SAFETY AND HEALTH INVESTMENT PROJECTS
FINAL REPORT

Addressing the Health and Safety Needs of Washington Women in the Trades
(Safety and Health Empowerment for Women in Trades)
2014WH00281
07/01/2014 – 08/30/2016

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November 18, 2016

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Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects.

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PART I

Narrative Report

Organization Profile:

University of Washington (Managing Partner)
The University of Washington Department of Environmental and Occupational Health Sciences (DEOHS) has been conducting occupational health and safety research since the 1960s and provides health and safety training, consultations, laboratory testing, and clinical services to business and labor organizations. UW DEOHS aims to identify the hazards in the environment and the workplace that affect human health, to understand the mechanisms of action, to develop strategies for confronting their effects, and to share the knowledge obtained. The UW mission includes prevention of environmental and occupational illness and injury as foundational components.

Washington Women in Trades (Primary Community Partner)
Washington Women in Trades (WWIT) is a community-based non-profit organization that facilitates connections between working women, 'wanting-to-be-working' women, prospective employers, and government agencies in order to enhance the working lives of women in the trades. WWIT aims to improve women's economic equity and self-sufficiency through access and success in high-wage, high-skilled careers in the construction trades and other non-traditional employment.

Washington State Labor Education and Research Center (Subcontractor)
The Washington State Labor Education and Research Center (WA LERC) works with unions, community-based organizations and colleges to provide direct education and research services for workers and students in Washington State. WA LERC's mission is to use the best practices of adult education to design programs to help working women and men develop the skills, confidence, and knowledge to be leaders at work and in their communities.

Abstract:

Background

Construction workers experience many health and safety hazards including slips/trips/falls, being struck by machinery, electrocution, and other health hazards such as stress, dust, noise, etc. Women workers, who compose less than 3% of the industry, may face additional risks from inadequate personal protective equipment and a culture that ranges from discriminatory to openly hostile. Little is known about tradeswomen's current workplace hazards or how their under-representation in the industry affects their well-being.

Objective

To better understand the nature, range, and extent of health and safety risks experienced by women in the trades in order to generate effective, evidence-based solutions.

Methods

We conducted four focus groups in the spring of 2015 with tradeswomen and tradesmen, held in three locations in WA State. Groups discussed physical and psychosocial workplace hazards as well as strategies to reduce risks. Data were analyzed and, together with existing literature on the subject, used to inform development of a questionnaire assessing tradeswomen's workplace risks. We administered the survey to female & male workers throughout WA State via online, paper, and phone interview methods. Survey data were analyzed in conjunction with information from three follow-up focus groups.

Results

Focus group findings revealed many themes that may impact tradeswomen's injury and illness in the workplace including: the presence of hazards (electrical, lifting, work stress, etc.); inadequate personal protective equipment; physical overcompensation; gender discrimination and unequal training; sexual harassment; and fear of layoff for reporting concerns. Almost 300 workers (198 tradeswomen and 93 tradesmen) participated in our survey. Survey results show that gender is a significant predictor of injury and perceived stress, with women having higher risk compared to men. Several gender-related stressors identified in the focus groups (including sexual harassment, discrimination, and overcompensation) were significantly associated with negative health and safety outcomes for women. For instance, tradeswomen who reported high overcompensation were more than four times as likely to have been injured at work in the past year. Having bad work/life balance created almost eight-fold risk of stress in women. Social support and having a high safety climate were found to help protect against high levels of stress.

Purpose of Project:

This study aimed to describe the exposures—both physical and psychosocial—health outcomes, and effectiveness of protection systems experienced by women working in the construction trades in WA State in contrast to those experienced by male workers.

Specifically, we planned to:

- Identify key health and safety risks affecting women in construction trades
- Understand the relationship between these hazards and their effect on women's health and injury risk
- Compare risks between women and men
- Identify points for intervention (future grant programming)

Statement and Evidence of the Results:

Objective 1: Develop a questionnaire addressing work-related health and safety exposures and control systems potentially affecting women working in the trades

For **Objective 1**, we conducted four focus groups in March and April of 2015 with 25 construction workers (three women-only groups with 19 total tradeswomen and one group with 6 tradesmen). Our original goal was to have 8-10 participants in each group; however, due to construction scheduling and last-minute participant cancellations, our final numbers were lower, albeit still sufficient for rich discussion. Three groups with only women were held in Seattle, Spokane, and Vancouver, WA while the men's group was in Seattle. Participants were identified by our advisory committee partners from WWIT. We met our recruitment logistic goals to represent tradeswomen voices from different areas of the state. Participants represented a variety of trade professions and career levels (see Table 1). Each group lasted approximately two hours with a short break and were held at convenient times for the workers. Food was provided and each participant received $50 as compensation for their time. All study procedures were reviewed and approved by the Washington State Institutional Review Board.

Table 1. Participant characteristics

	N
Gender	
Women	19
Men	6
Trade	
Carpenter	6
Drywall finisher	1
Electrician	9
Ironworker	1
Laborer	5
Operator	1
Plasterer	1
Tile setter	1
Location	
Seattle, WA	14
Spokane, WA	6
Vancouver, WA	5
Career stage	
Apprentice	3
Journey-level (including instructors)	20
Retired	2

Demographic information was collected including gender, trade, career stage, and union status. Participants were predominantly Caucasian and union members, which reflects our recruitment using union partners. Some of our participants were non-union and minority women, however, future projects should include partnerships with worker centers and other community-based organizations to reach these workers.

All of the groups discussed what they liked about working in the trades, their physical risks at work, non-physical risks to worker well-being, women-specific risks, and solutions for reducing risks (Attachment A). Data were anonymously recorded and were transcribed along with notes taken by UW research staff in attendance. Two researchers from UW analyzed the data and identified the main themes (see Table 2). Themes were then discussed with our advisory committee to verify their accuracy. Our focus group findings are comparable with existing research on tradeswomen health and safety risks, and identified some new themes related to women-specific risks and solutions. In addition, our study included men, which allowed for a reference group to compare our findings by gender and to understand how men perceive risks to their female coworkers.

Table 2. Focus group themes

Best part of work	Physical risks	Non-physical risks	Women-specific risks	Solutions
Work outdoors	Slips/trips/falls	Job insecurity	Ill-fitting PPE	Better PPE
Physical work	Toxic chemicals	Macho culture	Overcompensation	Equal training
Good wages and benefits	Acute and chronic injuries	No paid sick leave	Constantly having to prove selves	Proactive supervisors
Pride	Noise	Hazing	Tokenism	Mentorship
Camaraderie	Electricity		Sexual harassment	Share knowledge
"Earn while you learn"	Coworkers who don't care about safety		Unequal training (information withheld)	
Diversity of tasks	Management prioritizes production over safety		Physical limitations	
Skills can go anywhere			Lack of clean facilities	

Illustrative quotes:
"You could die any day if you stick your finger in the wrong place at the wrong time." (Journeywoman electrician)

"The harnesses—safety harness for tying off…they're not made for women. You would have to buy a specific one for female's bodies. They don't fit you right. If you were to fall off a building with a standard harness on, it would do more damage than good. End of story." (Journeywoman laborer)

"The heartbreak about onsite job accidents is someone who's new to the trade that was withheld the training and information from the journey-level workers around them. And while this happens to a lot of new people it specifically and oftentimes uniquely happens to women and minorities in the trades. They are not told all the safety concerns of their trade, or how to

do something safely, but left out to fend for themselves because there is a group of people who don't think they should be there."
(Retired electrician)

