

Networks of influence: practising safety leadership in low hazard environments

Report submitted to the IOSH Research Committee

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Published in 2016

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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

Safety leadership is increasingly espoused in guidance notes and safety standards to improve organizational safety. Furthermore, it has been the focus of much research. Nevertheless, two things still remain unclear: who are safety leaders? and what do they do to ensure safety?

The aim of this research was to address these questions in the context of low hazard environments characteristic of service sector organizations, where the overwhelming majority of the UK's workforce is employed and which have been under-investigated. In contrast to the high hazard environments, such as energy, construction and manufacturing industries, which have been the predominant focus of safety research and which often draw extensively on design and technical solutions to achieve safety improvements, service sector organizations rely heavily on communication and personal influence to change behaviours and attitudes towards safety and reduce accidents and injuries, typically caused by slips, trips and falls.

The project created four datasets using a variety of methods. Deploying a systematic literature review methodology, the first dataset reviewed existing academic, policy and practitioner literatures to identify where safety leadership was enacted, who was demonstrating leadership and what they did. The second dataset comprised of 143 semi-structured interviews of employees from four leading UK organizations across 10 different stores, one global logistics company (including two warehouses and one office) and one local hotel. These interviews characterised the organizational context, the variety of safety practices, the measures of safety performance and made suggestions of what worked well. Twenty-eight of these individuals then kept an audio-diary for a two-week period to record moments in their working day when safety became salient to them. This was the third dataset and revealed those situations when safety was a concern and their response to these circumstances. The final data set comprised of a survey of employees in four of the participating retail stores to discover individual attitudes to safety, largely based in existing scales and the nature of the connections between employees using social network analysis.

The senior management team is responsible for organizational safety, although UK legislation notes that everyone has a responsibility for their own safety and that of others. Nevertheless, much of the research has focused on the supervisor-front-line worker relationship, or on the safety professional. So it remains unclear who are 'safety leaders'. Moreover, an individualistic transactional-transformational leadership perspective is commonly adopted, ignoring the more 'pluralistic' forms of leadership that appear more appropriate for achieving relationally-dependent improvements in safety.

The practices adopted by safety leaders to ensure safety appear to conform to the variety of practices identified in existing standards and guidance notes, despite variation in organizational settings. There were, nevertheless, differences in hierarchical responsibilities for these practices with junior staff having more responsibility for maintaining the safety of the immediate work environment and more senior staff establishing the safety context.

Audio diaries suggested that safety most often became salient when there was an incident, but that these were swiftly resolved by the individual concerned. Many of the responses adopted a single-loop learning model, which precluded the opportunity for organizational learning from safety incidents. As a consequence incidents recur and organizational safety performance is not improved.

Attitudes to safety were almost universally positive with little dissent, suggesting that induction and on-going 'refresher' training was effective. Social network analysis of the stores showed that managers and key supervisors were central to the networks and therefore had the highest potential influence over attitudes.

This report complements the previous reports on each individual data set and begins by highlighting the problematic nature of defining environments as low or high hazard, which occurs in policy reports and guidance notes. It then considers the origin of safety leadership, the responsibilities of safety leaders and, drawing on mainstream leadership studies, offers alternative ways of framing safety leadership. Finally, it considers organizational learning from safety incidents and suggests that this is under-developed and that near-miss reporting is weak. Both are detrimental to the development of a positive organizational safety culture.

INTRODUCTION

Safety leadership is believed to be vital for creating and maintaining safe working environments characterised by low rates of accidents and near-misses and by employees proactively engaged in safety. Much research on safety leadership has been conducted in high hazard environments (HHEs) but there is a paucity of studies in low hazard environments (LHEs) where the overwhelming majority of employees both in the UK and the EU work. Moreover, because accidents in LHEs are rarely life-changing for individuals or catastrophic for communities, it is possible that safety has a lower priority in organizations, or amongst employees of organizations, operating in these environments. Consequently we have little understanding of how safety is led in LHEs and whether the same safety leadership practices that are evident in HHEs also pertain in LHEs. The skills and practices required to enact safety leadership may differ, perhaps in significant ways, between low and high hazard environments.

The Young Report (Young, 2010)¹ noted that health and safety (H&S) regulations for HHEs have been uncritically extended to LHEs. Yet accidents and 'near misses' are comparatively rare in HHEs, but common in LHEs. Additionally, H&S issues are perceived to be less significant and of lower priority in LHEs. Moreover, organizational pressures differ between HHEs and LHEs, so practices appropriate for HHEs, where research on safety related issues is common (e.g. Choudhury and Fang (2008)²; Hart (2002)³), may not be applicable in LHEs, where research is scarce. The focus of our research was on LHEs, such as retail, warehousing, offices and catering and hospitality.

'Slips, trips and falls', which are the subject of the HSE's "Shattered Lives" Campaign, characterise the accidents typical of LHEs. More than 10,000 employees in the UK suffered major injuries from these types of accident in 2008/09 and many more suffered minor injuries, generating a societal cost in excess of £800m p.a. (HSE, 2010)⁴. Occupational Safety and Health (OSH) practitioners play a vital role in securing a continued reduction in these numbers but require support to maintain their efficacy as they adapt their role to fit networked forms of organization, with altered patterns of accountability and greater interdependence and to knowledge-driven changes in organizational practices, including H&S, common to organizations in LHEs. Increasingly OSH practitioners are required to act as leaders on H&S issues within contemporary UK organizations. 'Safety leadership' (Barling et al., 2002)⁵ requires the active promotion of safe work behaviour and practices amongst employees (Kelloway et al., 2006)⁶. Such transformational leadership behaviour has been shown to have a positive effect on a variety of safety outcomes in health care organizations (Mullen and Kelloway, 2009)⁷ raising awareness, positively influencing perceptions of safety and reducing accidents and injuries. While more recent research provides 'safety leaders' with a plethora of tools, techniques and practices to aid their performance, there is a general lack of understanding of their leadership role (Zanko and Dawson, 2012)⁸. In particular, it is unclear how OSH practitioners discharge their duties?; what attention they afford to H&S in the face of competing pressures?; how different information sources support their actions?; and what contextual enablers and inhibitors affect their ability to persuade both managers and employees (contracted and casual) of their expert knowledge and of the need to embrace the health and safety agenda.

Numerous researchers (e.g. Choudhury and Fang, 2008²; O'Toole, 2002⁹; Mullen, 2004¹⁰) have noted the importance of socialisation among colleagues, the attitudes of fellow employees and peer pressure as key factors in encouraging employees to adopt safe working practices. Each of these is predicated on relationships highlighting the importance of social relationships as crucial factors enabling or constraining the efficacy of safety leaders (Zanko and Dawson, 2012)⁸. While relational factors appear to be important in HHEs and also in High Reliability Organizations (Weick and Sutcliffe, 2007)¹¹ where the concepts of 'heedful interrelating', 'collective mind' and 'deference to expertise' (Weick and Roberts, 1993)¹² presume interactions between people, there have been no similar studies in LHEs where relationships are at least equally important. This project addresses this deficiency by the application of social network analysis techniques (Wasserman and Faust, 1994)¹³. Investigating the presence or absence of ties and their content has revealed the social structures surrounding the implementation of the H&S agenda by OSH practitioners and helps to explain their capacity to lead and to engage the wider workforce (Markey and Patmore, 2011)¹⁴.

External contextual changes including, for example, greater deregulation; outsourcing; multi-stakeholder environments; increase the ambiguity and complexity within organizations. Consequently, rather than an individual heroic model of leadership, shared and distributed models of leadership

(Carson et al., 2007¹⁵; Pearce and Manz, 2005¹⁶; Gronn, 2002¹⁷) are emerging that acknowledge that leadership may be found throughout the organization and not simply at the top. Distributed leadership accepts that multiple individuals are involved in leadership practice but also anticipates the interaction between these individuals and their context (Spillane, 2006)¹⁸. Fitzsimons et al. (2011)¹⁹ suggest a number of approaches to examining distributed leadership. Two (relational-structural and relational-processual) are pertinent here. The former suggests a networked approach that investigates the embedded nature of relationships in a wider system. Responding to Zanko and Dawson's (2012)⁸ plea, the latter provides a longitudinal perspective on how leadership practice emerges and changes over time in response to contextual factors. This project seeks to integrate empirically these two complementary approaches in the study of OSH leadership practice in organizations.

Overall, this research aimed to explain how safety leadership is enacted in low hazard environments (LHEs) by pursuing four distinct objectives and creating four separate datasets. The first dataset was a synthesis of existing research evidence of the occurrence of different types of safety leadership. The second dataset, based on semi-structured interviews, identified safety leadership practices and any enabling and constraining factors. Longitudinal processual data obtained by a novel audio-diary method provided the third dataset indicating triggers for leadership practices and appropriate responses. The fourth dataset was an analysis of the particular social context within which identified safety leaders operated, using conventional survey instruments in combination with social network analysis. By integrating these data sets we contribute to the theory and the practice of safety leadership in LHEs.

Objectives

Within the overall aim of investigating safety leadership in low hazard environments the research project had four stated objectives. These were:

1. To identify the variety of types of safety leadership observed and to characterise the contexts in which each is displayed from an examination of existing empirically-based OSH studies, gathered through a systematic review of relevant academic and practitioner-based literatures and policy reports.
2. To determine the variety of practices enacted and shaped by safety leaders operating at different levels in organizations typical of LHEs (catering and hospitality, retail, warehousing and corporate offices). Attention will be given to the ways in which leadership practice is shaped by the context in which it is delivered, noting in particular any adaptations in response to differing organizational pressures (e.g. customer satisfaction or organizational efficiency) or employed to accommodate different groups/individuals (e.g. casual workers or volunteers).
3. To discover the variation in safety leadership practices actually enacted by individual leaders over a short period of time in LHEs, focusing especially on those triggers which initiate safety practices and whether others are involved, and if so, how?
4. To reveal the social interaction between workers within organizations operating in LHEs through the application of social network analysis techniques and how these influence the perception and attitudes of workers to H&S and their engagement with organizational H&S. Through discovering the extent to which safety leaders are embedded in these social networks we can better understand the enabling and constraining influence of social interactions on their efficacy as safety leaders.

METHODS

Responding to Smallman's review findings (Smallman, 2001²⁰; pg 397) that empirical OSH management research had ignored organizational context and that the use of multiple methods was a 'comparative rarity', this study proposed a comparative multi-sector mixed methods research design to tackle the research questions. We gathered narrative data of on-going safety practices, captured individual perceptions of organizational H&S culture and practices, and the social structural configurations of these actors working in different organizational contexts in LHEs. Data collection was by a mix of survey, semi-structured interviews and diary-methods.

Organizations from three sectors in LHEs yet differing in their frequency of incidents (catering and hospitality, retail, logistics) provided case studies of OSH practice and highlighted variations caused by contextual difference. Participants for our pilot investigations came from a local independent hotel, while those for the main studies came from 14 different sites across four UK branded retail organizations and one global logistics company. Three units each from two different UK retail chains, one with more than 700 stores selling general merchandise and another selling DIY materials and home furnishings from more than 300 stores and four units from a third selling groceries from 280 stores in the UK were used. 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.

The details of the number of respondents to each of the methods applied to the particular sites are shown in the complete data set (Table 1). The 'local' hotel was treated as a pilot-study site for both the interview and diary data collection methods. As a consequence of the initial interviews the protocol was amended so that the data from the hotel were no longer compatible with the data from the other sites. For this reason these interview data were not included in the reports. A number of recordings have not been transcribed (notably from site 4 of store C) reducing slightly the total number of interviews used in the final report. The two different reports of the diary data (Report 3 and Part C) drew on different sub-sets of the total data set. All of the diary respondents were interviewed, but not all of those responding to the questionnaire (notably from site 4 of store C and site 2 of store B) were interviewed.

The background information to each organization informed the cases. A survey of interactions (Objective 4) revealed social relationships between organizational members, an important factor in enabling or constraining the embedding of H&S practice by OSH practitioners. The individual OSH practitioners and their practice were the unit of analysis (Objective 2 and 3).

A brief synopsis of the methods used to investigate each of the objectives is provided below.

Objective 1

The systematic literature review followed the approach outlined in Tranfield et al. (2003)²¹ and developed by Denyer and Tranfield (2009)²². Keywords relating to the review question were developed. Search strings incorporating these key words were developed and applied to relevant bibliographic databases (including for example Scopus, Psycinfo and Ebsco) which permitted electronic searching. Since this is known to be only partially effective (Greenhalgh and Peacock, 2005)²³, relevant specialist academic and practitioner journals (e.g. Safety Science, Journal of Safety Research and Accident Analysis and Prevention, Professional Safety) were hand searched. Inclusion/exclusion criteria were developed focusing on leadership practices particularly in low hazard environments. Outputs identified as relevant provided the basis for "snowball sampling" using reference and citation tracking. Relevant outputs from all sources, agreed by three of the research team, were appraised for quality. Data extraction and synthesis was influenced by the realist synthesis approach of CIMO-logic (Denyer et al., 2008)²⁴ and reviewed by the whole research team. These data form our first dataset.

Table 1: Number of respondents involved in three different modes of data collection from different sites in a variety of organizations from three sectors

Sector	Hotel	Retail											Logistics			Totals
Organization	'local'	Store A			Store B			Store C				Store D	Global Logistics			6
Site	1	1	2	3	1	2	3	1	2	3	4	1	Warehouse 1	Warehouse 2	Office	15
Interviews	9	4	11	6	8	9	8	10	12	7	6	9	21	21	20	161
Audio-diaries	7	3	3	0	3	3	0	0	0	0	0	0	5	4	0	28
Questionnaire	0	22	0	0	28	5	0	0	0	0	17	0	0	0	0	72

Objective 2

Recognising that safety leadership may be both formally designated and informally enacted, we interviewed, using a semi-structured interview schedule, a total of more than 150 individuals from across the organizational hierarchy within each of the 14 participating sites. (143 responses from 13 sites are used in the report). Specifically, we endeavoured to interview individuals who differed according to demographic characteristics, position/role within the organization and span of control to maximize variation in their experience of leading and being lead. The interview schedule followed the earlier CIMO-Logic, exploring contextual elements, including: the priority of safety; safety practices and who enacts them; possible explanations for their efficacy; and indicators of safety performance. These interviews were recorded with permission and transcribed. The data were coded and analysed by question by a single researcher. Summaries were reviewed and discussed by the research team. The data forms our second dataset.

