

Workers' Compensation Claims by Temporary Help Services Workers and Traditional Employees¹

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Abstract:

Worker moral hazard has been shown in some empirical studies to influence workers' compensation insurance claims patterns. According to moral hazard theory, temporary help services workers would be expected to file a greater number of spurious claims than traditional, directly-hired employees as a result of greater safety information asymmetry between staffing agencies and the temporary help services workers they place in third party workplaces than between employers and their directly-hired employees. Analysis of a survey of 30,000 working age adults finds that, of workers surveyed who experienced a work-related injury or illness, temporary help services workers are statistically significantly more likely to file a workers' compensation claim than traditional employees by an estimated 15%. Temporary help services workers and traditional workers who file a workers' compensation claim are equally likely to receive benefits, however, indicating that the additional claims made by temporary help services workers are considered legitimate by staffing agencies and their insurers rather than a result of moral hazard. Qualitative responses suggest that traditional employees may file fewer claims than temporary help services workers, conditional on work-related injury or illness, because traditional employees refrain from filing workers' compensation claims out of loyalty in occasional cases and due to claim discouragement or suppression in more frequent cases. Employer behavior is found to substantially affect the odds of a worker filing a claim with a high degree of statistical significance. Survey data reveal, controlling for industry and employer size, the existence of employer high road and low road approaches to workers' compensation, with one-third of employers very helpful to workers surveyed who experienced a work-related injury or illness. Nearly one out of five traditional employees surveyed who experienced a work-related injury or illness, however, reported a perceived threat of dismissal for filing a workers' compensation claim.

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Introduction

The declining rates of reported work-related injuries and illness since the early 1990s have been partially explained by changes in state workers' compensation laws, shifts in employment across industries, and incidence rate declines within industries. (Boden and Ruser 2003, Morse et. al. 2009, Guo and Burton 2010, Ruser 2014) Both workers and employers have faced changing incentives vis-à-vis workers' compensation insurance claim filing. Workers, due to more stringent eligibility requirements and restrictions in many states, confront a stronger disincentive to filing a workers' compensation claim. Employers, as a result of increases in workers' compensation insurance deductibles and self-insurance, have a stronger incentive to avert the filing of a workers' compensation claim.

A downward trend in workers' compensation benefits payments has accompanied the ongoing decline in reported work-related injuries and illnesses. (Baldwin and McLaren 2016) The rise in alternative work arrangements may be another relevant factor contributing to the trend since some workers in alternative work arrangements do not qualify as employees and are therefore not eligible for workers' compensation insurance benefits. Employment in alternative work arrangements, such as independent contracting, temporary help services, on call work, and freelancing, increased from 9.3% of those employed in 1995 to an estimated 17.2% in 2015. Nearly all of the net employment growth in the U.S. economy from 2005 to 2015 occurred in alternative work arrangements. (Katz and Krueger 2016) While workers classified as independent contractors are not considered employees and are ineligible for workers' compensation, temporary help services (THS) workers are considered employees for the purposes of workers' compensation. Temporary help services agencies, also known as staffing

agencies, are required to carry workers' compensation insurance or self-insure according to the same state regulations as other employers.

Empirical analysis has shown that THS workers experience a higher incidence of work-related injuries and illnesses than standard, directly-hired workers. (Underhill and Quinlan 2011, Silverstein et. al. 2002, Foley 1998, Mayhew et. al. 1997) Whether THS workers are more or less likely to collect workers' compensation benefits is unclear. One study estimated that THS workers incurred higher workers' compensation insurance costs than similar non-contingent workers. (Park and Butler 2001) Another study found THS workers had lower awareness of workers' compensation benefits than directly-hired workers. (Mayhew and Quinlan 2002) Arguments have been made that the growth of precarious employment has contributed to the decline in workers' compensation benefits by preventing workers from reporting some injuries and illnesses. (Azaroff et. al. 2004)

THS status has the potential to affect claiming and safety incentives in a number of ways. The current research investigates whether THS workers have a higher or lower propensity to file workers' compensation claims than traditional standard, directly-hired workers. The research also considers the factors affecting the propensity to file a claim of THS workers and standard workers, and the implications of similarities and differences. Data were collected through a large scale mobile phone-based survey, which improves access to employed adults and to younger adults increasingly underrepresented through traditional survey methods. (Link et. al. 2007)

Background and Literature Review

Asymmetric information and moral hazard have long been considered potential impediments to efficiency in insurance markets.³ In the workers' compensation insurance market, moral hazard associated with information asymmetry has been proffered as a factor influencing workers' compensation claims patterns. Behaviors on the part of insured employers and workers that deviate from behaviors without insurance in ways that increase risk represent moral hazard. Ex ante moral hazard in workers' compensation insurance markets refers to behaviors of insured employers and workers that precede workplace injury, such as decreased investment in worker safety by employers or reduced attention to safety by workers. Ex post moral hazard in the market for workers' compensation insurance concerns the effects of insurance incentives on claiming behaviors after an incident of injury or illness. The existence of insurance, in theory, creates an incentive for workers to claim losses to the full extent of and possibly beyond what the framework of allowable losses permits.

Differences between THS and standard, directly-hired workers both in ex ante and ex post moral hazard may arise due to differences in employer and worker incentives. Staffing agencies have less access to information about and, more importantly for ex ante moral hazard, less control over worker safety. The firms that use staffing agencies, moreover, have less incentive to invest in THS worker safety than the safety of their directly-hired workers since THS workers are not covered by their workers' compensation insurance and THS worker injuries or illnesses do not affect their experience rating. The high frequency and severity of THS worker

³ Kenneth Arrow introduced asymmetric information, moral hazard, and adverse selection in his seminal 1963 article.

work-related injury as a consequence has been well documented. (Mayhew et. al. 1997, Foley 1998, Silverstein et. al. 2002, Underhill and Quinlan 2011)

Asymmetric information is a relevant differentiator in ex post moral hazard between THS and standard, direct hire employment arrangements. Employers have more information on the safety practices and incidents of injury or illness of standard, directly-hired workers than staffing agencies have about the safety practices and incidents of injury or illness of THS workers placed at client firms' work sites. Because staffing agencies have limited information to use to contest a claim, THS workers could be expected to seek to file a greater number of spurious claims than directly-hired employees.

Evidence on the claims behavior of all workers, more generally, is contradictory. Research finding evidence of moral hazard by workers in filing workers' compensation claims stands in contrast to empirical research revealing substantial under-claiming of work-related injuries and illnesses. Research focusing on moral hazard on the part of workers is discussed below, followed by a review of research on insurer efforts to mitigate against employer moral hazard through experience-rating. Empirical evidence on claims-filing is subsequently presented, and the limited literature on THS workers' compensation claims is discussed.

Worker Moral Hazard. Early work on potential worker moral hazard by Krueger (1990) using Current Population Survey microdata from 1983 to 1985 found an association between higher levels of workers' compensation benefits and higher incidence of workers' compensation claims, controlling for worker characteristics and other state-specific workers' compensation program characteristics. Butler (1994) similarly found that the incidence and severity of claims

increased as benefits increased and attributed the increased benefit utilization to ex post moral hazard rather than a decrease in effort to preventing work-related injuries by workers. Erin and Bronchetti (2012) undertook a comprehensive analysis of the elasticity of response of worker claims behavior to higher workers' compensation benefits using a Current Population Survey 25 year time series from 1977 to 2004 that yielded results contradicting Krueger (1990) and Butler (1994). They found that with additional controls, including for levels of prior earnings, higher cash benefits for workers' compensation were not found to be correlated with higher incidence of receiving workers' compensation. While the finding of no evidence of moral hazard behavior on the part of workers is attributed to the additional controls, the difference in time period studied cannot be ruled out as a factor affecting the results. It is possible that the more recent data reflect changes in the extent of moral hazard behavior of workers since the early 1980s due to changes in state workers' compensation insurance programs, terms of workers' compensation insurance policies, and resultant incentives.

