Workers Compensation Board of Manitoba
Research and Workplace Innovation Program

Young Worker Responses to Workplace Hazards, Responsibility for Safety, and Workplace Injuries across Time

Final Report

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Executive Summary

In 2011, the Research and Workplace Innovation Program of the Workers Compensation Board of Manitoba awarded funding to understand the psychosocial causes (e.g., supervisory and parental influences), consequences (e.g., work-related injuries), and patterns of safety-related voice (e.g., reporting a safety issue to a supervisor) over time among working youth. We conducted three studies to explore these questions. In total, 489 young people (the vast majority aged 15 to 20 years) and 120 parents of participating youth provided survey data to this research.

In Study 1, we examined the predictors and consequences of safety voice for young workers by tracking a sample of Manitoban young workers at three time points. Compared to young workers who reported having fewer ideas about how to improve safety, young workers who reported having frequent ideas about how to improve workplace safety reported higher safety voice one month later —that is, they reported speaking up about their ideas one month later—and this relationship was stronger among young workers who reported being more highly committed to their organization. Having ideas about safety and being committed to the organization encourages greater safety voice. Furthermore, young workers reported experiencing more frequent workplace injuries when they voiced their safety concerns but had a supervisor who was *not open* to listening about their safety concerns.

In Study 2, using a number of challenging but realistic work scenarios, we explored the relationship between safety voice and supervisor commitment to safety by asking workers across a wider age range (from 15 to 60) to provide their intentions to speak up about safety issues. When faced with supervisors who were committed to safety, workers of all ages reported higher intentions to speak up than when faced with a supervisor who was not open to hearing about concerns. However, when faced with supervisors about whose commitment to safety was uncertain, younger workers persisted with speaking up, but older workers read the proverbial writing on the wall and were more likely to remain silent.

The 15-month longitudinal study (Study 3) surveyed an average of 165 youth once a month and approximately 110 parents/guardians of participating youth every four or five months. We found that many youth learn very little about job-related hazards and workplace conditions, generally, as part of the hiring process for a new job. A minority (20%) are not provided with safety training after being hired. In the first 3-5 months at a new job, males reported greater fear of being injured, more injuries and exposure to dangerous work than did females. Supervisor openness was positively associated with voice and compliance behaviour and, at high levels, resulted increasing levels of voice. Finally, there was moderately strong evidence that parental self-report voice was positively associated with their child's reported voice. We also found that about 20-30% of participating parents worried about the safety of their child or that their child may be injured at work. Further, there was evidence (though not consistently found) of a positive relationship between parent-reported worry and child-reported fear of being injured at the child's job. Parental worry about their child being injured was positively associated (though, again, not consistently) with child-reported injuries at the child's job.

Based on these findings, we make recommendations related to improving the social marketing of occupational safety to young workers (e.g., focusing on the positive implications of proactive forms of safety behaviour), effective safety management of young workers (e.g., supportive safety communication from supervisors), and public policy. More specifically, these findings have important implications for Workers Compensation Board of Manitoba's marketing campaigns for improving young workers and safety.

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1.0 Background and Project Objectives

Between 2011 and 2013, two Manitobans aged 15 to 24 years lost their lives at work and 6,704 lost-time injuries were reported for this cohort (Association of Workers Compensation Boards of Canada (AWCBC), 2015). While the lost-time time injury rates declined for young workers in Manitoba between 2011 and 2013 (3.4 to 3.3 injuries per 100 young workers), injury statistics reveal that young workers continue to experience a higher rate of injuries than older workers, with young males experiencing the highest rate (SafeWork Manitoba, 2015). Early-career exposure to unsafe work environments and injuries can have negative long-term effects.

This research project consisted of three studies that extend the findings from a previous WCB-funded, Manitoba-based research project related to young worker responses to hazardous work.[1] We focus on young worker responses to hazardous work for several reasons. First, as previously noted, young workers, and young male workers specifically, continue to experience an elevated rate of injuries compared to adult workers (AWCBC, 2015). Second, safe work behaviours are associated with reduced injury exposure (e.g., Christian et al., 2009). Lastly, our earlier work found that young workers are generally reluctant to raise safety concerns in the workplace (Tucker & Turner, 2013).

The first study in the current project involved analysis of longitudinal data (collected in our previous WCB-funded project) on young workers' use of safety related voice. The second study compared voice behaviours of young workers with adult workers using an experimental scenario study. Finally, in a third study, we tracked the safety experiences of a group of young workers over a 15 month period, with surveys administered on a monthly basis. This design provided insight into how and why safety attitudes (e.g., taking responsibility for safety) and safety behaviours change over time in one job and even how they change between different jobs. In this study, we also examined the frequency of workplace injuries over one year and if and how parents influence their childrens' occupational safety behaviours.

Collectively, these studies increase knowledge about young worker safety attitudes, safety behaviours, and workplace injuries over time. This research also identifies similarities and differences between young and adult workers use of different safety behaviours. The findings from these studies inform recommendations that appear later in this report.

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[1] Tucker, S. & Turner, N. (2011). Young worker responses to workplace hazards. Final Project Report. http://safemanitoba.com/RWIP-YoungWorkerResponse. The results summarized in the 2011 project report are also presented in three published, peer-reviewed papers:
1. Tucker, S. & Turner, N. (2011). Young worker safety behaviors: Development and validation of new measures. *Accident Analysis & Prevention, 43,* 165-175.
2. Tucker, S. & Turner, N. (2013). Waiting for safety: Responses by young Canadian workers to unsafe work. *Journal of Safety Research, 45,* 103-110.
3. Tucker, S. & Turner, N. (2014). Safety voice among young workers facing dangerous work: A policy-capturing approach. *Safety Science, 62,* 530-537.

There are two broad objectives for this project:

1. To understand changes across time among safety-related behaviours, the work attitudes of taking responsibility for safety, and workplace injuries among young workers in Manitoba.

2. To understand similarities and differences among adult workers and young workers in safety attitudes and safety behaviors.

2.0 Overview of Young Worker Safety in Manitoba

Statistics provided by WorkSafe Manitoba (2015) reveal that the vast majority of young workers in the Province of Manitoba are employed in the service sector and that within this sector youth are concentrated in the trade and accommodation/food services sub-sectors (Table 1). However, the rate of lost- and non-lost-time injuries experienced by young workers varies widely by sector, with the lowest injury rate in the service sector and the highest in manufacturing and construction (Table 1). In terms of occupational group, young workers in the following roles report the highest number of lost-time injuries: construction trades helpers, other trades helpers, material handlers, food counter attendants, and cooks (Table 2). Finally, in a sample consisting of work-related injury data from several Canadian provinces, Breslin and Smith (2006) found that workers of all ages are at elevated risk of being injured in the first month of working a new job (Figure 1). This pattern is especially relevant to young workers because, compared to older workers, young workers have shorter job tenures and will experience more jobs over the same period.

Table 1: Youth Labour Market Participation in Manitoba by Service and Goods Producing Sectors and Youth Injury Rates by Sector (2013)

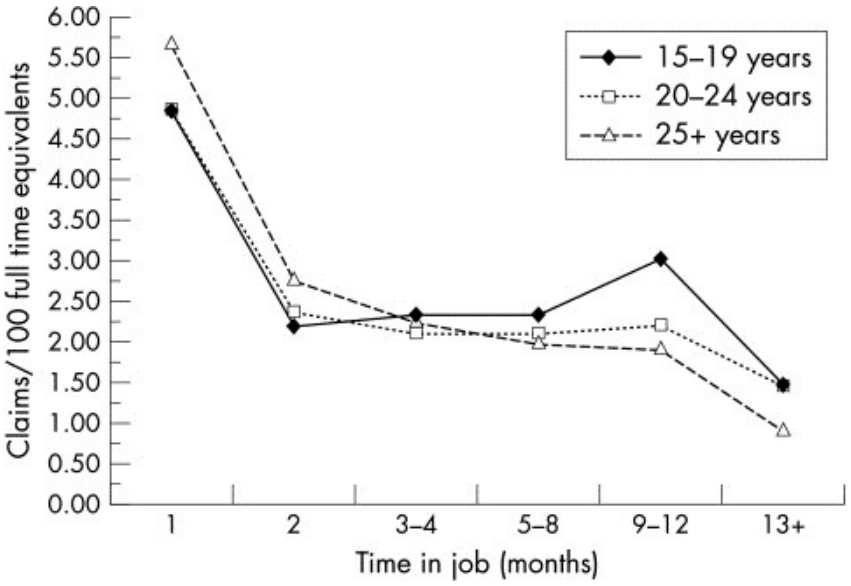
Services-producing sector	Number	Time-lost Injury Rate	Total Injury Rate
Trade	24,100	1.8	4.0
Accommodation and food services	20,200	-	-
Healthcare	10,200	-	-
Transportation	3,100	-	-
Other	25,400	-	-
Total service-producing sector	**83,000**	**2.1**	**4.5**

Goods-producing sector	Number	Time-lost Injury Rate	Total Injury Rate
Construction	7,600	8.0	17.4
Manufacturing	5,600	6.5	16.0
Agriculture	3,900	-	-
Other	1,500	-	-
Total goods-producing sector	**18,600**	-	-

Table 2: Number of Injuries to Youth by Occupation (2009-2013)

Occupation	Number of Time-Loss Injuries (2013)
Construction trades helpers	926
Other trades helpers	694
Material handlers	532
Food counter attendants	509
Cooks	409
Nurse aides	382
Welders	352
Retail Sales Persons	350
Grocery clerks	280
Carpenters	252
Truck drivers	212
Automotive service technicians	203
Food and beverage servers	200

Figure 1: Injuries over time (Breslin & Smith, 2006)



3.0 Overview of Research on Young Worker Safety Voice

Young workers, like older ('adult') workers, encounter physically hazardous work, have the potential for or experience on-the-job injuries, and participate in efforts to protect the safety of themselves and others (Koehoorn, Breslin, & Xu, 2008). Despite affordances provided to workers in many employment regulatory systems, such as the right to know about physical hazards, the right to refuse dangerous work, and joint responsibility implied in occupational safety legislation (Gray, 2009), the young worker population remains different from adult worker populations in a number of ways. These differences include: (1) the nature of the work that young workers typically undertake compared to adult workers; (2) the range of social influences that may affect young workers' attitudes and behaviors towards work; and (3) comparatively limited life and work experience and, as such, the behavioral repertoire, job-related knowledge, and extent to which young workers may feel vulnerable to workplace hazards. In this section, we explore the latter issue in terms of how young workers make sense of occupational safety, finding that their reactions to physically dangerous work contradict the idealistic expectations of "speaking up" against dangerous work and sharing ideas to make workplaces safer.

Espoused and Enacted Responses to Hazardous Work

In the last several decades, young worker safety has received considerable attention, not only from researchers but also educators and policy makers (Loughlin & Frone, 2004). Many jurisdictions have adopted injury prevention initiatives with the aim of raising awareness about safety hazards and young worker rights. Three ways to address this has been to introduce safety-focused, school-to-work education into secondary school curricula (e.g., Andersson et al., 2014; Chin et al., 2010; Pisaniello et al., 2013; Power & Baque, 2010; Schulte et al., 2005), public-private partnerships on specific young worker safety initiatives (e.g., Lee, Westaby, & Berg, 2004; Linker, Miller, Freeman & Burbacher, 2005), and social marketing campaigns promoting young worker safety (e.g., Lavack et al., 2007; McCloskey, 2008). These approaches have several goals. First, they seek to increase young peoples' awareness about workplace hazards. Second, they attempt to educate young people about occupational safety legislation, in particular the right to ask questions about potentially hazardous work and the right to refuse dangerous work. Third, they encourage young workers to be proactive about hazards and to speak up to a supervisor when they have concerns.

While a comprehensive review of such initiatives is beyond the scope of this report, an informal review associated with several current and recent initiatives in Canada revealed the core assumptions that underpin messages related specifically to speaking up about safety concerns (or safety voice). First, it is evident that voicing safety concerns is the 'right thing to do' and that it is every worker's responsibility to do so. Second, speaking up is portrayed as permissible, legitimate, and legally sanctioned. Third, speaking up is nearly always portrayed as an individual act. Fourth, managers are open to acting on employee suggestions about improving safety because there is business or legal reasons to do so. Finally, young workers are also seen as rational agents who should leave physically dangerous jobs if and when speaking up becomes ineffective.

There are striking disconnections between the above-mentioned assumptions and young workers' frontline experiences of speaking up about safety concerns (Mayhew & Quinlan, 2002; Tannock, 2001). Recent interviews with Canadian teenaged workers has found that speaking up about safety concerns is not particularly prevalent (Breslin, Day, Tompa, Irvin, Bhattacharyya, Clarke et al., 2007; Tucker & Turner, 2013). Collectively, research suggests that young workers hold negative beliefs about the appropriateness of raising safety issues, and that when issues are raised, they are frequently not taken seriously by supervisors and managers. Further, one study found that young females were more likely to voice than young males (Breslin et al., 2007), but also that such behavior was likely to be viewed as complaining and trivialized.

There are several reasons why teenaged workers may avoid speaking out about dangerous work. First, they may feel powerless to raise concerns (Zakocs, Runyan, Schulman, Dunn, & Evensen, 1998) and fear losing their job or having their hours reduced. Second, teenagers believe that demonstrating hard work and loyalty is likely to impress employers (Lehmann, 2005). Refusing to perform unsafe work may be perceived as a sign of weakness or costly to their employer. Third, young workers may be less likely to raise concerns because they perceive it to be detrimental to their performance evaluations. Studies of young female workers in the retail sector in which the mantra "the customer is always right" dominates have found that while low-level forms of sexual harassment is commonplace, speaking out against such incidents to a supervisor is rare (Hughes & Tadic, 1998). If, as previous qualitative-based research shows, teenaged workers are reluctant to voice safety concerns, two related questions emerge for more representative studies of young workers' responses to hazardous work: (1) when do young workers voice safety-related concerns; (2) what are the consequences of voice; (3) what do they do when they have safety-related concerns but do not voice?