Objective 3

A sub-sample of those interviewed to create the dataset for Objective 2 were invited to participate in a study of safety salience and safety practices using digital voice recorders in a modified diary-method (Balogun et al., 2003)²⁵. In total there were 28 volunteers from four of the retail units, the two warehouses and the hotel. Although the original plan had been to investigate safety practices over a period of six months with recordings at fortnightly intervals, discussions with senior managers in participating organizations and a closer reading of the relevant research methods literature suggested that daily recordings for a fortnight were more feasible and realistic. Participants were asked to identify when during their working day that they became mindful of safety, specifying the nature of the trigger, what they did in response, what the outcome was and whether others were involved. These short recordings were transcribed and coded by three of the research team working collaboratively. Differences of opinion were resolved by discussion. These data formed the third dataset.

Objective 4

Social network maps of social relations were produced using a paper-based survey of employees in some of the participating organizations. The tool used questions derived from existing network studies (Borgatti and Cross, 2003²⁶; Cross and Sproul, 2004²⁷). These questions focussed on the reciprocity of the relationships, the content of the exchanges and their frequency. Measures of centrality were derived from these data using the UCINET software package (Borgatti et al, 2002)²⁸. These were then correlated with other data from the second part of the survey tool which investigated both the perceptions of safety and their engagement with safety of the same participants. These measures of safety perception and engagement had been developed from other questionnaires (notably Vinodkumar and Bhasi, 2010²⁹; Mearns et al., 2003³⁰). Following a more structuralist network theoretic perspective, which focuses on the configuration of the ties and the resources that these ties make available (e.g. Oh et al., 2004³¹; Podolny and Baron, 1997³²) we investigated whether positions in the network affected either perceptions of safety or engagement with safety. These data provided our fourth dataset.

EXECUTIVE SUMMARIES OF FOUR REPORTS

The project developed four reports based on the four datasets, one for each of the four research objectives. The executive summaries for each of these reports are included below following the order of the research objectives rather than the report submission date. The fifth objective was an integration and synthesis of this material. This is presented in Parts A-C which follows the summaries. Three separate parts are included because three separate and distinct challenges arose during the project and from its findings.

The first challenge related to the definition of hazard, the binary distinction between low and high and their subsequent application to organizational contexts. More work is required to clarify and to resolve the implications of this brief paper.

The second challenge related to the main focus of the study – safety leadership. The evolution of the term from safety management without a concomitant change in practices reduces clarity and creates confusion in terms of what is required and who is to perform these actions. Moreover, the empirical evidence from our empirical investigations suggests that generic safety leadership practices are insensitive to context, although specific details may vary considerably from site to site. Further research could investigate the impact of the institutional environment on constraining the development of appropriate safety practices.

The third challenge arose unexpectedly from the data and relates to the learning opportunities for organizational change inherent in safety incidents and paradoxically, how these may not be embraced by adhering to the perceived good leadership practice of empowering employees. It also questioned the veracity of near-miss reporting data upon which improvements in safe working practices are supposed to be based. Future work could investigate the barriers and enablers to the effective capture and use of near-miss data.

REPORT 1: SAFETY LEADERS: Who are they? What do they do?³³

There appears to be no unequivocal or unambiguous definition of safety leadership and no definitive statement of the roles and practices of a safety leader. Yet the questions: Who is a safety leader? Where do they reside in the organization? What roles and practices are constitutive of safety leadership, are important ones and affect organizational working environments and the safety of employees?

The purpose of this report is to review safety-related literature in order to address these questions. It also reviews the wider academic literature on leadership known to the authors to identify alternative leadership perspectives that may impact safety and to suggest possible directions for future research.

Adopting the method of systematic literature review we identify 21 academic articles, 18 policy reports and 18 practitioner articles published in the ASSE journal, *Professional Safety*, that address issues pertinent to safety leadership.

The 21 academic articles using survey-based quantitative data, empirically investigated the relationship between supervisor and front-line employee and how this affects safety outcomes, principally safety compliance and safety participation. These studies were cross-sectional and view leadership either from a transformational-transactional perspective or through Leader-Member Exchange (LMX). It is striking that there is an absence of any systematic academic study of questions related to safety leadership.

The 18 policy reports were a mixture of empirical studies and literature reviews. The empirically-based reports typically examined either directors or supervisors of front-line workers using a variety of qualitative techniques including interviews, focus groups and questionnaires. The studies also adopted either a transformational-transactional perspective on leadership or viewed leadership through LMX. The empirical studies identify leadership practices that could be mapped onto either one of the four dimensions of transformational leadership (idealized influence, inspirational motivation,

intellectual stimulation and individual consideration) or the constructive leadership dimension of transactional leadership.

A set of 8 different practices that safety leaders were encouraged to adopt were identified from the 18 articles published in *Professional Safety*.

Three discrete categories or bundles of leadership practices could be identified from these different literature sources. The first, **Safety Coaching**, has a future orientation and includes the practices of role modelling, being visible, prioritising safety, involving or empowering others, training and coaching. The second, **Safety Caring**, is focused on other people and includes the practices of showing care and concern for others, creating and maintaining a safe working environment, valuing and developing others, communicating and listening. The third, **Safety Controlling**, is focused on ensuring safe working in the present and is characterised by practices that align more closely with management than leadership. This includes the practices of setting goals, monitoring performance and rewarding appropriately.

Alternative conceptualisations of leadership that have not been adapted for empirical investigation of safety leadership include authentic leadership, technical-adaptive leadership and various forms of 'plural' leadership. Each suggests opportunities for future research. Authentic leadership might encourage an exploration of the values and beliefs concerning safety of individual safety leaders. Technical-Adaptive leadership encourages an examination of the effect of context. The existing studies focus on stable organizational contexts, but how is safety leadership practised in dynamic environments? and does it differ? 'Plural' leadership asserts that leadership may not reside with a single person and suggests that safety leadership may be shared between a small number of people or more widely distributed amongst a team. The implications of these for safety leadership practices have not been investigated.

REPORT 2: Safe Working: Designing Safety Practices for Service Sector Organizations³⁴

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 standardisation 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 handling and the use of manual handling 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 standardisation 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.

REPORT 3: Using Audio-Diaries to Capture Safety Practices and Incidental Learning About Safety³⁵

It is widely recognised that informal learning complements the learning attained through formal training. While informal learning is intentional, incidental learning is the by-product of engaging in another activity. The importance of incidental learning for developing and sustaining working practices that are safe has not been investigated. Using a novel audio diary method 25 participants from organizations in three different service sectors (retail, logistics and hotel) recorded their experiences of workplace safety related incidents over a 14 day period. These brief recordings were analysed using Marsick and Watkins framework of incidental learning to reveal the triggers for safety learning, the choice of alternative solutions to the incident, the assessment of the consequences and the lessons learned. Hierarchical differences were found in the susceptibility to various triggers. Front-line workers were more frequently challenged by hazards and violations, whereas managers responded to safety meetings and the practices of safety compliance.

REPORT 4: Social Network Influences on Safety Behaviours of Employees in Retail Environments³⁶

Safety leaders must be able to influence others to ensure safe working conditions and practices and so achieve organizational safety goals. Influence is achieved not only by the validity and persuasiveness of the message, but also by the relationships between individuals. Those individuals who are well connected to many others, either directly or indirectly through others who are themselves well connected, have greater opportunity to influence than those who are distant from most people in the organization. Moreover, those individuals who sit between many others in the relationship network may be able to influence more than those who do not connect to other people. Taking a social network perspective, this study examined 1) the types of relationships individuals had with each other, and 2) their opinions and perceptions of different aspects of workplace safety. A two part questionnaire was distributed to all employees in four different retail units from three different companies. Response rates varied from 11% to 100%, permitting the construction of social networks in two of the stores only. In these cases more senior figures (managers and team leaders) and those on full-time contracts occupied the more central positions in the network, while more junior employees and those on part-time contracts were found on the periphery. Perceptions of safety across the four stores were positively skewed, but with some variation in responses between stores. However, most people agreed with each of the statements pertaining to safety knowledge, safety consciousness, safety participation, safety compliance and safety motivation. This suggests that individuals have a strong view of safety and are well trained in aspects of safety in their organizations. They were also convinced that managers were committed to safety and that safety was not a secondary consideration to performance. Nevertheless, greater uncertainty was evident when respondents were asked about shared working and mindfulness. With a very small number of exceptions, most respondents noted that managers were responsible for delivering organizational safety goals, indicating a strongly held

view that the manager (not front-line employees) was the safety leader. The generally positive views of safety were well distributed throughout the networks, with some of the more strongly held views evident on the periphery, ensuring that any correlation between separation and perception were negative. However, there was a tendency for greater agreement with safety statements in the denser network. This suggests that network density rather than leader position was critical for creating positive safety perceptions, perhaps through the establishment and maintenance of social norms. As the number of ties decreases and density declines the opportunity exists for divergent views and opinions to exert their influence and the positive views of safety may dissipate.

LIMITATIONS OF RESEARCH PROJECT

While each of the four components of the project may have its own limitations, nevertheless, there are several overarching limitations which affect the whole project that merit comment.

The two-year time constraints of the project created a limitation when weaknesses were discovered in the extant underpinning knowledge-base. The project ambitiously attempted to complete four independent work packages and then integrate and synthesize these findings through a fifth work package within a two year period. This plan was predicated upon implicit assumptions that proved to be ill-founded. The first assumption was that the field of safety leadership had been rigorously researched. The second assumption was that prior work had been critically evaluated. The third assumption was that there was a coherence and consensus in the understanding of safety leadership and the associated practices. Upon closer scrutiny of the literature, after the project was awarded and in dialogue with the senior practitioners comprising the project's Advisory Group, it became apparent that these assumptions were optimistic. This realisation inevitably required us to make some adjustments to the project plan. It was clear that a number of additional preliminary actions were required prior to commencing the project. First, the definition and specification of terms needed to be thoroughly and critically appraised. Specifically, the meaning of low hazard environments (and by contrast high hazard environments too) needed to be considered. This is identified in Part A of this report as the first challenge. It was also apparent that safety leadership had not been properly defined. In many cases 'safety' had been appended to 'leadership', uncritically reflecting simply a particular focus of, or context for, more general leadership activities. Moreover, these activities more closely resembled managerial actions than those associated with leaders. These form part of the second challenge discussed below in Part B of this report. Second, it was apparent that there was no clear understanding of how particular safety leadership practices contributed to specific outcomes. This necessitated a re-focusing of the project onto the uncovering of explanatory mechanisms of how safety leadership practices result in safety outcomes, the subsequent adoption of CIMO-logic and an alteration of the initial interview protocol. The impact of this is discussed in Project Report 2. The ambitious project time-frame did not permit adequate reflection on these points before empirical investigation had to begin in earnest if timely completion of a project approximating to the original scope was to be assured. As a consequence the empirical phases of this project have not benefitted fully from the insights gained from the more detailed critical literature review and attendant research design and methodological reflections. These have been reported here and will be published elsewhere and we hope others will benefit from them in the future. In practice, data collection was delayed for a combination of reasons to do with visa regulations for employment of one of the team members and the commercial imperative of the busy Christmas period that affects retail and logistics firms. Most of the empirical data were collected in an intensive six month period from February to July 2014.

Initially the project was to focus on 'low-hazard environments', as a contrast to the 'high-hazard environments' investigated in much of the previous research on safety and safety leadership. However, as noted above, this description proved problematic for reasons discussed in Part A of this report. An expedient alternative description was 'service sector' since that was the intended empirical focus of the project. The two descriptors are unhelpfully conflated in policy documents. Our experience suggests the need for more careful and accurate descriptions of organizational contexts. Three of the dominant sectors in service industries are hospitality and tourism, retail and logistics and transportation. Organizations from these three sectors participated in this study. Our data are limited to these three sectors and obviously there are other sectors falling under the umbrella of service industries (such as financial services). Whether the practices of safety leadership would differ in these environments from those investigated here and if they were to do so, then how, is not known and merits further investigation. Nonetheless, this investigation provides one of the first studies of safety in service sector contexts and therefore makes a significant contribution to our understanding. Furthermore, this study, unlike many others, considers more than one sector, allowing cross-sector and multi-environment comparisons. This too is a substantial development permitting greater insights and making a valuable contribution to our knowledge of safety leadership.

Limitations might arise not only from the choice of sector and their possible influence on the findings, but also from the choice of organizations within a sector. For example, with the exception of the hotel,

all of the participating organizations were large national or international companies having a centralized headquarters including a small safety function and many small subsidiary units dispersed throughout the UK and beyond. Safety leadership in these organizations emanated from the centre, with local leadership merely ensuring safety compliance with rules, policies and procedures dictated centrally. It should be noted that this study did not investigate the activities of the centre, but only those of the distributed units, where leadership does appear to be wholly compliance driven. Alternative organizational forms, including more decentralized or autonomous units may exhibit different safety leadership practices. Similarly, smaller organizations, including SMEs, may also have different safety leadership practices. This remains to be investigated.

A fourth and final limitation of this study is the choice of analytical frameworks. These inevitably influence the interpretation of data. In this case learning is considered against Marsick and Watkins framework of incidental learning (Report 3) and Argyris's widely accepted framework of single- and double-loop learning (Part C) suggesting different outcomes. Alternative models of learning either individual or organizational may render different interpretations of the data. The adoption of CIMO-logic (Denyer et al., 2008)²⁴ is less well known but usefully informs investigations seeking to design solutions for field-problems. Leadership practices that create and sustain safe working environments is one of these.

Practical Implications

The component parts of this research project suggest a number of implications which have practical significance.

Firstly, there exists considerable confusion over who is a safety leader, how safety leadership is enacted and what it is safety leaders do. Some of this arises from differences between policy documents and research accounts of where in the organizational hierarchy safety leadership is attributed. Typically, policy documents focus at the board level while research reports focus on supervisors of front-line workers. Acknowledging these differences and accommodating them seems to be required by policy makers. Another source arises from the uncritical adoption of problematic leadership constructs and their application to the study of safety. Safety researchers need to be cognisant of these debates and the challenges they raise. A further source of confusion stems from whether safety leadership is embodied in a specific person or in a set of practices enacted by anyone. Grasping this distinction between leader and leadership is critical for developing effective safety leadership training.

Secondly, the empirical evidence gathered in this study (see Project Report 2) (and much of the evidence reported in existing studies) suggests that the practices adopted in organizations by those considered to be leaders might be described more accurately as management. In other words the focus should be on safety management rather than safety leadership. This again has implications for the content and delivery of safety training.