Other research has investigated difficult-to-diagnose injuries as a proxy for injuries involving greater information asymmetries and therefore having greater potential for behavior consistent with moral hazard. Empirical analysis of administrative data from 1978 to 1982 showed that workers with hard-to-diagnose injuries obtained benefits of greater variation than workers with clear-cut injuries, which researchers attributed to the effect of moral hazard on workers' claim behaviors. (Dionne and St. Michel 1991) Consistent with this finding, empirical analysis of the construction sector in Quebec from 1977 to 1986 found higher levels of workers' compensation benefits were associated with a higher incidence of workers' reporting hard-to-diagnose injuries than clear-cut injuries and ascribed the change in composition to moral

hazard. (Bolduc et. al. 2002) More recent study of the phenomenon of proportionally higher workers' compensation insurance claims by workers on Mondays, however, has yielded ambiguous findings on worker moral hazard. Analysis of filings of a single large employer from 2010 did not show higher benefits contributing to a higher incidence of soft tissue injury reports on Mondays. (Butler et. al. 2014) The existing research has not demonstrated conclusively that cases of greater information asymmetry lead to additional, potentially moral hazard-related claims.

Employer Experience-Rating. Insurers' main prospective approaches to management of ex ante moral hazard in the market for workers' compensation insurance include partial insurance coverage and premium levels based on past experience. In practice, insurers require deductibles, which have increased notably over the course of the past decade.⁴ Insurers also apply experience modification penalties to insured employers with poor worker safety records. While experience modifications serve to improve the alignment of the incentives of employers with those of insurers, they generate conflicting incentives for employers versus workers. The self-interested behavior of employers subject to experience-based rate modifications is to minimize workers' compensation claims.

The literature on experience modifications corroborates the theorized incentive for employers to reduce workers' compensation claims. Experience modifications are referred to as an "injury tax," intended to encourage employers to improve worker safety through workplace safety and training initiatives. (Moore and Viscusi 2014) Multiple studies have revealed results

⁴ Insurers require deductibles in 45 states. Deductibles are not allowed by the state monopolies - North Dakota, Ohio, Washington, and Wyoming –or in Wisconsin.

consistent with the hypothesis that experience modifications catalyze employers to implement measures to improve working conditions and/or reduce work-related injury claims. (Lengagne 2016, Tompa Sheilah et. al. 2012, Barth et. al. 2008, and Thomason and Pozzebon 2002) The introduction of experience rating and increase in degree of experience rating are both associated with a lower frequency and severity of injuries based on moderate evidence, according to a meta-analysis by Tompa Cullen et. al. (2012).

Most research on the effects of experience modifications that identify a relationship between experience rating and reduced claims activity, however, do not clarify whether the observed relationship is due to occupational safety and health improvements or claims suppression. (Mansfield et. al. 2012). Puelz and Snow (1997) investigated empirical contracts to manage workers' compensation costs, finding that managers under-reported less severe injuries and illnesses to meet their targets. Thomason and Pozzebon (2002) report that employers subject to experience-rating were more likely both to put in place preventive measures to improve safety and to implement aggressive claims management.

Workers' Compensation Insurance Claims Filing. While early moral hazard literature on worker claims for work-related injuries and illnesses identified a slight increase in claims for hard-to-diagnose injuries associated with higher benefits, more recent work on the effects of benefit levels and on Monday filings do not yield evidence of worker moral hazard behavior leading to increased benefit payments. The literature investigating the proportion of claims for work-related injuries and illnesses for which claims are filed is unambiguous in its verdict that many workers do not file claims for potentially eligible injuries and illnesses. This suggests that it is possible that employer incentives against claims filing created by experience-rating of

employers are outweighing worker incentives to file claims due to worker moral hazard in many cases.

Analysis of data from a sample of workers in Michigan drawn from a survey and administrative data showed that 45% of workers who missed work due to an injury did not file a claim for workers' compensation benefits. (Biddle and Roberts 2003) Of the roughly 350 respondents to a Washington State survey who reported a work-related injury or illness, 48% did not file a workers' compensation claim. The propensity of workers to file a claim varied across industry and occupational groups. (Fan et. al. 2006) A mixed methods study of workers in the health care industry, which accounts for approximately one in five reported work-related injuries or illnesses,⁵ indicated that 55% of injured workers did not file workers' compensation claims. (Galizzi et. al. 2010) Out of a sample of 1,020 union carpenters, 30% expressed the perception that work-related injuries were almost never or rarely reported. (Lipscomb et. al. 2013)

Studies of workers not filing potentially eligible claims have yielded several potential explanations. The reasons for failing to file a workers' compensation claim are, in many instances, tied not only to the nature of the injury itself, but also to environmental conditions in the employing firm. Examination and empirical analysis of documentation from multiple administrative sources by Azaroff et.al. (2002) revealed that workers failed to report job-related injuries due to concern that filing a workers' compensation claim would be considered an indicator of a worker's insufficient attention to risks or a tendency to express grievances, which

⁵ Data are from the Bureau of Labor Statistics Survey of Occupational Injury and Illness (SOII).

could inhibit career advancement. Lackdawalla et. al. (2007) concluded, based on data from the BLS National Longitudinal Survey of Youth, that because workplace environment and employer heterogeneity critically affect worker decisions about workers' compensation claim filing, any efforts to increase the use of workers' compensation would depend on influencing employers. Supplementing quantitative and qualitative inquiry with onsite research in the health care industry, Galizzi et. al. (2010) observed that failure to file a claim is explained by time pressure and worker concerns about eligibility and adverse effects on reputation, future earnings and career advancement.

Spieler and Burton (2012), in their synthesis of literature seeking to explain the discrepancy between the number of people disabled due to work-related injuries or illness and the number of people who receive workers' compensation benefits cite exclusions of categories of workers from coverage, failure to file by individual workers, and barriers to approval and receipt of benefits. The procedural challenges faced by those injured or ill workers who file a claim, including higher standards of evidence introduced through workers' compensation law amendments during the 1990s, reduce the success of claims. In other words, not only employer conditions, but also increasingly restrictive rules for compensability in many state workers' compensation programs have reduced benefit receipt.

Temporary Help Services Worker Claims Behavior. The heterogeneity of workers' claims behaviors across sectors and occupational groups implies that averages across samples and reporting patterns in industries and occupational groups such as health care and carpentry may not provide insight into the claims behavior in the temporary help services sector. The results of the limited research reporting on workers' compensation claims by THS workers employed

through staffing agencies are contradictory. Mayhew and Quinlan (2002) determined that THS workers in the fast food industry had lower awareness of workers' compensation policies than directly hired workers. In contrast, Park and Butler (2001) reported, based on analysis of workers' compensation claims by THS workers in Minnesota from 1991 to 1996, that workers employed through staffing agencies incurred workers' compensation costs four times those of standard workers. They found both higher degrees of severity of claims and higher claim frequency rates and ascribe the difference in part to moral hazard behavior on the part of staffing agency workers. In the 20 years elapsed since the study period for the Park and Butler research, THS worker occupations have diversified, including into higher skill and higher paying jobs, and shifted into manufacturing, transportation, and health services. (Dey et. al. 2017, Luo et. al. 2010, Katz and Krueger 2016) The number of temporary help services workers has grown by 149%.⁶ With the maturation and expansion of the THS employment industry over the past 20 years, claims patterns and behavior may have evolved.

Temporary help services workers have been shown by several studies over an extended number of years to have a higher level of injury than directly-hired workers. (Mayhew et. al. 1997, Foley 1998, Silverstein et. al. 2002, Underhill and Quinlan 2011) The high incidence of work-related injury may be explained in part by the short tenure of staffing agency jobs, which last on average 12-14 weeks.⁷ Breslin and Smith (2006) demonstrated an association between short tenure at a particular workplace to increased risk for injury due to lack of familiarity with work practices and the workplace, insufficient safety training, and the higher probability of

⁶ Data from the BLS Quarterly Census of Employment and Wages, accessed 12/22/2016.

⁷ From the American Staffing Association at <http://www.americanstaffing.net/statistics/faqs.cfm>, accessed on 1/9/2014.

short tenure workers being younger. Short tenure may not fully explain higher THS worker injury rates, however. Ellen et. al. (2012) found, through focus groups and in depth interviews, that employers, in some instances, purposefully hired THS workers to carry out risky assignments in order to protect their standard, directly-hired employees. With the precarious nature of the contract, moreover, THS workers may have less ability to refuse hazardous work or petition for appropriate protective equipment. (Mayhew et. al. 1997)

The incentive effects of experience rating on staffing agencies may differ than the effects on other employers. As the “employers of record” for the worker, staffing agencies are responsible for compliance with all labor regulations, including state workers’ compensation insurance requirements. While staffing agencies obtain workers’ compensation insurance for THS workers and are subject to experience modifications based on injuries to their workers, they do not directly control the training and safety measures that may affect the likelihood of worker injury. Employers with more injuries that lead to filing of workers’ compensation claims pay higher workers’ compensation insurance rates. Staffing agencies are subject to similar incentives to avoid injuries for which claims are filed as standard employers but limited in their ability to respond to the incentives. The incentive to avoid costly experience resulting from workers’ compensation claims filing, moreover, may be weaker for staffing agencies. Staffing agencies are reputed to charge client employers for workers’ compensation insurance costs for the THS worker through their mark-up over the wage rate.

