on the literature surrounding successful strikes, successful labor strategies, and the contemporary importance of strikes in education, there exists a justification for a mixed methods approach to evaluating strike success. The scarcity of research on this topic allows for an expansive approach to investigating strike success as measured by wage outcomes. Therefore, I aim to answer the following question: why have some education strikes been more successful than others in terms of strike-wage outcomes?

3. Theory

The foundational theory used in this paper is a game theory model called *War of Attrition*. This is a good fit for answering my research question—why some strikes are more successful than others in terms of wage outcomes—because Card & Olson (1995) use this model to quantitatively evaluate wage outcomes in their study. The *War of Attrition* model is used primarily for quantitative evaluation, while additional qualitative theories are used to address unquantifiable factors in strike success. The *War of Attrition* model is largely based on private sector strikes in a dated historical context, so qualitative theories are added to capture the public nature of education strikes. A general description of the *War of Attrition* model follows next.

Firstly, the *War of Attrition* model describes the game theory of who will win a strike when two actors decide to concede to their opponent, based on the costs of continued conflict (Smith, 1974;

Kennan & Wilson, 1989; Card & Olson, 1995). The model applied to strikes is characterized by the ability of actors, workers, and employers to impose costs on each other in pursuit of a valuable prize—wage increases or employer demands. This paper uses the term “concession costs” interchangeably with “costs of winning the strike”. Workers go on strike and impose costs through the daily stoppage of production. Employers impose costs on employees by not paying wages and the threat of permanent job losses. These delay costs are also referred to as disruption costs. Each party considers, daily, the cost of continuing the strike an additional day in relation to the probability of their demand(s) being met. In the model, the probability of victory is based on the perceived likelihood of how long their opponent can continue the strike and thereby impose costs on the opposition. When the costs of delay exceed the potential gains of an unlikely outcome, one party concedes to the other, the strike ends, and the outcome is determined based on the same factors that influence who wins the strike (Card & Olson, 1995). There is limited previous scholarship that analyzes determinants of successful strikes, which makes the *War of Attrition* model a fitting theoretical foundation for this thesis. The model enables this thesis to evaluate additional theories through the lens of delay costs (disruption costs) and potential gains (concession costs). This theory also sheds light on how to define success and measure the dependent variable.

Beyond Card & Olson, the additional previous scholarship of Jimenez-Martin motivates and forms a guide for this study through their use of post-strike wage as a dependent variable to measure strike outcome (2006). Card & Olson firstly define success for workers as a binary measure of whether the employer concedes to workplace demands, because the 1880s strike outcomes were largely “winner-take-all” (1995). Conditional on victory, they also analyze the percentage of wage increases to measure the relative differences among positive outcomes. Since this thesis is concerned with identifying factors that create a variety of victorious strike results, wage outcomes serve as an easy-to-measure and theoretically justified dependent variable for the regression. This thesis observes that, within the data, many strike demands focused on pay increases, but many also demanded and won concessions that are difficult to measure, such as class size or curriculum. Due to scope limitations, this thesis does not quantitatively evaluate non-wage-based strike outcomes; rather, only qualitatively. In future research, I aim to build a quantitative analysis of non-wage outcomes. Overall, the standalone use of the strike-wage outcome is justified in the literature. Next, I outline different adaptations scholars have used in *War of Attrition* models which relate to my research question and public sector strikes.

The following section of this thesis outlines the different explanatory variables to measure, and how they are theoretically connected to strike outcomes within the *War of Attrition* model outlined in Card & Olson (1995). The variables are based on a body of literature on strikes (Burns, 2012; Nowak, 2018; Card & Olson, 1995), union revitalization (Schmalz *et al.*, 2018; Jenkins, 1983; Wright, 2000; Foster, 1930), and social movement outcomes (McAlevey, 2016; Luders, 2012; Ganz, 2000). I group these variables into four categories: *Size and Degree of Disruption*, *Opposition and Concession Costs*, *Strategy and Engagement*, and *Power Resources*. These categories justify my intended quantitative and qualitative variables and reconfigure them into measurable data for analysis. Qualitative theories also provide much-needed nuance to the *War of Attrition* model to account for the fact that my data is from the public sector in education. In this thesis, these qualitative theories attempt to determine which strike characteristics impacted notable strike outcomes. To build upon the narrow scope of variables used in current strike literature, this paper seeks to apply new social movement and labor strategy theories to evaluate strike outcomes.

3.1 Size and Degree of Disruption

Most previous studies hitherto including Smith (1974), have used the number of participants and the participation percentage to measure the impact of strike size on outcome. Smith's study is expanded upon by additional findings that the strike-wage outcome is related to the number of strikers, duration, and participation percentage of the workforce (Card & Olson, 1995; Jimenez-Martin, 2006). With these studies as evidence, this thesis includes the same three variables to evaluate their relevance in the education sector. These variables provide insight into how the scale of disruption relates to strike-wage outcomes because they are key to imposing delay costs on employers (Card & Olson, 1995). Yet, modern labor scholars argue that other methods of imposing delay costs achieve higher wage gains from employers. Not all these methods are explicitly connected to strikes or the *War of Attrition* model's theory of strike delay costs, but this thesis aims to investigate their potential connection to delay (or disruption) costs.

The fundamental nature of education is rooted in the community. Schools and their workers produce educated students, whose parents pay the salaries of the school employers and employees through taxes. Because strikes are organized around the class and social relations present in the

environment in which they operate, my model attempts to test the relevance of students and parents to strike outcome (Nowak, 2018). The relevance of the community to labor struggle is outlined by Mcalevey, who posits church groups and parent organizations as key allies (2016). She also notes that the point of production for many workers, including educators, is the community. Under this assumption, for educators to halt production, a key element of imposing delay costs, the community must support educators' strike actions (Burns, 2012). It is challenging to quantitatively evaluate the role of a complex and diverse community of education stakeholders in a strike, but the literature justifies adding a 'student' and 'student-to-striker' variable. By adding this variable, the student cost associated with one additional striking educator can be measured in relation to the strike-wage outcome. Further theoretical explanation underscores how community involvement can be evaluated in relation to the strike-wage outcome from a qualitative angle.

I turn to a similar topic: public favorability as a disruption cost. The education sector is led by public officials, and strike concessions are approved by "democratically" elected legislatures, governors and school boards. In most cases, educators negotiate directly with elected officials such as the mayor or school board, which makes them the employer in our strike model. In Mcalevey's book *No Shortcuts: Organizing for Power in the New Gilded Age*, she outlines a theory of Joseph Luders, who uses a matrix of concession costs (strike gains) ranging from low to high on the x-axis, and disruption costs ranging from low to high on the y-axis (see Figure 2) (2016). If high concessions are going to be extracted from an employer, workers will need to impose equal or even greater amounts of disruption on that employer (McAlevey, 2016). Luders (2012) builds a case that public officials, such as school employers, are susceptible to strike disruption costs that impact public opinion, since officials require votes to maintain their power. Furthermore, alliances with community groups in public sector strikes are shown to increase the likelihood of workers winning (Devinatz, 1997). In the case of education strikes, if the strike is perceived as just by community members and the employer refuses to concede, a shift in public opinion could jeopardize employer electability and impose higher disruption costs. However, the public support for striking educators is hard to measure quantitatively. It is possible that the percent of the workforce on strike, and students missing from classes, are measures that could amplify the coverage of strikes in the news cycle, but there is no way to measure whether these numbers impact public opinion. It is also possible that employers could perceive a higher number of parents and students in support of educators as a potential threat to their future revenue and profit sources,

because yearly revenue is determined by enrollment (Juravich, 2007). This thesis evaluates the disruption costs imposed by the community using interviews. I analyze the impact of public opinion, and the attitudes of parents and students towards the strike, in relation to strike-outcome. Next, I analyze the characteristics of employer resistance to striker demands in order to help explain how much disruption is needed to attain an above-average strike-wage outcome.

Figure 2. Potential Employer Response to Movement Demands

Disruption Costs	High ↑ ↓ Low	I. <u>Accommodators</u> . Concede to movement demands.	II. <u>Vacillators</u> . Respond with unstable mixture of minor concessions, protracted negotiation, and support for movement repression; exit.
		II. <u>Conformers</u> . Inaction. Resist or accept movement demands in keeping with dominant local norms.	IV. <u>Resisters</u> . Offer durable opposition to movement.
		Low	High
Concession Costs			

3.2 Opposition and Concession Costs

Scholars note that strike concessions are influenced by the cost of a given proposal in relation to the cost of the continued disruptive effect of the strike. Luders speculates that, “targets [the employers] also weigh the actual or anticipated losses from acceding to movement demands” (Pg. 3, 2012). In the case of employer concession costs, it could range from additional money going to educator wages versus their own salaries, the cost of additional educators in the classrooms, or changes in public opinion due to strike outcomes. According to Luders, attaining a high strike-wage outcome (concession costs) will depend on the capability of labor to impose disruption costs equal to or greater than the concession costs (see Figure 2) (Ch. 2, 2012). The variation in strike disruption in relation to concession cost could better explain strike-wage outcomes. This also fits the *War of Attrition* model’s framework, which weighs strike delay costs against potential gains from strike outcome (Card & Olson, 1995). It also applies well to public sector strikes, since disruption costs include damage to the employer’s credibility. In this study, concession costs are

measured through investigating the approximate cost of the striker's proposal to public employers (such as state or local governments). I investigate the relationship between striker demands and the disruptive qualities of the strike through interviews and regression analysis, to understand which disruptions lead to which wage outcomes. However, potential opposition parties in a strike can alter disruption and concession costs.

