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ABSTRACT

Disability and the Unionized Workplace*

The employment of people with disabilities has received significant attention, but little is known about how unions affect their employment experiences. To address this, we analyze monthly U.S. Current Population Survey (CPS) data from 2009 through 2017 and find that the unionization rate declined more rapidly among employees with disabilities. The results are not due to demographic or occupational factors, but to the lower rate at which people with disabilities are hired into unionized jobs. This lower hiring rate more than offsets the greater job retention of unionized workers with disabilities. Given that employers generally control hiring, it appears they are particularly reluctant to hire people with disabilities into jobs with union protections. Overall, in the union context, workers with disabilities appear more likely to be "last hired," but less likely to be "first fired." We also find that a union wage premium of 29.8% for workers with disabilities is greater than the 23.9% premium for workers without disabilities. There remains a pay gap of -5.7% between union workers with and without disabilities, compared to a -10.1% pay gap between non-union workers with and without disabilities. Exploratory data reveal that both union coverage and disability status increase the likelihood of requesting accommodations, supporting the voice model of unions. Overall the results indicate that while unions appear to help workers with disabilities in the U.S., unionized positions are becoming less available to workers with disabilities.

JEL Classification: J14, J51, J31

Keywords: disability, unions, wage differentials, job mobility

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Introduction

Expanding employment opportunities for people with disabilities is one of the primary goals of the 1990 Americans with Disabilities Act (ADA), the 2008 ADA Amendments Act, and the 2006 UN Convention on the Rights of Persons with Disabilities. People with disabilities still face low employment rates, however, nearly three decades after the passage of the ADA. In fact, only 35.9% of working-age people with disabilities were employed in the U.S. in 2016, compared to 76.8% of those without disabilities (Lauer & Houtenville, 2018). People with disabilities represent a sizable one-tenth (10.6%) of the U.S. working-age population (Lauer and Houtenville, 2018). Due to their low employment levels, however, they represent only 5.2% of employed individuals (Lauer and Houtenville, 2018). Their low employment levels are due in part to employer reluctance to hire them (Ameri et al. 2018). People with disabilities who are employed face a variety of disparities including lower earnings, less job security, and lower job satisfaction than co-workers without disabilities, both in the U.S. and other countries (Jones, 2008; Jones et al. 2006, 2010; Kruse et al., 2018; Mitra & Kruse, 2016; Schur et al., 2013, 2017).

Unions are recognized as providing many benefits for workers. These benefits include higher wages, better benefits, just cause dismissal protections, grievance procedures, and a collective voice for workers to negotiate pay and working conditions (Freeman and Medoff, 1984; Farber, 1986; Hirsch, 2004). At a societal level unions have been found to reduce economic inequality (Farber et al., 2018). The wage and inequality effects appear to transcend country boundaries (Rios-Avila and Hirsch, 2014). Despite these advantages of unions for workers, unionization has been declining in the United States—over the past three decades the percent of workers in unions has halved from 20.1% of the workforce in 1983 to 10.7% in 2017.[1]

[1] https://www.bls.gov/cps/cpslutabs.htm, accessed 9-2-18

The union wage premium has, however, stayed roughly constant as the level of unionization has changed (Farber et al., 2018).

Despite the large scholarly literature on unions, little is known about the effects of unions on workplace outcomes for people with disabilities, or even about the basic question of how likely it is for workers with disabilities to be affiliated with unions. This is an important area of inquiry given the benefits that unions generally provide combined with the projected increase in disability prevalence as baby-boomers age and medical technologies increase survival of people who are born with or acquire disabilities. Union-established worker protections may benefit workers with disabilities by reducing the disparities they face in the workplace, but union policies may also limit the ability of workers with disabilities to gain access to jobs appropriate to their abilities. We argue that the study of unions and disability can further reveal barriers and facilitators to employment for workers with disabilities.

This paper examines three basic questions about the relationship between disability and unions:

1) How likely are employees with disabilities to be in jobs covered by union contracts, and has this been changing in recent years?
2) How do unions affect the disability pay gap?
3) How likely are unionized workers to request and receive workplace accommodations?

The answers to these questions shed light on what policies—in both union and non-union contexts—can enhance employment opportunities for workers with disabilities.

We address the first two questions using representative data from the Current Population Survey (CPS) between the period of 2009 to 2017, relying on union and wage data in the outgoing rotation groups combined with six disability measures introduced in the CPS in late

2008. The third question is addressed using a special CPS supplement in May 2012 focused on disability issues. The question of what policies may help or hurt workers with disabilities is discussed in the literature review and conclusion.

Literature review

Several models of disability shape perspectives about people who live with disabilities (WHO, 2001; Schur, Kruse, and Blanck 2013; Mitra, 2018). Below we describe three of the common ones, which are the medical, social, and universal models. The medical model views disability as an impairment located within an individual, with little or no relation to the environment. In the medical model, the focus is on curing impairments, rather than on changing the environment. The social model views disability as caused by an interaction between an individual's impairments and his or her environment, with the result that certain environments may "create" disability that would not exist in other contexts—for example, a flight of steps can "disable" a wheelchair user who is otherwise highly capable of working. The social model was developed and used by the disability rights movement to empower people with disabilities and helped drive the push for legislation such as the ADA. The universal model also views disability as dependent on the environment but has a more fluid view of disability as existing on a continuum both across humans and across time, with every person experiencing disability at some point in life. The universal model emphasizes that disabilities may be temporary, permanent, or episodic. The ultimate goal is to achieve a more accommodating system for workers with disabilities and society in general. It could be argued that unions, as an intermediary body that represents workers' interests before management, may be a good

institutional vehicle to help achieve this goal. However, as discussed below, evidence in this area is inadequate and needs more attention.

While many union contracts address disability issues (Basas, 2013), systematic information on the relation of disability to unionization levels and union policies is not available. One example of a program that seeks to assist union employees is the Accommodating Disabled People in Transition (ADAPT) program negotiated by the United Auto Workers with General Motors.[2] This program lays out options for union employees to be retained at work, or return from work, after sickness or workers' compensation leave, including options for workers to obtain alternative jobs if they can no longer perform their original jobs.

Looking more broadly, Basas (2013) identifies two tensions in union policies regarding disability. The first tension is between treating disability as a civil rights issue (consistent with the social model) and protecting the employment of union workers who experience disability. In examining collective bargaining agreements at AFSCME, Basas concluded that policies enacted in contracts reflect the medical model of disability which views disability exclusively as a health or medical problem to be cured, since these agreements only address sick leave, workers' compensation, and injuries which are factors that mostly relate to the onset of disability at work. The emphasis does not seem to be on inclusion and changing the workplace environment in line with the ADA's principal objective of equal access and opportunity (Basas, 2013). Moreover, according to Basas, another tension exists between individual interests that are protected by the ADA, and "the collective good position of union representation where individual interests are submitted to the needs of the whole" (p.75). That is, workers with disabilities risk disrupting the

[2] https://www.uawgmjas.org/j/index.php?option=com_content&view=article&id=1049, accessed 6-19-18

status quo regarding seniority, job reassignment, job restructuring, and flexible scheduling to which unions have historically adhered.

As a result, some claim that collective bargaining agreements may often hurt workers with disabilities since they lack provisions demonstrating true inclusion, which may come from resistance by some unions and employers to the ADA and lack of understanding about disability as a social category (Basas, 2013; Williams-Whitt, 2007). For example, no public-sector collective bargaining agreements in the sample examined by Basas (2013) included technology-based provisions to accommodate workers with disabilities, despite many technology-based accommodation requests from workers with disabilities.

Based on these tensions, Basas (2013) raises questions about whether unions improve the labor market status of workers with disabilities, and notes that they may mainly benefit workers whose onset of disability happens at work. She claims that even for current workers, however, there is room for more support. Her review of public-sector collective bargaining agreements shows that most contracts lack procedures for raising disability-related matters, soliciting accommodations, and ensuring that ADA requirements are followed (Basas, 2013).

While Basas claims that most union contracts are based on the medical model of disability and do not explicitly use the social model, it should be noted that the social model's focus on the importance of the environment is reflected in union policies that sometimes provide reassignment or other accommodations to enable a member to work and be productive.

The potential for unions to play a positive role is supported by Williams-Whitt (2007) who examined 72 arbitration cases using semi-structured interviews of managers, union representatives, employees with disabilities, and occupational health workers in multiple industries. The respondents narrated episodes of successful and unsuccessful attempts to

accommodate workers with disabilities. This analysis found that "unions may have a particularly influential role to play by nudging collective beliefs and norms about accommodation" (p. 419). Unions can also assist with workers' compensation claims, offer emotional support, uphold contact with workers who are away and rehabilitating, offer guidance to employers about the ADA, and take other actions to lessen employer animosity that is produced when there are disruptions to the existing state of affairs (Williams-Whitt, 2007). The potential for unions to play a positive role obviously depends on the nature of the labor-management relationship--many employers would resist union efforts to be more involved in these areas.

The union voice role may be particularly important for workers with disabilities. As indicated in prior studies, workers with disabilities fare better in workplaces where employers pay more attention to individual needs and accommodations are more common in general, so that accommodations for workers with disabilities do not stand out as "special treatment" and engender resentment or jealousy (Schur et al., 2009, Stone & Colella, 1996). To the extent that unions facilitate more accommodation requests, they make accommodations more common and less stigmatizing.