Thirdly, alternative conceptualizations of leadership away from individuals acting as transformational or transactional leaders and towards either 'plural leadership' or conceptualizations of leadership 'in the moment' may reveal respectively characteristics of safety leadership that require complementary expertise, or the inherent qualities of safety leaders and the characteristics of the contexts in which safety leadership should be practiced. These too alter the content of safety training away from the HSE's conventional Plan-Do-Check-Act format and towards a less formulaic and more principals-driven approach.

Fourthly, the diary studies in particular revealed a number of contextual triggers that stimulate action either by individuals or by others to whom the individual reports. These elicit respectively single- or double-loop learning. The nature of these triggers could be characterized to provide a checklist of potential circumstances in which safety might be compromised. Furthermore the application of a single- and double-loop learning framework to the data suggested that organizations which empower individuals to find solutions to safety incidents miss the opportunity to learn from these incidents, because single loop rather than double-loop learning occurs. The data also suggest that predominantly those formally designated with safety responsibility report safety incidents to others in

the organization suppressing the opportunity for the organization to learn from the experiences of the many others in the organization without formal safety responsibilities.

Fifthly, safety, perhaps reflecting its disciplinary heritage, typically anticipates linear cause and effect models of action. So the existing research presumes a relatively simple and unproblematic causal relationship between leadership practices and safety outcomes. However, organizational environments are rarely that simple, more often accidents and incidents occur through the combination and interaction of various factors at different levels of analysis over time. This 'interactive complexity', whereby system components are tightly coupled so that errors can cascade rapidly through the system giving operators little or no time to respond effectively, is one characteristic feature of organizations. Another is 'conjunctural causality', the particular combination of factors that create an effect in a specific circumstance. Together these two characteristics suggest a more complex and less predictable interaction between contextual factors, leadership practices and subsequent outcomes. This study addresses this complexity and develops design propositions from the literature that may explain why particular combinations of practices may lead to particular safety outcomes in high hazard settings. These are complemented by a set of propositions derived from the empirical investigations of service sector organizations that account for the bundling of particular practices to achieve specific outcomes in these settings. Although these require further validation, they nevertheless provide practitioners with a more nuanced guide to more effectively managing safety in different organizations. Future studies could develop other guides for other organizational contexts.

Sixthly, safety is a highly institutionalized field replete with isomorphic pressures that ensure conformity to a common standard. The apparent similarity of practices evident between different organizations in different industries within the service sector and their general similarity to practices reported in high-hazard environments testifies to this. This suggests that compliance is a key driver of organizational safety practices and that a "one-size-fits-all" approach is common amongst organizations, which show little differentiation despite the possibility for this permitted by the Health and Safety at Work etc. Act (1974)³⁷. However, it is not clear whether the removal of the threat of inspection in the sectors investigated here would encourage divergence of practices and the development of local variation. Nevertheless, closer examination of the data might also suggest that there is substantial variation in actual practices but that these practices are sufficiently aligned with safety standards (e.g. OHSAS 18001) to permit an inference of local compliance with safety legislation. Safety leadership and associated practices therefore appears to be compliance driven and consequently inflexible and rigid rather than adaptable and responsive as dynamic environments would require. This observation has implications for policy directions and legal practices.

Recommendations

A number of recommendations may be proposed:

- Abandon the notion of 'safety leadership'. This creates confusion through a lack of conceptual clarity and imprecise definitions. Moreover, many of the practices adopted by "safety leaders" are more accurately characterised as management;
- Focus on the practices of safety leadership rather than on the person of the safety leader;
- Seek to explain the relationship between specific interventions (practices) and the anticipated outcomes; and as a consequence
- Tailor practices to align with the features of the context and the role and position in the organizational hierarchy;
- Encourage organizational learning from safety incidents through double-loop learnings;
- Support leadership 'in the moment' by equipping individuals to deal with presenting circumstances rather than relying on role or position in the organizational hierarchy.

PART A: Defining Low Hazard Environments for Common Safety: Common Sense Isn't It?

The methodology of problematisation (Alvesson and Sandberg, 2011)³⁸ which seeks to generate interesting research questions by identifying and challenging the assumptions that undergird a particular field, has not to our knowledge been applied explicitly to the field of safety. Yet safety studies often blindly follow the assumptions of the disciplines that underpin them, simply applying uncritically borrowed theoretical perspectives. Alvesson and Sandberg (2011)³⁸ developed a typology comprising five different broad sets of assumptions, namely: in-house; root metaphor; paradigmatic; ideological and field assumptions, that progressively, with increasing breadth and depth, challenge the assumptions underpinning a field of study. Safety research is vulnerable to each of these as we will now demonstrate, before problematising the classification of hazardous environments.

Leadership is regularly conceptualised as a set of attributes encompassing knowledge, skills, styles, attitudes and personality traits possessed by a leader. Studies of safety leadership follow a similar path (e.g. Clarke's meta-analysis of leadership styles (Clarke, 2013)³⁹). However, this view may be challenged if it was assumed that leadership is defined more by the social context and interaction with followers, and less by the traits of the leader. Research into safety leadership has not acknowledged this possibility and fails to challenge an *in-house assumption*.

Government policies relating to safety, safety investigations and practitioner literatures, frequently make reference to the development of a safety culture which assumes a unitary set of values and beliefs shared by everyone in the organization. However, we know that organizational cultures are differentiated across groups within organizations, fragmented because there is a lack of consensus, and rarely unambiguous (Meyerson and Martin, 1987)⁴⁰. It is unlikely that safety culture will be any different. Antonsen et al. (2012)⁴¹ noted the differences in safety practices between on-shore and off-shore operations in an oil and gas company. Moreover, Arboleda et al. (2003)⁴² drew attention to the effect of hierarchical position and prior training of employees in the trucking industry on their perception of safety culture. Examining the notion of an homogeneous safety culture would challenge a *root-metaphor assumption*.

Paradigmatic assumptions apply to the concept of risk believed to be a vital weapon in the organizational arsenal to secure safety. Technical perspectives on safety adopt a positivist ontology and assume that risks are objectively identifiable. Renn (1992)⁴³ challenges the objective nature of risk, demonstrating its inherent subjectivity which raises questions about the significance of risk assessments and how they ensure safety. Rather than identifying where resources, including training, need to be directed, do risk assessments enhance mindfulness instead, ensuring that individuals pay greater heed when undertaking a particular task or working in a particular environment?

Two specific *ideological assumptions* are evident in the safety research literature. First, there is the question "why workers don't work more safely?", and second "why are there so many accidents?". It might be more pertinent to ask "why do workers work as safely as they do?", and following Jørgensen's, (2015)⁴⁴, quoting earlier work by Sundström-Frisk) question "why are there so few accidents?" These alternative framings suggest different research questions that might provide more compelling insights into safe working.

Finally, *field assumptions* are a broader set of assumptions that are more widely shared. Adopting an institutional theory perspective, it is assumed that legislation and guidance notes encourage the development of safe working practices enhancing organizational safety. There is anecdotal evidence (Foulkes-Williams, 2015 pers. comm.) that these practices (which are legal or quasi-legal requirements) are not identified as practices by employees. This raises the intriguing prospect that many of the 'safety practices' deployed in organizations are not perceived as practices that contribute to the safety of employees. As a consequence it is pertinent to ask whether the institutionalisation of safety actually reduces both the attentiveness to safety and the perceived scope of practices that can be modified to support organizational safety.

Here we problematise (Alvesson and Sandberg, 2011)³⁸ the binary classification of environments according to their inherent hazard. While classification has been fundamental to policy development (Young Report (2010)¹ to the UK Government) and safety guidance (HSE, 2013)⁴⁵, such definitions are simplistic, underplaying the socially constructed nature of the underpinning measures and overlooking the importance of structural features of the environment. We challenge this classification and suggest four negative consequences. First, the prioritisation and extent of resource allocation for regulatory activities is reduced for low hazard environments (Black and Baldwin, 2010)⁴⁶. Second, working in environments designated as low hazard may dull the perception of inherent risk and encourage risk-taking behaviour in employees. Third, managers acknowledge work environments are composite, being neither wholly high nor low hazard. A binary classification superimposed on heterogeneous work environments creates confusion, undermining effective safety decision-making. Finally, research, education and training may be directed away from low to high hazard environments because of perceived lower priority.

The definition of low hazard in the Young Report (2010)¹ refers to “places where the risk of injury or death is minimal”, like shops and offices, where injuries are a result of slips and trips, lifting things and repetitive strain. The definition drew on apparently objective measures of potential sources of harm, risk, frequency, consequence and sector. Many of these measures are socially constructed and we examine the implications of this. Additionally important characteristics of organizational context overlooked in the earlier definition are considered.

Hazard is often defined as a *potential source of harm* or adverse effect, but these are hard to define and are open to misinterpretation. In many reporting standards, experiencing harm at work may not necessarily be related to a hazard unless there is an identifiable external event that causes the harm, e.g. a falling object striking someone. Cumulative exposures to hazards, which eventually cause harm (e.g. repetitive lifting), may not be classed and reported as ‘accidents’. Definitions often also draw attention only to physical injury, ignoring psychological injury. Organizational environments, such as service contexts, may not pose physical harm to employees but nevertheless may pose significant psychological harm, such as through stress, which is detrimental to health (WHO, 1948)⁴⁷.

Risk is the likelihood that harm would result from exposure to a hazard. Risk is also not absolute, but is influenced by context. ‘Inherent’ risks may be mitigated to produce ‘net’ risks (Black and Baldwin, 2012)⁴⁸. For example, the competences of the exposed population or the control measures taken to reduce the potential of exposure are important facets of context that transform ‘inherent’ risks into ‘net’ risks. Safety in some extremely hazardous environments has been defined as “a dynamic non-event” (Weick, 1987)⁴⁹. It is dynamic because safety is preserved by timely human adjustments; it is a non-event because successful outcomes rarely call attention to themselves. These High Reliability Organizations “almost never experience an operating failure of grievous consequences” (LaPorte and Consolini, 1991)⁵⁰. Thus, risk is context sensitive and of limited value in differentiating between high and low hazard environments.

The focus of the definition in the Young Report was on *frequency* of death and serious physical injury. However, frequency of incidents is misleading and fails to adequately differentiate between high and low hazard environments. For example, annual fatalities on the UK road network, annual deaths in the UK from medical errors and the people who died in the 9/11 terrorist attacks are numerically similar (Buchanan and Denyer, 2012)⁵¹, yet roads, hospitals and office complexes would normally occupy different categories of hazard.

High hazard environments may be defined by the magnitude of physical, psychological or material consequences of an untoward event (Hannah et al., 2009)⁵². Definitions of high consequence involve ‘social loss, large-scale, unusually costly, unusually public, unusually unexpected, or some combination’ (Vaughan, 1999)⁵³. All of these terms, including ‘unusually’, are open to multiple interpretations. Hazards can be labelled as high consequence because they are judged as such by those who are implicated and by observers, particularly regulatory authorities and the media. In some environments operators and the public perceive the hazards to have such potentially grave *consequences* as to warrant their absolute avoidance (Roberts et al., 1994)⁵⁴. Thus the categorisation of environments as low or high hazard is not an objective decision, but a subjective one supported by a legal framework geared to ensuring compliance.

In seeking to provide generic guidance, low hazard environments are often characterised at a *sector* level, e.g. retail or education. This fails to account for variation below the sector level. Companies in the same sector differ in their safety performance. Organizational units within the same company differ also in their safety performance. This heterogeneity raises doubts about the utility of the comprehensive classification of sectors and organizations as low hazard. Moreover, this is even problematic within a single organizational unit, where a range of different yet inter-related activities may occur, some of which are more hazardous than others. Stock rooms typically have more incidents than shop floors.

The nature of organizational environments influences the level of hazard or risk. *Interactively complex* (Perrow, 1984⁵⁵; Zohar and Luria, 2003⁵⁶) environments are those where outcomes are unknown and potentially unexpected, socio-technical systems are multifaceted with incompatible functions and where information flow is indirect and ambiguous (Roberts, 1990a)⁵⁷. *Tightly coupled* environments have 'time dependent processes', 'invariant sequences of operations', 'the only way to reach the goal', and 'little slack' (Roberts, 1990b)⁵⁸. Such interactively complex and tightly coupled systems have failure as an inherent property because they will inevitably experience accidents that cannot be foreseen or prevented ('normal accidents' Perrow, 1984)⁵⁵. High hazard environments characterised by *high velocity* (Eisenhardt, 1989)⁵⁹ may exhibit rapid and discontinuous change in demand, competition, technology and regulations. In high velocity environments exacting tasks are performed under considerable time pressure and decision-making processes are prone to heuristic reasoning processes and bias (Kahneman and Tversky, 1984)⁶⁰. We propose that factors including the degree of interactive complexity, organizational coupling and velocity may provide a better guide to the hazardousness of the organizational environment.

PART B: Why is Safety Leadership Difficult?

For more than two decades different stakeholders in the safety field have promoted the idea of safety leadership. Researchers investigate the personal traits or behaviours that encourage it. Professional bodies exhort individuals to enact it or suggest practices to promote it. Policy makers and accident investigators demand more of it. Such continued attention suggests not only that it is important, but also that it is difficult to enact. The question is: Why?

Safety is primarily about prevention. These circumstances require a 'defensive agenda' to maintain safe working conditions and ensure the continued safety of personnel, rather than a 'progressive agenda' which seeks to innovate and make new things happen (Buchanan and Denyer, 2015)⁶¹. 'Defensive agendas' have a set of characteristics that contrast with progressive agendas and these characteristics contribute to the difficulty in enacting safety leadership.

First, according to Karl Weick, the American social psychologist who has spent time investigating the development of high reliability organizations (e.g. Weick and Roberts, 1993)¹², safety is a "dynamic non-event" (Weick, 1987)⁴⁹. Nothing should happen. Inevitably this is unexciting or as the ACSNI report noted, "there is no doubt that safety is often perceived as boring" (HSE, 1993; section 154)⁶². Encouraging individuals to embrace the safety challenges of an organization with enthusiasm is not easy. It is much less interesting and perhaps has less career value than driving other organizational agendas, especially those that may have been developed personally and are not related to safety.

Second, accidents and incidents may be seen as atypical or uncommon and any subsequent interventions are therefore unnecessary and a costly over-reaction that is to be resisted. This response is particularly likely in service sector organizations which employ the majority of the UK's workforce and where the likelihood of serious or life-changing injuries is low.

Third, safety agendas may arise from recommendations made by a safety review, perhaps following an incident. These recommendations may be felt to be imposed and to that extent resented by those affected. They may be seen as interfering with existing working practices, particularly if they add layers of processes and create circumstances where "it is impossible to make an unproblematic choice because of contradictory rules" (Mascini, 2005; pg 482)⁶³.

