

The Elusive Union Safety Effect: Toward a New Empirical Research Agenda

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Abstract

Although unions engage in numerous activities designed to promote workers' safety and health, surprisingly few social scientific studies have confirmed the existence of a "union safety effect." Much extant literature, I argue, is fraught with empirical biases that may mask unions' true impact. I suggest several possible solutions. First, researchers should devote more effort to understanding the empirical biases that confound empirical analysis. Second, when comparing union and nonunion firms, researchers should try to compare groups that are relatively homogenous and obtain as much information as possible about the study subjects. Finally, when implementing new safety- or health-related programs, unions should bring credibly impartial social scientists in on the ground floor to assist with programmatic design, testing, and long-term evaluation. Greater use of such techniques will help unions target their resources more effectively, improve organized labor's competitive advantage, and convince skeptics of unions' unique and important role in protecting American workers.

Introduction

The U.S. labor movement is at a critical crossroads. On one hand, private-sector union membership has continued to decline in recent decades, and as of this writing one of the last bastions of trade unionism—the U.S. auto industry—is teetering on the brink of extinction. As the recession spreads and deepens, the ranks of the unemployed are likely to swell, further worsening an already difficult environment for union organizing. Yet the inauguration of President Barack Obama may herald the arrival of a new, more labor-friendly environment in which some entrenched obstacles to organized labor may finally be overcome. Many of the same economic forces that are pushing labor issues to the forefront of the political agenda are also encouraging policy-makers to reconsider the design of the U.S. health care system, including the delivery system for treatment of occupational injuries.

Given the confluence of momentous challenges, this is a particularly opportune time for organized labor to evaluate its role in the promotion of occupational safety and health (OSH). In the early 20th century, the grave risks borne by workers in hazardous industries helped to spur the growth of unions in many high-hazard industries, such as mining and steel. Unions also were instrumental in the establishment of the Occupational Safety and Health Administration (OSHA) and the Mining Safety and Health Administration (MSHA), the federal agencies that for nearly four decades have been charged with protecting the American worker from workplace hazards (Graebner 1976, Mendeloff 1980, Schurman et al. 1998). Yet as unions' political influence has declined, their role in protecting the American worker from workplace hazards has become harder to define. From a research standpoint, many important questions about the relationship between union membership and OSH remain unanswered.

In an effort to further empirical research in this important area, I will examine, in turn, three interrelated questions:

1. What do unions do in the safety and health arena?
2. What does extant literature say about union's indirect and direct impact on OSH, and what challenges have limited the utility of past research?

3. How might unions demonstrate their effectiveness to a skeptical public?

In answer to the first question, I will suggest that unions can play numerous important roles: informing workers about workplace hazards, affecting the OSH-related behavior of union members, changing the mix of workers at unionized firms, directly inducing employers to reduce on-the-job hazards, increasing the stringency of regulatory enforcement, and forming new collaborations to develop and test OSH-related innovations.

Yet existing empirical literature on unions' impact is mixed. On one hand, it suggests that the presence of a union does change labor market conditions, and institutional features of the workplace, in ways that can in turn affect safety and health. Yet on the other hand, there is little direct empirical evidence that unionism lowers occupational hazards. In most real-world settings, I suggest, a number of confounding statistical biases are likely to obscure unions' true impact. These methodological hurdles may partly explain why prior literature provides, at best, only equivocal support for the claim that unionism improves OSH.

I propose several new and potentially fruitful approaches to examining the union safety effect. One way for researchers to make more credible comparisons is to learn more about the biases that afflict such comparisons and, when comparing union and nonunion firms, to restrict the sample to relatively homogenous subjects and to expand the scope of the data analyzed. An even more promising approach may be for social scientists to confine their attention to unionized environments and rigorously analyze union-sponsored programs or innovations that are designed to improve OSH outcomes. By directly collaborating with unions before new programs are implemented, academic collaborators can help facilitate rigorous program evaluation and disseminate important findings among a wider audience.

The remainder of the paper proceeds in four sections. Drawing on prior literature, I describe the important roles that unions can play in the OSH arena. I then discuss the empirical evidence on the union safety effect and describe the empirical biases that complicate the task of evaluating unions' impact. After next describing several ways in which unions, in collaboration with academic social scientists, can mitigate these biases, I summarize the main conclusions.

What Unions Do in the Occupational Safety and Health Arena

In their seminal book *What Do Unions Do?* Freeman and Medoff (1984) describe the impact of unions on such critical economic outcomes as unemployment, wages, inequality, worker turnover, and corporate productivity. Although the authors do not detail unions' role in promoting workplace safety and health, in the nearly four decades since the creation of MSHA and OSHA, other observers have identified numerous ways in which unions intervene—whether directly or indirectly—in the OSH arena. My goal in this section is to describe the scope of unions' activities in some detail before I take up the question of efficacy in the following section.