Despite expectations from school-to-work education and public service campaigns promoting young worker safety, young workers' most common reaction is to 'wait-and-see' (Tucker and Turner [2011] call this 'safety patience'). Young workers in a series of focus groups report a number of reasons why being patient (and not speaking up) is the short to medium-term reaction to physically dangerous situations at work (Tucker & Turner, 2013). First, many young workers feared retribution from supervisors, in the form of reduced hours or losing their job outright for speaking out against the work conditions. Second, they felt powerless as inexperienced and often newcomers to the workplace to do anything about safety despite being dissatisfied with the safety conditions. This is consistent with Lucas's (1997) age segregation explanation for young workers feeling little need for or expectation of chances to speak up or make improvements to their workplaces, and Detert and Edmondson's (2011) notion that employees have heuristics ('implicit voice theories') for speaking up and shutting up. Finally, there was a sense of how serious the experienced injury or chance of injury to self or others was: as injury severity increased, the probability of finding ways to speak up increased. This often involved first speaking to co-workers, then building an informal coalition to get the courage to raise the issue with a supervisor.

More systematic data on how young workers respond to hazardous work are relatively new. Tucker and Turner (2011) developed psychometrically-valid scales of different ways that young responded to physically hazardous work. Using Hirschman's (1970) exit-voice-loyalty framework as a conceptual basis and multiple samples of young workers from two Canadian

provinces, Tucker and Turner's model suggests young workers most frequently chose to display, in order of frequency, the previously-mentioned notion of 'safety patience' (sample item: "Adapt to safety conditions until the situation improves"); then, 'safety compliance' (sample item: "Wear protective clothing/equipment"); then about equally 'safety exit' (sample item: "Told my parent(s) that I was thinking about quitting the job") and 'safety voice' (sample item: "Tell the supervisor about the consequences of dangerous working conditions"); and, finally, 'safety neglect' (e.g., "Take short cuts that threaten my personal safety").

Prevalence of young worker responses to hazardous work replicates in larger-scale samples. Using a sample of over 19,000 Canadian young workers, Turner et al. (2014) show that young workers self-reported safety compliance behaviour more frequently than self-reported safety voice, and self-reported safety voice more frequently than self-reported safety neglect. The frequency of these responses differed by age category. Younger workers (aged 15-18) reported complying less and neglecting more than older younger workers (aged 19-22), and older younger workers (aged 19-22), in turn, reported complying less and neglecting more than the oldest category of young worker (aged 23-25). The youngest category of young worker (aged 15-18) reported voicing less than the other two age categories combined (i.e., ages 19-25). Compared to young female workers, young male workers reported more safety compliance, more safety voice, as well as, somewhat surprisingly, more safety neglect. Turner et al. attribute these seemingly opposing findings to the nature of some of the work undertaken by young males (e.g., construction) as it may reflect greater physical risks, and thus the greater opportunity to comply, speak up, but also ignore safety rules.

4.0 Overview of Three Studies on Safety Voice

Three studies were conducted to deepen our understanding of the causes (e.g., supervisory and parental influences), consequences (e.g., work-related injuries), and patterns of safety-related voice over time among youth.[2] Table 3 summarizes the methodological design at a high-level as well as sample characteristics for each study. A fourth study (i.e., Study 3b) was proposed in the original funding application that was to replicate and extend the findings from Study 2 (reported below) using a sample of construction workers with data collected over three months. Unfortunately, we were unable to recruit organizations to participate in the research despite considerable effort and use of financial incentives for employees of participating organizations.[3]

[2] Working papers of these studies may be available by contacting the researchers.

[3] We worked with a large Winnipeg-based construction company and two provincial construction industry associations to garner interest among their employees and organizational members in this research project. Despite initial interest from all three of these organizations, along with financial incentives for employee participants and a free safety benchmarking report for participating member organizations, we could not generate a sufficiently robust sample to complete this fourth study. Thinking this indifference might be industry-wide at the time of data collection, we tried a similar strategy with a Winnipeg-based hospitality industry association, but this also yielded the same disregard.

Table 3: Summary of Studies

Study	Date Range	Study Design	Other Study Information
1. Predictors and outcomes of safety voice	2009-2012	Longitudinal field study (3 months)	Participant age = 15 to 19 years Sample size = 155 Sectors & occupations = Various
2. Comparing young and adult worker safety voice	2012-2014	Experimental scenario study (3 conditions)	Participant age = 15 to 60 years old Sample size = 129 Sectors & occupations = Food services
3. Understanding youth safety voice over time and the influence of parents on voice	2012-2015	Longitudinal field study (15 months)	Participant age (youth) = 15 to 20 years Sample size (youth) = 134 to 205 Sample size (parents) = 91-120 Sectors & occupations = Various

5.0 Presentation of Results

5.1 Study 1: Predictors and Outcomes of Safety Voice

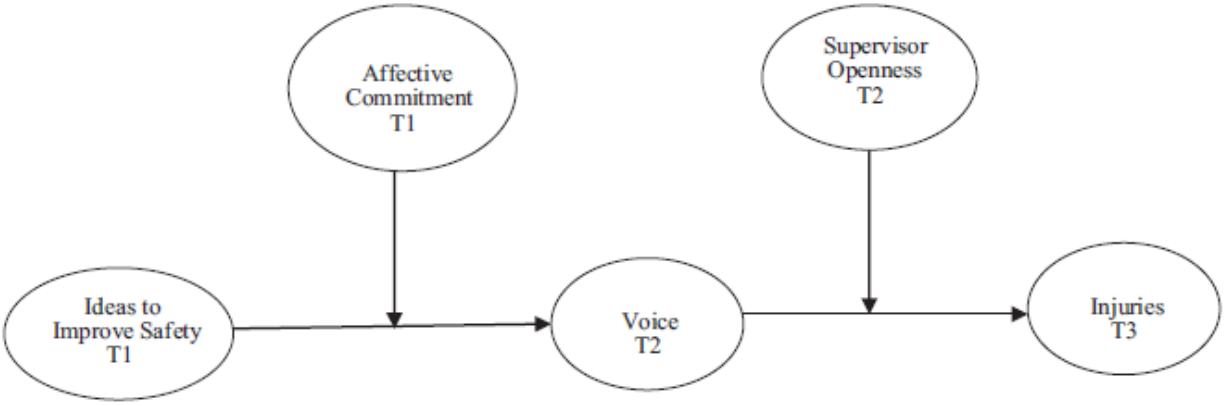
Introduction

This study uses a three-wave longitudinal design to examine predictors and consequences of safety voice by young workers. Of particular interest is how having ideas about improving safety and young workers' commitment to their employer influences their safety voice. Given that young workers are typically employed for short periods in part-time, low-wage, and non-unionized jobs (Galarneau, 2005; Marshall, 2007), it is unclear if and how organizational commitment promotes speaking up about safety concerns, despite some existing evidence that organizational commitment predicts more general voice in working adult samples (e.g., Burris et al., 2008). Further, when young workers do speak up about safety concerns, little is known about how the reactions of supervisors may influence young workers' future injuries.

While the predictors of general employee voice have received substantial attention (Ng & Feldman, 2012), relatively less is known about the consequences of general employee voice (e.g., Burris, Detert & Romney, 2013). To our knowledge, no studies have concurrently examined antecedents of safety voice and the impact of safety voice on subsequent work-related injuries in either adult or young worker samples. Figure 2 shows the hypothesized model. Readers interested in more details about the conceptual background and analysis for this study are encouraged to read the peer-reviewed, published version of this study.[4]

[4] Tucker, S., & Turner, N. (2015). Sometimes it hurts when supervisors don't listen: The antecedents and consequences of safety voice among young workers. *Journal of Occupational Health Psychology*, *20*, 72-81.

Figure 2: A model of the predictors and consequences of safety-voice



Method

Participants were employed teenagers residing within or near Winnipeg, Manitoba. They completed surveys at three points in time (hereafter Time 1 = T1, Time 2 = T2, Time 3 = T3) between April 2009 and July 2009, with one month between each survey. We deliberately conducted the study during the summer months when the highest proportion of teenagers in this jurisdiction was employed in the formal economy.

We used three different approaches to advertise the study to an occupationally-diverse group: in-person recruitment at popular gathering places for teenagers (e.g., movie theatre lobby), contacts in local high schools, and through a union magazine. Interested participants contacted the researchers by e-mail or telephone at which point their eligibility for the study was confirmed (i.e., 15- to 19 years of age and currently employed). Alternatively, people who were recruited in person (e.g., at the movie theatre lobby) were asked about their age and work status. Those who qualified were asked to provide their name and e-mail address, and received a copy of a letter of information. Participants aged 15 years were asked to provide parental consent. A financial incentive of $50 (Canadian) was offered to retain participants over the course of the three-wave study ($20 for completing the T1 survey, and $15 for completing each survey at T2 and T3). The incentives were sent to participants through regular mail.

The surveys were administered through Surveymonkey.com. Participants had 14 days to respond to each survey. For each time period, participants received an e-mail invitation, a phone call, and up to two reminder e-mail messages. At T1, 593 people received an e-mail message inviting them to participate in the study and a unique link to the T1 survey. Approximately nine percent of these messages were returned because the receiver's e-mail account was invalid. Approximately 61% (n = 327) of recipients who received an invitation started the T1 survey, with less than one percent of the sample ultimately opting out of participating in the study at T1. Participants who completed the T1 survey were e-mailed a unique link to the T2 survey exactly one month after they completed the T1 survey, thus guaranteeing the same amount of time between each participant's survey (the same method was used for T3). Two hundred and fifty-three responded to the T2 survey (77% response rate) of which 27 reported changing jobs and

two reported being unemployed. At T3, 210 participants responded to the survey (83% response rate); twenty-three indicated changing jobs and five noted being unemployed.

The final sample, therefore, consisted of 155 participants who had worked at the same job over the three surveys, reported working hours each month, were not self-employed, were within the target age range (i.e., 15 to 19 years), and responded to all study variables each month. Focal participants were aged 15 to 19 years (M = 17.64 years, SD = 1.16) and 63% were female. The median job tenure at T1 was 12 months (M = 17.02 months, SD = 17.12). The most common workplaces were restaurants and food service operations (34%), grocery stores (24%), and retail stores (13%). The following were common job titles: cashier, server, sales associate, and cook.

Measures

Unless noted otherwise, participants responded to all variables at each time period and the response scale ranged from 1 (*strongly disagree*) to 5 (*strongly agree*).

Work related injuries. Participants were asked about their experience of common work-related injuries in the previous month. These injuries included a strain or sprain; scratch or abrasion (superficial wound); cut, laceration, or puncture (open wound); work-related burn or scald; and bruise or contusion. The response scale was 0 (*never*), 1 (*once*), 2 (*two to three times*), 3 (*four to five times*), and 4 (*more than five times*). Scores for these five items were summed and then divided by five to produce an average injury rate.

Safety voice. We measured safety-specific voice using three items from Tucker and Turner's (2011) measure of safety voice. Participants were asked to rate how frequently at their main job they engage in these behaviors: "Tell my supervisor about the consequences of dangerous working conditions," "Group together with co-workers and take safety concerns to the supervisor" and "Tell my supervisor about hazardous work." The response scale ranged from 1 (*almost never*) to 7 (*almost always*).

Affective commitment. Three positively worded items from Meyer, Allen, and Smith's (1993) measure of affective organizational commitment were used (i.e., "This organization has a great deal of personal meaning to me," "I would be very happy to spend the rest of my career with this organization," and "I really feel as if this organization's problems are my own").

Ideas for improving safety. Two items from Burris et al.'s (2008) related measure were adapted to a workplace safety context. These items included "I have ideas about how to improve safety at my workplace" and "I have ideas about how my job could be made safer."

Supervisor openness to safety concerns. Participants were asked to rate the degree to which their main supervisor was receptive to listening to safety concerns. We used House and Rizzo's (1972) four-item measure of top management receptiveness that was adapted by Mullen (2005) to fit an occupational safety context. The items are: "My supervisor cares about my safety opinions," "My supervisor is interested in ideas and suggestions regarding safety," "Good safety ideas get serious consideration from my supervisor," and "When suggestions are made to my supervisor, they receive fair evaluation."

Control variables. We included the following variables as conceptually-relevant controls of both safety-specific voice and workplace injuries. All control variables were measured at T1. To account for different levels of work-related risk exposure participants experienced in their jobs, we controlled for *fear of injury* using two items ("I fear that I could get hurt at this job" and "I fear that I could have an accident at this job") as well as the self-reported index of average *injuries* over the previous month. We expected participants who experience more injuries at T1 would score higher on safety-specific voice and future injuries. Finally, we controlled for participant *gender* as research suggests that females may be more likely to voice than males do (Breslin, Polzer, MacEachen, Morrongiello & Shannon, 2007) and occupational injury claims show that young males experience more injuries than young females do (e.g., McCall, Horwitz & Carr, 2007).

Results

Table 4 shows the means, standard deviations, and zero-order correlations among all the study variables[5]. Having ideas about how to improve safety at T1 was positively related to safety-specific voice at T2 ($r = .41$, $p < .001$; $\beta = .68$, $p < .001$). We next examined the influence of T2 safety-specific voice on T3 workplace injuries, which we predicted would be negative. However, the results show no relationship ($r = .14$, *ns*, $\beta = .02$, *ns*).

We next conducted analyses to test the effects of the two moderators, namely organizational commitment and supervisor openness to safety concerns. The results reveal a significant interaction ($\beta = .32$, $p < .01$), such that the highest levels of safety voice were reported by participants who scored high in both affective commitment to their organization and ideas for improving safety (see Figure 3). This finding supports the first moderated relationship in our model (see Figure 1). The results of the second regression analysis indicate a significant interaction ($\beta = -.06$, $p < .05$). Figure 4 shows that under conditions of high safety-specific voice and low supervisor openness to safety suggestions, participants experienced the highest level of workplace injuries one month later. Finally, we explored if and how T1 ideas for improving safety are related to T3 workplace injuries at different levels of the two moderators. For values of 2.75 (i.e., one standard deviation below the mean) of supervisor openness to safety suggestions combined with values between 2.53 to 3.48 (i.e., mean score and one standard deviation above the mean) of affective commitment to the organization, safety-related ideas at T1 are positively related to workplace injuries at T3 ($\beta = .06$-$.09$; $p = .02$-$.03$).

[5] Tables containing detailed results from the regression analyses are available from the authors.

