AN EXPERIMENTAL EVALUATION OF PEOPLES' REACTIONS TO DIFFERING LEVELS OF SAFETY HAZARDS IN AN OFFICE ENVIRONMENT

A dissertation submitted in partial fulfilment of the requirements for the

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Abstract

There has been extensive research examining the link between safety voicing behaviours and safety outcomes in the workplace. However, very little research has examined the effect that the severity of a safety hazard has on individuals' voicing behaviours. Additionally, no known research has considered that individuals may simply be removing or fixing hazards instead of informing others about them. In the current study, participants completed an office task in an environment that contained either low-risk or high-risk safety hazards. Twenty seven participants completed the task in the low-risk condition and 27 the high-risk condition. Twelve of the high-risk participants noticed at least one hazard, while 14 of their counterparts noticed at least one hazard. However, only two reported high-risk hazards and one participant neutralised a high-risk hazard. Additionally, only two participants reported low-risk hazards and two neutralised low-risk hazards. These findings raise concerns for the usefulness of self-report data. Results and implications are discussed within the context of the strengths and limitations of the research design.

Introduction

The health and safety situation around the world is abysmal. For example, it has been estimated that every day, more than 960,000 workers get hurt due to workplace accidents, and 5,330 die due to work-related diseases (Hämäläinen, Saarela, & Takala, 2009). Unfortunately, the situation is no different in first-world countries, including New Zealand, as evidenced by the Pike River disaster in 2010 and other serious workplace incidents throughout the country. For example, in 2014, 3,503 workers were seriously injured and 34 workers died due to workplace incidents (WorkSafe New Zealand, 2015a; WorkSafe New Zealand, 2015b). Also, in 2013, 182,900 claims were made to ACC for work-related injuries, of which 378 were cases of serious injury (MacPherson, 2014). While this is a small percentage of serious injuries, even minor injuries result in employee suffering, and lost money for ACC and the worker's employer, so it is imperative to reduce the amount of minor injuries as well as serious injuries and deaths (MacPherson, 2014). According to the Department of Labour, work-related injury and disease has an annual cost of $3.5 billion, which includes costs incurred by organisations and ACC (WorkSafe New Zealand, 2012). These data clearly show that something needs to be done to reduce the amount of workplace incidents, as organisations cannot afford the costs associated with injury and/or death, and people should not be dying in their workplace.

This study examines one aspect of workplace safety – individuals' reactions to safety hazards. Reactions of interest included whether individuals fix or remove the hazard – henceforth referred to as neutralising the hazard, ignore the hazard, or tell others of the hazard – referred to as voicing. Reactions to six hazards, which varied in terms of seriousness, were examined. The rate at which participants noticed hazards was also recorded, as it is impossible to react to a hazard that has not been noticed. The introduction examines types of safety hazards and the effect they can have on the workplace. This is followed by an overview of voicing research and safety research that has examined voicing in the context of different safety hazards. The introduction concludes with a number of predictions about peoples' reactions to each level of safety hazards.

Safety Hazards: How do they happen?

While a workplace accident is ultimately the event which results in injury or loss of life, there must be a catalyst in place to cause the accident. Safety researchers have developed models to explain causes of accidents, with Reason's Swiss cheese model perhaps being the most widely-used (Dismukes, Berman, & Loukopoulos, 2007; Salmon, Cornelissen, & Trotter, 2012). This model states that accidents occur when several latent failures come into alignment and are accompanied by active failures, known as unsafe behaviour (Reason, 1990).

There are several levels of latent failures which can interact to create situations that allow for accidents to occur. These levels can include organisational influences, environmental, team, and/or individual factors. For example, in a hospital ward, the first level could include high workload with a handwritten prescription system instead of a computerised system which would reduce errors. This could interact with staffing levels and a lack of a supportive culture to allow for accidents if the ward becomes too busy, has a lack of supervision, or has inexperienced nurses. These final factors could increase the likelihood of an error occurring, which could result in an accident such as a patient receiving an incorrect prescription.

However, even if a hazard is present and latent failures allow for a situation where an accident could occur, the accident will not happen if active failures are avoided. Ramsey's Accident Sequence model describes the processes that can occur when an individual is exposed to a safety hazard, and how the situation can result in an incident or not (Ramsey, 1989).

Ramsey's Accident Sequence Model describes the sequence of events which can occur when a worker is exposed to a safety hazard (Ramsey, 1989). Ramsey's model stipulates that when an individual is exposed to a safety hazard, they must first perceive the hazard, then recognise that the hazard poses some level of danger. Until these processes have occurred, the individual cannot react to the hazard, increasing the likelihood that an accident will occur. Once they have recognised that the hazard is dangerous, the worker can decide to avoid the hazard, and attempt to take action if they are capable of doing so. This action could include neutralising the hazard or informing someone else about the hazard, which is known as using their safety voice.

Recent research has expanded upon this idea by examining the link between situational awareness and safety. As Sætrevik (2013) explains, situational awareness is essentially knowing what is occurring around you, which is extremely important in the workplace. If an individual has an incorrect perception of what is occurring, or simply not enough information of what is happening, then it is highly likely that an incident can occur as the individual will not know how to react appropriately (McGuinness, 2004; Sætrevik, 2013). While situational awareness is extremely important for maintaining safety in certain situations (for example, while flying an aircraft), it can also be a variable of interest when considering individual's reactions to safety hazards, including reporting, neutralising, avoiding, or doing nothing whatsoever about a hazard.

The commonly accepted model of situational awareness is Endsley's hierarchical model which consists of three levels (Endsley, 1995; McGuinness, 2004; Sætrevik, 2013). Level one involves perceiving relevant factors in the environment, such as any objects or situations that could disrupt the individual's task and/or cause injury (Endsley, 1995; Sætrevik, 2013). Level two involves compiling the information from Level one into a comprehensive view of the situation, while Level three involves using information from the previous levels to predict what the environment will look like in the near future (Endsley, 1995; Sætrevik, 2013).

While no known research has specifically examined the link between situational awareness and safety voicing, it is obvious that some degree of situational awareness must be required for an individual to notice a safety hazard and therefore report the hazard. As such, situational awareness was considered to be a potentially important control variable for this study. However, situational awareness is simply the first stage of what can occur when a worker is exposed to a safety hazard. The worker must react in some way to the safety hazard. This could include using their safety voice to inform someone of the hazard, neutralising the hazard, or avoiding the hazard. Very few studies have examined workers' reactions to safety hazards, however some have looked at workers' voicing rates compared across different types of hazards.

Voicing and severity of hazards

While many researchers have examined worker's reasons for not informing their supervisor about safety hazards (refer to Pages 8-10), few have looked at the hazards themselves (Lu, 2014). In particular, very few researchers have examined the effect of hazard severity on the likelihood of workers voicing their concerns to a supervisor. Unfortunately, this area seems to be neglected by researchers, possibly because they believe that common sense would indicate that workers are more likely to report hazards that are more dangerous.

The few studies that have examined this area seem to support this line of thinking, with participants indicating that they would not report trivial hazards but would report serious or life-threatening hazards (Evans, et al., 2006; Lawton & Parker, 2002; Lu, 2014). While these studies work to fill an important gap in the health and safety voicing literature, they fail to consider an important factor. It is possible that workers do not report trivial hazards because they simply neutralise them to avoid the hassle of filing report forms and to save time.

However, there is no known research that examines workers' neutralising behaviours in regards to safety hazards, so the voicing literature will be discussed to further develop predictions of workers' behaviour in response to different types of hazards. The first issue to discuss is: who, exactly, do workers voice to in order for it to be considered voicing?

Who do workers voice to?

A key question in safety research is who do workers voice (or not) safety concerns to? Several safety researchers have examined workers' "voicing" or "silence" behaviours in the workplace (e.g.; Cortina & Magley, 2003; Dundon & Gollan, 2007). Due to the abundance of research in this field, some researchers use differing definitions for voicing and silence. Of particular importance is the distinction of who the worker reports to. Some researchers state that this could include supervisors, managers, co-workers, or anyone in the workplace who works for the same organisation (e.g. Brewster, Velez, Mennicke, & Tebbe, 2014; Dundon & Gollan, 2007). This line of thinking is based upon the premise that even if co-workers cannot neutralise a workplace issue, they may be able to assist in some way, possibly by warning others to stay away, by finding someone who can neutralise the danger, or by providing emotional support to a colleague. Additionally, if the issue could harm the co-workers physically, mentally, or emotionally, then they have the right to know about the issue so that they can take action to avoid it themselves (e.g. Brewster, et al., 2014).

In contrast, other researchers stipulate that supervisors and managers should only be considered in the definition, as co-workers or subordinates may not be able to do anything about the workplace issue (e.g. Cortina & Magley, 2003; Lee, Heilman, & Near, 2004). This particular line of thought is commonly used in research that is focussed on whistle-blowing behaviours, for example when an individual is reporting sexual harassment in the workplace. In this situation, informing your manager or supervisor may be the only effective way to solve the issue.

However, to properly determine any limits for who workers voice to and how that determines if the behaviour is truly considered voicing behaviour, one must determine exactly how voicing and silence are defined – rather than relying on the varying definitions provided by researchers. Considering general voicing and silence research, definitions of voicing and silence were developed to fit the health and safety arena, with particular focus on who workers voice to. Additionally, the current legal situation in New Zealand was considered when developing these definitions, as the Health and Safety law in New Zealand is currently being updated. The law change states that if an employee informs their superior – who could be any employee that is higher in the workplace hierarchy – of a safety hazard, then the first individual is absolved of any blame should an incident occur (Health and Safety at Work Act, 2015). The last person to be informed of the hazard is the individual that will be prosecuted if any legal action is taken (Health and Safety at Work Act, 2015).

Therefore, the following definitions for voicing and silence were developed. Voicing is the act of an employee mentioning a safety issue within the workplace to their supervisor or manager with the intention that the issue will be neutralised or removed. Conversely, silence is the intentional withholding of information by an employee about a safety issue within the workplace. It is important to note that silence is only considered to have happened if the individual has noticed the hazard and decided to do nothing about it; if the employee did not notice the hazard, then they are not exhibiting silence. Additionally, co-workers have been excluded from these definitions, as there are very few situations where co-workers will be able to help neutralise safety hazards, and the upcoming law change does not consider co-workers to be included in voicing behaviours (Health and Safety at Work Act, 2015). Now that voicing and silence have been clearly defined, possible reasons for workers not expressing their safety voice can be considered.

Why do workers voice or not?

Due to the abundance of research on workplace voicing and silence, many different reasons have been found for workers not voicing safety concerns. These include unwillingness to strain workplace relations (e.g. Bienefeld & Grote, 2012), fear of punishment (e.g. Bienefeld & Grote, 2012), and perceived time pressure (e.g. Bell, Özbilgin, Beauregard, & Sürgevil, 2011).

Many researchers focus on either silence or voicing when examining workers' reasons for not informing others of workplace issues, however results seem to be fairly consistent across both fields (Klaas, Olson-Buchanan, & Ward, 2012). It is commonly accepted that workers consider multiple costs and benefits of voicing when deciding if they should voice; this process occurs every time the worker experiences an issue in the workplace (Bell, et al., 2011; Bienefeld & Grote, 2012; Cortina & Magley, 2003; Detert & Edmondson, 2011). While very few researchers have examined more than two reasons for silence in a single study, those that have explored multiple reasons found consistent results.

For example, Bienefeld and Grote (2012) examined possible reasons for aircrew silence when safety issues arise on commercial airliners. Their findings indicate that operational pressures were a chief cause for silence among Pursers and Captains, such as conflict between efficiency, comfort, and safety for passengers and perceived time pressure in daily operations. Additionally, Bienefeld and Grote (2012) found that many airline workers would remain silent to avoid damaging relationships with co-workers or to avoid potential punishment for speaking up. Similarly, Tucker et al., (2008) found that bus drivers were more likely to report safety hazards if their organisation listened to, encouraged, and took action on safety suggestions. However, this relationship was fully mediated by co-worker support for workplace safety. So, if an individual's co-workers are supportive of safety voicing, then the individual is more likely to voice safety concerns to their supervisors. This is similar to Bienefeld and Grote's (2012) findings with regards to workplace relationships.

Additionally, a meta-analysis conducted by Klaas, Olson-Buchanan, and Ward (2012), revealed that there are several common factors that individuals consider before voicing about workplace issues. In particular, if the organisation is supportive of workers who inform their supervisors about workplace issues, then workers are more likely to voice about issues, as they feel comfortable that the organisation will approve of their actions (Lee, Heilmann, & Near, 2004; Near & Miceli, 1996). Additionally, lower risk of retaliatory action for voicing or whistleblowing behaviour is linked to higher rates of voicing workplace concerns (Casal & Bogui, 2008; Miceli & Near, 1988a; Miceli & Near, 1988b; Trevino & Victor, 1992).

