Safe working: designing safety practices for service sector organizations

Report submitted to the IOSH Research Committee

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Published in 2016

Cranfield UNIVERSITY
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ACKNOWLEDGEMENT

The authors would like to acknowledge and thank the Institution of Occupational Safety and Health for their financial and all other support for this project.

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EXECUTIVE SUMMARY

A wide range of practices are adopted by organizations to ensure the safety of their employees. Their purpose is two-fold; they aim to reduce accidents and injuries and they aim to change individual behaviours to encourage safer working practices. Nevertheless, it is often unclear how the adopted practices will deliver these desired objectives. Moreover, the influence of context on the efficacy of particular practices is also unclear. Following a realist synthesis approach of identifying what works for whom in which circumstances and why, we adopted 'CIMO-logic' to attempt to address these limitations in our understanding in two ways.

First, we conducted a systematic review of the safety literature to identify organizational practices that contributed demonstrably to improved safety outcomes, taking note of contextual details and the proposed explanatory mechanisms identified by the authors of these studies. It was notable that most safety research had been conducted in the energy or manufacturing/process industry sectors, and involved experienced full-time male employees. The focus of these studies was on the safety of front-line workers and their supervisors. Three different explanations were used to indicate how particular practices of supervisors achieved the outcomes of either a reduction in accidents or a change in behaviours of the front-line workers, namely Mintzberg's standardization of work, Skinner's operant conditioning, or perspectives on trust. A fourth explanation (Eisenberger's theory of perceived organizational support) applied to both supervisors and front-line workers and required management involvement. Consequently four distinct design propositions could be advanced that may help to explain why specific practices produce particular outcomes in these defined contexts.

Second, we embarked on an empirical investigation of safety practices in service sector organizations, which were almost entirely absent from the earlier empirical studies examined in the preceding literature review. This is despite 80% of the UK workforce working in these environments. Specifically, we targeted retail, office environments and warehouses. We also examined differences in practices and perceptions of safety across the organizational hierarchy, interviewing front-line workers (n=57), team leaders or supervisors (n=52) and managers (n=33). We conducted 143 semi-structured interviews in 13 different organizational locations (1 office, 2 warehouses and 10 retail stores). Four main hazards were commonly reported (trip hazards, slip hazards, manual handing and the use of manual handing equipment), although a further nine were reported by more than 10% of the interviewees. Some hazards appear to be common to more than one context, whereas others are unique to one environment only. There were also hierarchical differences in the emphasis placed on the different hazards. A total of 41 different safety practices were adopted by these organizations. Some like reporting and investigating or training were common to all three environments, while others were specific to particular sectors, for example the extensive observation of practices in retail organizations. Engagement with different practices also varied across the organizational hierarchy and demonstrated some exclusivity. Front-line workers alluded to briefings and focussing on good housekeeping, while supervisors made sure training was up to date and challenged poor practice. Managers referred to many more practices, including reporting, setting procedures and assessing risks. These data allowed us to develop a number of empirically-based design propositions incorporating a range of explanatory mechanisms for ensuring safety in each of the different low hazard contexts in this study. In the offices safety is improved through increasing safety knowledge and by devolving responsibility to an identified individual or group. In the warehouses standardization of working practices and establishing clear expectations promote safety, while in the retail sector greater task competency and regular checking locally create safer working environments. Perceived organizational support and external monitoring (perhaps by headquarters) also encourage safe working in retail and warehouse environments.

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INTRODUCTION

Organizations in the UK are legally obliged to provide safe working conditions for their employees (Health and Safety at Work Act, 1974)[1] and there is extensive guidance available on how this might be achieved from the UK's Health and Safety Executive (e.g. HSE, 2013)[2] and membership bodies of safety practitioners and professionals such as the Institution of Occupational Safety and Health (IOSH). Furthermore, many academic studies indicate a wide range of different practices that are empirically linked to safety performance in organizations. To illustrate Hale *et al.* (2010)[3] provided a framework to categorise organizational interventions that contribute to improving safety, with each main category containing a number of practices. Monitoring, feedback and learning systems for example, included supervision; task checking and monitoring; incident analysis; inspection; and review and feedback, while from the same framework, safety management systems embraced the presence of a safety committee; specialist advisory service; safety officer and risk assessment. In addition, Shannon *et al*. (1997)[4] in their review identified some of these same practices, but also highlighted good housekeeping, amount/duration of training, conducting safety audits and delegating safety activities. Yet despite this diversity of available safety practices to ensure safe working conditions and extensive guidance on their implementation, which ought to provide comprehensive if not complete coverage, accidents and injuries still occur. Why?

One possible explanation may lie in a failure to appreciate why a particular safety practice results in improved safety outcomes and in which circumstances it does so, in other words the context specific nature of practice. As a result inappropriate safety practices may be implemented and are deemed to be largely ineffective in improving safety performance. This may arise, for example, when rules are developed centrally in an organization and with limited engagement with particular local conditions. Moreover, rules may be contradictory resulting in confusion and non-compliance (Lawton, 1998[5]; Mascini, 2005[6]). Hale and Borys (2013)[7] point to a body of evidence that demonstrates that safe working practices are violated, almost routinely. Drawing on Dekker's Model 1 and Model 2 of safety they suggest that practices developed "bottom-up" (Model 2), in response to the dynamic work environment may result in locally viable practices which deliver safe outcomes, because "top-down" (Model 1) generic practices, which are necessarily abstracted from the immediate circumstance found on the ground, cannot always adequately address the disparate local conditions.

Design science research which seeks to specify interventions that transform present practices and improve the effectiveness of organizations (Denyer *et al*., 2008)[8] supports this suggested line of argument. Design sciences, including engineering and management, aim to develop knowledge to solve field problems either by designing interventions to improve current practice or by creating completely new systems. Such prescriptive knowledge permits the development of design propositions, which offer "a general template for the creation of solutions for a particular class of field problems" (Denyer *et al.,* 2008; p. 395)[8]. By following 'CIMO-Logic' [Context-Intervention-Mechanism-Outcome] the design propositions capture what to do, in which situations, to produce what effect whilst also offering some explanation of why this happens. This approach, when applied to safety, may help managers and other practitioners' better design, or implement more effectively, safety practices to ensure safe working in a specified context.

The aim of this study is to develop design propositions for safety practices by identifying those practices that achieve desired safety outcomes in a specified context and by providing new explanatory insight into why this occurs. This report has two objectives. The first is to review existing safety literature using a systematic literature review methodology (Tranfield *et al*., 2003)[9], identifying the contextual circumstances of existing empirical studies, those practices that have been deployed in these circumstances and the impact on safety outcomes. The proposed explanations for these effects, specified by the authors, will also be recorded. Design propositions for effective safety practices in specific contexts can then be developed by synthesizing this information. These will be reported in Part A of this report. It was evident from this literature review that there is a dearth of empirical evidence to support the development of design propositions for safe working in service sector organizations, which employ more than 75% of the UK workforce (Office for National Statistics, 2013)[10]. Part B of this report describes an empirical investigation through interviews of employees in retail, office and warehouse environments to elicit the components of context, intervention, mechanism and outcome in these environments. This empirical evidence is compiled and reported. Tentative design propositions for safe working practices in these three environments are developed.

Part A
Methodology

A literature review based on the systematic literature review methodology developed for management and business studies (Tranfield *et al*., 2003[9]; Denyer and Tranfield, 2009[11]) was deployed. The steps in the review process are explained below.

Searching and Screening

A series of keywords were developed in relation to each of the primary terms of interest in the larger study, of which this study was a part, namely safety, leadership and role (Table 1). We were particularly interested in the safety practices of those with some responsibility for safety in organizations.

Table 1: Keywords used to create search strings

Main term	Additional terms
Safety	safety OR security OR sure* OR safeguard OR protect* OR reliab* OR resilien*
Leadership	Leader* OR manage* OR advisor OR director OR supervisor OR facilitator OR officer OR superintendent OR chief OR commander OR expert OR coach OR specialist
Role	activity OR action OR role OR function OR skill OR enact OR do OR conduct OR routine OR practi?e

These keywords were combined to make strings using the Boolean character 'OR' and different strings were combined using the Boolean character 'AND' as shown in Table 2 and applied to five different electronic databases (ABI-Proquest, EBSCO Host - Business Source Complete, SCOPUS, Science Direct and PsychInfo) in February and March 2013. Table 2 indicates the number of items appearing at that time in scholarly peer reviewed academic journals in the different databases in relation to the different search string combinations.

Table 2: Number of items discovered by applying a search string to an electronic database. Number of relevant titles are in parenthesis

	Database				
Search String	ABI	EBSCO	SCOPUS	Science Direct	PsycInfo
Safety + Role	1263	1533	20425	6124	2250
Safety + Leadership + Role	90 (12)	100 (21)	480 (37)	134 (18)	66 (24)

An initial screen of these titles permitted a substantial reduction in apparently relevant articles (Table 2). Titles were excluded on the basis of perceived relevance. These exclusion criteria included book reviews and Non-English language articles. Other topics or themes warranting exclusion developed for articles identified for the Safety + Leadership + Role string are shown in Table 3.

Table 3: Topics and themes excluded in a title screen of results from a search string

Search String	Primary Topic or Theme	Subsidiary Topic or Theme
Safety + Leadership +Role	Cyber Security	IT systems/Networks, data security
	Health and Patient Safety	Medicine, mental health
	Financial Security	Pensions, stocks, fund management, loans, credit, investment, Tax, bankruptcy
	Food safety/security	
	Environmental safety	Environmental protection, climate change, marine, agriculture
	Psychological safety	
	Technical safety	Engineering
	Business performance	Production, litigation, law
	Transport safety	Driving, air transport, vehicle safety
	Modelling	
	National security	
	Family	Child protection, community, Mothers and adolescents
	Schooling/education	
	Energy security	
	Chemical safety	
	Product safety	

After the removal of duplicates occurring in each of the databases, the string for 'Safety + Leadership + Role' was reduced from 112 to 54. A three member panel then reviewed the abstracts of each of these 54 articles for relevance. Once consensus was reached 32 articles pertinent to safety practices remained (see Appendix 1). Using these as a foundation, the reference lists of these 32 articles were scanned for additional potentially relevant articles. The citations of these 32 articles were also reviewed. A further 29 articles relevant to safety practices were identified (see Appendix 2). A number of these were excluded from data extraction on the basis that they were either literature reviews and therefore did not contain empirical details of practices and outcomes in a particular context (e.g. Gyeke, 2010[12]; Clarke, 2003[13], 2006[14]; Hofmann *et al.*, 1995[15]; Shannon *et al.*, 1997[16]) or they

contained insufficient information about context, practices, outcomes and/or possible mechanisms (e.g. Beaumont, 1981[17]; Beaumont *et al*., 1982[18]). In total 16 papers were excluded on these bases.

Data Extraction

These academic articles were read and analysed and the following information extracted from each item (where appropriate):

- Author, title and year;
- Context (national, sector, characteristics of people and organization);
- Interventions;
- Outcomes;
- Suggested mechanisms or theoretical perspective.

Only interventions that were reported by the authors to be statistically significant were captured. Similarly, mechanisms record those theories or explanatory frameworks that are offered by the author(s) of the particular articles to frame their model design or explain their results. For example, the papers by Conchie and her colleagues (Conchie and Donald, 2009[19]; Conchie *et* al., 2012[20]) focus on trust as an explanation for the relationship between the safety practices of leaders and safety outcomes. By contrast the work of Hofmann and Morgeson (1999[21]; Hoffman *et al*., 2003[22]) focus on social exchange. So trust and social exchange respectively are identified as the mechanisms that explain the outcomes.

Reporting

These extracted data are reported in summary form in Tables 4 and 5. From this it is possible to identify generic safety outcomes and the interventions that appear to enable them in a particular set of circumstances. Possible mechanisms explaining their efficacy are also identified. Each of these elements of the CIMO framework will be discussed in turn. Together this information then permits the development and articulation of tentative design propositions for achieving safety outcomes.

Findings

Outcomes

Two broad categories of outcome are the focus of most of the empirical research. The first category relates to the occurrence of accidents or injuries (Table 4). Often the purpose of the empirical research is to establish the nature of the relationship between a particular intervention and accident or injury rates, or similar proxy. Typically the studies show a negative relationship (i.e. accidents or injuries decline as the intervention increases).