Table 4: Means, Standard Deviations, and Cross-Sectional Correlations Between Variables (*N* = 155)

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Gender	.63	.49	-						
2. Fear of injury T1	2.25	1.12	-.18*	(.88)					
3. Injuries T1	1.65	.68	.01	.41***	-				
4. Affective commitment T1	2.53	.95	-.02	-.21*	-.16	(.71)			
5. Safety ideas T1	2.73	1.08	-.11	.41***	.28***	.09	(.97)		
6. Safety voice T2	2.98	1.78	-.08	.15*	.12	.15	.41***	(.89)	
7. Supervisor openness T2	3.69	.94	.05	-.21**	-.22**	.21**	-.12	.23**	(.95)
8. Injuries T3	1.48	.56	-.04	.24**	.57***	.01	.22**	.14	-.20*

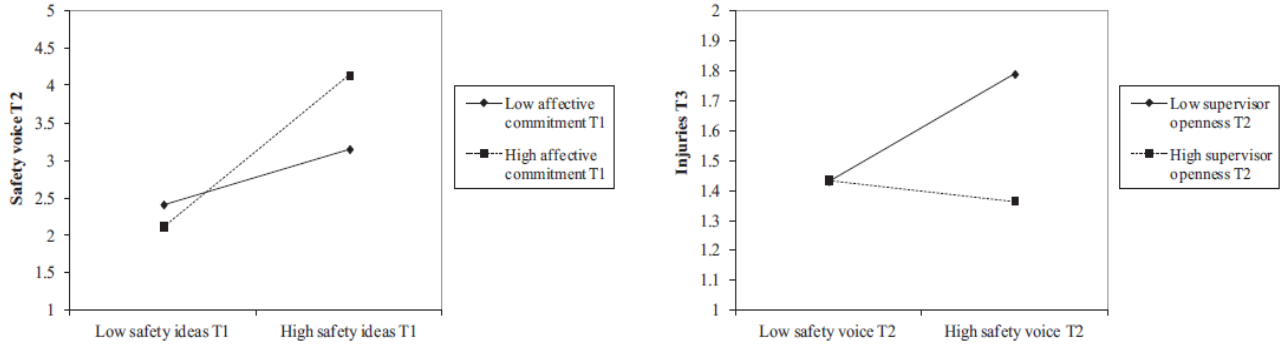
Notes. T1 = Time 1; T2 = Time 2, T3 = Time 3. Gender: 1 = Female, 0 = Male. *** $p < .001$. ** $p < .01$. * $p < .05$. Cronbach's alphas on diagonals.

Notes. *** $p < .001$. DV = dependent variable. T1 = time 1. T2 = time 2. T3 = time 3.

Discussion of Results

In this study we found that teenaged workers who reported having ideas about how to improve workplace safety reported higher safety voice one month later than those who were less likely to have safety-related ideas. This relationship was stronger among participants who reported being more highly committed to their organization than those who felt lower organizational commitment. In terms of the consequences of safety voice, we found that the frequency of speaking up about safety issues was not directly related to future workplace injuries. However, higher levels of safety voice were related to higher workplace injuries when participants experienced a supervisor who was *less* open to listening to their safety concerns than participants who voiced about safety and experienced a supervisor who was open to listening to their concerns. These results are shown in Figures 3a and 3b.

Figures 3a and 3b: Organizational commitment and supervisor openness influence the expression and consequences of voice



These data suggest that the exchange of safety-related ideas with a supervisor is critical to processes of managing safety effectively and injury prevention. Employee participation in the process of safety management – for example, by speaking up about concerns or active

participation in a joint employee-management health and safety committee – is engrained in occupational safety legislation and related policy (e.g., Gray, 2009). Our results, however, suggest that young workers who have ideas to improve safety may not fully participate in safety management process by speaking up to supervisors when they feel little emotional connection to their organization. Even though young workers have relatively short job tenures compared to adult workers, our results point to the benefits of fostering commitment to the organization among this group of workers to facilitate safety-related knowledge sharing.

Contrary to our expectations, we found that over a short period of time, safety voice on its own may not prevent work-related injuries. As a follow-up, we tested how supervisor openness influences the efficacy of safety voice on workplace injuries. As expected, we found that among participants who reported high levels of safety-specific voice as well as perceiving that their supervisor was indifferent to hearing safety-related concerns reported more frequent work-related injuries one month later than those who voiced to a supervisor who listened to their safety-related concerns. Related research has found that young people are generally reluctant to voice unless a safety concern is particularly serious (Tucker & Turner, 2013). Therefore, when a frontline teenaged worker speaks up about a workplace hazard, from their point of view, their concern should be listened to because of the serious nature of the hazard. When, in these situations, a supervisor is not open to hearing about hazards, remedial actions may not in turn be taken to address unsafe working conditions. Such conditions persist or even worsen, putting workers at even greater risk of workplace injury.

By comparison, high safety voice and high supervisor openness to safety suggestions were associated with lower future workplace injuries than the high safety voice and low supervisor openness to safety conditions. And while high safety voice and high supervisor openness to safety produced the lowest level of workplace injuries among all the conditions, it was not statistically different from the low safety voice with either low or high supervisor openness conditions. As previously mentioned, we believe that safety voice has an important role as an early indicator that safety conditions are declining and in need of attention. Thus, those who reported elevated levels of safety voice were likely experiencing the most dangerous work conditions and were at greatest risk of future workplace injury. We note, however, that it may be difficult over a one-month period for a supervisor to take all of the actions needed to significantly improve the safety climate in his or her work group to the point where workplace injuries are lowered.

Limitations

Several limitations warrant discussion. First, despite using a panel design, support for causation cannot be assumed based on these results. Even though the independent variable and mediator precede the dependent variable in time, reciprocal relationships cannot be ruled out. In addition, the time interval between each survey was only one month, with the total time between predictor (i.e., ideas about safety) and criterion (i.e., workplace injuries) variables spanning only two full months; different time lags can have different effects (Gollob & Reichardt, 1986). Further, alternative explanations may exist for the voice-to-injuries relationship moderated by supervisor openness finding. Specifically, those who speak up about safety may be more attentive to future workplace injuries and are more accurate in their recall of workplace injuries than those who use

less voice, who experience less injuries, or both. Relatedly, participants who spoke up about safety and were confronted with an indifferent supervisor may "over-report" injuries to "even the score" with a supervisor who is not open to listening to their concerns. While we do not think this is a concern in this case because we controlled statistically for T1 workplace injuries ahead of the T3 workplace injuries variable, the possibility that workplace injuries reflect a site for employee-manager resistance or conflict is not unheard of (e.g., Kamoche & Maguire, 2011; Trist & Bamforth, 1951). Finally, participant gender was not related to work-related injuries despite past research and workers compensation statistics showing that males tend to experience more work-related injuries than females do (e.g., Breslin & Smith, 2005). We suspect this is related to controlling for time 1 injuries and our measure of injures primarily captured minor injuries rather than lost-time injuries.

Practical Implications

The present findings have important implications for safety management of young workers. First, they suggest that ideas about improving safety alone may be insufficient for promoting voice - a key form of safety participation - among young workers. It is important that organizations take steps to cultivate among young workers both the development and expression of ideas about improving safety and organizational commitment. Second, to mitigate the likelihood of workplace injuries, organizations need to role model and impress upon supervisors the need to be genuinely open to listening and acting on safety concerns that are expressed by workers. Our results point to the harm that can be caused by supervisors who do not listen to safety concerns raised, in this case, by young workers—many of whom who work part-time and only temporarily for their organization. We add that participation in the control of workplace hazards from a legal perspective is a shared duty among employees, supervisors, and management, with the latter groups having a disproportionately greater duty and, based on empirical evidence, substantial opportunity to enable safe working (Christian et al., 2009).

Evaluation of 3-Month Longitudinal Study

The evaluation of this study is based on feedback from two sources: (1) Tucker and Turner's (2011) final report to Workers Compensation Board of Manitoba, which was assessed by the advisory board and approved by the RWIP program; and (2) two anonymous peer-reviewers and an action editor at the *Journal of Occupational Health Psychology*, an academic journal published by the American Psychological Association.

5.2 Study 2: Comparing Young and Adult Worker Safety Voice

Introduction

To understand how supervisor commitment to safety affected safety voice intentions across participants of different ages, we created three hypothetical scenarios in which we manipulated how clearly supervisors cared about safety and were open to hearing suggestions about safety. We randomly assigned one of these hypothetical scenarios to participants of different ages to identify whether participant age accounts for differences in their willingness to speak up when faced with varying degrees of supervisory commitment to safety and openness to safety-related

ideas. This experimental approach allows us to identify causal relationships among the study variables. Like we did in previous research (Tucker & Turner, 2014), we developed these scenarios by drawing on the real-life experiences of kitchen workers.

Method

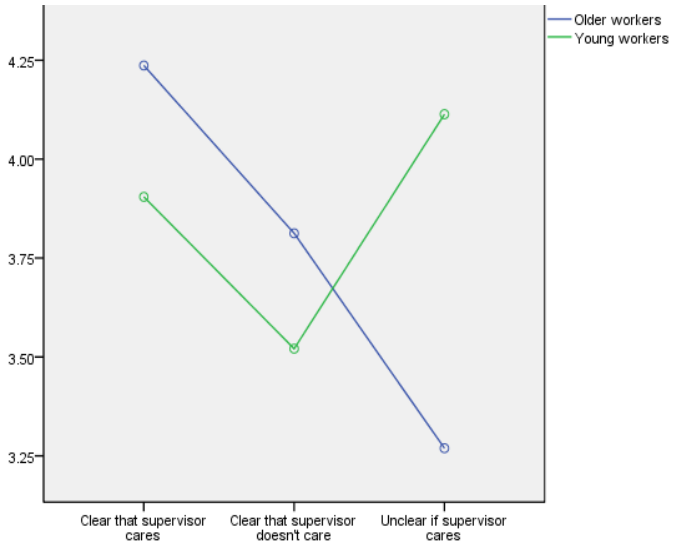
Appendix A shows the three different hypothetical scenarios used in this study. We pilot tested the scenarios with a sample of 20 respondents to help ensure quality and realism. These results showed that participants believed the three vignettes to be equally realistic, and could clearly recognize whether a supervisor cared about safety, did not care about safety, or was unclear about his/her commitment to safety. In the main study, participants were food services personnel (e.g., concession workers, kitchen staff, food preparation) working in three broad settings: (1) at university food services across the prairies – University of Manitoba, Canadian Mennonite University, University of Winnipeg, and University of Regina; (2) at Winnipeg's Shaw Park; (3) enrolled as culinary students Saskatchewan Polytechnic and Northern Alberta Institute of Technology.

One hundred and forty-four people started the survey for which 129 provided useable data. The average participant (58% female) was 26 years old (*SD* = 10.19), ranging from 15 to 60 years old. The majority (72%) reported working currently in a restaurant or food services organization. In addition to providing demographic information and information about where they were currently working, respondents completed a six-item scale of safety voice (Tucker & Turner, 2011) and a four-item measure of implicit voice theories (Detert & Edmondson, 2011).

Results

Overall, we found that participants were less likely to want to speak up when a supervisor was not open to listening to safety concerns compared to when the supervisor was open to voice. Age did not affect the intentions of respondents to speak up about safety when they worked for a supervisor who was either clearly committed to safety or who was clearly not committed to safety. However, when respondents encountered a supervisor who was unclear about their commitment to safety, age seemed to matter: older workers were less likely than younger workers to speak up about safety concerns (see Figure 5; however, note the mean scores plotted in this figure slightly differ depending on whether the analysis treats participant age as a continuous variable or younger (under 25 years age) and older (over 25 years of age) groups of participants are compared). This pattern of results held even when we controlled for respondents' beliefs about the disadvantages of speaking up in general (implicit voice theories). When the sample is divided on the median age (i.e., <= 22 and > 22), young workers compared to older workers report having more strongly held beliefs about being reluctant to speak up (M = 2.67 vs. 2.36, respectively, $p < .05$) – where higher scores reflect, for example, concern about offending people in charge. However, the correlation between age as a continuous variable and IVT is non-significant (r = -.10, p = .28, n = 117).

Figure 5: Safety voice intentions (y-axis) across the three scenario conditions (x-axis) by age grouping



Discussion of Results

These scenarios illustrate the importance of age in making sense of supervisors' commitment to safety and workers' willingness to speak up about safety concerns. It appears that older workers interpret the ambiguity of supervisors' commitment to safety as a lack of receptiveness in hearing about safety concerns, and are less likely than younger workers facing the same uncertainty to speak up about safety. For younger workers, however, voicing safety concerns in the face of uncertainty about a supervisor's commitment to safety is not diminished. As reported in Study 1 – a real-life setting – young workers who spoke up about safety concerns but are met with a supervisor not open to safety suggestions reported higher subsequent injuries (Tucker & Turner, 2015). Understanding the difference between explicit or ambiguous commitment to safety is seemingly an important distinction in predicting workers' willingness to speak up about safety concerns.

Limitations

In using hypothetical scenarios to study safety voice, it is important to remember that participants report on their intentions to speak up, rather than the extent to which they would actually speak up. This type of study does not take into account whether participants would respond differently had they actually experienced the working conditions described in the scenario. Additionally, although the majority of respondents were working in or around kitchens at the time of the study, their work roles may be very different (e.g., concession stand worker versus cook), and this may have influenced their responses. One of the benefits of randomly assigning participants to one of the three scenarios is that variation in work roles, along with variation in age and gender, would be spread across the different groups equally.

Evaluation of Scenario Study Method

The evaluation of this study is based on feedback from two sources: (1) analysis of the quality of the survey data and (2) participant ratings of the extent to which they could imagine themselves in the scenario and the overall realism of the scenarios. First, there were no extreme responses (also known as outliers) on participants' intentions to speak up about safety concerns, suggesting participants took the survey seriously. Second, we asked participants to what extent they could imagine themselves in the scenarios and how realistic they thought the scenarios were. The average score was approximately 4.4 out of 5 for the extent to which respondents could imagine themselves in the scenarios, and a realism score of almost seven out of ten,[6] both of which are acceptable for experimental research of this type.

In comparing safety voice intentions between this scenario study and the one conducted in previously-funded WCB Manitoba research (Tucker & Turner, 2014), there are several differences. First, the sample in this study is older (*M* age = 26.12) than both studies (*M* age, Study 1 = 18.10 years; *M* age, Study 2 = 16.89 years) in Tucker and Turner (2014). Second, and perhaps relatedly, the mean scores on the six-item safety voice intentions scale are also higher in the current study (*M* score = 3.94) compared to scores in both of Tucker and Turner's (2014) studies (*M* score, Study 1 = 3.33; *M* score, Study 2 = 3.52). While the focus of the scenarios among these studies is different, it is possible that there is a small direct effect of age on safety voice intentions.

Study 3: Understanding Youth Safety Voice Over Time and the Influence of Parents on Youth Safety Voice

Introduction

The primary aim of Study 3 is to understand the safety experiences of young people over the course of their first few months at a new job, a time in which workers of all ages vulnerable to injury (See Figure 1; Breslin & Smith, 2006). To our knowledge, there is no published research that examines young worker safety behaviours over several months at a new job.