Fourth and related to the previous characteristic, is the constraint placed by statutory regulatory requirements on the agenda. These constrain the freedom of individuals and organizations to be creative and innovative and the changes deployed may therefore be resented or resisted. Where they are apparently embraced, this may be done with reluctance because there are too many other important things to do and so the agenda is not prioritised.

Finally, the agenda may be rejected because different stakeholders have different opinions as to the nature of the hazard and the risk and so too the legitimacy of the desired actions to mitigate them.

Safety leadership demands the development of a defensive agenda but this seems to stimulate a set of defensive reactions amongst those affected by the actions required to deliver the organizational safety agenda. It is perhaps unsurprising therefore that safety leadership is difficult to enact.

One of the answers to the opening question of this chapter is the absence of a clear definition of safety leadership and with that clarity over who is a safety leader. This chapter continues with a consideration of both of these points, dealing first with the nature of safety leadership and following this with a discussion of who is responsible for safety leadership, motivated both by the literature and by our recent empirical research. This leads naturally into a discussion of the genesis of the term. This shows that the terms 'leadership' and 'management' have been used interchangeably and synonymously according to fashion, with 'safety leadership' currently in vogue. This breadth of terminology forewarns the reader that it may not be possible to define safety leadership practices narrowly. In point of fact, a brief review of a range of different literatures reveals that a wide variety of practices are available for the 'safety leader' to demonstrate their safety leadership. We subsequently confirm this by reporting our empirical investigation of safety leadership practices in service sector organizations; although we note that many of these appear to be managerial practices. However,

these practices typically presume a transactional or a transformational model of individual leadership. At the end of the chapter we draw on the wider field of leadership studies to consider three alternative modes of leadership which have clear implications for the nature and practice of safety leadership and for the training and development of those responsible for Health and Safety in organizations.

What is Safety Leadership?

In addition to the practical reasons for why safety leadership is difficult there are also definitional problems with the concept (Suddaby, 2010)⁶⁴. At a fundamental level safety leadership has never been defined. Each stakeholder in the field of safety may have a different perspective on what safety leadership is, who is involved and what practices are required. Consequently understandings of safety leadership are typically driven from the bottom-up by who is involved and what they do. While this is a pragmatic response it lacks conceptual clarity, impeding the accumulation of knowledge, making comparative studies impossible and the development of practical guidelines difficult.

Safety leadership has two primary aims, a measurable reduction in accidents or injuries in the workplace, and an observable change in the behaviour of employees so that both compliance and participation with safety are improved, leading to reduced rates of injury or accidents (Kapp, 2012a)⁶⁵. Success in achieving the first aim is easily demonstrated through appropriate statistics and often secured by ensuring adherence to standard operating procedures, by providing appropriate personal protective equipment (PPE), by re-designing work processes to remove hazards and by appropriate training and supervision. Achieving the second aim is more challenging because individual behaviours are elicited in response to a variety of different stimuli. Nevertheless, it is customary to explain safety behaviours in terms of either extrinsic or intrinsic motivation. Extrinsic motivation based on reward which includes praise and feedback as an alternative to tangible rewards is assumed to encourage compliance (Dahl and Olsen, 2013)⁶⁶. Participation on the other hand is promoted by factors such as stimulation and challenge that trigger intrinsic motivation in the individual employee (Kapp, 2012a)⁶⁵.

Safety leadership has a specific focus - safety. However, unlike other particular roles that have acquired leadership status like IT-leadership or sales-leadership, safety is not functionally based and its performance target is rarely conceived in financial terms. As a consequence safety may not be seen as integral to the performance of the organization, lacking a sizable group of staff directly responsible for its delivery who continually raise its profile amongst others. Moreover, it is often seen as a cost rather than as a saving, ignoring the adage, "if you think safety is costly, try an accident". By identifying safety leadership as a distinct activity, safety in organizations is marginalised and possibly separated from mainstream activity rather than being integrated into everything an organization does. In addition this separation encourages it to be seen as a cost to the organization rather than contributing to the efficiency of the organizational processes and increasing margin (see for example, Evans et al., 2005)⁶⁷.

The notion of safety leadership raises two particular questions. Why does leadership in general not embrace safety adequately?; and therefore, how does safety leadership differ from leadership more broadly? And second, if leadership does embrace safety, why is it considered to do so inadequately necessitating a separate and distinct activity? A partial answer to these questions may lie in the perspectives used to explore leadership in general and safety leadership in particular. As Ladkin (2010; pg. 2)⁶⁸ noted, the "one thing that is clear about the leadership literature is that there is relatively little that is clear about leadership". If definitional clarity of the primary concept - leadership, is lacking then it is perhaps unsurprising that safety leadership is equally ill-defined. Much of the literature that investigates leadership employs positivistic research methods that seek to identify particular leadership characteristics, traits and competencies (e.g. Gordon, 2002)⁶⁹. Investigations of safety leadership have followed a similar path. However, this approach focuses on an individually-based unit of analysis - the leader - and ignores the collective processes of leadership which encompass the leader, their followers and the details of the particular context in which they interact. Furthermore, by focusing on particular characteristics or traits of the individual or on their interaction with another, leadership studies (including those of safety leadership) fail either to discern the meaning attributed by the leader (or others) to the particular activity or outcome, or to judge its relative success, which depends on context (Ladkin, 2010)⁶⁸. Thus leadership in general and safety leadership in particular need to be more broadly conceptualised.

Grint (2000)⁷⁰ argues that leadership is encapsulated by a portfolio of four arts (The Philosophical Art, The Fine Art, The Martial Art and The Performing Art) concerned with establishing and co-ordinating the relationships between four things: the why, the what, the how and the who. These seem to suggest that leadership has four purposes: to provide meaning; to give direction; to prioritise activity and to build community. Safety is implicit within each of these. It would seem unnecessary therefore to distinguish safety leadership from leadership more generally. It is also difficult to imagine leadership that provides meaning, gives direction, prioritises activities or builds community and yet disregards the safety of the individuals concerned with these things.

Who are the Safety Leaders? Suggestions from the Literature

In common with leadership studies the focus of safety leadership is typically at the individual level. Most often research studies have focused on supervisors and team leaders (e.g. Zohar and Luria, 2003⁵⁶; Conchie and Donald, 2009⁷¹) and very occasionally on senior managers or board members (Smallman and John, 2001)⁷². Conversely, much of the specific guidance on safety leadership from the Health and Safety Executive relates to the activities of members of the senior management team or board members (e.g. HSE, 2004)⁷³ and less frequently to those of the supervisors and team leaders. The Health and Safety legislation however takes a more inclusive view. Rather than emphasising one group over another, it highlights the need for everyone to attend to health and safety and to show concern for their fellow worker(s) (Health and Safety at Work etc Act, 1974: section 7)³⁷.

While individuals are most often conceived of as the safety leader, in some circumstances industries and sectors also have been encouraged to demonstrate safety leadership. The Cullen Report (2001: section 5.12)⁷⁴ on the Ladbroke Grove rail disaster noted that “there was no clear identification of safety leadership in the UK rail industry”, suggesting that safety leadership applies across industrial sectors as well as within individual companies in the sector. That particular individuals, groups (e.g. senior management team) or industries can all be safety leaders demonstrates that safety leadership is a fluid concept. This adds to the confusion over meaning and usage of the term.

Who are the Safety Leaders? Empirical Evidence

More than three-quarters of the interviewees in our study of safety leadership in service sector organizations (Pilbeam et al., 2015b)³⁴ identified themselves as being personally responsible for safety. One retail worker 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, challenging others and 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, as well as completing the periodic audit assessment sheet.

However, overall, more than half of the interviewees also identified everyone or a specific person or groups of persons as responsible for safety. The balance between these two 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 the 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”. This suggests that perhaps 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”.

Genesis of the Term – Safety Leader

The third edition of the HSE's publication "Managing for Health and Safety – HSG65" (HSE, 2013)⁷⁵ identifies both leaders and managers as key actors in managing health and safety and draws clear distinctions between the activities each engages in as they deploy the suggested Plan, Do, Check, Act approach to safety management. Leaders can be differentiated from managers and in this guidance are typically senior managers, directors or members of the board. This publication also refers to leadership, which together with training and involvement of workers is "key to effectively managing for health and safety, pg. 10" (HSE, 2013)⁷⁵. So a set of leadership processes are also identified. But these processes are aimed not at leading but at managing. This is confusing.

Greater conceptual clarity might be gained by charting the evolution over the past 25 years of these ideas and what they embraced. Figure 1 shows a time-line of the publication of various reports or guidance notes by the HSE or HSC and some practitioner and academic articles indicating who the focal actor was and what they were to do, either lead or manage safety.

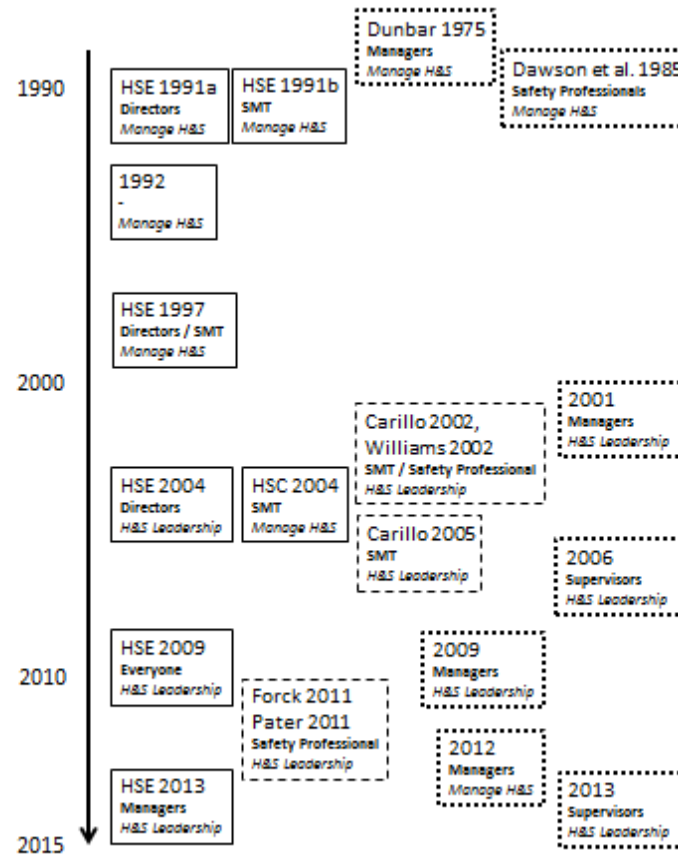
In parallel the figure also shows the appearance of the term "safety leader" or "safety leadership" in the practitioner and research literatures, again indicating who it was that should be leading safety. Prior to 2000 much of the work focused on managing safety whereas after 2000 it was all about safety leadership. Until recently many of the reports and articles focused on Directors or senior managers. Now everyone, and in the research literature supervisors in particular, is to demonstrate safety leadership.

The ethos of the Health and Safety at Work etc. Act (1974)³⁷ was 'command and control' and this was reinforced by the HSC leaflet, "It's your job to manage safety" (HSE, 1991a)⁷⁶. This was aimed at directors and drew on comments from the then recent disasters (including: Herald of Free Enterprise (Department of Transport, 1987)⁷⁷, King's Cross Underground Fire (Department of Transport, 1988)⁷⁸ to point out the legal duties of directors towards safety enshrined in the 1974 Act. However, it notes that "safety is a management objective" and that "poor health and safety performance is a reflection of bad management", suggesting that directors are to manage safety directly.

At the same time the first edition of HSE's guidance document "Successful Health and Safety Management (HSG65)" (HSE, 1991b)⁷⁹ was published. In the 'POPMAR' management framework included in the guidance, "visible and active leadership of senior managers is necessary to develop and maintain a culture supportive of health and safety management". This summarised the guidance on organizing but without any further elaboration in the rest of the document. Senior managers were to establish an organizational culture conducive to safe working and so indirectly manage safety.

This incipient orientation towards safety leadership was supplanted by The Management of Health and Safety at Work Regulation (1992)⁸⁰ needed to implement an EU council directive (CEC, 1989)⁸¹. This shifted the focus from leadership back to managing health and safety. This orientation continued for several years with accident reports of the time emphasising safety management (e.g. The fire at Hickson & Welch Ltd (HSE, 1992)⁸²; The explosion and fires at the Texaco Refinery, Milford Haven (HSE, 1994)⁸³; The Southall Rail Accident Inquiry Report (HSC, 2000)⁸⁴).

Figure 1: Time-line of emergence of term ‘Safety Leadership’ in selected guidelines for practice, professional and academic journals



The second edition of HSG65 (HSE, 1997)⁸⁵ has a greater emphasis on leadership, but with the objective of successfully managing health and safety. According to the guidelines management needs to include leadership skills. Managers were now to lead. While this guidance was still aimed at directors, it also now focused on senior managers with health and safety responsibilities. The scope of those charged with managing health and safety had broadened. The publication of the Turnbull Report (ICAEW, 1999)⁸⁶ encouraged the HSE to emphasise the importance of visible leadership of health and safety by senior managers with companies ideally appointing a champion on their board of directors (Eves, 2014)⁸⁷. Together these promoted the idea of safety leadership amongst the senior managers of organizations, a point emphasised in the Cullen Report (2001)⁷⁴ investigating the Ladbroke Grove rail disaster and in the HSE publication “Leadership for major hazard industries” (HSE, 2004)⁷³. This aimed to “refresh your knowledge of effective health and safety leadership”, based on a transformational and transactional models of leader engagement with followers. However, the notion of “safety leadership” had not yet become mainstream. The HSCs publication, “A strategy for workplace Health & Safety in Great Britain to 2010 and beyond” (HSC, 2004)⁸⁸ contained no mention of safety leadership but emphasised that “appropriate health and safety management is an integral part of effective business management and as such, is an enabler and not a hindrance, pg. 8”. At this point in the chronology the question becomes - is safety managed by directors and other senior managers, or is safety lead and if so, by whom?

In 2009 “Be part of the solution” (HSE, 2009)⁸⁹ was published, this unequivocally stated that “health and safety leadership is all about accountability, pg. 9” and that “following the example of leadership

at the board level, leadership must also permeate throughout the management and supervisory levels and the workforce, pg. 9". So from this point everyone is potentially a safety leader, which echoes perhaps the wider sense of accountability for safety enshrined in the Health and Safety at Work etc. Act (1974; section 7)³⁷, namely "*It shall be the duty of every employee while at work to take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions at work*". Moreover, by emphasising accountability, which transcends the traditional scope of a managers activities (see Hales, 1999)⁹⁰, safety is now the responsibility of a leader. Subsequent guidance including the third edition of HSG65⁷⁵ reinforces this.