A few scholars have speculated that unions' influence conceivably could *increase* injury rates in some workplace settings. For example, it has been suggested that the union seniority and job-bidding systems used in unionized mines could increase injuries by encouraging less-experienced miners to bid on new jobs (Appleton and Baker 1984). It has also been claimed that in some industries, unionism is associated with more frequent turnover, higher absenteeism, and poorer labor–management communication, all of which tend to worsen on-the-job safety (Hannah 1981, Appleton and Baker 1984, Leigh 1984).

Most prior scholarship, however, has identified myriad ways in which unions' influence might be expected to have a salutary effect on workers' safety and health. In general, one can usefully group such activities into five distinct (albeit somewhat overlapping) “channels of influence.”

Channel of Influence #1: Educating Workers About On-the-Job Hazards

The first channel of influence reflects the simple reality that workers cannot respond to hazards of which they are unaware. Acting in isolation, a single worker may have few incentives to obtain information about workplace hazards. Such information is often expensive or difficult to acquire, and if a worker requests it directly from her employer, she may fear retaliation. Moreover, even if the worker *is* able to obtain OSH-related information, much of its benefits will accrue to other workers who “free-ride” on her efforts.

To be sure, even in nonunion environments, employers acting out of pure economic self-interest

may inform workers about some job-related hazards. For example, if such hazards are relatively inexpensive to abate, or well-informed workers can easily avoid them, providing workers with this information can improve the firm's bottom line by shrinking its workers' compensation premiums, cutting absenteeism, reducing worker turnover, and lowering the firm's OSHA penalties. However, if hazards are difficult to avoid and expensive to abate, or if learning about them encourages some workers to demand higher pay (or seek alternative employment), employers may try to conceal them. In some nonunionized environments, therefore, information about workplace hazards is likely to be underprovided.

Unions can help solve the potential dangers posed by inadequate information. By collecting OSH-related data systematically, and spreading the costs among all of its members, unions can reap economies of scale, overcome the free-rider problem, and minimize the risk of stigma or retaliation. For example, some unions have used a portion of membership dues to maintain their own chemical testing labs or to conduct epidemiological studies of suspected carcinogens (Ashford 1976, Silverstein et al. 1985).

Armed with such information, unions can alert members to occupational risks and educate them about their rights under federal and state law (Ashford 1976; Viscusi 1979a; Dedobbeleer, Champagne, and Pearl 1990; Walters and Denton 1990; Biggins and Phillips 1991a; Brown 1995; Gillen et al. 2002; Morse et al. 2003; Weil and Pyles 2005). Importantly, even if occupational hazards cannot be easily avoided or abated, a well-informed worker can still demand a "risk premium" (or "hazard pay") in the form of higher wages or benefits in exchange for accepting a higher level of occupational risk.

Economic theory suggests, then, that unions can serve a critical function by educating workers about their legal rights and the risks they face in the workplace. In so doing, they can help overcome the informational barriers that make it prohibitively difficult or costly for workers to acquire such information on their own. Even if the hazards themselves cannot be avoided, workers may be able to use this knowledge as a bargaining chip to boost their wages.

Channel of Influence #2: Changing Workers' Behavior and Attracting More Safety-Conscious Workers

Although workers can use workplace hazard information to bargain for higher pay, unions can also alter workers' behavior in more direct and concrete ways. For example, unions can help workers identify and avoid many workplace hazards by establishing training centers or specialized safety workshops (Ashford 1976; Dedobbeleer, Champagne, and Pearl 1990; Hugentobler, Robins, and Schurman 1990; Biggins and Phillips 1991a, 1991b; Gillen et al. 2002; Dong et al. 2004; Nissen, Angee, and Weinstein 2008). Unions are particularly well equipped to implement such programs because they can often take advantage of economies of scale and spread costs across an entire trade or geographic region encompassing many employers (Walters 2001). Particularly if hazards can be substantially mitigated by workers' own behavior, such union safety programs may be instrumental in reducing occupational accidents. Unions can also alter workers' behavior *after* an injury occurs by informing them of their legal rights, helping them file claims, and facilitating their return to work (Schurman et al. 1998).

In some industries, unions have even begun to play an active role in deterring workers from consuming illegal drugs and alcohol on the job, which is believed to elevate occupational risks (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration 2000). Ironically, many U.S. unions initially opposed employer-mandated drug testing, which grew in popularity during the 1980s and was ruled a mandatory subject of bargaining in 1989 (National Labor Relations Board 1989, Seeber and Lehman 1989). Since the 1990s, however, two major building-trade unions have made mandatory drug testing an important component of their safety and health agendas, requiring their members to submit to scheduled and random screening tests (IMPACT Programs Overview 2009, MOST Programs 2009).

Union interventions primarily designed to affect the *behavior* of workers can also indirectly affect the *mix* of workers. For example, in addition to encouraging union members who use illegal drugs to kick their habit, a union-sponsored drug testing program may encourage some workers to forgo union membership in order to evade mandatory drug screening. More subtly, workers who are particularly focused on occupational hazards, or who value their perceived safety and health particularly highly, may be disproportionately drawn to unionized work environments (Hills 1985; Gegax, Gerking, and Schulze 1991; Gillen et al. 2002). For these reasons, a union's ability to recruit safer employees can also reduce the frequency of accidents and illnesses

among covered workers.