In this study, we also continue to investigate the influence of supervisor openness to voice, as well as consider the impact of other workplace factors (e.g., job control) and the influence of parental attitudes and behaviours on their childrens' safety voice and other safety behaviours.

Between June 2012 and August 2013, we surveyed on a monthly basis (for a total of 15 months) a cohort of approximately 162 teenagers residing in the province of Manitoba. The surveys contained questions related to safety attitudes, safety beliefs, work-related injuries, and other aspects of participants' work and non-work lives (e.g., frequency of texting while driving). In addition, we surveyed one parent/guardian of the participating youth three times with a lag of approximately 4 months between each of the three surveys. These survey questions related to the parents' work and safety experiences and knowledge of their childrens' work safety experiences. In this section of the report, we provide a wide-ranging descriptive summary of these data

[6] Where 1 = "not realistic" and 10 = "very realistic".

primarily by graphing the average scores of participants over time and limited inferential statistical analyses of focal variables.

Method

High school students, aged 15-19, were recruited from across the province of Manitoba between April and June 2011, with the majority residing in Winnipeg. We chose this time to attract interest in the study as it was just before students began summer jobs. High school principals were contacted and asked to identify suitable grade 11 and 12 classes. In some cases, this involved a research assistant visiting classrooms to explain the study to potential student participants.

To be eligible for the study, participants either had a job at the time of recruitment or indicated that they were or would be searching for a job in the near future. Students were offered $10 for each completed survey and multiple follow-up emails and phone calls were used each month to maximize participant retention on a monthly basis. Participants received a check in the mail every three months for up to a maximum of $30 (i.e., $10 per survey completion). Surveys were completed on-line, outside of school hours, and took approximately 15 minutes to complete.

The survey was structured so that participants who were unemployed or in between jobs in any given month were directed to respond to a unique set of survey questions appropriate for their situation (e.g., related to their job search behaviours). Participants who were new to a job in a given month were asked to fill out additional questions about their new position (e.g., sector, job title, nature of job-related safety training) in addition to the regular questions employed participants completed each month. All survey questions were asked in relation to the young worker's main job (i.e., the job they work the most hours).

The first survey was administered June 2011 (referred to as Month 1) and the final survey was offered in August 2013 (referred to as Month 15) At Month 2, participants were asked to provide the name and contact information for the parent or guardian who had the most influence on their work. Parents were then invited to complete surveys in Months 2, 7, and 11. Hereafter, when we refer to "participants", we are referring to teenaged participants.

The participants' surveys consisted of two broad categories of variables: (1) those that were asked each month and (2) those that were asked once or at regular intervals (e.g., once every three months). Across the 15 months, participant surveys included questions related to 73 different variables. Variables could be a single survey question/statement or comprised by multiple items from a validated measure. The parents' surveys collected data on 20 different variables across three months. Given the significant number of variables we collected data on across the surveys, we are unable to report descriptive and statistical analysis on all variables in this report due to space constraints.

Table 5 shows the number of participants by employment status by study month. The number who reported starting a new job is a subset of the total number employed. The average response rate over the course of the study was 78%. An average of nine percent of participants started a new job each month (i.e., either changed jobs or started a new job after being unemployed the

previous month) and, in total, there were 189 job changes over the study period. This highlights the relatively high month-to-month turnover rate among teenagers in the labour market. In Months 2, 7, and 11 of the study, 132, 113, and 99 parents/guardians, respectively, completed a survey.

Table 5: Number of responses by child participants

Month	Employed	Started new job	Unemployed	Total	Response %
1	167	0	38	205	100
2	130	28	37	167	81
3	127	17	55	182	89
4	125	20	58	183	89
5	118	13	57	175	85
6	111	15	52	163	80
7	108	11	51	159	78
8	96	5	52	148	72
9	104	7	47	151	74
10	111	10	48	159	78
11	104	7	49	153	75
12	99	12	42	141	69
13	112	20	26	138	67
14	105	17	25	130	63
15	100	7	34	134	65

Results

We report the results of this study in several parts beginning with the nature of discussions a young worker has with a new employer during the hiring process and during the first shift at the new job. We then turn to young workers' exposure to workplace hazards and injuries over the course of their early months on the new job and, for example, how experiences vary for males and females. Next, we examine the frequency of different safety behaviours over the same time period. Finally, we investigate how workplace factors, such as supervisor openness, may shape the trajectories of safety behaviour and injury experience.

Discussing Safety in the Hiring Process for a New Job

We first compare the perceived importance of and actual level of discussion of a variety of topics during a hiring process for a new job. Each month, participants who indicated they were unemployed were asked to rate how important they felt it was to discuss several topics during the hiring process on a scale ranging from one to five, where 1 = not important and 5 = very important. We collected 633 responses over 15 months. Table 6 shows that "scheduling" and "weekly pay" topped the list in terms of importance, while safety topics ranked sixth ("My employer's expectation of my safety behavior") and tenth ("My expectations of workplace safety conditions"), suggesting safety is of mid-range importance relative to other topics. We compared these responses to the actual amount of discussion of each of these topics reported by participants who started a new job (N = 189). Specifically, we asked participants to report on the amount of discussion of each topic on a five point scale, ranging from 1= no discussion to 5 = a lot of discussion. Table 7 shows that the most time was spent on discussing topics related to employer expectations of job performance followed by scheduling. Conversations about safety topics ranked relatively low, specifically eighth and twelfth out of a list of fourteen possible

topics. Together, these results suggest that discussions about safety during the hiring process are considered somewhat important by unemployed youth, but are not actually given a lot of discussion during the actual hiring process compared to other job-related topics. This suggests that the young people in our sample had little sense of their new employers' expectations of workplace safety behaviour. Moreover, the young workers themselves did not have much in the way of discussions with their employer about their own expectations of workplace safety.

Table 6 Importance of topics to discussing during hiring process for next job (N = 633)

Rank	Discussion topic	Mean
1	Scheuduling	4.38
2	Weekly pay	4.34
3	Job-related training	4.16
4	My performance at my previous job(s)	4.16
5	My employer's expectation of my job performance	4.11
6	My employer's expectation of my safety behaviour	4.08
7	Duration of the job	4.06
8	My expectations of job-related training*	4.04
9	Requied tools/equipment	3.99
10	My expectations of workplace safety conditions	3.89
11	Hourly pay	3.86
12	Required clothing	3.85
13	My interest in the job	3.83
14	My expectation of the job	3.70

Table 7 Amount of discussion of topics during actual hiring process (N = 189)

Rank	Discussion Topic	Mean
1	My employer's expectation of my job performance	3.62
2	Scheuduling	3.54
3	Weekly pay	3.48
4	Job-related training	3.48
5	My interest in the job	3.47
6	Required clothing	3.39
7	Duration of the job	3.27
8	My employer's expectation of my safety behaviour	3.27
9	My expectations of job-related training*	3.23
10	My expectation of the job	3.15
11	Requied tools/equipment	3.05
12	My expectations of workplace safety conditions	3.03
13	Hourly pay	2.92
14	My performance at my previous jobs(s)	2.88

We also explored the prevalence of discussions about the organization's safety record and safety training during job interviews and the first shift at a new job. The results shown in Figures 6 to 9 indicate that young workers entering new jobs know very little about safety conditions at their new workplace. For example, just over 20% of respondents said an employer shared information about the organization's injury record and 40% were told about job-related hazards during the job interview. Further, nearly 30% indicated that they were not provided with safety training during their first shift and 20% indicated they did not receive safety training. When training was offered, the most common provider of such training was a supervisor or co-worker (Table 8).

Taken together, these data suggest that many young workers were going blindly into new jobs with little sense of the expectations for their safety behaviour and the hazards in their new workplace.

Figure 6: Responses to the question: "During the job interview, my employer told me about the business' injury record. (Responses from Months 3-5 surveys, N = 49)

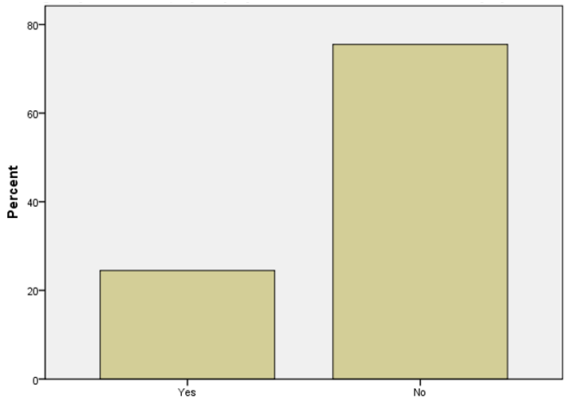


Figure 7: Responses to the question: "During the job interview, my employer told me about job-related hazards. (Responses from Months 3-5 surveys, N = 49)

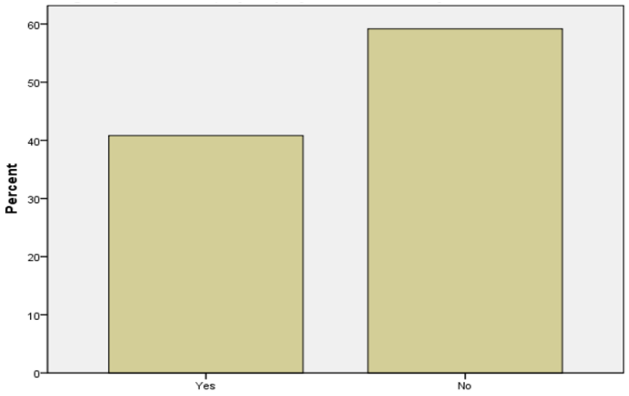


Figure 8: Responses to the question: "During the job interview, my employer told me about job-related safety training. (Responses from Months 6-15 survey, N = 109)

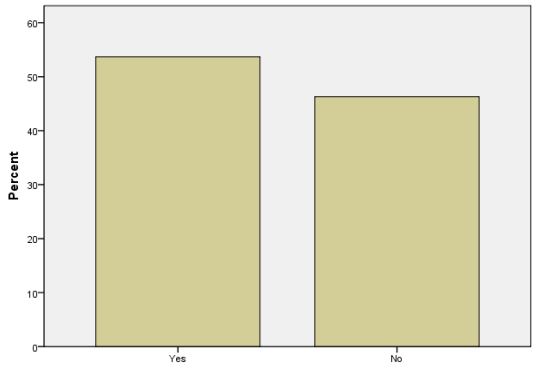


Figure 9: Responses to the question: "During my first shift, my employer provided me with job-related safety training. (Responses from Months 6-15 surveys, N = 109)

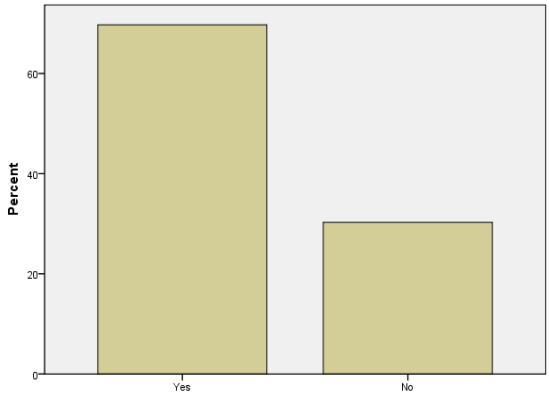


Table 8: Percentage of Participants who Received Job Safety Training for a New Job by Source of training (Responses from Months 1-15 surveys N=189)

No Training	WHMIS training	Co-worker trained	Supervisor trained	Safety supervisor trained	Training workshop
20%	34%	56%	56%	14%	12%

Safety Experiences at New Job

To deepen understanding of the safety experiences of young workers starting new jobs, we developed a separate data set in which all participants started a new job started at "Time 0 (T0)" (i.e., the first month at a new job was identified as T0 whether they actually started a job in, for example, October 2011 or May 2012). Out of the sample of 189 job changes, this resulted in a

sample of 88 job changes by unique participants. For participants who reported more than one job change over the course of the study, we included their job for which we had the most monthly responses following a job change. Participants in this sample worked an average of 4.81 months at the new job before changing jobs again, becoming unemployed, or not responding to the next survey. In this sample, the longest period of employment by any participant, from starting a job to the last survey completed, was 13 months. Figure 10 shows that rate of attrition from this same is relatively high and, for example, by Time 5 (i.e., 5 months after starting a new job) there were 35 participants in the sample.

Table 9 identifies the sectors and characteristics of the new jobs (e.g., job title). We focus attention on responses reported between Time 0 and Time 5 (range of N = 35 to 88). In latter months, where the sample size is significantly diminished, extreme experiences of a small group of participants can skew the results, sometimes dramatically. Moreover, at later time points, the sample size declines as does its representativeness of the population of young workers.

Figure 10: Number of responses to survey for participants starting a new job at Time 0

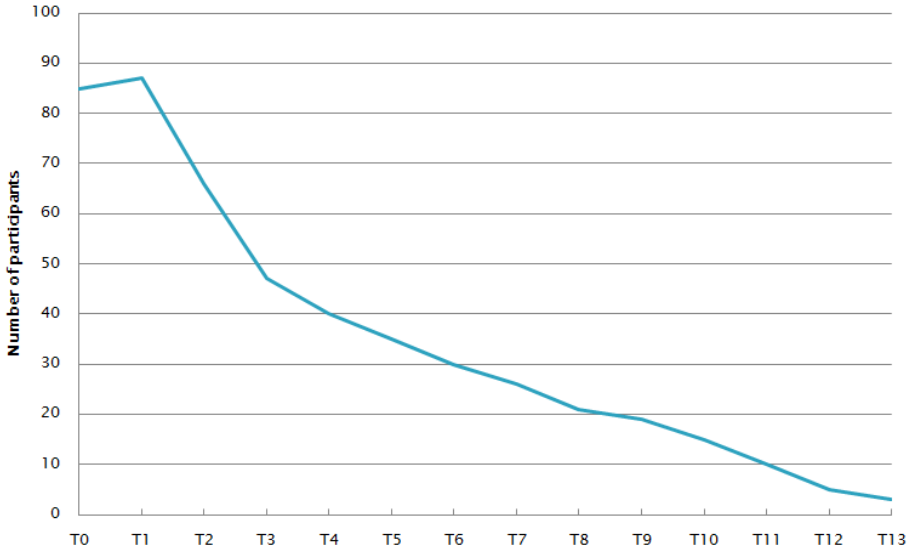


Table 9: Description of New Jobs (N = 88)

Sectors	Number	%Females/ %Males	Common jobs
Sales and Service (e.g., food service, grocery, retail jobs)	52	62/38	customer service representative, cashier, sales associate
Trades, Transport & Equipment Operators (e.g, construction labourers, carpenters, drivers, roofers)	9	33/67	Roofer, mechanic, home renovator
Processing, Manufacturing (e.g., assemblers, manufacturing labourers, manufacturing machine operators)	2	50/50	Warehouse sorter
Business, Finance & Administration Occupations (e.g., clerical, call centre jobs)	3	33/67	Sales representative
Health Occupations	2	50/50	Respite support
Primary Industry (e.g., agriculture labourers/supervisors, logging)	2	0/100	Farmer
Art, Culture, Recreation	7	57/43	Sports supervisor, lifeguard
Social Science, Education, Government (e.g., teachers, social workers)	5	80/20	Tutor, camp instructor
Natural & Applied Sciences & Related	0	-	-
Management Occupations	1	100/0	Cashier
Other	5	80/20	Lab assistant, timekeeper

We begin by presenting the pattern of self-reported injury and exposure to unsafe work over time. Here also we consider differences in these safety experiences by gender, age, and sector that the young person is employed. Next, we examine the trajectories of safety voice and other safety behaviours over time and explore differences in these behaviours between, for instance, males and females and injury experience. Finally, we describe how workplace factors such as supervisor openness to voice, safety-related discussions during the hiring process, and job control, are associated with safety behaviours over time.