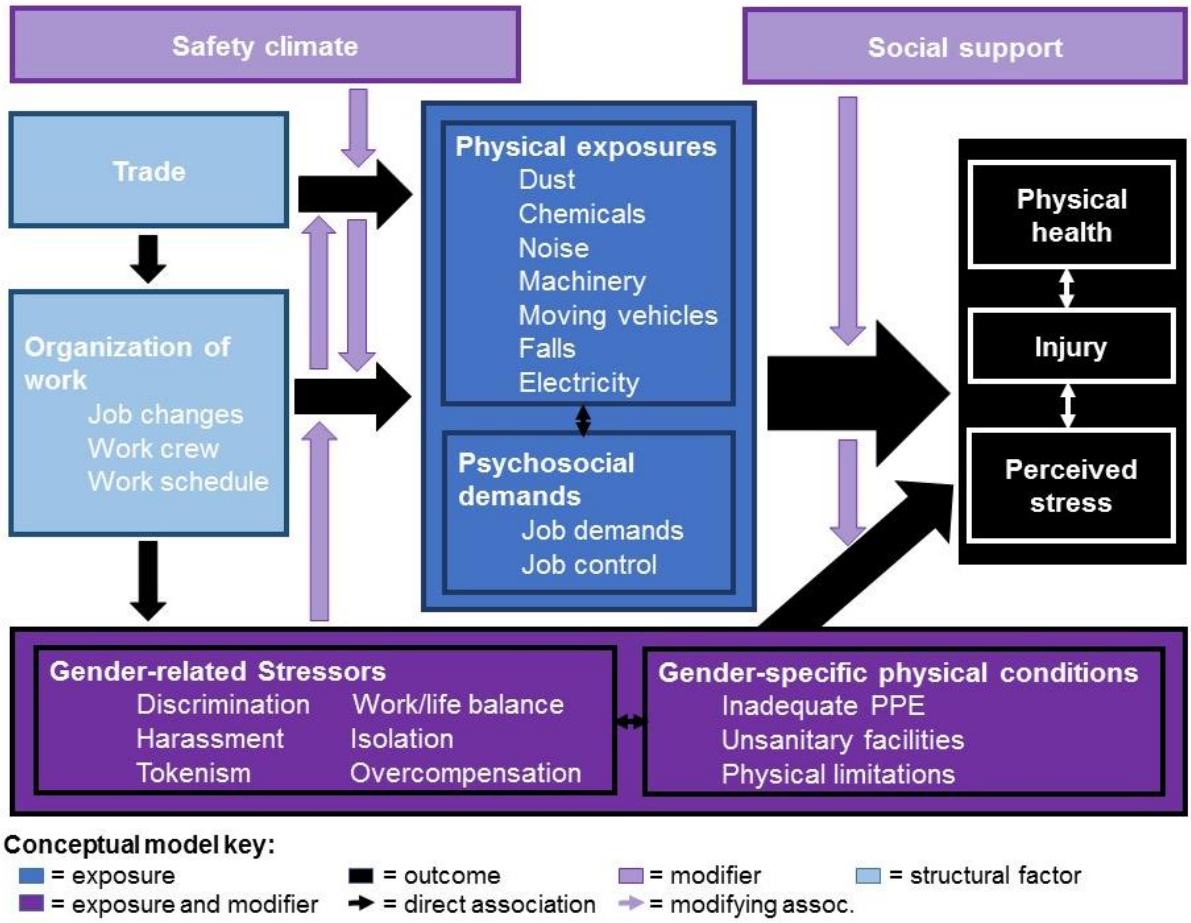
"It's [filing a complaint] a stigma. I mean because I hear it about where—I mean there's a woman from Lakeside who sued and that's all you ever hear…she never worked again…"
(Journeywoman laborer)

Questionnaire development

We then used the focus group findings—together with occupational and behavioral health frameworks and other exposures identified in previous studies on tradeswomen—to create a conceptual model that would guide our ongoing research (see Figure 1). Our model examines the impact that occupational exposures and gendered conditions of work, in conjunction with protective systems, have on tradeswomen's physical health, injury risk, and perceived stress. These were the outcomes identified in our exploratory research and focused on in our grant proposal. As minorities in a male-dominated industry with hazardous jobsite conditions, tradeswomen appear to have unique physical and psychosocial stressors compared to tradesmen. We used our data- and theory-driven model to further explore these stressors.

The model assisted with the creation of our questionnaire. We used questions derived from our focus group findings as well as previously-validated scales (adapted for our target population) to measure workplace exposures collected from other studies. The questionnaire included sections on: workers' trade information; apprenticeship training; general health; exposure to occupational hazards (e.g. dust, loud noise, traffic, electrocution, etc.); personal protective equipment; and experience with psychosocial stressors (including discrimination, sexual harassment, isolation, work/life balance, tokenism, bullying, overcompensation, and facilities) and protective systems (i.e. safety climate and social support). Primary outcomes measured were injury risk, self-reported health, and perceived stress. The survey also collected demographic information and included several open-ended questions on potential solutions to improve tradeswomen's conditions at work. See Attachment B for a complete copy of the questionnaire.

Figure 1. Conceptual model on tradeswomen's workplace stressors:



Our survey covered the majority of workplace exposures we proposed to measure in our grant proposal. Not wanting to burden participants with an excessively long questionnaire, we were unable to include all exposures of interest (e.g. thermal extremes, radiation, repetitive motion, etc.). We focused on those hazards raised in our focus groups and those identified in the literature. The Washington State IRB reviewed and approved our study procedures.

We pilot tested our survey with three tradeswomen and two tradesmen to gain feedback on the survey's length, topics covered, and comprehensiveness. We made adjustments to the survey after this testing period. In order to determine the validity of our two administration methods—online and over the phone with an interviewer—we had testers take the same survey using both methods. This yielded similar results so both methods were used.

Objective 2: Conduct a survey among a target group of 300 women working in the trades and a comparison group of 100 men matched for trade, statewide

For **Objective 2**, we conducted our survey to assess the impact of various occupational health and safety hazards on tradeswomen's well-being. After the questionnaire was developed, tested, and finalized, we trained three WWIT members to conduct the phone interviews. Training included human subjects protection, per our IRB. We had originally proposed to train 10 WWIT members as peer interviews; however, due to low demand for the phone format, we started with just three interviewers. We completed four surveys via phone interview so we did not need additional interviewers. The survey length and logistics of scheduling interviews made this a less popular method for our population.

To recruit survey participants, the Research Coordinator contacted over 150 leaders from apprenticeship programs, trade associations, unions, and contractors around WA State. We started with contacts recommended by our advisory committee (WWIT and WA LERC) and grant supporters (Northwest Laborers-Employers Training Trust, Associated General Contractors, WA State Labor Council, IBEW local 77, IUPAT 5, and Atkinson Construction) and continued to grow our network over the course of several months. We used flyers (see Attachment C) created by a WWIT advisory committee member that explained the study and linked to the UW DEOHS website where participants could access the survey. Contacts were invited to share the flyer with their workers/members via email and word-of-mouth. The study was also advertised on partner websites and through social media (i.e. Facebook). Paper flyers were posted throughout the greater Seattle area at community centers and shops frequented by tradeswomen. In addition, several UW researchers attended local union meetings and safety forums to promote the study and answer questions. Because women represent such a small minority of workers in construction, we relied on snowball sampling methods to reach them. Non-union workers, an even more difficult population to reach, were recruited via contractors and organizations such as the Construction Industry Training Council. We do not know the exact number of people reached by our recruitment efforts but estimate that roughly 1,100 women and men working in the trades heard about the study.

Per our proposal, the online survey was hosted by UW on a webpage explaining the purposes of the study and its procedures: http://deohs.washington.edu/shewt. Before starting the survey, participants were screened for eligibility and asked to consent to study procedures. Only women and men currently working in one of the building and construction trades in WA State were eligible to complete the survey. Women no longer in the trades could choose to answer a couple of questions about their reasons for leaving the trades. This information helped us better understand the challenges women face in the industry. After completing the survey, participants received a $20 Amazon gift card to thank them for their time.