Methods

The objective of the research is to gain empirical understanding of workers’ compensation claiming behavior of temporary help service workers hired through staffing

agencies and workers directly hired by employers, which requires access to both categories of workers. THS workers represented 2.9% of the U.S. workforce in 2015.⁸ As Foley et. al. (2014) point out, given the small percentage of the workforce employed through staffing agencies, a survey of establishments may fail to capture a robust picture of THS workers placed in third party workplaces across the range of industries. To reach a broad group of THS workers, the research relies on a survey of workers accessed directly.

Survey. The methodology for gathering data on workers' compensation claims behavior of directly-hired and THS workers is a large scale mobile-phone based survey. The use of mobile phones to deliver the survey addresses shortcomings of traditional landline based surveys. Due to an increase in the proportion of adults who are either exclusively or primarily mobile phone subscribers, traditional surveys relying on direct dial to landlines increasingly suffer from noncoverage error, declining contact and cooperation rates, reduced representativeness, and lower data quality. (Steeh et. al. 2007)

While comparability across mobile phone-based surveys is limited by rapidly evolving populations, platforms, and features, mobile phone-based surveys have performed well in experimental studies. (Link et.al. 2014) De-Bruijne and Wijnant (2014) found higher survey completion rates for surveys taken using smartphones than for other devices. Ha et. al. (2016) found equivalent data quality between surveys taken on smartphones and laptops, although laptop entered surveys had higher completion rates on open-ended questions. Given the

⁸Data from the BLS Quarterly Census of Employment and Wages, accessed 12/22/2016.

intermittent nature of general cell phone usage, shorter and simpler surveys are considered more effective. (Link et. al. 2014)

The survey application used is designed to function across a wide range of mobile technology platforms, so respondents are not limited to a single or small number of common platforms, thereby expanding the sample frame. The flexibility to invite participation of respondents across multiple platforms addresses a limitation raised by Buskirk and Andrus (2013) on generalizability as a result of the technology constraint that permitted response by users of only one operational system.

The mobile phone survey method offers advantages in access to the population of THS workers targeted by the study. It enables greater access to younger and working adults than a traditional survey. (Link et. al. 2007) An estimated 92% of adults owned cellphones in the U.S. in 2015, according to a Pew Research Center survey. (Anderson 2015) Smartphone ownership increased from 35% in 2011 to 68% in 2015, with 86% of those ages 18-29 and 83% of those ages 30-49 owning a smartphone. Smartphone ownership was not found to differ across racial and ethnic groups. Smartphone penetration rates are higher among more educated demographics, but exceed 50% across all income levels. Hence, the mobile phone-based survey mechanism provides access to workers at a range of income levels.

While demographic data specific to THS workers have not been collected by the Bureau of Labor Statistics since the Current Population Survey supplement on Contingent and Alternative Work Arrangements (CWS), last completed in 2005 and scheduled to resume in 2017, the Census Bureau's American Community Survey gathers data at the level of the

employment services industry.⁹ Temporary help services workers represented 81% of workers on the employment services industry in 2015.¹⁰ Compared to workers in all industries, employment services industry workers are notably younger, with strong representation in the 26-35 year old range. The employment services industry worker population includes more women than the total worker population. Workers in the employment services industry are less likely to have earned an advanced degree beyond college, with only 7% holding a degree beyond a bachelor's degree compared to 12% of the population. (Nicholson 2015)

Katz and Krueger (2016) conducted a survey that sought to replicate the CWS on a smaller scale. Logit regression analysis indicates that workers with less education have a higher probability of holding THS jobs than workers with higher levels of education. Although the proportions of workers in all forms of alternative work arrangements show that White workers represent 80% of all workers in alternative work arrangements, the likelihood of an African-American or Hispanic worker being a THS worker appears to be higher than that for a White worker in their sample of THS workers. The Katz and Krueger estimates regarding THS workers, however, are based on a small number of THS workers – 35 out of the total sample of 2,196 workers.

As with an online survey, the sample recruited for the mobile phone-based survey cannot be considered random. Probabilistic inferences to the population of workers cannot be made. (Tourangeau et. al. 2013) A 2010 survey comparison study, however, found that an opt-

⁹Data from the Census Bureau's American Community Survey were drawn from Nicholson 2015.

¹⁰Employees of professional employment organizations and executive search services constitute the balance of the industry. Calculations are based on data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages, accessed 1/4/2017.

in online panel produced results as accurate as a random digit dialing sample. (Ansolabehere and Schaffner 2014) Moreover, the post-survey stratification of the sample into standard workers and THS workers allows for testable comparisons to be made between the two groups within the sample.

The 2005 CWS yielded a lower share of THS workers in the workforce based on information provided by individuals about their employment arrangements, than the share calculated based on the Current Employment Statistics based on data provided by employers. (Bernhardt et. al. 2016) The difference between these two surveys raised questions about workers' ability to identify themselves as THS workers. A possible confounding issue in the case of the CWS was the use of the term "temporary" both to describe the expected duration of employment or disability early in the survey and to describe a type of employer later in the survey when trying to identify THS workers.¹¹

This survey included only one usage, in the expanded expression "temporary help agency or staffing agency" to describe employers of THS workers in order to facilitate THS worker self-identification. Further, this survey not only asked the respondents who paid them, as in the CWS, but also inquired about the nature of the position the worker held at the workplace or work site where the worker became ill or injured. The use of mobile technology allowed for those who selected the responses consistent with being a THS worker based on either concept to complete confirmatory questioning.

¹¹ For example, question PES2-2 asks, "Even though you told me your job was not temporary, are you paid by a temporary help agency?" From <https://www.census.gov/prod/techdoc/cps/cpsfeb05.pdf>.

Analysis. A claim-filing model is estimated using logistic regression with the binary dependent variable coded as $Y=1$ if a respondent who experiences a work-related injury or illness files a workers' compensation claim and $Y=0$ if not. A key independent variable of interest is the dummy variable THS_i indicating whether the worker was employed by a staffing agency at the time of the work-related injury or illness. A vector of other independent variables X_i includes indicators of injury severity, human capital, worker demographics, and employer characteristics. The logistic regression equation follows:

$$p = \frac{1}{1 + e^{-(\beta_0 + \beta_1 THS_i + \beta_2 X_i)}}$$

Include in the vector of independent variables X_i , injury severity has been shown through prior empirical studies to be a factor affecting the decision to file a claim. (Tucker et. al. 2014, Biddle and Roberts 2003, Rosenman et. al. 2000) Human capital variables included provide indicators both of firm-specific human capital (tenure) and of general human capital (educational attainment). With increased tenure, the information asymmetry regarding worker safety practices would be expected to be lower, reducing the opportunity for moral hazard behavior on the part of the worker. This would suggest that the coefficient would be negative. However, with increased tenure, workers may be more likely to have familiarity with employer human resources policies and procedures, including regarding workers' compensation. Lack of knowledge of worker's compensation policies and procedures may constitute a filter that prevents a workers from filing a claims. (Azaroff et. al. 2002) The ability to maneuver through the claims filing process may also be facilitated by a higher level of educational attainment. The

predicted effect of tenure, therefore, is uncertain, while the effect of educational attainment is expected to be positive.

Worker demographic variables are included in the model due to potentially confounding differences between THS and standard worker groups. Women are more highly represented in employment services and black or Hispanic workers are more likely to be THS workers. (Katz and Kreuger 2016) Since THS workers are on average younger, age at injury or illness is included as a variable. (Nicholson 2015) Age may also serve as a weak proxy for general health, known to affect filing propensity. (Biddle and Roberts 2003) While logic would suggest that workers without health insurance would be more likely to seek workers' compensation to cover medical costs, health insurance was found through empirical study to be positively associated with workers' compensation benefits due to differences in employer characteristics between employers that offer and do not offer health insurance. (Lackdawalla et. al. 2007) Because THS workers may be less likely to have health insurance, a variable for health insurance is included. (Dillender 2015)

As prior studies have noted that worker claim-filing can vary by industry, due to differences in unionization and other cultural factors, the model controls for industry by NAICS 2 digit code. (Fan et. al. 2006, Morse et. al. 2005) For directly-hired workers, the variable "industry" refers to the industry of their employer. The NAICS 2 digit industry designation for all THS workers is "Employment Services." For THS workers in the survey, however, the variable "industry" refers to the industry of the employer to which the THS worker was assigned when injured or ill due to work. The inclusion of this variable "industry," allows for controls for

differences in environmental factors across workplaces where work-related injuries or illnesses took place.