Table 4: Literature reporting on practices that reduce accidents and injuries

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Ali, Abdullah, and Subram-aniam	2009	Malaysia - manufacturing companies	single firms	no information	Communication and feedback; Employee participation.	Reduced injuries	Contingent reward/ operant conditioning
Antonsen, Skarholt, and Ringstad	2012	Norway - oil and gas	Three installations in a single company. Shift workers and contractors. Prior companywide change programme to standardize operating model.	***Managers and employees***, although greater contrast between on-shore and off-shore staff.	Standardization of work process through greater management involvement, increased job rotation, prioritization of operations and maintenance tasks.	Reduced injuries. Increased compliance with operating procedures.	Coordination and control. Requisite variety
Barling, Loughlin and Kelloway	2002	Canadian - Restaurants & service sector organizations	Young part time workers.	Supervisor/ ***employee***	Leadership (transformational). Work design - reduce role overload.	Safety consciousness. Reduced injuries	Trust. Perceived Organizational Support

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Bentley and Haslam	2001	UK - Postal Service	20 Offices comparing high and low performance. Experienced DOMs with 35-150 staff.	***Delivery office manager*** and postal delivery officer	Safety communication and supervision; hazard management; equipment and uniform management; accident investigation and reporting.	Reduced accident rates	Attitude of manager towards safety. Removal or control of hazard (direct effect). Influence on workers (indirect effect)
Burt, Sepie and McFadden	2008	NZ - construction, forestry and energy	Predominantly males with at least 5 yrs work experience and 3 or 4 yrs with current team.	***employee*** - co-workers	Identify hazards, accident reporting, communicating safety information, worker support through team working	Reduced accidents	Trust.
Chew	1988	Asia – manufacturing	n/a	n/a	Supervisory involvement, training and housekeeping.	Reduced injury rates	none described
Cigularov, Chen and Stallones	2009	USA – farm workers	200 farms. Mainly livestock	***adolescent employee*** - owner	Communication and feedback; advice	Increased reporting of errors	Safety locus of control. Communication
Dawson, Poynter and Stevens	1984	UK – chemical and allied industries	8 different organizations	Safety specialist and relationship to others	Identify hazards, assess risk, develop procedures, implement procedures, monitor	Reduction in numbers of accidents or injuries	Technical control

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Donald and Young	1996	UK - Energy company	Single target region	***Employees***	Safety teams, planning and budgeting, management involvement	Reduced accident rates	Responsibility. Awareness. Trust
Evans, Michael, Wieden-beck and Ray	2005	USA – wood manufacturing	4 different organizations. Predominantly experienced males. Hourly paid.	Organization (manager) - ***employee***	Housekeeping. Use of PPE and safety guards.	Reduced accidents and injuries	Prioritization of safety by managers (values/beliefs)
Hofman and Morgeson	1999	USA – manufacturing	Single manufacturing site. Employees arranged into 64 work groups. Work group leaders experienced older workers.	Organization (***supervisor***) - ***work group leader***	Feedback, monitoring, coordination of work.	Reduced accidents. Improved safety behaviours	Perceived Organizational Support. Trust
Horstman-shof, Hassall, Hassall, O'Connor and Glendon	2002	Australia – construction, manufacturing and service sectors	22 Organizations. Respondents were managers, employees or H&S officers	H&S officer relationship to others	Training	Reduced accidents. Improved compliance	Awareness

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Huang, Chen, Krauss and Rogers	2004	USA – shipping companies	Employees of 13 different companies. Younger males with mixed experience	Organization/ supervisor - ***employee***	Execution of safety policies (safety committee, disciplinary measures, incentives, PPE provision, information display).	Reduced accidents	Perceived Organizational Support.
					Communication & Feedback. Clear job descriptions		Control/autonomy. Competence.
Kelloway, Mullen and Francis	2006	USA - casual workers	Young part time workers.	***employees***	Leadership - transformational or passive	Reduced injuries	Trust
Lingard, Cooke and Blismas	2012	Australia - construction	Different work groups across a number of sites	Supervisor- ***employee***	Execution of safety policies. Communication and feedback.	Reduced accidents	Values/beliefs of supervisor. Role modelling.
Mearns, Whitaker and Flin	2003	UK – oil and gas	Workers and supervisors on 13 off-shore rigs. 30% were experienced workers.	Organization (management) - ***employee***	Enactment of safety policies	Reduced accidents	Perceived Organizational Support. Trust. Awareness. control/autonomy.
Probst and Estrada	2010	USA – mixed sector	Majority male mid-late 30s with c. 9 yrs work	Organization (supervisor) - ***employee***	None clearly specified but relate to communication, training and safety	Accurate accident reporting	Contingent reward

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
			experience.		systems.		
Rinefort and Van Fleet	1993	USA – chemical, paper and wood manufacturing	HR managers from a range of organizations	supervisor - employee	Workplace organization, especially span of control.	Reduced injuries	Communication. Coordination
Smith, Cohen, Cohen, and Cleveland	1978	USA - manufacturing	Site visits to 6 organizations.	***all employee***s	Management involvement, selection of employees, training by peers, housekeeping,	Reduced accident rates	Trust. Reward/motivation. Awareness. Role modelling. Control
Varonen and Mattila	2000	Finland - wood processing	8 wood processing organizations.	***employees***	Management involvement, hazard awareness, training.	accident rates reduced	none described
Vreden-burgh	2002	USA – hospital employees	Risk managers of 62 hospitals with 390 employees on average.	***organization*** - employees	Selection. Training.	Reduced injury rates	Risk-aversion. Reward
Wu, Li, Chen and Shu	2008	Taiwan – university laboratories	Employees from 4 universities. One-third female.	Organization (leader) - ***employee***	Safety coaching. Safety caring. Safety control	Reduced accidents	Trust. Role modelling

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Zohar	2002	Israel – manufacturing organizations	Single organization. Male respondents in 36 work groups. Experienced workers	***Supervisors - line workers***	Communication and feedback	Reduced accidents	Contingent reward

Table 5: Literature reporting on practices that change safety behaviours.

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Antonsen, Skarholt, and Ringstad	2012	Norway - oil and gas	Three installations in a single company. Shift workers and contractors. Prior companywide change programme to standardize operating model.	***Managers and employees***, although greater contrast between on-shore and off-shore staff.	Standardization of work process through greater management involvement, increased job rotation, prioritization of operations and maintenance tasks.	Reduced injuries. Increased compliance with operating procedures.	Coordination and control. Requisite variety
Arboleda, Morrow, Crum and Shelley	2003	USA - Trucking industry (Logistics)	566 different firms stratified for safety performance	Individual responses from drivers, dispatchers (supervisors), safety directors in each firm	Safety training. Safety input by drivers, management commitment.	Safety perceptions (linked to behaviours and then to accident rates)	Knowledge and understanding. Involvement/ ownership. Concern - trust/POS.
Barling, Loughlin and Kelloway	2002	Canadian - Restaurants & service sector organizations	Young part time workers.	Supervisor/***employee***	Leadership (transformational). Work design - reduce role overload.	Safety consciousness. Reduced injuries	Trust. Perceived Organizational Support
Clarke	1999	UK - railway workers	Managers, supervisors and drivers, mainly male with wide	***Managers, supervisors, drivers.***		Perception of safety	Trust

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
			age range				
Clarke and Ward	2006	UK - manufacturing	2 sites of manufacturing organization but data merged. Predominantly experienced males	Supervisor / manager - ***employee***	Leadership tactics – inspiration, explanation, involvement.	Increased safety participation	Trust
Conchie, Taylor and Donald	2012	UK - oil	Single site. Predominantly experienced males. Supervisors had >5 yrs experience on average and were responsible for 8 employees	***Supervisor - employee***	Transformational leadership practices	Increased safety voice by employees	Trust

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Conchie and Donald	2009	UK - construction	5 projects within a single company. Predominantly younger males with >16yrs experience. Supervisors were slightly older, more experienced and had been supervising for 8 yrs on average.	***Supervisor-employee***	Transformational leadership	Improved safety behaviours	Trust
Credo, Armenakis, Feild and Young	2010	USA – drilling company	6 sites. Project personnel and field technicians	Organization (management) - ***employee***	Safety communication, management responsiveness.	Improved safety behaviours (compliance and participation)	Perceived organizational support
Dahl and Olsen	2013	Norway - oil	Offshore workers on 28 different platforms employed by company. Predominantly male and over 36 years	Organization (management) - ***employee***	Leadership involvement in planning and preparing work, monitoring execution of work, encourage team co-operation.	Increased safety compliance	Values and beliefs of manager about safety
					Worker competence and involvement, role clarity and monitoring		

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
DeJoy, Schaffer, Wilson, Vandenberg and Buts	2004	USA - retail chain	21 locations. FT employees but many had worked for <2 yrs.	***Employees***	Safety policies and procedures (compliance, training, resources and feedback). Communication and support	Perceived safety	Perceived Organizational Support. Trust. Awareness - communication
Dunbar	1975	UAS - Warehousing	2 work groups of forklift operators. Young males.	***Employees***	Housekeeping. Safety communication.	Safety behaviours	Trust - caring
Griffin and Neal	2000	Australia - manufacturing		***Employees***	Management values, inspections, training, communications	Safety behaviours	Knowledge/ understanding, competence
Hofmann and Morgeson	1999	USA - manufacturing	Single manufacturing site. Employees arranged into 64 work groups. Work group leaders experienced older workers.	Organization (***supervisor***) - ***work group leader***	Feedback, monitoring, coordination of work.	Reduced accidents. Improved safety behaviours	Perceived Organizational Support. Trust
Hofmann, Morgeson and Gerras	2003	USA - Army (logistics)	Young males.	***Team leader- team member***	LMX - leadership	Safety behaviours	Trust - social exchange relationship

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Horstmanshof, Hassall, Hassall, O'Connor and Glendon	2002	Australia – construction, manufacturing and service sectors	22 Organizations. Respondents were managers, employees or H&S officers	H&S officer relationship to others	Training	Reduced accidents. Improved compliance	Awareness
Kapp	2012	USA – manufacturing and construction	Hourly employees at 6 sites. Males with a spread of ages.	Supervisor - ***employee***	Transactional and Transformational leadership practices (i.e. setting goals, monitors performance and gives feedback, OR role model, set challenging goals, encourage alternative views, personalized consideration)	Improved safety behaviours (compliance and participation)	Contingent rewards. Motivation
Luria, Zohar, and Erev	2008	Israel – manufacturing organizations	Mainly males in 30s.	***Supervisors-employees***	Feedback, monitoring. Workplace design	Safety behaviours(compliance)	Control
Mearns and Reader	2008	UK -oil	Older moderately experienced workers across 18 sites.	***employee*** - other (incl. supervisor, workmates)	Enactment of safety policies	Improved safety behaviours	Perceived Organizational Support.

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Parker, Axtell and Turner	2001	UK - manufacturing	Heterogeneous sample in terms of age, gender and experience.	***team leaders - employees***	Work design (job autonomy). Support. Communication.	improved safety behaviours (compliance and conscientiousness)	Trust. Self-efficacy.
Prussia, Brown and Willis	2003	USA – steel manufacturing	Single organization had undertaken a safety improvement programme over preceding 5 years.	***Managers/supervisors - employees***	Technical solutions – equipment, design of work and work place.	Increased safety compliance	Self-efficacy. Risk-aversion.
Thompson, Hilton and Witt	1998	USA - aviation manufacturing and warehousing	no details	Manager/supervisor **-** ***Employees***	Management involvement.	Safety compliance. Safety conditions of workplace	Trust. Interactional justice
Tucker, Chmiel, Turner, Hershcovis and Stride	2008	UK - bus drivers	Males in early-mid 40s	***employees***	None clearly specified but relate to communication.	Safety voice	POS. co-worker support

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Vinodkumar and Bhasi	2010	India – chemical process industries	Employees from 8 units. Most were older than 35 and had >10 yrs experience	organization - ***employees***	Safety training. Management Commitment. Worker involvement. Communication and feedback. Safety rules and procedures. Safety promotion	Improved safety behaviours	Understanding. Motivation.
Watson, Scott, Bishop and Turnbeaugh	2005	USA – steel plant	Single plant. Predominantly middle aged males.	***employee*** - other (incl. supervisor, workmates)	Monitoring. Communication and feedback.	Improved safety behaviours	Shared norms. Values/beliefs of managers
Yagil and Luria	2010	Israel – manufacturing organizations	Variety of organizations. Males, with an average age of almost 40, and 10 years work experience.	Organization - ***manager***; manager-***employee***	Leadership: provision of PPE, reporting, training, listening, holding safety events, disciplines unsafe behaviour, safe work environment, audit and monitor compliance, safety procedures, feedback, role modelling	Improved safety compliance	Social support from co-workers. Values of managers about safety

Author	Date	Context	Context	Context	(Significant) Interventions	Outcomes	Suggested Mechanisms
		(National and sector)	People & Organizational characteristics	Relationship			
Zohar and Luria	2003	Israel – manufacturing organizations	Mainly experienced male workforce in three different organizations	***Supervisors -line workers***	Training. monitoring and feedback	Improved safety behaviours	Contingent reward

The second category relates to individual safety behaviours, typically either safety compliance or safety participation (Table 5). According to Neal *et al.* (2000: p.101)[23], safety compliance is "adhering to safety procedures and carrying out work in a safe manner", while safety participation involves "helping co-workers, promoting the safety programme within the work place, demonstrating initiative and putting effort into improving safety in the workplace". Some authors differentiate safety voice from safety compliance, defining safety voice as "communication motivated toward changing perceived unsafe working conditions that have implications for individual and organizational health" (Tucker *et al*., 2008: p.320)[24]. Communication may be both formal and informal and directed towards a wide variety of stakeholders. Again interventions are assessed for their impact on improving each of these behaviours.

A smaller set of studies investigated the impact of an intervention on both accident rates and safety behaviours simultaneously (Antonsen *et al*., 2012[25]; Barling *et al*., 2002[26]; Hofmann and Morgeson, 1999[21]; Horstmanshof *et al*., 2002[27]).

Context

A majority of studies were conducted in the UK or USA. Many of the remainder came from developed countries (Australia, Norway) with few from developing countries (Malaysia, India). The industrial sectors were primarily energy (oil or gas), manufacturing and some construction. The studies typically investigated large, single organizations. Manufacturing organizations were often located on a single site, whereas energy organizations might operate numerous drilling sites. An overwhelming majority of respondents to the questionnaires used in these studies were male, typically aged between 30 and 50 years and with significant (i.e. >5 years and frequently more than 10 years) work experience. They were mainly employed as front-line workers. In some studies, particularly those exploring relational characteristics (e.g. trust, Conchie and Donald, 2009[19]; Zohar, 2002[28]), supervisors were included in the sample. These were also males who had a slightly older age profile and longer working experience. Few studies investigated managers.

Mechanisms

The authors of these empirical studies adopted a range of different theories to explain the effects of the particular interventions under investigation on the specified outcomes.

Perceived organizational support (POS). According to Eisenberger and colleagues (1986[29]; 1990[30]) when employees perceive that they are valued by their organization and that it is committed to them (i.e. high POS), then an implied obligation develops for future reciprocity that benefits the organization. High POS is associated with greater participation, better performance and increased communication. Each of these may shape safety outcomes (e.g. Hofmann and Morgeson, 1999[21]; Credo *et al*, 2010[31]).