In order to include a diversity of worker experiences, we recruited broadly and worked with our community partners to make the survey accessible to workers. In response to a recommendation by the Northwest Laborers-Employers Training Trust, we started sending paper copies of the survey for apprentices to complete during class. This method yielded almost one-third of all completed questionnaires. We also monitored the surveys as they came in, which allowed us to tailor our recruitment efforts with diversity in mind. Per our proposal, women and men were matched during recruitment based on trade, location, and experience. We collected surveys from workers in more than 20 trades, which greatly exceeded our goal of three trades.

We opened the survey in October, 2015 and closed it in May, 2016. During this time, we collected almost 300 surveys (198 from tradeswomen and 93 from tradesmen). This included 198 online questionnaires, 89 paper surveys, and 4 phone interviews. Our target of 200 phone interviews was not feasible because participants found it easier to complete paper surveys or use the online format. Our original goal was to have 400 workers (300 women and 100 men) participate. However, a number of unforeseen challenges caused the research team to lower our goal to 300 total participants. Barriers included: time commitment to take the survey (approximately 20 minutes online); busy schedules for construction workers; recruitment drop-off over the winter holidays; and community partners' recruitment constraints, including sending flyers via email rather than directly asking workers to participate. We addressed these challenges by adapting our strategies, extending our data collection period, and working closely with our partners to ensure positive collaboration. On November 10th-12th, 2015, we received a large amount of suspicious data and were forced to close the survey for several weeks to update our security settings. This unfortunate event cost the project a large amount of time and lost data (we threw out all data collected on these dates because the anonymous nature of the survey made it impossible to tell which ones were real or fake). The timing was very bad for the project as it occurred in the middle of heavy recruitment and the reopening of the survey hit during the holiday season when participation was low. Fortunately, we worked closely with our IRB and community partners to protect our data and study participants, and were able to continue the project. We also learned an important lesson about not having an anonymous survey with an e-gift card incentive. In response to the fake data we changed the survey from anonymous to confidential and mailed gift cards to participants' home addresses.

Objective 3: Characterize the health and safety hazards encountered by women working in the trades

For **Objective 3**, we analyzed the data from our questionnaire, focusing on relationships between the exposures and any differences across gender. Data were cleaned and labeled by a UW research scientist and graduate student, who collapsed scales when appropriate. During exploratory analysis, UW research staff examined frequencies and compared them across the genders. Using our conceptual model as a framework, we identified key predictors for each outcome stratified by gender. Logistic regression was used to create models of association for the main outcomes (i.e. injury and stress) and stressors. All continuous variables were transformed to binary by splitting at the 75th percentile.

Looking at participant demographic data (Table 3), we see that our sample is very diverse. Because the study is focused on the experience of tradeswomen, we have a larger sample of women compared to men, and they are significantly different on a number of demographic characteristics.

Table 3. Survey participant demographics

	Women (n=198)	Men (n=93)
	%	%
Trade*		
Carpenter	10	8
Electrician	23	17
Laborer	31	43
Operating Engineer	7	1
Plumber/pipefitter	11	19
Welder	2	3
Sheet Metal Worker	7	6
Other	9	2
Level in trade*		
Apprentice	37	57
Journey	63	43
Years in trades		
1-3	34	43
4-10	32	32
11+	35	25
Current union member		
Yes	89	94
No	11	6
Age Range (yrs)		
<30	14	23
30-40	35	38
41-50	26	16
>50	25	23
Race		
White	80	75
Black or other	20	25
Ethnicity*		
Latino	8	16
Not Latino	92	84
Sexual orientation*		
Heterosexual/Straight	81	97
Other	19	3
Marital status*		
Married	31	46
Single	35	43
Divorced/Other	35	11

Formal Schooling Level*		
Less than/finished High School or GED	14	20
Finished Trade/ Vocational School	20	14
Some College	31	48
Finished College	35	18

*Women and men are significantly different at p<0.05 based on chi-square test

Survey results show that women scored significantly higher than men on the perceived stress scale and were significantly more likely to have been injured at work in the past year (see Table 4). To measure perceived stress, we used a scale that assess the degree to which situations in a person's life are appraised as stressful [Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 386-396]. Predictors for risk of stress and injury were further explored in our models (Tables 6 and 7). Of those respondents who were injured in the past year (one-quarter of the total), women were more likely than men to not report their injury due to fear of layoff. Fear of reporting health and safety concerns was raised repeatedly by women in the focus groups as well as in the survey short answers (Tables 2 and 8), which highlights the significance of this barrier.

Availability and proper fit of PPE, the last-line of defense against occupational injuries/illness, was a common cause for concern among survey participants but also one which they were reluctant to raise with management. Of women who did not feel comfortable asking for better PPE (23% of the total), one-third listed "fear of being labeled as complainer by coworkers" as the primary reason and 20% listed "fear of layoff." The former concern ties back into a construction culture discussed by our male focus group participants that emphasizes "toughness" and social pressures, while making personal safety dependent on the behavior of others. As a journeyman carpenter stated, *"I think another one that comes up is just the macho thing that you get in construction. Fatigue's a good example…Like 'I've been up for 47 hours and hey uh, I'm tired as hell'…where you're really…you're basically drunk at that point. You're inefficient, you're unsafe, but there's this need to push through. And you see that, not just in that, but you also see that with a lot of other things. When I got into the trade before, I was the wuss because I put on knee pads."* As our data demonstrate, by using masculinity to define trade skills these cultural norms and industry practices often ignore the needs of women.

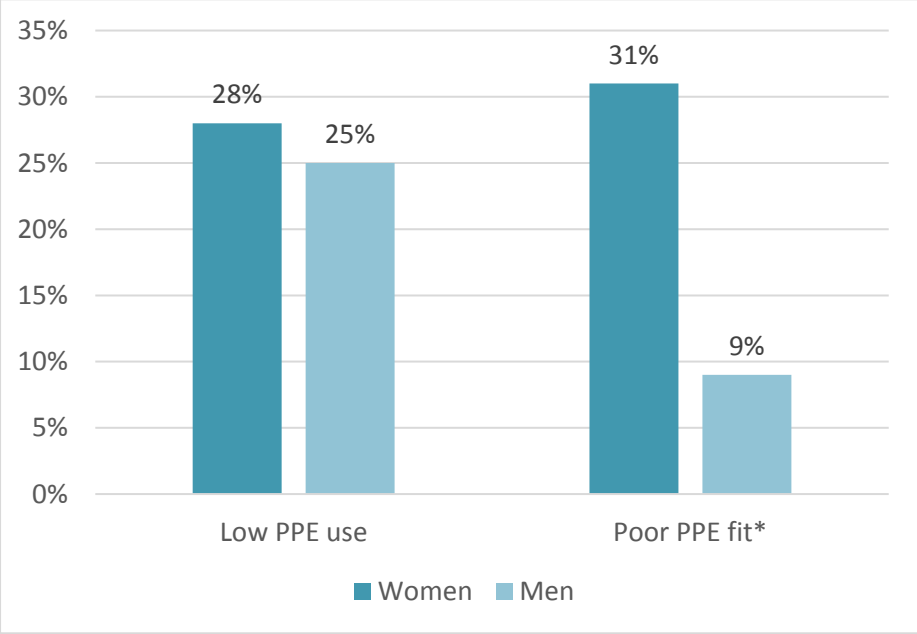
As Figure 2 reveals, although women and men had similar rates of using PPE (i.e. coveralls, hard hat, eye protection, hearing protection, gloves, fall harness, and respiratory protection) when exposed to the relevant hazard at work, women were significantly more likely than men to report PPE not fitting properly. This was especially true for PPE that conforms to the body (e.g. coveralls, gloves, and fall harnesses).