Within the education sector, the concession costs of a strike are directly related to the reaction of potential opposition parties. For parents and students, a wage increase for strikers could attract better educators to serve their interests, or it could mean a local tax increase. Luders speculates that, "those third parties that suffer high costs from movement protests and other activities but are unlikely to be harmed by the target's [employer's] acquiescence to movement demands, will be disposed to support accommodation [to strike demands]" (Pg. 12, 2012). In the case of education, if parents and students must endure the costs of no school from a strike, but ultimately see a neutral or positive outcome arising from it, they could support striker demands. Conversely, if they feel the strike outcome harms their interests, they may support the employer's resistance to conceding (Luders, 2012). This is crucial in education, since parents and students are a key source of imposing disruption costs in a strike because they often elect the education employer. A theory of strike opposition parties builds off the importance of communal support in a strike that was discussed previously and adds that the demands of strikers could neutralize opposition and build allies who impose additional disruption costs. Furthermore, if educators make efforts to limit the disruptive costs on students and parents themselves and provide a benefit to these parties as a result of strike outcomes, it could serve to further expand community willingness to maintain support for disruption or become directly involved in the strike (Luders, 2012). This paper structures interview questions around how demands and strategies impact opposition, their effect on strike costs, and subsequently on wage outcomes.

3.3 Strategy and Tactics

The decline of union membership and wages has led to a wealth of literature on strategies for labor to make gains for members, despite the weakened negotiation position vis-à-vis employers. This thesis examines tactics and strategies used by militant trade unionists who largely built the American labor movement through direct collective action, solidarity with the community, and organized outreach (Foster, 1936). Mcalevey expands Foster's theory by conceptualizing three key

elements necessary for labor to make gains for members: power, strategy, and engagement (2016). This approach is titled “whole worker organizing” and gives workers the means to win the hard fights (high concession cost) and enable majority strikes. This section details the relevance of Mcalevey’s theories on strategy and engagement to evaluate their impact on the strike-wage outcome. Overall, these methods are a crucial element of education strikes because they can shape how disruption and concession costs are manifested upon the employer and workers.

The basic premise behind the strategy of the “whole worker organizing” model is that workers are the architects of their own destiny. Not only must workers be at the forefront of democratically decided strategy: they must also execute their approach themselves, because it builds a broader base of supportive coworkers (McAlevey, 2016). This means that successful strikes should primarily be organized by the educators themselves. Strategies will have the highest impact on the strike-wage outcome if they are aimed at increasing the scale of disruption costs to employers, neutralizing opponents of concession costs, building allies in favor of concession costs, and creating the solidarity between workers necessary to continue disruption. Workers leading the execution of these tactics make them more effective because this method creates internal solidarity between workers (Card & Olson, 1995; McAlevey, 2016; Luders, 2012; Johnston, 1994). This theory is evaluated in interviews by analyzing the effect of the workers’ central strategic roles in the strike, in relation to the strike-wage outcome. Furthermore, the way in which strike leaders frame the struggle is a key tactic that allows workers and the community to win for themselves. Framing the terms of workplace struggle around the betterment of workers, families, and the community positions employees and their networks as the central actors in each labor initiative (McAlevey, 2016). Furthermore, public unions make gains when workers and the community advocate for their shared interests (Johnston, 1994). Worker leaders who make public interest-based demands allow community members to have a common interest in the outcomes of struggle, and to build willingness to impose disruption costs and avoid opposition-based concession costs in labor struggle (McAlevey, 2016; Luders, 2012). The impact of demands on strike outcomes are assessed by how worker leaders frame their goals and the impact this has on community involvement in the strike. This study investigates whether demands impact the perceived concession costs of employers, and whether these demands are successful in building alliances to impose disruption costs on the employer. Once worker and community leaders understand that this

is their fight, the question of which workers should lead, and how they intend to do so, becomes relevant to strike outcome.

In order to build and maintain a disruptive majority strike, employee leaders with an actual following among other workers can employ tactics to maintain and build solidarity (Mcalevey, 2016). However, a prerequisite is that worker leaders need to have influence among their peers, otherwise labor movements may simply be populated with employees isolated from the majority (Ibid.). Limited involvement would theoretically lead to no strike (Card & Olson, 1995). Accordingly, mass strikes can only be developed and won if influential leaders are willing to build support for movement demands among the workforce (Foster, 1936; in Mcalevey 2016). Once convinced of the need to fight for movement demands, leaders should be coached in the methods of building solidarity among their peers in order to build maximum support for their endeavors (Mcalevey, 2016). In relation to the research question, identifying and training influential leaders could build persistent enough solidarity to maintain support for a strike and impose more disruption costs. Worker leaders' influence on potential opposition parties could also serve to limit concession costs. How leaders specifically use their influence to build collective action is also a crucial feature of Mcalevey's hypothesis. Through interviews, this thesis examines the role of the identity and actions of key workplace leaders in relation to the strikes' outcome.

Workplace leaders' use of direct action to increase the number of workers and community members involved in opposing the employer could also explain the strike-wage outcome. This tactic is titled "structure tests" and relies on workers' ability to learn how to make gains through experiencing workplace struggle. The first structure test could be whether the worker identified as a leader can get most of their peers to agree to a high-risk confrontation against the employer's exploitation (Mcalevey, 2016). This action, if initially successful, is then continuously expanded to build larger and larger actions until workers are ready to impose the disruption costs required to outweigh the employer's concession costs (Card & Olson, 1995; Mcalevey, 2016). A structure test serves the purpose of "socializing workers to take a risk together; [structure tests] are solidarity and confidence building showing workers the strength of their numbers" (Mcalevey, loc. 742, 2016). Effectively, structure tests solidify the practice of solidarity among workforces. Structure tests also fit well within my strike model because they enable workers to practice decision-making in a strike: to stay united in solidarity or break from the group to pursue individual wants or needs

(Card & Olson, 1995). Also, structure tests are a display of activism that “Increases the wages of union members”, which I test in a strike setting (Wilmers, Pg. 1, 2017). In addition, the use of these tactics is particularly useful in the American context since, as Mcalevey explains, workers cannot overcome the ingrained individualism that has been fed to the masses by corporate media. Rather, people “must forge solidarity by struggling together” (Ch. 7, loc. 3740). This paper evaluates the use of structure tests on the strike-wage outcome by investigating the connection between escalating preliminary collective action and the ability of a workforce to impose and maintain disruption costs on the employer during a strike. While the use of different tactics and strategies may influence strike outcome, modern authors argue that a focus on the power resources available to the union could impact strategy and the ability to achieve movement or strike demands.

3.4 Power Resources

The use of specific tactics and strategies leading up to and during a strike may influence the strike outcome, but union revitalization literature also stresses the importance of the resources available to the union, known as the Power Resources Approach (PRA). Theorists argue that “the workforce can successfully defend its interests by the collective mobilization of power resources in the structurally asymmetric relationship between capital and labour” (Schmalz *et al.*, Pg. 115, 2018). Essentially, labor parties can win if they use the resources available to them. Authors go on to describe four categories of power: structural, associational, societal and institutional. Structural power is the workers’ ability to disrupt the economic operations of the employer and broader economic system (Schmalz *et al.*, 2018; Silver, 2003; Wright, 2000). Associational power refers to the organizational strength of a worker group and is broken down into the categories of ‘organizational efficiency’, ‘internal cohesion’, ‘financial capability’ and ‘member numbers’ (Schmalz *et al.*, 2018). Institutional power is the capability to enact change through negotiating practices, such as the use of collective bargaining or co-determination in Germany (Ibid.). Finally, societal power is the ability of workers to transcend the workplace and build support for trade union demands among societal groups and organizations. This is further categorized into discursive and coalitional power, which is the ability to reconcile trade union demands with commonly held beliefs and the ability to expand organizational resources through solidarity networks, respectively (Schmalz *et al.*, 2018). All these power resources, if used appropriately, should enable labor to

successfully advocate for their interests. It should also be noted that, on a practical level, the striking teacher and educator workforce has a structural power disadvantage, in that school districts are not immediately impacted financially by a labor stoppage. In comparison, most private sector strikes halt production and incur immediate financial costs to employers. Since this thesis analyzes the effects of strike action, one of the fullest measures of structural power, I can isolate the other power resources to evaluate whether associational, societal or institutional power is connected to the ability to effectively utilize structural power to achieve a higher strike-wage outcome.

Furthermore, this thesis evaluates the arguments made by critics of this theory, who contend that the power resources approach should look more deeply at *how* power is used to achieve worker objectives (Gallas, 2016; Ganz, 2000). In accordance with these critiques this thesis analyzes whether there is a relationship between the power resources available to unions and strike-wage outcomes, and whether the way power resources are used to advocate for broader class interests is related to strike-wage outcomes. To explore how power resources are related to strike-wage outcomes, I include an education union ‘power’ proxy in my regression analysis based on a nationwide study of teacher union power. I investigate the relationship between how power resources are used (class interests or alternative interests) and the strike-wage outcome (applied structural power) through the regression analysis, and qualitatively by interviewing strike participants on the role of demands, and the formal union and institutional settings.

3.5 Building a Holistic Model of Strikes

This section has detailed several relevant theories necessary to investigate strike-wage outcomes. Using Card & Olson as a foundation, I combine all these theories into a coherent model that evaluates strike success through the lens of wage outcomes. The model assumes that worker success in strikes is determined by the ability of employees to show employers that they can credibly maintain a production stoppage and impose disruption costs (Card & Olson, 1995). This model compliments my chosen theoretical framework because Mcalevey, Luders, Juravich, Burns, and to some extent Schmalz *et al.* (2018), argue that achieving a high concessionary outcome is connected to the degree of disruption costs imposed on the employer. I analyze these theories through the following lens: concession costs are treated as the theoretical equivalent of the prize for winning/defeating the strike (strike-wage outcome), and disruption costs represent the

worker/employer cost of strike continuation. Additionally, I include the following potential strike disruption costs: public scrutiny and pressure, communal support for strikers, escalating collective action, leadership of workers who have a following in the workplace, and framing the strikes' demands around the common good (Mcalevey, 2016). This thesis quantitatively and qualitatively analyzes the relationship between both circumstances and strategy with the strike-wage outcome by examining their effects on disruption and concession costs. In conclusion, since the Card & Olson model uses the additional measure of wage outcomes as a measure of success, the use of such a measure is justified in this paper. Further specifications of the methodological impact of Card & Olson are discussed in the methodology section (1995).