Some disability accommodations conflict with seniority rights bargained in the contract (Schur, 1998), and the Supreme Court ruled in *US Airways v. Barnett* that the ADA does not require an employer to assign a disabled employee to a particular position when the assignment would violate the employer's established seniority system.[3] Unions are covered entities under the ADA and as such they are entitled to medical information used in making an accommodation and required to keep such information confidential.[4]

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[3] US Airways v. Barnett, 535 US 391 (2002). The NLRB later used this ruling to declare that an employer violated the duty to bargain by unilaterally providing an accommodation in conflict with the collective bargaining agreement (Industria Lechera de Puerto Rico, 344 NLRB 1075 (2005).

[4] Roseburg Forest Products, 331 NLRB 999 (2000).

While employers have a duty to bargain over disability accommodations and other policies affecting current employees, they typically do not have to bargain with the union over hiring of workers with disabilities in the United States since hiring policies and practices are not a mandatory subject of bargaining.[5] The exception is that a hiring practice is a mandatory subject of bargaining where there is an objective basis for believing it to be discriminatory, since such discrimination affects the terms and conditions of employment for current employees. In addition, before making a bargaining demand, the union is entitled to information relevant to the issue of discrimination if it has a rational basis for believing that the practice may discriminate. The National Labor Relations Board quoted the Supreme Court saying that "the elimination of discrimination and its vestiges is an appropriate subject of bargaining." While prior cases on this topic were based on race and sex discrimination, the principles would presumably apply to disability discrimination.

Disability organizations can play an important role in how unions deal with disability issues. As described by Bagenstos (2016), the relationship between the disability rights movement and labor is complicated (as has been true regarding the civil rights movement and labor). Sometimes unions have supported disability rights efforts, such as in recent struggles to challenge Medicaid budget cuts under the ADA, and the push by the Service Employees International Union (SEIU) for increased wages and benefits for direct care workers who provide home and community-based service. At other times, unions and disability rights advocates had come into conflict, such as in the 1970s and 1980s when the American Federation of State, County, and Municipal Employees (AFSCME) fought de-institutionalization of people with

[5] Star Tribune, 295 NLRB 543 (1989). See also US Postal Service, 308 NLRB 1305 (1992), enf. denied 18 F3d 1089 (3d Cir 1994)(Board did not err in "concluding that a hiring practice is a mandatory subject of collective bargaining where there is an objective basis for believing it to be discriminatory").

mental disabilities and, more recently, when state Medicaid cuts led many disability advocates to fear unions' efforts would lead to re-institutionalization of many people with disabilities. Another example of the conflict is the U.S. Department of Labor's rules in 2013 that expanded the Fair Labor Standards Act (FLSA) protections for home care workers. This was supported by some disability rights groups but opposed by others that feared increased FLSA coverage would lead to re-institutionalization of people with disabilities and less control by consumers over how care workers do their jobs—especially if the workers were unionized. Bagenstos argues that disability rights groups need to support efforts of unions for decent wages and FLSA protections for home care workers for both moral and practical reasons. The moral argument is that all workers deserve fair pay and FLSA is the main way our society ensures this.[6] The practical argument from Bagenstos is that better quality of home care and less turnover occur when home care workers receive better pay.

The U.K. experience can provide insights into disability and unions. Echoing the tension identified by Basas (2013), Foster and Fosh (2010) argue that the U.K.'s Disability Discrimination Act (DDA) follows a medical model of disability in which the law requires employers to provide reasonable accommodation to employees with disabilities, but the requests for such accommodations are to be made by individual employees with disabilities, and reasonable accommodations are individually negotiated with management. Hence, the British model conflicts with the collective approach supported by unions. The authors delve into the antecedents of the DDA and argue that in the U.K. the movement to pass the DDA was built on the assumption that disability is an individual issue. Therefore, the resulting law did not focus on

[6] Exceptions include when workers do not need these protections (e.g., for well-paid salaried employees), or the moral argument is outweighed by the economically unsustainability of giving full FLSA protections to necessary workers (e.g., firefighters in very small departments), but neither exemption applies in the case of home care workers.

social aspects of discrimination and established a legal system that relied more on experts than on giving voice to employees with disabilities. In doing so, it avoided encouraging organizations to create conducive organizational cultures and policies for employees with disability.

Foster and Fosh (2010) claim that for the U.K. system to work, proactive representation of employees with disabilities in the workplace is necessary to avoid discrimination. Drawing on interviews with employees with disabilities, trade union officials, disability-related voluntary organizations, and government organizations, they find that disability organizations play a positive role in the workplace for employees with disabilities. They argue, however, that unions are the only workplace actors that can reconfigure the organizational strategies to integrate and institutionalize disability concerns. They note that while unions address discrimination in job retention, discrimination against people with disabilities is not addressed at the point of recruitment, and one way to overcome this issue is to develop links between unions and groups that support individuals with disabilities. They argue that full-time union officers may play an especially positive role in disability accommodations when employees with disabilities are reluctant to reveal their disabilities and where the broader policy to mitigate discrimination does not exist.

A recent U.K. innovation is the creation by unions of "Disability Champions" (DCs) as described by Bacon and Hoque (2012, 2015). The position of DCs was created to bridge the gap between unions, employees with disabilities, and management. These individuals receive a five-day training to become "lay workplace union activists." Their job includes offering advice to employees with disabilities and employers on disability issues, including informing employees with disabilities about their rights, supporting these rights before management, facilitating policy and practice change, and improving grievance procedures. The authors find that DCs improve

the ability of unions to represent individuals with disabilities and enhance the voice of employees with disabilities which has a positive impact on employer efforts to make reasonable accommodations. They argue that this is consistent with Freeman and Medoff's (1984) model in which unions can have a positive impact by providing "direct voice channels" which can be formal (e.g., collective bargaining) or informal (e.g., dialogues with management). Additionally, they note that DCs may have an impact through the "facilitation effect" (Budd and Mumford, 2004) as they inform the employees with disabilities about their rights and help facilitate representation and grievance procedures. The potential for positive union effects is indicated by the finding that unions can positively influence the adoption of a range of equal opportunity practices (Hoque and Bacon, 2014).

The role of DCs is also described by Richards and Sang (2016) based on interviews with DCs, neurologically impaired employees, and union officials. This innovation illustrates an important way in which unions can provide a voice to employees with disabilities and institutionalize disability concerns in organizational strategy and culture.

In sum, there are conflicting perspectives on how well unions address the concerns of workers with disabilities. There is remarkably little evidence on either the prevalence or effects of unions for workers with disabilities. One study found that in 1984 union coverage was slightly higher among men with more-stigmatized disabilities, and slightly lower among men with less-stigmatized disabilities, than among men without disabilities (Baldwin and Johnson, 1994). Regarding outcomes, data from a 1992 survey show that union status was associated with an increased likelihood of women's employment following onset of a health impairment for women, although this did not happen for men (Daly and Bound, 1996). The potential for unions to reduce the disability pay gap is supported by a study that finds that unions reduce the wage

penalty associated with obesity (Debeaumont & Nsiah, 2016), although evidence from 1984 finds that union premiums were just slightly higher among workers with disabilities than among non-disabled workers (Baldwin and Johnson, 1994).

The conflicting perspectives highlight the need for new evidence to shed light on the experiences of workers with disabilities with respect to unions. Given the sparseness and age of prior evidence, we analyze more recent evidence on prevalence, trends, pay, and accommodations for workers with disabilities in unions.

How likely are workers with disabilities to be in unions?

Unionized workers may be more likely than non-union workers to have disabilities because: a) union workers are older on average (BLS, 2018), and age is associated with an increased likelihood of disability (Erickson et al., 2018); b) they tend to be overrepresented in blue-collar jobs where the risk of disabling injuries is higher; and c) union contracts often have provisions facilitating return to work and accommodations for workers with disabilities. The opposite relation may hold, however, to the extent that union contracts give preference for light-duty positions or preferable schedules to workers with more seniority over workers who experience disabling injuries (Schur, 1998). In addition, unions may negotiate provisions for disability income in collective bargaining agreements for injured workers, and such income may facilitate their withdrawal from the workforce.

We examine the levels and trends in union coverage using CPS out-going rotation groups over every month in the 2009 to 2017 period, comprising a total of 1,497,721 individual employee observations (including all employees 16 or older, and excluding self-employed).[7] The

[7] We also did all analyses for union membership rather than union coverage, with very similar findings.

out-going rotation groups contain information on union status and wage levels, which is combined with the six disability measures introduced in the CPS in late 2008. These six measures include questions on four basic types of disabilities (i.e., hearing, visual, cognitive, and ambulatory) and two types of activity limitations, including self-care and navigating independently outside the home. While the activity limitations generally indicate more severe disabilities, the yes/no nature of the questions does not allow a better measure of severity (as explored in Miller et al., 2010). The questions are shown in Appendix A. We follow the convention of the Bureau of Labor Statistics that a "yes" answer to any question qualifies one as having a disability, although we also break out the measures by type of disability for some analyses. There are 54,950 observations of employees who are recorded with a disability, representing a weighted 3.37% of all employee observations.[8] Among those recorded with a disability, 33.6% report a hearing disability, 15.5% report a vision disability, 25.5% report a cognitive disability, 39.1% report an ambulatory disability, 6.2% report a self-care disability, and 12.7% report an independent living disability. All of our estimates use CPS weights to reflect population averages more accurately.