Table 4. Main outcomes by gender

	Women (n=198)	Men (n=93)
	%	%
Self-Rated Health		
Poor	6	7
At Least 1 Injury in Past Year*		
Yes	31	12
Perceived Stress*		
High	31	18

*Women and men are significantly different at p<0.05

Figure 2. PPE use and fit by gender



*Women and men are significantly different at p<0.05
Women (n=198), men (n=93)

The issue of PPE fit is important when talking about worker exposure to traditional occupational hazards. More than half of participants reported working around several of the measured hazards—high noise, traffic or moving vehicles, and materials/tools/equipment that could strike them in the head or body—at least half of the time (Table 5). These hazards put them at risk of injury, illness, or even death. Men had statistically higher exposure to dust/welding fumes and working at heights of at least four feet without barriers, compared to women. This might be due to job task segregation based on gender. Exposures varied by trade, with electricians reporting the highest percentage of exposure to electric shocks more than half the time (51% of women, 69% of men) and plumbers/pipefitters having the highest exposure to being struck by materials/tools/equipment (76% of women, 72% of men).

Table 5. Exposure to workplace hazards by gender

	Women (n=198)	Men (n=93)
	%	%
Dust or welding fumes*		
>half the time	33	44
Chemicals/acids/solvents		
>half the time	15	9
High noise		
>half the time	58	56
Traffic or moving vehicles		
>half the time	52	47
Struck by materials/tools/equipment		
>half the time	55	57
Heights without barriers*		
>half the time	18	29
Electric shocks		
>half the time	23	26

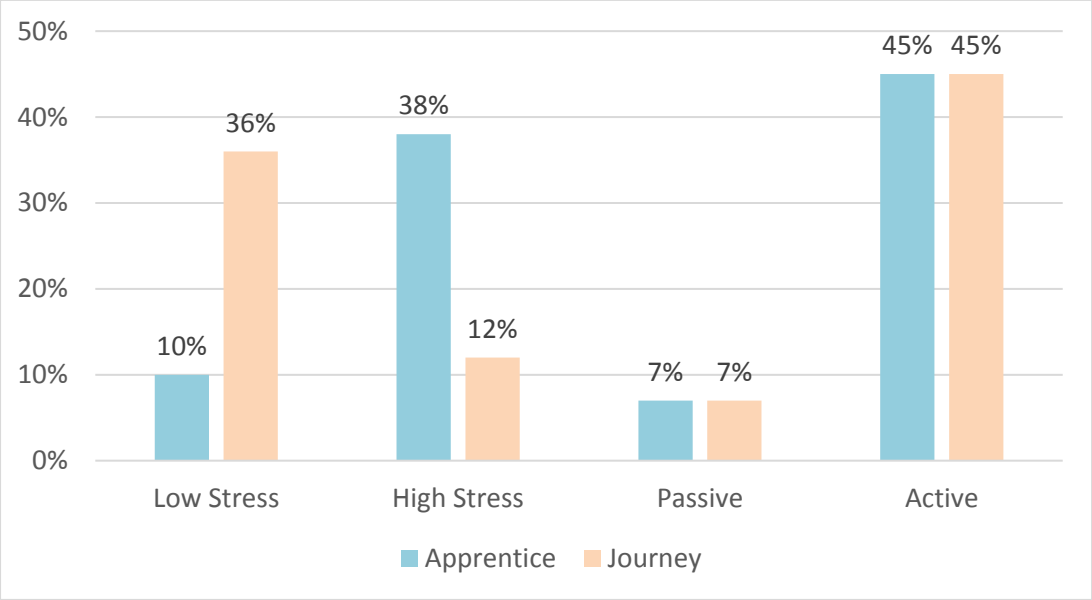
*Women and men are significantly different at $p<0.05$

Preliminary analyses using frequencies of responses by gender also revealed the impact the male-dominated culture has on women's mental health. Forty percent of women felt discriminated against at work because of their gender. As our focus groups demonstrate, many women end up overcompensating in an effort to overcome sexist stereotypes and prove their abilities. Indeed, over half (55%) of women in our survey reported pushing themselves past their physical comfort at least half of the time to get the job done. Women respondents experienced higher levels of alienation and bullying compared to their male counterparts. The literature tells us that social support can protect against workplace stressors; unfortunately, our women workers perceived significantly lower levels of social support from their supervisors compared to men.

From the focus groups we learned that apprenticeship can be a stressful time for both female and male workers. Apprentices are often seen as incapable and can be mistreated through hazing and assignment of "scut" work. Our survey results support the idea that new workers experience higher levels of job stress than those who have been in the trades more than a few years (Figure 3). Using job demand/job control as a proxy for stress, we see that apprentices experience significantly higher levels of stress from high job demands and low control compared to journey-level workers. We did not find a statistically significant difference between women and men in terms of demand/control (Figure 4). However, qualitative evidence from our focus groups shows that while men journey out and gain their peers' respect and reduced stress, women workers remain trapped in the role of perpetual apprentice, even after they have been in the trades for many years. As a retired female electrician stated, *"And so you would hope when you'd take a call…that you would get out on a crew of people that already knew you... Because if you got out there with a bunch of yeahoos who didn't think women should be in the trades, it's like you're a first year apprentice even though you've been a journey-level whatever in your trade…it didn't matter. You were sweeping the floors, taking out the garbage, you*

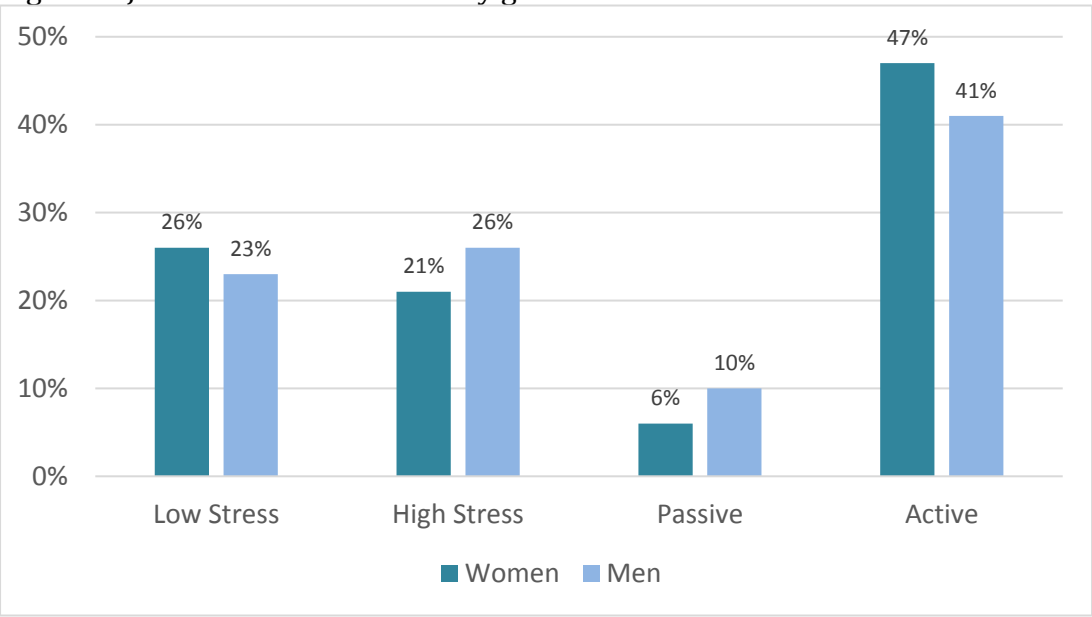
know, doing the scut work when you're a talented journey-level worker." This may help explain why women workers had higher overall stress (as measured in the perceived stress scale in Table 4) than men.