Contingent rewards. The theory of operant conditioning (Skinner, 1953)[32] suggests that the selection of a behavioural response to a stimulus will receive a particular consequence. This consequence will either be rewarding and so reinforcing or punishing and so deterring. In this way preferred behaviours can be encouraged and unacceptable behaviours extinguished. Clearly, positive safety behaviours may be encouraged by appropriate feedback (Kapp, 2012[33]; Zohar, 2002[28]).

Trust. Trust requires the belief by an individual that another will act in the individual's best interest, either because they are competent and able to do so (cognitive-based trust) or because they will show care and concern for the individual (affect-based trust). Both of these types of trust may affect safety outcomes (Conchie *et al*., 2012)[20].

Coordination/control. Mintzberg (1983)[34] identified five ways to achieve coordination. One of these - standardization of work processes - ensures that practices are uniform and consistent and can be executed safely (Antonsen *et al*., 2012)[25]. Changes to the organization of work may remove hazards reducing accidents (e.g. Bentley and Haslam, 2001)[35] or may result in improved safety behaviours by making workers more visible (Luria *et al*., 2008)[36].

Competence - autonomy. Greater autonomy is often given to those employees with higher skill levels, which may be achieved either through careful selection or the provision of training. Such skilled employees display greater competence in their role by performing better and working more safely (Parker *et al*., 2001)[37].

Awareness. High reliability organization theorists (Weick and Sutcliffe, 2001)[38] draw attention to the importance of being attentive to the context of work to reduce the probability of accidents occurring. This attentiveness can be enhanced through mindfulness (Langer, 1990)[39].

Social learning. Bandura (1977)[40] noted that individuals learn from others through observation, imitation and modelling. Role modelling appeared to be an important explanation for the effectiveness of some safety interventions (e.g. Wu *et al*., 2008[41]; Smith *et al*., 1978[42]).

Interventions

A wide range of practices were identified as significantly affecting safety outcomes (Tables 4 and 5). These may be aggregated into four categories: (i) Leadership practices, for example goal setting, monitoring performance, giving feedback, if transactional leadership was being investigated, or role modelling, giving explanation or seeking involvement if transformational leadership was the focus. (ii) The execution of safety policies including hazard identification, risk assessment, accident investigation and reporting, provision of advice and PPE. (iii) The standardization of work processes through the development and implementation of procedures including the correct use of PPE and housekeeping rules, and the design and organization of work. (iv) Communication, including feedback and training.

Developing design propositions for safe working

The extraction and synthesis of information from the 61 articles provides the basis for creating a range of design propositions to enable safe working through the combination of information according to different outcomes, different explanatory mechanisms and different aspects of context. The literature could be divided into studies that focussed either on accidents and injuries or on safety behaviours. The same literature could also be divided into studies that focussed either on supervisors and their relationship with employees or on employees (principally front-line workers). Explanations commonly invoked include trust, leadership and communication. Synthesizing this material, the following four independent design propositions are offered.

In large hierarchical centralised organizations in manufacturing/process or energy industries, employing full-time experienced males, supervisors who:

- Identify hazards, conduct risk assessments, provide PPE, demand good housekeeping, implement stated work procedures reduce deviance and encourage the standardization of work practices enabling a reduction in accidents or injuries. (Proposition 1).
- Recruit carefully, train rigorously and regularly, actively communicate, give appropriate feedback frequently and consistently establish clear expectations against which performance can be monitored and assessed, and then rewarded encourage safety compliance and reduce accidents and injuries. (Proposition 2).
- Role model safe working practices, prioritize safety, act consistently and fairly, show consideration for subordinates, listen to safety concerns, encourage the development of trusting relationships and increase safety participation. (Proposition 3).

These three draw respectively on Mintzberg's standardization of work practices (1983)[35], Skinner's operant conditioning (1953)[33], and various authors' views on trust (Rousseau *et al*., 1998[43]; Dirks and Ferrin 2002[44]; Lewicki *et al*., 2006[45]). A fourth proposition also emerged.

In these organizations employees who:

- Observe consistent management involvement in safety (including proactive risk assessment, hazard identification, accident investigation and reporting, frequent safety briefings), receive appropriate training, provision of PPE, have higher perceived organizational support (POS) for safety and better safety behaviours. (Proposition 4).

This latter proposition draws on Eisenberger's theory of perceived organizational support.

This synthesis of research in the safety literature reveals a number of gaps. First, the contextual focus is primarily on large single hierarchical centralised organizations. The evidence fails to explain how safety may be affected in dispersed networked and decentralised organizations, which are increasingly prevalent. Second, current research focuses on manufacturing/process or energy industries. A majority of UK employees work in service sector organizations. It does not account for the enactment of safe working in these settings, especially those that involve the public. Third, the literature reports on employees who are experienced males, working full time. It fails to explain how safe working might be encouraged in inexperienced or part-time workers. It also presumes that there are no gendered differences in safety performance. Finally, the focus of attention is on supervisors and front-line workers, to the exclusion of managers. How this group and their interactions with others affect safety is not known. Even though the search string incorporated "leadership", many of the practices outlined in the design propositions are nevertheless 'managerial' in nature.

In an attempt to address some of the contextual omissions in earlier safety research, we have investigated safety practices through semi-structured interviews with participants spanning the organizational hierarchy from middle managers to front-line workers in a variety of service sector organizations. This empirical study is explained in Part B.

Part B
METHODS

Context

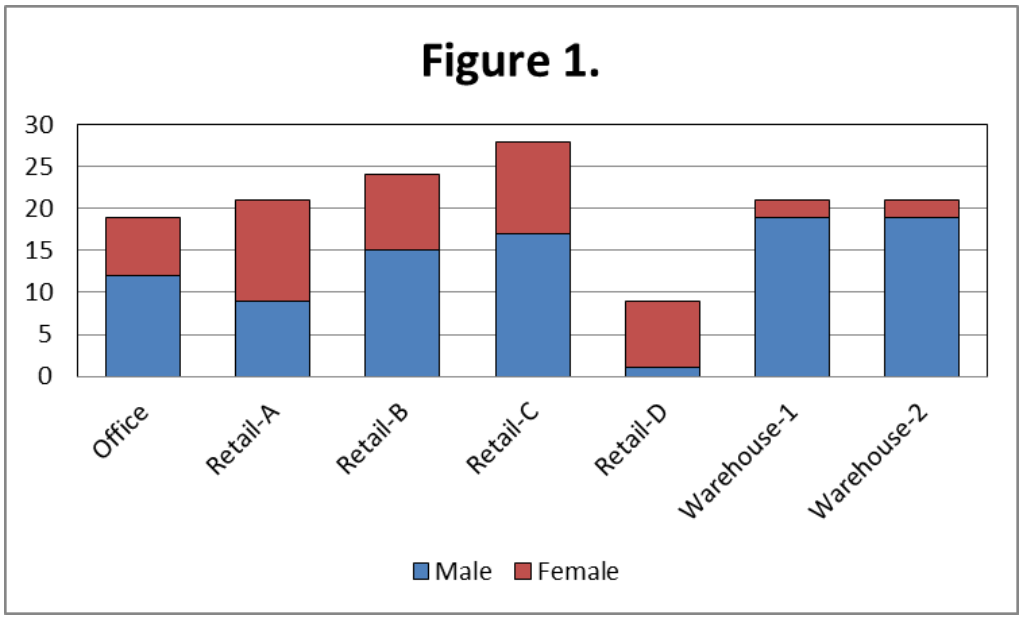
This study formed part of a larger investigation of safety leadership and safety practices in service sector organizations. Research sites (*i.e.* distinct locations where a number of employees were interviewed) included retail (10), offices (1) and warehouses (2). The organizations to which these sites belong characteristically have a highly centralised bureaucratic structure with a dominant head-quarters developing policies and practices to be enacted locally without deviation. The study from which the data for this report were drawn, sought to determine the contingent relationships between multiple facets of context and different practices and how this affected safety outcomes. Here we present data revealing how practices differ with organizational context and how they are perceived by employees across an organizational hierarchy to include not only front-line workers and supervisors or team leaders but also their managers.

Demographics of the sample population

One hundred and forty three people consented to being interviewed and completed (as they felt able) a questionnaire soliciting demographic information. Not everyone answered every question.

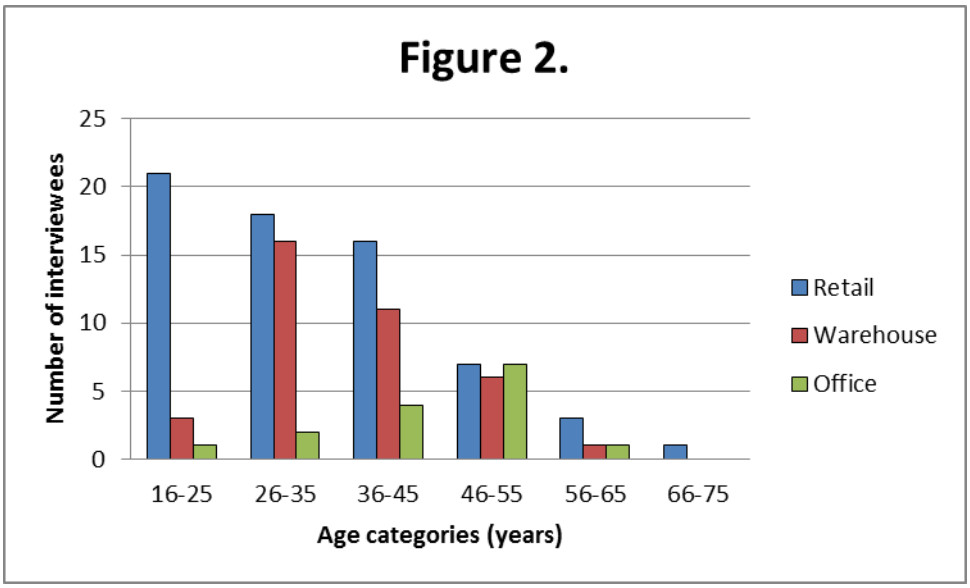
Overall more males were interviewed than females. There was however a difference between sectors (Figure 1). While interviewees in the warehouses were predominantly male, the balance was more equal in the retail and office sectors. With one exception in the office environment, all of the employees in the office and warehouse environment were full-time. This, of course, may be company policy, but it contrasts with the retail sector where more than one-third of the interviewees were part-time (29 were part-time and 53 were full-time). Although, even here, there was variation between the four different organizations, two had a more equal balance of full and part-time workers, where the other two organizations favoured full time workers.

Figure 1: Number of male and female interviewees in each organization



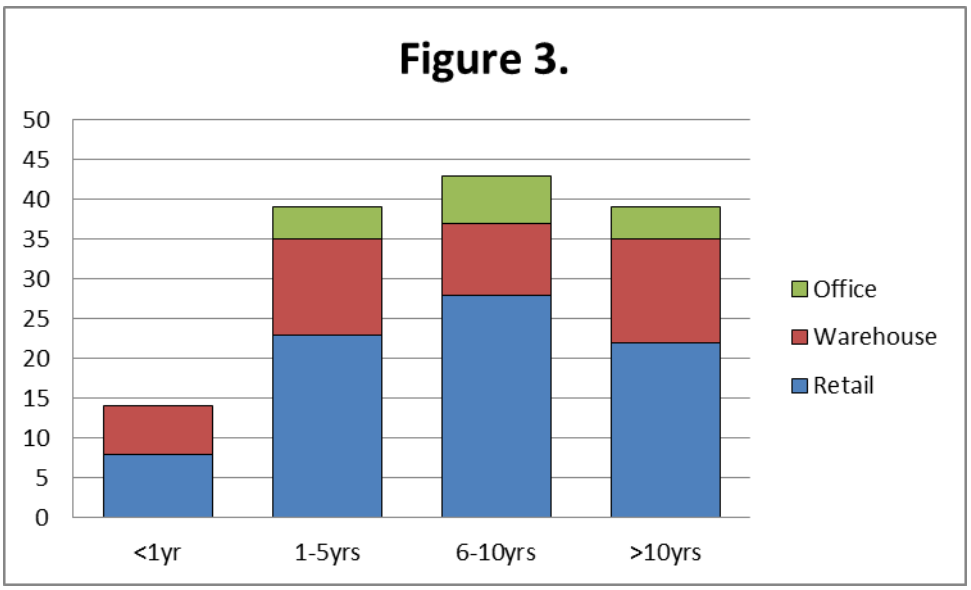
Age profiles also varied by sector (Figure 2). Interviewees in the retail sector spanned the whole age range, but with a preponderance of younger people. The interviewees were slightly older in the warehouse and more senior again in the office environment.