An ordinal variable for employer size is included because firms with very few workers are not required to hold workers' compensation insurance in several states. Further, underreporting in the construction industry was found to be more common among small employers. (Dong et. al. 2011) Guo and Burton (2010) included a variable for large employers in their analysis of benefit payments. Large employers may have greater human resource capacity or more formalized procedures to support workers' compensation claims.

Data

Data were collected between March 1 and March 15, 2017, through a two part survey. A total of 10,417 respondents completed the first part of the survey, which was designed to identify individuals who had experienced a work-related injury or illness during the five year period from January 1, 2012, to January 1, 2017. A national panel of 30,000 working-age adults assembled by the mobile technology and research firm Embee Mobile, Inc., was invited to take the survey.

Table 1 presents information on the demographics of the respondents to the first part of the survey. Representation of female, Black, and Asian individuals is greater than in the population of employed persons, while representation of Hispanic individuals is lower. The sample of respondents skews younger than the population of employed persons, as expected, given the mobile-based survey delivery platform. The sample also includes a low percentage of individuals over 25 years old with Bachelor's and advanced degrees.

Table 1
Demographic Statistics of Survey Respondents
Compared to U.S. Employed Persons and Population

	Sample ¹	Employed, U.S., 2016 ²	Population, U.S., 2015 ³
<u>Gender</u>			-
Male	47.3%	53.2%	49.2%
Female	52.7%	46.8%	50.8%
<u>Race and Ethnicity</u>			
White	61.5%	78.8%	77.1%
Black	13.9%	11.9%	13.3%
Asian	6.9%	6.1%	5.6%
Mixed Race	6.6%		2.6%
Other	11.0%	3.3%	1.4%
Hispanic	13.8%	16.7%	17.6%
<u>Age</u>			
16-19	3.7%	3.3%	5.3%
20-24	11.7%	9.3%	7.0%
25-34	33.2%	22.3%	13.7%
35-44	25.6%	20.8%	12.6%
45-54	16.0%	21.6%	13.4%
55-64	7.9%	16.9%	12.7%
65+	2.0%	5.9%	14.9%
<u>Educational Attainment (>25)</u>			
Some High School	8.0%	7.5%	11.6%
High School Degree	25.8%	25.5%	29.5%
Some College	33.6%	16.4%	16.6%
Associate Degree	12.7%	11.1%	9.8%
Bachelor's Degree	14.0%	24.5%	20.5%
Advanced Degree	6.1%	15.0%	12.0%

Sources: ¹Survey data, ²U.S. Bureau of Labor Statistics, and ³U.S. Census Bureau

Of those who completed the first part of the survey, the 1,032 respondents who had experienced a work-related injury or illness from 2012 to 2017 were invited to take the second

part of the survey. A total of 783 of these respondents completed the second part of the survey, yielding a response rate of 76%. The two part approach to survey delivery may have helped to raise the response rate to the second part of the survey, but inhibits comparison of response rates to single stage surveys. The two part approach means, further, that the survey did not gather data for as many variables from respondents who did not suffer any work-related injury or illness. The data do not permit, for example, calculation of the proportion of respondents without work-related injuries or illnesses by industry. The survey, nonetheless, does allow for exploratory analysis of workers' compensation claims-behavior of respondents who did suffer work-related injuries or illness.

Of those respondents who completed the second part of the survey, 79 were working for a temporary help services agency when a work-related injury or illness occurred. At 10.1%, the percentage of survey participants who were temporary help services workers when injured is substantially greater than the 2.9% of the workforce employed in the THS sector in 2015.¹² The difference is consistent with the higher propensity of THS workers to become injured or ill compared to standard workers. (Mayhew et. al. 1997, Foley 1998, Silverstein et. al. 2002, Underhill and Quinlan 2011) It also reflects the overlap, hypothesized in advance of the survey, between the THS worker population and the mobile survey-taking population in age and educational attainment.

¹² Data from the BLS Quarterly Census of Employment and Wages, accessed 12/22/2016.

Results

Descriptive Analysis. The respondents who reported a work-related injury or illness during the five year period from January 1, 2012, to January 1, 2017 were employed in a wide range of industries when the work-related injury or illness occurred. The distribution across industries, according to NAICS code, is presented in Table 2. The proportion of all workers who became injured or ill due to work was highest in retail trade, transportation and warehousing, and health care and social assistance. The distribution of work-related injuries and illnesses across industries in the U.S. in 2015 according to the Survey of Occupational Injuries and Illnesses (SOII) is shown for reference. The survey sample, although not probabilistic, exhibits similarity to relative rates of injury by sector to those reported to the SOII. With the exception of transportation and warehousing, the five industries with the highest injury or illness rates are the same for the survey sample and the SOII. Respondents to the survey employed in public administration are shown in this table for completeness, but these were excluded from the analysis of workers' compensation claim behavior due to differences between workers' compensation insurance programs for government employers and those for private employers.

Table 2
Industry of Respondents Reporting a Work-Related Injury or Illness, 2012-2017¹³

	THS ¹	Employee ¹		U.S. ²
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	2.5%	2.9%		1.9%
Mining, Quarrying, Oil and Gas Extraction (NAICS 21)	1.3%	0.6%		0.4%
Utilities (NAICS 22)	0.0%	1.9%		0.4%
Construction (NAICS 23)	3.8%	8.5%		7.0%
Manufacturing (NAICS 31-33)	26.6%	10.1%		16.1%
Wholesale Trade (NAICS 42)	0.0%	1.2%		6.0%
Retail Trade (NAICS 44-45)	5.1%	14.4%		14.1%
Transportation and Warehousing (NAICS 48-49)	13.9%	12.7%		6.9%
Information (NAICS 51)	7.6%	3.2%		1.1%
Finance, Insurance, and Real Estate (NAICS 52-53)	1.3%	1.3%		2.7%
Professional and Business Services (NAICS 54-56)	7.6%	4.8%		7.4%
Educational Services (NAICS 61)	7.6%	6.6%		1.3%
Health Care and Social Assistance (NAICS 62)	15.2%	11.8%		20.6%
Arts, Entertainment, and Recreation (NAICS 71)	0.0%	1.3%		1.9%
Accommodation and Food Services (NAICS 72)	7.6%	12.6%		9.5%
Public Administration (NAICS 92)	0.0%	6.2%		n/a
N =	79	696		

Sources: ¹Survey data; ²Author’s calculations based on Survey of Occupational Injury and Illness (SOII) 2015 data

Temporary help services agency-employed workers who experienced a work-related injury or illness were concentrated in third party workplaces in a few industry categories. The highest proportion of THS workers who experienced a work-related injury or illness was at workplaces in manufacturing, followed by health care and social assistance and transportation and warehousing. While data on THS employment by industry of workplace are not collected through Bureau of Labor Statistics or Census surveys, a breakdown of THS employment by occupation is suggestive of industries to which THS workers are more likely to be assigned. The three broad occupational categories in which THS employment is concentrated are

¹³ The “industry” of THS workers here refers to the industrial classification of the client firm to which the staffing agency assigned the THS worker. See Methods section for discussion.

transportation and material moving occupations (24.4%), productive occupations (23.5%), and office and administrative support occupations (18.4%).¹⁴ The elevated proportion of injuries and illnesses in the sample in manufacturing and in transportation and warehousing may in part reflect this occupational distribution of THS workers.