Experience of injuries, exposure to dangerous work, and fear of being injured

Each month employed respondents were asked several questions about their personal experience of safety in the previous three weeks. The first measure was "injuries," which included five items: a strain or sprain; scratch or abrasion (superficial wound); cut, laceration, or puncture (open wound); work-related burn or scald; and bruise or contusion, dislocated joint, and fractured bone. The response scale was 1 (*never*), 2 (*once*), 3 (*two to three times*), 4 (*four to five times*), and 5 (*more than five times*). Scores for these five items were summed and then divided by five to produce an average injury rate. Second, we asked young people to report on their *fear of injury* using two items ("I fear that I could get hurt at this job" and "I fear that I could have an accident at this job") and, third, how many times in the past three weeks they were asked to do a task that they thought was dangerous? **Again, given the relatively low number of participants after T5 (i.e., less than 35), we encourage readers to focus on the trends between T0 and T5 in all of the forthcoming analysis and to put little weight on the results covered by gray shading.** Figure 11 shows that number of injuries and exposure to dangerous work at highest in the first full month on the job before declining slightly. Figures 12 to 14 compare the safety experiences of young males and females. In the first few months of starting a job males reported higher injuries, higher exposure to dangerous tasks, and higher fear of being injured than female participants. This may be due to the difference occupations worked by males and females (see Table 9).

Figure 11: Experiences of injuries and dangerous tasks, and fear of being injured

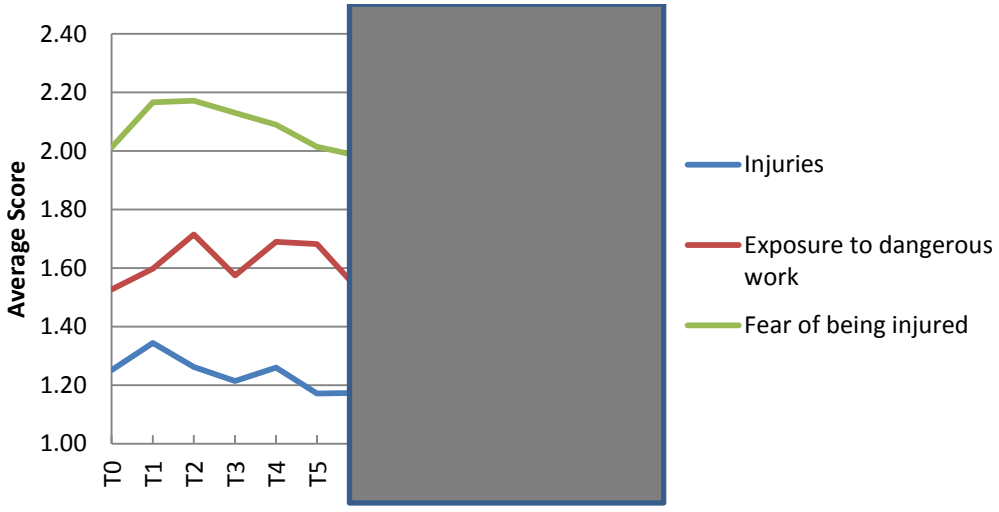


Figure 12: Injuries by sex

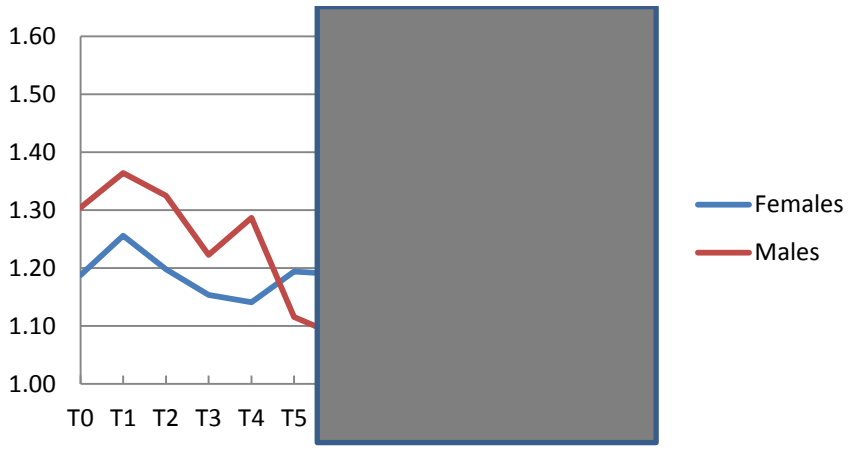


Figure 13: Exposure to dangerous work by sex

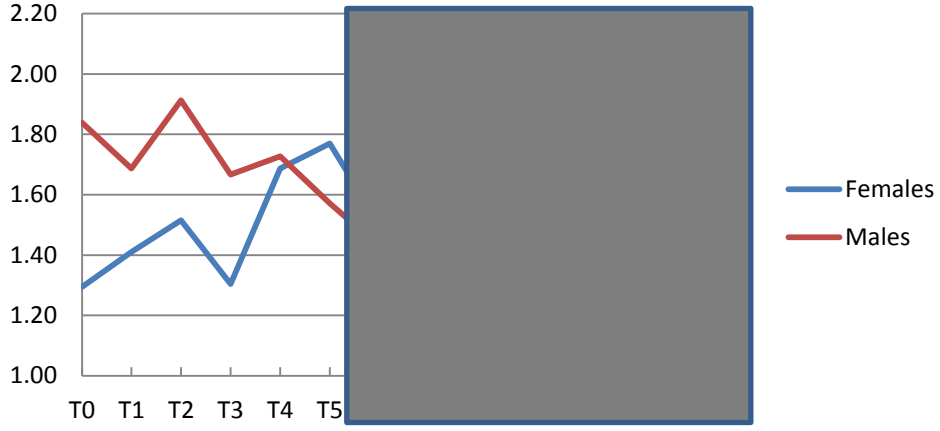
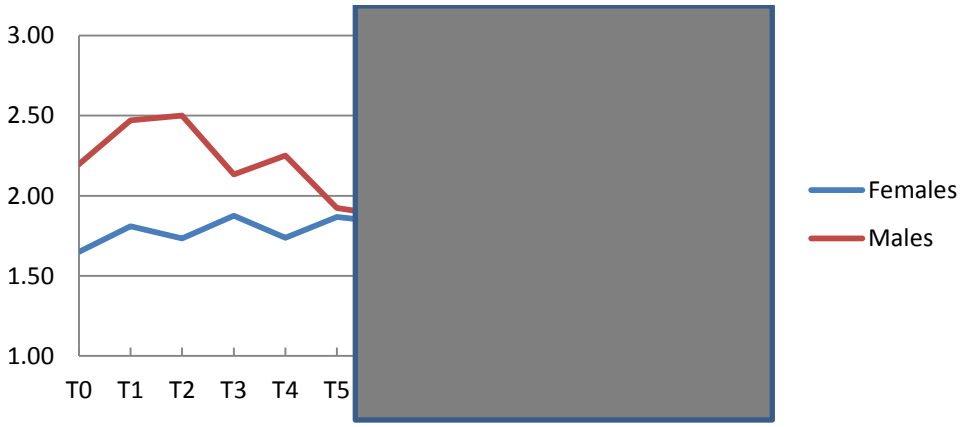


Figure 14: Fear of being injured by sex



Figures 15 to 17 compare the safety experiences of 15 to 17 years and 18 to 20 years. These responses suggest that among this sample there was very little difference in injuries, however older workers in the sample reported greater exposure to dangerous tasks and greater fear of being injured in the first few months on a job. This could be due in part to 18 to 20 year olds working more hours per week.

Figure 15: Injuries by age group

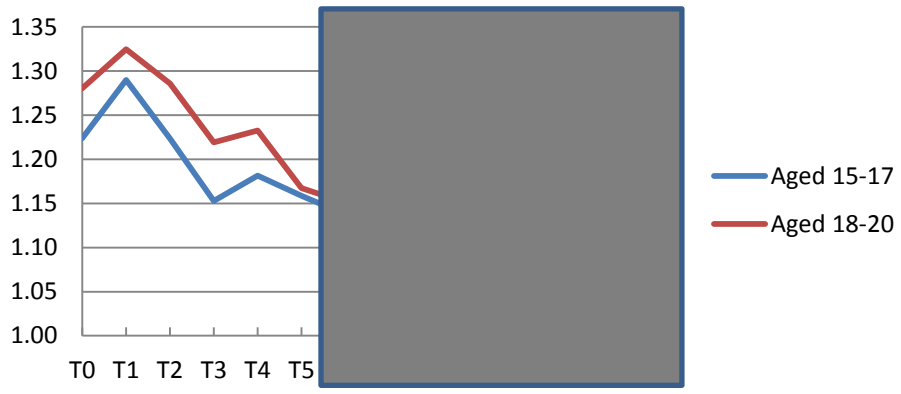


Figure 16: Exposure to dangerous work by age group

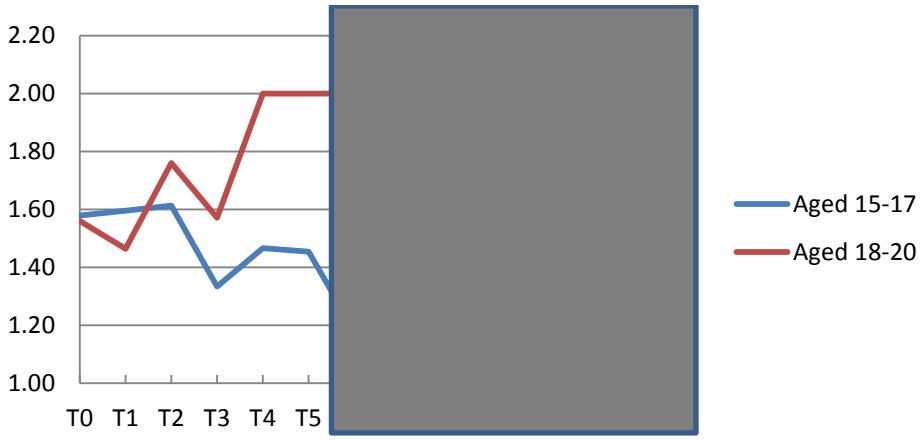
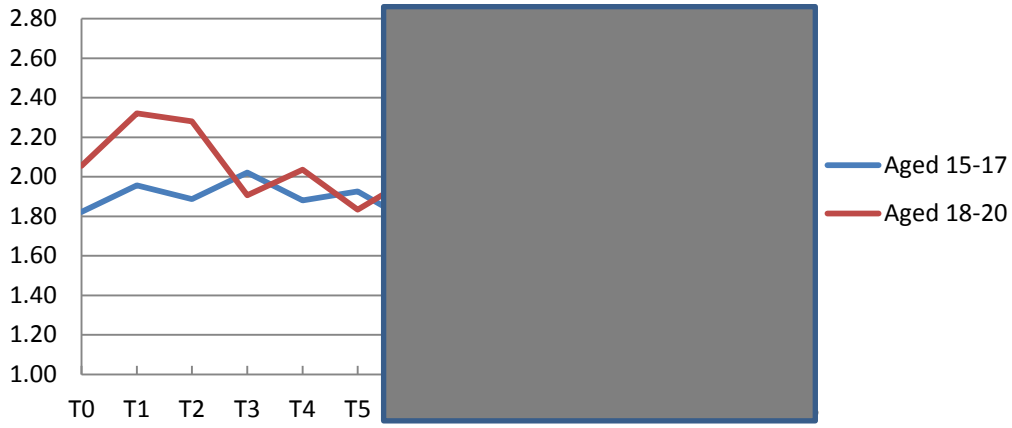


Figure 17: Fear of injury by age group



Finally, we examined the safety of experiences of participants based on their sector of employment. Given our relatively small sample size and the fact that 59% (i.e., 52 out of 88) of participants in the sample were employed in the service sector (see Table 9), we compare the experiences of those in the service sector with all other sectors. Figures 18 to 20 show that the safety experiences are largely similar with the exception of exposure to dangerous work, which is higher in the combined non-service sector group.