We recognize two potentially tricky issues with this sample. The first is that it is possible that union status influences the reporting of disability. The reporting of disability appears to be sensitive to employment conditions: it has been found that nonemployed people are more likely to overreport medical conditions than are employed people (Baker et al., 2004). While the issue of "justification bias" (leading nonemployed workers to report a disability to justify their lack of employment) would not appear to be relevant in comparing union and nonunion workers, it is

[8] This figure is lower than the figure derived from the American Community Survey (Lauer and Houtenville, 2018), even though the disability questions were the same. The difference probably reflects differences in survey mode, question placement, and other factors discussed in schur et al. (2013: 14-20).

possible that union workers may be more aware of their legal rights and consequently less afraid to report a disability. In addition, the greater health care access of union workers may affect the reporting of disability as health care can reduce the likelihood of developing a disability. While these issues may affect the overall level of reporting of disability, they are unlikely to affect the trends on which we focus. A second issue is that the 2009-2017 period may be different from earlier periods, given that it a) was subsequent to the financial crisis and recession of 2008, and b) followed the passage of the 2008 ADA Amendments Act that expanded coverage of the Americans with Disabilities Act. We return to the timing issue in the discussion.

Levels of unionization

Workers with disabilities were more likely than non-disabled workers to be covered by unions across the 2009 to 2017 period, as shown in Table 1. The difference is slight (13.0% compared to 12.5%), but strong enough to be statistically significant. The gap varies by a variety of demographic and job characteristics. The gap is similar in the private sector, although, among public sector workers, those with disabilities have a lower unionization rate. The type of disability matters, too. While workers with hearing impairments are significantly more likely than workers without disabilities to be covered by unions, those with cognitive or independent living disabilities are significantly less likely to be covered. Only a small difference in the disability union gap exists between women and men, but age is an important factor, as workers with disabilities are less likely to be covered by unions in the youngest (18-34) and oldest (65 or higher) age groups.

Part of the overall union gap may be due to the disproportionate representation of employees with disabilities in blue-collar occupations that have generally higher unionization rates. Table 1's breakdown by occupation shows that employees with disabilities have higher

unionization rates than employees without disabilities in 6 of the 10 major occupations, including significant positive gaps in management-related and office-administrative support occupations.

The higher union rate among workers with disabilities is preserved when controlling for detailed occupation, but not when controlling for demographic variables. Table 2 reports linear probability models predicting the likelihood of union coverage, first without controls (see column 1), then with detailed occupational controls using 564 dummies (see column 2), and then adding demographic controls (see column 3). [9] The positive disability effect disappears from columns 1 to 3, indicating that workers with disabilities are no more or less likely to be covered by unions after controlling for demographic variables. Additional unreported tests showed that this switch was driven by controlling for age (using both linear and squared terms), indicating that the positive disability effect in column 1 is due to the higher average age of workers with disabilities.

Table 2 also shows that the relative likelihood of union coverage varies by type of disability. The likelihood is highest among those with hearing and ambulatory impairments, and lowest among those with cognitive impairments. The hearing and ambulatory coefficients decrease substantially when controlling for occupation and demographic variables in column 6, which indicates they are primarily responsible for the flipping of the overall disability coefficient from column 1 to column 3. These two disabilities are also the most positively correlated with age. The fact that older people are more likely to have hearing and ambulatory disabilities helps explain why the coefficients on these variables have the largest declines from column 4 to column 6 when age and age squared are added as controls.

[9] The results are similar using probit models in place of linear probability models.

Trends in unionization

While the average rate of unionism across all years from 2009 to 2017 was slightly higher among workers with disabilities, Figure 1 shows the trend was more negative for workers with disabilities over this period. Unionization decreased from 13.5% to 11.9% among workers without disabilities, whereas it decreased from 14.9% to 11.3% among workers with disabilities. The latter drop of 3.6 points was over twice the drop of 1.6 points for workers without disabilities.

The trend is broken out by type of disability in Figure 2, which shows roughly similar declines among workers with each of the disabilities.

This differential decline is not explained by occupational or demographic factors, as evidenced by regressions in Table 3. The disability interaction with the time trend shows a yearly decline that is 0.24 greater among workers with disabilities (see column 1), which narrows to only .21 points when controlling for occupation (see column 4) and .20 points when also controlling for demographics (see column 3). When broken out by type of disability, column 4 shows that the largest relative declines in unionization were among people with vision disabilities, while the time trend interactions could not be distinguished from zero for the other disability types. There is very little change in time trend interactions from column 4 to column 6 for any of the disability types due to controlling for occupational trends and demographic variables. In addition, we tested separate models for public and private sector workers, and found similar declines in union coverage over time in both sectors.

Changes in disability status and union coverage

What might explain the more significant decline in unionization for employees with disabilities? We attempt to shed more light on this puzzle by tracking individual CPS

respondents over a 12-month period. Half of the respondents in an out-going rotation month were interviewed 12 months earlier, and half were interviewed 12 months later. We followed the procedure used by Madrian and Lefgren (1999) to match respondents across time, based not just on household and respondent number but also on gender, age, race, and educational status. For each respondent, we track their movements among six categories created by the permutations of disability status with non-employed, non-union employed, and union employed.[10] Unlike Tables 1 and 2 that include only current employees, the transition matrix includes all out-going rotation group members age 16 or older, so that it includes both labor market participants and non-participants. The total number of matched observations is 910,541 over 2009 to 2017. The resulting matrix of transitions is shown in Appendix Table A1.

We recognize some difficulties in tracking the union status of workers over time. The first is that a one-year comparison does not provide much time to capture disability and union transitions. The Family and Medical Leave Act (FMLA), for example, provides a guarantee of 60 days of unpaid leave for a medical issue, and it is possible that union workers who acquired disabilities were especially likely to remain "employed" without working due to the FMLA or union-negotiated income with extended leave (Johnson and Ondrich, 1990). A second methodological issue is that disability and union status may be misreported, and it is well known that misreports exacerbate the downward bias of estimated effects when using longitudinal data (due to the large number of misidentified "changers" in the independent variable who have little change in the dependent variable). This is less of a problem for us since we are not using the

[10] Note that to keep the number of categories manageable we combined non-union employees with self-employed, though we also tested models that separate self-employed from non-union employees with little difference in the pattern of results. We made adjustments in the weights to account for the greater likelihood of telephone interviews in the second year, since the data clearly show that people are less likely to report disability in a telephone interview than in a personal interview

longitudinal data to estimate effects of disability on wages or other outcomes. Instead we are using longitudinal data to track general changes in union coverage. We do not have a good way to estimate the magnitude of errors in reporting of union and disability status. We recognize that many of the "transitions" reported in Appendix Table A1 may reflect misreporting in one period, but such misreporting should be equally likely in the first and second periods (after adjusting for differences in interview mode as we do) so that the misreporting balances out and the net changes are still informative in decomposing the *changes* in union coverage.

With these cautions, we configure the data from the transition matrix by dividing all individuals into four categories by changes in disability status: (1) those who did not report a disability in either the first or second period; (2) those who had the onset of a disability (reporting one in the second but not first period); (3) those who recovered from a disability (reporting one in the first but not second period); and (4) those who had a disability in both periods. Table 4 shows that union workers in period 1 were more likely than non-union workers to stay employed in period 2, among all of the disability transition categories. For example, among those who had a disability in both periods, 83.4% of union workers in period 1 remained employed in period 2 (see row 4), compared to 76.9% of non-union workers (see row 8). The ratio of these two numbers is 1.084, and the difference from 1.00 (which would indicate an equal likelihood of remaining employed) is statistically significant (see row 16).

While unions appear to help the retention of workers with disabilities, these workers are less likely to become newly covered in union jobs (probably because employers are less likely to hire them in union positions). Column 2 shows the union coverage percentage broken out by change in disability status. Continuance of union coverage was higher for those who had a disability in both periods (74.9%) than for those without a disability in either period (68.6%) (see

rows 1 and 4). The difference is statistically significant. The opposite story holds, however, for those with a disability in both periods who began as non-union workers in period 1. In fact, only 3.5% became union workers in period 2, compared to 4.6% of workers without disabilities in either period (see column 2, rows 5 and 8). (Note that these comparisons refer to whether the person remained a union employee, while they may not necessarily have remained in the same job.)

Table 5 confirms that these two differences are maintained in multinomial logit regressions that control for demographic factors and year. Regressions were run separately for three groups based on their status in period 1 of being union employees, non-union employed, or non-employed. Within each of these three groups, the multinomial regressions predicted their status in period 2 as a union employee, non-union employed, or non-employed. The disability transitions are used as predictors of the employment transitions. The relative risk ratio of 1.307 in column 1 indicates that unions were especially likely to retain workers with disabilities. That is, people who started as union workers and had a disability in both periods were more likely to remain union covered in period 2 than were those without a disability in either period, relative to their likelihoods of becoming non-union employed workers. In contrast, the 0.829 ratio in column 3 shows that workers with disabilities were especially unlikely to be hired into unionized positions. That is, people who started as non-union workers and had a disability in both periods were less likely to become union workers in period 2 than those without a disability in either period. The .805 ratio in column 5 indicates that non-employed people with disabilities were less likely to become union employees than non-union employed in period 2, but this difference is not statistically significant. These patterns are maintained in unreported estimates that separate out self-employed workers from other non-union workers. While having a disability in both

periods appears to affect the likelihood of either becoming or remaining a union employee in period 2, there was no significant effect from the onset of, or recovery from, a disability between the two periods (though again we caution that many of these apparent changes may reflect measurement error in disability status).