Two problems arise from this brief history. First, if safety is the responsibility of a leader and everybody is potentially a leader, then there is a real risk that nobody will show leadership and simply assume that somebody else will take responsibility for safety. Consequently safety performance may deteriorate. Second, by emphasising 'safety leadership' and particularly encouraging the appointment of safety champions either in the workplace or in the board room, safety becomes perceived as a separate stand-alone activity carried out by specialists. This inevitably divorces safety from everyday workplace activity and militates against the development of a safety culture and improved safety performance.

Practices of Safety Leaders – Evidence from the Literature

According to the HSE sponsored literature review of effective leadership behaviours for safety conducted by Lekka and Healey (2012)⁹¹ much of the current safety leadership research is focused on transactional and transformational leadership.

Transactional leadership is based on non-individualised hierarchical relationships and comprises three dimensions (constructive leadership, corrective leadership and laissez-faire leadership) (Zohar, 2002a)⁹². Constructive leadership offers material rewards (e.g. increased salary, promotion, job security) contingent upon satisfactory performance. This requires clear communication between leader and follower. Some understanding of the individual needs and abilities is needed in order to offer motivationally relevant rewards. Corrective leadership (or active management by exception) monitors individual performance against standards, detecting errors and correcting them. Laissez-faire leadership (passive management by exceptions) disowns all leadership responsibility and only engages with subordinates in an emergency.

Based on an ABC (Antecedents-Behaviours-Consequences) model, studies by Zohar and colleagues (Zohar, 2002b⁹³; Luria, Zohar and Erev, 2008⁹⁴; Zohar and Luria, 2003⁵⁵) showed supervisors were providing workers with verbal and non-verbal feedback (both positive and negative) on their performance of safe working practices. These consequences were set in the context of prior training and goal setting (the antecedents to the desired behaviours). The transactional safety leadership practices of supervisors therefore included:

- Establishing and communicating appropriate safety goals.
- Monitoring performance towards these goals.
- Rewarding (through giving feedback) behaviours that sustain or improve safety performance.

These three items for transactional safety leadership practices were confirmed by Kapp (2012a)^{95a}.

Transformational leadership may be defined as leader behaviours that transform or inspire followers to perform beyond expectations, while transcending self-interest for the good of the organization (Avolio et al., 2009⁹⁶; pg. 423). Transformational leadership comprises four leader behaviours (Bass, 1985)⁹⁷ namely: idealised influence, inspirational motivation, intellectual stimulation and individualised consideration is characterised by value-based and individualised interaction, which results in better exchange quality and greater concern for welfare (Zohar, 2002b)⁹³. Studies focusing solely on transformational safety leadership come from the work of two groups. A group based in Canada (Barling et al., 2002⁹⁸; Kelloway et al., 2006⁹⁹; Mullen and Kelloway, 2009¹⁰⁰) studied safety leadership mainly in service sector settings, whilst a UK-based group (Conchie et al., 2012¹⁰¹; Conchie and Donald 2009⁷¹; Conchie et al., 2013¹⁰²) studied the role of trust in the relationship

between supervisors and workers in high hazard settings. The constituent activities of transformational safety leadership (Kelloway et al., 2006)⁹⁹ include:

- Expressing satisfaction when jobs are performed safely.
- Rewarding achievement of safety targets.
- Continuous encouragement for safe working.
- Maintaining a safe working environment.
- Suggesting new ways of working more safely.
- Encouraging employees to openly discuss safety at work.
- Talking about personal value and beliefs in the importance of safety.
- Behaving in a way that demonstrates commitment to safety.
- Spending time to demonstrate how to work safely.
- Listening to safety concerns.

A number of research studies that investigate the co-occurrence of both transformational and transactional safety leadership (Zohar, 2002a⁹²; Dahl and Olsen, 2013⁶⁶; Clarke and Ward, 2006)¹⁰³ suggest that safety performance (i.e. the reduction of injuries) and safety compliance is positively related to transactional safety leadership practices. Safety behaviours (i.e. safety participation) on the other hand are encouraged by transformational safety leadership (e.g. concern and motivation).

Table 2 identifies eight leadership practices that may affect safety outcomes and which have been reported by key authors in *Professional Safety* – the American Society of Safety Engineers (ASSE) journal. According to these articles safety leadership is fraught with difficulty not only because of the commonly perceived tension between safety and productivity (Carillo, 2005)¹⁰⁴, which creates ambiguity, but also because safety leaders are commonly squeezed between senior leaders and operations (Forck, 2012)¹⁰⁵.

In addition there are a number of policy research reports mainly published by the HSE that investigate safety leadership and empirically derive a number of leadership practices enacted by individuals that either directly or indirectly impact others, mainly front-line workers, to deliver safety outcomes. Indirect effects of leaders were achieved through role modelling appropriate safety behaviours to others (Poxon et al., 2007)¹⁰⁶, or setting agendas or safety goals and targets for others to follow (e.g. King et al., 2010)¹⁰⁷. More direct effects of leaders on others occur through direct challenge (Cummings, 2006)¹⁰⁸ or through engaging with the workforce (Healey and Sugden, 2012¹⁰⁹; Cummings, 2006¹⁰⁸; Busby and Collins, 2009¹¹⁰) demonstrating the value of the employee to the leader (Poxon et al., 2007¹⁰⁶), ensuring effective two-way safety communication (Fleming, 1999)¹¹¹ and motivating employees (King et al., 2010)¹⁰⁷. Direct effects also occur through empowering employees to problem solve and to make decisions (Fuller and Vassie, 2005)¹¹². Finally, these direct effects might occur through developing skills, especially in independent and inter-dependent working (Poxon et al., 2007)¹⁰⁶ and knowledge of safety practices (Lekka and Healey, 2012)⁹¹. These are summarised in Table 3 and categorised according to the four dimensions of transformational leadership and transactional leadership.

Table 2: Leadership practices identified in articles published by different authors in the practitioner journal “Professional Safety”

Leadership Practices	Drennan and Richey (2012) ¹¹³	Krause and Weekley (2005) ¹¹⁴	Kapp (2012b) ^{95b}	Geller (2000 ¹¹⁵ , 2008 ¹¹⁶)	Mathis (2013 ¹¹⁷)	Williams (2002 ¹¹⁸)	Forck (2012 ¹⁰⁵)	Petersen (2004 ¹¹⁹)
Set goals / define roles	X	X		X	X	X		
Monitor performance	X	X			X			X
Educate / train	X	X		X				X
Role model	X		X		X			X
Communicate (share information, seek ideas and opinions, listen)		X		X		X		X
Involve others / participation / collaboration							X	X
Show care / concern / interest						X		X
Reward / give feedback / recognise good work	X	X			X			X

Many of these practices are echoed in the literature reviews found in other policy reports. Lekka and Healey (2012)⁹¹, for example, note that other studies show the importance of leader support for safety and safety communication between management and workforce. Active involvement in safety and enforcement of safety promotes perceptions of a positive safety climate and fosters employee accountability and responsibility for safety. Gadd and Collins (2002)¹²⁰ concur. They observed that management commitment to safety reduced under-reporting of incidents and promoted a positive safety culture, but often without indicating how this was achieved. O’Dea and Flin (2003)¹²¹ also agree and develop a descriptive model that shows how safety leadership and the required actions differ according to the level of the leader in the organizational hierarchy.

- Senior managers demonstrate safety leadership through:
 - positive attitudes to safety by committing to safety policies and procedures;
 - ensuring safety is integral to competitiveness and profitability and safety;
 - assuring safety compliance; and
 - committing to developing trusting relationships with subordinates.

- Middle managers (or managers of sites, typically construction sites or oil platforms which are the focus of much empirical research) show safety leadership through:
 - demonstrating commitment to safety by interpreting and implementing safety policies positively;
 - prioritising safety in work planning and scheduling;
 - being actively involved in safety by being visible in taking responsibility;
 - communicating openly; and
 - showing concern and appreciation for employees.
- Safety leadership is demonstrated by supervisors and team leaders:
 - by support (giving open and fair feedback);
 - by involvement (in safety training, inspections and meetings); and
 - by being participative (encouraging teamwork and building trusting relationships).

HSE guidelines (e.g. HSE, 2012)¹²² on safety leadership differentiate the leader and the manager and their respective responsibilities for safety. Similar distinctions are made in their guidance on 'Managing for Health and Safety (HSG65)' (HSE, 2013)⁷⁵. This suggests perhaps that safety leader roles can be differentiated from safety manager roles and that observed safety practices can be similarly disaggregated. O'Dea and Flin's (2003)¹²¹ review noted a similar differentiation of safety roles and practices across the hierarchy of an organization. Moreover, a comparison of the practices of safety leaders with the 11 features that characterise managerial work (Hales, 1999)⁹⁰ reveals considerable overlap between the two lists, implying that what is often described as safety leadership practice is actually management practice.

Table 3: Leadership practices identified in the empirically-based policy reports as they map onto the dimensions of transformational – transactional leadership

Authors	Transformational Leadership dimensions				Transactional Leadership
	Idealized Influence	Inspirational Motivation	Intellectual Stimulation	Individual Consideration	Constructive leadership
Healey and Sugden (2012) ¹⁰⁹	Consistent implementation Role Modelling	Clarity Develop a safe environment Team working Prioritise safety	Involve others Listen Empower others	Train	Reward Set goals Monitor Give feedback
Conchie and Moon (2010) ¹²³		Communicate	Voice Communicate	Coach Show concern	
King, Lunn and Michaelis (2010) ¹⁰⁷	Set an example Be visible	Motivate others Prioritise safety Communicate	Seek feedback Consult Communicate	Care	Set goals Monitor
Busby and Collins (2009) ¹¹⁰	Consistency	Prioritise safety	Engage others	Develop working relations	Provide resources
Poxon, Coupar, Findlay, Luckhurst, Stevens and Webster (2007) ¹⁰⁶	Model behaviours	Define issues Share agenda	Empower others Communicate	Value others Develop others	Set goals
Cummings (2006) ¹⁰⁸			Encourage commitment		Challenge behaviours
Fuller and Vassie (2005) ¹¹²	Be responsible	Motivate others	Communicate Engage others Problem solving Decision making	Train	
Brazier, Gait and Waite (2004) ¹²⁴			Involve others Communicate		Plan Monitor performance
Fleming (1999) ¹¹¹	Be visible	Prioritise safety	Participative decision making	Value others	

Table 4: Safety leadership practices synthesized from different sources based on a Coaching-Caring-Controlling model of safety leadership

	Source of Safety Leader Practices			
	Academic	Policy	Practice	Summary generic practices
Safety Coaching	Demonstrate commitment Prioritise safety Encourage open discussions Talk about values and beliefs Provide direction Problem solve	Role model Set an example Be visible Prioritise safety Motivate others Involve others Empower others Coach	Role model Educate Train Involve others / participation	Role model Prioritise safety Involve others Empower others Train Coach Be visible
Safety Caring	Provide support Express satisfaction Listen to safety concerns Demonstrate how to work safely Support Care Show concern Maintain a safe working environment	Share agenda Communicate Develop a safe environment Listen Care Consult Develop working relationships / team work Value others Develop others	Show care / concern Communicate (Share information / seek ideas / listen)	Communicate Listen Show concern Care Support Create and maintain a safe working environment Value others Develop others
Safety Controlling	Monitor Reward	Assure Compliance Reward Set goals Monitor performance	Set goals / define roles Monitor Performance Reward / give feedback	Set Goals Monitor Performance Reward

Rather than debating whether these practices are leadership or management it may be more helpful to collate them to more effectively capture the safety objectives behind the practices. Building on earlier suggestions identified in the ACSNI report (HSE, 1993)⁶² and developed independently by Wu et al. (2008)¹²⁵ and reiterated in “A review of the literature on effective leadership behaviours for safety” (Lekka and Healey, 2012⁹¹; HSE, 2012)¹²² we propose three cross-level categories (Safety Controlling, Safety Caring and Safety Coaching). Using these three categories it is possible to overlay the empirical findings from research, policy and practitioner literatures and to develop a generic list of practices

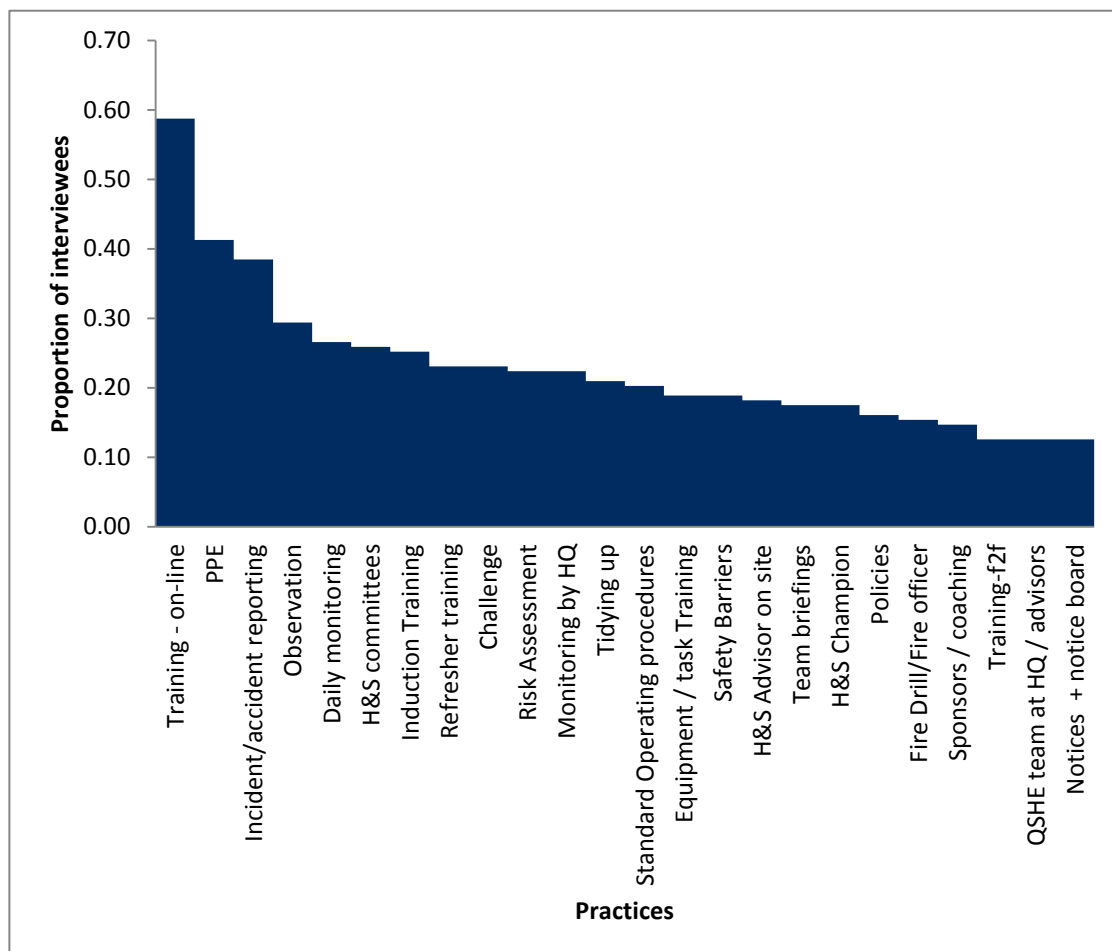
covering different themes that may be used as a diagnostic of safety enactment in organizations (Table 4).