Furthermore, employees consider the effectiveness of the reporting system before voicing any issues. That is, if they believe their whistleblowing will be acted upon, then they are more likely to inform their supervisor or manager about the workplace issue, especially if detailed documentation is utilised to protect the individual from retaliation (Casal & Bogui, 2008; Trevino & Victor, 1992; Victor, Trevino, & Shapiro, 1993). Any laws or organisational policies that protect whistle-blowers from retaliation also increase the likelihood of individuals voicing issues to their supervisors or managers (Miceli & Near, 1989; Miceli, Rehg, Near, & Ryan, 1999). Finally, researchers have found that the degree of job security that an individual has can determine the likelihood of voicing behaviours (Bacharach & Bamberger, 2004; Rusbult, Farrell, Rogers, & Mainous, 1988). This relationship is strengthened if the individual has alternative employment opportunities, probably because they do not need their current employment as much as someone who has no alternatives (Rusbult et al., 1988).

To summarise, common findings indicate that several factors can determine workers' willingness to report workplace issues, including workplace safety climate and culture, the supervisor's or manager's leadership style, the effectiveness of the hazard reporting system, the individual's job security, and the presence of organisational policies or laws that protect whistle-blowers (Bienefeld & Grote, 2012; Mark, et al., 2007).

Each of these factors can determine the likelihood of a worker expecting undesirable outcomes if they voice their ideas or concerns to their supervisor or manager, which potentially could cause workers to neutralise hazards instead of reporting them (Bienefeld & Grote, 2012; Cortina & Magley, 2003; Detert & Edmondson, 2011). This is particularly likely for minor hazards, as research indicates that individuals are less likely to report minor hazards compared to serious or life-threatening hazards (e.g. Evans, et al., 2006; Lawton & Parker, 2002; Lu, 2014). This is likely due to workers considering serious or life-threatening hazards to be worth the inconvenience caused by voicing, as they are more easily recognised as capable of causing severe injury or death. In comparison, minor hazards are often not associated with serious injuries or death, as is evident in the Cave Creek tragedy, therefore any negative outcomes caused by voicing are probably not considered worth the risk. As such, workers may simply neutralise minor hazards themselves as the effort required could be less of an inconvenience than the negative outcomes from voicing behaviours.

Research on workplace safety outcomes suggests several variables which have not been specifically linked to safety voicing behaviours or worker reactions to safety hazards, but could still influence the relationships between any of the aforementioned variables and workers' reactions. These include an individual's previous experience of workplace incidents and injuries, their safety consciousness, their tendency to undertake risky behaviours, and their aversion to making a scene.

Avoiding undue attention

Popular social psychology research indicates that individuals try to avoid making a scene wherever possible, as the majority of people do not enjoy "bad" attention, which is evident from social conformity and social influence research (Aronson, Wilson, & Akert, 2005; Moore, 1852). For example, consider the results of Asch's conformity experiments which utilised a line perception task. The majority of participants simply agreed with the actors who were providing incorrect answers, as they did not wish to draw attention to themselves by disagreeing. Several studies have since replicated these findings, using multiple methodologies, therefore providing support that this phenomenon is applicable in many different scenarios (e.g. Crutchfield, 1955; Spitzer, Fischbacher, Herrnberger, Grön, & Fehr, 2007). To the author's knowledge, there is no research specifically linking this phenomenon to safety voicing or safety outcomes in the workplace, however it is logical to deduce that the same principles apply for safety-related concerns as for other scenarios. That is, individuals may be less willing to draw attention to themselves by using their safety voice if they do not consider the hazard to be threatening enough. Therefore, they may attempt to neutralise the hazard to avoid the unwanted attention. Because the experimental manipulation in this study altered the severity of hazards presented to participants, it was predicted that:

Hypothesis 1: More participants in the low-risk condition will neutralise hazards than report them.

Furthermore, the second hypothesis was based off of the aforementioned reasoning, albeit with an addendum. While people try to avoid making a scene wherever possible, it was expected that the types of hazards present in the high-risk condition would warrant such a scene. Additionally, it was expected that the majority of participants would not possess the necessary skills to neutralise the types of hazards present; therefore the second hypothesis predicted that:

Hypothesis 2: More participants in the high-risk condition will report hazards than neutralise them.

Note that this is the opposite relationship to that predicted in the first hypothesis, as participants were expected to react differently to the types of hazards present in each condition. Another factor which could potentially have an effect on an individual's reactions to safety hazards is their safety consciousness and how often they undertake risky behaviour.

Safety consciousness and risk-taking

Several researchers have found that safety consciousness and dangerous risk taking in the workplace are significant predictors of workplace injuries and incidents (Barling, Louglin, & Kelloway, 2002; Westaby & Lee, 2003). In particular, higher ratings of safety consciousness are related to fewer injuries and incidents, while higher ratings of risk-taking are associated with more injuries and incidents (Rees, 2005; Westaby & Lee, 2003; Zhao, Han, Wen, & Zhang, 2014). The definition of safety consciousness varies across studies, with some researchers defining it as an individual's awareness of safety issues in the immediate environment (Barling et al., 2002; de Koster, Stam, & Balk, 2011; Kelloway, Mullen, & Francis, 2006). However, this definition is very similar to that of situational awareness, just with a safety focus. As such, the following definition was used: safety consciousness is an awareness and positive attitude towards acting safely across all situations. This definition has been utilised by several researchers in an effort to make the concept applicable in both non-work and work domains (e.g. Conrad, Bradshaw, Lamsudin, Kasniyah, & Costello, 1996; Westaby & Lee 2003).

Interestingly, some research in this area is contradictory; for example, de Koster, et al., (2011) found that safety consciousness was not a significant predictor of safety performance in warehouses when considering safety-specific transformational leadership and hazard-reducing systems. Conversely, Barling, et al., (2002) found that safety consciousness was a significant mediating variable in the relationship between safety-specific transformational leadership and safety outcomes in restaurants. Similarly, Kelloway et al., (2006) found that safety consciousness was a significant mediating variable when predicting safety outcomes from leadership style. While these discrepancies mean it is difficult to know if safety consciousness will have an impact on safety outcomes, it is clear that safety consciousness should definitely be considered.

To the author's knowledge, there are no published studies which explicitly examine the link between safety consciousness and workers' reactions to safety hazards. However, despite this lack of research, it was determined important enough to include as a control variable to ensure that the groups of participants were equivalent. As Westaby and Lee (2003) speculate, an individual who has high levels of awareness and strong positive attitude towards acting safely is likely to do whatever is necessary to reduce the threat posed by workplace hazards. Informing co-workers and/or supervisors about a safety risk is one way of reducing the threat posed by said risk, as the person who has been informed can either neutralise the hazard or avoid the hazard. Therefore, it is logical to conclude that an individual with high levels of safety consciousness may be more likely to undertake safety voicing behaviours or neutralising behaviours, so it is important to measure individuals' safety consciousness levels when examining peoples' reactions to hazards. In turn, an individual's safety consciousness level could be affected by their history of workplace incidents and injuries.

Workers' incident and injury history

An individual's history of workplace injuries and incidents could be related to their reactions towards safety hazards. To the author's knowledge, no research has specifically examined the link between the amount of incidents that an individual has previously experienced and their current reactions to safety hazards, such as voicing or neutralising behaviours. As such, each of the possibilities discussed below are based upon common sense logic and research from similar fields that could factor into the equation.

As mentioned previously, an individual's safety knowledge, workplace safety climate, and their safety consciousness levels may have an impact on behaviours that they express in response to safety hazards. As several researchers have found that safety consciousness levels are negatively correlated to workplace injuries and incidents, it is possible that the number of incidents that an individual has been involved in might not be directly related to behavioural outcomes in response to hazards (Barling et al., 2002; Westaby & Lee, 2003). Or, any relationship between previous incidents and current voicing behaviours could be mediated by the individual's safety knowledge and safety consciousness.

However, it is also possible that an individual's safety consciousness and safety knowledge could be affected by the amount of incidents that they have previously been involved in. In particular, organisations tend to give extra safety training if certain employees are accident-prone or take too many risks. Therefore, if an individual experiences more workplace accidents, then they may increase their safety knowledge, and potentially become more safety conscious. This could have a flow-on effect to their workplace behaviours, leading them to inform others of safety hazards rather than remaining silent or neutralise hazards rather than ignoring them.

Of course, it is entirely possible that an individual's history of workplace injuries and incidents has no relationship whatsoever to their safety-related behaviours. Thus, it is important to at least consider it as a potential control variable when examining workplace safety behaviours.

The Current Study

As mentioned above, current health and safety research has examined the link between types of safety hazards and voicing outcomes. The majority of research has consistent findings, indicating that several factors influence an individual's decision to use their safety voice. However, no known research has examined the possibility that individuals could simply be neutralising safety hazards instead of reporting them. Therefore the aim of this study was to fill this crucial gap in the literature by examining how individuals react to two different levels of safety hazards, by measuring whether they neutralise, report, or ignore the hazards. This built upon the research undertaken by Lu (2014), which examined the effect of differing levels of safety hazards on individuals' voicing behaviours. This study utilised two conditions to compare participants' reactions to either low-risk or high-risk hazards.

As mentioned above, the first two hypotheses were based off of social psychology research examining social conformity. As individuals try to avoid attracting too much attention to themselves, it is possible that individuals consider minor hazards to not be worth the extra attention. Therefore, the first hypothesis asserted the following:

Hypothesis 1: More participants in the low-risk condition will neutralise hazards than report them.

Furthermore, the second hypothesis was based off of the aforementioned reasoning, albeit with an addendum. While people try to avoid making a scene wherever possible, it was expected that the types of hazards present in the high-risk condition would warrant such a scene. Additionally, it was expected that the majority of participants would not possess the necessary skills to neutralise the types of hazards present; therefore the second hypothesis predicted that:

Hypothesis 2: More participants in the high-risk condition will report hazards than neutralise them.

Note that this is the opposite relationship to that predicted in the first hypothesis, as participants were expected to react differently to the types of hazards present in each condition. As individuals report that they are more likely to report high-risk hazards than low-risk hazards (Evans et al., 2006; Lu, 2014), the third hypothesis states the following:

Hypothesis 3: More participants in the high-risk condition will report hazards than participants in the low-risk condition.

However, due to the untrained nature of the planned participant pool and their expected unwillingness to attempt to neutralise electrical hazards or neutralise any danger presented by the hazard, the fourth hypothesis asserted the following:

Hypothesis 4: Fewer participants in the high-risk condition will neutralise hazards than participants in the low-risk condition.

In summary, the aim of this study was to examine how individuals react to high-risk or low-risk safety hazards by measuring whether they report, ignore, or make the hazards safe. Individuals' reasons for doing nothing were also collected, however no predictions were made regarding that data. Four hypotheses were proposed in an effort to better understand how individuals react to different types of safety hazards in an office environment.

Method

Design

The study used a between-groups experimental design as approved by the University of Canterbury Ethics Committee. Two conditions were used: low-risk and high-risk. Each condition contained three “safety hazards” which are considered to be of the same category as the condition label (i.e. the high-risk condition contained three high-risk safety hazards). The hazards were located throughout the experiment environment, as shown in Appendix A and B. Note that the “hazards” were not dangerous to participants; each hazard was perfectly safe and only appeared to be a hazard (see Table 3 and 4 for descriptions of each hazard). The dependent variables were the report-, neutralise-, and notice-rates of participants; that is, how participants reacted to the hazards. Participants were misled regarding the nature of the study to prevent pro-social behaviour; they believed that the experiment was to determine common information-retrieval techniques through the use of an office-style task.

Procedural Overview

The study involved two sessions approximately 12-48 hours apart. In the first session, participants completed an office-style task that involved searching for postal information on a computer, then addressing envelopes with that information. The second session involved the participant answering some questions about the hazards that were present in the room during the first session and their reactions to the hazards. After completion of these items, participants were debriefed to inform them of the true nature of the study then given the appropriate reward for completing the study. Table 1 shows the experiment stages and provides explanations for each step.

Table 1:
Overview of each experiment stage

Experiment Stage	**Reason/explanation**
1. Session 1 Part 1: Greeting and instruction-giving	Was undertaken at a calm pace to allow participants to become comfortable talking with the experimenter and ensure they knew how to complete the task.
2. Session 1 Part 2: Office task	Was completed at participants' own pace and was designed so they would move around the room, increasing the likelihood that they would notice hazards.
3. Interphase interval	A 12-48 hour break between the first and second sessions to allow participants the chance to talk to someone about any hazards that they noticed. Without this break, any use of safety voice would have been limited to the experimenter.
4. Session 2 Part 1: Follow-up questionnaire	A follow-up questionnaire was completed by participants to measure control variables and to determine if any participants had noticed hazards but not neutralised or reported them.
5. Session 2 Part 2: Debrief	Participants were informed of the true purpose of the study, as required by ethical guidelines. Expected results were discussed, and participants were offered a final chance to withdraw their data.