3.6 Hypothesis

Based on the above theory, this paper hypothesizes that:

H0: The model does not identify a statistically significant relationship between the observed independent variables and the strike-wage outcome.

H1: There is a significant positive relationship between the power resources of statewide unions (i.e., union strength), variables that proxy disruption (size of strike, participation percentage, student-to-striker ratio, and duration), and the wage outcome following the strike.

4. Methodology

This study seeks to address a major gap in strike literature and fill methodological gaps, namely the lack of quantitative tests that assess the success factors of strikes. To test the hypothesis presented in Chapter III, I have chosen to apply a mixed methods approach to contemporary quantitative strike data, which I collected, refined, and which, to my knowledge, is the first strike data set expanded upon by using wage outcomes. To analyze the resulting data, I reviewed descriptive statistics, ensured the validity of the sample data against assumptions of Ordinary Least Squares (OLS) regression, and then applied four theoretically appropriate regression models. The first three regression model specifications were chosen in order to accurately test variables that were highly correlated with one another (multicollinearity) in separate regressions. A fourth

regression was conducted in order to utilize the larger sample size that had fewer variables, and test whether results remain consistent with previous regression analyses. The statistical analysis was conducted using Stata 16.

In order to enrich the quantitative analysis with non-quantifiable details (such as union strategies), as well as to supplement the shortage of quantitative data, I conducted five one-hour interviews in January 2020 with five teachers and organizers, each of whom participated in different strikes: West Virginia (statewide); Chicago, Illinois; and Denver, Colorado.

The quantitative portion of this study serves as a precise estimate of the relationship between measurable strike characteristics and strike-wage outcomes, a test of the results against past strike studies, and an assessment of the relevance of power resources available to unions. To address the shortcomings of quantitative analysis, semi-structured interviews are used to evaluate the unobserved variables of strike strategy, public employer opposition, and the impact of community support on the strike-wage outcome. In order to apply theory practically, this study aims to motivate workers to become more involved in organizing strikes in their workplace by testing a universal strike outcome: a wage increase. Card & Olson provide justification for using wage increases as a direct, albeit limited, measure of success.

4.1 Data

The process of data collection, refining, and imputing proved to be one of the most challenging steps of this thesis. The lack of available data poses a significant barrier to enabling researchers to use quantitative methods to better understand strikes. Franzosi (1989) underscores the limited publicly available strike data and suggests that researchers should aim to create and publish micro-data on strikes to fill the gap that government data fails to address. Therefore, a focus was placed on: defining suitable variables, gathering data from local and national news sources (many of which block or charge users for access), alternative news sources, union websites, and periodical databases; and then verifying data against at least two media sources to ensure accuracy. Overall, I compiled a wealth of data that could be used to further expand this study. In the following paragraphs, I describe my data process in detail.

4.2 Quantitative Data Sources

The data collection process began by locating publicly available, cross-sectional instances of education work stoppages from the BLS database between 1989 and 2019. There were 159 US strikes recorded by BLS, including five duplicate records, which leaves 154 unique strikes. Duplicate records were identified and excluded from the analysis by comparing the union involved and the strike dates reported. The next step included imputing data on wage increases or decreases following the strike. This study refines the location and time frame of the analysis to US work stoppages after the year 2008. This is justified methodologically (see Ley & Wines, 1985) because the education sector has consistently declined in revenue following the 2008 financial crash, whereas it consistently rose before 2008 (Chingos & Blagg, 2020). Selecting post-2008 strikes helps to improve the external validity of the results of this paper because it better matches current educational funding conditions. I then further refined the data to strikes involving Kindergarten through to 12th-grade (K-12) employers, because alternative education employers and strikes face significantly different conditions to those in the K-12 sector. I expanded the work stoppage data from BLS using the Federal Mediation Conciliation Services (FMCS) strike database, because BLS only includes strikes with over 1,000 participants.¹

4.3 Independent Variables

Cross-sectional work stoppage data from BLS and FMCS provide the following relevant quantitative variables: date of the strike, number of workers involved, and strike duration. I supplemented the work stoppage data by sourcing additional variables from news articles, studies on the power of American teachers' unions (Winkler, Scull and Zeehandelaar, 2012), the National Center for Education Statistics (NCES) database, and personal interviews to gather information on the proposed dependent and independent variables. After all other sources were exhausted, news articles providing further details were gathered using a Lexis Nexis search of "district name, strike and year" with a date range of no more than three months prior to the beginning of and three months following the end of the strike. The total wage settlement from the strike, the dependent variable, was largely collected in this manner, and at least two media sources, if available, were

¹ Under the Reagan administration, BLS stopped publicly reporting data on strikes with under 1,000 participants. Nonetheless, I contacted BLS to request these data and they confirmed that they have no such data.

used to confirm the authenticity of wage outcomes. Aiming to further enrich the analysis, I collected information from press sources on non-quantitative measures that I could define and then quantify, such as: demands of strikers; whether the strike included multiple worker types; union(s) involved; and employer(s) involved. These measures were motivated by my theoretical framework laid out in Section III (see Mcalevey, 2016; Burns, 2012). These measures were ultimately excluded from the regression, but some are included in descriptive statistics. The final data set consists of 40 strikes in the U.S., 34 of which have complete information on school fixed-effects (such as full-time-equivalent teachers). Although most of the data were excluded due to missing information, the sample size still surpasses the standard threshold of 30 observations to run an OLS regression.

Data collected on the power of the teacher's union, the worker-participation ratio, and the student-to-striker ratio, have several caveats that will be discussed here. The power of the teacher's union variable is collected from a study titled *How Strong are U.S Teacher Unions? A State-by-State Comparison* (2012). This study is a statewide evaluation of the strength of teacher's unions, so it may not be a wholly accurate description of the power resources available to local unions within the broader organization. Moreover, the measurement of power does not fully conform with the theoretical use of the power resources approach. This study evaluates the perceived influence of the union, state policies affecting labor relations, scope of bargaining, involvement in politics, and resources and membership. This lays the foundation for operationalizing the evaluation of institutional and associational power variables but misses communal and structural power. My theoretical model is therefore designed to address these gaps through previously discussed theory (see sections, 'Size and Degree of Disruption', and 'Strategy and Engagement'). Finally, this data source is a snapshot in time, as it was conducted in 2012. Since my strike data are time-variant, it is possible that this study does not accurately portray the power resources available at the specific time of the strike. This poses some limits but, overall, the use of this data can advance the scope of strike research, and thus merits inclusion.

The ratio of workers on strike to total full-time-equivalent (FTE) workers is not a perfect proxy for strike participation percentage. It is based on the NCES database, which only measures FTE staff in the schools. This means that part-time or near full-time employees are measured as a fraction of their full-time peers and are thus not included as individual employees in the overall

headcount, which would be a more fitting indicator of strike solidarity. This measure could create heterogeneity across districts that have a larger make-up of part-time staff, which is an omitted variable that the regression model cannot tease out. It could appear that these districts have a higher strike participation rate due to the relatively smaller FTE, when, in fact, it is simply being driven by a higher share of part-time staff, none of whom count as a full “employee”. To account for this flaw in the participation variable which, in the end, is intended to represent part of the cost that the employer will face if the strike continues, I add another variable: students divided by the number of striking workers, or student-to-striker ratio. This is a proxy for employer cost, in that it represents the number of students who are affected for each additional striking worker. The primary limitation of this variable is that it could be less of a proxy for students affected, but rather a proxy for class size. Fortunately, we can control for class size with the student-to-FTE ratio, which, in practice, is the definition of the student-to-faculty ratio. Thus, the resulting effect should be the student cost to the employer. This too is not a perfect proxy for class size, which is defined as students divided by number of classes, but it provides a school fixed effect that can help to isolate pre-existing school characteristics. These two measures are the best sources to evaluate the effect of scale of participation and employer cost—while accounting for total population—on the strike-wage outcome.

4.4 Regression Models

This study expands upon one of the few existing quantitative research studies that aims to identify which observable factors are correlated with strike success. Card and Olson (1995) use a two-fold quantitative approach: a probit regression to estimate the factors that influence the success of a strike, and an OLS regression model to estimate wage gains from the strike. They conclude that, “variables that raise (lower) the likelihood of a successful strike also raise (lower) the wage conditional on workers winning the dispute” (Card and Olson, 1995, 51). This justifies the use of wage gain as a proxy for strike success (while noting that not all strike demands are related to wages, which will be covered in the descriptive statistics subsection in Chapter V), because Card and Olson conclude that the same explanatory factors are at play. This study includes variables from their probit and OLS models. The theoretical conception of my regression analysis, which tests which observable factors influence strike-wage outcomes, primarily builds upon the adapted theory of the *War of Attrition* model in Chapter III (Theory).

In terms of the formal regression model I employ, variables from Card and Olson's model, such as the fraction of employees on strike, log of the number of workers on strike, strike participation, year, and strike duration, will be used. Based on my previously discussed amalgamated theoretical model, I add the number of striking workers, percentage of the workforce on strike, number of students in the district, the number of students as a function of total strikers, and the power of a union in each state. Thus, the first regression model specification is as follows:

(1.1)

$$\varpi_i = \alpha + \beta_1 \eta_i + \beta_2 \tau_i + \beta_3 (\eta_i / \delta_i) + \beta_4 \mu_i + \beta_5 \gamma_i + \beta_6 (s_i / \delta_i) + i$$

Where ϖ_i is a continuous variable for strike i , which represents the percentage wage increase following the strike. α is the intercept of the regression model; η_i is a numeric variable indicating the total number of striking workers measured on the day with the maximum number of strikers; and τ_i is a numeric variable that represents the strike duration measured in working days. The following variables are school(s)/location fixed-effects: δ_i is a continuous variable indicating the total number of FTE teachers in the affected striking school(s), and thus the interaction variable (η_i / δ_i) indicates the share of FTE teachers who went on strike; and μ_i is a numeric variable that represents an inverted state ranking of union strength from 0-49, with 49 being the state with the highest union strength and 0 being the state with the lowest union strength. γ_i indicates a time fixed-effects variable of the year during which strike i occurred; s_i is a numeric variable indicating the total number of students in the affected school(s) and thus the interaction variable (s_i / δ_i) indicates the student-to-striker ratio; and i is the error term.