Practices of Safety Leaders in Service Sector Organizations – Empirical Evidence

The practitioner and policy literatures and research reports identify a variety of practices enacted by those designated as safety leaders, mainly supervisors and team leaders. These practices might therefore constitute safety leadership practices. Furthermore practical guidelines (e.g. HSE, 2013)⁷⁵ indicate practices that should be enacted to ensure compliance with legislation. These include writing safety policies, assessing risks, controlling and monitoring risks, training, instructing and supervising. These have a more managerial orientation reflecting the administrative tasks embraced by the acronym POSDCORB (Planning, Organizing, Staffing, Directing, Co-ordinating, Reporting and Budgeting) proposed by Gulick (1936)¹²⁶ to distinguish management from other roles.

Our recent empirical investigation of three different work environments (retail, warehouse and offices) (Pilbeam et al., 2015b)³⁴ identifies a range of practices deployed by managers, supervisors and front-line workers in service sector organizations, where there has previously been little research. Much prior work on safety leadership has examined organizations in the energy and manufacturing sectors (e.g. Clarke and Ward, 2006¹⁰³; Dahl and Olsen, 2013⁶⁶; Zohar and Luria, 2003⁵⁶) and ignored those sectors where most people work.

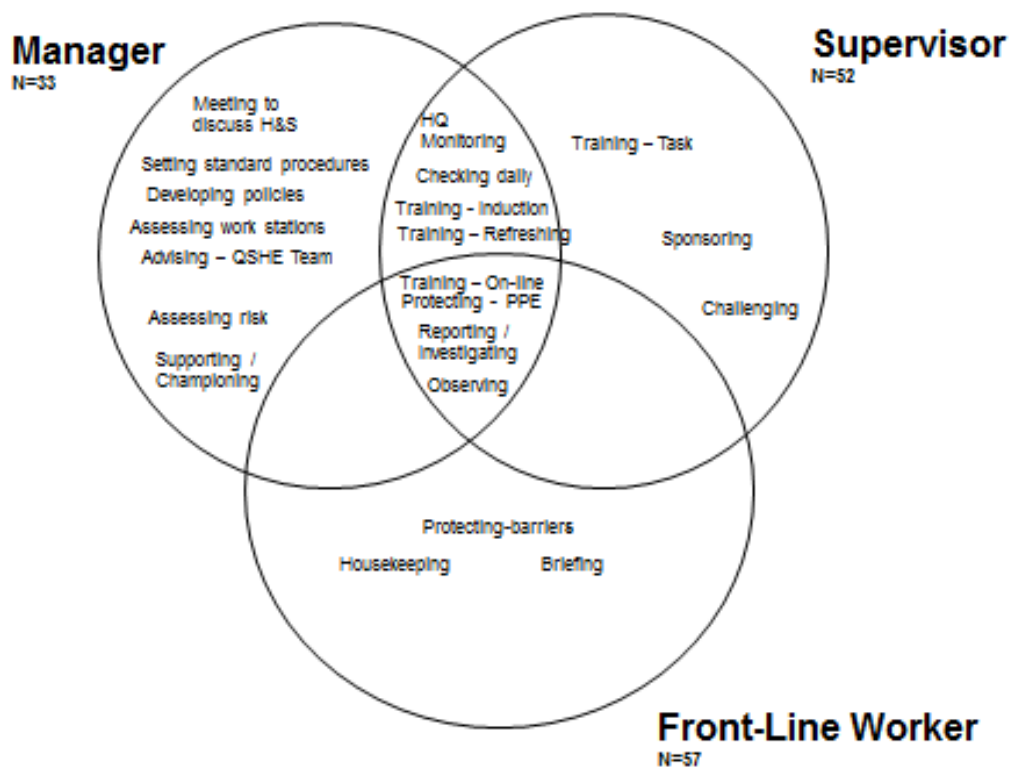
Figure 2: Proportion of interviewees identifying different safe work practices in three different sectors (Pilbeam et al., 2015b)³⁴



From 143 interviews our study identified 41 different practices. Figure 2 shows the 24 practices reported by more than 10% of the interviewees overall. The most common ones reported by more than one-third of the interviewees were on-line training, wearing PPE, reporting accidents and near-misses and the observation of work practices.

The practices that ensured the delivery of safety in these organizations may be differentiated by hierarchical role (Figure 3). Some practices were mentioned by all three roles: training, protecting, investigating and reporting, observing. Moreover, the absence of overlaps in the mention of practices between some of the 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 books submitted to head-quarters. Managers referred to a greater range of practices including: setting procedures; developing policies; dealing with audits; seeking advice from the QSHE team; discussing health and safety at regular meetings; and assessing risks.

Figure 3: Safety related practices reported by 20% or more of interviewees in each role (Pilbeam et al., 2015b)³⁴



Alternative Modes of Safety Leadership

The current mode of safety leadership building on the Health and Safety at Work etc. Act (1974)³⁷ and subsequent guidelines from the HSE has a ‘command and control’ ethos. The directions of the few are supposed to be followed uncritically and systematically by the many. The importance of the board room and senior managers in organizations to the implementation of safe working practices and to the

establishment of a safe working environment and, in so doing, develop a safety culture within their organization, is clear.

In practice however, it may be less clear. In our investigations in service sector organizations about 10% of the total sample was unclear who sets the safety policy and goals in these organizations. However, up to one-third of interviewees in some retail organizations didn't know where the policies and goals originated. In the office environment interviewees, *"imagine[d] that 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 that 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"*.

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"*.

Nevertheless, we suggest that there may be forms of leadership other than command and control that are applicable to safety and which respond to different aspects of safety legislation or of the nature of safety itself. First, safety legislation requires everyone to take care of themselves and their fellow worker. This plays to the more recent notions of plural forms of leadership, particularly distributed leadership. Second, safety may be enacted 'in the moment' suggesting a phenomenological approach may help our understanding of safety leadership. Third, safety because of its systemic nature may be defined as an adaptive challenge requiring adaptive leadership, rather than a 'command and control' style of leadership. We shall consider each of these possibilities in turn, drawing out the required leadership characteristics and the implications for training and development where appropriate.

Plural Leadership

Recent reviews of leadership (e.g. Thorpe et al., 2011)¹²⁷ consider perspectives on leadership that reach beyond the earlier unitary views of leaders as individuals - the heroic leader. By considering that leadership skills and responsibilities can be dispersed or shared throughout an organization these perspectives draw attention to the process of leadership rather than the person as leader (Gordon, 2002)¹²⁸. Denis et al. (2012)¹²⁹ describe these leadership forms as 'plural leadership' and identify distinct streams that make sense of a confusing array of leadership studies, where terms like "shared", "distributed", "collective", "collaborative", "relational" or "post-heroic" are often used loosely and interchangeably.

The first stream of 'plural leadership' research considers **mutual or shared** leadership within a group or team, where members collectively lead each other. This more participatory approach to leadership is encouraged by transformational leadership and is supported by earlier studies focusing on the emergence of leadership in groups (e.g. Bales and Slater, 1955)¹³⁰. These studies noted the need for individuals to play different and complementary roles, embracing "task functions" and "expressive functions" in the leadership of the group. In general this demands that individuals are motivated to share leadership responsibilities and that opportunism or 'free-riding' is discouraged. Shared leadership has a distinct application in team-based organizations which are common in low hazard environments. Sustaining a shared appreciation for the importance of safety and that those responsible for this seemingly "lesser" activity continue to be valued equally to those who lead more creative and exciting

tasks are important (Table 5). Team working skills notably valuing others and taking responsibility are especially important for delivering safety leadership in this mode.

A second stream of 'plural leadership' research builds on the first and explores the circumstances where a small number of individuals pool their leadership capacities to co-lead others. Here the co-leaders play roles that are specialised (i.e. each operating in particular areas of expertise), differentiated (i.e. avoiding overlap) and complementary (i.e. cover all the required areas of intervention). Gronn (2002)¹³¹ suggested that they conjointly exert leadership, having a collectively agreed and common purpose, characterised by reciprocal influence. Currie and Lockett (2011)¹³² augment this with concertive action, whereby skills and expertise are pooled permitting individuals to work together closely within a framework of shared understanding, often developed implicitly. Achieving both **conjoint agency** and **concertive action** are not small challenges, particularly in relation to safety where there may be disagreement over its importance and the best way to achieve it. Skills of negotiation, listening and communication are required (Table 5).

A final stream of 'plural leadership' research embraces much of the work on **distributed leadership** (Fitzsimmons et al., 2011¹³³; Spillane, 2006¹³⁴), where leadership roles are dispersed or spread across organizational levels over time, so that multiple actors take on leadership roles at appropriate moments thereby exerting influence jointly. Distributed leadership, insofar as it is seen to be democratic, encourages collective capacity-building, increases efficiency and effectiveness by better utilizing expertise (Mayrowetz, 2008)¹³⁵. Obviously this model of leadership demands that everyone is both aware of and respects the different skills and competencies found throughout the organization. It also requires a reduction in power-differentials between individuals and groups so that individuals are able to freely challenge others and to assume leadership responsibilities as required (Table 5).

Table 5: Key challenges and skill requirements of safety leadership in 'plural' mode

Type	Key Safety Leadership Challenges	Skills
Shared	• Maintaining Safety as a priority • Ensuring technical skills and knowledge of safety requirements are current	• Valuing others • Taking responsibility • Communication
Co-leadership	• Reaching agreement on priority of safety • Sharing a clear view of the way of working safely	• Negotiation • Listening • Adaptability
Distributed	• Awareness of safety competencies throughout the workforce • Promoting the freedom to challenge • Maintaining ownership of leadership responsibilities	• Deferring to expertise • Appreciating others • Challenging others

Phenomenological Approach to Leadership

Taking a phenomenological approach to leadership, Ladkin (2010)⁶⁸ in her book "Rethinking Leadership" introduced a model of the 'leadership moment', which "conceptualizes the interactive and context-dependent nature of leadership; pg. 27" identifying those elements that interact so that leadership can be experienced. The four elements are; leader, follower, context; purpose. Leaders and followers must relate within a particular context as together they pursue a common purpose. Moreover, these elements interact dynamically within the context so that the follower's perceptions of context will affect their interpretation of the leader's pronouncements and the leader's behaviour will be affected by the follower's. Their combined actions show how the purpose is being understood and lived out.

While a reduction in injuries, the creation of a safe working environment or improvements in workforce safety behaviours might constitute the ostensive purposes of safety leadership, it is not known to what extent these are achieved or how this achievement might differ with context, the degree of follower involvement or the leader's ambition. Using audio recorders we asked employees in stores of two retail chains to keep a record of when safety became salient to them during their working day. Some of the responses demonstrated 'leadership moments', for example when employees chose to relocate or reposition items of stock that were creating potential trip or fall hazards in the stock room, or when they helped others lift heavy items. In both of these circumstances possible injuries were prevented and safer working assured.

From this perspective 'safety leadership' will remain elusive because it depends on the circumstances in which it is enacted and each 'moment' contributes a small piece to our understanding of the whole. Nevertheless, as Ladkin (2010)⁶⁸ suggests, this approach may help us to better engage with 'leadership' in a safety context by helping us to clarify what it is we are seeking to know about the elements of the 'leadership moment', their interrelationship and subsequent contribution to safety. Are we interested in a better understanding of how to lead the members of our team to work safely? Or instead, are we trying to make sense of why a particular set of leadership practices designed to achieve safety outcomes worked in one setting but were less effective in another? Alternatively we may be interested in understanding how the same safety outcomes may be achieved in so many different ways?

Adaptive Leadership

Organizations typically develop safety policies and standard operating procedures anticipating that, respectively, these will provide a safe working environment and safe working practices. Yet accidents, injuries and near-misses still happen. Clearly these "technical solutions", although necessary and beneficial, are insufficient to achieve safety completely. One of the reasons for this is that safety is a systemic problem that arises from the multiple interactions between both human and technological components of a system. Such systemic problems create adaptive challenges, which call for adaptive leadership (Heifetz and Laurie, 1997)¹³⁶. Systemic problems often demand changes to organizational values and beliefs. Prioritising safety is just such a value that often runs counter to traditional organizational cultures that emphasise, for example, productivity, standardisation, innovation and creativity or personal development (Denison and Spreitzer, 1991)¹³⁷. Furthermore, solutions to the problems of embedding safety (like other systemic problems) lie throughout the organization and are not merely the responsibility of the director or health and safety manager.

Heifetz and Laurie (1997)¹³⁶ identify six principles for leading adaptive work:

- **"Getting on the balcony"**. Stepping back from the day-to-day detail to assess the bigger picture.
- **Identifying the adaptive challenge**. Fully understanding the nature of the existing problem.
- **Regulating distress**. Inspiring change and allowing employees to debate issues and clarify assumptions before providing direction so that people are not disabled but challenged.
- **Maintain disciplined attention**. Grapple with the issues, digging deeper into the conflicts emerging from different perspectives on the problem and encourage collective problem solving.
- **Give the work back to employees**. Supporting and empowering individuals to take both risks and responsibility to find the solution to the problem.
- **Protect voices of leadership from below**. Don't silence the whistle-blower or the deviant, rather take time to explore why they are doing what they do.

Each of these can be applied to the practice of safety leadership, enabling responses to specific safety related questions and particular safety challenges (Table 6). The table also suggests a number of abilities that adaptive safety leaders would need to display to be effective.