Participants

The participants were 54 students at the University of Canterbury, 47 of whom were undergraduate students. Participation was voluntary and participants were randomly assigned to an experimental condition. Across both conditions, there were 16 males and 38 females; they ranged in age from 18 to 42 years (M = 21.87, SD = 5.03). The demographic information of participants for each condition is shown in Table 2.

Table 2.
Demographic information of participants by condition

	Low-risk (N = 27)	High-risk (N = 27)
Males	6	10
Females	21	17
Mean age	23.15 (6.38)	20.59 (2.74)

All participants provided informed consent by signing a consent form before beginning the experiment. However, completion of the experiment was considered a final affirmation of informed consent, as all participants were provided with multiple chances to withdraw from the study due to the necessary deceit. That is, participants were purposefully misinformed to believe that the office-style task was the main purpose of the study to prevent socially desirable responses in reaction to hazards.

Recruitment

Eight participants were rewarded with course credit upon completion of participation, as per their first-year psychology course requirements. These participants were recruited through the course website, which advertised multiple studies that could be completed for course credit. The remainder of participants were given a $10 Westfield or petrol voucher as a reward upon completion of their participation. These participants were recruited through the use of poster-style advertisements which were placed on noticeboards around the university (see Appendix C).

Materials

Experimental stimuli – first session. Table 3 and 4 outline the fake safety hazards that were used in each condition, while providing photos of each hazard (Appendix A provides larger versions of each photo). Additionally, Figures 1 and 2 show the exact position of each hazard in the room using a diagram of the room layout – each hazard is highlighted in red (larger versions of these diagrams are available in Appendix B). Participants completed an office-style information-retrieval task that involved the labelling of envelopes with postage information. Each participant was required to obtain the address and the name of the school's careers advisor for five schools from a list that was provided. This was done to ensure that participants would not spend time looking up schools that did not provide the relevant information on their websites, as this would cause unnecessary delays. Appendix D contains the written instructions that participants received.

Figure 1.
Diagram of hazard positions in the low-risk condition

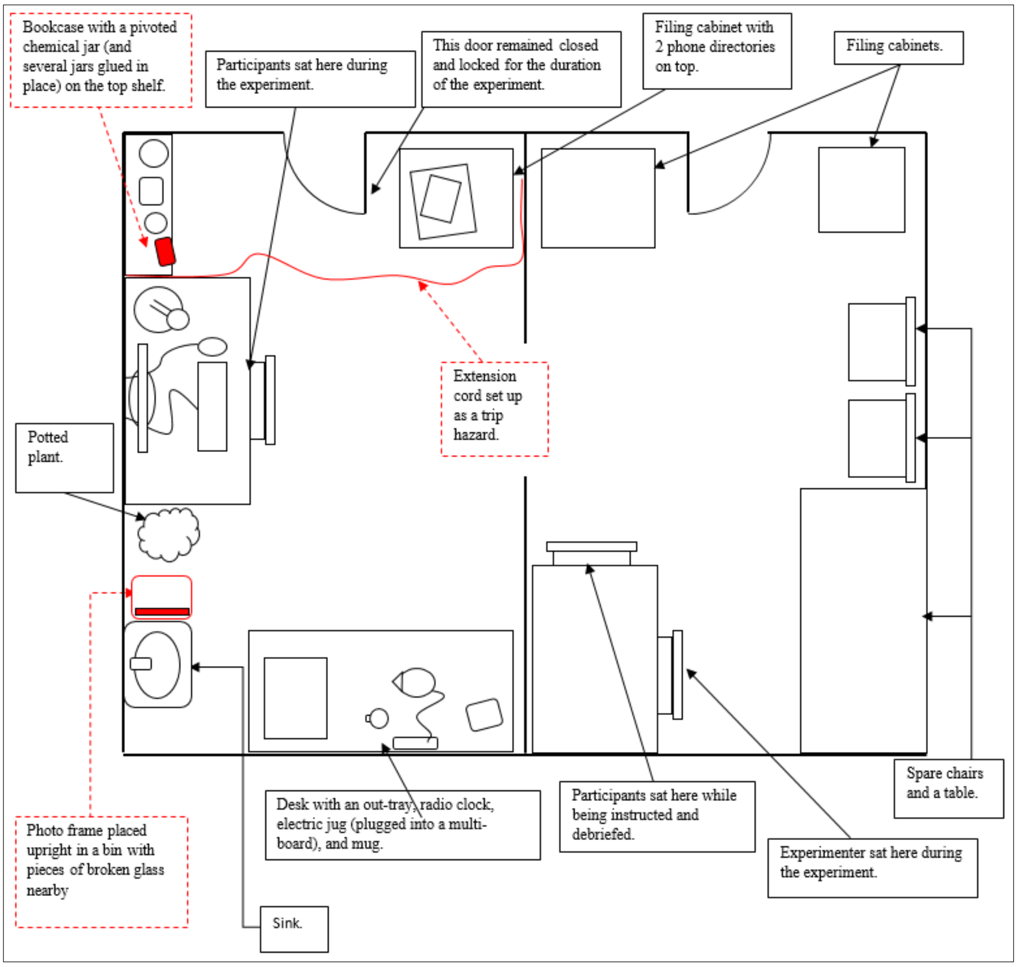

Figure 2.
Diagram of hazard positions in the high-risk condition

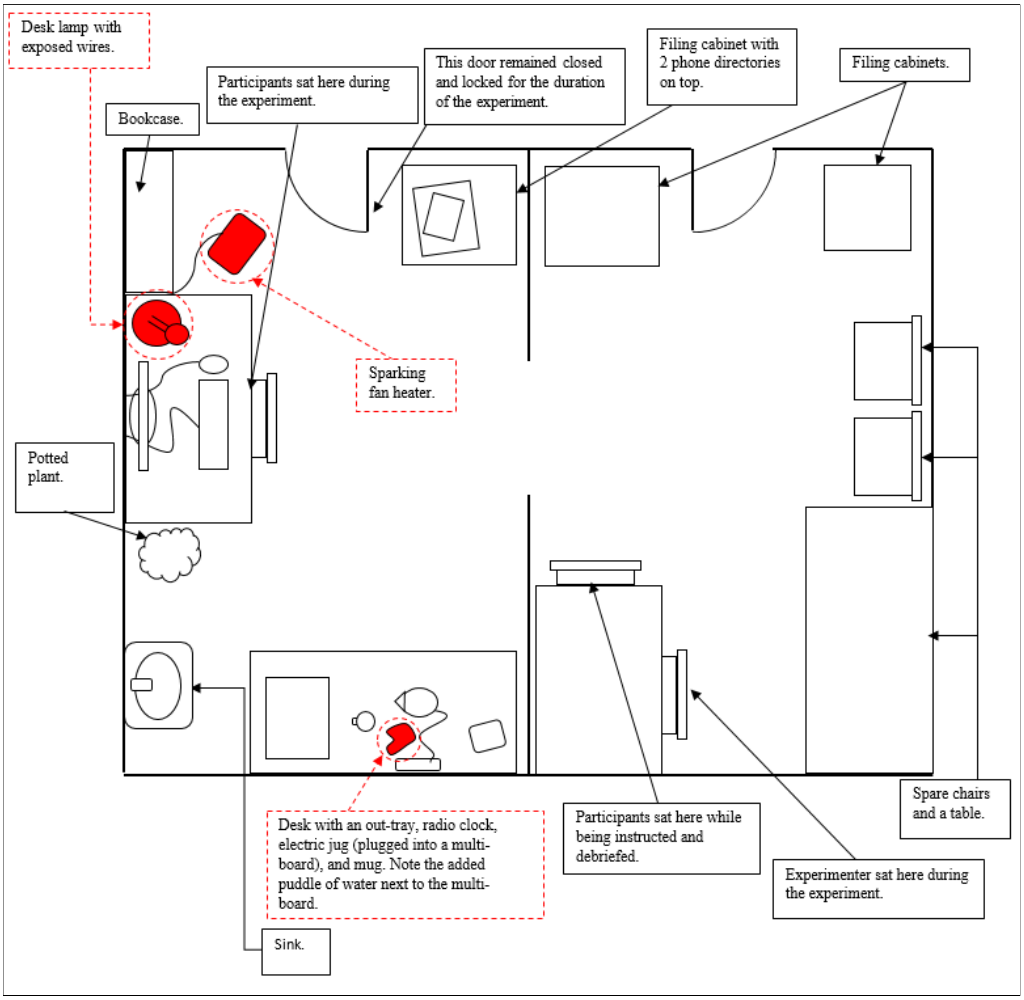

Table 3.
Hazard descriptions for low-risk condition

Hazard Label	Hazard description and location	Why the hazard posed no threat	Actions to make the hazard safe	Photo of hazard
Trip Hazard	• An extension cord was laid across the floor near a door, with the anti-trip safety cover moved slightly out of place. • This could result in someone tripping if they walked through the door.	• The door was locked so that nobody could come through it.	• The participant was able to move the extension cord so that it would no longer be a trip hazard.	
Falling Hazard	• An empty glass chemical jar was placed on a high shelf (on the bookcase). • It appeared to be a falling hazard, as it was “teetering” on the edge of the shelf.	• The jar was attached to a pivot so that it could not fall off the shelf.	• To make this hazard safe, the participant simply needed to push the jar back onto the shelf.	
Glass	• A picture frame with broken glass was leaning against the sink unit on the floor. • Broken glass was lying on the floor next to the picture frame. • The glass shards looked sharp enough to cut.	• The glass was actually a realistic-looking rubber movie prop that cannot hurt participants.	• A brush and shovel was placed nearby to allow participants to move any “glass” shards off the floor.	

Table 4.
Hazard descriptions for high-risk condition

Hazard Label	Hazard description and location	Why the hazard posed no threat	Actions to make the hazard safe	Photo of hazard
Exposed wiring	• A lamp on the desk where the participant worked had wires with the insulation visibly damaged/removed from part of the wire • Cord was plugged into a wall socket, the socket was turned on	• Wall socket was disconnected and not conducting electricity	• The on/off switch was turned on at the wall socket, allowing participants to turn it off • The on/off switch on the lamp cord was set to the *on* position, which could also be turned off	
Faulty appliance	• A fan heater was emitting sparking/arcing noises similar to white noise and flashing simultaneously. This was controlled by the experimenter to spark once every 3 minutes • This situation is an obvious fire hazard, as the heater could ignite due to the sparking	• The heater contained a sound device which had a recording of electrical arcing. The sound recording was downloaded from Pond5™, however the artist has since removed the recording. • The heater also contained a blue LED which flickered in synchronisation with the arcing noises	• Participants could turn the heater off at the wall to stop the sparking sound and flickering LED	
Water near multi-board	• A mug with some water in it next to a multi-board • Some spilt water on the desk next to the multi-board, simulating an electrocution or fire hazard.	• The wall socket that the multi-board was plugged into was disconnected from the power supply	• A cloth was positioned nearby that participants could use to clean up the water	

Experimental stimuli – second session. Despite random assignment, variables related to hazard reporting such as previous experience of injuries, employment safety level, individual safety orientation, and situational awareness were measured to ensure there were no between-group differences. The following items and scales were used to measure demographic information, situational awareness, employment safety level, previous experience of injuries, and individual safety orientation. All items are presented in Appendix E.

Previous Injury Experience and Employment Safety Level. Individuals' past experience of workplace accidents and incidents were measured using three items, "Near miss incidents, which had it turned out differently, could have resulted in injury or damage", "Minor injuries requiring medical attention (e.g. first aid treatment or a visit to the doctor)", and "Lost Time Injury (LTI) that has required you to take time off school/university/work". Participants responded to these three items by writing the number of times that they had experienced each type of incident. Participants' current employment safety levels were measured using a single item "Does your current job have a safety component? (E.g. could you be hurt doing this job?)". Participants responded to this item by ticking "Yes" or "No".

Safety Consciousness. Safety consciousness was measured using the 12-item safety consciousness and risk-taking scale developed by Westaby and Lee (2003). Example items include "People think of me as being an extremely safety-minded person" and "I get upset when I see other people acting dangerously". Participants responded to these items using a 5-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (5). The safety-consciousness subscale consists of items 1 through 7, while items 8 through 12 make up the risk-taking subscale. Westaby and Lee (2003) reported a coefficient alpha of .85 for the safety consciousness items and a coefficient alpha of .77 for the risk-taking subscale. In this study, the coefficient alpha was .68 for the safety consciousness subscale, and .76 for the risk-taking subscale. However, Cronbach's alpha could be improved to .73 by removing item six "I get upset when I see other people acting dangerously", so this item was removed.