Figure 2: Age categories of interviewees in the different sectors



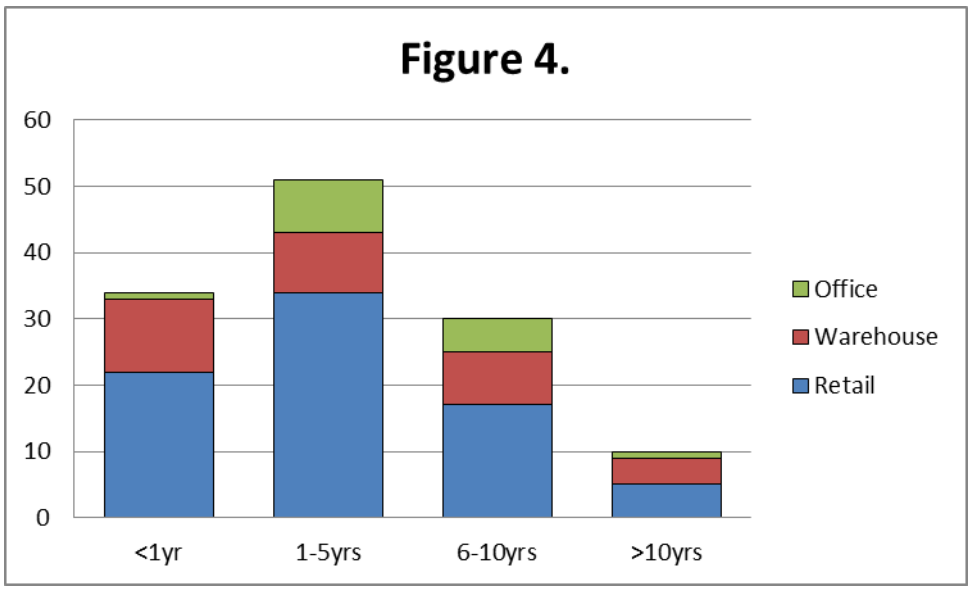
More than 60% of interviewees had been with their current employer for six years or more (Figure 3), with little variation between sectors. Also, most interviewees had been with this employer for more than one year. The responses were therefore mainly from experienced employees who were familiar with their organization.

Figure 3: Duration of employment with current employer (years) for interviewees from three different sectors



Nevertheless, they may have been less familiar with their particular task environment since more than one-quarter had been in their particular post for less than one year and more than half of the remainder had been in post for five years or less (Figure 4).

Figure 4: Duration of employment in current role (years) for interviewees from three different sectors



Data Collection

A semi-structured interview schedule comprising 15 questions which followed the CIMO-logic and were designed to provide information on context, interventions, mechanisms and safety outcomes (see Appendix 3) was used. A total of 143 people were interviewed during the first six months of 2014. Interviewees came from four UK branded retail organizations and one global logistics company working across 13 different sites (see Table 6 for the distribution of interviewees across the organizational units). Three units each from three different UK retail chains, one with more than 700 stores selling general merchandise, another selling DIY materials and home furnishings from more than 300 stores and the last selling groceries from 280 stores in the UK. The final retail unit was a model store of a retailer selling fashion and home furnishings with approximately 200 stores in the UK. These were complemented by two warehouses and an office of the logistics company having more than 100 sites in the UK.

While interviewees had a variety of job titles, they were assigned to one of three different role categories (managers, supervisors or front-line workers) based on their duties and responsibilities within the organization. Front-line workers had no line-management responsibility for other employees while managers were accountable for functions or departments within the unit, or even the whole unit, and with responsibility for a larger number of staff. Supervisors were typically responsible for a smaller number of staff, such as a shift or a team and reported to another more senior individual (often a manager) with overall responsibility for the unit or section. The distribution of interviewees across these three role categories by sector are shown in Table 7.

Table 6: Number of interviewees in each location

		Unit		
		1	**2**	**3**
Retail	**A**	11	6	4
	B	9	8	7
	C	12	9	7
	D	9	-	-
Logistics	**Office**	19	-	-
	Warehouse	21	21	-

Table 7: Number of interviewees in different roles in three different sectors. (N.B. one interviewee did not indicate his role in his demographic data)

	Manager	**Supervisor**	**Front-line Worker**	**Total**
Office	9	6	4	19
Retail	15	30	37	82
Warehouse	9	16	16	41
Total	33	52	57	142

Data Analysis

Each of the interviews were recorded and lasted between 9 and 50 minutes (16 minutes on average). These recordings were transcribed and then coded initially against each of the 15 questions. The responses to each question were coded inductively as they emerged from the data. Individual responses were then aggregated across organizational units; organizations and sectors; and also by role category. The responses to the questions in each of the four CIMO categories were then collated to provide an overview.

The data on responses to questions 10 (concern about hazards) and 12 (talking about safety) and the identified incidents are not included in this report because as yet we have been unable to attribute clear meaning to these data.

FINDINGS

Context

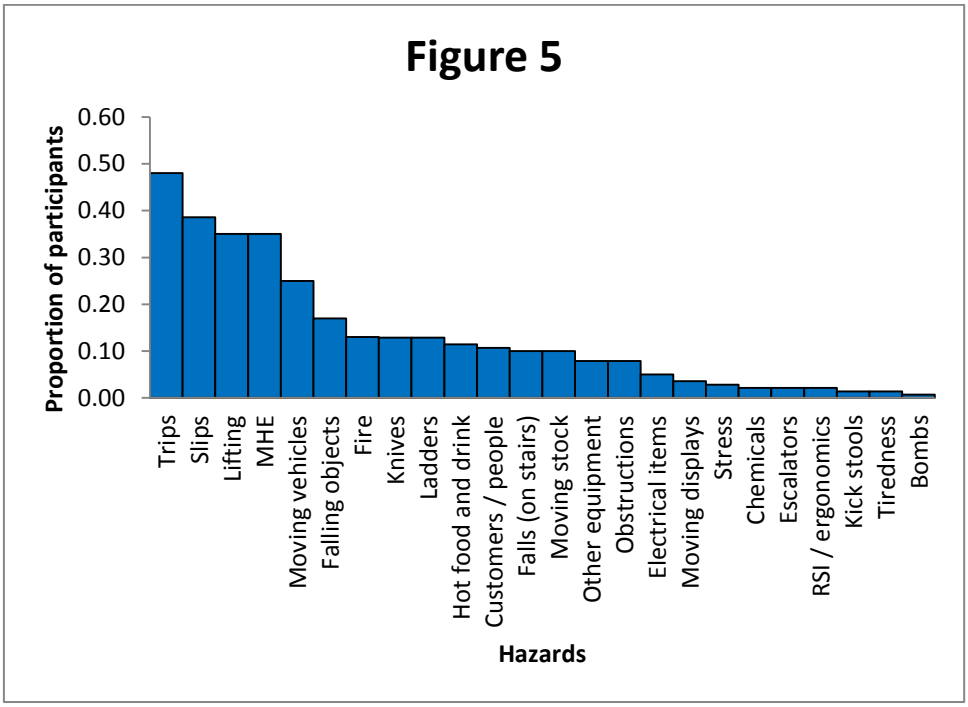
Hazards

Twenty four different hazards were identified across the three different organizational environments (Figure 5). Four types of hazards dominated and were identified by more than one third of the interviewees. In order of decreasing frequency these were:

- Trip hazards caused by rubbish, trailing cables, boxes and bags;
- Slip hazards caused by spillages of liquids, typically water or paint;
- Manual handling hazards, particularly lifting heavy and awkward items; and

- Injuries from using manual handling equipment, including forklift trucks and pallet pumps.

Figure 5: Proportion of interviewees identifying particular hazards overall in the three different environments



A further nine hazards were reported by between 10 and 20% of interviewees (Figure 5). These were:

- Moving vehicles, typically lorries in loading bays and cars in car parks;
- Falling objects from racks, shelves or cupboards;
- Fire;
- Sharp implements, particularly knives in cafes in retail outlets or warehouses;
- Falls from ladders, notably by employees in stock rooms in some warehouse and by field workers from office locations and also hazards associated with working at heights;
- Hot food and drink found in cafes in retail stores, but also in kitchens in offices;
- Inattentive people, both customers and colleagues who do not pay attention to their surroundings. This category also included aggressive customers;
- Falls on stairs; and
- Moving stock in cages in retail stores.

Eleven other hazards were less frequently mentioned (Figure 5). Often these were specific to an environment, for example, obstructions in the stock rooms of one retail environment and escalators or moving displays in another retail environment, or electrical items such as kettles and toasters or RSI in the office environment.

Figure 6: Hazards identified by interviewees in each of the three sectors investigated in this study

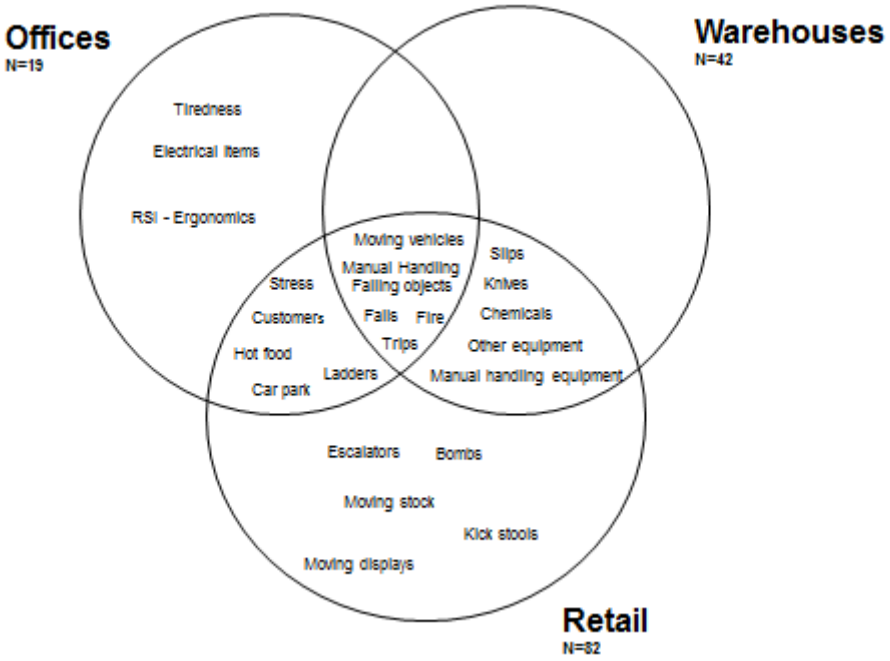
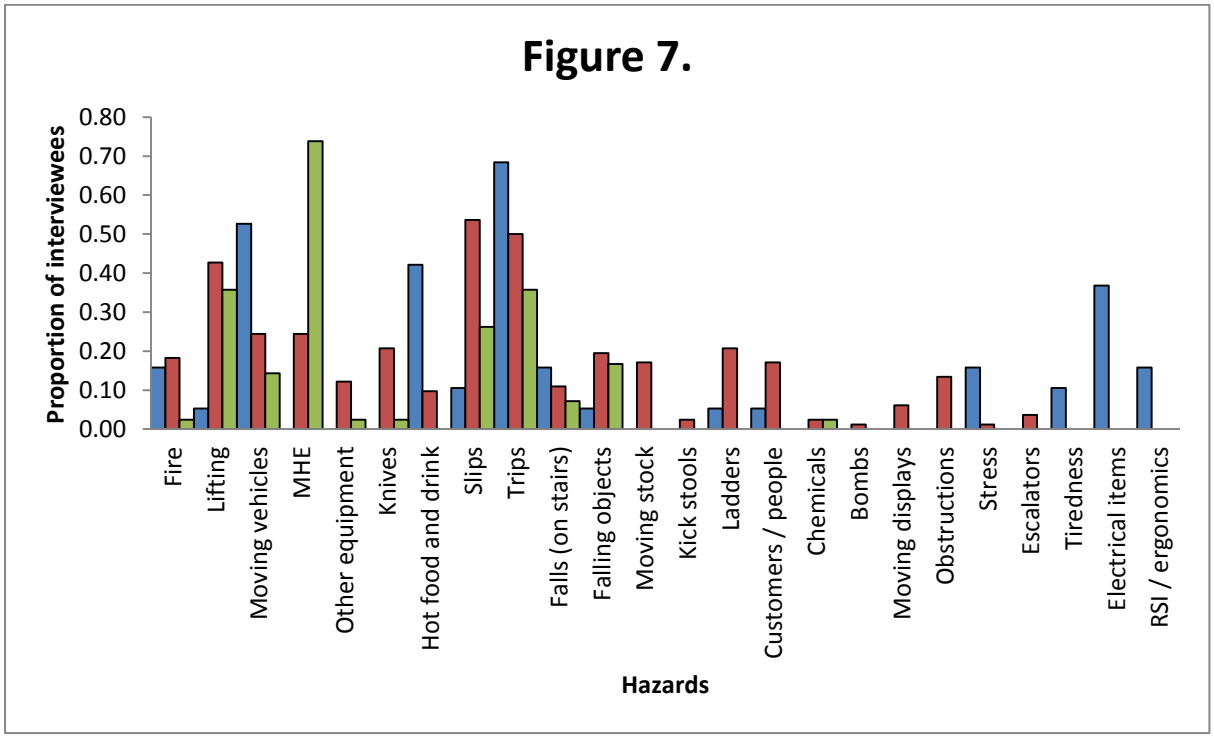


Figure 6 illustrates the differentiation of hazards by context. Some hazards, such as lifting (and other manual handling hazards), trips and moving vehicles, were perceived to be present in all three environments, while others such as ladders (and dangers of working at heights), stress, customers, hot food and drinks, and then slips, sharp implements and the dangers of using manual handling and other equipment, were found in two different paired sets of environments. Finally, some were found only in one sector such as RSI in the office context.