In short, the fact that workers' own behavior can either exacerbate or mitigate the hazards they face on the job presents unions with an opportunity. In many workplace settings, unions may not only influence the care with which workers perform their jobs, but in principle, they also can encourage more safety-conscious workers to join unions.

Channel of Influence #3: Inducing Employers to Directly Reduce Occupational Hazards

The third important way that unions can lower occupational risks is by inducing employers to correct dangerous workplace conditions. In deciding whether to remedy a particular hazard, employers must weigh its anticipated costs—such as the possibility that future injuries will raise medical costs, increase employee absenteeism and turnover, and lower worker morale—against the costs of abatement. Under some conditions, unions may be able to bring about desired improvements by changing the costs or benefits that affect the firm's decision-making.

Since OSH is a mandatory subject of bargaining, the most direct way for unions to put these issues on the firm's agenda is to bargain for relevant provisions to be included in the collective bargaining agreement (Kochan and Katz 1980; Robinson 1988a, 1991). Although the OSH-related provisions of the 1970s and '80s rarely did more than codify employers' general obligation to keep the workplace free of recognized serious hazards (Bacow 1980, Robinson 1988a), in recent years some contracts have included more specific OSH provisions (Schurman et al. 1998). Such detailed clauses can encompass a wide variety of protections, such as expanding substantive safety protections, granting unions automatic access to company-collected OSH records, requiring the use of impartial health and safety experts, mandating company-sponsored medical examinations, and requiring the training of union safety and health stewards (Silverstein et al. 1985, Schurman et al. 1998). If bargaining breaks down, unions can try to secure OSH-related concessions by striking or deploying other forms of organized protest (Egarian 1990, Robinson 1991, Brown 1995, Hebdon and Hyatt 1998, Boal 2009).

Unions also have cooperated directly with management in an effort to monitor OSH-related issues (Kochan, Dyer, and Lipsky 1977; Hall et al. 2006). Probably the most widespread (and extensively scrutinized) collaborative mechanisms are joint labor-management health and safety committees, which are mandated in many U.S. states and also required in many parts of Canada, Europe, and Great Britain (Assennato and Navarro 1980; Bryce and Manga 1985; Walters 1987; Cassou and Pissarro 1988; Walters and Gourlay 1990; Robinson 1991; Shannon et al. 1992, 1996; Tucker 1992; Tuohy and Simard 1993; Reilly, Paci, and Holl 1995). Another common collaborative approach is the appointment of a "safety representative," often a union official, to address OSH-related concerns. Safety representatives are legally mandated in Australia, Britain, and much of Europe (Codrington and Henley 1981; Frick and Walters 1988; Walters and Gourlay 1990; Warren-Langford, Biggins, and Phillips 1993; Hillage et al. 2000; Walters 2004, 2006).

Finally, it is worth noting that to the extent that unions encourage workers to report all workplace injuries, they may also be encouraging employers (albeit indirectly) to implement OSH-enhancing improvements. Large firms with a history of excellent safety and health—just like drivers with clean driving records—generally pay lower workers' compensation insurance premiums through the mechanism of "experience rating." Since reducing on-the-job hazards can be expensive and time-consuming, a well-functioning experience rating helps "make safety pay" by financially rewarding firms that excel at OSH promotion (through lower workers' compensation insurance premiums) and penalizing those that lag behind. In helping to ensure that all on-the-job accidents are reported, unions can help the experience rating system function more effectively by forcing employers to internalize more of the costs of workplace injuries and, in turn, to reap more economic benefits from safety enhancements (Brown 1995).

Channel of Influence #4: Influencing the Stringency of Regulatory Oversight

Another important way unions can affect OSH outcomes is to increase the level of regulatory scrutiny. Unions helped to spur the passage of protective state labor laws in the 19th century, and beginning in the late 1960s, the labor movement played a critical role in the creation of OSHA and MSHA (Graebner 1976, Mendeloff 1980, Schurman et al. 1998). In the nearly four decades since OSHA's establishment, unions have been involved in setting standards and have continued to lobby for increased funding and stricter

enforcement (Brown 1995, Mendeloff 1980, Robinson 1991, Schurman et al. 1998).

In addition to advocating for change at the state or national level, unions can help increase the level of regulatory scrutiny at organized worksites in the U.S. (Brown 1995). For example, unions can dramatically increase the likelihood of an OSHA inspection by filing a complaint with the appropriate regulatory body. Union officials can also encourage employees to exercise their “walkaround right” by ensuring that a well-informed employee accompanies an inspector on his or her tour of the workplace.

In short, the presence of regulatory agencies presents unions with an additional channel of influence over employer behavior. By increasing the frequency and stringency of enforcement at the federal and state levels—as well as in individual worksites—unions can help ensure that the regulations on the books are brought to bear against individual employers.

Channel of Influence #5: Developing Safety-Related Innovations

A final way unions can reduce on-the-job hazards is by developing innovative programs designed to further OSH-related goals. The hallmark of such innovations is the ability to transcend traditional boundaries and form new partnerships across institutional, geographic, or political boundaries. Although far from comprehensive, several recent examples help illustrate the potential scope for union innovation.