Safety consciousness ratings were calculated for each participant by adding all scores on the safety consciousness subscale excluding item six, then dividing by the number of items (Westaby & Lee, 2003). The same methodology was used to obtain risk-taking scores for each participant for the risk-taking subscale (Westaby & Lee, 2003). A higher score on the safety consciousness subscale is indicative of higher levels of safety consciousness, whereas a higher score on the risk-taking subscale indicates higher levels of risk-taking behaviour.

Situational Awareness.

The QUASA technique was utilised to obtain an objective measure of participants' situational awareness (McGuinness, 2004). Ten true/false statements were generated about the experiment environment to objectively measure each individual's knowledge of the experiment environment – their situational awareness. Additionally, 5-point confidence ratings for each true/false statement were utilised, ranging from *Very Low* (1) to *Very High* (5). Example items include "There is carpet on the floor of the experiment room" and "There were two (2) chairs in the experiment room". The true/false statements were scored by summing the correct number of responses by each participant, to give a score out of ten (e.g. six). The confidence ratings were scored by summing the ratings for each item and dividing the result by the number of items, which was recorded as the *SA Confidence*. A higher *SA* score indicated that the individual had correctly recalled more features of the experimental environment. Additionally, a higher *SA Confidence* score indicates higher levels of confidence with the true/false answers provided.

Dependent Variables. Additionally, the experimental materials included items for measuring whether the individual noticed any hazards, their reactions to any hazard that they noticed, and their reasons for neutralising, ignoring, or reporting each hazard (see Appendix E for the full questionnaire). This was based on the premise that individuals may notice a hazard but choose to do nothing whatsoever about it; directly asking participants is the only way to measure this. The dependent variables were the report-rate, the neutralise-rate, and the notice-rate. The notice rate is the number of hazards that each participant correctly identified – several participants suggested hazards which were not present in the experimental environment. The report rate is whether or not a participant informed the experimenter about any hazards, while the neutralise rate is whether or not a participant neutralised any of the hazards. The report-rate and neutralise-rate were recorded by the experimenter immediately after each participant left the room using a checklist (see Appendix F). The notice-rate of participants was measured using two items, "Did you notice any hazards in the room during the experiment?" and "In this section, please describe each hazard that you noticed in the room during the experiment, what you did (you can select multiple options), and if you did nothing, please indicate why you did nothing". Participants answered the first item by selecting "Yes" or "No". The second item was answered freely and included several options that participants could select, for example "told the experimenter", "made sure I did not interact with the hazard (avoided it)" and "other" (see Appendix E for the full questionnaire). Participants were also given a space to write what they should have done given the benefit of hindsight.

Procedure

To begin the experiment, participants were greeted and invited to "sit down" and make themselves comfortable so they would feel comfortable talking to the experimenter. Participants were then provided detailed written instructions for the completion of the information retrieval task, shown below (see Appendix D for the document that participants were given):

> *On the bookcase next to the desk there is a pile of envelopes and UC Careers information booklets. These booklets are to be mailed to high school career's advisors throughout New Zealand to provide them with essential information about the types of careers that UC graduates can achieve.*

You are required to find the postage details of five (5) high school careers advisors from schools in the list provided on the next page. You may use the provided computer to obtain this information. Note that postage details include the career advisor's name and the school address.

Neatly write the postage details on the provided envelopes (one school per envelope) and securely put a single booklet inside each envelope.

Place completed envelopes inside the Out Tray that is on the table next to the computer desk.

These materials were arranged so that participants were required to move around the room to increase the chance that they would notice any safety hazards (a detailed diagram of the room layout is provided in Appendix C).

Once you have addressed, packaged, and placed all five envelopes in the out tray, return to the experimenter.

This final instruction was included so that participants would return to the other area of the room upon completing the task, as the door separating the two areas was closed during the experiment. This prevented the need for the experimenter to enter the second area of the experiment room and potentially interrupt the task.

Participants were given two minutes to read the provided instructions, then provided with the following verbal instructions to ensure that each participant understood the task before commencement:

Everything you'll be doing is in that room right there. Next to the desk is a bookcase with a pile of envelopes and booklets. I need you to grab five of each and *address them with the postage details of any five of the schools on that list. You can use the computer in that room to find the information that you need. Any questions?*

The room had been set up to fulfil one of two conditions prior to each participant's arrival. Upon completion of the task, participants were asked "do you have anything you would like to say about the experiment?" After each participant left the room, the experimenter checked the hazards to determine if the participant had tried to mitigate the threat caused by each hazard (see Table 3 & 4). The experimenter then scored the participant for reporting and neutralising; each hazard that was reported and/or neutralised was recorded. This marked the end of the first session.

The second session was scheduled 12-48 hours after the first session to allow participants the chance to report any hazards that they noticed to someone other than the experimenter, as it is more realistic to expect them to report to someone that they know. The second session involved a follow-up compilation of items and scales regarding the first session, followed by a debrief. Once participants had completed each scale, they were debriefed to explain the true purpose of the study and requested to keep the true purpose of the study a secret (see Appendix G). At this stage, participants were given a chance to withdraw their data from the study. Once the debrief process was completed, participants were rewarded appropriately and given another chance to withdraw their data from the study.

Results

Table 5 shows the descriptive statistics by condition for job status, job safety component, safety consciousness, risk-taking, and previous accident experience. The composite incident scores were created by summing each individual's number of experiences for all types of accident experiences – LTI, minor injuries, and near misses. Although participants were randomly assigned to conditions, it is important to ensure that participants in each condition are equivalent in terms of the control variables. The ANOVA comparisons shown in the last column of Table 5 indicate that the groups are not different in terms of safety consciousness, risk-taking, or previous accident experience for any types of accidents. Additionally, job status and job safety component appear very similar across conditions. Therefore, any subsequent analyses comparing the groups would not require these variables to be controlled for to validate the comparison.

Table 5.
Unadjusted means and standard deviations of independent and control variables by condition

	Low-risk Hazards *M* (*SD*)	High-risk Hazards *M* (*SD*)	ANOVA Comparisons
Job status*	2.22 (1.01)	2.30 (1.03)	N/A
Job safety component**	1.30 (0.47)	1.44 (0.64)	N/A
Safety consciousness	3.16 (0.64)	3.31 (0.66)	$F(52,1) = .76, p = .388$
Risk-taking	2.96 (0.78)	2.76 (0.81)	$F(52,1) = .85, p = .360$
Near miss incidents	6.44 (11.56)	11.96 (22.19)	$F(52,1) = 1.31, p = .257$
Minor injuries	8.30 (14.62)	6.44 (11.67)	$F(52,1) = .27, p = .609$
Lost time injuries (LTI)	1.26 (1.48)	2.15 (4.73)	$F(52,1) = .87, p = .356$
Composite incident scores	16.00 (25.70)	20.56 (33.35)	$F(52,1) = .32, p = .576$

* 0 = Unemployed, 1 = Casual, 2 = Part-time, 3 = Full-time
** 1 = No safety risk, 2 = Safety risk

Hypothesis testing

Table 6 shows the immediate responses of participants as recorded by the experimenter, in particular whether they neutralised or reported any hazards. This shows that very few participants reported the hazards to the experimenter or neutralised the hazards during the experiment. While these data do address the hypotheses, too few participants neutralised or reported hazards to test each hypothesis statistically. However, given the numbers, hypothesis one is not supported, as the same amount of participants reported and neutralised low-risk hazards. However, the data tentatively supports hypothesis two, as more participants reported than neutralised high-risk hazards. Additionally, hypothesis three is also not supported by the data, as report-rates were the same across conditions. Hypothesis four was also tentatively supported, as fewer participants attempted to neutralise high-risk hazards compared to low-risk hazards. The appropriate statistical analysis for these hypotheses is a comparison of two binomial proportions. However, due to the tiny proportions of each condition that reported or neutralised hazards, this analysis cannot be undertaken.

Table 6.
Neutralise- and report-rates of participants recorded immediately after completion of the office task

	Percentage of the sample that neutralised each hazard	Percentage of the sample that reported each hazard
High-risk hazard condition		
Sparking fan heater	3.74%	7.41%
Desk lamp with exposed wiring	0%	0%
Multi-board next to water puddle	0%	0%
Low-risk hazard condition		
Broken picture frame with glass shards on floor	7.41%	7.41%
Chemical container on high shelf as falling hazard	0%	0%
Extension cord as trip hazard	0%	0%

Extra analyses – why did so few people report/neutralise hazards?

Table 7 shows the number of participants that noticed each hazard. This data was obtained the day after the experiment, using a written questionnaire without any prompts, as detailed in the *Experimental stimuli – second session* section of the Method (Pages 24-26). This shows that the majority of participants did not notice the hazards; however due to the nature of the data, the hypotheses could not be statistically tested. Therefore, further analyses were undertaken to determine if there were any common factors that contributed to so few participants noticing the hazards. Note that some participants suggested hazards which were not part of the experiment; these are listed under the *Other Hazards* category in Table 7.

Table 7.
The number of participants that noticed each hazard

Hazard Description	N	Percentage of condition sample that noticed each hazard
High-risk hazards		
Sparking fan heater	9	33.33%
Desk lamp with exposed wiring	2	7.41%
Multi-board next to water puddle	1	3.70%
Low-risk hazards		
Broken picture frame with glass shards on floor	10	37.04%
Chemical container on high shelf as falling hazard	3	11.11%
Extension cord as trip hazard	1	3.70%
Other hazards		
Dim lighting	1	3.70%
Chemical bottles on top of the bookcase*	3	11.11%
Hot water kettle beside a clock radio	1	3.70%
Sliding door was difficult to open/close	1	3.70%

**Note:* participants included here were in the *high-risk* condition, where the chemical bottles were not included as a hazard (they were not positioned to look like they would fall).

Table 8 shows the reactions of participants to each hazard as recorded during the second session. The most common reaction was to tell someone other than the experimenter – this could include a friend, person of authority, or someone else. Additionally, many participants actively avoided the hazards or ignored them completely. Note that it is possible for a participant to avoid a hazard and also do nothing, as avoiding a hazard is considered a passive response, so the participant did not actively attempt to mitigate the danger caused by the hazard. But if they attempted to neutralise the hazard while also avoiding it, then they have taken decisive action. Table 9 shows what participants said they should have done given the benefit of hindsight. The most common response was that they should have informed the experimenter about the hazard, while the second most common response was that the participant should have neutralised the hazard. Surprisingly, two participants stated that they should have done nothing whatsoever about the broken glass, suggesting that they did not consider it to be sufficiently dangerous.

Table 10 includes the reasons that participants listed for doing nothing about hazards that they noticed. The most commonly listed reason was that the hazard seemed inconsequential, especially in regards to the sparking fan heater. Additionally, three participants believed that the broken glass was intentionally placed, not dangerous, and obviously part of the experiment as a memory test.

Table 8.
Participant reactions to each hazard

Hazard Description	N	Percentage of condition sample that noticed each hazard	Told the Experimenter	Told Someone Else	Neutralised the Hazard	Attempted to make it safe	Avoided it	Nothing
Sparking fan heater	9	33.33%	2	4	1	0	4	5
Desk lamp with exposed wiring	2	7.41%	0	0	0	0	1	1
Multi-board next to water puddle	1	3.70%	0	1	0	0	1	0
Broken picture frame with glass shards on floor	10	37.04%	2	1	2	1	1	6
Chemical container on high shelf as falling hazard	3	11.11%	0	1	0	0	3	2
Extension cord as trip hazard	1	3.70%	0	0	0	0	1	1

Table 9.
Hindsight statements of ideal responses to hazards

Hazard Description	N	Percentage of condition sample that noticed each hazard	Told the Experimenter	Neutralised the Hazard	Paid more Attention	Nothing
Sparking fan heater	9	33.33%	7	1	1	0
Desk lamp with exposed wiring	2	7.41%	1	0	1	0
Multi-board next to water puddle	1	3.70%	1	0	0	0
Broken picture frame with glass shards on floor	10	37.04%	4	6	0	2
Chemical container on high shelf as falling hazard	3	11.11%	1	1	0	0
Extension cord as trip hazard	1	3.70%	0	0	0	1

Table 10.
Participants' reasons for doing nothing

Reasons for doing nothing	Desk lamp with exposed wiring	Sparking fan heater	Multi-board next to water puddle	Chemical container on high shelf as falling hazard	Extension cord as trip hazard	Broken picture frame with glass shards on floor
Hazard was inconsequential.	1	5	0	1	1	2
Reporting was futile.	0	0	0	0	0	0
Fixing the hazard was too difficult.	0	0	0	0	0	0
Not sure how to make the hazard safe.	0	0	0	0	0	0
Fixing the hazard would endanger myself.	0	0	0	0	0	0
Did not want to offend the researcher.	0	0	0	1	0	1
Did not want to prolong the experiment.	1	0	0	0	0	1
Too shy to say anything.	0	0	0	0	0	0
Did not care enough to mention it or fix it.	0	1	0	0	0	0
It seemed intentionally placed.	0	0	0	0	0	3
It was not dangerous.	0	0	0	0	0	3
It was obviously part of the experiment as a memory test.	0	0	0	1	0	3

Situational awareness

Participants' data was then split into two groups based on whether or not the participants noticed any hazards. That is, one group consisted of participants who noticed hazards, while the other group consisted of participants who did not notice any hazards. Twenty-two participants noticed at least one hazard, while 32 participants did not. Additionally, it was noted that 12 participants expected a distraction to occur to divert them from the experiment task, as the experiment was being conducted in the Psychology Department. Four of these participants had noticed the sparking fan heater, but "assumed it was simply being used as a distraction from the task and was not dangerous until you asked if I noticed any hazards in the room". The remainder failed to notice any hazards, as they "blocked out any potential distractions and focussed entirely on the task".