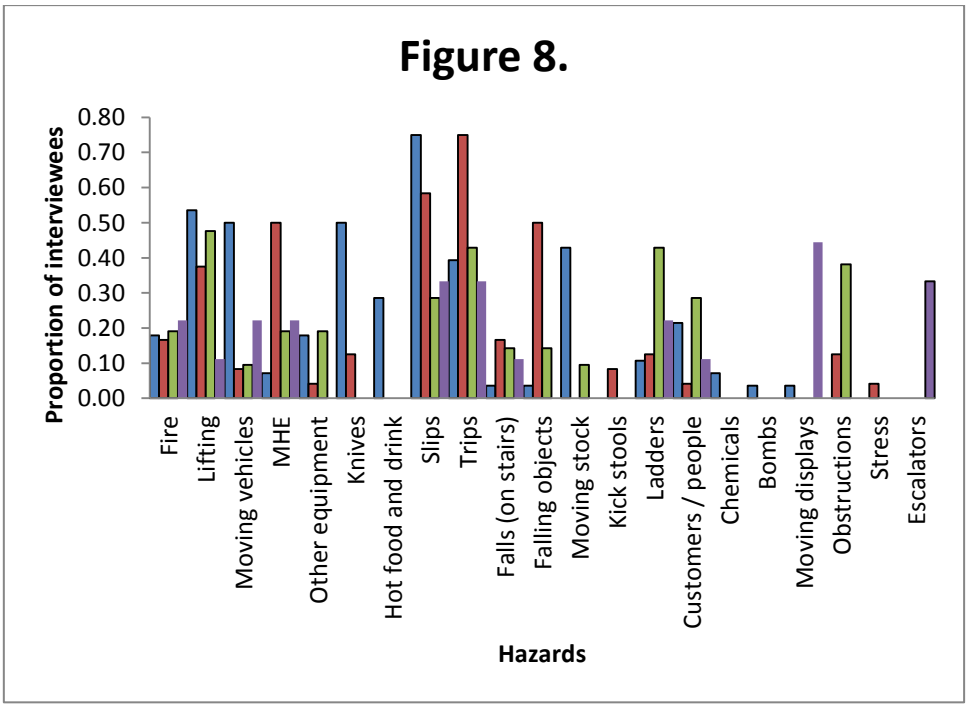
The relative frequency of reporting of the hazards differed across these contexts (Figure 7). Trip hazards were reported relatively more often by interviewees in an office than in a warehouse, while manual handling issues were reported more often in retail settings than in offices. Reports of hazards due to manual handling equipment and slip hazards were absent in the office environment, but not in the others. Falls on stairs were more likely to be reported as a hazard in offices than in warehouses, but falling objects were a more likely hazard in retail and warehouses than in offices.

Figure 7: Sectorial differences in the proportion of interviewees identifying different hazards (Red is retail, green is warehouses, blue is offices)



Even within sectorial contexts, interviewees in different organizations reported different hazards (Figure 8).

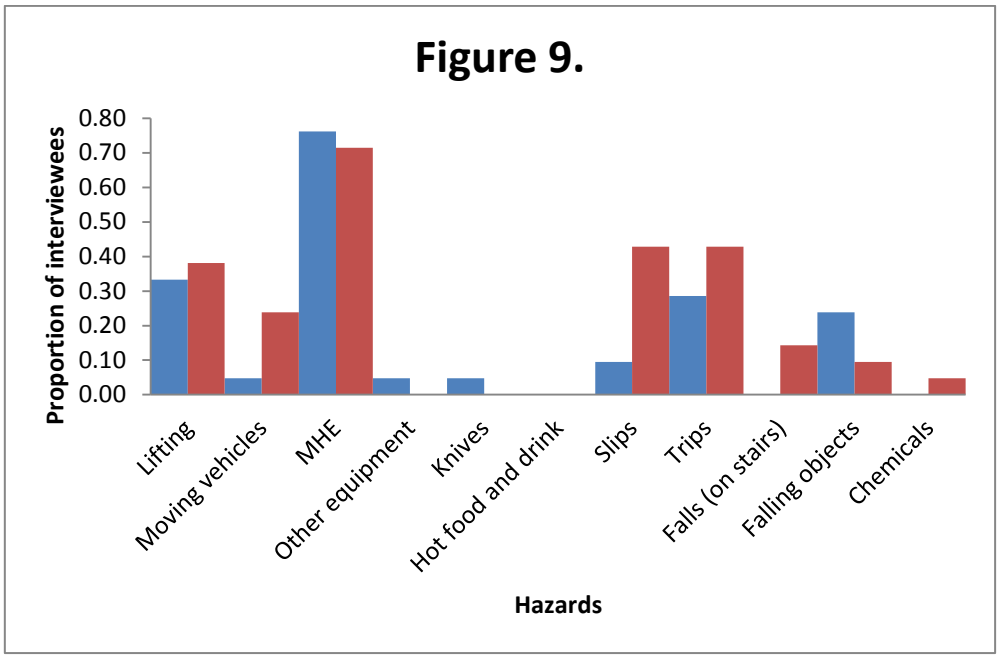
Figure 8: Hazards reported by interviewees from four different retail organizations (Blue = store A, red = Store B, green = Store C and purple = Store D)



While a number of hazards appear to be common to all of the retail environments in this study (Figure 8), their relative importance may vary. Some were not reported for one organization (e.g. moving vehicles) although there are moving vehicles involved in stock delivery. Other types of hazard were limited to one retail organization (e.g. hot food (store C), escalators (store D), chemicals (store A) and bombs (store C)).

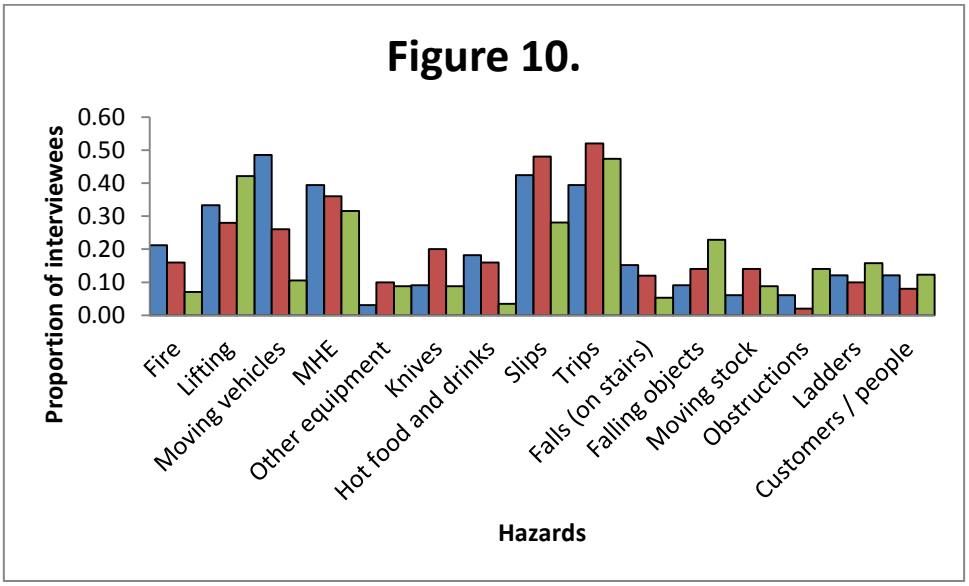
Moreover, variation is also evident within an organization (Figure 9). Interviewees in the two warehouses differed in their reporting of hazards, occasionally substantially so. For example, slips due to spillages, moving vehicles and falling objects.

Figure 9: Hazards reported by interviewees from two different warehouses



The four main categories of hazards noted above were reported in different measures by interviewees according to their role (Figure 10). Managers emphasised the hazards associated with using manual handling equipment, supervisors emphasised slip and trip hazards while front-line workers more often mentioned manual handling. There were other differences too. Falling objects (from racking, shelving or out of cupboards) were salient to front-line workers but not supervisors or managers. Conversely, fire was relevant to managers but less so to front-line workers. Both managers and supervisors alluded to the dangers of moving vehicles, but this was less apparent among front-line workers.

Figure 10: Hazards reported by managers (blue), supervisors (red) and front-line workers (green) from three different low hazard environments



Willingness to challenge others

All interviewees indicated that they were prepared to challenge the behaviour of others if they were working in an unsafe manner. Most of them were happy to challenge their peers, but fewer would challenge those more senior to themselves including their manager. This difference between challenging peers and managers appeared to vary by site. Managers at some locations within the same organization were less approachable than others at different locations, perhaps reflecting their more recent arrival to the site and the subsequent lack of familiarity with the staff.

While the interviewees said they would challenge, less than 40% actually did so, reflecting the observation that "*the majority would be reluctant to do that*". Often they would get someone else (e.g. a manager, team leader or Health and Safety Adviser) to raise the issue. Again there is sectorial variation. No challenges had been raised in the office setting, approximately 40% of interviewees working in retail outlets while 50% of interviewees working in warehouses had challenged others. There was also local variation within sectors. A majority of interviewees at one store had not actually challenged their peers, whereas a majority of those in another store in the same organization had challenged the unsafe working practices of another.

Where challenges occurred the focus typically had one of four common causes:

- Failing to wear personal protective equipment, particularly high-visibility vests or jackets in areas with moving vehicles;
- Failing to tidy up and clear away rubbish, thereby creating potential trip hazards for themselves and others;
- Failing to lift correctly; and
- Failing to follow correct procedures.

Is safety compromised for performance?

The majority (95%) of interviewees had a very clear view on whether safety was compromised for organizational performance. Opinion varied discernibly across the three environments. In the office environment all but one were adamant that safety would not be compromised for performance, "*No, definitely not. No. No.*". The exception was the Head of the QSHE department who said, "*Frankly I'd*

be bullshitting if I told you it never does". He may have been reflecting on the whole organization including the warehouses rather than just the offices.

In the warehouses, approximately one third thought safety was compromised for production, "*definitely, yes*", or more explicitly, "*nobody bats an eyelid until something goes wrong*". Often though, it was the "*little stuff, all the time*", like litter on the floor, but "*cutting corners can be with tidying up not with health and safety*". However, two thirds thought otherwise, "*no, absolutely not*". "*Safety comes first … there's nothing more important*".

Overall, in the retail sector, slightly more interviewees felt that safety would be compromised for production than that it would not be. However, there was considerable variation by organization. In one organization (with the fewest interviewees) two thirds of the interviewees felt it would be compromised, whereas in another organization (with the most interviewees) half of the interviewees felt that safety would be "*not knowingly compromised*", although employees might "*squeeze it but not bend it*".

Five reasons for compromising safety for performance were evident in the data:

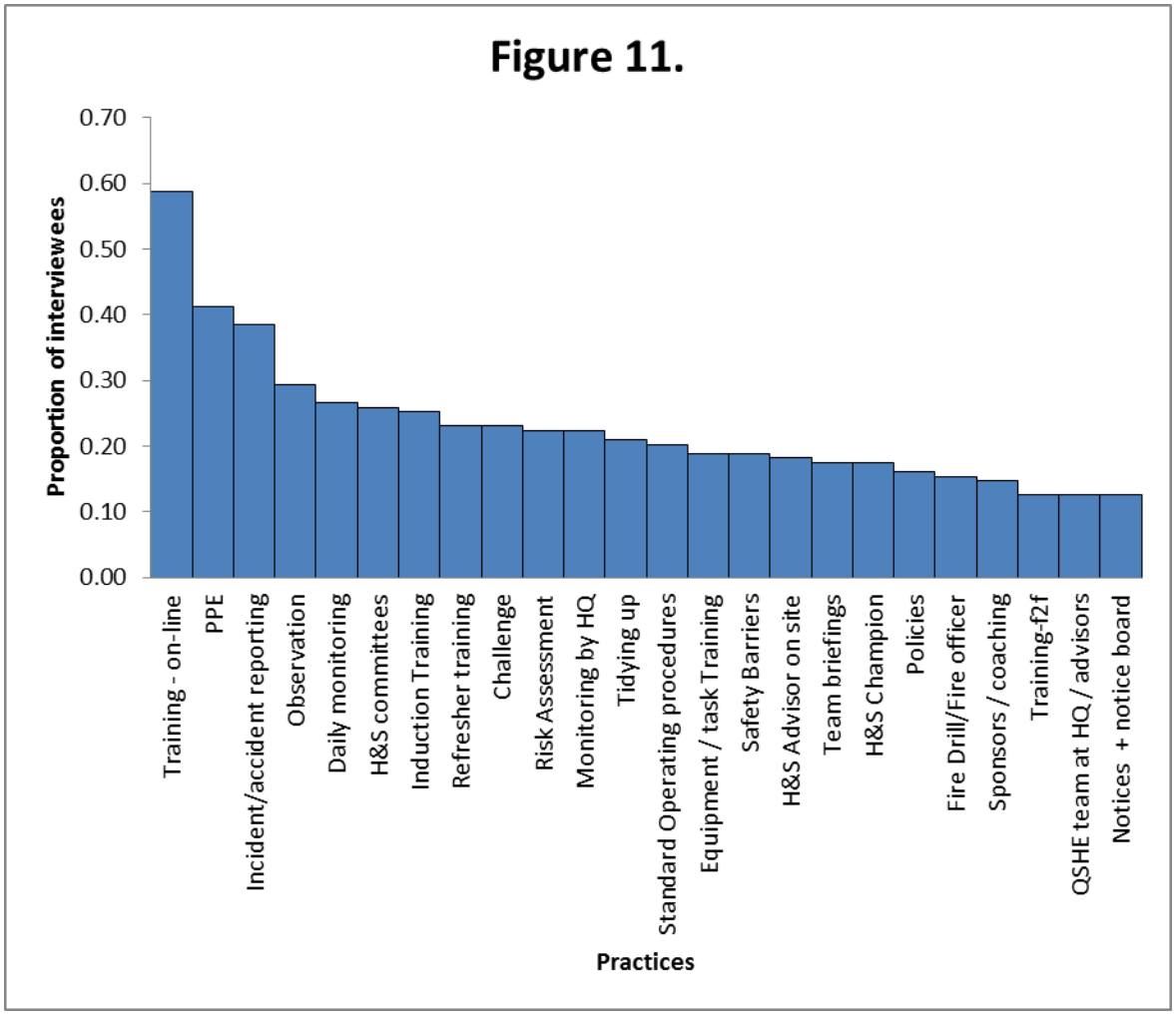
- First, "*it becomes more difficult [not to compromise safety] in peak periods*", when there is increased pressure and "*when you're really busy*" with "*no time to check*". "*Boxes are left for a quiet moment*" before they are cleared away;
- Second, deliveries of stock can compromise safety with large volumes of stock being moved immediately following a delivery and often being temporarily left in the wrong (unsafe) place. Safety is "*definitely [compromised] in the stock room*";
- Third, tiredness contributes to the "*risk of short cuts*". "*Corners are definitely cut at the end of the day*";
- Fourth, compromising safety has become an accepted norm, "*everybody does it*". "*Everyone cuts corners at some point*", although staff "*work to mitigate it*";
- Finally, it may be compromised in the "*little things*", like rubbish on the floor. "*No one deliberately works unsafe, [but their practices] may be not to the book*".