Figure 3. Job demand and control by apprentice versus journey level



Statistically significant difference between apprentices and journey-level workers
[This graph shows data from the four categories of the combined Job Demand scale (2 items measuring how hard and fast work is) and the Job Control scale (2 items measuring worker control over their work). Per the Demand-Control model of job stress, these categories can be used to measure job stress]
Low stress = low demand/high control; High stress = high demand/low control; Passive = low demand/low control; Active = high demand/high control

Figure 4. Job demand and control by gender



Difference between women and men is not statistically significant
Low stress = low demand/high control; High stress = high demand/low control; Passive = low demand/low control; Active = high demand/high control

Results from our logistic regression models (Tables 6 and 7) allow us to understand which psychosocial stressors are predictive of negative health and safety outcomes. We started by forming base models with workers' trade, career level (i.e. apprentice or journey), and age category. These variables were selected because we predicted that they would have an impact on injury and stress. The women and men combined model (Table 7) also included participant gender in the base model. Although the base model for women only (Table 6) was not statistically significant, we found higher rates of injury for apprentices compared to journey-level workers, and for workers over age 30. After testing the base models, we added each psychosocial and gender-related stressor variable from our conceptual model one at a time and looked for significance. Table 6 represents each of these variables (i.e. job stress as measured by the combined job demand/job control, overcompensation, sexual harassment, work/life balance, age discrimination, gender discrimination, bullying, isolation, tokenism, safety climate, social support, overtime, family death, marriage, and financial hardship) as a predictor of either injury or perceived stress in women participants, controlling for base model variables. All variables were measured using validated scales, adapted for our population.

For women participants (Table 6), we found that the odds of being injured at work in the past year were significantly associated with the following stressors: high levels of overcompensation and gender discrimination. For these stressors the injury risk more than doubled for women with high levels of exposure. Tradeswomen who reported high overcompensation were more than four times as likely to have been injured at work in the past year (95% CI: 2.09, 8.56).

Most notably, many psychosocial demands and gender-related stressors were related to the negative mental health outcome. For women, the odds of reporting high levels of stress were significantly associated with experiencing high levels of age discrimination and having bad work/life balance. Discrimination based on age was highly associated with stress for tradeswomen, with almost a ten-fold (OR: 9.77, 95% CI: 3.89, 24.53) increased risk for women who reported high age discrimination compared to those with low discrimination. Tradeswomen who reported having bad work/life balance were almost eight times (OR: 7.78, 95% CI: 3.67, 16.47) as likely to report high level of perceived stress as those with good balance. This demonstrates the importance of looking at the influence of home stressors on the workplace, and vice versa. As the women in our focus groups noted, society's sexist double standard, whereby women have a higher burden of unpaid labor compared to men, can contribute to their stress at work. In addition to the abovementioned predictors, financial hardship (losing a job, getting into debt beyond means of repayment, or period of homelessness) was also found to be significantly related to risk of high stress for women.

We found a protective effect of social support on perceived stress. Women respondents who reported receiving high levels of support from their coworkers and supervisor showed a lower risk of reporting stress, compared to those who received low levels of support. This is important for future program development aimed at reducing women's risk of work-related stress. Although, as our exploratory data demonstrated, women perceive lower social support from their supervisors compared to their coworkers.

Table 6. Logistic regression models predicting the association between various psychosocial exposures to injury and perceived stress for women

	Injury (yes in last year) OR [95% CI]	Stress (>2.2) OR [95% CI]
Variable (reference category)		
Trade (Laborer)		
Carpenter	0.63 [0.17, 2.37]	0.68 [0.18, 2.53]
Electrician	2.05 [0.86, 4.89]	1.52 [0.65, 3.54]
Pipe Trades	1.25 [0.40, 3.90]	1.27 [0.42, 3.84]
Sheet Metal	3.24 [0.92, 11.39]	0.34 [0.07, 1.78]
Other	1.32 [0.51, 3.41]	0.99 [0.38, 2.55]
Level (Journey)		
Apprentice	1.92 [0.88, 4.22]	0.67 [0.29, 1.56]
Age (≤30)		
31-40	2.11 [0.75, 5.91]	0.52 [0.19, 1.45]
41-50	1.89 [0.59, 6.07]	0.37 [0.12, 1.20]
>50	1.47 [0.44, 4.94]	0.26 [0.08, 0.89]
All controlling for above covariates		
Demand/Control (low D, high C)		
High D, Low C	2.37 [0.75, 7.42]	3.16 [0.98, 10.20]
Low D, Low C	2.13 [0.88, 5.15]	2.45 [0.97, 6.19]
High D, High C	1.03 [0.39, 2.72]	2.84 [1.13, 7.11]
Overcompensation (low)		
High	4.23 [2.09, 8.56]***	1.94 [0.99, 3.81]
Sexual Harassment (low)		
High	2.13 [1.05, 4.31]	2.40 [1.19, 4.81]
Work/Life Balance (good)		
Bad	1.45 [0.75, 2.81]	7.78 [3.67, 16.47]***
Age Discrimination (no)		
Yes	2.17 [0.97, 4.86]	9.77 [3.89, 24.53]***
Gender Discrimination (no)		
Yes	2.71 [1.36, 5.39]**	2.46 [1.23, 4.93]
Bullying (no)		
Yes	2.28 [1.17, 4.46]	2.43 [1.24, 4.78]
Isolation (low)		
High	1.53 [0.79, 2.98]	2.08 [1.06, 4.07]
Tokenism (low)		
High	1.21 [0.55, 2.65]	0.76 [0.33, 1.76]
Safety Climate (low)		
High	0.61 [0.29, 1.28]	0.40 [0.19, 0.86]
Social Support (low)		
High	1.24 [0.49, 3.12]	0.25 [0.10, 0.59]**

Overtime (no)		
Yes	0.99 [0.52, 1.88]	1.20 [0.63, 2.31]
Death in family (no)		
Yes	1.34 [0.58, 3.10]	3.51 [1.52, 8.07]
Marriage/Divorce (no)		
Yes	1.47 [0.61, 3.57]	1.33 [0.55, 3.23]
Debt/Job Loss/Homelessness (no)		
Yes	2.83 [1.33, 6.03]	4.65 [2.09, 10.37]***

*p<0.05 **p<0.01 ***p<0.001 (only included if overall model is significant)
The base model (trade, career level, and age category) is controlled for in each of the individual predictor models. These base model variables were selected a priori and forced into each model. The base model by itself is not a significant predictor of injury or stress for women.

Table 7 shows the models for all participants, women and men combined. We used the same base model variables but added gender. Looking at the base model data for both women and men we see that gender is in fact a significant ($p<0.01$) predictor for both injury and stress, with men having lower risk of being injured in the past year (OR: 0.36, 95% CI: 0.18, 0.72) and lower risk of reporting high perceived stress (OR: 0.38, 95% CI: 0.19, 0.76) compared to women. For the women and men combined data we built the same models to test significance of the psychosocial and gender-related stressor variables, with a few changes. Because men were not asked questions about tokenism in the survey we did not include that variable in the Table 7 models. In addition, questions about sexual harassment varied between women and men—women were asked about their experiences with harassing behaviors at work while men received questions about harassing behavior they had witnessed happening to their female coworkers—so that variable was also excluded from the regression analysis.

For all workers, the odds of being injured in the past year were significantly associated with experiencing high levels of overcompensation, gender discrimination, bullying, and financial hardship. We found having a high safety climate to be significantly protective against the risk of injury for all workers, which is promising given increased national attention on this intervention. In terms of stress, we found a significant association between reporting high stress and the following risk factors: high levels of age and gender discrimination, bullying, having poor work/life balance, and having had a family death or financial hardship. The risk of reporting high stress was especially high for workers with bad work/life balance (OR: 6.13, 95% CI: 3.29, 11.43) and for those who experienced age discrimination (OR: 5.68, 95% CI: 2.65, 12.20). High safety climate and high social support were shown to be significantly protective against stress for all workers.