Table 3
Work-Related Injuries and Illnesses Reported, by type

	THS	THS	Employee	Employee
Injury				
Back or neck injury	14	17.7%	148	21.3%
Shoulder injury	5	6.3%	61	8.8%
Other strain or sprain	14	17.7%	90	12.9%
Cut or puncture wound	17	21.5%	101	14.5%
Contusion/bruise	4	5.1%	28	4.0%
Dislocation	1	1.3%	9	1.3%
Fracture	5	6.3%	44	6.3%
Other Injury	7	8.9%	147	21.1%
Illness				
Respiratory condition	2	2.5%	15	2.2%
Poisoning	3	3.8%	6	0.9%
Hearing or vision loss	0	0.0%	1	0.1%
Skin disorder	0	0.0%	7	1.0%
Other Illness	7	8.9%	39	5.6%
Total	79	100%	696	100%

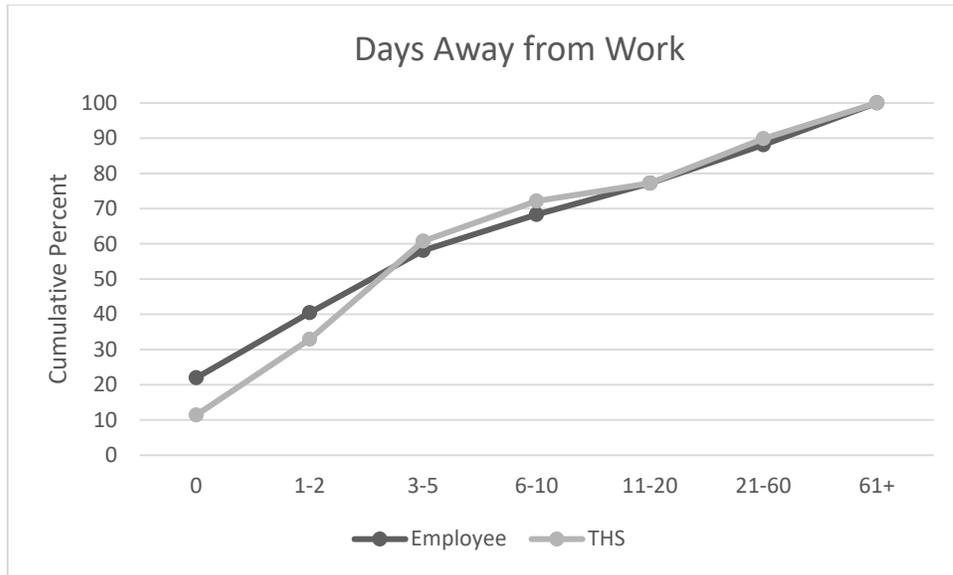
Source: Survey data

Types of work-related injuries or illnesses reported by survey respondents are presented in Table 3. Roughly similar distributions of types of injuries or illnesses are observed for THS workers and standard, directly-hired employees, although employees had more non-specified

¹⁴ Bureau of Labor Statistics Occupation Employment Statistics 2016 estimates, located at https://www.bls.gov/oes/current/naics5_561320.htm, accessed on 4/2/17

injuries or illnesses. THS workers suffered a higher rate of cut or puncture wounds, sprains or strains.

Figure 1



The mean number of days missed due to work-related injury or illness by THS workers was 18 days, while the mean number of days missed for directly-hired workers was 32 days. Only 5% of THS workers subject to work-related injury or illness missed more than 90 days, while 10% of directly-hired workers subject to work-related injury or illness missed more than 90 days of work. The difference in means is statistically significant at the 5% level ($t=2.97$). The cumulative percentage of mean number of days missed for THS workers and employees, shown in Figure 1, however, exhibit similar trajectories. A Pearson's chi-squared test of the difference in medians, moreover, does not show a difference in median number of days missed due to work-related injury or illness between THS workers and standard workers ($p=0.81$).

Table 4
Transferred or Restricted Workers and DART*

	THS	THS	Employee	Employee
Transferred or Restricted	39	49.4	303	43.5
No Transfer or Restriction	40	50.6	394	56.5
Total	79	100.0	697	100.0
DART	71	89.9	579	83.1
No DART	8	10.1	118	16.9
Total	79	100.0	697	100.0

*Workers with injuries/illnesses warranting Days Away, Transfer, or job Restriction

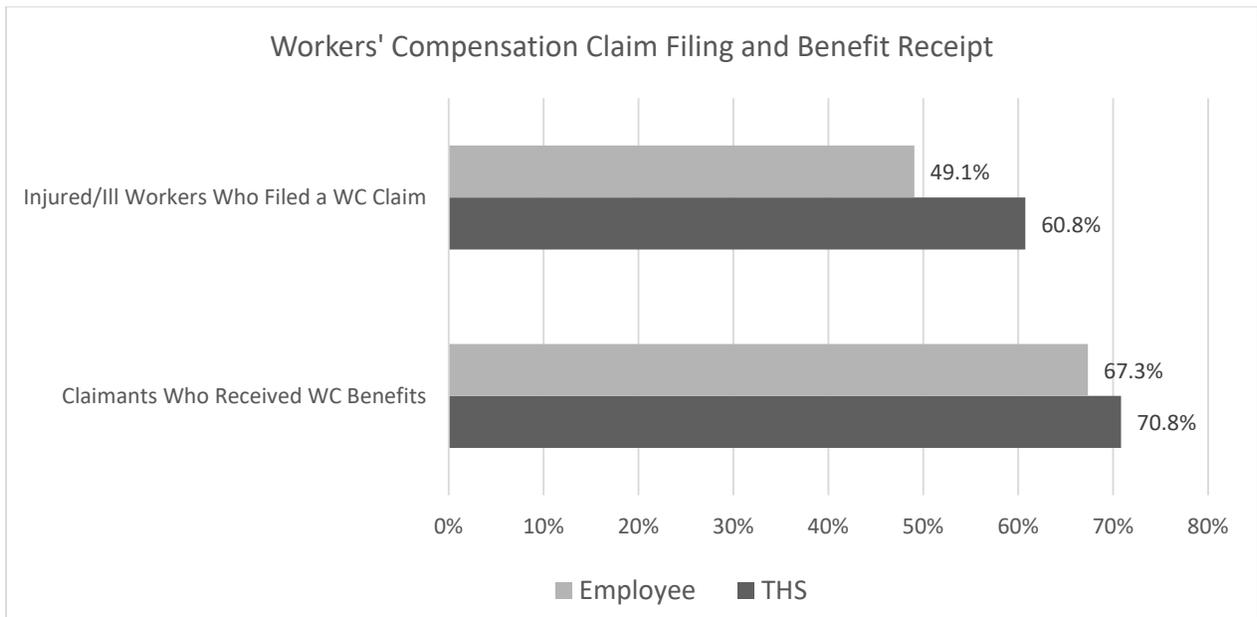
Source: Survey data

The percentage of THS workers who were subject to job transfer or restricted activity was 49.4%, while the percentage of directly-hired workers who were subject to job transfer or restricted activity was 43.5%. The difference of means, however, was not found to be statistically significant ($t=0.99$). That is, injured or ill THS workers and directly-hired workers were reassigned or limited in activity at roughly an equivalent rate. The overlap between missed days of work and job transfer or activity restriction was substantial in the survey sample. Of those injured or ill workers who missed days of work, 49.8% also had their jobs transferred or activity restricted. The percentage of THS workers who experienced work-related injuries or illnesses warranting either days away from work or job transfer to restriction (DART) was significantly higher than the percentage of directly-hired workers, possibly indicating a higher average degree of severity of injuries or illnesses.

Workers' Compensation Claim Results. A greater percentage of THS workers with work-related injury or illness filed workers' compensation claims than directly-hired workers. Of standard, directly-hired employees with work-related injuries or illnesses, 49.1% filed claims, while 60.8% of THS workers filed claims. The 11.7% difference in claims-filing in this survey

sample between THS workers and directly-hired workers, shown in Figure 2, is significant ($t=2.001$). While the finding of an elevation in claims filing by temporary help agency-hired workers is consistent with prior empirical work by Park and Butler (2001), the magnitude is dramatically smaller. Park and Butler estimated, based on aggregate data, that THS workers in Michigan between 1991 and 1996 were 4 times as likely to file a claim as directly-hired full time workers and attributed the difference to a higher propensity to file a claim as well as higher incidence of injury. This survey finds a comparatively modest difference in propensity to file a claim if injured or ill for THS workers than directly hired workers. Detailed testing and analysis of claims filing behaviors follows in the Regression Analysis section.

Figure 2



THS workers who filed a claim appear to receive workers' compensation benefits slightly more frequently than directly-hired workers who filed a claim. Testing of the difference, however, indicates no statistically significant difference in the rate of workers' compensation

benefit awards between the groups in this survey ($t=0.492$), due possibly to sample size. A comparison of the frequency of benefits receipt by THS and standard, directly-hired workers merits further study with a larger sample. This survey indicates that THS agencies accepted workers' compensation claims at either a higher or the same rate as other employers. This suggests that THS workers' work-related injuries or illnesses were equally likely to be seen by staffing agencies and their insurers as qualifying for workers' compensation as standard employees' work-related injuries or illnesses were seen by direct-hire employers and their insurers and qualifying for workers' compensation. THS workers subject to work-related injury or illness did not make more claims that staffing agencies or insurers found spurious. Further analysis of benefit receipt follows in the discussion section.