Figure 18: Injuries by Sector

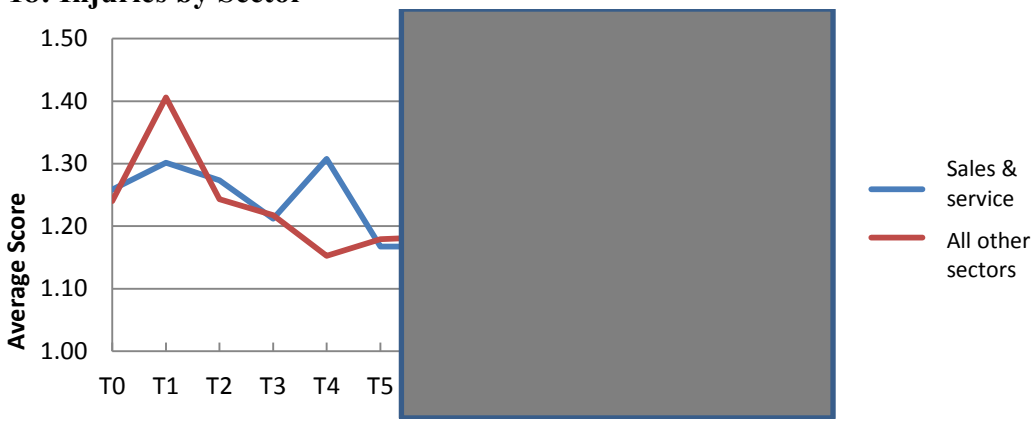


Figure 19: Exposure to Dangerous Work by Sector

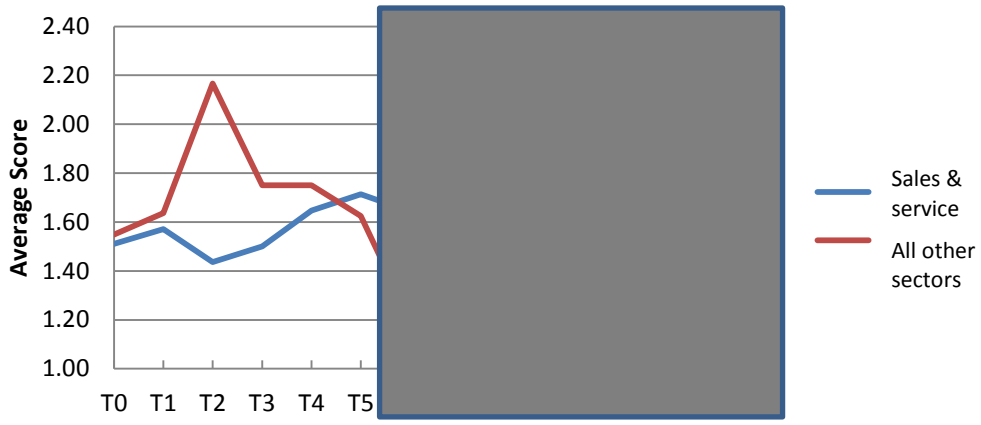
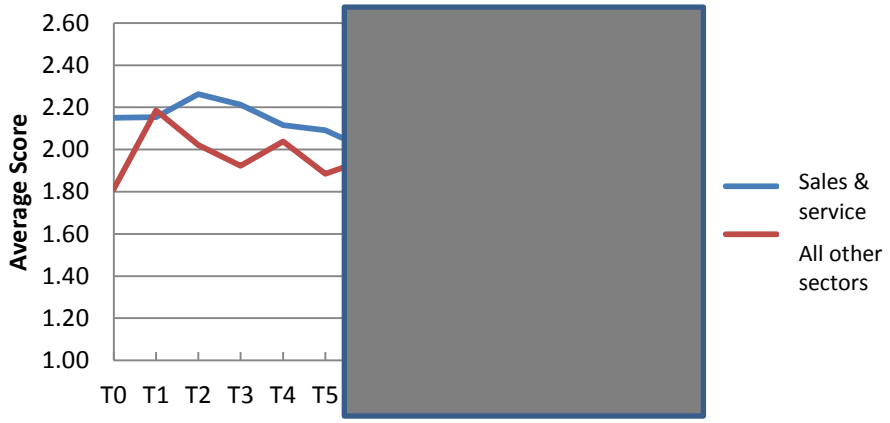


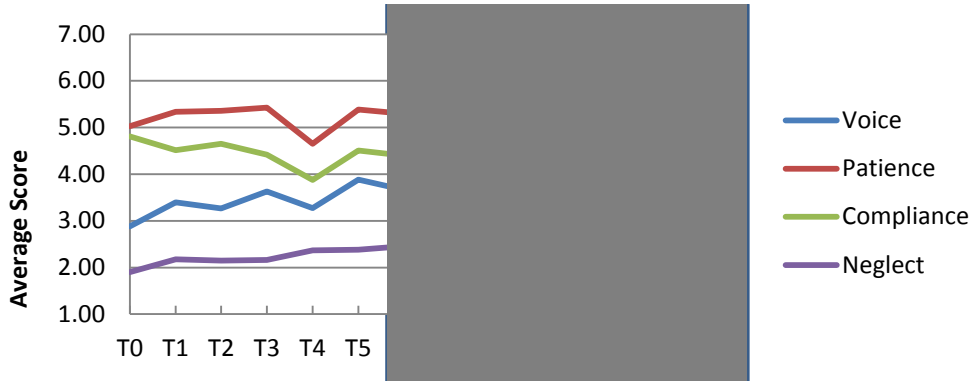
Figure 20: Fear of being injured by sector



Safety Behaviours at the beginning of a new job

Next, we turn our attention to patterns of young workers safety behaviours in the months after starting a new job. Here we examine four additional behavioral responses to declining workplace safety conditions: safety-related *compliance* (e.g., following safe work practices), *patience* (e.g., adapting to unsafe working conditions), *neglect* (e.g., not following safety procedures), and *exit* (e.g., talking to friends about leaving an unsafe workplace) (Tucker & Turner, 2011). Figure 21 shows that, over time, patience and compliance were most frequently reported. Although the behaviours were mostly stable, compliance behaviour gradually declined between T0 and T5, while voice gradually increased in frequency over this period.

Figure 21: Safety-Related Behaviours (voice, patience, compliance, and neglect)



Figures 22 to 25 plot the prevalence of the different safety behaviours by participant sex between T0 and T5. This sample is comprised only of participants who completed each survey between T0 and T5 and thus is limited to the same 35 participants. We note that the pattern of each behaviour differs between males and females. Females reported slightly higher voice to T3 than males. The frequency of patience steadily increased for males over time but not for females, while the prevalence of compliance declined over time among females and grew slightly for males. Finally, males consistently reported higher neglect behaviour compared to females.

Figure 22: Voice by participant sex (N = 35)

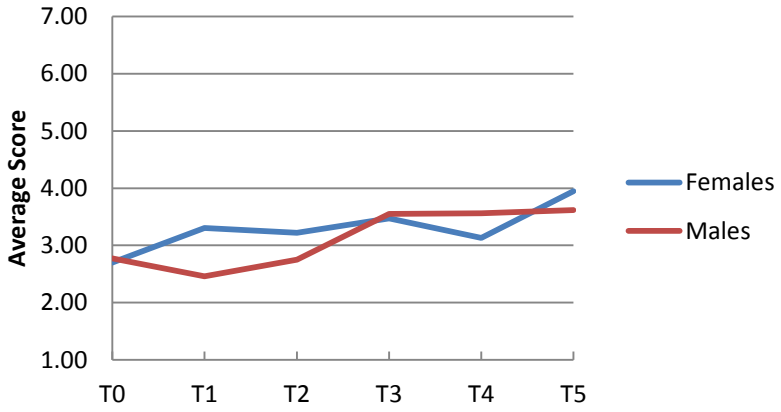


Figure 23: Patience by participant sex (N = 35)

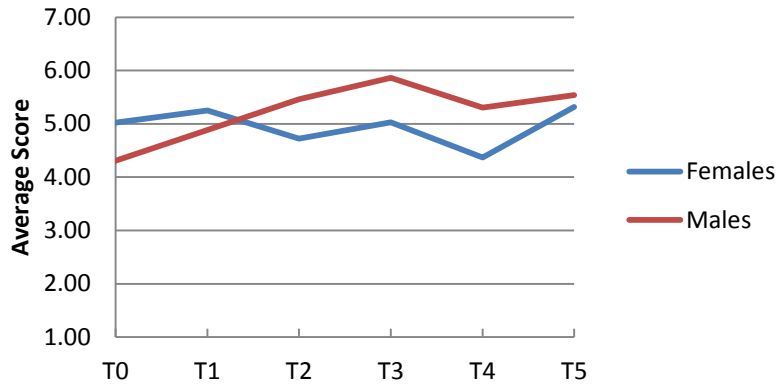


Figure 24: Compliance by participant sex (N = 35)

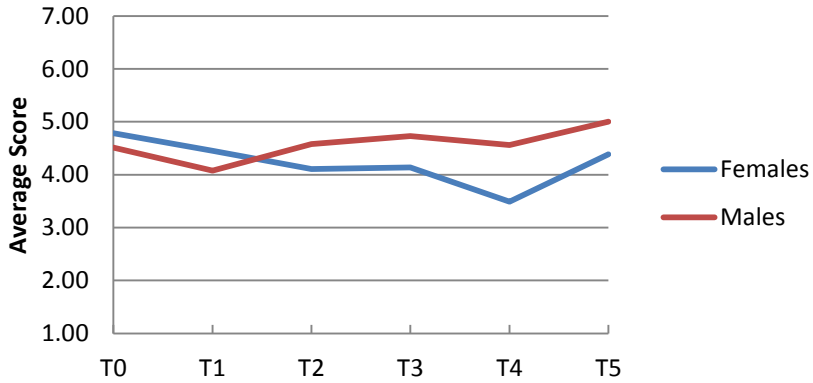
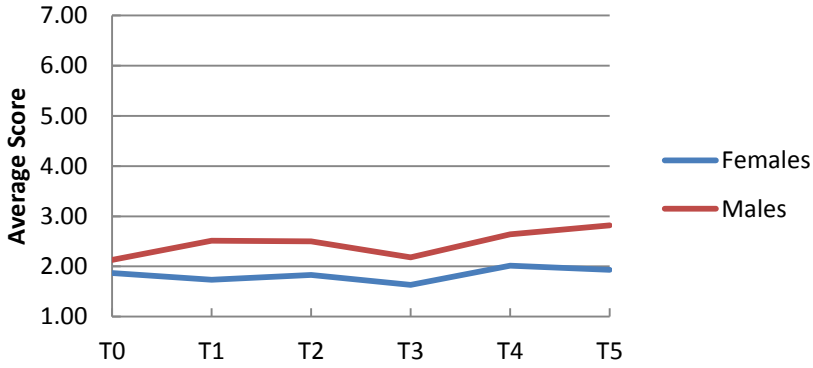


Figure 25: Neglect by sex (N = 35)



A practical and important question examined in our previous research study is how young workers' respond to unsafe working conditions (Tucker & Turner, 2013). Teenaged participants in a focus group study expressed that they take a "wait-and-see" approach to hazards (i.e., safety patience) unless the threat is serious to their personal safety, in which case they would be more likely to speak up (i.e., safety voice). Few participants said they considered leaving a dangerous job (i.e., exiting), despite this strategy being prescribed. Figures 26 and 30 compare the voice,

patience, compliance, neglect, and exit intentions from T0 to T5 of participants reporting above and below average injuries (specifically, we averaged the injury scores between T1 and T3 and divided the sample into two groups, those experience above average injuries and those reporting below average injuries). The pattern of behaviour below seems to replicate the findings from our earlier study. While higher exposure to injuries from T1 to T3 is associated with slightly elevated levels of voice, and distinctly higher patience, it was not related to higher exit intentions except at possibly T0.

Figure 26: Patience by injury intensity (N = 35)

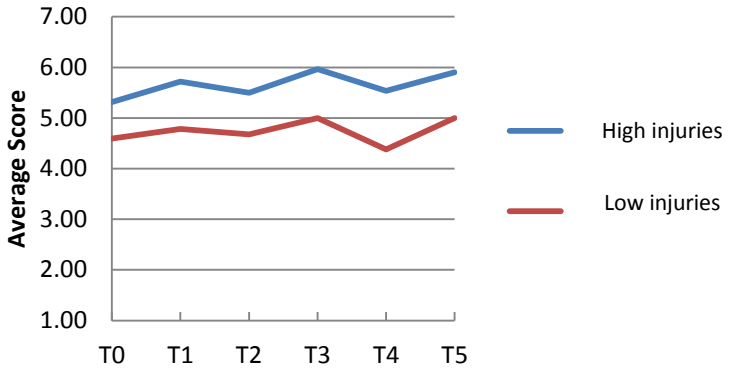


Figure 27: Voice by injury intensity (N = 35)

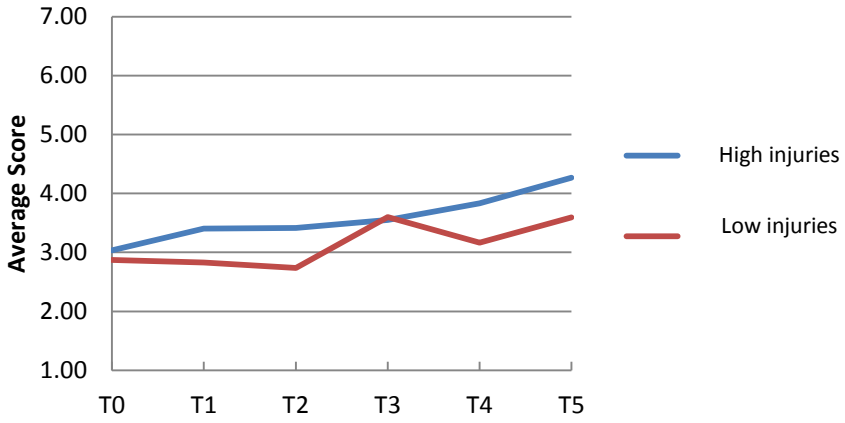


Figure 28: Compliance by injury intensity (N = 35)

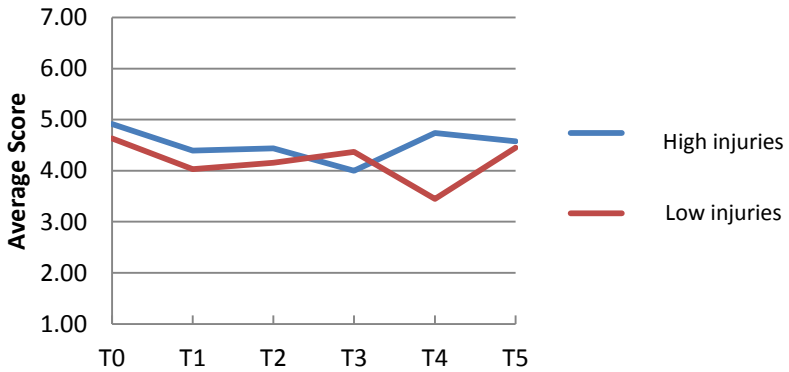


Figure 29: Neglect by injury intensity (N = 35)

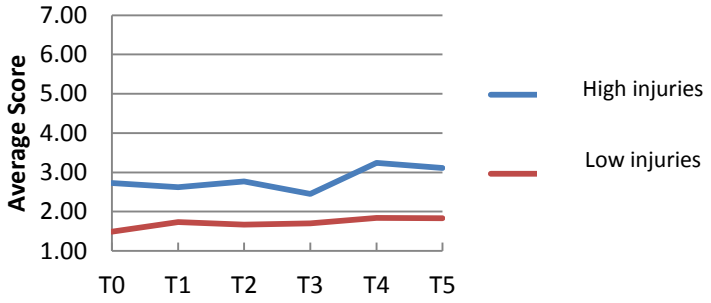
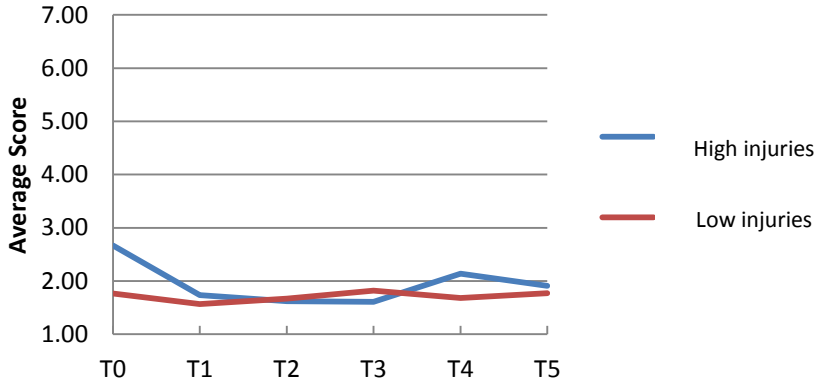


Figure 30: Exit intentions by injury intensity (N = 35)



We also examined how conceptually-relevant workplace factors were related to two important safety behaviours: safety voice and safety compliance. These include organizational sector, the nature of discussions about safety in the hiring process, job control, and supervisor openness to voice. We begin with a broad consideration of whether voice and compliance behaviours vary in the service sector versus all other sectors. Figures 31 and 32 indicate that voice and compliance behaviour were generally lower in the service sector compared to all other sectors combined.