Table 7. Logistic regression models predicting the association between various psychosocial exposures to injury and perceived stress for all participants (women and men combined)

	Injury (yes in last year) OR [95% CI]	Stress (>2.2) OR [95% CI]
Variable (reference category)		
Trade (Laborer)		
Carpenter	0.76 [0.24, 2.42]	0.47 [0.14, 1.60]
Electrician	1.93 [0.90, 4.11]	1.35 [0.66, 2.77]
Pipe Trades	1.10 [0.42, 2.87]	1.05 [0.42, 2.58]
Sheet Metal	2.91 [0.99, 8.57]	0.26 [0.05, 1.24]
Other	1.35 [0.56, 3.22]	0.78 [0.32, 1.88]
Level (Journey)		
Apprentice	1.61 [0.80, 3.22]	0.89 [0.43, 1.82]
Age (≤30)		
31-40	1.67 [0.72, 3.90]	0.61 [0.27, 1.38]
41-50	1.56 [0.58, 4.18]	0.47 [0.18, 1.25]
>50	1.02 [0.36, 2.91]	0.33 [0.12, 0.94]*
Gender (women)		
Men	0.36 [0.18, 0.72]**	0.38 [0.19, 0.76]**
All controlling for above covariates		
Demand/Control (low D, high C)		
High D, Low C	2.66 [1.01, 6.96]*	2.25 [0.84, 5.98]
Low D, Low C	2.34 [1.11, 4.97]*	1.87 [0.86, 4.10]
High D, High C	1.00 [0.41, 2.43]	3.09 [1.40, 6.84]**
Overcompensation (low)		
High	3.57 [1.93, 6.57]***	1.78 [0.99, 3.19]
Work/Life Balance (good)		
Bad	1.39 [0.78, 2.47]	6.13 [3.29, 11.43]***
Age Discrimination (no)		
Yes	1.67 [0.80, 3.48]	5.68 [2.65, 12.20]***
Gender Discrimination (no)		
Yes	2.46 [1.28, 4.75]**	2.22 [1.31, 4.36]*
Bullying (no)		
Yes	2.21 [1.21, 4.05]*	2.00 [1.10, 3.67]*
Isolation (low)		
High	1.23 [0.68, 2.20]	1.71 [0.95, 3.06]
Safety Climate (low)		
High	0.50 [0.26, 0.97]*	0.44 [0.23, 0.87]*
Social Support (low)		
High	1.56 [0.65, 3.74]	0.31 [0.15, 0.65]**
Overtime (no)		
Yes	1.00 [0.57, 1.76]	1.03 [0.59, 1.82]

Death in family (no)		
Yes	1.46 [0.68, 3.12]	3.43 [1.62, 7.26]**
Marriage/Divorce (no)		
Yes	1.08 [0.48, 2.43]	1.75 [0.78, 3.90]
Debt/Job Loss/ Homelessness (no)		
Yes	2.26 [1.16, 4.41]*	3.89 [1.93, 7.83]***

*p<0.05 **p<0.01 ***p<0.001 (only included if overall model is significant)
The base model (trade, career level, age category, and gender) is controlled for in each of the individual predictor models. These base model variables were selected a priori and forced into each model.

Survey participants also had the opportunity to comment on their experiences with workplace safety and to identify what they perceive to be the top risks for women workers (Table 8). Answers were reviewed by independent researchers who coded themes. Short answer responses supplement the multiple choice data and reinforce many of the themes identified by our preliminary focus group participants.

Table 8. Survey short answer themes by frequency

Number 1 risk for women	Other experiences/ comments	Solutions
Sexist stereotypes	Conditions improved	More women
Physical limitations	Variability	Education
Gender discrimination	Inadequate bathrooms	Improved training
Harassment	Tokenism	Treat women equal to men
Under-representation	Job insecurity	Don't know
Having to prove selves	Love work	Mentoring
No respect	Fear of speaking up	
Poor work/life balance		
Poor training		
Inadequate PPE/tools		
Bad women		

Illustrative quotes:
"Point blank, we are not as strong as men. I have to work twice as hard as a man to do the same job. It is not their fault, and I don't let it hold me back, but we are just not built the same as men." (Journeywoman laborer)

"I have been doing this a long time. It has gotten better but so much of the stress is covert, hard to pin down. The harassment never really stops; you learn to ignore it. They will take the first opportunity available to replace you. Men don't want us there so it is a constant, unstated hostile environment. But these are good jobs, so f... them." (Journeywoman electrician)

"Being a woman in the industry, I believe the biggest problem we face is still just proving that we can perform the work as well as other men. I feel I should just be able to walk onto a jobsite and have the confidence of my male coworkers and supervisors, but I have not had that experience in this job." (Journeywoman laborer)

"I think the number one problem facing women in the trade is them coming into the trade expected to be treated differently, not wanting to do the work, not coming to work prepared, no tools not wearing the proper work attire and not really wanting to put in the hard work and effort. It makes the rest of us who want to work and learn look bad." (Apprentice sheet metal worker)

"We need to continue to educate both sexes in communication, and not single out women as the weaker link... Everyone needs to be taught it's ok to say 'no this doesn't feel right or safe.' There is plenty of pressure for men to just get it done too." (Journeywoman electrician)

"It would be ideal to have a mentoring program for women as an apprentice in the particular trade she is in to help understand the construction industry or to have seminar/curriculum for women in all trades to speak and share how to become successful and overcome certain issues and have resources and referrals available to them." (Journeywoman ironworker)

We combined data from our focus groups and surveys to produce a description of the key physical hazards and psychosocial stressors affecting tradeswomen in Washington State, which was shared and discussed with our community partners. From the study we learned that gender-related stressors (including discrimination, sexual harassment, fear of speaking up about safety concerns, and overcompensation) play an important role in determining tradeswomen's risk for negative health and safety outcomes. As visible minorities in the industry, tradeswomen are not treated equal to their male counterparts, which can have a tangible, detrimental impact on their ability to work safely and succeed professionally. Indeed, the five women who completed our ex-tradeswomen survey—women who were no longer working in the trades and therefore ineligible for the full questionnaire—cited disability and a "hostile" work environment as their main reasons for leaving the trades. These data tell us that the construction industry (including contractors, unions, and apprenticeship programs) continues to lag in addressing the needs of women workers.

<u>Follow-up focus groups</u>

In June, 2016 we held three focus groups with 16 current tradeswomen to discuss preliminary survey findings and programs to reduce workplace stressors. Two groups were held in South Seattle, one with 6 journeywomen and one with 8 female apprentices. A third group with two journeywomen in Tacoma was held via teleconference due to difficulty with participant scheduling. Participants represented 6 trades: carpenters, cement masons, electricians, laborers, sheet metal workers, and tile setters. The groups followed a similar format as the 2015 focus groups and participants received $50 compensation for their time. Data were collected anonymously and the Washington State Institutional Review Board approved all study procedures. The participants validated our preliminary survey findings—workers agreed that discrimination, overcompensation, injury risk, fear of speaking up, and stress negatively affect them as women—and shared their ideas for mentoring program development. This included desired mentor characteristics, training components for mentors, and expected program outcomes.

Follow-up grant

Another important success of this project was receiving a follow-up grant to fund program development based on the study's findings. Our aim has always been turning research into practice and ensuring that we do more than simply identify the risks to tradeswomen's health and safety. Based on the results of our focus groups, literature review, and preliminary survey data, we worked closely with our community partners to develop a program that would address the primary hazards identified in our research. Because so many of their physical and psychosocial stressors relate to women's minority status in the industry, working to make construction a safer, more welcoming place for women so as to increase their representation makes sense. Mentoring is already a key component of construction work and many unions and apprenticeship programs in WA State are currently working with informal mentoring programs targeted towards women and minorities. For the new grant we are working with both previous and new partners to develop, implement, and evaluate a pilot program that will train journeywomen and journeymen to mentor female apprentices. The program aims to reduce apprentices' work-related psychosocial stressors by improving their health and safety communication and compliance.