Interventions

Practices

Forty one different practices were identified by the 143 interviewees. Some (e.g. DSE Assessments and safety poster displays) were identified by only a few people and from a particular context, in these cases from an office environment. Sponsoring (broadly defined as coaching and mentoring) was mentioned only in a retail context. Others, such as on-line training, wearing PPE, accident or near-miss reporting and observing working practices were identified by 30% or more of the interviewees. Figure 11 shows the 24 practices reported by more than 10% of the interviewees overall. Each of these practices (underlined in the following text) will be described briefly in approximate order of frequency.

Figure 11: Proportion of interviewees identifying different safe work practices in three different sectors



Practice descriptions

Training

Training, delivered in different modes for different purposes is a highly salient practice in ensuring safety at work. All organizations offered an induction (even if it was only vaguely remembered, especially by those working in an office environment). Induction typically included an H&S briefing and often a tour of the building or site to indicate fire exits. In the warehouses it also included instructions on how to use a pallet truck, a safety knife and a tape gun. In many of the organizations across the three sectors, training was delivered either on-line or through DVDs. The content covered many of the basic operational practices in the organization, as well as including those with a specific safety component like manual handling. Safety training was therefore part of the basic training. These on-line courses were 'refreshed' at regular intervals, often more frequently than annually. Face-to-face training was used to supplement this on-line training, particularly in the warehouse environment, where basic practices were demonstrated and then repeated back. This also occurred on some retail stores. However, in these environments it was often aligned with observing.

Reporting/Investigating

Some form of incident or accident reporting was identified by a significant proportion of individuals in all three sectors. There were near-miss reporting cards in the warehouses, or on-line incident forms in many of the retail stores. Upon completion these would be reviewed by managers locally or centrally in the head-quarters and investigated. Local investigations were reported centrally.

Meeting to discuss H&S
All of the organizations held a periodic meeting, often designated a H&S Committee, where H&S matters were discussed. Typically these were either monthly, if H&S formed part of a wider agenda, or quarterly if the sole purpose of the meeting was to discuss H&S. A number of individuals were co-opted into these meetings representing different units or stakeholder groups within the organization.

Observing
This involved designated individuals, typically team leaders, discretely watching others working and then providing feedback to the individual, for example, on their manual handling techniques or use of manual handling equipment. Poor technique could result in the need to repeat on-line training. This observational practice was described overtly as sponsoring, where more senior individuals, including front-line workers, were involved in the training of more junior staff in a coaching-style relationship. These sponsors were required to sign-off the newer member of staff once they were deemed to be competent and were accountable for their on-going safe working practices. This sort of relationship encouraged individuals to challenge each other to work safely, use equipment properly and not seek to cut corners and moreover, was expected by managers. Not only were individuals expected to challenge others, including those more senior than themselves if they saw them working unsafely, but they were also expected to continuously monitor the environment around them, aiming to keep it tidy and establishing good housekeeping practices. Checking or monitoring was practised by managers in response to the prescribed checklists circulated by their headquarters at regular intervals, typically monthly. These provided a checklist of actions that needed to be completed and signed for. The report was then returned to their headquarters for monitoring by the central QSHE team.

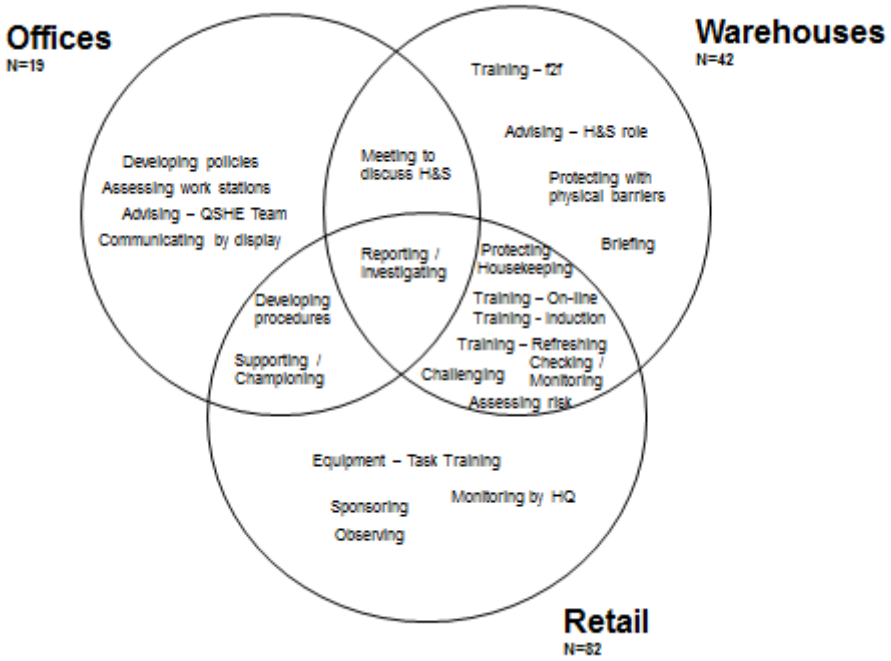
Organizations protect their employees by providing appropriate personal protective equipment (PPE). In these contexts this was mainly high visibility jackets to wear when walking in areas where there were vehicles: Lorries in delivery yards; cars in car parks; forklift trucks in stock areas. Assessing risk generally across all facets of activity in the organization or specifically around DSE in office environments were part of the management and supervisory roles. Organizations developed roles either formally or informally that regularly advised or supported H&S practices within the organization. Advising roles were discrete formal roles, while H&S Champions were an informal role with a responsibility to monitor H&S and advocate for it.

All organizations provided information on-line that individuals could access as needed. These included guidelines on specific practices as well as more general H&S guidance. In addition the QSHE team in the headquarters of all organizations had developed policies for H&S that were updated. The QSHE team was also available to give advice as required. Finally, organizations communicated to employees about health and safety in various ways using newsletters that needed to be acknowledged as having been read or by visual displays such as posters on noticeboards.

Sectorial differences in practices
Not all of the 41 reported practices were considered equally important, as indicated by the proportion of interviewees who noted their existence. Some practices were deemed more important in particular sectors than in others (Figure 11). For example, developing policies was referred to only by interviewees in offices, whereas training in the use of equipment or the performance of tasks was referred to only by interviewees in retail settings.

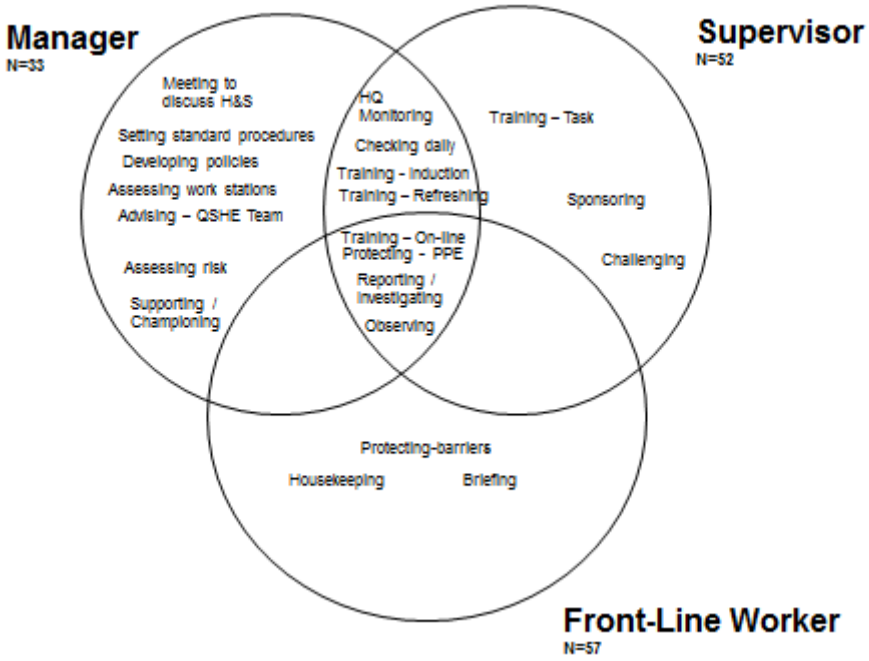
Figure 12 shows the distribution across sectors of those safety practices reported by more than 20% of the interviewees in a sector to highlight the differential salience of practices between sectors. One set of practices (reporting and investigating accidents and incidents) was common to all three sectors. The prioritization of Health and Safety Committee meetings was evident in offices and warehouses, perhaps this is a requirement of the organization to which they belonged. The reliance on informal advocacy for safety through the appointment of safety champions and supporting informally with safety advice was common to offices and retail. There were many practices that fell in the overlap between retail and warehouse reflecting perhaps the commonality of areas of stock of different sizes and the need for competent and effective performance in this arena.

Figure 12: Safety related practices reported by 20% or more of interviewees in each sector



Some practices were apparently unique to particular sectors. In retail the practices of sponsoring, observing and training for proficiency in task performance and equipment use was a coherent bundle of practices that reinforced the need for skilful enactment of tasks and practices. While these practices were enacted locally, the regular reporting to the organization's headquarters through weekly or monthly monitoring of *inter alia* training records and near miss and accident records and the resultant actions, encouraged attention to performance. The warehouse relies on face-to-face interactions through briefings to communicate, unlike the office environment in the same organization where policies and procedures were written and posted on the intranet. Warehouses were the only environment where man and machinery met extensively, and necessitated safety barriers. Continuous monitoring of the physical work space reflected the frequently fast-paced nature of the environment with considerable stock turnover ("*I ship 32 million individually picked cases each year through 16 doors*") and the need for vigilance because conditions could change quickly. While a local safety advisor was present in each of the warehouses, the office environment relied on a central QSHE team from headquarters for formal safety advice.

Figure 13: Safety related practices reported by 20% or more of interviewees in each role



The data on practices which support safety in organizations may also be examined from the perspective of the different hierarchical roles (Figure 13). This analysis suggests that interviewees in different roles attend to (and therefore comment on) different sets of practices. Some practices were mentioned by all three roles: training, protecting through the provision of PPE, reporting and investigating and observing. The absence of overlaps in the mention of practices between roles suggests that there may be some exclusivity. Front-line workers alluded to being told what to do through briefings and that they were to focus on good housekeeping and respect safety barriers designed for their protection. Supervisors focussed on ensuring front-line workers were working safely by making sure their training was up to date, challenging poor practices and providing support through coaching and mentoring where necessary. They also played some part in the daily inspection of the local work environment and were aware of, even if not necessarily involved in, the regular tracking book submitted to headquarters. Managers referred to a greater number of practices, including: setting procedures; developing policies; dealing with audits; seeking advice from QSHE team; discussing health and safety at regular meetings; and assessing risks.

Who sets policy?

There was some uncertainty among about 10% of the total sample on the question of 'who sets safety policy and safety goals' in these organizations. However, up to 30% of interviewees in some retail organizations didn't know where the policies and goals originated. In the office environment interviewees, "*imagine[d] the QSHE team do that*". "*The HSE team I would have thought, I don't know of anybody specifically*". This lack of certainty contrasted with the much stronger conviction that individually they had no involvement, "*No, No, No*". It was all somewhat vague, "*we usually get an email when there's something new*", which corresponds with the view from some retail organizations where, if interviewees knew where the policies came from, they "*imagine[d] most of it comes from corporate*" or simply from "*someone up above*". When they didn't know, or thought it came from their manager by a process of "*filtering down*", they were "*just told to follow procedure and that's what I do*". There was a sense that policies from head office were followed passively, with only limited scope for local adaptation: "*We follow the company guidelines. No matter how big or small your store is you*

don't get the opportunity to flex or opt in or opt out". "*Each store will have the same Health and Safety policy*" or "*we just follow the [organizations] overarching policy*". This suggests that employees have little input to these safety policies, and perhaps little ownership or knowledge of them.

In contrast to the retail and office sectors where at least 60% interviewees felt that safety policies came from head office, in the warehouse less than 40% thought policies came from head office, but rather from local health and safety advisers, where these had been absent elsewhere. The greater awareness of the health and safety adviser may reflect their full-time paid role, but also the potential to develop policy locally in addition to following generic company-wide safety policies. A H&S adviser at one warehouse noted that the "*policy for this site may be slightly different to what you'll see over next door, because they've got different risks*".

Responsibility for safety

More than 75% of interviewees identified themselves as being personally responsible for safety. One retail interviewee noted that, "*it says on the board you are all responsible*". Typically, this involved "*following the rules*", or more colloquially, "*doing nothing stupid*", or "*trying to keep out of mischief*". For most, "*following the rules*" meant wearing PPE, tidying up, lifting correctly and challenging others to looking out for potential safety issues. For others it meant participation in Health and Safety meetings and training others who were less experienced. For managers it meant leading by example or acting as a role model for others to follow, as well as completing the periodic audit assessment sheet.