Table 6: Adaptive Leadership and its application to safety leadership

Principles of Adaptive work	What are the challenges for a “safety leader”?	Suggested abilities / characteristics of safety leadership	Key safety question / issue to be addressed
Get on the balcony	Understanding the interactions of the system	Ability to take an holistic view, to integrate	What contributes to safety?
Identify the adaptive challenge	Clarifying the safety problem/issue	Ability to interrogate multiple sources of data	What is the cause of the particular safety problem?
Regulate distress	Managing discomfort/disbelief/resentment of others	Ability to live with uncertainty and frustration	How do I motivate others?
Maintain disciplined attention	Surfacing differences of opinion / priority about safety	Ability to draw complementary skills together, to facilitate dialogue	What conflicts with safety?
Give the work back to people	Empowering others to solve safety problems...take ownership of safety	Ability to remove distractions and focus on key issues	What skills are available to solve this safety problem? Who can help?
Protect voices of leadership from below	Listening to the views of others	Ability to consider alternative perspectives	What’s really going on here?

Conclusions

Delivering safety in organizations is prescribed by Government regulations and informed by guidelines promoted by the Health and Safety Executive. These largely dictate the diversity of practices deployed by safety leaders in organizations. In part this diversity of leadership practice is a result of the historical overlaying of leadership onto those managerial practices formerly used to ensure safe working. Rather than emphasising either safety leadership or safety management, which inevitably separates safety from mainstream organizational activity, we suggest that safety may be more effectively delivered in organizations by collating the existing (and future) practices according to three evident safety objectives – Caring, Coaching and Controlling. These ‘3Cs of Safety’ could provide a useful diagnostic for safety enactment in organizations.

Hitherto, safety leadership has followed individualistic transactional or transformational models of leadership. While these may have applicability in more hierarchical organizations or where there is a heavy emphasis on supervisory control, they may be much less applicable in more networked organizational forms or where there is a dominance of professional workers. Both of these are characteristics of service sector industries. In these circumstances recent conceptualisations of ‘plural’ leadership may be more appropriate for delivering safety. Furthermore, simple technical solutions may not resolve the organizational challenges created by the increasing turbulence of the organizational environment. Assuring the effective delivery of organizational safety is one such challenge. Harnessing the principles of adaptive leadership to safety problems may ensure a safer working environment for all.

PART C: What learning happens? Using Audio Diaries to Capture Learning in Response to Safety-Related Events within Retail and Logistics Organizations.

Safety in organizations is, for many, critically dependent upon reducing errors and eliminating mistakes. Yet the occurrence of both errors and mistakes provides opportunities for individuals and organizations to learn and to change, facilitating improved safety practice. Learning from errors and mistakes however is not guaranteed. In organizations it is not uncommon for the same mistakes and errors to be repeated and for safety incidents to recur (Buchanan and Denyer, 2015)⁶¹, even serious ones. For example, accidents on the UK railways are attributed regularly to drivers passing signals at danger. This caused an accident on the Great Western main line at Southall, London in September 1997 and another a few miles away on the same line at Ladbroke Grove, London in October 1999. Less critical incidents recur more frequently in many organizations. Despite the organizational desire to reduce errors and to eliminate mistakes and so minimise accidents and incidents, they are still repeated. An important question therefore is: What prevents organizations from learning from their mistakes and errors to improve their safety performance?

According to Argyris and Schön (1974)¹³⁸ learning involves the detection and correction of error. They suggest two forms of learning. Single-loop learning simply fixes the presenting problem, while double-loop learning challenges the existing situation to discover a different way of acting or behaving. Fixing a presenting problem without addressing the underlying cause(s) allows an organization to continue with its existing policies and practices but results in the possibility of the problem recurring. Conversely, modifying organizational policies and practices through double-loop learning may eliminate the possible recurrence of a particular mistake or error. Of course this can be more costly in terms of time and resources. Organizations that emphasise single-loop learning more than double-loop learning may therefore be less likely to learn from their mistakes and errors. In an observational study of junior nurses in eight hospitals in the USA (Tucker and Edmondson, 2003)¹³⁹ argued that single-loop learning (or simply fixing a presenting problem) was overwhelmingly the more common response of these junior staff. They also suggested that the relatively dynamic, strongly hierarchical organizational context actively discouraged double-loop learning. Their conclusion was that incidents in such high risk environments were therefore inevitable, as staff became burnt-out with the additional burden of managing the day-to-day irritations of a partially effective organizational system.

Our study investigates the occurrence of single and double-loop learning amongst different hierarchical categories of employees in response to safety incidents caused by a 'gap' between an expected and an actual state or practice in organizations in more stable, less dynamic, low risk environments using a novel audio-diary approach. It contributes empirically to our understanding of safety learning in organizations in four ways. First, we confirm the findings reported for other contexts, that employees in service-type environments predominantly adopt single-loop learning rather than double-loop learning following safety related incidents. Following the well-rehearsed argument (Tucker and Edmondson, 2003¹³⁹; Lukic et al., 2012¹⁴⁰) this may suggest that learning from safety related incidents in these settings is uncommon. Second, the data suggest that organizational role rather than hierarchical position in the organization affects whether employees engage in double-loop learning. Those with formal safety responsibility regardless of position are more likely to engage in double-loop learning than those without such responsibility. Third, a comparison of our data with records of accidents and particularly near-misses in the case organizations suggest that organizational estimates of near-misses are low and that there is substantial under-reporting. This has implications for improving levels of organizational safety, if such near-miss data are used as significant indicators of future incidents. Fourth, while diaries have been used in other fields to capture live experiences they have not been used in the field of safety research. Here we modify this approach to make use of audio-recorders, which are a cost effective and accessible method for collecting real-time data relating to safety incidents across a larger population than would be possible by the ethnographic methods previously used in safety research.

LITERATURE REVIEW

Learning in Organizations

Edmondson and Moingeon (1998)¹⁴¹ and Shipton (2006)¹⁴² develop very similar frameworks along two separate dimensions to categorise perspectives on learning in organizations. The first dimension distinguishes between studies that have the individual as the unit of analysis and those that focus at the organizational level. The second dimension considers whether the research is prescriptive and interventionist, or descriptive. Organizational learning research is then populated against the resultant 2x2 matrix. Both reviews consider the existence of organizational routines and practices as evidence of prior learning at an organizational level, which is then typically communicated to new employees through induction and other ongoing training and codified in standard operating procedures. The problematic nature of the connection between learning at an individual level and learning at the organizational level is highlighted. One framework which encapsulates the interplay between learning at the individual and the organizational level, is that proposed by Crossan et al. (1999)¹⁴³. The 4I framework suggests that through the processes of intuiting and interpreting, individuals feed-forward their learning to influence the organization. The processes of integrating and institutionalising formalise and embed this individual learning in organizational rules and practices. These then feed-back from the organizational level to the individual level constraining and directing individual behaviours and actions.

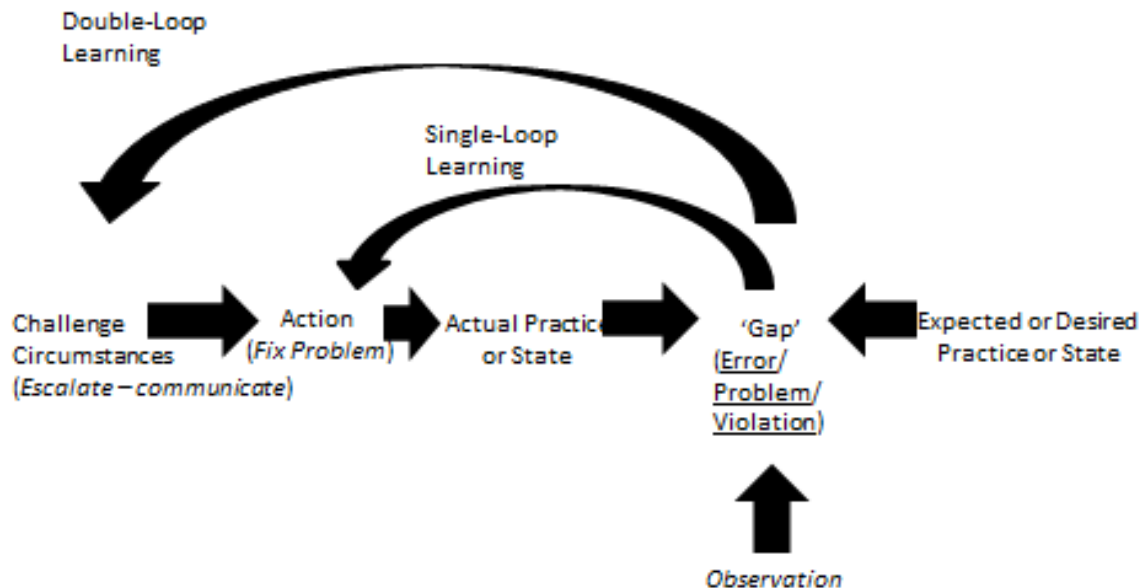
Feed-forward and feed-back loops are vital characteristics of learning which Argyris and Schön (1974¹³⁸; 1978¹⁴⁴) incorporate into their models of single and double-loop learning. Single-loop learning occurs when individuals, after detecting an error, seek to find a solution consistent with their framing of the circumstances and one that permits the organization to continue with its policies and practices unaltered. When an individual, in developing a solution, scrutinises the circumstances and the proposed action plan and in so doing modifies the organization's policies and practices, a double-loop model of learning is apparent. Single-loop learning takes the circumstances as given and operates broadly within existing routines to increase organizational effectiveness. This is essentially a closed and defensive response to the error (Argyris, 1976)¹⁴⁵ that seeks unilateral control of the environment and the task to protect self and others, so that no-one is embarrassed by challenge. Causal reasoning reduces sensitivity to feedback permitting only confirmation of existing expectations and so the freedom of choice of potential solutions is restricted.

Double-loop learning is quite different. Here individuals are encouraged to publicly test assumptions and beliefs and to participate in the design and implementation of actions and to create a wide variety of solutions that subsequently may feedback to affect individual behaviours in the future. In this mode, radical organizational change is more likely.

Reason et al. (1998)¹⁴⁶ define errors as "the failure of planned action to achieve their desired ends, pg. 292" and according to Argyris (1976)¹⁴⁵ their detection and correction is key to organizational learning. Alternatively, Tucker et al. (2002)¹⁴⁷ suggest that learning can occur through problem solving, the closing of "an undesirable gap between an expected and observed state that hinders a worker's ability to complete a task, pg. 124". The difference between these two concepts of learning hinges on the definitional distinction between 'errors' and 'problems' (Tucker and Edmondson, 2003)¹³⁹. However, in practice both errors and problems require the resolution of a discrepancy between expected and actual practice. This 'gap' (Figure 4), once it has been observed (which is the starting point for the cycle in the figure), can be investigated and then often it can be resolved in similar ways, irrespective of whether it came from an error or a problem. Correcting errors through single or double-loop learning is considered to be analogous to first and second-order problem solving (Tucker et al, 2002)¹⁴⁷. First-order problem solving, like single-loop learning, fixes the presenting problem but does nothing to prevent it reoccurring, whereas second-order problem solving like double-loop learning seeks to diagnose and alter the underlying causes of the problem to prevent recurrence.

Figure 4: Model of possible safety learning opportunities arising from a 'gap' between an actual or expected state or practice caused by errors, problems and violations (inspired by Carroll et al., 2002)¹⁴⁸

Items in *italics* represent actions evident in the data either explicitly (fix problem/ escalate-communicate) or implicitly (observation).



In addition to problems and errors, a third category of discrepancy between expected and actual practice exists, namely rule violations. Desai (2010; pg 185)¹⁴⁹ defines these “as the voluntary and intentional departure of behaviours from rules governing how that behaviour should occur in organizations” and notes that they are only infrequently incorporated into discussions of organizational learning. Problems, errors and violations each provide opportunities or stimuli for learning. However, we suggest that the type of learning that occurs depends upon the individual’s response to the circumstance (Figure 2). Observing a rule violation by another colleague, but not taking corrective action, indicates that the individual is aware of organizational rules and operating procedures, most probably learnt through prior training. Following Crossan et al. (1999)¹⁴³, feed-back mechanisms exert organizational level influence on the individual, raising awareness of what behaviours are acceptable and reinforcing prior individual learning. Taking corrective action to fix a problem, but not addressing any of the underlying causes indicates single-loop learning (or first-order problem solving). Escalating or communicating a problem to more senior colleagues or external agencies to make wider systems changes to resolve a problem and remove the underlying causes to prevent recurrence indicates double-loop learning or second-order problem solving (Tucker and Edmondson, 2003)¹³⁹. In Crossan et al.’s (1999)¹⁴³ framework this corresponds to feed-forward where the individual influences the organization, suggesting possible changes to practices and providing an opportunity for organization-level learning.

Problems, errors and violations therefore provide opportunities for observing and investigating organizational learning. However, the type of learning that occurs depends upon whether individuals simply fix the problem following the model of single-loop learning, or whether they make wider system changes to remove the underlying causes following a model of double-loop learning. Highly centralised organizations operating in stable environments, where the focus is on efficiency, tend to reinforce past behaviours. In these contexts challenges to existing operating processes are likely to be unwelcome and double-loop learning discouraged (Fiol and Lyles, 1985)¹⁵⁰. The focus is more likely to be on

problem solving to ensure technical improvements and the maintenance of the processes. These environments are also likely to limit discretionary activity which facilitates experimentation and investigation, thereby reducing opportunities for double-loop learning and emphasising single-loop learning. Such conformity tends to inhibit organizational learning (Edmondson, 2004)¹⁵¹.

Organization Learning for Safety

In their review of learning in the safety literature Drupsteen and Guldenmund (2014)¹⁵² concluded that how learning occurs had been rarely studied, noting that safety research would benefit from input from organizational learning theories, such as Argyris and Schön's (1978)¹⁴⁴ models of single and double-loop learning. Prior to this review, Lukic et al. (2010)¹⁵³ had developed a framework for learning from incidents in the workplace that had four dimensions (learning process, learning participants, type of knowledge, type of incident). The learning process incorporated the single and double-loop learning concept of Argyris and Schön (1978)¹⁴⁴ to question what kind of learning process was adopted in response to the incident. Following empirical validation of the framework in the energy sector a fifth dimension (learning context) was added (Lukic et al., 2012)¹⁴⁰ but the choice of learning process (single or double-loop learning) remained. Moreover, Lukic et al. (2012)¹⁴⁰ noted the emphasis on single-loop rather than double-loop learning in response to safety incidents, because there was no incentive to share near misses and other small-scale incidents with others for fear of embarrassment. Yet they acknowledged the importance of the need for awareness of small-scale events in potentially mitigating further more serious safety incidents. This supports Drupsteen and Guldenmund's (2014)¹⁵² more general conclusion that existing safety learning studies report the reluctance of individuals to share information with others and that learning in safety research implicitly adopts a single-loop learning approach focusing mainly on ways to improve existing processes.