(1.2)

$$\varpi_i = \alpha + \beta_1 \eta_i + \beta_2 \tau_i + \beta_3 (s_i / \eta_i) + \beta_4 \mu_i + \beta_5 \gamma_i + \beta_6 (s_i / \delta_i) + i$$

Where instead of using the share of FTE teachers who went on strike, this specification replaces that with the interaction variable (s_i / η_i) , which represents the student-to-striker ratio. Striking teachers are used in this interaction because this variable is a proxy for the cost as measured in the

number of students for every worker on strike, whereas FTE does not represent the full workforce and is highly dependent on part-time status. The remainder of the model is the same as (1.1).

(1.3)

$$\varpi_i = \alpha + \beta_1 s_i + \beta_2 \tau_i + \beta_3 (s_i / \eta_i) + \beta_4 \gamma_i + \beta_5 (s_i / \delta_i) + i$$

Where instead of using the total number of striking workers, due to multicollinearity, this specification replaces that with the numeric variable s_i indicating the number of students in the affected school(s) (a proxy for size) for strike i . Union strength is omitted from this model specification because it has high multicollinearity with the total number of students. The remainder of the model is the same as (1.2).

(2.1)

$$\varpi_i = \alpha + \beta_1 \eta_i + \beta_2 \tau_i + \beta_3 \mu_i + \beta_4 \gamma_i + i$$

This model specification is used on a slightly wider sample due to missing data, where percentage of FTE workers on strike and student-to-striker ratio are omitted. The regression is otherwise the same as model (1.1) and (1.2), respectively.

In order to reduce multicollinearity between variables and follow the basic assumptions of OLS regression, variables were adapted to three different regression analyses. There was a strong correlation between ‘% on strike’, ‘students’, and the ‘student to striking worker ratio’. Separate regressions were conducted for each highly correlated variable (over 80%) in order to isolate the true relationship between the explanatory variables and the strike-wage outcome. Since the final sample was relatively low in size, a fourth regression was conducted with fewer control variables but more observations to test whether the findings would still hold. Furthermore, I normalized all the non-binary variables to better assess the rank of importance that each explanatory variable has (i.e., the magnitude of their influence) on the wage outcome as measured by the absolute value of

their standardized coefficient.² These results are included in Table 2: Normalized Regression Results.

After data collection and analysis, interviews were conducted to analyze non-quantitative or immeasurable elements of what makes strikes successful. In order to gain the most accurate picture of what made a particular strike successful, my interview questions were structured so as to ask for information about what happened before, during and after the strike, and how each participant connected their perspective of the events to the strike's success. I aimed to select a geographically and characteristically diverse trio of strikes for my interviews—West Virginia (statewide); Chicago, Illinois; and Denver, Colorado—to provide a holistic set of perspectives on strikes that are different in terms of: union strength; statewide as compared to citywide; the so-called “Red4Ed” strike wave beginning in West Virginia;³ being a right-to-work state; and historical precedent of striking. This selection enables this study to display commonalities and differences between successful strike tactics in multiple diverse settings. The broader approach allows this paper to identify the specific, on-the-ground events that participants naturally observed as important to the strike. The interviews were conducted in a semi-structured fashion and are methodologically justified to fill gaps related to the inherent obstacles one faces when conducting a quantitative analysis on strike success factors.

5. Results

This chapter presents descriptive statistics and analyzes the results of the four regression models based on the hypothesis described in the theory section, and then relates the findings of the regressions to themes found in qualitative interviews.

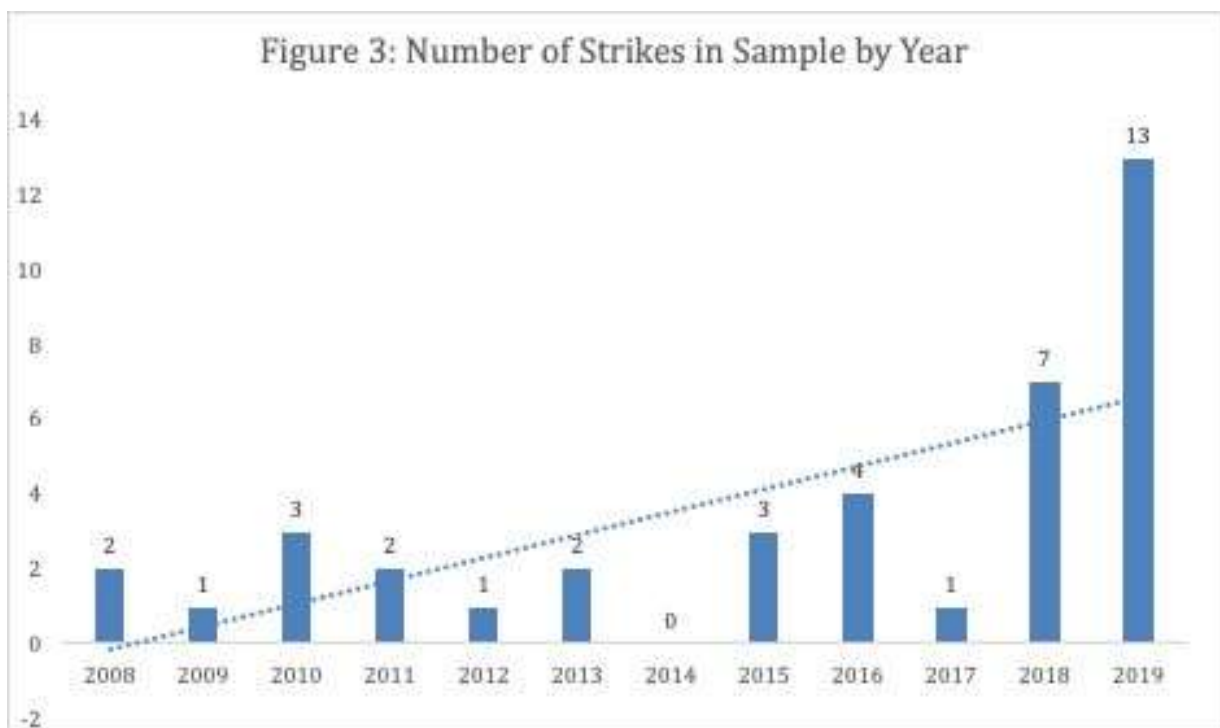
5.1 Descriptive Statistics

To begin, a brief descriptive summary of the quantitative data will illustrate the general characteristics of education strikes from 2008 to the present. I begin by detailing frequency

² My standardization approach was to subtract each value by the mean of that variable, and then divide by that variable's standard deviation.

³ A term for the education strike wave movement beginning in 2018 with Arizona, North Carolina, South Carolina, Oklahoma, West Virginia, and numerous other states and localities demanding significant reform.

and size. The data show that there were a significantly higher number of strikes in the most recent years compared to prior years (see Figure 3), with thirteen strikes in 2019, eight in 2018, and only four in 2016. The number of participants per strike is highly varied, ranging from only eleven participating workers to 123,000 at the maximum (North Carolina, 2018). The average number of strike participants in my sample from 2008-2019 was roughly 14,000 workers. This could be due to the more frequent emergence of statewide strikes, which only started in 2018. Amongst all of the sampled strikes, 20% were statewide. Additionally, eight of these strikes occurred in major metropolitan areas, which would expand the number of participants. With an understanding of the frequency and scale of strike movements in the sample, this thesis reviews statistics on participation, potential costs to the district, and wage outcomes to provide a fuller picture of education strike characteristics.



Strikes in this sample were highly inclusive of the whole workforce. In other words, they displayed high worker solidarity, with an average strike participation rate of 115% of the FTE faculty. While it should in fact be impossible for strikes to have more participating workers than existing educators in the school(s), this is likely a product of the way full-time employees are calculated in the education database from which I collected data, as mentioned in the data section in Chapter

IV. Alternatively, it may be that some workers who went on strike were not teachers. Rather, they could be paraprofessionals or other support staff.

In terms of duration, strikes lasted an average of seven working days. A handful of strikes exceeded ten days, and another handful were limited to just one day. The “student-impact-proxy,” represented by students-to-striking-worker ratio, averages seventeen students per striking worker. This variable also has a vast range, between roughly seven and forty students per striker. Finally, data on the strike-wage outcome show that, on average, these strikes achieved a 3% wage increase. Wage outcomes ranged from a pay reduction of 3.7% to an increase of 13%. There were several outliers in the wage outcome data, with Denver, Strongsville and Oklahoma each achieving increases above 10%. Accordingly, the next section details the OLS regression results.

5.2 Regression Results

Table 1: Regression Results

(1.1)-(1.3) are the primary regression models, which estimate the change in wages with all relevant controls. (2.1) uses a larger sample with fewer controls due to missing data.

	(1.1)	(1.2)	(1.3)	(2.1)
	y = % Wage Δ	y = % Wage Δ	y = % Wage Δ	y = % Wage Δ
Log of striking workers	-0.0003 (-0.04)	-0.0000 (-1.51)	---	0.0005 (0.09)
Log of students in affected school(s)	---	---	0.0104 (1.57)	---
% of FTE teachers on strike	0.0298** (2.30)	---	---	---
Student to striking worker ratio	---	-0.0023*** (-3.34)	-0.0014** (-2.15)	---
Duration (work days)	0.0021*** (2.85)	0.0019*** (2.93)	0.0019** (2.57)	0.0023*** (3.36)
Union strength rank (0=weakest; 49=strongest)	-0.0012** (-2.06)	-0.0019*** (-3.16)	---	-0.0009* (-1.91)
Year of strike	0.0010 (0.58)	0.0018 (1.31)	0.0019 (1.22)	0.0014 (1.03)
Student to faculty ratio	-0.0019 (-1.17)	0.0003 (0.21)	-0.0019 (-1.18)	---
_cons	-1.7780 (-0.56)	-3.51 (-1.27)	-3.8867 (-1.22)	-2.77 (-1.01)
N	33	33	33	40
R ²	0.46	0.57	0.41	0.34

t-statistic in parentheses

** p < 0.10, ** p < 0.05, *** p < 0.01*

Results are not normalized. Coefficients represent the impact in absolute terms on the outcome, e.g. as strike duration increases by 1 day, wages increase by 0.0021 or 0.21% in regression (1.1).