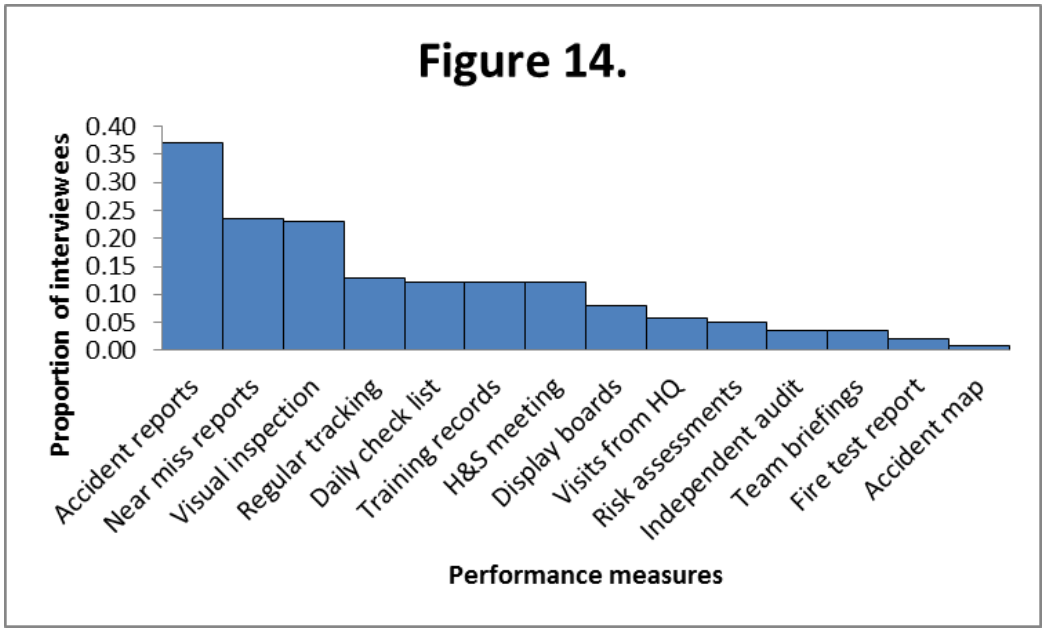
However, more than half of the interviewees also identified everyone as responsible for safety, or a specific person or group of persons. The balance between these perspectives varied by sector. In an office environment three quarters of the interviewees identified a single individual or the safety committee as having responsibility for safety, but only one quarter suggested that everybody did. It was either "*down to individuals to be aware of their own safety*" or "*absolutely nobody*" had responsibility. In the retail environment about 60% of interviewees said that managers and supervisors or the Health and Safety representative/champion were responsible for safety. A similar proportion noted that it was down to "*everybody really*", and that "*we're all responsible for making sure that everybody does things in the correct way*", although "*not everyone cares*". So perhaps this universal participation in safe working happens more "*in theory*" than in practice. In the warehouse, only 30% of interviewees identified the manager or Health and Safety adviser as being responsible for safety, while 70% thought that "*everybody does their bit*", and "*all were responsible for each other*", although "*some don't bother*".

Outcomes

Performance monitoring

Across all of these organizational environments interviewees identified 14 different practices for monitoring safety performance (Figure 14).

Figure 14: Practices for measuring or monitoring safety performance identified by interviewees from three different sectors



There were three times as many practices for recording accidents, near-misses and fire drills in the retail environment than in the office environment. These statistics were reviewed at the regular health and safety meeting and acted upon as necessary. Almost half of the interviewees in the office had no idea that safety performance was monitored (Table 8).

Table 8: Exemplar quotes from interviewees in the office environment

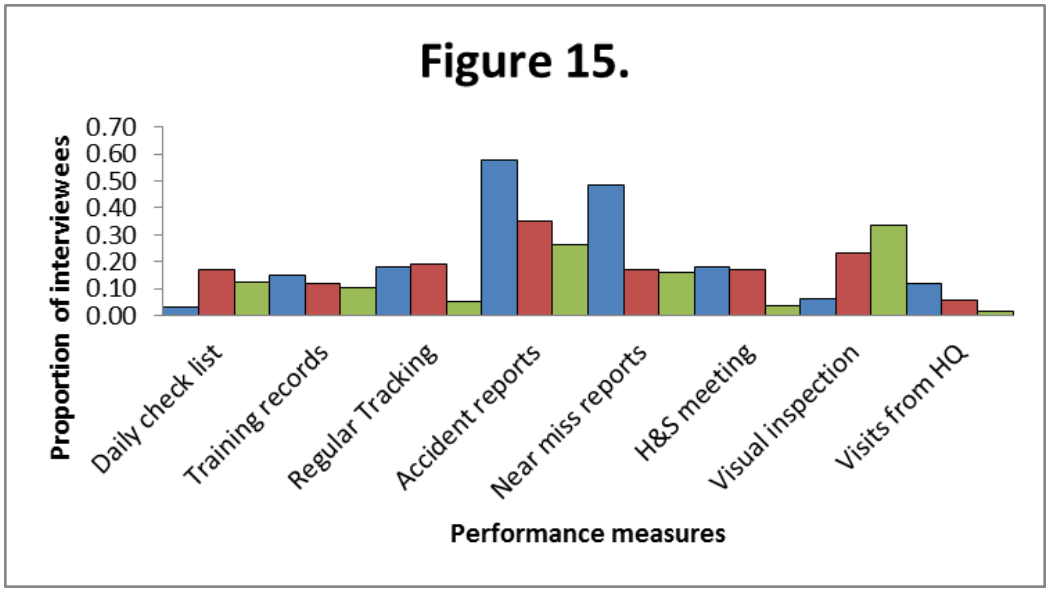
Interviewee Number	Exemplar quote
1	"I've never been asked to complete any monitoring or measurement for H&S"
2	"I'm just trying to think, in the office, I don't know"
3	"I suspect they've got an accident book, I think I might have even seen it"
4	"You'd get worried if you saw an accident board in the office"
5	"I don't have any measures for H&S, no "
6	"I'm not really sure, I don't know I'm afraid"
7	"[nothing] that I'm aware of being recorded"
8	"I don't even know if it is [measured]"
9	"There's not really a lot in terms of office, that I'm aware of"

Despite having many more measures, safety in the retail environment was monitored principally using the measures: accident reporting, visual observation of working practices and the weekly or monthly self-assessment check book that was completed and returned to head office. The latter provided a comprehensive guide to what activities were required to ensure continued safe operations. Visual observations encouraged attentiveness amongst the employees. Several different practices to

monitor safety were perceived to be adopted by between a quarter to one-third of interviewees in the warehouses. Although accident reporting occurred there was considerable emphasis on near-miss reporting. The data from these sources were considered at the regular health and safety meetings and used to up-date information boards displayed throughout the building informing workers of lost-time injury rates or injury frequency rates or time since last accident, for example.

There were some striking differences in awareness of practices for safety monitoring across the organizational hierarchy (Figure 15). Managers emphasised the reporting of accidents and near misses and gave less attention to the health and safety meeting, the weekly and monthly self-assessment book and external inspections. Front-line workers were largely unaware of the latter practices, but acknowledged the reporting of accidents and near misses. For them the focus was on visual inspection. They were conscious that "*people were spying*" on them, but thought they had "*got their eyes open*", and were monitoring their environment. Supervisors were often the observers so this featured strongly in their safety practices. They used daily check lists to help them as well as having some responsibility for the weekly/monthly self-assessment book returned to head office. They also attended health and safety meetings to discuss the accident and near-miss reports.

Figure 15: Practices reported by managers (blue), supervisors (red) and front-line workers (green) in three different low hazard environments



Changing safety performance

Interviewees rated the safety performance of their organizations in a variety of ways. Some gave a score out of ten, ranging from six to ten. Most others used a qualitative description ranging from "*very, very good*" to "*only OK*"; 50% thought it was "*good*". A few others rated it as "*fine*" or "*high*". These assessments seemed to be based on an absence of serious accidents.

Only three of the interviewees (two from the same store) felt that safety performance in their organization had deteriorated. The remainder, if they had an opinion, felt that it had either improved or had remained the same. Sectorial differences were evident. In the office environment two thirds felt that safety performance was improving because the profile had been raised and there were more initiatives and "*more guidelines to follow*", although this was "*getting ridiculous*". There was also a greater focus on DSE assessments. The remainder felt that safety performance was about the same.

In the warehouse environment less than 20% of interviewees felt that safety performance had remained the same, and these were mostly from one site. Everyone from one site, and more than 80% overall, felt safety performance was improving, "*coming on in leaps and bounds*", evidenced by a

"*60% drop in accidents*" in the last year. Historically safety had been poor, in fact "*when I first started it was rubbish*" and the site had come under considerable scrutiny from the EHO. This had changed with a new management team and a greater focus on safety by managers and awareness of safety by front-line workers.

In the retail environment about 25% had no opinion and those seeing an improved safety performance were slightly more than those seeing no change. Triggers for an improved performance appeared to be the opening of a new store, the appointment of a new manager with a greater emphasis on safety or a change in the focus of the head-quarters and a greater number of initiatives. Evidence of the improved safety performance included more briefings and talks and an increase in reporting requirements. It had been "*drilled in*" during the training. Interviewees considered that safety had been tightened up, there was greater focus and "*awareness increased*". Organizations were "*a lot hotter*" on safety to the point of being "*anal*" about it. Nevertheless, for others there was "*always room to improve*" and "*it could be better*".

DISCUSSION

A review of the safety literature facilitated the development of a set of design propositions (Part A) that may help to explain how particular safety interventions achieve the aim of either a reduction in accident numbers or a change in employee safety behaviours in the context of front-line workers and their supervisors in large hierarchical single-site centralised manufacturing/process or energy organizations. One of the objectives of this empirical study was to investigate whether these propositions, developed in manufacturing contexts, applied in the very different low hazard environments of many service sector organizations (Prajogo, 2005)[46]. In order to achieve this objective and following the CIMO-logic (Denyer *et al*., 2008)[8], it was necessary to examine the actual practices and safety outcomes to see if they differed in this new context. The empirical study also investigated the new dimension of organizational hierarchy. Earlier studies had focused mainly on front-line workers and sometimes their supervisors. Although some studies have investigated board-level safety practices (Smallman and John, 2001)[47], middle managers have been largely ignored, yet they act as boundary spanners who "mediate between the organization, its customers and its suppliers (Floyd and Wooldridge, 1997: p. 466)[48]", and "perform a coordinating role where they mediate, negotiate and interpret connections between the organization's strategic and technical levels" (Floyd and Wooldridge, 1997; p. 466)[48], being "structurally closer to their employees and so [more] likely to be attuned to their subordinates' emotional needs" (Huy, 2002; p. 32)[49]. These were included in this study.

Outcomes

The practices that were used to measure or monitor safety performance in these service sector organizations in this study suggest that the same safety outcomes as in the manufacturing sector are important here. These are a reduction in accidents and changes in safety behaviours. Considerable attention was given to reporting accidents and near-misses in all environments, often with the intention either to design out the cause of the accident by changes in processes (as in the warehouse environment: "[the company] *will generally take the position that will cost us a hundred grand to make sure that there's literally no risk whatsoever*"), or to revise training regimes to raise awareness of safety issues and improve specific task competency (as in the retail environment).

Observation of working practices was especially important in the retail environment and also in the warehouses, but absent entirely in the office environment. These frequent interactions between supervisors or team leaders and their team members encouraged the routine adoption of safe working practices, and the amendment of individual behaviour. Failure to comply meant that individuals had to undertake re-training and subsequent failure could result in disciplinary measures and ultimately loss of employment. Re-training appeared to be sufficient to stimulate behaviour change.

In addition, in the retail environment especially, considerable attention was given to monitoring the level of safety of the working environment by frequent checking (several times per day) triggered by a "guide" from headquarters. The removal of trip hazards and obstacles from fire exits, the clearing up of spillages and the separation of man and machine and other safety practices will quite likely reduce accidents. However, the maintenance of a safe working environment in the retail and warehouse contexts seemed to have become an organizational safety objective in its own right, distinct from reducing accidents and changing behaviours. This focus on an alternative safety outcome is perhaps unsurprising in environments where accidents are uncommon and often not life changing. For example, recently reported accidents included slipping on an empty coke can, scalding from hot liquids in a café and gashing of hands on cages whilst moving stock. None of these are life changing.

An additional safety outcome in the retail and warehouse environments not apparent in other safety research is the minimizing or mitigation of risk. By contrast, in the office environment, the main focus appeared to be on accident reporting, with little effort to change behaviours or to intentionally maintain a safe working environment or mitigate risk. Safety outcomes in the offices were assumed, "*I wouldn't say it's a hazardous environment in the first place*", and "*it's kind of a comfortable, safe environment, you just expect yourself to be safe here*". Because accidents happened so infrequently, where they did, they were attributed to individual carelessness and the desired safety outcomes were not made explicit.

Interventions

Safety practices on the one hand appear generically similar across organizational contexts and yet, on the other hand, are observed to be different in detail. This conundrum merits an attempt at an explanation.

DiMaggio and Powell (1983: p. 148)[50] define organizational field as "those organizations that, in the aggregate, constitute a recognized area of institutional life". Safety is such a field, with its regulatory frameworks supported in law, with insurers covering costs of safety failures, with its professional associations giving training and advice, with H&S advisers in organizations, with organizations and their employees seeking to comply with safety standards and with a public keenly aware of lapses in safety. DiMaggio and Powell (1983)[50] suggest that many organizational structures and practices are adopted by organizations because the cultural environment encourages them to do so. Failure to adopt would be deemed improper or illegitimate (Suchman and Edelman, 1996)[51]. This 'institutional isomorphism' (DiMaggio and Powell, 1983)[50] may result in dissimilar organizations adopting similar practices.