The decline in union coverage from 2009 to 2017, thus, does not appear to be due to demographic or occupational factors, but instead to a disproportionately low intake of workers with disabilities among those who started out as non-union workers. This is only partially counterbalanced by unions' greater retention of workers with disabilities once they have union coverage, so the net effect is a faster decline in the overall union rate for workers with disabilities.

As mentioned earlier, these results may reflect a special period following the 2008 financial crisis, and the enactment of the 2008 ADA Amendments Act. Prior research shows that workers with disabilities are more likely than those without disabilities to be laid off in times of distress (Kaye, 2010; Mitra and Kruse, 2016). Our results, in contrast, indicate that union workers with disabilities were more likely to be kept on during this period. The 2008 ADA Amendments Act, however, may have played a role if employers became less likely to hire union workers with disabilities due to the increased coverage provided by this Act, based on the perception that it had become more difficult to fire workers with disabilities. In addition, while employers may have been reluctant to hire workers in general after the 2008-2010 crisis given that the recovery was still uncertain, they may have been particularly reluctant to hire people with disabilities.

How do unions affect the disability pay gap?

Disability is linked to lower pay for workers with disabilities, and at least part of the pay gap appears to reflect discrimination (Baldwin and Johnson, 2006; Baldwin and Choe, 2014a, 2014b; Kruse et al., 2018). Unions may reduce this pay gap, both because unions raise wages in general, and because union contracts may reduce wage dispersion and discriminatory wage gaps, as indicated by evidence that unions narrow the black/white pay differential (Freeman & Medoff, 1984; Peoples, 1994; McGregory, 2013). While the union wage premium is higher for men than for women (Gabriel and Schmitz, 2013), unions tend to narrow the overall gender pay gap since they raise the relative pay of women who tend to be at the bottom of the wage distribution (Blau & Kahn, 2003). As noted earlier, unions appear reduce the wage penalty associated with obesity (Debeaumont & Nsiah, 2016), while evidence from 1984 finds slightly higher union premiums among workers with disabilities than among non-disabled workers (Baldwin and Johnson, 1994).

Using the 2009 to 2017 CPS data for all employees, we find that the union wage effect is larger for employees with disabilities than for those without disabilities.[11] Based on the standard wage equations presented in Table 6, the union wage premium for workers without disabilities is 0.214 log points or 23.9% higher pay. The disability main effect is -0.106, indicating 10.1% lower pay for non-union workers with disabilities (consistent with the results from Kruse et al., 2018), while the positive disability interaction of 0.047 indicates that unions are linked to a wage

[11] The regressions are based only on employees and use the natural logarithm of hourly pay as the dependent variable, adjusted for inflation using the monthly CPI. Allocated values, which are imputed in the CPS for people who did not report earnings, are excluded since their inclusion will bias union and disability estimates toward zero (Hirsch and Schumacher 2004, Bollinger and Hirsch 2006). Nonresponse is highest in the left and right tails of the earnings distribution, indicating that estimates of earnings differentials are most likely to be biased in the tails rather than the middle of the distribution as we estimate here (Bollinger et al. 2018). After excluding the allocated values the sample was reweighted to reflect the likelihood of nonresponse using code kindly provided by Barry Hirsch. We also tested employment selection equations using the Heckman correction with the number of household members under age 6, ages 6-15, ages 16+ non-employed, and ages 16+ employed excluding respondent, as additional variables determining selection into employment. The results were very similar between regressions corrected and not corrected for selection.

premium of 0.214+.047=.261 log points or 29.8% higher pay for unionized workers with disabilities compared to non-union workers with disabilities.[12]

Figure 3 illustrates the joint effects of unions and disability on pay rates. The disability pay gap among non-union employees is -10.1%. Union employees with disabilities earn 16.8% more than non-union employees without disabilities, and 29.8% more than non-union employees with disabilities. There is nonetheless a -5.7% pay gap between union employees with and without disabilities, which is a bit more than half of the -10.1% disability pay gap among non-union employees. In other words, unions clearly reduce but do not eliminate the disability pay gap.

The difference in the union wage premium holds up when running separate regressions for employees with and without disabilities (see Table 6, columns 2 and 3), and the union premium is fairly consistent across disability types (see columns 4 to 9), with estimated premiums from 28.4% to 37.2%.[13]

The union premium estimated here is larger than the simple differences found by Hirsch and Macpherson (2018: 21), which range between 0.138 and 0.151 log points over the 2009-2017 period. Further testing shows that this difference is due to controlling for occupation, since our coefficient for the base union premium is 0.147 before controlling for occupation, 0.169 when controlling for 10 major occupations, and 0.214 when controlling for 564 detailed occupations. We also found similar union premia for workers with and without disabilities in the

[12] While Budd and Na (2000) find differences in the union premium between members and non-members in union-covered jobs, our estimates using union membership instead of coverage produce very similar results.
[13] Wald tests show that the non-disability union coefficient in column 3 is significantly different from the union coefficients for any disability in column 2 (p=.0001), hearing disability in column 4 (p=.0027), cognitive disability in column 6 (p=.0199), ambulatory disability in column 7 (p=.0027), and independent living disability in column 9 (p=.0021). The significance levels are lower when comparing the non-disability union coefficients with the union coefficients for vision disability in column 5 (p=.0890), and self-care disability in column 8 (p=.0803),

private and public sectors, with only a slightly lower union premium and disability wage gap in the public sector.[14]

Are unionized workers more likely to request accommodations?

Generally, unions provide workers with increased voice on the job (Freeman & Medoff, 1984), which may help workers with disabilities in asking employers for accommodations. Union contracts often spell out procedures for accommodating workers who develop disabilities, including providing grievance procedures for employees who feel that they have been treated unfairly. The contract language may, however, also restrict the availability of accommodations. For example, unless specified otherwise, the right of senior workers to be assigned to vacant light-duty positions outweighs the right of injured workers to be reassigned there (Schur, 1998).

Consistent with the voice perspective, we find that union covered workers, in general, are more likely than non-union employees to request accommodations, regardless of disability status (see Table 7). These results are based on a special CPS supplement on disability issues conducted in May 2012. Employees were first asked "Have you ever requested any change in your current workplace to help you do your job better? For example, changes in work policies, equipment, or schedules (yes/no)." If employees selected "yes," they were then asked, "Were the changes granted? (yes/no/partially)." It should be noted that the accommodation would not have to be disability-related.

[14] When regression 1 in Table 6 is run just for private (public) workers, the coefficient is 0.222 (0.195) on union coverage, -0.107 (-.094) on disability, and 0.048 (0.034) on the union-disability interaction. All coefficients remain significant at the .01 level in both sectors. The coefficients are significantly different at the .01 level between the public and private sectors for union coverage but not for disability or the disability-union interaction. These figures imply a union premium for workers with (without) disabilities of 30.9% (24.9%) in the private sector and 25.7% (21.5%) in the public sector.

Accommodation requests were highest among union workers with disabilities (17.9% in column 4), next highest among non-union workers with disabilities (13.6% in column 2), next highest among union workers without disabilities (11.5% in column 3), and lowest among non-union workers without disabilities (9.0% in column 1). There appears to be a positive effect both of unions, and of having a disability, on the likelihood of requesting an accommodation. The likelihood of having a request partially or fully granted appears higher among people with disabilities (11.2% compared to 7.3% among non-union employees, and 12.0% compared to 9.0% among union employees, although the latter difference is not statistically significant).

Both unionization and disability continue to exert positive effects on the likelihood of an accommodation request when controlling for demographic and occupation variables, as shown in logit results in column 1 of Table 8. The odds ratios show that disability creates a 72% increase in the odds, and union coverage creates a 30% increase in the odds, of requesting an accommodation. The interaction coefficient, however, is not significant, indicating that the effects of unionization and disability are additive rather than interactive. Looking at the outcomes of these requests, columns 2 to 4 of Table 8 show that unionized workers in general were significantly more likely to make requests that were denied, only partially granted, or fully granted (see columns 2 to 4), while workers with disabilities were almost twice as likely as those without disabilities to make requests that were fully granted (see column 4). There is again no significant interaction effect between unionization and disability in predicting the results of requests.

These results support the idea that unions provide a voice mechanism encouraging employees to ask for accommodations, and that the mechanism has similar effects for workers with and without disabilities. Unionized workers with disabilities are the most likely to request

accommodations and have them fully granted, but the combination of unionization and disability is additive rather than interactive. In other words, unions may increase the likelihood of accommodations in general, but appear to do so as much for workers without disabilities as for those with disabilities. It should be noted that while there is a respectable 38,129 workers with union data in the CPS supplement, this sample contains only 157 unionized workers with disabilities. These numbers should therefore be considered exploratory.

Limitations

As in all studies, there are limitations and qualifications to our analysis. The standard disclaimers about causality apply: there may be selection effects so that we cannot be certain that having a disability increases the likelihood of remaining a union employee, or raises the union wage premium. Our use of longitudinal data for employment changes that control for pre-existing differences, and testing of selection effects for the wage premium, helps alleviate such concerns.