Measures to Judge Success:

Objective 1: The focus group facilitation guide was developed by UW staff with program development and research skills and it was verified by community representatives from the trades. The groups were facilitated by a labor educator with many years' experience in group moderation. Once collected, the data were analyzed by UW researchers who had experience working with qualitative data. To create the questionnaire, UW research staff were guided by our conceptual model, which was based on existing research and theory as well as the focus group data. Survey questions were derived and adapted from validated survey instruments.

Objective 2: To measure the success of our survey, UW researchers collected information on the number and demographic characteristics of participants. We performed quality control on the data, which were monitored as they came in. A research scientist with statistical training helped design the survey questions and analyzed the completed dataset.

Objective 3: A UW research scientist with statistical training cleaned and analyzed the survey data with input from the research team. We used participant feedback with focus group members of the target population to validate our findings and also shared the data with our community partners.

Relevant Processes and Lessons Learned:

Objective 1: We relied on our community partners to identify focus group participants. This had the benefit of strengthening our connection to our partners while utilizing their established networks for recruitment. However, we recognize that this convenience method of sampling created a biased participant group; our focus groups were primarily composed of white, older/more experienced workers who were affiliated with a union. When planning logistics for the focus groups we talked to trade representatives and our partners to ensure that the groups were convenient for the participants. This included holding the groups around workers' schedules, providing food, and offering incentives comparable to hourly wages to compensate them for their time. Construction workers are very busy and we ended up having smaller than anticipated group sizes due to last-minute cancellations. We learned that is it important to consider participant needs when planning and to recruit more people than you need for this type of research.

A major lesson learned from the second phase of this objective was that developing a questionnaire takes a long time to complete. Not wanting to reinvent the wheel, we used existing literature and validated instruments—in addition to the findings from our focus groups—to inform development of our survey. The toughest challenge was selecting which variables to measure, given participant time constraints. Tradeswomen health and safety is a complex issue and our focus groups yielded a wealth of data. We worked with our partners to narrow down the factors that most accurately represented our conceptual model and adapted long scales. We also learned the importance of pilot testing our survey to ensure that participants understood the question wording and that the survey length was not burdensome.

We included several open-ended questions in our survey in order to give participants a space to raise additional issues not identified by the research team. The qualitative data from these short answer questions also supplemented the quantitative data and allowed the researchers to paint a broader picture of tradeswomen's experience with workplace hazards. The short answer data had an unexpected benefit as well; incoherent responses to these questions raised suspicion when we received the flood of invalid data and allowed us to close our survey and make the necessary security changes. Future researchers should consider using open-ended questions to help with quality control in cases where the validity of the data might be compromised.

Objective 2: A major takeaway from this phase of the study was that survey recruitment is a very long, complicated process. We had originally planned on recruiting participants over the course of six months but ended up extending that time to eight months due to low survey completion over the holidays and when the survey was hacked. Being flexible to the needs of the community was essential. Through our continuous communication with our partners we learned new strategies for survey recruitment and administration. Using phone interviews was deemed impractical due to logistical barriers, while paper surveys were introduced as an easy method for engaging apprentices in the study. Our partners also helped the research team understand that low survey response rate reflects the fact that participants are busy and have other priorities, not that they don't care about the issue. We relied heavily on snowball sampling due to the hard-to-reach nature of our target population; our union and apprenticeship contacts shared the survey flyer with their networks and used word-of-mouth to reach other women workers. This method can create bias in the data but was the most feasible strategy for our population. However, it did create challenges for following up with potential participants, since the research team did not have direct access to them and relied on reminders sent by our partners. Despite being creative and working with the community, we were not able to engage as many participants as we had originally hoped. Future researchers conducting surveys with tradeswomen, or with other hard-to-reach populations, should remember that it is not always possible to hit their target numbers.

Engaging tradesmen in the survey also proved challenging, likely due to the study being focused on the risks to women workers. We asked our contacts to reach out to male workers who had an interest in the health and safety of women so as to increase their participation. Another challenge was inclusion criteria for participants. We limited the survey to skilled workers from all of the building and construction trades, but received some responses from non-construction trades or workers in management positions. The screening questions we added after the security issue helped weed out ineligible participants, although our broad recruitment continued to attract workers who were not our target population. Dealing with the fallout from our unexpected security issue also taught us an important lesson about survey design. We would not recommend future researchers use an anonymous survey with a e-gift card incentive. Balancing participant confidentiality with survey security is important, as well as closely monitoring your data and having good, open communication with your partners and IRB.

Objective 3: The research team worked with our partners to identify the most important risks for analysis, using the follow-up focus group findings as a guide. Through the survey short answers and focus groups we learned that word choice can effect participant response. For example, "sexual harassment" is not always identified as such by tradeswomen due to myriad factors. Many women did not acknowledge having experienced harassing behaviors in the scaled survey questions but wrote about it in the open-ended questions.

Sharing study results with community partners is also important and it is essential to do so in an accessible format. Many of the partners were unfamiliar with the statistical output shared by the research team and needed a lay language summary to understand the findings.

Product Dissemination:

During our monthly advisory committee meetings, research findings were shared with our partners and their input was solicited. The research team is in the process of developing fact sheets and infographics to disseminate the study results to a broad audience including the union, apprenticeship programs, contractors, and participants who helped with the study. These products will be made publically available on the study website (http://deohs.washington.edu/shewt) and on the websites of our committee partners (WWIT and WA LERC) when ready. In addition, several research papers are currently in production that will be used to share the findings with others engaged in occupational safety and health research.

Findings from our preliminary focus groups were shared in poster form at the 2016 Epidemiology in Occupational Health conference on September 6, 2016 in Barcelona, Spain and as an oral presentation at the American Public Health Association conference in Denver, CO on November 1, 2016 (see Attachments D and E, respectively). An overview of the study and key findings was presented at the Washington Regional Pre-Apprenticeship Collaboration meeting on October 21, 2016 and at Washington Women in Trades' annual Dream Big Awards dinner on November 12, 2016. UW DEOHS Continuing Education also included study outcomes in their OSHA newsletter that is sent to over 6,000 people and on the Northwest Center for Occupational Health & Safety's blog (Attachment F).

Future Dissemination

The data from this study are being used to inform development of a mentoring program for our follow-up SHIP grant. In addition, the UW research team plans to publish at least three papers on the study's findings, and continue submitting the results to occupational health conferences, which will raise awareness about the issue of tradeswomen health and safety.

Feedback:

Feedback from survey participants who were asked to share their thoughts about the questionnaire and study helped us assess the effectiveness of our research. Overall, participants thought that the survey was very comprehensive and covered the main work-related stressors they experience. However, participants raised several risks that we had not included in the survey (e.g. nepotism and stress from commuting to work), which would be important to include in future research. Participants also requested that we ask more questions about their past experiences, since exposures and stressors vary depending on the jobsite.

The men who completed surveys expressed interest in the issue of women's workplace safety, which is a promising sign. And many female workers were grateful to be given the opportunity to voice their complaints. Women in both the focus groups and survey said that our study had made them feel less alone in dealing with workplace stressors.

When asked about their experience with the project, our advisory committee members from Washington Women in Trades expressed satisfaction, saying that they felt very included in most of the conversations. They were happy with the way meetings were conducted and dissemination of minutes. Their only critique was that sometimes research theories and terms were not explained clearly to them by UW research staff during meetings. We will work on this issue for the next grant and make sure that research is translated and accessible for all audiences.

Our WA LERC subcontractor and committee member also appreciated the collaborative nature of the project and felt that the process went well overall. She noted that our findings, while informative, show that nothing has really changed in terms of tradeswomen's workplace stressors, and that we are facing a deep, intractable problem that requires systemic change to overcome.