Figure 31: Voice in the service sector and other sectors

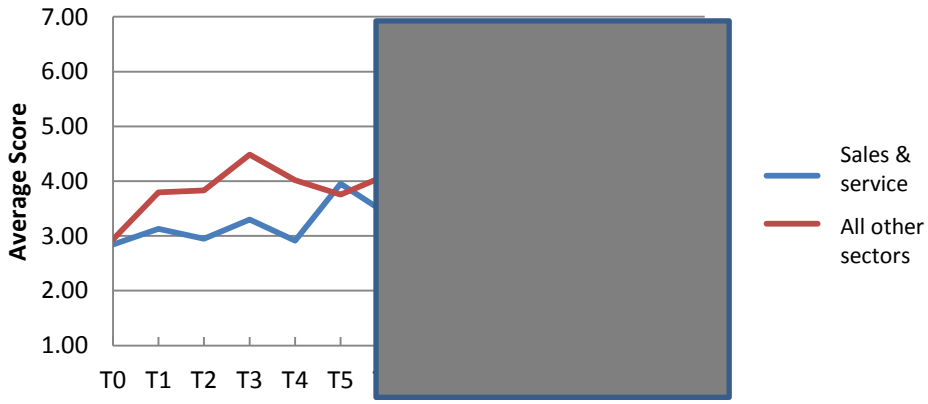
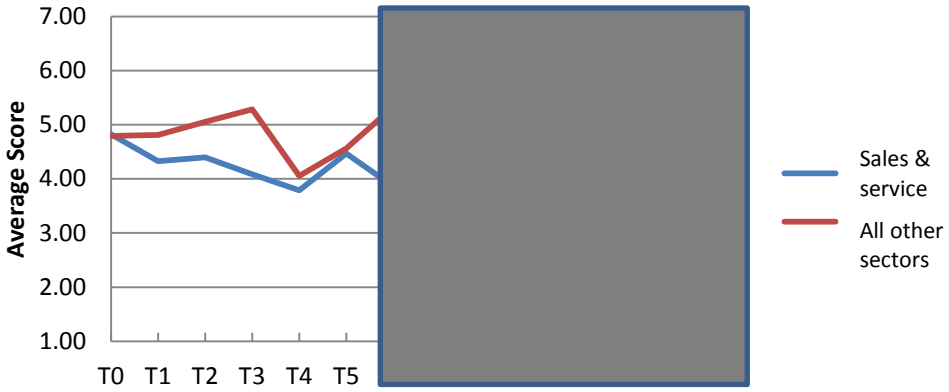


Figure 32: Compliance in the service sector and other sectors



Next, we turn to whether (and how) early conversations about safety are associated with future on-the-job voice and compliance behaviour. Specifically, we examined if and how the amount of discussion related to the employer expectations of the new worker's safety behaviour (see Table 7) was associated with safety voice and compliance behaviour over time. The results in Figures 33 and 34 clearly indicate that the more time an employer discussed their expectations of the new employee's safety behaviour at the beginning of the job (i.e., at T0), the higher the employee's frequency of voice and compliance (T0 onwards). We assume that discussions related to the employer expectations of the new employees safety behavior focused on encouraging safe work performance.

Figure 33: Voice behaviour by amount of discussion employer's expectations of new employee's safety behaviour (T0)

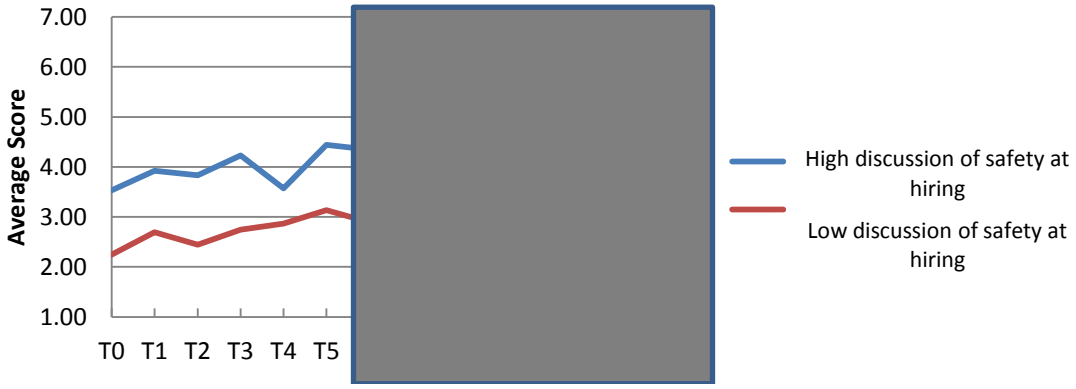
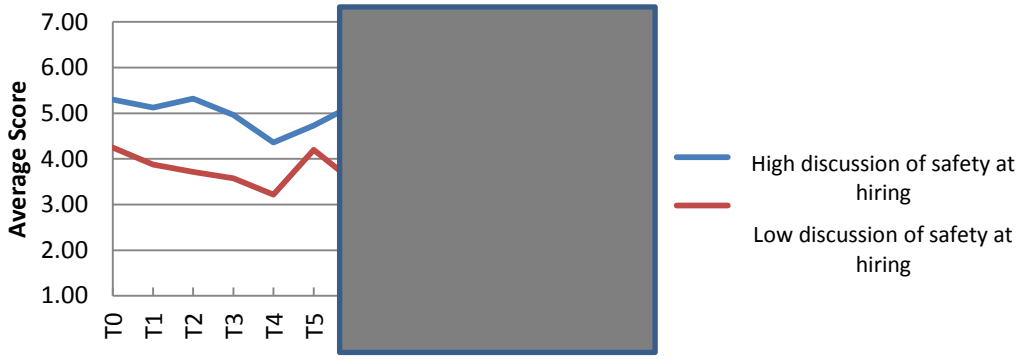
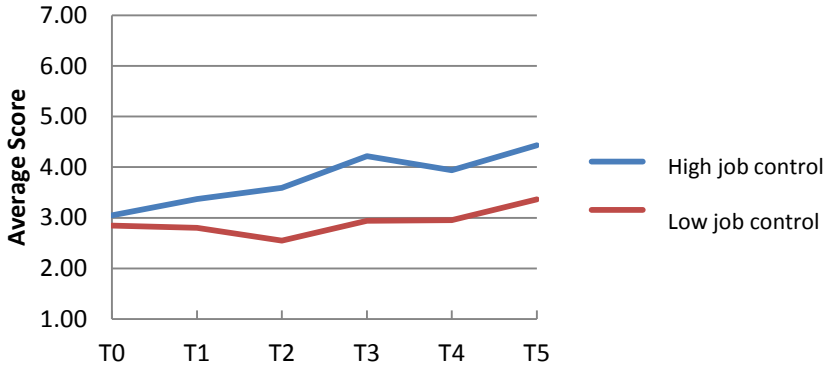


Figure 34: Compliance behaviour by amount of discussion employer's expectations of new employee's safety behaviour (T0)



Job control reflects the amount of latitude employees have to make decisions about how and when they do work-related tasks. Research shows that job control is positively associated with a variety of desirable employee and work-related safety outcomes (e.g., Turner et al., 2005). The responses graphed in Figure 35 relate to the sample comprised of participants who completed each survey between T0 and T5 (N = 35). We created high and low job control groups based on the average score of self-reported job control from T1 to T3, inclusive. Figure 35 indicates that those that perceived more job control reported consistently higher voice over time. There appear to be no differences in patience, compliance, and neglect behaviour based on left of job control.

Figure 35: Voice (T0-T5) by high and low level of job control (average T1-T3)



To further build on Studies 1 and 2, we explored the pattern of voice and compliance behaviour under high and low perceived supervisor openness to hearing employee suggestions for improving safety. Figures 36 and 37 demonstrate that both voice and compliance were sustained at higher levels when supervisors scored higher in openness than when they scored lower. These patterns suggest that a willingness to listen genuinely to employees about safety could represent a supervisor's broader commitment to safety.

Figure 36: Voice by supervisor openness to listening to safety concerns

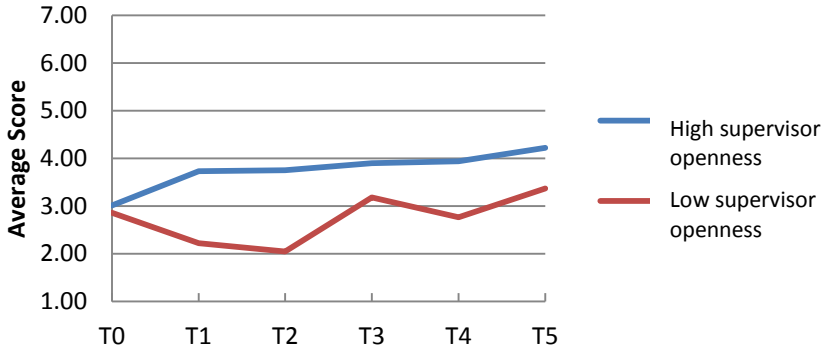
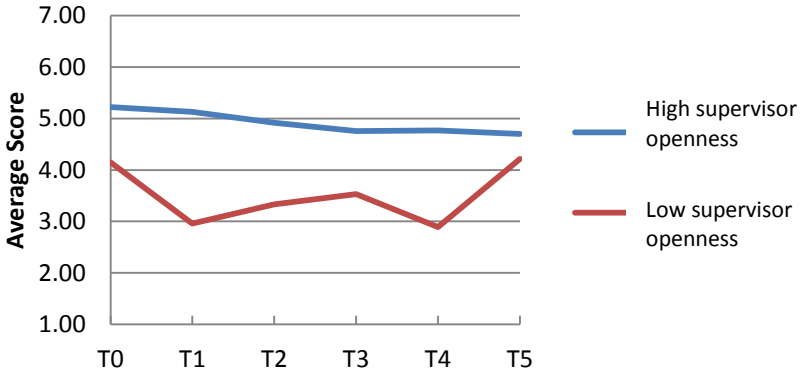
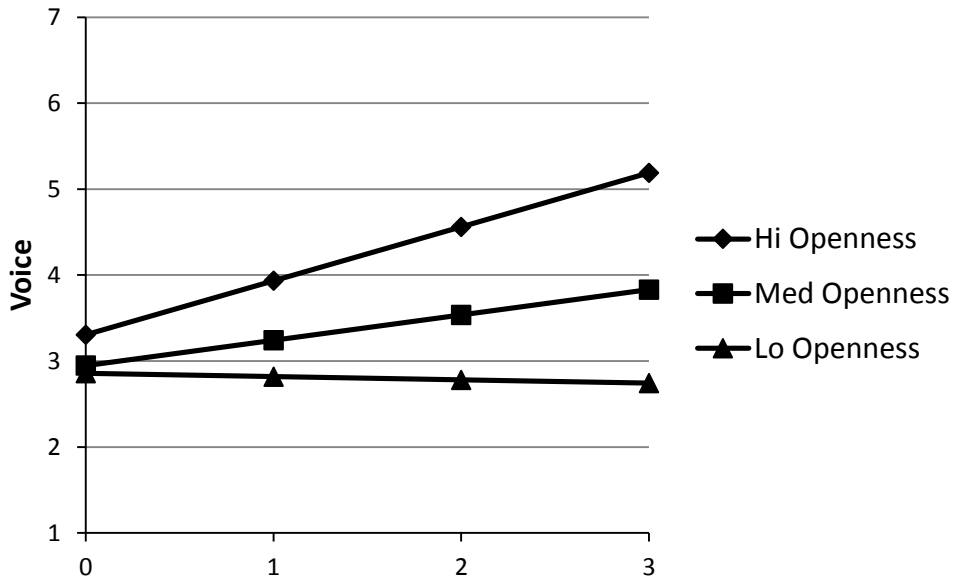


Figure 37: Compliance by supervisor openness to listening to safety concerns



Finally, we tested whether supervisor openness interacted with time such that it had an additive effect on the frequency of voice, i.e., voice increased at a growing rate with each passing month. Figure 38 shows that at high and medium levels of supervisor openness, voice increased over time compared low levels of supervisor openness whereby voice remained unchanged and stagnant. These results suggest a reciprocal effect between supervisor openness and voice: new workers may discover how open their supervisor is to voice early on in the job. Signs of interest in employees safety ideas and concerns invites more voice, and thus through this back-and-forth employee voice grows over time. In contrast, consistently low openness was associated with low safety voice. These relationships held while controlling for participant sex and over longer periods of time (i.e., T0 to T5).

Figure 38: Supervisor openness interacting with time



Parental Influence on Child Work-Related Safety

An average of 110 parents responded to surveys at Months 2, 7, and 11. Each survey asked questions related to how often the parent gave their child assistance with various work-related topics on a scale from 1 (never) to 5 (always). Table 10 shows that support was given most often for how to handle difficult issues, followed by suggestion questions to ask about work hours. Offering assistance in the form of suggesting questions about workplace safety ranked seventh out of ten, suggesting that safety may not be frequently discussed.