As described earlier, context may be very important. Our results pertain to the period following the passage of the 2008 ADA Amendments Act and the 2008-2010 recession, both of which could influence the results. Employers may have become less likely to hire union workers with disabilities due to the increased coverage provided by the 2008 Act, based on the perception that it would be more difficult to fire workers with disabilities. Also, while employers may have been reluctant to hire any workers after the 2008-2010 financial crisis, they may have been particularly reluctant to hire people with disabilities given the uncertainties about the recovery in its early years.

Sample sizes are always an important consideration. We are fortunate to have very large sample sizes of close to 1.5 million for the cross-sectional analyses of union coverage, over 900,000 for the longitudinal changes in union coverage, and over 900,000 for analyses of the union wage premium. The analyses of union accommodations, however, rely on samples of 38,000 workers overall, and only 157 unionized workers with disabilities. The latter results should therefore be considered exploratory.

As in most studies, we raise more questions than we can answer. We do not know the full experiences of workers with disabilities in unions and unionized workplaces, so cannot examine the full range of union effects. We also cannot measure union policies regarding disability, and therefore can suggest, but not definitively assess, their role in explaining our results.

Summary and Conclusion

Despite the large literatures documenting labor market disparities facing workers with disabilities, and the advantages that unions can provide to workers in general, there is almost no existing evidence on the prevalence and effects of unions among workers with disabilities. This paper uses new data to examine trends in unionization, union wage effects, and accommodation requests by disability status, to explore how unionized workplaces may facilitate and/or impede employment of workers with disabilities.

Our key findings are that:

- The union rate for employees with disabilities in the U.S. declined more rapidly than for employees without disabilities over the 2009 to 2017 period.

- This faster decline is not explained by other demographic or occupational factors, or by workers with disabilities disproportionately leaving union jobs (in fact they are more likely to be retained in union jobs than in non-union jobs). It is instead tied to a lower likelihood of workers with disabilities being hired into union jobs than into non-union jobs. Relative to the common complaint that workers with disabilities are "last hired, first fired," in the union context they appear more likely to be "last hired" but less likely to be "first fired."
- The union wage premium is 29.8% for workers with disabilities, relative to non-union workers with disabilities. This is greater than the 23.9% union premium for workers without disabilities, and more than offsets the -10.1% disability pay gap among non-union workers, but union workers with disabilities still earn 5.7% less than union workers without disabilities.
- Union workers both with and without disabilities are more likely than their non-union counterparts to request workplace accommodations, which reflects a positive additive effect of both union coverage and disability status. By providing greater voice in general, unions may benefit workers with disabilities by decreasing employer resistance and potential stigma and co-worker resentment associated with accommodation requests. Our exploratory results indicate, however, that accommodation requests made by workers with disabilities are about equally likely to be granted in union and non-union settings.

While we do not have systematic data on union contracts, the literature indicates that contract provisions on disability are generally concerned with helping existing employees who are injured or otherwise develop impairments while they are employed. This fits with our

findings that unions increase the job retention of workers who have a disability lasting at least 12 months. It appears that most union contracts do not include provisions for accommodating new hires with disabilities, probably because workplace accommodations are seen as employer obligations and outside the union role. We find a lower likelihood that non-union workers with disabilities will enter a union job, relative to their counterparts without disabilities. It should be recognized that employers are responsible for hiring in most unionized settings, so the lower rate of hiring people with disabilities in union settings may reflect employer reluctance to hire people with disabilities into positions with union protections where they will be more difficult to lay off. It should also be noted that our 2009-2017 period of study immediately followed the passage of the 2008 ADA Amendments Act, which was designed to increase coverage by clearing up and expanding legal interpretations of the ADA; consequently, the increased coverage may have made employers been even more reluctant than they were before to hire workers with disabilities into union jobs. This period also followed the 2008-2010 recession, which may have made employers particularly anxious about hiring workers with disabilities in the early stages of the recovery because they may have perceived these workers as riskier.

Unions in the U.K. have developed a strategy of creating "Disability Champions" who are resources for employees with disabilities, employers, and unions on disability issues, and advocate for workers with disabilities. Two studies find that the Disability Champions have improved outcomes both for workers with disabilities and for employers, helping workers preserve employment and employers retain valuable human capital and avoid costly turnover.

Several authors suggest that unions could also enhance outcomes for workers with disabilities by working more closely with outside disability organizations. Many employers have successfully worked with non-profit and government organizations in identifying, recruiting, and

training qualified individuals with disabilities for employment positions (National Council on Disability, 2007). Unions may similarly find it useful to work with employers and outside organizations to identify, recruit, and help train people with disabilities for unionized jobs. This could involve creating a permanent union office to represent employees with disabilities that coordinates with voluntary disability organizations and, in essence, institutes a proactive union approach to disability within and outside the organizations. In cases where unions are more involved in hiring, such as by providing hiring halls, they could pursue a more active role with outside organizations to create pipelines of workers with disabilities (e.g., through apprenticeship programs). Finally, it would be good for unions and employers to ensure that collective bargaining agreements contain clear policies not only for existing workers but for new hires as well (though hiring policies and practices are not a mandatory subject of bargaining in the United States as noted earlier). While collective bargaining contracts have been criticized for using the medical model of disability, some union policies, such as on job reassignment and scheduling, focus on adapting the environment to accommodate the needs of workers with disabilities. This is in line with the social model's idea that the environment is a crucial factor in whether an impairment limits employment and productivity and thereby becomes a disability.

Our results raise interesting research questions about the employment of people with disabilities. The higher union wage premium among workers with disabilities suggests either that: a) unions are helping to decrease discriminatory wage differentials as they appear to do for black workers, and/or b) unions are helping to raise the relative productivity of workers with disabilities, possibly through increased stay-at-work and return-to-work policies that provide accommodations for workers who develop disabilities while employed. It would be valuable to explore which of these (or other) explanations is responsible for the differential in the union

wage premium. Given the higher wage premium and job retention of workers with disabilities in unionized jobs, unions appear to provide significant benefits to workers with disabilities. They may not have the opportunity to do so, as hiring decisions for unionized jobs are driven by employers. Some of the value of unions for workers with disabilities may be the result of establishing written policies in collective bargaining agreements governing the treatment of disability; one study in a non-union context found that written policies were more important than expressed intentions in subsequent hiring of people with disabilities (Araten-Bergman, 2016). The reasons behind the low hiring rate of workers with disabilities into unionized jobs is another excellent question for investigation. It would be valuable to explore whether this is due to employer reluctance to hire people with disabilities into unionized jobs, reluctance by unions to encourage applicants with disabilities, an otherwise unwelcome environment for new workers with disabilities in unionized jobs, or some other factors. Further research could also explore any difference in employment experiences in unionized workplaces between workers with visible and invisible disabilities, which we could not do with our measures.

People with disabilities have historically faced many barriers to employment, and it appears that affiliating with unions can improve their workforce participation and help them achieve greater economic equality. As the population ages there will be more workers with disabilities in the coming decades. In some respects, unionized workplaces may serve as models for how to increase retention and pay equity for workers with disabilities. It would be valuable for unions, employers, workers with disabilities, disability advocacy groups, and policymakers to work together to ensure greater job opportunities and more positive employment outcomes for people with disabilities.

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Appendix A: Questions used by Census Bureau to identify disability status on American Community Survey (https://www.census.gov/topics/health/disability/guidance/data-collection-acs.html, accessed 3-28-19)

1. "Is this person deaf or does he/she have serious difficulty hearing?"

2. "Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?"

3. "Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?"

4. "Does this person have serious difficulty walking or climbing stairs?"

5. "Does this person have difficulty dressing or bathing?"

6. "Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?"

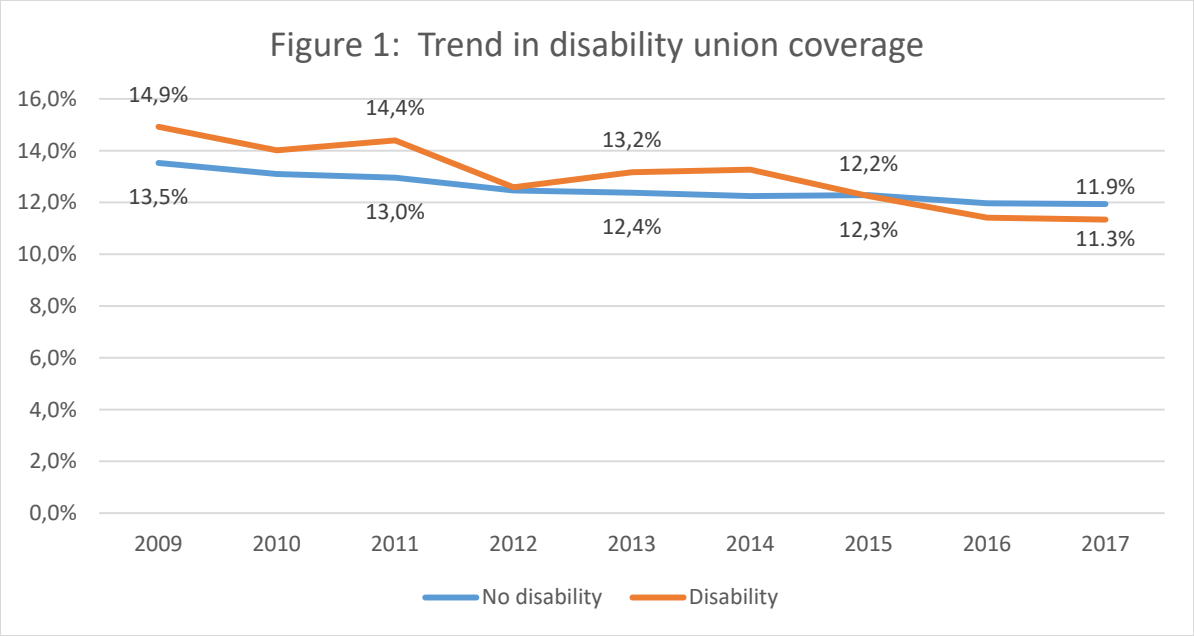
Figure 1: Trend in disability union coverage
16,0%
14,0%
12,0%
10,0%
8,0%
6,0%
4,0%
2,0%
0,0%
14,9%
14,4%
13,2%
12,2%
11.9%
13,5%
13,0%
12,4%
12,3%
11.3%
2009
2010
2011
2012
2013
2014
2015
2016
2017
No disability
Disability