A one-way ANOVA was conducted to determine if there was a significant difference in situational awareness scores and confidence ratings between these two groups of participants. The ANOVA indicated a significant difference between-groups for attention scores, $F(52,1) = 7.86$, $p = .007$, with means of 5.56 for participants who did not notice anything and 6.59 for participants that noticed hazards. However, there was no significant difference between-groups for SA confidence ratings, $F(52,1) = 1.88$, $p = .176$, with means of 3.06 for participants who did not notice anything and 3.34 for participants that noticed hazards.

Workplace incident experience

Table 11 shows ANOVA comparisons that were conducted to determine if there were any significant differences in past accident experiences between participants who noticed hazards and those that did not notice hazards. Separate ANOVAs were undertaken for each type of incident, and another used the composite incident scores mentioned above. None of the results were significant, indicating that participants who noticed hazards have similar experience of workplace incidents to their counterparts who did not notice hazards.

Another one-way ANOVA was conducted to determine if there were any significant differences in current employment safety focus between participants who noticed hazards and those that did not notice hazards. There was no significant difference between-groups, $F(52,1) = .01$, $p = .934$.

Table 11.
ANOVA comparisons of injury experience between participants who noticed hazards and those who did not

	Participants who noticed hazards (N = 22) M (SD)	Participants who did not notice hazards (N = 32) M (SD)	ANOVA Comparisons
Near Miss Incidents	7.27 (11.81)	10.53 (20.96)	$F(52,1) = .44$, $p = .512$
Minor Injuries	5.00 (8.52)	9.00 (15.46)	$F(52,1) = 1.21$, $p = .276$
Lost Time Injuries	1.41 (3.19)	1.91 (3.74)	$F(52,1) = .26$, $p = .613$
Composite Incident Score	13.68 (22.00)	21.44 (33.81)	$F(52,1) = .89$, $p = .349$

A one-way ANOVA was conducted to determine if there were any significant differences in safety consciousness and risk-taking behaviours between participants who noticed hazards and those that did not notice hazards. As expected, there was a significant difference between-groups for safety consciousness ratings, $F(52,1) = 9.56$, $p = .003$, with means of 3.45 for participants who did not notice anything and 2.93 for participants that noticed hazards. However, there was no significant difference between these two groups for risk-taking ratings, $F(52,1) = 1.10$, $p = .297$.

Additionally, Pearson correlations were calculated to determine if participants' situational awareness scores were significantly related to whether or not they noticed any hazards. Within the low-risk condition, participants' situational awareness scores were significantly related to whether or not they noticed a hazard, r = 0.57, p = 0.003. However, this relationship was not significant within the high-risk condition, r = .20, p = .329.

Discussion

The aim of this study was to compare the rates at which individuals reported, neutralised, and ignored low-risk and high-risk safety hazards. The research tested four hypotheses regarding the expected behavioural outcomes between experimental conditions. Hypotheses one and two were related to the within-condition hazard report-rate versus neutralise-rate of participants, while hypotheses three and four were related to differences in hazard report-rate versus neutralise-rate of participants across experimental conditions.

Given that such a small proportion of participants actually reported or neutralised hazards, the planned analyses could not be undertaken to test the hypotheses. However, this was a result in itself, and the unexpected high level of failure to neutralise or report hazards is discussed below. Of the 54 participants who completed the experiment, 22 noticed at least one safety hazard in the experimental environment. However, of these 22 participants, only four neutralised any hazard, while three reported a hazard. This is a startlingly low proportion, as previous research suggests that the majority of people indicate they will at least report a serious hazard to whomever is capable of addressing the issue (Evans, et al., 2006; Lawton & Parker, 2002; Lu, 2014). However, as these results show, of the thirteen participants who noticed a serious hazard, only two voiced their concerns to the experimenter, while another neutralised the hazard by turning the sparking appliance off at the wall socket.

This discrepancy in findings could be due to the type of data utilised, as previous studies have relied on self-report data based on hypothetical situations. Self-report data is highly susceptible to manipulation, as individuals can respond in socially desirable ways to create a better impression of themselves. This study was designed so that this simply was not possible, as individuals' behaviour towards the hazards was measured in an experimental environment. Additionally, participants did not know that their behaviour towards the hazards was the main focus of the study, so they would feel no need to respond in socially desirable ways. These findings show the importance of utilising objective data to study safety whenever possible, rather than relying on self-report data, which can be easily manipulated by participants.

While the main hypotheses could not be statistically tested due to the low number of participants who reacted to hazards, there was enough data from the post-experiment questionnaire to compare participants who said they noticed hazards to those who did not notice hazards. This data was examined to determine if any variables were significantly related to whether or not individuals' noticed any hazards. A significant between-groups difference was found for participants' situational awareness scores, indicating that participants who noticed hazards had significantly higher awareness scores than those who did not notice hazards. Essentially, this finding shows that individuals who noticed hazards were more attentive to the experimental environment, rather than simply focussing all of their attention on the experimental task. This finding supports the use of a QUASA technique as a valid measure of situational awareness for identifying items which are present in the environment.

Additionally, a significant difference was found in safety consciousness ratings between participants who noticed safety hazards and those who did not notice any hazards. However, the relationship was in the opposite direction to what previous safety research has found, with lower safety consciousness ratings for participants who noticed hazards. At first glance, this seems contradictory to previous research, which shows that individuals with higher safety consciousness ratings are more likely to notice and report hazards (e.g. Conrad et al., 1996; Westaby & Lee, 2003), however these studies relied purely on self-report data which is susceptible to manipulation. Additionally, if one considers pro-social behaviours, then the current results make more sense. In particular, the order that participants answered questions must be taken into consideration; participants were first asked if they noticed any safety hazards and what those hazards were, while the safety consciousness scale was completed later. This means that participants were probably thinking about the safety hazards while answering the scale items. This may have influenced their responses to the safety consciousness scale, as discussed below.

It is possible that participants who did not notice safety hazards inflated their safety-consciousness ratings to make up for their lack of attentiveness during the experiment. In comparison, participants who did notice safety hazards would feel no need to rate themselves highly on the safety consciousness scale items, as they were able to provide examples of hazards in the first part of the questionnaire, rather than skipping those items. This finding outlines how important it is to consider prosocial behaviours when using self-report data, as results can be altered considerably if participants wish to provide a certain impression of themselves. This is why the study relied on objective data as much as possible, while minimising the use of self-report data.

Additionally, participants' situational awareness ratings were significantly related to whether or not they noticed any hazards within the low-risk condition, but there was no significant relationship within the high-risk condition. This seems to suggest that the hazards utilised in the high-risk condition may have been more noticeable than those in the low-risk condition. In particular, it is likely that this was due to the sparking noise emitted by the fan heater, which was the only auditory-based stimulus; every other hazard was purely visual, requiring participants to observe their surroundings. This is supported by the data, as 9 participants noticed the heater, while only two noticed the exposed wires on the desk lamp and one noticed the water next to the multi-board. This could explain why situational awareness scores were not significantly related to participants noticing high-risk hazards, as awareness of their surroundings may not have been necessary to notice the noise created by the sparking heater.

Individuals' previous incident history, current employment safety levels, risk-taking ratings, and situational awareness confidence ratings were not significantly different between participants who noticed hazards and those who did not notice hazards. While there is no previous research that has examined the relationship between an individual's previous incident history and their likelihood of noticing hazards, it might be expected that individuals who had experienced more workplace incidents would be more likely to notice hazards, as their experiences would cause them to be more cautious. However, it is possible that some individuals who have experienced more incidents are simply less attentive of their environment, which would cancel out any relationship if other participants are more cautious due to their unfortunate experiences.

Additionally, an individual's current employment safety risk was not related to whether or not participants noticed hazards. This variable was included as a control variable to ensure that each group of participants were statistically equivalent on any variables which might have an effect on their reactions to safety hazards. While no known research specifically examines the link between safety behaviours and employment safety risk, it was considered to be a potentially significant factor as individuals with higher risk jobs are likely to have undertaken more safety training, and therefore be more aware of hazards or have higher levels of safety consciousness.

Also, an individual's risk-taking ratings were not significantly different between participants who noticed hazards and those who did not notice hazards. However, these ratings may have suffered from pro-social biases, as every individual who did not report or neutralise a hazard was undertaking risky behaviour simply by working in a room alongside "safety hazards" then leaving the room in a "dangerous" condition when leaving. This again highlights the importance of considering potential differences between self-report data versus actual behaviour. This in itself is an important finding, as risky behaviour has been shown to be related to higher rates of injuries and incidents in the workplace (e.g. Rees, 2005; Zhao et al., 2014). Therefore, organisations that wish to reduce the amount of workplace safety incidents may need to target their workers' attitudes towards risky behaviour instead of increasing awareness of hazards, as many participants who noticed hazards did nothing whatsoever about them. Although, it is possible that increasing awareness of hazards and the risks they pose could change workers' reactions towards risky behaviour, simply by improving their knowledge of how badly they could be hurt if they continued taking risks.

Finally, an individual's situational awareness confidence ratings were not significantly different between participants who noticed hazards and those who did not notice hazards. Memory research would expect individuals who noticed more hazards to be more confident with their responses to the situational awareness true/false items, as they would believe they had a more complete perception of what was in the room by remembering more (e.g. Anooshian, Ashbrook, & Hertel, 1985). However, these findings show that this is not the case.

The most likely explanation for this finding is that individuals who did not notice hazards may have overcompensated with their confidence ratings to make up for their lack of attention. Meanwhile, individuals who did notice hazards may have given more accurate confidence ratings, without feeling the need to be overly modest or overconfident. Another possibility is that participants who noticed safety hazards gave low to moderate confidence ratings as they thought that they should have noticed more hazards than they did. Either of these occurrences would have resulted in our finding of extremely similar average confidence ratings for each group. This finding highlights the importance of using an objective measure of situational awareness alongside a subjective measure, rather than solely using a subjective measure. If participants had simply been asked to rate how well they knew what was in the room, then the ratings could have been completely different to their actual knowledge. By including true/false probes and confidence ratings, it is possible to compare participants' opinions of their situational awareness to their actual situational awareness.

Additionally, this finding can be used to argue the importance of using objective data instead of self-report data when examining individuals' voicing and neutralising behaviours in response to safety hazards. As mentioned above, previous safety research has relied solely on self-report data, which can be easily manipulated by participants to create socially desirable results. In contrast, objective experimental data is not susceptible to this manipulation, so should be used whenever possible.

This study adds to the literature on measuring situational awareness by providing evidence that supports the use of the QUASA technique, as participants who noticed hazards had significantly higher scores of objective situational awareness than their counterparts. With regards to the purpose of this study, not enough participants reacted to the hazards, so statistical analyses could not be undertaken to test the hypotheses. However, as mentioned above, a large proportion of participants did not react to the hazards even though they noticed them. This discrepancy with previous findings shows the important difference between objective data and self-report data. Additionally, simply attempting an experimental study to examine peoples' reactions to safety hazards has added to safety literature, as no known studies have attempted this before. All known previous studies have used surveys to attain the relevant data, which can easily be fraught with self-report biases. As such, important lessons can be learnt from this study for future safety research, each of which are considered below.

Strengths and Limitations

The current study had three main limitations: potential issues with internal validity, threats to the generalisability of the results, and the small number of hazards used. Firstly, this study has a few potential issues with internal validity. In particular, several participants seem to have undertaken hypothesis guessing by expecting some sort of distraction and ignoring everything in the room except for the task at hand. By ignoring their environment, the majority of these participants failed to notice any hazards, potentially skewing the results. Additionally, seven of these participants noticed the sparking fan heater, but failed to react to it as they believed it was simply a distraction from the task and did not consider it to be dangerous until they thought about it during the second session. Unfortunately, it is impossible to prevent participants from hypothesis-guessing and altering their reactions to situations (Cook & Campbell, 1979). However, by hiding the true purpose of the study until after completing the office task, it was possible to prevent participants from responding to hazards in ways that the researchers expected. While this resulted in some participants purposefully ignoring their surroundings to avoid being distracted, it prevented a large proportion of participants from actively altering their reactions to hazards, meaning that the results of the study could be more valid, but are more useful than if participants had known the purpose of the study beforehand.