First, since the early 1990s, two U.S. construction unions have developed innovative partnerships among contractors, workers, and union leadership in an effort to increase union competitiveness in the building trades. The first of these programs is the Boilermakers’ Mobilization Optimization Stabilization and Training (MOST) program, established in 1989, which uses a nationwide web-based tracking system to record and verify each member’s safety training and certification. Each union member must pass regularly scheduled and random drug tests, complete periodic safety training, and undergo regular pulmonary function and qualitative respirator fit testing (MOST Programs 2009). Both union and contractor representatives serve on the governing committee. Meanwhile, the Ironworker Management Progressive Action Cooperative Trust (IMPACT) program describes its mission as “expand[ing] job opportunities for union Ironworkers and their signatory contractors through progressive and innovative labor management cooperative programs” (IMPACT Programs Overview 2009). Its centerpieces include a substance abuse program, a unique safety insurance program that tries to help contractors reduce their workers’ compensation premiums, and a training program that comprehensively addresses safety concerns (IMPACT Programs Overview 2009). What distinguishes both programs is their multifaceted approach toward OSH promotion, centralized recordkeeping function, and emphasis on labor–management cooperation. More recently, officials within the AFL-CIO Building and Construction Trades Department have begun to implement a similar program that encompasses all of the building trade craft unions (Building Trades National Drug and Alcohol Program 2009).

Another intriguing union-sponsored innovation has been the development of workers’ compensation “carveouts,” also known as “collectively bargained workers’ compensation.” The goal of these programs is to lower workers’ compensation costs without jeopardizing the quality of workers’ compensation coverage that employees receive following an injury. Through the mechanism of collective bargaining, such programs permit unions and management to increase benefits, jointly modify the medical care delivery system, and tailor dispute prevention and resolution procedures to the union environment. To date, at least 10 states have passed laws permitting carveouts (IMPACT 2007). Given the opportunity they provide for policy experimentation, carveouts are likely to remain a fertile arena for future innovation.

Another promising avenue for union innovation has been the formation of international agreements designed to protect the health and safety rights of all workers in countries in which multinational firms operate. Corporate signatories to such agreements well known to North American consumers include Goodyear, IKEA, Faber-Castell, and Chiquita (O’Neill 2002). Unions have also played important leadership roles in international anti-sweatshop campaigns and in efforts to combat the use of child labor under abusive working conditions (International Confederation of Free Trade Unions 2009).

Unions’ capacity to undertake safety- and health-related innovations is particularly critical in an era when only 7.5% of private sector U.S. workers are unionized (U.S. Bureau of the Census 2009). Forming new alliances that transcend political and geographic boundaries can enable unions to leverage their influence beyond their current membership. By facilitating experimentation with new models of workplace protection,

unions can help further policies that may have broad and lasting impacts on employees' physical well-being.

The Findings and Challenges of Empirical Research on “Union Safety Effects”

As the preceding discussion has made clear, unions can affect OSH in a wide variety of seemingly consequential ways. From a policy perspective, however, the critical question is whether these activities are demonstrably effective in achieving their intended goals. In fact, the relevant empirical scholarship on union efficacy encompasses two related, but distinct, bodies of literature. The first cluster of studies bears on the question of efficacy *indirectly* by asking whether unionism changes particular labor market conditions, or institutional features of the workplace, that in turn may affect OSH outcomes. The second body of literature focuses *directly* on the efficacy question by asking whether the presence of a union significantly reduces the prevalence of workplace hazards.

By and large, the literature that bears *indirectly* on the efficacy question confirms many of the channels of influence outlined in the preceding section. For example, union workers do appear to be better informed about their legal rights, consistent with the idea that unions play an important educational role (Meng and Smith 1993, Morse et al. 2003). Unions also may mitigate the adverse effects of occupational injuries; four different studies of Ontario workers found that injured union workers were more likely to return to work successfully than their nonunion peers (Johnson and Baldwin 1993; Butler, Johnson, and Baldwin 1995; Johnson, Butler, and Baldwin 1998; Campolieti 2001), although U.S.-based studies have reached more ambiguous conclusions (Johnson 1983, Johnson and Ondrich 1990, Ben-Ner and Park 2003).

As theory would predict, unionized workers in the U.S. appear to receive larger wage premiums for risk than their nonunionized counterparts (Thaler and Rosen 1976; Olson 1979, 1981; Viscusi 1979b, 1980, 1983; Kochan and Helfman 1981; Dorsey 1983; Dickens 1984; Hamermesh and Wolfe 1990; Moore and Viscusi 1990; Gegax, Gerking, and Schulze 1991; Fairris 1992, 1995), although a few scholars examining data from other countries have reported opposite findings (Marin and Psacharopoulos 1982, Martinello and Meng 1992, Meng 1989). Although joint labor–management safety and health committees take on a wide variety of institutional forms, existing scholarship suggests that they are both more prevalent and more efficacious in unionized settings (Beaumont et al. 1982; Hugentobler, Robins, and Schurman 1990; Walters and Gourlay 1990; Tuohy and Simard 1993; Brown 1995; Reilly, Paci, and Holl 1995; Walters 1996; Havlovic and McShane 1997; Ochsner and Greenberg 1998; Weil 1999; Robinson and Smallman 2000).