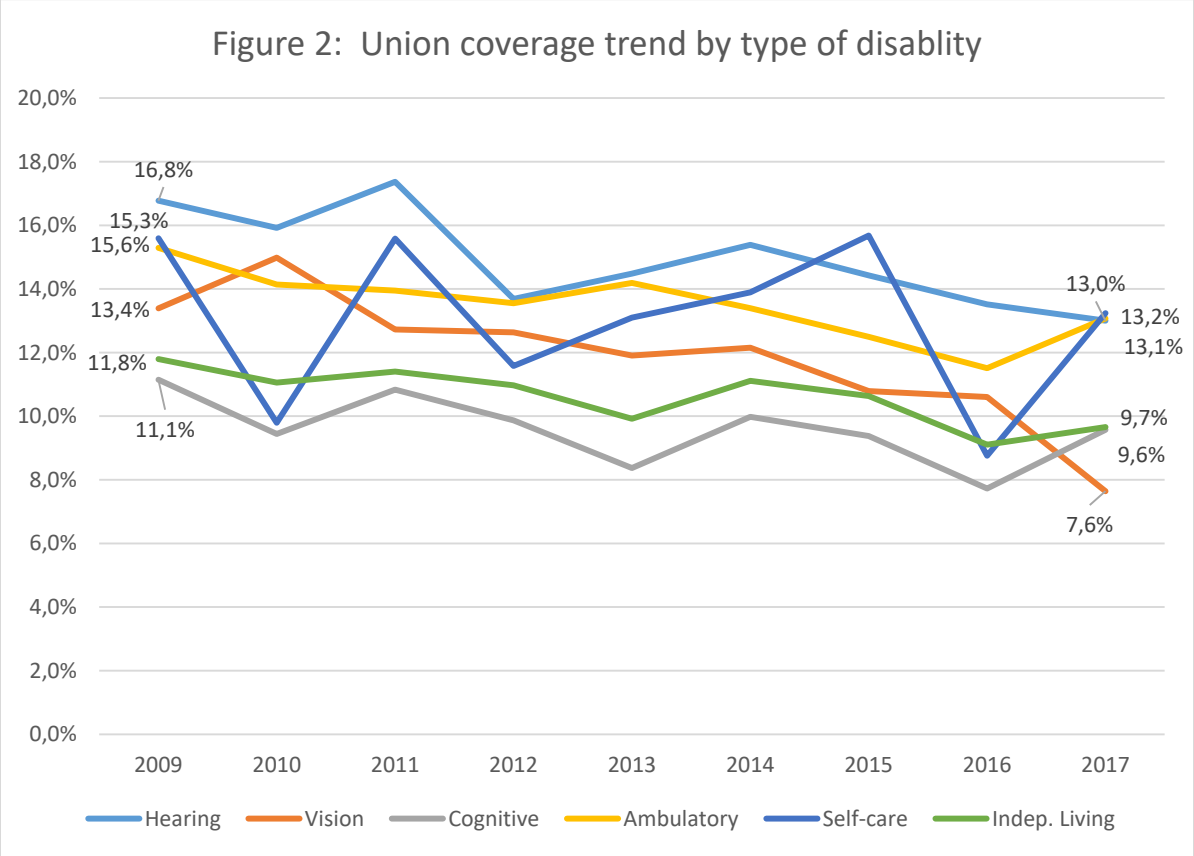
Figure 2: Union coverage trend by type of disablity
20,0%
18,0%
16,0%
14,0%
12,0%
10,0%
8,0%
6,0%
4,0%
2,0%
0,0%
16,8%
15,3%
15,6%
13,4%
11,8%
11,1%
13,0%
13,2%
13,1%
9,7%
9,6%
7,6%
2009
2010
2011
2012
2013
2014
2015
2016
2017
Hearing
Vision
Cognitive
Ambulatory
Self-care
Indep. Living

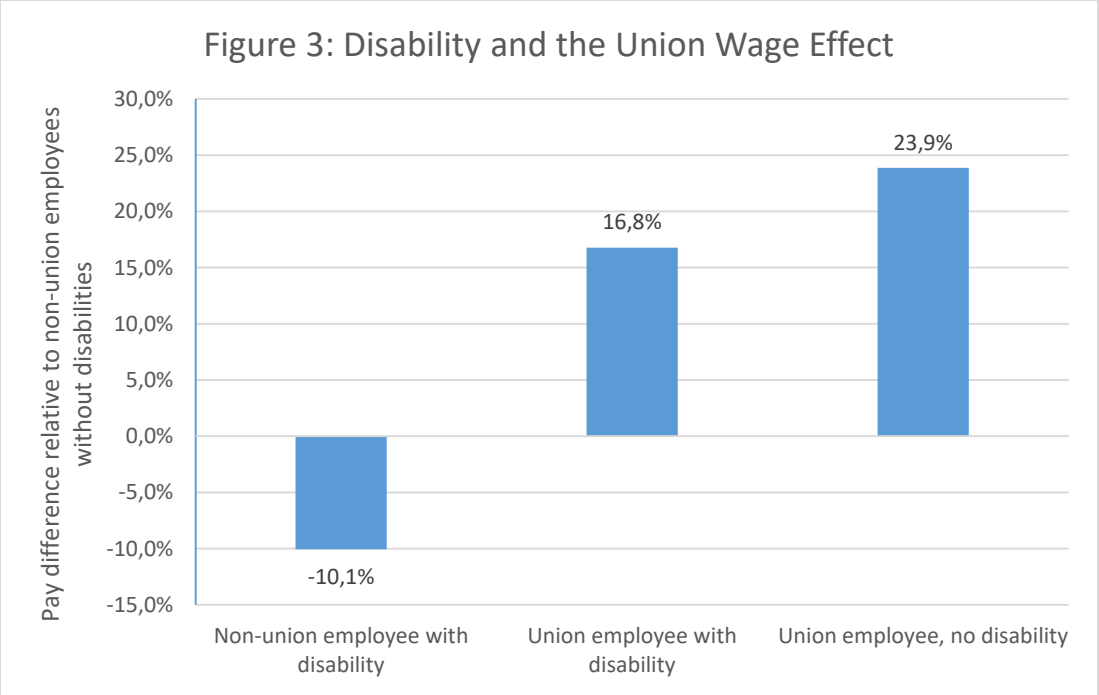
Figure 3: Disability and the Union Wage Effect
Pay difference relative to non-union employees without disabilities
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
-5,0%
-10,0%
-15,0%
-10,1%
16,8%
23,9%
Non-union employee with disability
Union employee with disability
Union employee, no disability

Table 1: Union coverage by disability status

	Unionization rate				Sample sizes	
	No disability	Disability	Difference		No disability	Disability
Overall	12.5%	13.0%	0.5%	**	1,442,771	54,950
Private sector	7.5%	7.9%	0.5%	**	1,198,369	45,024
Government	39.4%	37.0%	-2.4%	**	244,402	9,926
Disability type:						
Hearing		14.9%	2.4%	**		19,232
Visual		11.8%	-0.7%			8,216
Cognitive		9.5%	-3.0%	**		13,765
Ambulatory		13.5%	1.0%	**		21,313
Self-care		13.0%	0.5%			3,274
Independent living		10.6%	-1.9%	**		6,825
Gender						
Men	13.1%	13.5%	0.5%	*	727,446	28,615
Women	11.9%	12.4%	0.5%	^	715,325	26,335
Age						
18-34	8.8%	7.5%	-1.2%	**	503,196	10,884
35-49	14.2%	14.3%	0.0%		477,978	13,183
50-64	16.0%	16.4%	0.4%		396,990	22,455
65+	10.8%	9.7%	-1.2%	**	64,607	8,428
Occupation						
Management, business, and financial	5.5%	7.8%	2.3%	**	210,879	5,861
Professional and related	19.1%	19.8%	0.7%		341,906	10,143
Service	11.6%	10.9%	-0.7%		250,699	11,648
Sales and related	3.6%	4.1%	0.5%		145,649	5,365
Office and administrative support	10.5%	12.7%	2.2%	**	194,377	8,164
Farming, fishing, and forestry	3.4%	3.3%	-0.1%		11,183	494
Construction and extraction	19.8%	20.9%	1.1%		65,679	2,291
Installation, maintenance, and repair	16.7%	16.0%	-0.7%		49,660	2,050
Production	14.2%	15.0%	0.8%		85,273	4,391
Transportation and material moving	17.8%	14.9%	-2.9%	**	87,466	4,543

** p<.01 * p<.05

Table 2: Predicting Union Coverage

Dependent variable: Union coverage (dummy). Based on linear probability models.