Table 10: Frequency of parent's work-related support to child (N = 271)

Rank	Action	Average
1	Given advice on how to handle difficult issues	3.70
2	Suggested questions to ask about work hours	3.45
3	Identified job opportunities	3.44
4	Suggested questions to ask about job tasks	3.40
5	Helped child learn about employee rights	3.30
6	Prepared child for a job interview	3.20
7	Suggested questions to ask about workplace safety	3.08
8	Helped child get more training to do a job	2.67
9	Filled out job applications	2.49
10	Met with my child's direct supervisor	1.91

Interestingly, parent and child self-reported safety voice were positively associated at Months 2 and 7, but not at Month 11. These results provide some but by no means definitive evidence that social learning may partially influence the use of safety voice in addition to work-related factors.

We were curious to understand how aware parents are of safety conditions at their child's work. To this end, in each parent survey, we asked parents (1) if they were worried about their childrens' safety at work and (2) if they were worried about their children being injured at work. Responses were collected on a 5-point scale (1 = strongly disagree to 5 = strongly agree). The results, shown in Figures 39 and 40, reveal that 20-30% of participating parents worried about the safety of their child or that their child may be injured at work. Next, we correlated parental scores with their child's scores over the same period of time. In Months 2 and 11 there was a positive relationship between parent-reported worry and child-reported fear of being injured at the child's job. However, in Month 7 this relationship was not statistically significant. Parental worry about their child being injured was positively associated with child-reported injuries at the child's job in months 2 and 7 but not in month 11. These results suggest that some parents are aware of the safety conditions and injury exposure at their child's workplace.

Figure 39: Parent worried about their child's safety at work (N = 304)

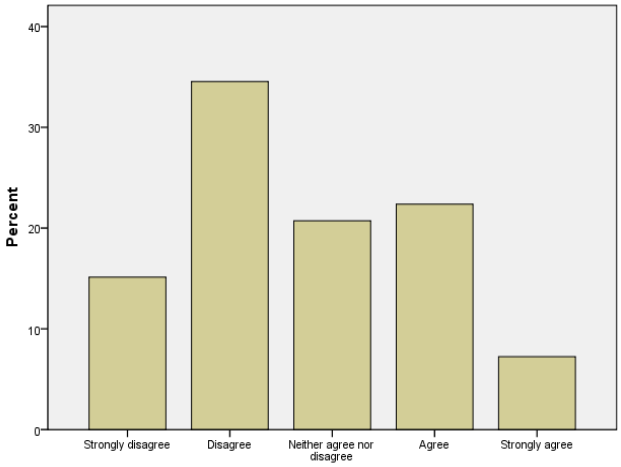
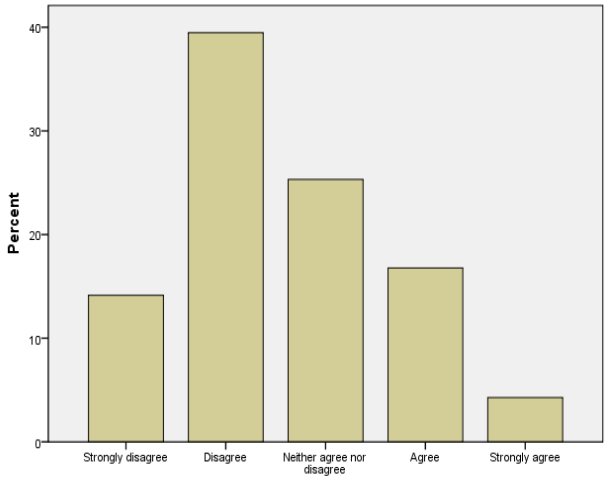


Figure 40: Parent worried that their child may be injured at work (N = 304)



Given that a relatively large minority of parents were concerned about the safety of their child at work and that there is some support for the accuracy of these perceptions based on child reports of fear of being injured and self-reported injuries, we explored the nature of the advice parents provided to their child about workplace safety issues. Specifically, in each parent survey we asked if their child had mentioned they may be doing potentially dangerous work in the previous three months. In months 2, 7, and 11, parents reported this occurring 18, 5, and 5 times, respectively. Next, we asked: "When your child mentioned that the work they are doing at their main job may be dangerous what, if any, of the following actions did you take?" We provided parents with a list of responses and an "other" category where they could write in a response. The results are provided in Table 11 and demonstrate that parents most often encouraged their child to speak to their supervisor about their concern followed by recommend they refuse dangerous work (this options was only available in Months 7 and 11).

Table 11: Parental responses when told child is engaged in potentially dangerous work (N = 28)

Action	% Yes
Encouraged your child to talk directly to their supervisor	94%
Told your child to refuse the unsafe work	60%*
Told your child to get training	60%*
Told your child to file a complaint	50%
Visited your child's workplace to check on the safety issue	28%
Talked directly to your child's supervisor yourself	22%
Told your child to wait and see if the problem goes away	22%
Explained to your child why the work isn't dangerous	22%
Told your child to get assigned to different duties	17%
Told your child to quit working for this employer	11%
Contacted government agency responsible for work safety	0%
Other responses:	
"Discuss with child that,"with experience and training the job will not be dangerous.""	
"Explained how to prevent injury"	
"Told him to refuse to do that work without proper equip."	

* Month 7 and 11 only (N = 5)

Limitations

These data are unique in that they are the only known longitudinal data set that tracks the safety experiences and safety behaviour of teenaged workers over several months from the start of a job. While data of this nature are valuable for conducting complex statistical analysis that bring us closer to understanding cause and effect relationships, and provide visual insights into young worker safety behaviour over time, several limitations warrant discussion. First, readers are cautioned not to draw conclusions about whether statistical differences exist between variables represented in the graphs above (e.g., comparisons of the male and female voice over time). Graphs are provided for illustrative purposes only. Second, the sample size is relatively small, which leads to questions about the representativeness of the sample and the robustness of the data for longitudinal data analysis. Recall that about 82% of young workers are employed in the service producing sector (WorkSafe Manitoba, 2015). It is challenging to make direct comparisons between our sample and labour market estimates; for example, in Table 9, 59% reported working in the "sales and services" sector and others that could be considered service producing (e.g., "arts, culture, and recreation") are not included. Overall, it would seem that the sector representation in our sample is fairly close to the population. However, assuming our sample is fairly representative in terms of sector and occupation, it may not be representative in terms of the spectrum of organizations in these sectors. We may, for example, have an over-representation of "safe" or "unsafe" workplaces in our sample. Another potential limitation stemming from the small sample size relates to whether there is adequate statistical power for conducting analysis, particularly with the attrition of the sample over time. By T5, for example, we had only 35 respondents who had completed all five surveys from the start of their job.

6.0 Recommendations

Based on the results of these three studies, we propose several recommendations related to young worker injury prevention campaigns, safety management, evaluation of injury prevention interventions, and young worker research.

1. Young worker injury prevention campaigns:

- Injury prevention campaigns should actively target supervisors and managers, informing them about practical actions they can take to prevent injuries to young and new workers and the organizational benefits of taking such actions. Establishing open lines of communication with new workers of all ages is especially important for encouraging positive safety behaviours in the future. Based on these three studies, we specifically recommend developing prevention messages such as the importance of exhibiting a *clear* commitment to safety, not only on-the-job and as soon as young workers' first few shifts, but during recruitment (the first interview). Young workers should not only receive job-related training, but also discuss the importance of safety in the initial job interview.

- While existing research is somewhat unclear about the influence parents have on their childrens' work-related safety, the results of this research generally suggested that the more children feared they would be injured on the job, the more parents worried about their childrens' safety. While further research is warranted regarding the knowledge and influence parents have regarding their childrens' safety, we encourage young worker injury prevention campaigns to target parents because they may be able to intervene effectively absent a supervisor who is open to hearing about safety concerns. Specific messaging could, for example, encourage parents to ask basic questions about their child's work and provide parents with practical guidance about what to do when they fear their childrens' safety at work is at risk.

2. Safety management:

- The results of Study 1 suggest that young workers' ideas about improving safety may alone be insufficient for promoting safety voice -- a key form of participation in improving their workplaces. It is important that organizations take steps to cultivate among young workers both the development and expression of ideas about improving safety and commitment to the organization. It is this combination of having safety ideas and caring about the organization they work for that will best encourage speaking up about safety concerns.

- To mitigate the likelihood of workplace injuries, organizations need to impress upon supervisors (and managers) the need to be genuinely open to listening and acting on safety concerns that are expressed by workers. The results in Study 1 point to the harm that can be caused by supervisors who do not listen to safety concerns raised by, in this case, young workers – many of whom who work part-time and only temporarily for their organization. We add that participation in the management of workplace hazards from a legal perspective is a shared duty among employees, supervisors, and management, with the latter two groups having a disproportionately greater responsibility and, based on empirical evidence, substantial opportunity to enable safe working (Christian et al., 2009).

- In Study 2, all participants, regardless of age, were more likely to speak up about safety concerns when supervisor openness was high compared to when supervisor openness was low. We also found that older participants were reluctant to speak up about safety issues when a supervisor seemed *unclear* about whether the supervisor was open to hearing about safety concerns. Thus, supervisors need to be mindful that both negative reactions and indifference to employee safety voice can have similar consequences in terms of discouraging communication about workplace hazards. This ambiguity about safety (manifested as

inconsistent commitment to safety by a supervisor) parallels previous research findings that show that supervisors doing nothing about safety can be as negative for young workers as supervisors who work for safety one minute and against it the next (Mullen, Kelloway, & Teed, 2011).

- In Study 3, we found that at the point of hiring the more discussion an employer had with the new young worker about their expectations of the young worker's safety behaviour, the higher the young worker's future safety voice and safety compliance behaviour were. Safety-related conversations very early in a new job may be especially salient for shaping new workers' future safety behaviour, particularly when the organization's safety culture is consistent with and reinforces the importance of safety that was conveyed in early conversations.

- Additionally, Study 3 also showed that experiencing work injuries (compared to those who remain work injury-free) is correlated with greater safety voice. While ideally young workers might be motivated to speak up about safety concerns without having to experiencing work injuries beforehand, the data in this study suggest that work injuries may be a catalyst for speaking up. Tucker and Turner (2013) showed that, for many young workers, workplace safety is a "wait-and-see" activity, and that speaking up about safety issues often does not occur until the implications of injury become severe.

One of the important determinants of young workers' safety voice is job control. Job control is having autonomy over the timing and method of work, and is a key feature of modern work design principles. Supervisors have the ability to provide young workers with job control, not only providing, as we know from other research, greater job satisfaction and performance, but also encouraging young workers to speak up about their safety ideas. Connected with the earlier idea of the importance of on-the-job safety training for young workers, job control gives young workers not only the opportunity to keep themselves and their co-workers safe, but also the opportunity to think ways of doing work tasks that may *improve* workplace safety. Speaking up about safety issues to people that can do something about it (e.g., supervisors) is a key part of improving workplace safety.

- Job-related training is important (and, indeed employers have a legal responsibility to provide job appropriate training), yet we continue to find (as we did in our 2011 report to the Workers Compensation Board of Manitoba) that a large minority proportion of young people starting new jobs receive no training and little information about job-related hazards during their first shift. Young workers who go in blind to new jobs about hazards are at risk of injury.

3. Evaluating injury prevention interventions:

    - Significant resources in terms of time, effort, and funding continue to be allocated to young worker injury prevention programming in Manitoba. We recommend on-going evaluation of the effectiveness of these programs using evidence from current research and small-scale or pilot studies to evaluate safety-related behaviour change in the young workers and their supervisors, who are exposed to such interventions.

4. Young worker research

    - Given the high rate of injuries among young construction workers, research is needed in this area to inform injury prevention activities of all stakeholders. A key factor in the success of future research will be access to construction companies employing young workers. Efforts should be made to strengthen partnerships among all organizations in the construction sector, including industry associations, and those in the research community. This may involve better communication of the practical benefits of research to industry partners and industry associations.

7.0 Dissemination of Results

On March 22, 2017, these research findings were presented at the WCB of Manitoba to stakeholders involved in young and adult worker injury prevention, public health, workers' compensation, and regulation and policy. SAFE Work Manitoba is currently using the research in presentations and education sessions for supervisors, committee members, and workers. They will also launch a campaign targeting supervisors.

The research team has begun preparing research papers for studies two and three for submission to peer-reviewed conferences and journals. This report will also be shared with young worker safety researchers in Canada and the United States.

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Appendix A:

Study 2 Experimental Vignettes

Vignette 1

We created three vignettes that corresponded to the following conditions:

Vignette 1: It was clear that the supervisor cared about safety and was open to hearing suggestions about safety.

Vignette 2: It was clear that the supervisor didn't care about safety and was not open to hearing suggestions about safety.

Vignette 3: It was unclear whether the supervisor cared about safety or was open to hearing suggestions about safety.

The baseline vignette text appears below, along with the three versions of description of the supervisor's care about safety and his/her openness to hearing about safety ideas.

Baseline Vignette

You're one month into a new job at a restaurant. You work in the restaurant's kitchen. In the past month, you've noticed that your coworkers and shift supervisor do not put much effort into keeping the kitchen clean. Much of the time they do not follow safe work practices. Employees who were hired in the past month received no training about how to do their jobs or about hazards in the kitchen. In the last month, you've also noticed that spills of oil and other liquids are frequently not mopped up, protective equipment (e.g., gloves, oven mittens, eye protection) is not available when you need it, and boxes and crates are often left out where people walk. Further, all cleaning chemicals are improperly labeled. Your coworkers and shift supervisor rarely communicate about potential hazards in the kitchen. For example, they usually do not let you know when liquid or food is spilled on the floor, or when they're walking behind you carrying a hot tray. Several people have been hurt in the last month. Recently, someone slipped on grease on the floor, fell backwards and hit their head on a fryer. This person needed stitches at the hospital. The most common injuries, which occur often, are burns and cuts to fingers and arms, and bruises from contact with equipment. Most of these injuries required first aid attention.

Conditions

Your supervisor has a reputation for caring about employee opinions related to workplace issues. In fact, your supervisor has been very open to hearing suggestions about matters that affect the workplace.

or

Your supervisor has a reputation for not caring about employee opinions related to workplace issues. In fact, your supervisor has not been open to hearing suggestions about matters that affect the workplace.
or

It is unclear whether your supervisor cares about employee opinions related to workplace issues. In fact, you are not sure if your supervisor is open to hearing suggestions about matters that affect the workplace.