A second concern is the limited generalisability of the results across different environments. While this experiment has high levels of ecological validity, it is not particularly generalisable to non-office workplaces. Unfortunately, it was not possible to address this issue in the design of the experiment, other than undertaking several experiments across multiple settings, such as in a workshop or at a construction site. While this would have resulted in a large amount of useful safety data for multiple environments, it would have required a much longer time period for data collection and multiple appropriate samples. While it was not possible to undertake such an endeavour within the given time-frame, future research could attempt a similar experiment in different settings, such as a workshop environment or a construction site.

A final concern is the small number of hazards used in the experiment. In reality, there are hundreds of potential safety hazards that can be present in a workplace. However, the six hazards used in this study were utilised because they are common office hazards. More hazards could have been included, but given the size of the office space, it was determined that more than three hazards per condition would have resulted in the room being somewhat crowded with hazards. This would in turn affect the validity of the study, as participants would be more likely to notice a hazard and therefore react to any that they noticed. Therefore, even though the number of hazards utilised was very limited, it was appropriate for the experimental environment to avoid over-exposing participants to hazards.

The current study has several strengths. Firstly, the experimental design with a controlled environment allowed us to determine how people react to hazards, rather than relying on self-reports based on hypothetical situations. Secondly, the high level of control over lab settings means that the study is easy for future researchers to replicate. Third, participants did not know that the experiment was about their reactions to safety hazards until after they had started the second session, which prevented pro-social behaviour biases. As such, there is no reason to believe that the people in this sample would act differently to hazards in a real-life office setting for any social reason.

Additionally, the experimental environment was an ecologically valid representation of a typical office space, meaning the results are probably generalizable to other office environments. Also, a student sample was used as students often work part-time, and are accustomed to office environments, so it was determined that a student sample was more appropriate than a random sample, which could include individuals from high-risk industries who may not consider office hazards to be dangerous. Therefore, these findings are likely to be relevant for most office settings, as the sample was appropriate for the environment, and the experimental environment was a regular office, which provides ecological validity.

Lastly, the use of the QUASA method allowed for a complete view of participants' situational awareness. Other measures, such as the SART or PSAQ rely solely on participants' self-ratings, which are very vulnerable to biases and manipulation (Matthews, Pleban, Endsley, & Strater, 2000; Taylor, 1990). Alternatively, Endsley's SAGAT method utilises a multiple-choice format to objectively measure situational awareness (Endsley, 1988). The QUASA technique combines both self-ratings and an objective measure of situational awareness to give a view of the individual's actual situational awareness and their perceived situational awareness. This allows for a more complete measure of individuals' situational awareness compared to other methods.

In conclusion, the current study examined the differences in report-rate and neutralising behaviours exhibited in response to high-risk and low-risk safety hazards. It is very clear from the data that self-report biases could be present in previous research, as a large proportion of participants who noticed hazards did not voice their concerns or neutralise the hazards. Also, additional analyses examining differences between situational awareness replicated the results of previous studies, while safety consciousness findings can be explained by participants overcompensating for not noticing hazards. This study contributed to the growing literature on individuals' reactions to differing levels of safety hazards by utilising an experimental design rather than relying on self-report data. The main limitation of the study is that the experimental findings are only relevant for an office context; further research is required to determine if these findings are consistent across multiple workplace settings. Overall, health and safety is an important field of study, as many workplace safety incidents occur each day. Therefore, it is paramount to explore causes and solutions to these problems and provide valuable information to organisations to reduce the number of workplace safety incidents that occur.

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Appendix A

Figure 3.

An extension cord as a "trip hazard"

Figure 4.
A broken photo frame and the front "glass" as a "cut/laceration hazard"

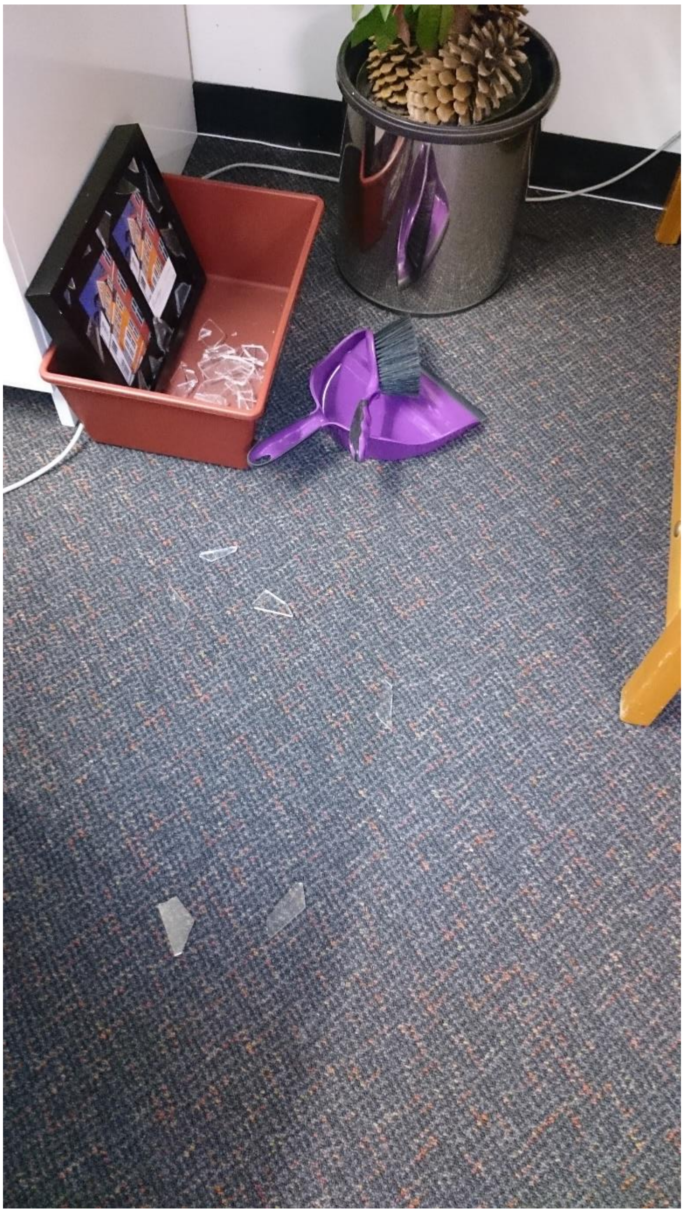


Figure 5.
A chemical container as a "falling hazard"

Figure 6.
A top-down view of the mechanism preventing the jar from falling

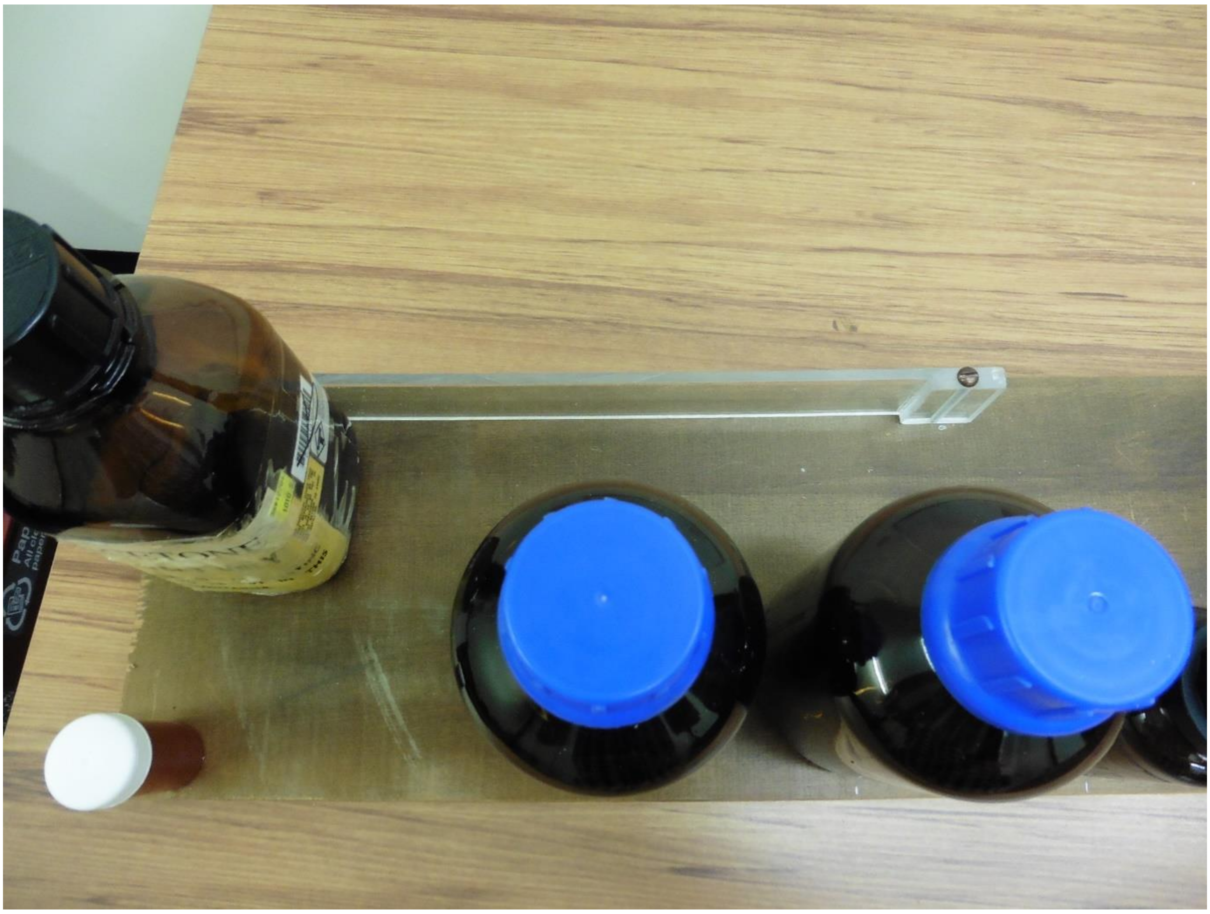


Figure 7.
A water spillage next to a multi-board – a potential "fire hazard"