Table 2: Normalized Regression Results

(1.1)-(1.3) are the primary regression models, which estimate the change in wages with all relevant controls. (2.1) uses a larger sample with fewer controls due to missing data.

	(1.1)	(1.2)	(1.3)	(2.1)
	$y = \% \text{ Wage } \Delta$	$y = \% \text{ Wage } \Delta$	$y = \% \text{ Wage } \Delta$	$y = \% \text{ Wage } \Delta$
Striking workers	-0.0065 (-0.84)	-0.0119 (-1.70)	—	0.0005 (0.08)
Students in affected school(s)	—	—	0.0045 (0.71)	—
% of full-time-equivalent teachers on strike	0.0139** (2.23)	—	—	—
Student to striking worker ratio	—	-0.0214*** (-3.71)	-0.0123** (-2.13)	—
Duration (work days)	0.0148*** (2.94)	0.0133*** (2.98)	0.0126** (2.36)	0.0157*** (3.35)
Union strength rank (0=weakest; 49=strongest)	-0.0204** (-2.44)	-0.0260*** (-3.44)	—	-0.0118* (-1.75)
Year of strike	0.0034 (0.59)	0.0079 (1.51)	0.0095 (1.54)	0.0051 (1.02)
Student to faculty ratio	0.0016 (0.27)	-0.0045 (-0.84)	0.0014 (0.23)	—
_cons	0.0293*** (5.63)	0.0309 (6.60)	0.0323*** (5.86)	0.0210*** (6.62)
N	33	33	33	40
R ²	0.46	0.57	0.41	0.34

t-statistic in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Results are normalized with a mean of 0 and standard deviation of 1. Coefficients represent the impact in standard deviations on the outcome, e.g. as strike duration increases by 1 standard deviation, wages increase by 0.0148 or 1.48%.

In the four regression analyses outlined in the methodology section, I test the relationship between the wage outcome of the strike and the following explanatory variables (listed in descending order of their magnitude of importance, as measured by the normalized results section in Table 2): statewide union strength; student-to-striking-worker ratio; the duration of the strike in working days; percentage of FTE teachers on strike; number of workers on strike; the year of the strike; total number of students in the affected school(s); and student-to-faculty (FTE) ratio.

In the first regression (see Table 1, Regression 1.1), there is a statistically significant negative relationship between the independent variable, union strength, and the dependent variable, the strike-wage outcome. A significant positive relationship exists between the independent variables,

duration and percentage of the workforce on strike, and the strike-wage outcome. These variables explain 46% of the variation in the strike-wage outcome.

In the second regression (1.2), union strength again has a negative and significant relationship with strike-wage outcomes, which is a sign of a robust relationship with strike wages. Additionally, the newly added variable, number of students to striking workers, is negative and significant, while duration remains positively significant, which is another sign of its robustness. The second regression has more explanatory power than the first, in that it explains 57% of the variation in wage outcomes. In the third regression (1.3), the significant variables from (1.2) remain robust, excluding union strength, which was removed from this specification. The explanatory power of this specification drops from 57% to 41%. In the final regression (2.1), which contains more observations, I find that union strength and duration are again negatively and positively significant, respectively, which is another sign of robustness. The following section of this paper analyzes the quantitative results within the framework of the employed theoretical models.

5.3 Quantitative Analysis

Despite limited observations, as well as the methodological challenge of multicollinearity, which required the separation of certain explanatory variables into three regressions, a number of variables were significant. This portion of the paper analyzes in further detail statistically significant and robust variables: the duration of the strike in working days, the student-to-striker ratio, the strength of the statewide union, and the percentage of the workforce on strike.

The positively correlated significance of duration reinforces the notion that strike costs influence wage outcomes in education (Card & Olson, 1995). In contrast, the counterintuitive, negatively correlated significance of union strength has implications for the power resources approach. Furthermore, the negative and significant student-to-striker ratio variable is similarly counterintuitive. Some of the variation is explained by one of the school size proxies, the number of students, as shown by the decrease in the coefficient for student-to-striker ratio from regression (1.2) to (1.3) when the latter controls for student size. The remaining negative significance in (1.3) is explained further in paragraphs below. The likely explanation is that this ratio is not only a proxy for cost, but also a proxy for an omitted variable: strikes which have more demands relating to working conditions or class sizes, which are non-wage-related successful outcomes that may

detract from wage gains. Interviews can potentially clarify the relationship between these variables and strike-wage outcomes, since they provide context using qualitative measures of strategy, disposition of employers, and circumstances on the ground. Next, I provide a more in-depth analysis of the regression outputs as to how they relate to my theoretical model of strike-wage outcomes, which ultimately explains why some strikes are more successful than others.

The regressions provide evidence that stronger power resources available to a statewide union could be connected to a lower strike-wage outcome. Intuitively, it is puzzling as to why unions with more capabilities would gain less from strikes in education. Numerous explanations arise naturally, and others are explored further in interviews. To begin, it is possible that states with stronger unions have attained past wage gains over previous bargaining cycles, which would limit the workers' potential relative wage gains from a strike under the *War of Attrition* model. It is also possible that strikes that fall into this category are predominantly focused on other issues such as class size, which was not included as a success variable in my regression model (Chicago charter strikes, for instance). Conversely, it is possible that weak unions have not been able to attain satisfactory wage gains over time, and thus asked for greater pay to recuperate past losses. This theory would certainly make sense in the South, where many of these strikes took place. Many of these states in the Red4Ed strike waves of 2018 and 2019 have the lowest-paid teachers in the country and weak union power. Although this result contradicts the original hypothesis, there are logical explanations which could be tested in future studies. Next, I discuss a secondary explanation, which relates directly back to the ongoing debate on power resources theory.

The power of unions to act (i.e., agency) does not always mean that said agency will be employed for the greater good of workers (Ganz, 2000). At face value, the regression analysis shows evidence that the demands for which union power is leveraged may be of greater significance to the strike outcome than the sheer amount of power available (Gallas, 2016). In short, priorities matter. A closer look at the strikes in Illinois proves this point. On a national level, the Illinois teacher's union is one of the strongest unions in the country, ranking 42nd, with 49th being the highest-ranked state. It also devotes the largest sum of money to state political candidates out of all other statewide unions. Yet, Illinois still suffers under remarkably unfavorable state policies for educators (Winkler *et al.*, 2012). Conversely, some Illinois strikes led to above-average outcomes, such as in Chicago and East St. Louis, while others had dismal outcomes, with no wage gains at all.

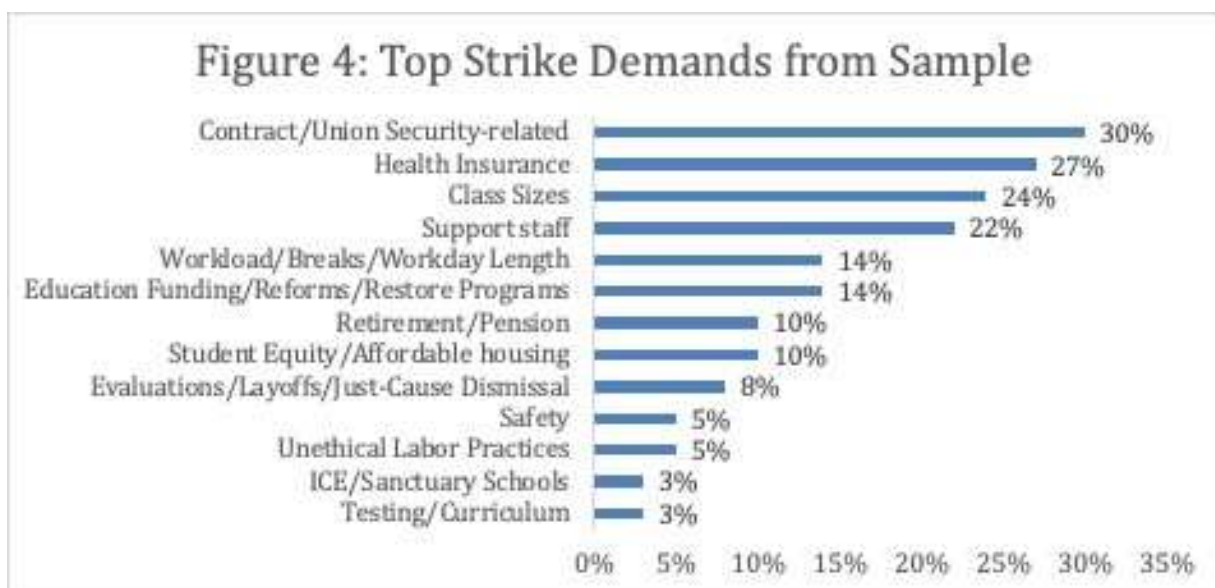
Overall, strikes in Illinois had an average wage gain of 2.95%, slightly below the average wage gain of strikes in my entire sample (see Appendix). So, in the case of Illinois, a supposedly strong union state, evidence reveals that the following statement holds value: “[the influence of power resources] needs to be located within the strategic environment in which workers find themselves” (Gallas 2016; Brinkman *et al.*, 2008 in Schmalz *et al.*, 2018).