Regression Analysis. Controlling only for indicators of injury severity, the base model yields no statistically significant difference in the probability of a THS worker and a standard worker in the survey sample filing a worker's compensation claim if subject to a work-related injury or illness. Table 4 presents the results of logistic regression analysis of claims behaviors in terms of odds ratios. When controlling for differences in indicators of human capital, the difference becomes statistically significant. Stepwise addition of controls widens the difference in the odds of filing a worker's compensation claim between THS workers and traditional, directly-hired workers in the sample. When controlling for human capital factors, worker demographics, and employer characteristics, the analysis finds that THS workers are more likely to file a workers' compensation claim if injured or ill due to work than standard workers.

The odds ratio estimates reported in Table 5 indicate that, conditional on work-related injury or illness, the odds of a THS worker filing a claim are approximately 1.9 times the odds of

a standard, directly-employed worker filing a claim, controlling only for injury severity and human capital factors. With controls of injury severity, human capital factors, worker demographics, and employer characteristics, the odds of a THS worker filing a claim are approximately 2.1 times the corresponding odds of a standard, directly-employed worker filing a claim. While these estimates are statistically significant at the one percent level of significance, the odds ratios may seem to suggest a more dramatic difference than is the case.

To facilitate the intuition of the magnitude of the difference in probability of filing a workers' compensation between THS workers and standard workers, linear probability regression models using equivalent sets of control variables were also evaluated. (See Appendix 1 for a reporting of the complete results of the linear probability regressions.) The results of the linear probability regression models were consistent with the results of the logistic regression models, as expected since the modeled probabilities are not close to the extremes of 0 or 1. Controlling for injury severity and human capital factors, THS workers who experience a work-related injury or illness are an estimated 14.1% more likely to file a workers' compensation claim than a standard worker. With the addition of worker demographics and employer characteristics, the estimated difference increases to 15.5%.

THS status is one of several variables significantly associated with a higher odds of claim filing. Factors related with a higher odds of a worker subject to a work-related injury or illness filing a workers' compensation claim fall in the categories of injury severity, human capital, worker demographic characteristics, and employer industry and size. The number of days of work missed serves as a key indicator of severity of injury or illness, reflecting evidence that the severity of a workers' condition is a key determinant of the decision to file a claim. (Biddle and

Roberts 2003) For each additional day missed, the odds of a worker who experienced a work-related injury or illness filing a claim increase by .004. (The probability of filing a claim increases by 0.08% for each additional day missed, per the linear probability model. See Appendix 1.) The odds of filing a claim are also positively correlated with worker job transfer or activity restriction, either without or with controls for human capital, demographic, and employer characteristics.

The odds of workers' compensation claim filing increases with greater job tenure. This is consistent with the hypothesis that workers' with greater tenure have the opportunity to acquire increased knowledge of workers' compensation policies and procedures, but does not support the moral hazard theory-based proposition that increased tenure leads to lower information asymmetry which leads to fewer moral hazard-induced claims. The result affirms the assertion that increasing job instability in the U.S. labor market may make workers less likely to file a workers compensation claim (Azaroff et. al. 2004). Conditional on experiencing a work-related injury or illness, a worker with one additional year of tenure has an odds of filing a claim that is 1.09 times the odds of a worker with one fewer year of tenure.¹⁵

While firm-specific experience is found to be correlated with claims behavior, general educational attainment is not. The set of educational attainment variables are not significant as a group ($p=0.263$). The only significant coefficient is on the "less than high school variable." Workers with less than a high school education have a lower likelihood of filing a workers' compensation claims.

¹⁵A one year increase in job tenure is associated with an estimated 1.6% higher probability of filing a workers' compensation claim, according to the linear probability model. See Appendix 1.

Table 5
Logit Odds Ratio Estimates of Factors Affecting Workers' Compensation Claim Filing

VARIABLES	(1) Base	(2) +Human Capital	(3) +Worker Demographics	(4) +Employer Characteristics
Filed Workers Comp Claim	(.)	(.)	(.)	(.)
Temporary Help Worker	1.575 (0.44)	1.877** (0.54)	2.022** (0.60)	2.140** (0.68)
Work Days Missed	1.005*** (0.00)	1.004*** (0.00)	1.004*** (0.00)	1.004*** (0.00)
Transferred Job or Activity Restricted	2.109*** (0.35)	2.228*** (0.38)	2.245*** (0.39)	2.273*** (0.42)
Work Tenure at Injury/Illness		1.106*** (0.03)	1.086*** (0.03)	1.087*** (0.03)
Education = 1, Some High School		0.414** (0.17)	0.410** (0.17)	0.363** (0.16)
Education = 3, Some College		1.017 (0.21)	1.050 (0.23)	1.036 (0.24)
Education = 4, Associate Degree		1.063 (0.31)	1.072 (0.32)	1.015 (0.33)
Education = 5, Bachelors Degree		1.094 (0.31)	1.197 (0.35)	1.119 (0.35)
Education = 6, Advanced Degree		1.255 (0.55)	1.139 (0.51)	1.379 (0.67)
Female			1.072 (0.19)	0.911 (0.18)
Race = 2, Black			1.072 (0.30)	1.081 (0.32)
Race = 3, Asian			0.708 (0.29)	0.792 (0.35)
Race = 4, Mixed Race			0.455** (0.16)	0.410** (0.15)
Race = 5, Other			0.466** (0.17)	0.466** (0.18)
Hispanic			0.438*** (0.14)	0.395*** (0.13)
Age at Injury/Illness			1.020** (0.01)	1.015 (0.01)
Had Health Insurance at Injury/Illness			0.832 (0.17)	0.788 (0.18)
Industry by NAICS = 1, Construction				0.471 (0.24)
Industry by NAICS = 2, Mining or Oil				0.0951* (0.13)

Table 5, cont.

	(1)	(2)	(3)	(4)
Industry by NAICS = 3, Transportation or Warehousing				0.665 (0.30)
Industry by NAICS = 4, Health Services				0.892 (0.41)
Industry by NAICS = 5, Manufacturing				0.577 (0.26)
Industry by NAICS = 6, Retail Trade Sales				0.546 (0.25)
Industry by NAICS = 7, Information Services, Data, Telecom, or Publishing				0.165*** (0.10)
Industry by NAICS = 8, Finance, Insurance, or Real Estate				0.347 (0.27)
Industry by NAICS = 10, Education				0.884 (0.45)
Industry by NAICS = 11, Hotel or Food Services				0.414* (0.19)
Industry by NAICS = 12, Arts or Entertainment				0.602 (0.53)
Industry by NAICS = 14, Agriculture, Forestry, Fishing or Hunting				0.795 (0.52)
Industry by NAICS = 15, Electric, Gas, Water Utilities				0.897 (0.70)
Industry by NAICS = 16, Wholesale Trade				0.553 (0.61)
Employer Size = 1, 1-4				0.453** (0.17)
Employer Size = 2, 5-9				0.374** (0.15)
Employer Size = 3, 10-19				1.049 (0.38)
Employer Size = 4, 20-49				1.195 (0.42)
Employer Size = 6, 100-249				0.725 (0.27)
Employer Size = 7, 250+				0.951 (0.29)
Constant	0.706*** (0.08)	0.436*** (0.09)	1.463 (0.99)	4.840* (4.25)
Observations	648	648	645	642

Standard errors in parentheses in exponential form.

*** p<0.01, ** p<0.05, * p<0.1

The industry in which the worker is employed, or assigned in the case of THS workers, influences the odds of filing a workers' compensation claim, consistent with earlier findings. (Fan et. al. 2006, Morse et. al. 2005) The set of industry indicator variables is significant as a whole ($p=0.047$). Employer size is not a significant determinant of the odds that a worker with a work-related injury or illness will file a workers' compensation claim for employers with 10 or more employees ($p=0.717$). A worker with a job-related injury or illness has a lower odds of filing a workers' compensation claim if the employer has 9 or fewer workers, as expected due to exemptions from the requirement to obtain worker's compensation insurance for small employers in many states. Qualitative comments, moreover, suggest that injured or ill workers in very small businesses did not want to impose a cost on a small business owner.