Finally, consistent with the prediction that enforcement is stricter at unionized workplaces, Weil has found in a string of studies (1987, 1991, 1992, 1999, 2001) that union status increases the probability and stringency of inspections in the mining, manufacturing, and construction industries. With one salient exception (Gray and Mendeloff 2005), studies based on more limited samples of U.S. workplaces have reached the same conclusion (Kochan, Dyer, and Lipsky 1977; Smith 1986; Grob 1998), as have several similar studies that analyze Australian and Canadian data (Brown 1995: 38; Gunningham 2008).

Given the numerous ways unions intervene to promote OSH—and the empirical literature generally confirming that such activities have measurable effects on labor market outcomes and institutional behavior—one would expect unionism to reduce workplace injuries and fatalities. Yet a survey of studies focusing *directly* on OSH outcomes provides surprisingly little support for this claim. (Although the majority of empirical studies focus on workplace injuries rather than illnesses, my use of the terms “union safety effect” and OSH throughout this article is intended to encompass unions' effects on both sorts of hazards.)

The safety of mine workers has been an especially fertile subject for scholarly scrutiny. A cluster of articles, relying on a wide range of methodologies and data sources, have explored whether unionism affects the frequency of mining accidents. The most recent study, by William Boal (2009), analyzes the union safety effect using both state-level and mine-level data on mining fatalities from the early 20th century. Boal's estimates suggest that unionism significantly lowered fatalities by at least 20%, even after controlling for state safety regulations. Yet to date, Boal's is the only empirical study that has found statistically significant negative associations between unionism and the frequency of mining fatalities. Two historical studies by Fishback (1986, 1987), relying on different early-20th-century data sources, find that unions had no statistically significant impact on the frequency of accidents during this period. Moreover, analyses of late-20th-century data by Appleton and Baker (1984, 1985), Boden (1976, 1985), Connerton (1978), the National Research

Council (1982), and Reardon (1991, 1996) have all found, if anything, a positive linkage between unionism and the frequency of mine injuries.

Studies focusing on other hazardous industries also suggest that unionism, in and of itself, does not consistently improve occupational safety levels. For example, one small-scale study of injury rates reported by U.S. construction workers revealed no significant negative association between union status and the probability of injury (Dedobbeleer, Champagne, and German 1990). Although a study of Canadian forest product manufacturing mills found that unionized mills had fewer serious accidents (Havlovic and McShane 1997), two studies of British manufacturing plants found a positive (albeit in one case, statistically insignificant) link between injury rates and union status (Nichols, Dennis, and Guy 1995; Reilly, Pierella, and Holl 1995). A study of injury rates in U.S. manufacturing echo the British findings (Fairris 1995).

Literature relying on aggregated cross-industry data from the U.S., Canada, and Great Britain exhibits broadly similar patterns. Although a few scholars have reported negative relationships between union penetration and the frequency and/or duration of reported injuries (Taylor 1987, Nichols 1997, Litwin 2000, Campolieti 2005), most have failed to find any robust negative association between unionism and the reported frequency and/or duration of injury claims (Chelius 1974; Olson 1979; Kochan and Helfman 1981; Butler and Worrall 1983; Worrall and Butler 1983; Leigh 1985; Fairris 1992; Shannon et al. 1992, 1996; Dionne, St. Michel, and Vanasse 1995; Hirsch, Macherson, and DuMond 1997; Habeck, Hunt, and VanTol 1998; Robinson and Smallman 2000; Ben-Ner and Park 2003; Fenn and Ashby 2004).

In short, despite the fact that unions play so many vital roles in the promotion of OSH, extant empirical literature contains little evidence of a pervasive union safety effect. A sizable number of studies find, instead, *positive* associations between unionism and occupational injuries. What are we to make of these puzzling findings?

To make sense of this literature, it is critical to understand why isolating a union safety effect is such an inherently difficult endeavor. The essence of the problem is that in most real-world settings, researchers have too little information at their disposal to make meaningful apples-to-apples comparisons between union and nonunion firms, making it difficult to reliably discern whether a union safety effect exists.

On one hand, the lack of relevant information could lead researchers to find a union safety effect where none exists by “upward” biasing of empirical estimates of the union safety effect. For example, suppose that union workers value safety more highly than their nonunion peers and therefore “buy” more safety from their employers in exchange for lower wages. In this situation, the superior safety outcomes observed in union workplaces would not indicate that unionism per se improves safety. Rather, such a disparity would simply reflect the fact that unions attract more safety-focused workers. The fact that unionized workers are more likely to receive group health care benefits also could bias estimates of the union safety effects if injured workers with access to group healthcare seek treatment through group health instead of filing workers’ compensation claims (Freeman and Medoff 1984, Biddle and Roberts 2003). Even if union workers are injured just as frequently on the job as their nonunion counterparts, their superior access to group health care could render some of their injuries invisible to the researcher. In industries where unionized workers tend to be older and more experienced, reliance on firm-level data also could be misleading if such demographic disparities cannot be accounted for in the analysis (Appleton and Baker 1985). The root of all of these problems would be the researcher’s inability to observe important worker characteristics that are linked to union status. In theory, such upward biases could make it appear that unions enhance OSH even if that is not the case.