These questions, namely how power is used, and for what exactly it is used, may prove more insightful to answer than the question of what power is available (Gallas, 2016; Ganz 2000). While my study of teacher’s union strength does not factor in the level of strike funding that goes to union locals, clearly the Illinois state union, in this case, has prioritized political spending over other union support activities (Winkler *et al.*, 2012). This provides evidence that the purposes for which union resources are used are important, and therefore more power is not necessarily related to a higher strike-wage outcome. It also illustrates the need to investigate, through interviews, how the use of power resources connects to organizing strategies used to build strikes and to the ability to impose strike costs on employers and workers. Before I move on to analyzing the interviews, in the next section, I explore the relation between my employed theory and the significance of duration, the percentage of the workforce on strike, and the student-to-striker ratio.

Both of my size and scale variables, the percentage of the workforce on strike and the student-to-striker ratio, were significant. However, the former was positive, while the latter was negative. This suggests that a higher percentage of the workforce on strike could explain a higher wage outcome (I caution that an OLS regression on cross-sectional data does not establish causality, only correlation), and the higher number of students per individual striker could explain a lower wage outcome. From an initial judgement, this appears contradictory, as both variables measure different aspects of size. However, the following two theoretical underpinnings may explain the answer: the disposition of opposition parties during a strike (Luders, 2012; Mcalavey, 2016; Card & Olson 1995), and the signal to an employer of greater strike participation, which is perceived as higher strike delay cost (Card & Olson 1995).

Firstly, regarding the student-to-striker ratio, the connection between high student-to-striker ratios and lower wage gains could be related to how the issue of overcrowding in the schools affects strikers’ wage demands. Secondly, it could also be explained by the ways in which different strike demands impact an employer’s willingness to concede (Card & Olson, 1995; Luders, 2012).

Regarding the former, data collected on the demands of strikers shows evidence that reducing class sizes was the second most common demand (see Figure 4). It is possible that workers in some strikes preferred to reduce class sizes rather than increase wages as a strike outcome, and that this could explain the negative significant relationship between the wage outcome and the student-to-striker ratio. Additionally, a reduction in class sizes could have been assessed by the employer as a less costly strike outcome rather than wage increases; however, this study does not weigh these concession costs against one another. Nonetheless, according to my theoretical model, a less costly concession would require workers to inflict fewer disruption costs on employers in order to succeed (Card & Olson 1995; Luders, 5-6, 2012; Mcalevey, loc 1195, 2016). If concession costs are lower, employers are more likely to concede, holding constant the level of strike disruption costs. If it is easier and more desirable to attain lower class sizes than salary increases, this could explain why districts with lower wage gains have higher student-to-striker ratios. I control for the student-to-faculty ratio; however, as previously mentioned, it is not a perfect proxy for class size. Overall, the negative significance of the student-to-striker ratio may suggest that demands, and the associated concession costs, are related to wage outcomes from strikes. This also reinforces the explanatory value of the *War of Attrition* model in education sector strikes. Further exploration of Card & Olson's theoretical model may explain the connection between concession costs and the positive significance of worker participation in the strike.



Turning now to the other size variable, many theorists speculate that greater levels of worker participation in direct actions and strikes is key to inflicting the disruption costs necessary to achieve concessions from employers (Luders, 2012; Mcalevey, 2016; Card & Olson, 1995; Wilmers, 2017). A closer examination of Card and Olson's methodology in evaluating strike success articulates the importance of the cost of one additional day of striking to both labor and employer parties to the strike. The significant positive relationship between participation and wage outcomes provides evidence that employees face a lower cost, and employers face a higher cost of strike continuation due to the strength of worker solidarity. Employers are more likely to concede if they perceive higher strike continuation costs as compared to the total value of winning the strike (Card & Olson, 1995). Therefore, higher striker participation could increase employer strike costs, and thus explain higher wage outcomes. It is also possible that higher levels of participation in strikes creates more public pressure on officials by garnering more news coverage, and thus more public scrutiny of the issues motivating the strike. This is also supported by the notion that disruption costs can include public opinion and must be equal to or exceed concession costs in order for labor to attain said concession (McAlevey, 2016; Luders, 2012; Johnston, 1994). Perhaps obviously, the significance of worker participation provides quantitatively backed evidence that solidarity between educators has a relationship with strike-wage outcomes. Another important and statistically significant component of disruption costs, duration, is discussed next.

The length of a strike is a sign of the power positions of both the employer and worker parties involved. Card and Olson (1995) theoretically support this claim in their cost function of a strike. A shorter strike, settled in favor of the workers, is a sign of higher employer delay costs, while longer strikes, settled in favor of workers, are a sign of lower employer delay costs. Why, then, are longer strikes associated with higher wage gains according to my data (especially, if one acknowledges that the same factors that lead to strike success also led to higher wage outcomes; Card & Olson, 1995)? A closer look at the data shows that the average strike duration was approximately seven days. Therefore, by investigating strikes which lasted longer than average and achieved an above-average wage gain, this should provide insight into the contradiction between the results from Card & Olson and the results of this study.

The West Virginia strike lasted thirteen days and achieved a wage gain of 5%, which is well above the 3% average. This suggests that the length of the strike, in relation to wage outcomes, may have

resulted from limited *initial* disruption costs for employers, together with increasing communal support which allowed workers to escalate employer costs over time (B. Bates, Phone Interview, January 20th, 2020). Jimenez-Martin's conclusions could also help to analyze this result. In his study, strike duration has a strong parabolic relationship with wage outcomes, in that wages rise with each day up to the 20th day, at which point the wage outcomes begins to fall (Jimenez-Martin, 2006). His study focuses specifically on analyzing the duration of strikes and has significantly more data. Since my sample data is fairly limited with respect to its representation of longer strikes, it is possible that the result—that duration is positive and significant—is only representative of relatively short strikes (i.e., decreasing the external validity of this study to longer strikes). Furthermore, the East St. Louis strike, which lasted forty-three days, is a prominent outlier in the duration data, and could impact or skew the result. Further effort to expand the data sample could resolve this external validity barrier and align the results with previous literature, especially if the expanded analysis uses a non-linear functional form to measure duration, which would test for the parabolic relationship with wage outcomes. It is also possible that the education sector has different characteristics that impact the strike duration curve in a unique way as compared to the circumstances present in the Jimenez-Martin study, which focuses on manufacturing industries in Spain.

5.4 Qualitative Analysis

5.4.1 West Virginia

West Virginia has a long history of labor traditions, from the bloodiest labor struggle in US history, the coal mines of Blair Mountain, to today's modern struggles for public education. The long history of labor struggles is hard to capture in the quantitative data, yet some key points from the results support my hypothesis. Of the strikes measured, West Virginia had the seventh highest wage gain, had relatively high union power (placing 37th among the 52 statewide education unions), and was one of the longest strikes in the data. According to my theoretical model, the long length of the strike and the weakness of the union should negatively impact the wage result. It is possible that the length of the strike and the weakness of the union did impact wage gain, but the unobserved quantitative variable, which will be explored further qualitatively, was able to overcome these challenges and still produce above-average strike-wage success. What is not

shown by the quantitative data is how the broader historical impact of community networks (Nowak, 2018), and the use of solidarity-building tactics impacted the ability of strikers to impose and maintain greater strike disruption costs on the employer (Mcalevey, 2016). Results from interviews tend to support my hypothesis: that strategy impacts strike disruption costs for the employer and workers, and that this influences the strike outcome. The story of the West Virginia strike begins a year before the formal strike declaration, when a decision was made to create a secretive Facebook group and conduct field research on the issues that matter to teachers. From this point, leaders of the strike began engaging with members on a mass scale through online and in-person outreach, and events. They began hosting “Red for Ed” days whereby workers would collectively wear their red teacher’s union shirts to school or would show up at a popular basketball game in Charleston and picket traffic lines to the game (B. Bates, Phone Interview, January 20th, 2020). The Facebook group, and strategic choices and actions within it, were identified as the most important factor leading up to the strike. The use of collective communication and escalating action fits the definition of a structure test (Mcalevey, 2016). The use of such a tactic in West Virginia provides evidence that the above-average strike-wage outcome in the state was related to the impact of structure tests on building greater solidarity to maintain and increase disruption costs on the employer (Mcalevey 2016; Ganz, 2000). My interviewee notes that the collective action of the Facebook group and Red for Ed events had an impact on solidarity:

“I remember, personally, I had a lot of thoughts that my county or my school is the only county/school that wants to do this, we’re going to look so dumb when we’re going to go on strike. And seeing the pictures on Facebook [of collective actions] everyday really reiterated the point that this isn’t just us in my school, or me and a few radicals, or whatever the case is: it’s that people everywhere are feeling the same way.”

The account here suggests that the Facebook group, and the structure test actions shared in it, acted as a conduit to build further solidarity between potential strikers through shared validation from peers and outside observers (Mcalevey, 2016). It is noted that this solidarity was crucial to building a statewide strike and achieving the demands they presented to the Republican legislature (B. Bates, Phone Interview, January 20th, 2020). The use of structure tests and Facebook shows evidence that these tactics can build the solidarity necessary to impose and maintain high enough

disruption costs to achieve an above-average strike-wage outcome. Under my theoretical model, a long strike signals that the employer is not subject to high enough strike costs to concede. This shows evidence that, in the long 13-day strike in West Virginia, structure tests could have played a key role in reaching the disruption costs necessary to win above-average gains (Mcalevey, 2016; Ganz, 2000). While the use of structure tests, aided by the Facebook group, was a hugely influential strategy in determining the strike's outcome, the focus on community interests is another tactic connected to the strike's outcome.