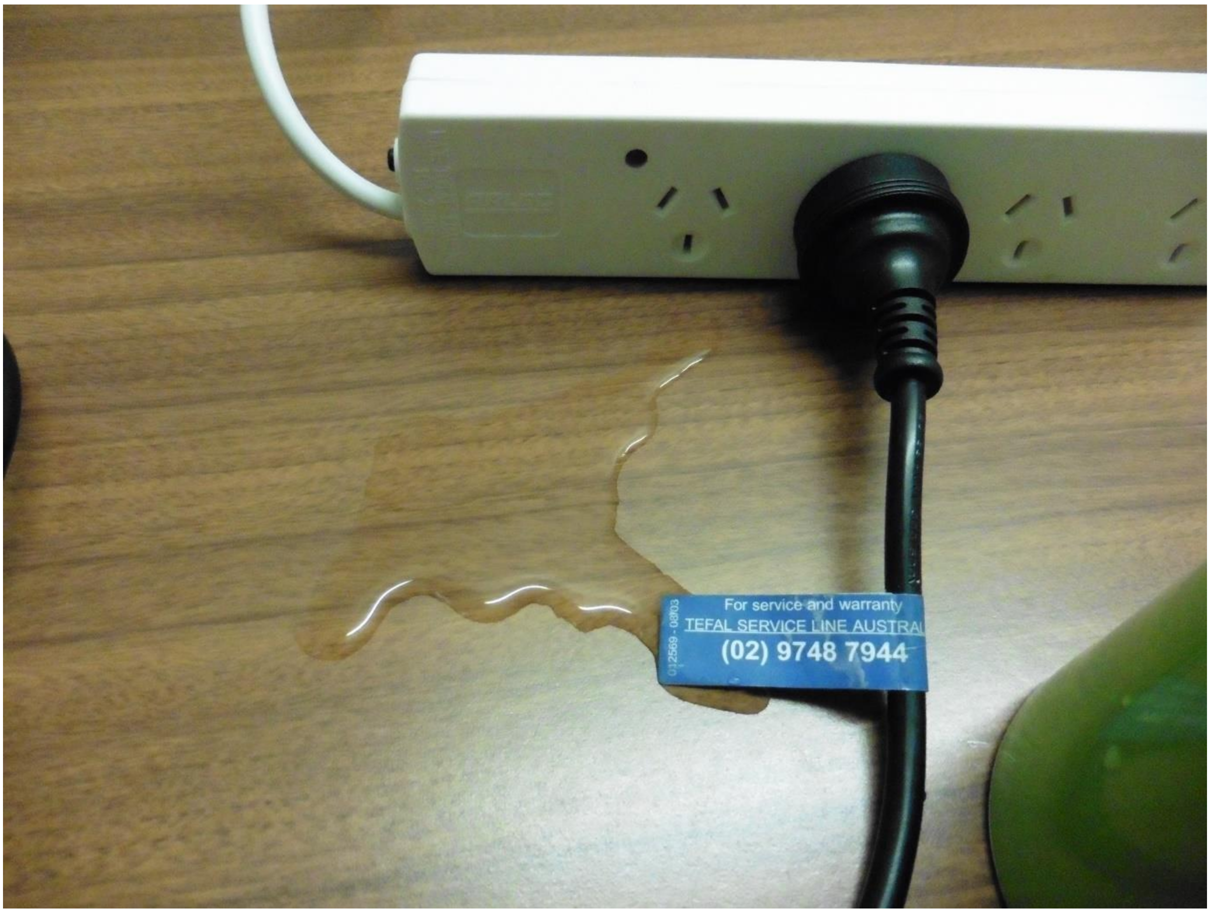


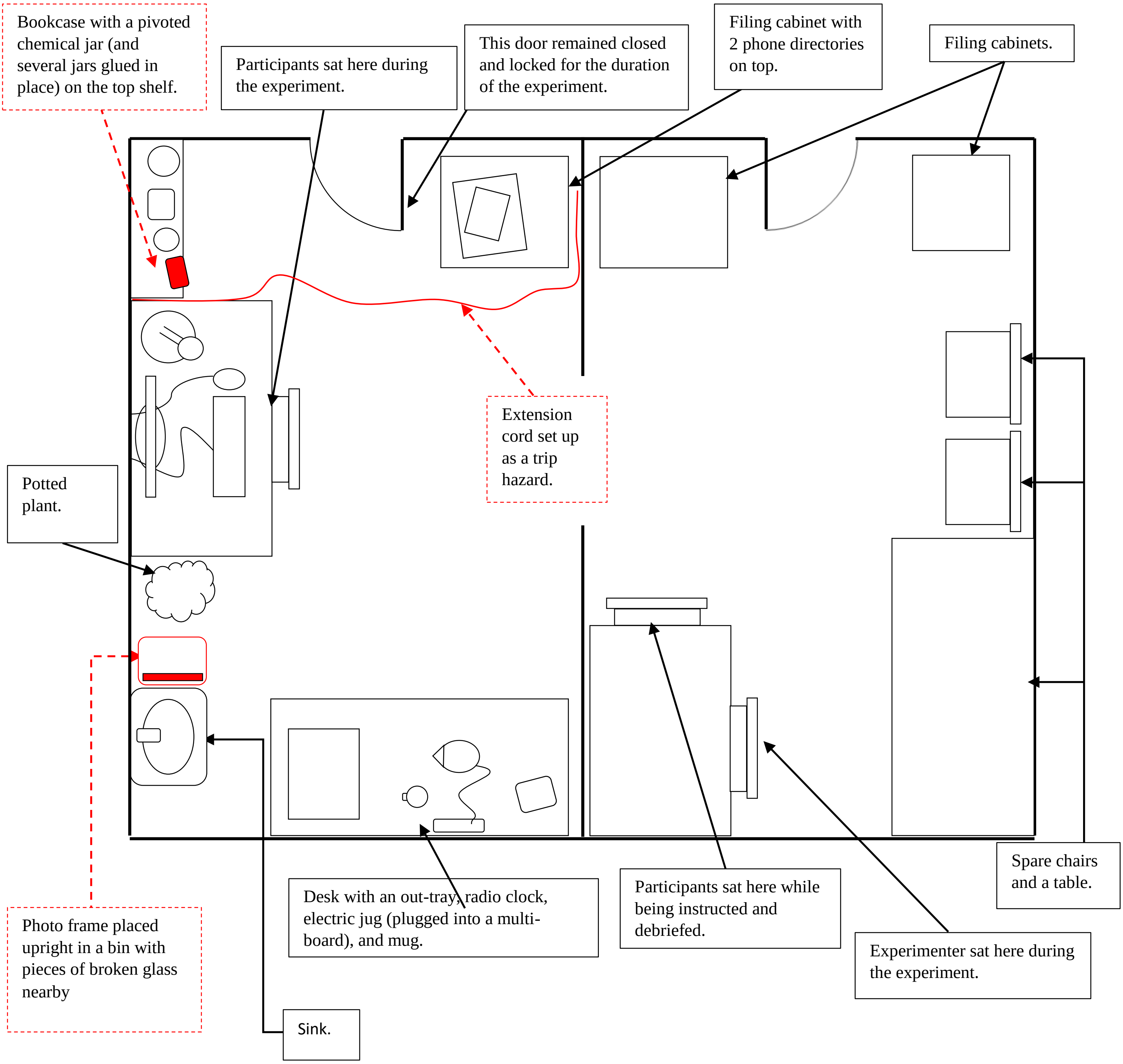
Figure 8.
A desk lamp with exposed wires – a potential "fire/electrocution hazard"

Figure 9.
A close-up view of the exposed wires on the desk lamp

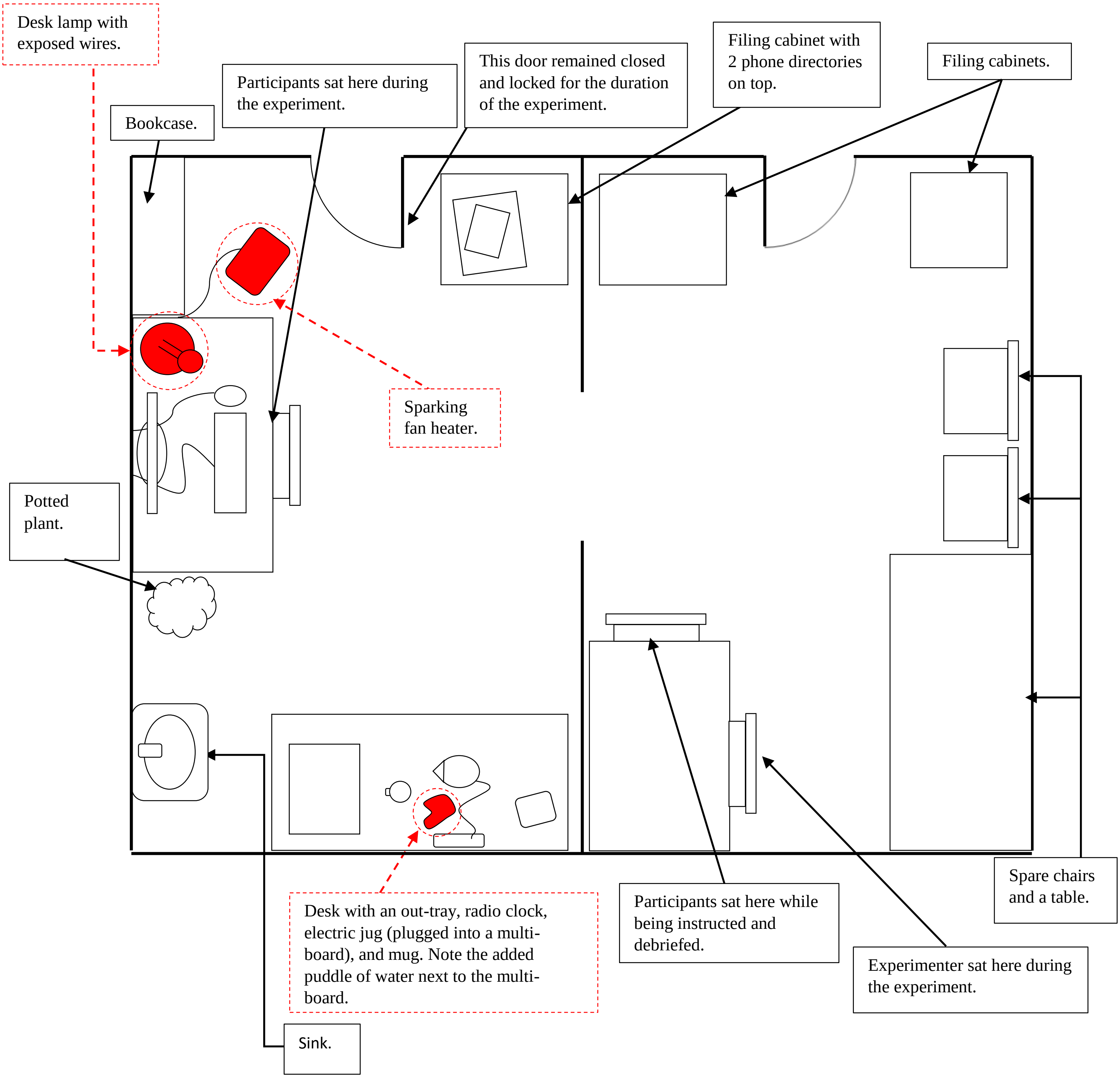
Figure 10.
A sparking fan heater as a potential fire hazard

Appendix B

Room layout diagram for minor hazards



Room layout diagram for high-risk hazards



Appendix C

$10 Voucher Reward

Participants wanted

Sign up for two 10min sessions (occurring 1 day apart)

$10 Westfield or petrol voucher upon completion.

That's $10 for 20 minutes of your time!!

When: A time to be organised that suits you

Where: Psychology 408 (Staff Block)

How to earn your reward:

- Complete an easy administration-style task in an office setting (first session)
- Complete a quick survey about the task (second session)

Open to all undergraduate students at the University of Canterbury

If you are interested in participating, please email Adam at adam.davies@pg.canterbury.ac.nz for more information.

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Appendix D

UC UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information retrieval: Common methods used by undergraduate students

Instruction Sheet

- On the bookcase next to the desk there is a pile of envelopes and UC Careers information booklets. These booklets are to be mailed to high school career's advisors throughout New Zealand to provide them with essential information about the types of careers that UC graduates can achieve.
- You are required to find the postage details of five (5) high school careers advisors from schools in the list provided on the next page. You may use the provided computer to obtain this information. Note that postage details include the career advisor's name and the school address.
- Neatly write the postage details on the provided envelopes (one school per envelope) and securely put a single booklet inside each envelope.
- Place completed envelopes inside the Out Tray that is on the table next to the computer desk.
- Once you have addressed, packaged, and placed all five envelopes in the out tray, return to the experimenter.

UC UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Otago High Schools

- Otago Boys' High School
- Otago Girls' High School
- South Otago High School
- Queen's High School
- Waitaki Boys' High School
- Waitaki Girls' High School
- Cromwell College
- Mount Aspiring College
- John McGlashan College
- Kaikorai Valley College
- Kavanagh College
- King's High School
- Logan Park High School
- Tokomairiro High School

Appendix E

Introductory Questions and Follow-up Questionnaire

Participant Number: ____

Gender:

- ☐ Male
- ☐ Female

How old are you? ____

Do you currently have a job?

- ☐ No
- ☐ Yes
  - ☐ Is it part-time
  - ☐ Full-time
  - ☐ Or casual

____

This is the start of the questionnaire

1. Did you notice any safety hazards in the room during the experiment?

- ☐ Yes
- ☐ No

If you answered No to the previous question, skip to Question 3

2. In this section please describe each hazard that you noticed in the room during the experiment, what you did (you can select multiple options), and if you did nothing, please indicate why you did nothing:

Hazard Description 1: ____

____

____

____

What did you do?

- ☐ Told the experimenter
- ☐ Told someone else after I left the experiment
- ☐ Fixed the hazard
- ☐ Attempted to make the hazard safe
- ☐ Made sure I did not interact with the hazard (avoided it)
- ☐ Nothing (If you did nothing, please indicate why? Tick as many boxes as apply:
  - ☐ I felt that the hazard was inconsequential
  - ☐ I felt that reporting it would not lead to it being fixed
  - ☐ I felt that fixing the hazard would be too difficult
  - ☐ I could not see a way to make the hazard safe
  - ☐ I felt that attempting to fix the hazard would endanger myself
  - ☐ I did not want to offend the researcher by mentioning it
  - ☐ I did not want to prolong the experiment
  - ☐ I was too shy to do or say anything
  - ☐ Other *(please specify)*: ______________________________

    ____

In hindsight what should you have done?

____

____

____

____

____

Hazard Description 2: ____
____
____
____

What did you do?