Although upward biases of this sort provide theoretical grounds for concern, they do not seem to be very large or pervasive in many real-world settings. Since union members tend to earn higher wages and accept more dangerous jobs than their nonunion counterparts (Chelius 1974; Feuille, Hendricks, and Kahn 1981; Kochan and Helfman 1981; Leigh 1982; Dickens 1984; Hirsch and Berger 1984; Hills 1985; Fishback 1986; Robinson 1988b; Shirom and Kirmeyer 1988; Fairris 1995), it seems unlikely that they “buy” more safety in exchange for lower wages. If anything, it seems more likely that union workers trade off lower safety levels for higher wages, although several scholars have argued that the latter effect also fails to plausibly explain observed disparities in union–nonunion wages (Feuille, Hendricks, and Kahn 1981; Dickens 1984; Gerking, de Haan, and Schulze 1988). Although some cost shifting from workers’ compensation to group health remains a theoretical possibility, even if union workers *could* obtain treatment through group health

instead of workers' compensation, it is doubtful that very many *would* do so. Unlike group health, workers' compensation provides full medical coverage with no co-pays and also entitles the worker to (untaxed) wage replacement benefits for any loss of work. Similarly, even in industries where demographic differences between union and nonunion workers could be consequential, researchers frequently possess the demographic data required to account for such disparities (Moore and Viscusi 1990; Farber 1983; Dedobbeleer, Champagne, and German 1990; Hirsch, Macpherson, and Dumond 1997).

On the other hand, the potential sources of "downward" bias—in which union safety effects do exist, but researchers fail to detect them—are numerous, and in some cases very difficult to overcome. One crucial source of downward bias, sometimes described as reverse causation, stems from the fact that "while unions may prevent hazards, hazards may also attract unions" (Brown 1995: 21). In other words, the prevalence of workplace hazards may be part of the very impetus for workers to unionize (or retain a union). A sizable number of empirical studies lend credence to this concern (Leigh 1982; Worrall and Butler 1983; Hirsch and Berger 1984; Hills 1985; Robinson 1988b, 1991). If unionism per se lowers injuries but the most dangerous workplaces are the very ones that attract unions, the union safety effect—although real—may be undetectable using conventional statistical methods (the same studies just cited).

Another important type of downward bias involves the frequency of underreporting. Researchers cannot observe how many on-the-job injuries actually occur; they can only observe how many injuries are *reported* to have occurred. If, for example, employer intimidation is more rampant in nonunion environments, many injuries suffered by nonunion workers may never get reported and therefore may be excluded from conventional data sources. Although underreporting is extremely difficult to detect, several studies have cited evidence suggesting it is more prevalent in nonunion environments (Boden 1976, Morse et al. 2003, Fenn and Ashby 2004). There is also the possibility of overreporting in union environments. For example, union members may use their superior knowledge of workers' compensation rules to successfully feign injuries, seek more time off work than is medically necessary, or obtain workers' compensation coverage for injuries sustained off the job (Hirsch, Macherson, and DuMond 1997; Meng and Smith 1993). One recent study, attempting to distinguish between underreporting at nonunion firms and overreporting at union firms, finds the former effect to empirically predominate (Morse et al. 2003). Importantly, however, both types of reporting bias tend to render union safety effects invisible to empirical researchers relying on conventional data sources.

The reliance on crude, imperfect, or highly aggregated measures of unionism can also be a source of downward bias. Unions differ along a number of safety-related dimensions, such as their relative bargaining strength, the content of their collective bargaining agreements, and the presence of a joint labor–management safety committee. By treating "unionism" as an undifferentiated characteristic, researchers may fail to account for the possibility that only certain types of unions are safety-enhancing, a form of aggregation bias (Zellner 1962; Hammer 1981; Shannon et al. 1992, 1996; Stoker 1993). Reliance on statewide or industrywide averages when calculating union membership can further confound the researcher's ability to see underlying trends (Olson 1979, Taylor 1987, Fairris 1992). Particularly in datasets that track changes in union status over time, errors in the coding of union membership—which one study found to be relatively common—can also skew the estimated effects of unionism (Freeman 1984).

Conventional measures of safety may also introduce downward bias. For example, studies of OSH outcomes that use the *initial* return to work as a proxy for injury severity may understate unions' beneficial effect, since union employees are more likely to return to *stable* work over the long term (Johnson and Baldwin 1993; Johnson, Butler, and Baldwin 1998; Campolieti 2001). Since occupational fatalities are such low-frequency events, using them as a metric of workplace safety also may obscure real union–nonunion disparities in small samples (Brown 19952).