Another key factor that my interviewee connected to the strike's outcome was the support of community members. As mentioned previously, strikers began outreach to members of the community well before the strike. However, the natural networks of people in West Virginia played a key role in preventing opposition (B. Bates, Phone Interview, January 20th, 2020). Mr. Bates explains, "I think it [community support] was central to the outcome of the strike. There were never counter-demonstrations.... The fact that Republicans had no one they could turn to as a parental ally during the walkouts was key" (Ibid.). This account suggests that theories on the important role of the community in labor struggle (Mcalevey, 2016; Nowak, 2018) and communal power (Schmalz *et al.*, 2018) are connected to strike outcomes in education. In this case, the utilization of communal allies allows educators to utilize discursive control and prevent negative public opinion (Schmalz *et al.*, 2018), which is connected to public officials' (the employer) recognition of disruption costs imposed by the action (Luders, Ch. 1 & 2, 2012). Essentially, the support of communal allies shows evidence that the keys to winning are in the community, because it maintains the maximum disruption costs of workers going on strike by preventing workers, and the public from being dissuaded from supporting the striker's cause. Furthermore, it also shows evidence that public sector employers—in this case, the State of West Virginia Legislature and Governor Jim Justice—are motivated to act in the strikers' favor because negative public opinion imposed a significant disruption cost to force a higher concession (Luders, 2012; Mcalevey, 2016). While community power can protect the ability of workers to utilize structural power and impose disruption costs, interviews show that solidarity and commitment to radical action amongst the workers is connected to their ability to escalate disruption costs to the state level and improve the strike outcome.

The role of empowered rank-and-file leadership is a key element of the West Virginia strike that enabled the strike to expand and maintain high disruption costs. For example, in preparation for the strike, the idea of rolling walkouts that changed location by the day was proposed. At this point, Mr. Bates and a group of educators made the argument on the Facebook page that a rolling walkout would have less leverage than an indefinite statewide strike. They began speaking to other educators in person in order to build support for their agenda. Eventually, the “decision was made by union leaders to call for a statewide strike instead of the rolling walkouts” (B. Bates, Phone Interview, January 20th, 2020). In this example, Mcalevey’s theory of making workers the central decision makers, empowered by a group of supportive peers, allowed the group to build support for a more disruptive statewide strike against a less than motivated union leadership (Ch. 2, 2016). The use of Mcalevey’s theory to overcome union bureaucracy (B. Bates, Phone Interview, January 20th, 2020) shows too that the PRA should incorporate the role of oppositional union leadership in its concept of associational power. In this case, however, the organization of educators as a cohesive class interest was the main source of workplace power that built the strike, and ultimately overcame the obstacle of what PRA authors would classify as associational power or the formal union organization. According to the interviewee, the national union was in private conversations with the state union chair to get a deal done and end the strike (Ibid.), while simultaneously paying lip service to the militant educators by calling publicly for a “fight”. West Virginia shows here that militant worker leadership, with a following among their peers, can overcome the lethargic, associational-empowered union bureaucracy to build disruption costs and achieve higher concession costs. Clearly, Gallas’ critique of the power resources approach holds merit here: that the question of what union resources are used for is key (2016). The case of West Virginia shows that associational power can have two sides with competing interests: one more aligned with the bosses and getting a deal done, and the other a true manifestation of education workers’ class interests. This case also shows that Mcalevey’s tactics were crucial to overcoming the obstacle of misaligned associational power, in a way that created a higher disruption cost for employers and resulted in an above-average strike-wage outcome. Perhaps the lesson of West Virginia is that the power and outcome of a strike depend upon a union of class interests between workers and the community.

5.4.2 Chicago

Strikes in Chicago are challenging to analyze quantitatively because there have been three different strikes by the same union, and four smaller charter school strikes in the same metropolitan area. The number of observations of Chicago-based strikes in the data may skew the strike-wage outcome relationship toward conditions that are prevalent there. However, I control for location-based fixed effects to account for this obstacle. To better uncover how conditions in Chicago led to an above-average strike-wage outcome, I conducted an interview with an observer and committee member of the Chicago Teachers Union Latinx caucus. Before I examine the data from the interview, a brief overview of the quantitative data is analyzed.

Chicago public school teachers went on strike in 2012, 2016 and 2019, with charter school strikes in 2018 and 2019. The power of the statewide union was one of the highest in the sample at a rank of 42nd and may account for the above-average strike result that the Chicago public school teachers attained in 2012 (Schmalz *et al.*, 2018). However, all the other strike-wage outcomes in Chicago were below or around the average of 3%, which is puzzling as to why there would be a lower result elsewhere if power resources are strong. It is possible that either the data on statewide union power was not updated to cover any major power shifts that may have taken place in the last five years, or that power is unequal across unions. This may account for the gap, yet the quantitative data also suggest that weaker statewide unions correlate with higher strike-wage results. This conflicts with Schmalz *et al.* theories on power resources and offers few answers to explain the difference in strike outcomes between 2012 and 2019 (2018). The other significant measure from my regression analysis that is worth examining is participation. Stronger participation of workers in the strike correlates with higher wage gains, but in the 2012 strike, levels of worker participation were lower than in the 2019 strike, with a higher wage gain in the former. Since it is unclear how the strength of the statewide union and participation in the strike are connected to the strike-wage outcome in a diverse number of strikes, interviews may better explain the phenomenon.

A few key differences between the 2012 and 2019 strikes are apparent in my interview with a member of the Chicago Public Schools Latinx caucus. Firstly, the level of community support is believed to be significantly lower in the 2019 strike than in 2012 (Lopez, E. Phone Interview. February 7th, 2020). Secondly, the collaboration between strikers and the community was perceived as hierarchical in 2019, whereas in 2012, collaboration was perceived as democratic

(Ibid.). The difference in community involvement between the two strikes provides additional support for Mcalevey's theory that the community is a crucial partner in winning labor-based initiatives (2016). In 2012, the Chicago teacher's union conducted surveys of parents' interests in the public school system, researched these issues, and incorporated them into demands (Lopez, E. Phone Interview. February 7th, 2020). Conversely, in 2019, either community organizations felt disconnected from the strike and surveys, or the feedback given to strikers from community members was mostly ignored (Ibid). The lack of inclusion was noted to have had a large impact on the turnout at strike events and picket lines (Ibid). Poor turnout could have been a signal to employers that the capacity of strikers to impose disruption costs was diminishing, and that a costly settlement (concession cost) could be avoided through waiting out the strikers (Card & Olson, 1995). Furthermore, parents felt disappointed, and toward the end of the strike, complaints were made about being unable to afford more days on strike. The sentiment of parents was exacerbated by the media, which successfully framed the strike as an issue of salary (Lopez, E. Phone Interview. February 7th, 2020). Parent sentiment and the media narrative are evidence that opposition parties can shift disruption costs of the strike from the employer towards the workers (Luders, 2012). Higher disruption costs for workers during the strike, according to the *War of Attrition* model, could increase their likelihood to concede or return to work, thereby limiting the strike-wage outcome (Card & Olson, 1995). In the case of the 2019 Chicago strike, a lack of focus on including parents and the wider community in strike decisions may have allowed a hostile media to successfully argue to education stakeholders that the strike was costly to their interests and narrowly served the interest of teachers. This shift in parent support provides further evidence that parents and the community are in fact centered at the point of production and can serve as a constituency that can impose strike costs on either strike party, labor or the employer.

5.4.3 *Denver*

The strike in Denver had a remarkable wage result that is a testament to the strength of Mcalevey's tactics and their influence on work stoppage disruption and concession costs. Among these tactics were framing the strike around public interests, outreach and mobilization of the education community, and agitation of workers around respect and dignity. This section outlines the essential tactics and strategies that could be connected to variables which were significant in my quantitative

analysis. Firstly, a brief overview of the conditions and the numbers should be given in order to provide better context to analyze my theoretical model's relevance to the research question.

To begin, Denver is in the state of Colorado which, in terms of union strength, placed 25th among 51 statewide education unions (Winkler *et al.*, 2012). The weakness of the state union is influenced by a legal limit that confines bargaining strictly to wage increases (A. Nutter, Phone Interview, February 7th, 2020). The state itself also devotes one of the lowest percentages of its total education budget to teachers' salaries (Winkler *et al.*, 2012). During the strike, educators were predominantly focused on potential wage increases. The legally prescribed focus on wages, in combination with low union power, may explain why Denver had the second highest wage result of strikes sampled, with an 11.7% wage gain (BLS, 2020; A. Nutter, Phone Interview, February 7th, 2020). The potential high reward of a winning strike by educators, and the relatively low concession costs required (as a percentage of total budget) from the employer, fits the theoretical model: that strikes are settled in favor of those parties who have higher potential gain in comparison to the cost of continuing the strike (McAlevey, 2016; Luders, 2012; Card & Olson, 1995). In this case, the teachers had far more to gain in comparison to their costs of continuing the strike, while the administration had limited potential gains from the strike in comparison to its daily cost of waiting out the strike. Quantitative data and data collected in interviews support theorists' understanding of strikes, but also suggest that the power resources available, strategies aimed at building solidarity among workers and the community, and pressure on the opposition, play a significant role in an above-average strike outcome.

The frame of messaging and communal support is also connected to the above-average strike-wage outcome achieved in the Denver strike. In my interview, one of the most influential motivators for educators to strike was an information leak that exposed large-scale wasteful spending by the education employer, and a threat to report employees on visas to Immigration and Customs Enforcement (A. Nutter, Phone Interview, February 7th, 2020). The leaked information was one step too far in a district where educators claim that the district is trying to privatize education, close schools, and legislate harmful incentive pay for educators (Greene, 2020). Educators successfully framed the strike publicly as a battle between a coercive, corrupt and anti-public-school employer, and educators who work three jobs just so they can afford to keep teaching underserved students. Furthermore, this framing motivated parents to put pressure on employers in favor of educators'

positions (Ibid.). The successful framing of the Denver strike, and its high wage outcome, support Johnston's finding that, for the public sector unions to win, community concerns should be addressed (1994). It also adds nuance to Johnston by showing evidence that communal framing works in strikes because a supportive community is capable of imposing costs on employers (Luders, 2012; Mcalevey, 2016; Card & Olson, 1995). When asked what the most important factor in the strike was, Ms. Nutter responded, "we won because we had badass people in the community, who were willing to dig deep and do the hard work to uncover all the unethical spending and waste that was happening" (A. Nutter, Phone Interview, February 7th, 2020, Minute 51). In this case, the unity of educators and community members in exposing the district's corruption could have been perceived as an unbearable disruption cost to the employer and forced an above-average wage gain (Card & Olson, 1995; Luders, 2012). This was certainly an accurate perception, as several anti-public education school board members were voted out of their seats following the strike, which threatened the education employers' power in the district (A. Nutter, Phone Interview, February 7th, 2020). The Denver strike shows evidence that framing the issues of the strike around communal concerns inspired public support for the striking workers, and imposed disruption costs on the employer that are connected to the above-average strike-wage outcome.