		(1)	(2)	(3)	(4)	(5)	(6)
Disability		0.0047**	0.0041**	-0.0025			
		(2.79)	(2.58)	(-1.55)			
Type of disability:							
	Hearing				0.0261**	0.0144**	0.0066*
					(8.52)	(5.01)	(2.29)
	Visual				-0.0090*	-0.0045	-0.0080*
					(-2.16)	(-1.13)	(-2.02)
	Cognitive				-0.0318**	-0.0212**	-0.0158**
					(-9.99)	(-7.07)	(-5.29)
	Ambulatory				0.0129**	0.0133**	0.0019
					(4.40)	(4.79)	(0.70)
	Self-care				0.0125	0.0094	0.0105
					(1.66)	(1.32)	(1.49)
	Independent living				-0.0166**	-0.0168**	-0.0143**
					(-3.32)	(-3.58)	(-3.06)
Demographics							
	Female			-0.0114**			-0.0114**
				(-17.11)			(-17.05)
	Age			0.0075**			0.0075**
				(65.69)			(65.76)
	Age squared			-0.0001**			-0.0001**
				(-53.02)			(-53.14)
	Hispanic			-0.0030**			-0.0031**
				(-3.45)			(-3.53)
	Black			0.0168**			0.0168**
				(15.95)			(15.95)
	Other race			0.0098**			0.0098**
				(9.27)			(9.26)
	High school			0.0341**			0.0341**
				(33.03)			(32.98)
	Some college, no degree			0.0459**			0.0458**
				(40.72)			(40.64)
	Associate's degree			0.0494**			0.0493**
				(36.65)			(36.57)
	Bachelor's degree			0.0395**			0.0394**
				(32.78)			(32.70)
	Graduate degree			0.0711**			0.0710**
				(47.04)			(46.98)
Year dummies		Yes	Yes	Yes	Yes	Yes	Yes
564 occupation dummies		No	Yes	Yes	No	Yes	Yes
Observations		1,497,721	1,497,721	1,497,721	1,497,721	1,497,721	1,497,721
R-squared		0.000	0.157	0.165	0.000	0.157	0.165

Robust t-statistics in parentheses

** p<0.01, * p<0.05

Table 3: Predicting Trends in Union Coverage

Dependent variable: Union coverage (dummy). Based on linear probability models.

	(1)	(2)	(3)	(4)	(5)	(6)
Main effects						
Any disability	0.0147**	0.0128**	0.0057			
	(4.63)	(4.27)	(1.91)			
Hearing disability				0.0343**	0.0223**	0.0140**
				(5.98)	(4.13)	(2.59)
Vision disability				0.0093	0.0131	0.0097
				(1.16)	(1.76)	(1.32)
Cognitive disability				-0.0325**	-0.0201**	-0.0149*
				(-5.27)	(-3.46)	(-2.56)
Ambulatory disability				0.0174**	0.0174**	0.0061
				(3.18)	(3.35)	(1.18)
Self-care disability				0.0032	-0.0025	0.0006
				(0.23)	(-0.19)	(0.05)
Indep. living disability				-0.0165	-0.0219*	-0.0199*
				(-1.74)	(-2.48)	(-2.26)
Linear year	-0.0019**			-0.0019**		
	(-15.39)			(-15.61)		
564 occupation dummies	No	Yes	Yes	No	Yes	Yes
Interactions of linear year with:						
Any disability	-0.0024**	-0.0021**	-0.0020**			
	(-3.77)	(-3.49)	(-3.30)			
Hearing disability				-0.0020	-0.0019	-0.0018
				(-1.74)	(-1.76)	(-1.64)
Vision disability				-0.0045**	-0.0043**	-0.0043**
				(-2.88)	(-2.93)	(-2.97)
Cognitive disability				0.0002	-0.0002	-0.0002
				(0.17)	(-0.22)	(-0.20)
Ambulatory disability				-0.0011	-0.0010	-0.0010
				(-0.97)	(-0.91)	(-0.92)
Self-care disability				0.0022	0.0028	0.0023
				(0.77)	(1.02)	(0.85)
Indep. living disability				-0.0000	0.0012	0.0013
				(-0.01)	(0.67)	(0.74)
564 occupation dummies	No	Yes	Yes	No	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,497,721	1,497,721	1,497,721	1,497,721	1,497,721	1,497,721
R-squared	0.000	0.158	0.166	0.000	0.158	0.166

Robust t-statistics in parentheses

** p<0.01, * p<0.05

Table 4: Changes in Disability Status, Employment, and Union Coverage

Figures based on CPS respondents matched across 12 months, 2009-2017, from transition matrix in Table A1.

		Outcome: Employed in period 2		Outcome: Union coverage among employed in period 2	Ratio of union coverage in (2) relative to those with no disability in either period	
		(1)		(2)	(3)	
Union employee in period 1						
1	No disability either period	93.8%		68.6%	--	
2	Onset of disability in second period	79.1%		68.0%	0.991	
3	Recovered from disability in second period	88.0%		68.6%	1.000	
4	Disability in both periods	83.4%		74.9%	1.092	**
Non-union employed in period 1						
5	No disability either period	91.4%		4.6%	--	
6	Onset of disability in second period	74.6%		4.1%	0.899	
7	Recovered from disability in second period	85.1%		4.8%	1.044	
8	Disability in both periods	76.9%		3.5%	0.773	**
Not employed in period 1						
9	No disability either period	17.6%		6.8%	--	
10	Onset of disability in second period	4.2%		7.8%	1.146	
11	Recovered from disability in second period	6.2%		7.4%	1.089	
12	Disability in both periods	2.2%		6.7%	0.997	
Union/nonunion ratio						
13	No disability either period	1.026	**			
14	Onset of disability in second period	1.061	**			
15	Recovered from disability in second period	1.035	**			
16	Disability in both periods	1.084	**			

* Difference is significant at p<.05 ** p<.01

Table 5: Predicting Union Coverage with Disability Transitions

Based on multinomial logit regressions predicting union employee, non-union employed, or non-employed in period 2. Figures are relative risk ratios, representing likelihood of entering category in period 2 relative to likelihood of becoming non-union employed worker.

	Regression 1, including all union employees in period 1		Regression 2, including all non-union employed in period 1		Regression 3, including all non-employed in period 1	
	Relative likelihood in period 2 of becoming:		Relative likelihood in period 2 of becoming:		Relative likelihood in period 2 of becoming:	
	Union employee	Non-employed	Union employee	Non-employed	Union employee	Non-employed
	(1)	(2)	(3)	(4)	(5)	(6)
Disability transitions:						
No disability either period (base)						
Onset of disability in second period	0.942	3.069**	0.933	3.166**	0.966	2.864**
	(-0.81)	(11.32)	(-1.04)	(38.50)	(-0.25)	(27.43)
Recovered from disability in second period	0.984	1.576**	1.092	1.560**	0.942	2.006**
	(-0.25)	(4.46)	(1.64)	(14.05)	(-0.57)	(23.17)
Disability in both periods	1.307**	2.757**	0.829*	2.520**	0.805	5.721**
	(2.82)	(7.93)	(-2.30)	(25.51)	(-1.59)	(48.94)
Demographics						
Female	1.037	0.939**	1.405**	1.005	1.549**	0.641**
	(0.90)	(-2.96)	(28.40)	(0.29)	(33.70)	(-10.09)
Age	0.890**	1.098**	0.847**	1.039**	0.918**	1.120**
	(-13.06)	(16.20)	(-82.45)	(9.54)	(-39.01)	(13.44)
Age squared	1.002**	0.999**	1.002**	1.000**	1.001**	0.999**
	(16.49)	(-14.49)	(85.07)	(-9.54)	(58.89)	(-12.74)
Hispanic	0.946	0.813**	1.091**	1.202**	0.939**	1.120
	(-0.89)	(-6.42)	(4.80)	(6.79)	(-3.58)	(1.84)
Black	1.030	0.673**	1.520**	1.911**	1.115**	1.151*
	(0.50)	(-12.63)	(21.71)	(25.42)	(5.49)	(2.15)
Other race	0.897	0.744**	1.264**	1.114**	1.218**	0.870
	(-1.44)	(-7.59)	(10.38)	(3.37)	(8.46)	(-1.63)
High school	0.918	1.485**	0.686**	1.420**	0.711**	1.437**
	(-1.00)	(7.47)	(-18.59)	(8.52)	(-17.40)	(4.91)
Some college, no degree	0.904	1.635**	0.650**	1.367**	0.611**	1.198*
	(-1.13)	(8.99)	(-20.13)	(7.27)	(-24.60)	(2.31)
Associate's degree	0.788*	1.715**	0.518**	1.481**	0.545**	1.666**
	(-2.44)	(9.41)	(-25.14)	(8.57)	(-21.68)	(5.40)
Bachelor's degree	0.656**	1.607**	0.455**	1.416**	0.573**	1.506**
	(-4.64)	(8.77)	(-34.60)	(8.21)	(-22.94)	(4.75)
Graduate degree	0.694**	2.023**	0.390**	1.872**	0.521**	2.289**
	(-3.90)	(12.66)	(-34.67)	(14.21)	(-21.08)	(8.67)
Year dummies	Yes		Yes		Yes	
Observations	66005		479798		361,804	