In short, identifying the union safety effect using conventional data sources and techniques is fraught with methodological pitfalls. Much of the information needed to make truly credible comparisons—such as the prevalence of underreporting, the extent to which hazards are the cause and not the result of unionism, and how differences between unions affect safety outcomes—are difficult to observe or quantify. In theory, such problems could create illusory union safety effects or mask real ones. In practice, however, the latter form of bias seems more prevalent and consequential. Thus, even in situations where unionism truly

improves workplace safety, the prevalence of empirical biases may render its impact invisible to the empirical researcher.

Toward a New Empirical Research Agenda

Although many of the biases enumerated above are familiar to empirical scholars, there has been little discussion in the literature of how to overcome them. How should researchers respond to these daunting empirical challenges? What, if anything, can be done to ferret out the impact of unionism on safety? Although there is no panacea for the problems just described, several important lessons may help point researchers in more fruitful directions.

Learn More about the Prevalence and Magnitude of the Major Biases

As noted above, the presence of important confounding biases—and uncertainty regarding their relative prevalence and magnitude—has made the literature on the union safety effect difficult to interpret. For example, studies finding a positive association between unionism and injuries often conclude by speculating that the seemingly perverse results could be explained by underreporting in nonunion workplaces, the greater tendency of hazardous workplaces to become unionized, or some combination of both (Leigh 1982; Boden 1985; Taylor 1987; Habeck, Hunt, and VanTol 1998; Fenn and Ashby 2004). Without knowing more about the scope and importance of such biases, however, it is hard to evaluate these findings.

Putting these biases themselves under the microscope, or finding plausible ways to mitigate them, could offer one promising step forward. For example, since minor injuries are particularly prone to underreporting, some researchers have focused on serious injuries, or fatalities, as the most plausible metrics of occupational safety (National Research Council 1982, Appleton and Baker 1984). In recent years, several OSH scholars have gone a step further and tried to directly measure the extent of injury underreporting in conventional databases (Glazner et al. 1998; Leigh, Marcin, and Miller 2004; Rosenman et al. 2006; Boden and Ozonoff 2008). Studies that break down underreporting trends by union status could shed light on the extent to which underreporting is likely to bias empirical estimates of unions' impact. Another small handful of studies has usefully begun to explore the extent to which perceived safety levels affect workers' support for unionism (Hills 1985; Robinson 1988b, 1991). To mitigate aggregation bias in the measurement of unionism, two studies have eschewed conventional measures of "unionism" in favor of indices designed to capture unions' relative "strength" (Hammer 1981; Reardon 1991). Further research in this vein could help researchers diagnose the magnitude of existing biases and devise new, more nuanced, ways of overcoming them.

Maximize Sample Homogeneity When Making Union–Nonunion Comparisons

Studies of the union safety effect that rely on public data sources—such as Census Data, the Current Population Survey (CPS), the Quality of Employment Survey (QES), the National Longitudinal Survey, or injury data collected by the Bureau of Labor Statistics—can only differentiate the firms or individuals examined along a few simple dimensions. For example, studies that rely primarily on CPS or QES data often use poor (if any) measures of firm- and union-level characteristics (Olson 1979, 1981; Leigh 1982; Kirmeyer and Shirom 1986). Many characteristics that differ markedly across union and nonunion environments—such as firm size, wages and benefits, the types of technologies employed, and workers' average experience and seniority—cannot be observed using these data sources. Therefore, such comparisons are especially prone to many of the biases enumerated.

Trying to obtain detailed, granular data on a smaller but more homogenous group of firms within a single geographic region or industry is a potential way to mitigate this problem. For example, Appleton and Baker (1984, 1985) restrict their study of underground coal mines to a small geographic region in an effort to minimize heterogeneity of mining conditions, which could be linked with unionization. Similarly, in a study of the effect of joint health and safety committees, Havlovic and McShane (1997) confine their sample to a relatively homogenous group of forest product mills in British Columbia.

Of course, such techniques are far from foolproof. Even in studies limited to a single region or industry, many firm-level characteristics that vary within the sample may be strongly correlated with

unionization. Nevertheless, the more homogenous the group examined—and the more granular data available on the differences that remain—the greater the researcher’s capacity to make credible apples-to-apples comparisons between union and nonunion firms.

Evaluate Efficacy of Discrete Union-Sponsored Interventions

As noted earlier, most literature on union safety effects implicitly treats unionism as a black box—first determining whether a workplace (or worker) is covered by a union contract, then measuring the effect of “unionism” on safety outcomes. The reality, of course, is considerably more complex. Not all unions are the same. Even if unionization tends to enhance worker safety, the question remains: *Which* union activities or interventions bring about this result? Studies that compare OSH outcomes among “union” and “nonunion” firms, therefore, share two important and related flaws. First, in failing to differentiate among unionized firms (or workers), they could statistically obscure the salutary effect of some unions on occupational safety and health. Second, more subtly, they provide no insight into the mechanisms that enable successful unions to achieve these effects.