An additional factor investigated, but not included in the main model above, since a novel variable not previously tested, is employer helpfulness with workers' compensation claims. A prior finding that claims propensities vary across workplaces was unable to explain the variation. (Biddle and Roberts 2003) Industry is one factor shown above to be correlated with workers' claiming behaviors. This analysis further reveals that the odds of a worker filing a workers' compensation claim are dramatically lower in cases where the employer is not helpful, negative/discouraging, or very negative/discouraging than if the employer is somewhat helpful, as shown in Table 6 below. The survey data suggest, controlling for industry and employer size, the existence of employer high road and low road approaches to workers' compensation, with one-third of employers very helpful and one-fifth of employers discouraging or very discouraging to workers who experience a work-related injury or illness. Those employer

approaches are substantially related to the odds that a worker injured or ill from work will file a claim for workers' compensation benefits.

Table 6
Logit Odds-Ratios Estimates for Employer Helpfulness,
Compared to "Somewhat Helpful"

VARIABLES	Model 4 Variables +Employer Helpfulness
Filed Workers Comp Claim	(.)
Very Helpful	0.906 (0.23)
Not Helpful	0.238*** (0.07)
Negative/Discouraging	0.254*** (0.11)
Very Negative/Discouraging	0.300*** (0.11)
Constant	6.408** (5.99)
Observations	634

Standard errors in parentheses in exponential form.

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

The odds of a worker who has been subject to a work-related injury or illness whose employer was not helpful, negative or discouraging, or very negative or very discouraging, of filing a workers' compensation claim are statistically significantly lower than one whose employer was very helpful or somewhat helpful at the one percent level of significance. To give a sense of the scale of the effect, according to linear probability regression analysis, injured or ill workers are an estimated 26%-30% less likely to file a claim if their employer is not at least somewhat helpful. (See Appendix 1.) Employers were reported as not helpful in 23.2% of cases, and discouraging or very discouraging in 19.2% of cases.

The distribution of reported degree of helpfulness of THS agencies was very similar to that of other employers. Inclusion of the helpfulness variable does not materially alter the relationship of THS status to claims filing. Claims propensities are not statistically significantly different between employers that are somewhat or very helpful. Similarly, claims propensities are not statistically significantly different among employers that are not helpful, negative or discouraging, or very negative or discouraging.

Another factor affecting claims-filing not yet addressed in the empirical literature is worker recourse to lawyers for guidance regarding workers' compensation claims. In this survey sample, 12.6% of those injured or ill due to work consulted a lawyer, as shown in Table 7. The frequency of worker consultation of a lawyer exhibits differences at different reported degrees of helpfulness of the employer. Only 9.1% of those who considered their employers to be somewhat or very helpful consulted lawyers, while 18.1% of those who considered their employers to be not helpful, discouraging, or very discouraging did so. The difference is statistically significant ($t=3.621$). Due to concerns about simultaneity of effects, a variable representing consultation of a lawyer is not included in the logistic regression equation.

Table 7
Recourse to Lawyers or State Workers' Compensation Agencies

	THS	Employees	All
Consulted a lawyer	19.0%	11.9%	12.6%
Sought information from a state agency	27.8%	14.6%	16.0%

Source: Survey data

It is noteworthy that THS workers consult lawyers more frequently than standard workers, although the difference is significant only at the 10% level of confidence. Nearly one

out of five THS workers consulted a lawyer. THS workers were, furthermore, substantially more likely to seek information from a state workers' compensation agency or department, with a numerically large and statistically significant difference from standard workers ($t=2.52$).

Discussion

The greater propensity of THS workers to file workers' compensation claims, controlling for a vector variables including injury severity, human capital, demographic, and employer variables, raises the question whether THS workers subject to work-related injury or illness are filing a greater proportion of spurious claims. Park and Butler (2001) found that THS workers had a lower rate of benefit receipt, and interpreted this as indicative of a difference from standard workers in the balance of moral hazard, with THS workers filing more claims and with THS agencies contesting relatively more claims due to concerns about greater THS worker moral hazard behavior or higher THS worker costs. In this survey sample, staffing agencies and their insurers accept roughly the same percentage of claims by workers subject to work-related injury or illness as legitimate and consistent with eligibility requirements as employers who directly hire workers and their insurers. Logistic regression analysis of workers' compensation insurance benefits receipt, moreover, reveals no difference between THS claimants and directly-hired claimants in their odds of receiving workers' compensation benefits. (See Appendix 2 for results of the logistic regression analyses with benefit receipt as the dependent variable.) We must look beyond moral hazard to explain the elevated rate of claims by THS workers injured or ill due to work than standard, directly-hired workers.

A variant of the question why THS workers have a higher odds of filing a claim is why standard workers are less likely to file a claim for a work-related injury or illness. The survey gathered quantitative and qualitative data from respondents about why workers injured or ill due to work did not file a workers' compensation claim. Quantitative data are presented in Table 8. Questions about eligibility were the most common reason for THS workers or standard employees not to file, with qualitative comments corroborating that workers did not believe or were uncertain that the injury was serious enough or that the illness was covered. Concerns about insufficient severity, sometimes unfounded, and ignorance regarding eligibility have been cited as reasons for not filing claims in prior research. (Spieler and Burton 2012, Fan et. al 2006, Biddle and Roberts 2003) The second most common reason for standard employees not filing a claim was worry about job loss. The percentage of standard employees concerned about being fired is higher than for THS workers. When additional qualitative comments about the expectation of job loss as a consequence of attempting to file a workers' compensation claim are included, nearly 20% of standard employees who chose not to file a claim believed that filing a claim would cause them to lose their jobs.

A reason for not filing a workers' compensation claim reported by standard workers but not by THS workers was that the standard employer offered money or other benefits to the injured or ill worker as a means to prevent the filing a claim. Respondents employed as standard, directly-hired workers reported being offered cash or paid time off as recompense. Such offers were not made in any instances to the injured or ill THS workers surveyed. The mechanisms for THS agency payment of workers based on invoicing of client employers may not leave THS agencies with flexibility to provide cash or paid time off. Another type of

rationale expressed through qualitative comments by standard workers, but not THS workers, was the decision not to file a workers' compensation claim as an act of kindness, generosity, or loyalty to the employer.

Table 8
Reasons Workers Did Not File a Workers' Compensation Claim

	Employees		THS	
I did not think I was eligible.	113	40.9%	8	33.3%
I was worried I would lose my job.	43	15.6%	3	12.5%
I did not have time.	28	10.1%	2	8.3%
I was offered money or other benefits instead of workers' compensation.	22	8.0%	0	0.0%
I did not have enough information about how to file a claim.	20	7.2%	2	8.3%
I thought it would take too long to get workers' compensation benefits.	17	6.2%	1	4.2%
I did not think my employer offered workers' compensation.	12	4.3%	5	20.8%
I was worried it would prevent me from advancing to better assignments.	13	4.7%	2	8.3%
I tried instead to apply for social security disability.	6	2.2%	1	4.2%
I tried instead to apply for unemployment insurance.	2	0.7%	0	0.0%
Total	276	100.0%	24	100.0%

Analysis of the survey sample suggests that THS workers are less likely to forgo filing a claim than a standard worker. THS workers may not feel the same loyalty to the staffing agency that some employees may feel toward their employer. Previous studies have shown that contingent workers, such as THS workers, tend to see their relationship with the employer where they are placed as an economic exchange rather than social exchange. (Moorman and Harland 2002) More THS workers may seek assistance and redress through the formal workers' compensation system since informal mechanisms are less available to them. THS workers in this sample were not made informal offers of cash or time off, while some standard workers were. THS workers are more likely to seek information or assistance from a state government entity or to consult a lawyer, possibly due to the increased complexity regarding liability with both a THS agency and host employer involved. These interactions with lawyers or government

agencies may provide THS workers with additional eligibility or process information that serves to facilitate filing a workers' compensation claim.

While more vulnerable to injury than their standard employee counterparts, temporary help services workers do not seem to be more vulnerable to pressure not to file a workers' compensation insurance claim than standard employees. To the contrary, based on the results of analysis of the survey, standard workers appear to be more subject to claim discouragement or suppression by employers than THS workers are by staffing agencies. Standard employees subject to a work-related injury or illness were more likely to encounter an employer responding with bribery or threats of dismissal. The comparison of the workers' compensation claims behavior of standard employees relative to THS employees suggests that employer response to incentives from experience-rating to reduce claims may dominate worker moral hazard to a greater degree in standard employment relationships than in THS employment relationships. Recent scholarship on the incentive effects of workers' compensation benefits using data through 2004 did not find that worker moral hazard dominated employer moral hazard, as studies using data from the 1980s and before had suggested. (Bronchetti and McInerney 2012, Butler 1994, Krueger 1990) The more recent data could potentially reflect a shift in the dominance of incentive effects from workers to employers, which would be consistent with the decline in workers' compensation insurance benefits since 1990.