- ☐ Told the experimenter
- ☐ Told someone else after I left the experiment
- ☐ Fixed the hazard
- ☐ Attempted to make the hazard safe
- ☐ Made sure I did not interact with the hazard (avoided it)
- ☐ Nothing (If you did nothing, please indicate why? Tick as many boxes as apply:
  - ☐ I felt that the hazard was inconsequential
  - ☐ I felt that reporting it would not lead to it being fixed
  - ☐ I felt that fixing the hazard would be too difficult
  - ☐ I could not see a way to make the hazard safe
  - ☐ I felt that attempting to fix the hazard would endanger myself
  - ☐ I did not want to offend the researcher by mentioning it
  - ☐ I did not want to prolong the experiment
  - ☐ I was too shy to do or say anything
  - ☐ Other *(please specify)*: ______________________________
    ____

In hindsight what should you have done?
____
____
____
____
____
____

Hazard Description 3: ____
____
____
____

What did you do?

- ☐ Told the experimenter
- ☐ Told someone else after I left the experiment
- ☐ Fixed the hazard
- ☐ Attempted to make the hazard safe
- ☐ Made sure I did not interact with the hazard (avoided it)
- ☐ Nothing (If you did nothing, please indicate why? Tick as many boxes as apply:
  - ☐ I felt that the hazard was inconsequential
  - ☐ I felt that reporting it would not lead to it being fixed
  - ☐ I felt that fixing the hazard would be too difficult
  - ☐ I could not see a way to make the hazard safe
  - ☐ I felt that attempting to fix the hazard would endanger myself
  - ☐ I did not want to offend the researcher by mentioning it
  - ☐ I did not want to prolong the experiment
  - ☐ I was too shy to do or say anything
  - ☐ Other *(please specify)*: ______________________________
    ____

In hindsight what should you have done?

____
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____
____
____
____

Hazard Description 4: ____
____
____
____

What did you do?

- ☐ Told the experimenter
- ☐ Told someone else after I left the experiment
- ☐ Fixed the hazard
- ☐ Attempted to make the hazard safe
- ☐ Made sure I did not interact with the hazard (avoided it)
- ☐ Nothing (If you did nothing, please indicate why? Tick as many boxes as apply:
  - ☐ I felt that the hazard was inconsequential
  - ☐ I felt that reporting it would not lead to it being fixed
  - ☐ I felt that fixing the hazard would be too difficult
  - ☐ I could not see a way to make the hazard safe
  - ☐ I felt that attempting to fix the hazard would endanger myself
  - ☐ I did not want to offend the researcher by mentioning it
  - ☐ I did not want to prolong the experiment
  - ☐ I was too shy to do or say anything
  - ☐ Other *(please specify)*: ________________________________
    ____

In hindsight what should you have done?

____
____
____
____
____
____

Hazard Description 5: ____
____
____
____

What did you do?

- ☐ Told the experimenter
- ☐ Told someone else after I left the experiment
- ☐ Fixed the hazard
- ☐ Attempted to make the hazard safe
- ☐ Made sure I did not interact with the hazard (avoided it)
- ☐ Nothing (If you did nothing, please indicate why? Tick as many boxes as apply:
    - ☐ I felt that the hazard was inconsequential
    - ☐ I felt that reporting it would not lead to it being fixed
    - ☐ I felt that fixing the hazard would be too difficult
    - ☐ I could not see a way to make the hazard safe
    - ☐ I felt that attempting to fix the hazard would endanger myself
    - ☐ I did not want to offend the researcher by mentioning it
    - ☐ I did not want to prolong the experiment
    - ☐ I was too shy to do or say anything
    - ☐ Other *(please specify)*: ______________________________
      ____

In hindsight what should you have done?

____
____
____
____
____
____

3. Does your current job have a safety component? (E.g. could you be hurt doing this job?)

- ☐ Yes
- ☐ No

4. For each of the three **accident and incidents categories** please indicate how many you have been involved with **over your entire life**

	Number of times
Near miss incidents, which had it turned out differently, could have resulted in injury or damage	
M**inor injuries** requiring medical attention (e.g. first aid treatment or a visit to a doctor)	
Lost Time Injury (LTI) that has required you to take time off school/university/work	

5. These statements are about your safety behaviour. For each statement, please circle the number which indicates the extent to which you disagree or agree.

	Strongly disagree	Disagree	Neither agree/ disagree	Agree	Strongly agree
I always take extra time to do things safely	1	2	3	4	5
People think of me as being an extremely safety-minded person	1	2	3	4	5
I always avoid dangerous situations	1	2	3	4	5
I take a lot of time to do something safely even when it slows my performance	1	2	3	4	5
I often find myself making sure that other people do things that are safe and healthy	1	2	3	4	5
I get upset when I see other people acting dangerously	1	2	3	4	5
Doing the safest possible thing is always the best thing	1	2	3	4	5
I would rather take risks than be overly cautious	1	2	3	4	5
In the past month I have done some exciting things that other people might think are dangerous	1	2	3	4	5
I love to take risks even when there is a small chance I could get hurt	1	2	3	4	5
Sometimes people get on my nerves when they tell me how to act “more safely”	1	2	3	4	5
I value fun more than being safe	1	2	3	4	5

6. For each of the following statements, please indicate whether it is true or false and provide a rating of how confident you are that your answer is correct. *Note: when the experiment room is mentioned, it refers to the room where you completed the task, NOT including the room where you were greeted.*

Statement	**Assessment**	**Confidence**
a) There were two (2) chairs in the experiment room.	☐ True ☐ False	☐ Very high ☐ High ☐ Moderate ☐ Low ☐ Very low
b) There were books on the bottom shelf of the bookcase in the experiment room.	☐ True ☐ False	☐ Very high ☐ High ☐ Moderate ☐ Low ☐ Very low
c) There is carpet on the floor in the experiment room.	☐ True ☐ False	☐ Very high ☐ High ☐ Moderate ☐ Low ☐ Very low
d) There were chemical jars in the experiment room.	☐ True ☐ False	☐ Very high ☐ High ☐ Moderate ☐ Low ☐ Very low
e) There was a candle in the experiment room.	☐ True ☐ False	☐ Very high ☐ High ☐ Moderate ☐ Low ☐ Very low
f) There is a sink in the experiment room.	☐ True ☐ False	☐ Very high ☐ High ☐ Moderate ☐ Low ☐ Very low

g) There is a clock in the experiment room.
- ☐ True
- ☐ False

- ☐ Very high
- ☐ High
- ☐ Moderate
- ☐ Low
- ☐ Very low

h) There are two (2) filing cabinets in the experiment room.
- ☐ True
- ☐ False

- ☐ Very high
- ☐ High
- ☐ Moderate
- ☐ Low
- ☐ Very low

i) There is a plant in the experiment room.
- ☐ True
- ☐ False

- ☐ Very high
- ☐ High
- ☐ Moderate
- ☐ Low
- ☐ Very low

j) There were two (2) phone books on top of a filing cabinet in the experiment room.
- ☐ True
- ☐ False

- ☐ Very high
- ☐ High
- ☐ Moderate
- ☐ Low
- ☐ Very low

Appendix F

An experimental evaluation of safety hazards in an office environment

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Experiment record

Condition 1 (Low-Risk hazards)

Participant Number: ____________________________

Hazard	Did they fix it?	Did they report it?
Falling Hazard (chemical container on high shelf)	☐ Yes ☐ No	☐ Yes ☐ No
Details:		
Extension cord as trip hazard	☐ Yes ☐ No	☐ Yes ☐ No
Details:		
Broken picture frame with glass on floor	☐ Yes ☐ No	☐ Yes ☐ No
Details:		

An experimental evaluation of safety hazards in an office environment

Experiment record

Condition 2 (High-Risk hazards)

Participant Number: ___________________________

Hazard	Did they fix it?	Did they report it?
Desk lamp with exposed wiring	☐ Yes ☐ No	☐ Yes ☐ No
Details:		
Sparking fan heater	☐ Yes ☐ No	☐ Yes ☐ No
Details:		
Multi-board next to water puddle	☐ Yes ☐ No	☐ Yes ☐ No
Details:		

Appendix G

Psychology Department
Telephone: +64 (03) 364 2987 ext. 7187
Email: adam.davies@pg.canterbury.ac.nz
14/5/2015

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information retrieval: Common techniques used by undergraduate students

Information Sheet for Participants

My name is Adam Davies, and I am currently completing my dissertation for my Masters of Science majoring in Applied Psychology. The purpose of this research is to determine the methods that people use to find information online. To achieve this, participants will be asked to address 5 envelopes to high school career advisors from a random region of New Zealand. A brief survey will be administered after completion of the task to determine methods used by participants.

Your involvement in this project will include the completion of the task described above, which will be set up to allow movement around the room. You will be required to find the shipping details (name and school address) of 5 high school career advisors and write these details on provided envelopes. Additionally, you must place the provided information booklets within each envelope and seal the envelope for postage. After completion of the task, a survey will be administered to gauge your reaction to the task and determine the information-seeking techniques that you utilized. Finally, a debrief will be completed to reiterate the purpose of the study, and provide you with a chance to withdraw from the study. Due to the nature of the study, the survey and debrief can only be administered 24-48 hours after completion of the task, so the entire experiment will be spread across two sessions. The first session should take approximately 10 to 15 minutes to complete, while the second session should take 10 to 15 minutes to complete.

You may receive a copy of the project results by contacting the researcher at the conclusion of the project. Participation is voluntary and you have the right to withdraw at any stage without penalty. If you withdraw, I will remove information relating to you; however this will be impossible after October 2, 2015.

The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public without your prior consent. To ensure anonymity and confidentiality, data will only be examined as a whole sample, not on the individual level. To allow for individual data removal, individual questionnaire data will be linked to individuals using a random number generator to allow for data deletion if any participants wish to be removed from the sample. Only the research team will have access to the data, as it will be kept in a locked filing cabinet in a locked room, and electronic data will be password-protected on password-protected computers. All data will be destroyed after five years. A thesis is a public document and will be available through the UC Library.

The project is being carried out as a requirement for a Master's of Science in Applied Psychology by Adam Davies under the supervision of Associate Professor Chris Burt, who can be contacted at christopher.burt@canterbury.ac.nz. He will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you agree to participate in the study, you are asked to complete the consent form and return it to Adam at Room 607 in the Psychology Staff Block or at the end of your debrief.

Psychology Department
Telephone: +64 (03) 364 2987 ext. 7187
Email: adam.davies@pg.canterbury.ac.nz

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information retrieval: Common techniques used by undergraduate students

Consent Form for Participants

I have been given a full explanation of this project and have had the opportunity to ask questions. I understand what is required of me if I agree to take part in the research.

I understand that participation is voluntary and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.

I understand that any information or opinions I provide will be kept confidential to the researcher and his supervisor, Chris Burt, and that any published or reported results will not identify the participants. I understand that a thesis is a public document and will be available through the UC Library.

I understand that all data collected for the study will be kept in locked and secure facilities and in password protected electronic form and will be destroyed after five years.

I understand the risks associated with taking part and how they will be managed.

I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.

I understand that I can contact the researcher Adam Davies (adam.davies@pg.canterbury.ac.nz) or his supervisor Associate Professor Chris Burt (christopher.burt@canterbury.ac.nz) for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

By signing below, I agree to participate in this research project.

Name: ____

Signature: ____

Date: ____

This form should be returned at the end of the experiment debrief or at the earliest opportunity afterwards. If this is not possible, it can be dropped off at Room 607in the Psychology Staff Block to Adam before October 9, 2015.

UC PSYC105/106 research participation debrief

An experimental evaluation of how people react to differing levels of safety hazards in an office environment

The idea of this study is to determine why people do not inform others of safety hazards. This study attempts to answer this by putting people in a room that has three safety hazards. The safety hazards will all fall into the same category, depending on the condition: low-risk or high-risk. Each of the hazards are faked so that participants will not be harmed. Participants can react to the hazards in three possible ways: they can attempt to fix a hazard, report a hazard, or do nothing. The survey which is completed after the task aims to determine why individuals may have done nothing. For example, it is possible that they did not notice the hazards; it is impossible to react to something that you have not noticed. It will be recorded whether or not participants report or fix hazards, and the survey data will be used to check for common reasons for participants doing nothing.

It is predicted that individuals will be more likely to fix low-risk hazards than high-risk hazards. However, it is also predicted that individuals will be less likely to report low-risk hazards than high-risk hazards. The hypotheses are presented below in an equation form:

$$H_1 = F_{LR} > F_{HR}$$

Where F is the fix-rate of hazards

$$H_2 = R_{LR} < R_{HR}$$

Where R is the report-rate of hazards

This information can be used by organisations that have high levels of workplace incidents or injuries, as it can help to provide employers with possible reasons for employees not reporting workplace hazards. This will allow employers to address reporting issues and promote a strong culture of hazard-reporting, which will reduce the amount of workplace injuries and deaths. This outcome is extremely important, as each day 960,000 people around the world are injured in their workplace.

Due to the design of the study, it is imperative that the true purpose of the study remain secret until the data collection phase is complete. If participants knew beforehand the purpose of the study, it is highly likely that they would react in socially desirable ways, therefore confounding the results of the study.