An alternative and potentially more fruitful strategy might be to limit the sample to unionized firms and examine the effect of specific programs or interventions that unions are particularly well equipped to implement. The cluster of studies analyzing the effect of safety and health committees in unionized environments exemplifies such an alternative approach (Kochan, Dyer, and Lipsky 1977; Beaumont et al. 1982; Boden et al. 1984; Weil 1995; Ochsner and Greenberg 1998; Eaton and Nocerino 2000). In like fashion, researchers could rigorously evaluate the efficacy of training certification programs, drug testing programs, collectively bargained workers’ compensation programs, and other discrete innovations described above that unions have pioneered in recent years.

This approach has several important advantages. First, limiting the comparison to unionized workplaces greatly reduces many of the biases discussed above. Second, evaluating the efficacy of particular union programs will help unions identify strategies that are promising candidates for more widespread adoption. Finally, over the long term, conducting small-scale studies of this kind in incremental fashion will help researchers peer inside the black box of unionism and determine which of unions’ varied activities and characteristics are the most consequential from a safety perspective.

Collaborate with Independent Social Scientists Skilled in Program Design and Evaluation

The most effective way for unions to study the efficacy of new programs or interventions is to establish research partnerships with academic social scientists. Such collaborators should be appropriately trained and credibly impartial, they should be brought in on the ground floor before implementation has begun, and they should help the union institutionalize mechanisms for data collection, storage, and analysis.

Although consultants or in-house experts may be capable of assisting with program design and evaluation, academic social scientists are likely to be the most valuable collaborators over the long run. Not only does their affiliation with postsecondary institutions create a presumption of independence and objectivity, but their ability to publish study findings in peer-reviewed journals, and to obtain federal grants, can enhance their credibility in the OSH arena and their capacity to bring their findings to the attention of public policy experts.

Establishing such collaborations at the programmatic design phase, before implementation has begun, is also enormously advantageous. No matter how effective a particular program may be, scientifically proving its impact may be very difficult unless it is undertaken in a manner that facilitates meaningful statistical analysis. For example, if a new program is implemented across an entire region simultaneously, it may be hard to distinguish its effects from other changes with which it happens to coincide (such as changes in the political landscape or workers’ compensation reforms). Staggering the implementation of a new program across different employers or subregions is often a much more promising strategy. By consulting with social scientists at the outset whenever possible, unions can help ensure that the programmatic details and manner of implementation are conducive to rigorous evaluation.

Finally, one of the most important functions that outside collaborators can serve is to install and test a workable system for data collection and storage. The ability of any social scientist to properly evaluate a program’s success will ultimately depend on the quantity and quality of the data collected. To protect any later

study's scientific validity, it is critical for collaborators to ensure that all necessary data fields will be at the researcher's disposal.

For example, the research of Levine et al. on collectively bargained workers' compensation programs in the California construction industry—the first study to rigorously examine a carveout program—involved a prolonged and successful collaboration between participating unions and a team of researchers from the University of California at Berkeley. Although the academic collaborators did not design the program, they were permitted to interview workers and union leadership and were provided the documentation and injury data necessary for empirical analysis. The study revealed that the program reduced claim processing time, was associated with a slight (albeit statistically insignificant) decrease in claim frequency, and did not harm the quality of medical care that workers received (Levine et al. 2002a, 2002b).

In short, partnering with academic social scientists is a particularly fruitful way for unions to build up a credible track record of OSH-related innovations. The expertise that academic collaborators bring to bear can help unions identify the most promising strategies, make their programmatic successes known to a wider audience, and ultimately enhance their credibility in the public policy arena.

Conclusions

Extant literature on the relationship between unionism and OSH contains a crucial dilemma. On one hand, unions can affect workplace hazards in numerous ways—such as educating workers about on-the-job hazards, changing the mix and behavior of workers in ways that are safety-enhancing, inducing employers to undertake safety improvements, increasing the stringency of regulatory oversight, and helping pioneer safety-related innovations. The empirical literature seems to confirm unions' ability to change labor market conditions and workplace institutions in ways that can affect workplace accidents. Yet surprisingly few rigorous empirical studies have directly linked unionism to improved safety and health outcomes.

Much of the existing literature, I have argued, is fraught with empirical biases that may mask unions' true health and safety impact. Although there is no perfect solution, I have suggested several promising ways to advance the research agenda. First, researchers should devote more effort to understanding the biases that are most likely to confound empirical analysis in this area. Second, when comparing union and nonunion firms, researchers should try to maximize the homogeneity of the groups compared and learn as much as possible about the study subjects. Third, in addition to comparing outcomes across union and nonunion environments, researchers should confine their analysis to unionized firms and isolate the effect of specific union-sponsored interventions. Finally, unions should bring social scientists in on the ground floor to assist with the design, testing, and evaluation of OSH-related programs. Adopting such techniques will help unions target their resources toward their most efficacious use, a task that will become increasingly critical as the economic downturn further shrinks union budgets.

At the very least, unions' ability to persuasively corroborate claims of programmatic effectiveness by citing the findings of impartial academic studies will give them significant competitive advantages in agenda-setting, organizing, and bargaining. Over the long run, embracing an evidence-based approach toward program adoption and evaluation also will help convince a skeptical public of the unique and important role unions can play in protecting American workers.

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