Robust z-statistics in parentheses
** p<0.01, * p<0.05
Demographic predictors are based on values in first year.
Based on CPS longitudinal matches, 2009-2017

Table 6: Disability and the Union Wage Effect

Dependent variable=ln(hourly pay)

Sample:	All	No disability	Disability	Hearing disability	Vision disability	Cognitive disability	Ambulatory disability	Self-care disability	Independent living disability
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Union coverage	0.214**	0.214**	0.247**	0.255**	0.250**	0.260**	0.254**	0.281**	0.302**
	(132.68)	(132.40)	(29.29)	(18.35)	(11.33)	(12.71)	(18.79)	(6.64)	(10.04)
Disability	-0.106**								
	(-33.64)								
Union coverage*disability interaction	0.047**								
	(6.06)								
Female	-0.109**	-0.110**	-0.076**	-0.112**	-0.104**	-0.025	-0.066**	-0.031	-0.033
	(-85.49)	(-85.30)	(-10.66)	(-8.47)	(-5.28)	(-1.87)	(-5.29)	(-0.93)	(-1.54)
Potential labor mkt experie	0.021**	0.022**	0.013**	0.015**	0.012**	0.009**	0.012**	0.013**	0.004
	(153.70)	(154.21)	(17.96)	(11.23)	(6.21)	(6.91)	(8.79)	(3.62)	(1.65)
Potential labor mkt experie	-0.000**	-0.000**	-0.000**	-0.000**	-0.000**	-0.000**	-0.000**	-0.000*	-0.000
	(-107.19)	(-108.20)	(-11.56)	(-8.84)	(-3.95)	(-4.77)	(-6.06)	(-2.57)	(-0.19)
Hispanic	-0.065**	-0.067**	-0.003	-0.022	-0.013	0.032	-0.016	-0.036	-0.028
	(-42.65)	(-43.42)	(-0.27)	(-1.13)	(-0.63)	(1.64)	(-0.99)	(-0.83)	(-0.88)
Black	-0.074**	-0.076**	-0.033**	-0.018	-0.036	-0.018	-0.037*	-0.007	-0.046
	(-42.02)	(-42.32)	(-3.22)	(-0.74)	(-1.51)	(-0.84)	(-2.54)	(-0.19)	(-1.49)
Other race	-0.011**	-0.011**	-0.019	-0.007	-0.025	-0.041	-0.003	0.023	0.041
	(-5.46)	(-5.38)	(-1.66)	(-0.36)	(-0.95)	(-1.84)	(-0.17)	(0.50)	(1.23)
High school	0.104**	0.104**	0.103**	0.097**	0.065*	0.086**	0.115**	0.156**	0.138**
	(54.09)	(53.53)	(10.00)	(5.07)	(2.53)	(4.60)	(6.69)	(3.59)	(4.95)
Some college, no degree	0.165**	0.165**	0.167**	0.134**	0.107**	0.168**	0.169**	0.187**	0.211**
	(78.97)	(77.83)	(14.81)	(6.47)	(3.61)	(8.18)	(8.83)	(3.67)	(6.10)
Associate's degree	0.204**	0.205**	0.183**	0.142**	0.144**	0.186**	0.180**	0.309**	0.263**
	(84.83)	(83.92)	(14.22)	(6.26)	(4.09)	(7.65)	(8.38)	(4.94)	(6.13)
Bachelor's degree	0.364**	0.366**	0.307**	0.267**	0.232**	0.297**	0.298**	0.338**	0.376**
	(151.77)	(150.40)	(22.65)	(11.31)	(6.25)	(11.46)	(13.01)	(5.57)	(8.58)
Graduate degree	0.554**	0.556**	0.488**	0.439**	0.379**	0.556**	0.478**	0.456**	0.569**
	(186.24)	(184.56)	(27.13)	(13.97)	(7.78)	(14.03)	(16.87)	(6.14)	(9.53)
Part-time	-0.115**	-0.109**	-0.215**	-0.164**	-0.213**	-0.206**	-0.226**	-0.285**	-0.270**
	(-70.32)	(-65.08)	(-27.89)	(-11.03)	(-10.56)	(-15.02)	(-17.97)	(-8.15)	(-11.98)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
564 occupation dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	929,234	893,734	35,500	12,291	5,340	9,142	13,463	1,929	4,108
R-squared	0.529	0.530	0.489	0.488	0.513	0.513	0.470	0.658	0.608

Robust t-statistics in parentheses

** p<0.01, * p<0.05

Based on CPS cross-sectional data, 2009-2017

Table 7: Unions and Accommodation Requests

		Non-union employees			Union employees		
		No disability		Disability	No disability		Disability
		(1)		(2)	(3)		(4)
Requested accommodations in current job		9.0%	*	13.6%	11.5%	^	17.9%
Granted accommodations in current job, as % of all employees							
	Any granted	7.3%	*	11.2%	9.0%	^	12.0%
	Partially granted	1.6%		1.7%	2.8%	^	3.1%
	Fully granted	5.7%	*	9.6%	6.2%		9.0%
n	Requested accommodations	31,955		1,190	4,827		157

* Difference between employees with and without disabilities is significant at p<.05

^ Difference between union and non-union employees significant at p<.05

Based on CPS supplement, May 2012

Table 8: Predicting Accommodation Requests and Results

Based on logit regressions predicting accommodation requests and results. Figures are odds ratios in column 1, and relative risk ratios in columns 2 to 4 representing likelihood of accommodation outcome relative to likelihood of not making any request (excluded category).

		Regression 1 logit	Regression 2 multinomial logit		
			Likelihood of outcome relative to likelihood of no accommodation request		
		Requested accommodation	Accommodation requested but not granted	Accommodation requested and partially granted	Accommodation requested and fully granted
		(1)	(2)	(3)	(4)
Union coverage		1.3025**	1.3469*	1.6049**	1.1872*
		(4.48)	(2.43)	(4.05)	(2.22)
Disability		1.7187**	1.4339	1.2379	1.9464**
		(5.31)	(1.58)	(0.74)	(5.60)
Union coverage*disability interaction		1.0339	1.7029	1.0832	0.8554
		(0.13)	(1.19)	(0.13)	(-0.46)
Demographics					
	Female	1.1172*	1.0653	1.0079	1.1670**
		(2.44)	(0.63)	(0.08)	(2.75)
	Age	1.0651**	1.0710**	1.1133**	1.0512**
		(6.17)	(2.97)	(4.21)	(4.07)
	Age squared	0.9993**	0.9993**	0.9987**	0.9994**
		(-5.98)	(-2.66)	(-4.21)	(-3.99)
	Hispanic	0.7184**	0.7491	0.6749*	0.7238**
		(-4.38)	(-1.74)	(-2.23)	(-3.47)
	Black	0.7322**	1.0108	0.7982	0.6278**
		(-4.04)	(0.07)	(-1.32)	(-4.55)
	Other race	0.7403**	0.9598	0.6808	0.6999**
		(-3.42)	(-0.22)	(-1.77)	(-3.34)
	High school	1.5698**	1.7629*	1.9854*	1.3997*
		(3.93)	(2.56)	(2.38)	(2.29)
	Some college, no degree	2.1176**	1.8852**	2.9543**	2.0130**
		(6.36)	(2.73)	(3.72)	(4.63)
	Associate's degree	2.0584**	1.5949	2.4454**	2.1351**
		(5.78)	(1.87)	(2.88)	(4.80)
	Bachelor's degree	2.2907**	1.8361*	3.2494**	2.2279**
		(6.94)	(2.57)	(3.99)	(5.26)
	Graduate degree	2.4837**	1.5893	4.0207**	2.4361**
		(7.19)	(1.75)	(4.61)	(5.53)
23 occupation dummies		Yes		Yes	
Observations		38129		38129	

Robust z-statistics in parentheses

** p<0.01, * p<0.05

Based on CPS supplement, May 2012

Table A1: Transition Matrix for Union and Disability Status

Figures represent cell percentages among all respondents matched over any 12 months in 2009-2017.

		Transition to:						
		Non-employed, no disability	Non-employed, disability	Non-union employee, no disability	Union employee, no disability	Non-union employee with disability	Union employee with disability	Totals
Transition from:		1	2	3	4	5	6	
1	Non-employed, no disability	22.72%	2.87%	4.56%	0.29%	0.12%	0.01%	30.57%
2	Non-employed, disability	3.15%	6.50%	0.19%	0.01%	0.14%	0.01%	9.99%
3	Non-union employee, no disability	4.25%	0.28%	43.59%	1.81%	0.81%	0.03%	50.77%
4	Union employee, no disability	0.38%	0.03%	1.76%	3.99%	0.03%	0.07%	6.26%
5	Non-union employee with disability	0.20%	0.19%	1.07%	0.04%	0.63%	0.02%	2.15%
6	Union employee with disability	0.02%	0.02%	0.04%	0.10%	0.02%	0.06%	0.26%
	Totals	30.70%	9.89%	51.22%	6.24%	1.74%	0.20%	100.00%

N=910,541. Figures weighted using CPS weights with adjustment for differential reporting of disability by interview type.