Project's Promotion of Prevention:

In order to address and prevent jobsite risks to worker health and safety we first need to understand what these exposures look like and why they are caused. Our study did just that through its use of comprehensive survey questions and focus groups. Identifying workplace hazards affecting tradeswomen, and understanding their relationships with each other and with negative health outcomes, allows researchers to develop evidence-based solutions. Our survey helped raise awareness of tradeswomen's work-related hazards, which will hopefully prompt the companies, unions, and workers who interact with tradeswomen to take action. Our community partners can also use our study findings to design their own programs to improve health and safety on the jobsite.

Our phase II grant will work to prevent some of the physical and psychosocial hazards identified in our phase I research through the mentoring program. Female apprentice mentees will gain skills for communicating concerns about unsafe and discriminatory working conditions. They will also gain self-confidence and skills to be proactive about avoiding unsafe working behaviors. The mentors (journeywomen and journeymen) will gain a better understanding of the negative impact psychosocial stressors have on female apprentices, which will allow them to advocate for improved conditions.

Uses:

The findings from our focus groups and survey can be used by other researchers, unions, apprenticeship programs, trade associations, and contractors to advocate for improved workplace health and safety measures. Our data can help inform the design of different programs to increase retention of women workers and reduce worksite hazards. It will also hopefully be used to raise awareness about the challenges tradeswomen experience in the workplace and changes that need to be made. By documenting worker experiences, this study is also helping to validate these challenges. It shows women workers that they are not alone and that their concerns are real. We hope this will provide encouragement to those pioneering women.

The study findings can also be applied to similar physically-demanding industries (including firefighting and the police force) where women represent a minority.

Additional Information

Project Type

- ☐ Best Practice
- ☐ Technical Innovation
- ☐ Training and Education Development
- ☐ Event
- ☐ Intervention
- ☒ Research
- ☐ Return to Work
- ☐ Other (Explain):

Target Audience:

Female construction trades workers
Male construction trades workers

Languages:

English

Industry Classification (check industry(s) this project reached directly)

- ☐ 11 Agriculture, Forestry, Fishing and Hunting
- ☐ 21 Mining
- ☐ 22 Utilities
- ☒ 23 Construction
- ☐ 31-33 Manufacturing
- ☐ 42 Wholesale Trade
- ☐ 44-45 Retail Trade
- ☐ 48-49 Transportation and Warehousing
- ☐ 51 Information
- ☐ 52 Finance and Insurance
- ☐ 53 Real Estate and Rental and Leasing
- ☐ 54 Professional, Scientific, and Technical Services
- ☐ 55 Management of Companies and Enterprises
- ☐ 56 Administrative and Support and Waste Management and Remediation Services
- ☐ 61 Educational Services
- ☐ 62 Health Care and Social Assistance
- ☐ 71 Arts, Entertainment, and Recreation
- ☐ 72 Accommodation and Food Services
- ☐ 81 Other Services (except Public Administration)
- ☐ 92 Public Administration

Please provide the following information - *- (information may not apply to all projects)*

# classes/events:	7 focus groups
# hours trained	N/A
# students under 18	0
# workers	332
# companies represented	~150
# reached (if awareness activities)	~1,100
Total reached	~1,582

List, by number above, industries that project products could potentially be applied to.

23

Potential impact (in number of persons or companies) after life of project?

Our follow-up mentoring program, based on the results of this research, will work with 60 journey-level and apprentice tradeswomen and men. We hope that the program will have a ripple effect through many trades.

Have there been requests for project products from external sources?

If Yes, please indicate sources of requests:

No, but all of our material is or will be accessible to the public through our website: http://deohs.washington.edu/shewt

PART II

Financial Information
Budget Summary

Project Title:	Addressing the Health and Safety Needs of Washington Women in the Trades		
Project #:	2014WH00281	**Report Date:**	11/18/2016
Contact Person:	Patrick Lennon	**Contact #:**	206-543-2883
Start Date:	12/01/14	**Completion Date:**	08/31/2016

1.	**Total original budget for the project**	$ 199,264.35
2.	**Total original SHIP Grant Award**	$ 199,264.35
3.	**Total of SHIP Funds Used**	$ 199,264.35
4.	**Budget Modifications (= or - if applicable)**	$ 0.00
5.	**Total In-kind contributions**	$ 0.00
6.	**Total Expenditures (lines 3+4+5)**	$ 199,264.35

Instructions:

- Complete the Supplemental Schedule (Budget) form first (on the next page).
- The final report must include all expenditures from date of completion of interim report through termination date of grant.
- Indicate period covered by report by specifying the inclusive dates.
- Report and itemize all expenditures during specified reporting period per the attached supplemental schedule.
- Forms must be signed by authorized person (see last page).
- Forward one copy of the report to **Anar Imin, SHIP Grant Manager** at **PO Box 44612, Olympia, WA 98504-4612**

PART II *(Continued)*

Financial Information
Supplemental Schedules (Budget)

Project Title:	Addressing the Health and Safety Needs of Washington Women in the Trades		
Project #:	2014WH00281	**Report Date:**	11/18/2016
Contact Person:	Patrick Lennon	**Contact #:**	206-543-2883
Total Awarded:	$199,264.35		

ITEMIZED BUDGET: How were SHIP award funds used to achieve the purpose of your project?

	Budgeted for Project	Amount Paid Out	Difference
A. PERSONNEL	$141,057.41	$152,860.76	($11,803.35)
Explanation for Difference and other relevant information: We spent more money than originally budgeted on personnel (salaries and benefits) due to the no-cost extension needed to complete all project activities. We used the surplus funds from unspent participant and interviewer incentives to cover this amount.			

	Budgeted for Project	Amount Paid Out	Difference
B. SUBCONTRACTOR	$15,000.00	$15,000.00	$0.00
Explanation for Difference and other relevant information: N/A			

	Budgeted for Project	Amount Paid Out	Difference
C. TRAVEL	$1,000.00	$763.05	$236.95
Explanation for Difference and other relevant information: Less money was spent on travel than originally anticipated. Most of the survey recruitment happened via email and over the phone and the follow-up focus groups were all held in the Puget Sound region, which cut down on UW staff travel costs.			

	Budgeted for Project	Amount Paid Out	Difference
D. SUPPLIES	$840.00	$1,055.47	($215.47)
Explanation for Difference and other relevant information: We had not originally budgeted for food for the focus groups, which was necessary to ensure participant comfort. In addition, we spent over our intended printing budget due to the large number of mailed surveys we sent to community partners. Mailed surveys were an unanticipated method of data collection that turned out to be very successful.			

	Budgeted for Project	Amount Paid Out	Difference
E. PUBLICATIONS	$0.00	$0.00	$0.00
Explanation for Difference and other relevant information: N/A			

	Budgeted for Project	Amount Paid Out	Difference
F. OTHER	$23,252.00	$11,470.17	$11,781.83
Explanation for Difference and other relevant information: The majority of unspent monies in this category came from participant and interviewer incentives. We completed			

~300 surveys rather than the budgeted 400 and only 4 were conducted over the phone by interviewers.

	Budgeted for Project	Amount Paid Out	Difference
TOTAL DIRECT COSTS	$181,149.41	$181,149.45	($0.04)
	Budgeted for Project	Amount Paid Out	Difference
TOTAL INDIRECT COSTS	$18,114.94	$18,114.90	$0.04
	Budgeted for Project	Amount Paid Out	Difference
TOTAL SHIP BUDGET	$199,264.35	$199,264.35	$0.00

	Budgeted for Project	Amount Paid Out	Difference
G. IN-KIND	$0.00	$0.00	$0.00
Explanation for Difference and other relevant information: N/A			

I hereby certify that the expenditures listed on this report were made with my approval:

11/18/16
Date

Signature of Project Manager