The review of the research literature identified a wide variety of practices adopted by mainly manufacturing/process industry organizations. These included practices associated with different leadership styles, for example, goal setting, monitoring and giving feedback and role modelling and explaining. They also included risk assessments, provision of PPE and the adoption of housekeeping practices, as well as training. All of these were evident in this investigation of service sector organizations, albeit with different emphases perhaps. Training in a variety of styles for example, was prioritized in these settings along with monitoring and observation and feedback. This similarity of practices resonates with the idea of institutional isomorphism in the safety field. DiMaggio and Powell (1983)[50] identify three forces that drive such convergence. Coercive pressures, often with legal backing, encourage organizations to adopt similar practices. Case law would seem to encourage the accretion of practices, as new legal rulings create uncertainty about the efficacy of existing safety practices in addressing legal challenge. Normative pressures from professional organizations with standardized training programmes encourage the adoption of common practices in organizations irrespective of their relevance and applicability. Finally, in uncertain or ambiguous situations organizations may succumb to mimetic pressures, simply copying what is deemed to be good practice by others. Each of these alone, or in combination, may account for the apparent similarity in safety practices observed in these organizations and their similarity with safety practices found in higher hazard environments.

Nevertheless, 'new institutional' theory also suggests that apparent convergence of structures and practices may be symbolic (Suchman and Edelman, 1996)[51]. Meyer and Rowan (1977)[52] in their seminal article argue that symbolic conformity allows ceremonial display and decoupling of actual practice from reported practices, so that a "logic of confidence" is maintained. Organizations can display appropriate artefacts and maintain a façade of proper practice that satisfies the expectations of stakeholders in the external environment, while actually doing different things. This is not to argue that safety practices are all a sham, but rather that in an uncertain and ambiguous environment ritual performances allow organizations to give meaning to their activities for the benefit of different stakeholders. This allows the possibility of difference in practice despite apparent convergence. It is likely that many of the practices adopted in the organizations in this study, although superficially similar, were different in detail. Training, for example, came in many forms and yet would be described generically as training. Monitoring too may take many forms, although this variety is not encapsulated and articulated in guidance notes like HSG65 (Health and Safety Executive, 2013)[2].

The prioritization of particular safety work practices varied by sector. In the office environment there was an emphasis on the collation and provision of safety information for individuals to access as required. Accidents and near misses were reported and discussed at H&S meetings. Written policies and procedures were developed and made available on-line. Posters communicated safety messages informally. Advice was readily available through either a local H&S champion or a central QSHE team. In the warehouse environment the safety practices emphasised the minimizing of risk in three ways: by providing protection; by constant attention to work practices and working environment; and by careful instruction through face-to-face briefings and readily accessible safety advice from an on-site H&S adviser. The four different organizations in the retail environment seemed to focus on improving competence through extensive training and on the monitoring of local activity by headquarters through checklists and regular audit reports to ensure local compliance with central policies and procedures.

Table 9: Top three practices noted by managers, supervisors and frontline-workers in three different sectors

	Office	Retail	Warehouse
Manager	Assessing DSE H&S Committee Developing policies (N=9)	Checking – Monitoring Training – on-line Assessing risk (N=15)	Checking-Monitoring Reporting/investigating Advising (H&S role) (N=9)
Supervisor	Support of QSHE Team Practicing fire drills Assessing DSE (N=6)	Training – on-line Protecting (PPE) Checking-monitoring (N=29)	Reporting/investigating Advising (H&S role) Protecting (PPE) (N=15)
Front-line worker	Supporting – responsible person Developing policies Assessing DSE (N=4)	Training – on-line Observing Protecting (PPE) Tidying up (N=37)	Protecting – safety barriers Protecting – PPE Advising (H&S role) (N=16)

It was notable that different hierarchical roles in each of the three sectors gave different credence to different practices (Table 9). In the office setting all employees anticipated the provision of a safer place to work (through DSE assessments) and the availability of support or advice if needed, which it rarely was. Employees in the retail environment anticipated competent colleagues who could reliably and safely execute their tasks. This was reinforced by observation of front-line workers and checking and monitoring to ensure safe working conditions and safe practice by supervisors and managers. In the warehouses all employees welcomed the availability of local H&S advice. Managers here (like those in retail) spent time checking and monitoring the work environment against standard criteria. With their supervisors they followed up on accidents and near misses investigating them and

reporting them to headquarters. Supervisors and front-line workers, but not managers, in both retail and warehousing valued the protection afforded by PPE (principally high visibility jackets).

Context

The organizational contexts in the reviewed safety literature differed from those in this empirical investigation in several important respects. First, they were studies of manufacturing and process industries while this was a study on service sector organizations. These industrial sectors differ in two important respects, namely, the intangibility of the outputs of services especially those involving customers in service industries compared to the measurable and standardized specifications of products in manufacturing and the difference in the operation systems, where in services the delivery and consumption process are often simultaneous (Prajogo, 2005)[46]. Second, the organizations in the reviewed literature operated mainly from a limited number of locations, in many instances just a single location. All of the organizations in this study had a centralised headquarters coordinating and controlling the activity of several hundred dispersed units. There was, therefore, a noteworthy physical separation of authority from activity that spawned practices such as a monthly checklist to provide an audit trail of compliance with organizational policy and procedure. Third, the population of respondents in the earlier studies were predominantly experienced, full time, male, front-line workers, whereas the interviewees in this study were demographically more diverse. They included many more females and part-time workers (particularly in the retail sector) and middle managers too. The variation in demographic characteristics of the sample may influence the levels of awareness of safety practices and perceptions of their efficacy because managers have a legal obligation to be more attentive to safety, and more junior part-time workers may be simply interested in the pay.

For the interviewees from the office context safety appeared to be a relatively insignificant consideration in their daily work. Moreover safety was an individual's personal responsibility. The main focus of attention was on DSE assessment and work station safety by a gender balanced sample with a greater proportion of older workers. Challenges by others to work safely never occurred and safety for the whole office was perceived to be devolved, being the responsibility of a designated H&S champion.

In the warehouses of the same organization a younger, predominantly male, population were strongly encouraged to meet organizational performance targets. Regular face-to-face communication and frequent challenge to work safely were key aspects of this environment.

The retail environments differed from these other two contexts and also those in the reviewed literature in one crucial respect - the presence of customers on site. Unpredictable customer behaviour (increasingly including aggression towards staff) creates a greater level of uncertainty that cannot be easily controlled and alters the balance of hazards, particularly around slip hazards through spillages and wet surfaces. Demographically too these settings were different as noted above, including more women and many younger (16-25 year olds) and part-time employees, for whom pay rather than safety performance might be the greater priority "*especially [because] the teenagers are more carefree about these things…If you have never seen any accident or seen any issue then you are going to be more carefree*".

Elucidating mechanisms and developing propositions

Earlier studies (see Part A) have drawn on seven different theoretical perspectives to explain the connection between the safety intervention and the safety outcome. Four of these seemed to more effectively account for the practices observed in the literature. In this empirical study interviewees were asked to identify which practices worked well and which ones were less effective in an attempt to surface potential explanations for the perceived efficacy of particular practices. Aggregating across all of the data, Table 10 indicates practices that were perceived positively and those practices that were not perceived positively. It also attempts to distinguish between those practices that are structural or organizational in origin and which individuals are subject to by another individual or group (typically headquarters) requiring only passive engagement and those practices that require discretionary effort. The former are organizational attempts to constrain individual behaviours and

delimit the possible extent of injury or harm. They suggest individual safety compliance (Neal *et al*., 2000)[23]. The latter, however, are activities that individuals can engage in to a greater or lesser extent and suggest safety participation (Neal *et al.*, 2000)[23]. These also help to reduce the overall risk of injury or harm.

Table 10: Safety practices perceived positively and not positively by interviewees in three different contexts

	Organizational/Passive	Individual discretionary/Active
Positive	Assessing workstations Communicating – posters Governing – Regulating (QSHE Team) Supporting – Advising (Formal) Training – online Protecting (PPE) Checking - Monitoring	Supporting – Advising (Informal) Training – f2f Observing Briefing
Not-Positive	Providing Information Developing Policies Reporting – Discussing (H&S Committee) Reporting – Investigating Assessing Risk	Training – Refreshing Sponsoring (Mentoring/Coaching) Challenging Tidying

The foregoing discussions of context, intervention and outcomes may be synthesized and the following specific propositions for designing safe working practices in service sector organizations developed.

Offices

In summary, in these environments safety is barely considered by interviewees because accidents and injuries are rare. Safety is an individual's responsibility and accountability is devolved to an individual or group of individuals who are expected to keep the others safe. Simple provision of information and easy access to it is all that is expected by employees.

> ***Proposition 1.*** In office environments where accidents and injuries rarely occur, employing mature experienced full-time workers, providing information on-line or through posters and informal advice, increases safety knowledge and reduces injuries, accidents and near-misses.

> ***Proposition 2.*** In office environments where accidents and injuries rarely occur, employing mature experienced full-time workers, devolving responsibility for group safety to an individual or small group afford protection to the larger group and reduces injuries, accidents and near-misses.

Warehouses

In these environments the aim was primarily to reduce the number of accidents and injuries and secondarily to change behaviours. This was achieved by removing hazards, the provision of protective equipment, by good housekeeping and by clear and careful instruction.

> ***Proposition 3.*** In warehouses employing younger males full-time, the provision of PPE, the physical separation of man and machine, the attention to good housekeeping and the implementation of stated work procedures encourages the standardization of work practices enabling a reduction in accidents and injuries.

Proposition 4. In warehouses employing younger males full-time, rigorous on-going training and frequent verbal communication through briefings and challenge establishes clear expectations of desired performance resulting in changed behaviours and a reduction in accidents and injuries.

Retail

In these environments the aim was to minimize the number of accidents but also to change behaviours by ensuring competence through extensive training.

Proposition 5. In retail organizations employing both full time and part-time workers, who may be younger, rigorous on-line and task specific training that is regularly refreshed and work performance that is constructively critiqued, develops skills and ensures greater task competency and reduces the risk of accidents and injuries.

Proposition 6. In dispersed retail organizations employing both full time and part-time workers, who may be younger, the provision of a daily check list of activities to undertake and the completion of a prescribed self-audit report on a regular basis reduces the risk of accidents and injuries.

Retail and Warehousing

Proposition 7. In retail organizations and warehouses, front-line employees who observe consistent management involvement in safety (including risk assessment, accident reporting and investigation, regular challenges to practice), receive appropriate training and provision of PPE, have higher perceived organizational support for safety and better safety behaviours.

Proposition 8. In retail organizations and warehouses, the regular observation of individual working practices and the regular monitoring of organizational working practices by headquarters, encourages individual and organizational attention to safety and reduces accidents and injuries.

CONCLUSION

This empirical study addressed some of the limitations noted in Part A as a result of the review of literature on safety practices and the development of design propositions to explain their efficacy in particular contexts. Specifically, it has provided empirical evidence of the hazards and safety practices prevalent in three service sector contexts (retail, office environments and warehouses), noting in particular that three main hazards were commonly reported (trips, slips and manual handling), which correspond to the focus of recent safety campaigns. To mitigate these hazards many different safety practices were reported that appeared to be implemented in all three contexts, although we suggest that the detail of the execution of these practices might show appropriate variation in response to differences in context. Using the same CIMO-logic deployed in Part A, it has been possible to develop a number of tentative design propositions to explain how particular practices may help to mitigate the hazards and advance safety outcomes in the different contexts studied here. These merit further examination and testing in other low hazard settings. Finally, the study has provided the first insight into hierarchical differences in engagement with particular safety practices. This provides a novel view, unavailable in earlier work, which has focused solely on front-line workers and occasionally on their supervisors. This study demonstrates that middle managers report awareness of a greater range of safety practices than either supervisors or front-line workers, suggesting that middle managers play a key role in the enactment of safety practices in organizations.

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APPENDIX 3

Interview protocol:

Intervention:

1. What is done in your organization to ensure safe working?
    a. Have there been any recent safety initiatives? What are they? In your opinion have they been successful? why (evidence)?
2. Who sets the policies and goals for safety in your organization?
    a. Were you involved?
3. Who is involved in ensuring safe working?
4. What do you/they do to contribute to safe working and a safe work place?
    a. Why are you/they involved? (*check for formal responsibility or informal engagement*)
    b. To what extent do you/they work as a team to achieve these safety goals? How does this happen? (*Examples*)

Outcomes:

5. How is safety performance measured/monitored in your organization?
6. How would you rate your organization's performance on these safety measures? Why?
7. Is safety performance changing? In which ways? Why? How do you know? i.e. *describe how you feel & factual evidence too safety behaviour is changing within your organization/unit*

Mechanisms:

8. Referring to your earlier answers about what your organization does to ensure safe working practices:
    a. What do you think works well? When? Where? Why? How do you know?
    b. What doesn't work well? Why? How do you know?

Context: (feeling vs. evidence)

9. What are the main safety hazards in your organization?
10. To what extent are staff/employees/colleagues concerned about the possible consequences of these hazards? Why? How do you know?
11. Do you feel able to challenge unsafe practices of others (*check below, same-level, above*)? Why? Example?
12. To what extent are people able to speak up about safety issues? Do you talk about safety to others? Who with? How often? Does this make a difference to you? How?
13. To what extent is safety compromised to achieve other organizational goals (e.g. *productivity, customer service, cost-savings*)? (When? Why?)
14. Are organization goals (as above) ever compromised for safety concerns?

Incident:

15. *Thinking of an incident or near-miss in the last few months*:
    a. What happened/what went wrong?
    b. Who was immediately involved? Why these people?
        i. Who was involved in the aftermath/follow up?
    c. How did it happen? Why did it happen?
    d. Were resources (equipment/skills) immediately at hand to deal with the incident?
    e. Was the incident/near miss investigated?
    f. What actions were prescribed?
    g. Were they implemented?

While this paper reports on research that was funded by IOSH, the contents of the document reflect the views of the authors, who are solely responsible for the facts and accuracy of the data presented. IOSH has not edited the text in any way, except for essential formatting requirements. The contents do not necessarily reflect the views or policies of IOSH.

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Suggested reference
Pilbeam C, Davidson R, Doherty N, Denyer D. *Safe working: designing safety practices for service sector organizations*. Leicestershire: IOSH; 2016.

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