The current survey data show a strong effect of employer behavior toward workers who experience work-related injury or illness on the workers' claim behavior. The survey data also reveal, controlling for industry and employer size, the existence of employer high road and low road approaches to workers' compensation, with one-third of employers very helpful to

workers surveyed who experienced a work-related injury or illness. Nearly one out of five traditional employees surveyed who experienced a work-related injury or illness, however, reported a perceived threat of dismissal for filing a workers' compensation claim. A review of state workers' compensation bureau programs intended to support the ability of injured or ill workers to file legitimate workers' compensation claims and to address the behavior of employers following low road workers' compensation practices seems warranted.

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Appendix 1
 Linear Probability Estimates of Factors Affecting Workers' Compensation Claim Filing

VARIABLES	(1) Base	(2) +Human Capital	(3) +Worker Demographic s	(4) +Employer Characteristic s
Filed Workers Comp Claim	(.)	(.)	(.)	(.)
Temporary Help Worker	0.107* (0.06)	0.141** (0.06)	0.152** (0.06)	0.155** (0.07)
Work Days Missed	0.00089*** (0.00)	0.00079*** (0.00)	0.000769*** (0.00)	0.000780*** (0.00)
Transferred Job or Activity Restricted	0.182*** (0.04)	0.186*** (0.04)	0.186*** (0.04)	0.176*** (0.04)
Work Tenure at Injury/Illness		0.0206*** (0.00)	0.0163*** (0.00)	0.0158*** (0.00)
Education = 1, Some High School		-0.195** (0.09)	-0.192** (0.09)	-0.207** (0.09)
Education = 3, Some College		-0.00113 (0.05)	0.00626 (0.05)	-0.00134 (0.05)
Education = 4, Associate Degree		0.0107 (0.07)	0.0138 (0.07)	0.00152 (0.07)
Education = 5, Bachelors Degree		0.0129 (0.06)	0.0326 (0.07)	0.0213 (0.07)
Education = 6, Advanced Degree		0.0467 (0.10)	0.0246 (0.10)	0.0601 (0.10)
Female			0.0125 (0.04)	-0.0200 (0.04)
Race = 2, Black			0.0163 (0.06)	0.0172 (0.06)
Race = 3, Asian			-0.0762 (0.09)	-0.0551 (0.09)
Race = 4, Mixed Race			-0.172** (0.07)	-0.188** (0.07)
Race = 5, Other			-0.164** (0.08)	-0.153* (0.08)
Hispanic			-0.177*** (0.07)	-0.192*** (0.07)
Age at Injury/Illness			0.00423** (0.00)	0.00306* (0.00)
Had Health Insurance at Injury/Illness			-0.0424 (0.05)	-0.0499 (0.05)
Industry by NAICS = 1, Construction				-0.166 (0.11)
Industry by NAICS = 2, Mining or Oil				-0.467* (0.25)

Appendix 1, cont.

	(1)	(2)	(3)	(4)
Industry by NAICS = 3, Transportation or Warehousing				-0.0884 (0.10)
Industry by NAICS = 4, Health Services				-0.0315 (0.10)
Industry by NAICS = 5, Manufacturing				-0.122 (0.10)
Industry by NAICS = 6, Retail Trade Sales				-0.135 (0.10)
Industry by NAICS = 7, Information Services, Data, Telecom, or Publishing				-0.383*** (0.12)
Industry by NAICS = 8, Finance, Insurance, or Real Estate				-0.228 (0.17)
Industry by NAICS = 10, Education				-0.0393 (0.11)
Industry by NAICS = 11, Hotel or Food Services				-0.191* (0.10)
Industry by NAICS = 12, Arts or Entertainment				-0.107 (0.19)
Industry by NAICS = 14, Agriculture, Forestry, Fishing or Hunting				-0.0634 (0.14)
Industry by NAICS = 15, Utilities				-0.0367 (0.16)
Industry by NAICS = 16, Wholesale Trade				-0.136 (0.25)
Employer Size = 1, 1-4				-0.177** (0.08)
Employer Size = 2, 5-9				-0.207** (0.08)
Employer Size = 3, 10-19				0.00898 (0.08)
Employer Size = 4, 20-49				0.0334 (0.07)
Employer Size = 6, 100-249				-0.0692 (0.08)
Employer Size = 7, 250+				-0.00650 (0.07)
Constant	0.418*** (0.03)	0.324*** (0.05)	0.586*** (0.15)	0.847*** (0.18)
Observations	648	648	645	642
R-squared	0.061	0.100	0.122	0.173

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 2
Logit Odds Ratio Estimates of Factors Affecting Workers' Compensation Benefit Receipt

VARIABLES	(1) Base	(2) +Human Capital	(3) +Worker Demographics	(4) +Employer Characteristics
Received Workers' Compensation Benefits	(.)	(.)	(.)	(.)
Temporary Help Worker	1.012 (0.08)	1.009 (0.08)	1.015 (0.08)	1.032 (0.09)
Work Days Missed	1.001*** (0.00)	1.001*** (0.00)	1.001** (0.00)	1.001** (0.00)
Transferred Job or Activity Restricted	1.000 (0.05)	0.999 (0.05)	1.004 (0.05)	0.997 (0.05)
Work Tenure at Injury/Illness		1.006 (0.01)	1.007 (0.01)	1.008 (0.01)
Education = 1, Some High School		0.906 (0.13)	0.910 (0.13)	0.955 (0.14)
Education = 3, Some College		1.119* (0.07)	1.130* (0.07)	1.117* (0.07)
Education = 4, Associate Degree		1.206** (0.10)	1.230** (0.11)	1.214** (0.11)
Education = 5, Bachelors Degree		1.061 (0.09)	1.069 (0.09)	1.065 (0.09)
Education = 6, Advanced Degree		0.946 (0.12)	0.914 (0.12)	0.954 (0.13)
Female			0.973 (0.05)	0.961 (0.05)
Race = 2, Black			1.016 (0.08)	0.979 (0.08)
Race = 3, Asian			0.957 (0.12)	0.922 (0.12)
Race = 4, Mixed Race			0.822* (0.09)	0.810* (0.09)
Race = 5, Other			1.234* (0.14)	1.205 (0.14)
Hispanic			0.933 (0.08)	0.916 (0.08)
Age at Injury/Illness			0.999 (0.00)	0.999 (0.00)
Had Health Insurance at Injury/Illness			1.036 (0.06)	1.052 (0.07)
Industry by NAICS = 1, Construction				1.179 (0.17)
Industry by NAICS = 2, Mining or Oil				1.036 (0.50)

Appendix 2, cont.

	(1)	(2)	(3)	(4)
Industry by NAICS = 3, Transportation or Warehousing				0.976 (0.12)
Industry by NAICS = 4, Health Services				1.085 (0.13)
Industry by NAICS = 5, Manufacturing				0.933 (0.12)
Industry by NAICS = 6, Retail Trade Sales				1.113 (0.14)
Industry by NAICS = 7, Information Services, Data, Telecom, or Publishing				1.023 (0.18)
Industry by NAICS = 8, Finance, Insurance, or Real Estate				1.163 (0.29)
Industry by NAICS = 10, Education				0.940 (0.13)
Industry by NAICS = 11, Hotel or Food Services				0.869 (0.11)
Industry by NAICS = 12, Arts or Entertainment				1.395 (0.36)
Industry by NAICS = 14, Agriculture, Forestry, Fishing or Hunting				0.809 (0.16)
Industry by NAICS = 15, Utilities				0.954 (0.19)
Industry by NAICS = 16, Wholesale Trade				1.276 (0.45)
Employer Size = 1, 1-4				1.017 (0.12)
Employer Size = 2, 5-9				1.006 (0.13)
Employer Size = 3, 10-19				1.115 (0.11)
Employer Size = 4, 20-49				1.070 (0.10)
Employer Size = 6, 100-249				1.184 (0.12)
Employer Size = 7, 250+				0.938 (0.08)
Constant	1.915*** (0.07)	1.729*** (0.11)	1.997*** (0.37)	1.975*** (0.46)
Observations	351	351	351	351
R-squared	0.023	0.052	0.087	0.156

Standard errors in parentheses in exponential form

*** p<0.01, ** p<0.05, * p<0.1