6. Conclusion

The intention of this paper is to ambitiously explore the ways in which the modern labor movement can rekindle its capacity to effectively overcome capital's power. To explore this topic, my research asks the question: why do some education strikes more effectively extract wage concessions from employers than others? By using regression analysis of striker participation, total size, year of the strike, the student-to-striker ratio, and the power resources available, I can accurately measure their influence on strike-wage outcomes. By conducting interviews, I was able to explore the impact of strategy, and the formal union and community involvement, on the strike-wage outcome. This paper provides contextual understanding of what makes strikes most successful. Based on Mcalevey (2016), Luders (2012), Schmalz *et al.* (2018), Card & Olson (1995), Ganz (2000) and Johnston (1994), I hypothesized that higher strike-wage outcomes are related to the ability of labor parties to impose higher disruption costs on employers through higher levels of worker participation in the strike, power available to unions, and communal pressure on

the employer. This thesis shows a statistically significant relationship between strike participation, power available to unions, and the wage outcome of the strike. It also provides evidence that communal pressure, the use of structure tests, and issue framing are key to an above-average strike-wage outcome. This adds explanatory power to Mcalevey and Luders' arguments that a high strike-wage outcome requires high disruption costs.

To date, no labor scholars have tested the relevance of social movement theories, power resources available to unions, and past quantitative theories of strike success in the modern public sector by using a mixed methodology. Through regression analysis, I confirm past findings that participation of the workforce (Card & Olson, 1995) and the duration of a strike (Jimenez-Martin, 2006) are significantly related to the wage outcome. Although there is a significant relationship between the students-to-striking-worker ratio and the strike-wage outcome, one cannot assess the effects of the individual components alone. It is possible that this is explained by the prevalence of class sizes as a strike demand (see analysis section). I also contribute new findings that add to the discussion on the relevance of how power is used in labor struggle. I find that the amount of power resources available to unions has a significant negative relationship with the strike-wage outcome. It is possible that the "power resources" relationship to strike-wage outcomes can be explained by the sample including predominantly states with weak unions. However, contrary to the argument of Schmalz et al. (2018), the regression findings support the idea that the amount of resources may be of secondary importance to *how* power is used to influence strike-wage outcomes (Gallas, 2016; Ganz, 2000). The qualitative findings support and build upon the conclusion drawn from the regression analysis.

In phone interviews conducted with strike participants in Chicago, Denver and West Virginia, I find evidence that the role of workers' leaders and community involvement is connected to higher strike-wage outcomes. In Chicago, the noted degradation of community involvement between 2012 and 2019 shows evidence that stronger community involvement in 2012 could explain its higher strike-wage outcome. West Virginia, the state that kicked off the streak of statewide strikes, provides evidence that the creative use of power by workers was more impactful on the strike-wage outcome than the involvement of the relatively well-resourced statewide union (Gallas, 2016; Ganz, 2000). Furthermore, the popular leadership's decisive acts of including the community and creatively using structure tests were attributed to the above-average wage success of the strike.

Thus, empowered and popular leadership, the use of structure tests, and communal support for strikes could impact the strike-wage outcome by imposing additional disruption costs on the employer and limiting strike continuation costs for striking workers (Mcalevey, 2016; Luders 2012; Card & Olson, 2016; Johnston, 1994). Likewise, Denver provides support that framing the issues of the strike around the common good (Johnston, 1994) was key to pushing parents and students to support the teachers and win the strike. This adds further evidence that, because the community, parents and students are part of the education-production process, they are a central and powerful force to impose disruption costs on employers and win larger wage increases (Mcalevey, 2016). Community support was consistently connected to strike success by all interviewees. Data and analysis from interviews thus provide strong evidence that community support is key to high strike-wage outcomes. I also find that the use of structure tests, and workers as empowered popular leaders, could also be connected to higher strike-wage outcomes. Overall, this paper provides strong evidence that: past strike success variables are still relevant to today's strikes, the power resources available are less relevant to strike-wage outcomes than the strategic use of resources, and communal support for educators can be a decisive factor in strike success. Overall, results show that David can indeed beat Goliath.

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Appendix A: Strike Data

Company Name	striking_workers	percent_on_strike	duration_workin	Duration_sq	Flag	Statewide	year	students	student_to_striking_wor	FTE employees	student_to_fac	union strength as measured by sit	wage_increas
North Carolina State Legislature	123000	1.237985003	1	1	1	2018	1,553,513	12,630,18699	99355	15,63598208	10	6.50%	
North Carolina State Legislature	92700	0.933017966	1	1	1	2019	1,553,513	16,75850054	99355	15,63598208	10	0.00%	
Arizona State Legislature	81000	1.68947105	6	36	1	2018	1,110,851	13,714,20988	47944	23,16976055	0	6.67%	
South Carolina State Legislature	18900	0.376216733	1	1	1	2019	777507	41,13793651	50237	15,47678006	1	0.00%	
Oklahoma State Legislature	45000	1.060020729	9	81	1	2018	695092	15,44648889	42452	16,37359842	7	13.00%	
Kentucky State Legislature	26000	0.620495442	10	100	1	2018	680978	26,19146154	41902	16,2516825	22	0.00%	
Kentucky State Legislature	16500	0.396162474	6	36	1	2019	680978	41,02277108	41902	16,2516825	22	0.90%	
Los Angeles Unified School District	34000	1.241915677	7	49	0	2019	621414	18,27688235	27377.06	22,69834672	44	3.00%	
Chicago Public Schools	26500	1.179893721	7	49	0	2012	395948	14,94143396	22459.65	17,62930411	42	4.40%	
Chicago Public Schools	32000	1.74721313	11	121	0	2019	373700	11,678125	18031	20,72541734	42	3.20%	
West Virginia Legislature	35000	1.77990236	13	169	1	2018	272266	7,779028571	19664	13,84591131	37	5.00%	
Denver Public Schools	3900	0.641297592	4	16	0	2019	91822	23,54410256	6081.42	15,09877627	15	11.70%	
Seattle School District	5000	1.643352966	5	25	0	2015	53317	10,6634	3042.56	17,52373002	40	3.17%	
Capistrano Unified School District	1800	0.941619586	3	9	0	2019	53192	29,55111111	1911.6	27,825905	44	-3.70%	
Oakland Unified School District	2300	0.985432734	7	49	0	2019	50231	21,83956522	2334	21,52142245	44	2.80%	
Sacramento City Unified School District	1900	0.929095355	1	1	0	2019	46595	24,52368421	2045	22,78484108	44	0.00%	
Oakland Unified School District	2500	1.137915339	1	1	0	2010	46586	18,6344	2197	21,20436959	44	0.00%	
Jersey City School District	3800	1.633705933	1	1	0	2018	29634	7,798421053	2326	12,74032674	43	4.13%	
Tacoma School District	2400	1.499063086	7	49	0	2018	29059	12,10791667	1601	18,15053092	40	4.80%	
City of Tacoma	1900	1.178141141	8	64	0	2011	28540	15,02105263	1612.71	17,6962009	40	0.00%	
Kent Public School District	1900	1.328392645	12	144	0	2009	27444	14,44421053	1430.3	19,18758302	40	2.18%	
Kennewick School District	1800	1.83728557	4	16	0	2019	18541	10,30055556	979.47	18,92962521	40	3.65%	
Pasco School District	1100	1.122804152	9	81	0	2015	17407	15,82454545	979.69	17,76786535	40	4.35%	
Bellevue School District	1200	1.27064803	9	81	0	2008	17249	14,37416667	944.4	18,26450657	40	1.67%	
North Penn School District	1100	1.185574788	6	36	0	2010	12698	11,54363636	927.82	13,68584424	46	0.00%	
Consolidated School District 158	600	1.115656378	4	16	0	2008	8617	14,36166667	537.8	16,02268501	42	5.25%	
Strongsville City Schools	400	0.986509483	40	1600	0	2013	6179	15,4475	405.47	15,23910524	42	10.30%	
McHenry Community High Schools Dist. 156	155	0.498392283	9	81	0	2016	6086	39,26451613	311	19,56913183	42	0.00%	
East St. Louis School District 189	211	1.543525969	23	529	0	2016	2318	10,98578199	136.7	16,9588398	42	5.12%	
Prospect Heights School District 23	183	1.016666667	11	121	0	2019	2200	12,02185792	180	12,22222222	42	2.00%	
Illini Bluffs USD #327	169	1.647173489	9	81	0	2015	1587	9,390532544	102.6	15,46783626	42	3.56%	
PRAIRIE GROVE SCHOOL DISTRICT #46	60	1.090909091	8	64	0	2011	959	15,98333333	55	17,43636364	42	0.00%	
Minooka Community High School District	130	1.107738998	1	1	0	2013	758	10,38356164	65.9	11,50227618	42	1.83%	
Mexican American Opportunity Foundation	100	100	6	36	0	2016					42	0.00%	
Rockford School Dist. #205	178	178	4	16	0	2017					42	0.00%	
Asian Human Services (Passages Charter School)/(Chicago Teacher	45	45	5	25	0	2019					42	2.00%	
Mendota Elementary Dist #289/(NEA/NEA Region 44	85	85	9	81	0	2019					42	4.17%	
LATINO YOUTH HIGH SCHOOL/(Chicago Teachers Union Local 1	11	0.55	2	4	0	2019			20		42	3.25%	
Aero Charter Schools/(Chicago Teachers Union - Charter Division	565	565	4	16	0	2018	7500	13,27433628			42	2.00%	

Appendix B: Interviewee List

- B. Bates, Phone Interview, January 20th, 2020
- A. Nutter, Phone Interview, February 7th, 2020
- E. Lopez, Phone Interview. February 7th, 2020