Accidents and near misses in organizations are often the result of problems, errors or violations and they recur because of the failure of organizations to learn (Drupsteen and Guldenmund, 2014)¹⁵². While rare and unusual events which can impact whole organizations may trigger organizational learning (Lampel et al., 2009¹⁵⁴; Beck and Plowman, 2009¹⁵⁵) commonplace incidents perhaps impacting single individuals or small groups also trigger organizational learning through either single or double-loop learning and occur more frequently. These latter incidents, arising from a discrepancy between expected and actual practices, have been attributed to the acontextual nature of much formal safety training. Somerville and Lloyd (2006)¹⁵⁶ reported that actual working practices deviated from codified safe working practices in a range of different sectors including aged care, coal mining, building construction and fire and rescue services because the standardised safety training failed to take account of the need to alter practice in response to the variation in social and physical environments in which the workers operated. As a consequence everyday work experiences are often valued more highly by individuals as safety-specific learning opportunities than formal safety training courses and seminars as shown by Maslen (2014)¹⁵⁷ for young engineers in the Australian gas pipe-line industry and by Størseth and Tinmannsvik (2012)¹⁵⁸ in the rail and marine sectors too.

While the experience of errors and problems during the working day may trigger individual safety learning through single-loop learning, the observation of rule violations indicates prior learning through the awareness of standardised practices and expected behaviours and may also act as a stimulus for learning as individuals seek to understand or correct the discrepancy between expected and actual practice. Sanne (2008)¹⁵⁹ in an ethnographic study of railway maintenance technicians in Sweden reported in detail how their practices deviated from written practice and why this deviance went unreported. An earlier study by Lawton (1998)¹⁶⁰ reported deliberate deviations from written rules by railway shunters in the UK and identified three classes of violations: exceptional (unusual circumstances requiring an unusual response); situational (based on a desire to keep the job going in adverse circumstances); and routine (a short cut regularly taken). These three were differentiated from unintentional violations arising from ignorance or inexperience, which correspond to error. Mascini (2005)¹⁶¹ reported similar rule violations by workers in a coke factory in The Netherlands. In all of these cases the deviation of actual practice from expected practice had been normalised and accepted (Vaughan, 1999)¹⁶². Deviant practice became acceptable and rarely triggered challenge and therefore no opportunity for individual learning. In these cases individuals had simply learnt a different practice, or routine, from that anticipated by the organization.

In their review of safety management in organizations, Zanko and Dawson (2012)¹⁶³ asserted that, “we need to examine individuals in work settings, [examining] the workplace environment and daily operating procedures as well as the tasks and activities that occur within context and over time, p.32”. Such studies of individuals in their daily workplace would indicate where single or double-loop learning occurs in response to the errors or problems that create safety incidents, including near-misses and where safety rule violations can be observed and responded to. Many of the studies in the safety literature, including those reported above, focus on riskier or more hazardous environments. Safety learning by individuals working in organizations in lower risk, less hazardous contexts remains under researched. Moreover, it is unclear whether safety rule violations occurring in risky high hazard environments are replicated in low hazard environments. In addition, Smallman (2001)¹⁶⁴ called for more safety research across hierarchical levels to indicate differences and similarities between different groups. Safety research has typically focussed on front-line employees and their supervisors (Zohar and Luria, 2003¹⁶⁵; Kapp, 2012^{95a, 95b}), and ignored managers further up the organizational hierarchy, who might have different experiences of safety, but also make a different contribution to safe working in organizations.

Collecting Data on Safety Practices

Accessing and collecting data about day-to-day activities and events relating to safety presents a challenge (Zanko and Dawson, 2012)¹⁶³. An ethnographic approach allows in-depth observation, for example Iszatt-White's, (2007)¹⁶⁶ investigation of violations of safety practices amongst UK construction workers. An alternative, more cost-effective technique is the diary method, where individuals record their actions in real time (e.g. Daniels et al., 2013¹⁶⁷; Katzeff et al., 2012¹⁶⁸). Diaries allow the collection of qualitative data that can provide rich descriptions of events to facilitate the understanding of day-to-day practices and inter-relationships (e.g. Symon, 2006)¹⁶⁹ or, to highlight the salience of a sensitive issue such as ethnic identity (e.g. Atewologun, 2011)¹⁷⁰. Thus, the diary method is particularly suited to collect data on responses to problems and errors affecting safety in the workplace and the recording of any violations of safety rules observed.

Using diaries as a mechanism for encouraging employees to record safety events and the outcomes at the time of their occurrence allows us not only to discover those triggers to learning but also to capture either explicitly or implicitly the courses of action taken in response to those triggers and therefore whether learning was single or double-loop. The diary approach can reveal not only how individuals respond to problems and errors, indicating the type of learning they display, but also the occurrence of safety rule violations and therefore deviation from taught practises and learned routines. Recording a number of events by individuals spanning an organizational hierarchy over time allows a rich picture to be developed that indicates what is being learnt by whom and how.

Responding to the challenges of both Smallman (2001)¹⁶⁴ and Zanko and Dawson (2012)¹⁶³ and using Argyris and Schön's model of single and double-loop learning as an organizing framework, we investigate the occurrence of different types of learning in the execution of safe working practices by respondents from across the organizational hierarchy in retail and logistics organizations. In order to capture these learning incidents we adopted an audio-diary method, whereby respondents were asked to use an audio recorder to capture the incident and their responses as the event occurred and where possible, within the constraints of normal, safe, working practice.

METHODS

This study formed part of a larger investigation of safety leadership and safety practices in service sector organizations. An overwhelming majority of the workforce in the UK (Office for National Statistics, 2013)¹⁷¹, across Western Europe and the US are employed in service industries. These organizations characteristically have a highly centralised bureaucratic structure with a dominant head-quarters developing policies and practices to be enacted locally without deviation. There has been only limited investigation of safety leadership and safety practices in these contexts, for exceptions see Barling et al. (2002)¹⁷², Bentley and Haslam (2001)¹⁷³, Dejoy et al. (2004)¹⁷⁴ and Kelloway et al. (2006)⁹⁹. The study from which data are drawn for this paper sought to understand when during the working day safety became salient to different categories of employees and to determine the nature of these triggers and what the response to them was. Taking a learning perspective, this paper describes and

synthesises the nature of learning (single/double-loop) in response to safety incidents (problems, errors or violations) reported by a cross section of employees (front-line workers, supervisors and managers) in major retail and logistics companies operating in the UK.

Data Collection

Using an event contingent data collection strategy, audio diary records were kept by 21 respondents. They recorded when, during their working day, safety became salient to them. Respondents came from three organizations across six different sites. Two units each from two different UK retail chains, one with more than 700 stores selling general merchandise and the other DIY materials and home furnishings from more than 300 stores, were complemented by two warehouses from a global logistics company with more than 100 locations in the UK. Participants occupied one of three possible roles: manager, supervisor or front-line worker. Table 7 shows the distribution of participants in different job roles across the three organizations.

Table 7: Numbers of participants according to their rank and sector of employment

Sector	Diarist's Rank Within Their Organization			Total Number of Diarists
	Frontline	Supervisor	Management	
Logistics	5	2	2	9
Retail	8	3	1	12
Total Number of Diarists	13	5	3	21

The participants, who were identified by their local manager, were asked to keep a diary for a period of 14 days, recognising that they may not be working every day. These individuals were given a digital voice recorder and then briefed by a research team member. Included in the briefing was an explanation of how to use the voice recorder and a short description of the data collection protocol. Diarists were asked to note when during their workday they became mindful of safety. For each of the identified incidents they were asked to respond to five open-ended questions. They were asked to identify when and where the incident occurred, why safety came to mind, whether anything happened, who was involved and what the immediate outcome was. Finally, they were encouraged to make their recording as close to the time of the incident as possible to minimise any hindsight bias (Podsakoff et al., 2003¹⁷⁵; Ohly et al., 2010¹⁷⁶). They were encouraged also to record, at the end of the day, if nothing happened during the day to make safety salient to them. To increase participation and following the suggestion of Atewologun (2011)¹⁷⁰ and Poppleton et al. (2008)¹⁷⁷, personalised text message reminders were sent by research team members to participants every few days encouraging them to complete their diary. Upon completion of the two week period of data collection, the recorders were collected by a research team member. Participants were debriefed to better understand their experience of keeping the diaries. Notes of these conversations were captured.

Data Analysis and Coding

The audio recordings for each incident from every participant were transcribed. Using template analysis (King, 2006)¹⁷⁸ the transcribed data were coded according to the type of trigger (or event) that raised safety awareness for the respondent and also according to the nature of the outcome of the incident. To ensure our coding of the data was robust, three researchers together coded each incident against the template reconciling differences of interpretation through discussion.

For many, but not all, of the incidents it was also possible to identify the learning opportunity they presented to the respondent. Following Tucker and Edmondson (2003)¹³⁹ we differentiated between single and double-loop learning. Single-loop learning (or first-order problem solving) responses were indicated by respondents recording that they found solutions immediately to presenting problems, often without the help of others, although like Tucker and Edmondson (2003)¹³⁹ we also included in this

category incidents where help was obtained from close peers. Incidents where respondents referred problems to more senior colleagues or external agencies were coded as double-loop learning (or second order problem solving), as Tucker and Edmondson (2003)¹³⁹ did in their study of problem solving in hospitals. Violations were indicated by deviation from either standard operating procedures which we had been told about in earlier interviews with the respondents or from known legal safety requirements.

Findings

The 21 respondents made a total of 162 separate reports covering at least 84 person-days of data collection; not everyone identified the day on which they reported. Twenty two reports stated that “there haven’t been any incidents today”, or simply “no issues”. Of the remaining 140 reports over half (n=77) were suggestive of some form of learning. Forty-eight reports referred to situations that were resolved immediately by the respondent with or without the help of a peer, indicating single-loop learning. Thirteen reported situations were referrals to other people more senior than the respondent, suggesting double-loop learning. There were 16 recordings which related to the observation of violations of standard operating procedures. The remaining 63 reports covered a range of topics such as ‘attending training’ or ‘H&S meetings’, ‘reading briefings’, ‘checking equipment’ and reflections on safety, such as “we talk about Health and Safety and we talk a good game but ultimately it always comes down to meeting the customers’ requirements”, and “I think sometimes [Health and Safety] can go slightly overboard, sometimes it can be a bit drastic, but if used correctly it can be brilliant”.

Single-Loop Learning

Table 8 shows the number of reports made by different groups of workers in the case organizations that indicate single-loop learning. This was most frequently presented by front-line workers in retail. In several cases this was because they were dealing with equipment that had been incorrectly placed or secured. In other instances stock in the stock rooms had been incorrectly positioned creating a hazard, requiring them to reposition it. For example, “overhanging objects in the aisle, so they’re below the ladder height, so as you push them along they’ll fall on top of you. So I just relocated them to a better space”. Another front-line worker in a different store described the following hazardous situation. “There is a suitcase in a box and a microwave perched on top, the microwave has got a warning sticker for 21 kg. There is a heavy item on top of a small item. There also appears to be an item of furniture in a box which is essentially propping up this microwave. If this item was moved it would definitely fall. What I’m going to do is attempt to rearrange some of the stock to a more safe and logical order so that it doesn’t present a hazard of danger to anyone passing by”.

Table 8: Number of reports of incidence of single-loop learning by different categories of staff in retail and logistics organizations

	Role Category			
	Front-Line worker	Supervisor	Manager	Total
Retail	28	8	0	36
Logistics	4	2	6	12
Total	32	10	6	48

At other times these front-line workers were dealing with slip hazards on the shop floor. These were created by spillages mainly of paint or other liquids, but sometimes of food and pencils (Table 9). Rain water too creates slip hazards for customers. One front-line worker noted that the rain water “was mopped up swiftly with paper towels to ensure the safety of our customers” and a “‘caution wet floor’ yellow sign was put out”, and another worker at a different store, “made sure there’s no water on the floor and there are signs set up as well”.

A number of front-line respondents noted that they had asked for assistance from their immediate colleagues to solve a problem. One reported asking for assistance to carry a heavy item to the back

door of the shop. Others reminded team members not to leave “kick stools on the shop floor”, because they create a trip hazard and told “them where to store [the kick stools] in the warehouse”.

Table 9: Responses to different spilt items in retail settings

Spilt Item	Observation
Paint	“a couple of colleagues were checking a tin of paint and the lid came off. That was easily cleared up with a few paper towels, unlike the usual thing where we have to get a trolley out and just put some compost down to soak all the paint up”. “we had a big paint spillage today, a lot of paint which would have caused a slip hazard. It has been sorted straight away”.
Food	“Somebody has spilt popcorn on the shop floor. Not the most exciting of things but it had to be swept up and everything, and I had to let the manager know”. “A child has spilt a drink of some sort onto the shop floor, but it was cleaned up immediately and put with a ‘wet floor’ sign”.
Pencils	“I noticed several pencils on the floor underneath one of the gondolas bearing the catalogues. I am simply going to pick these up and put them away in their correct place”.

While there were nine slip hazards reported by respondents in the retail sector there were no such reports by those from logistics. Fewer incidents leading to single-loop learning occurred in the logistics context (Table 8). Nevertheless, front-line workers in logistics did observe that equipment (a pump truck) had been incorrectly placed (left in the walkway) and needed to be moved. They also reported engaging with peers to resolve problems and prevent accidents or improve safety. One worker noticed that “an operator was reloading a Little York disposable cleaning cloth machine, stood in from of the main door between the fulfilment operations and returns. I’m not quite sure how the machine ended up in front of the door but clearly there was an infringement of Health and Safety and she was exposed to some risk as the door would have opened onto her, so I asked her to move into a safe area to re-load the machine”. Another “found someone had entered the warehouse without high-vis [high – visibility vest]. I just reminded him and he’s gone back to the security”. He concluded by asking the question, “why security allowed him to go into the warehouse without high-vis?” (This is contrary to company policy.)

Another difference between respondents from logistics and retail was that the managers in the logistics company reported fixing faulty equipment. For example, “scales that had not been PAT (portable appliance testing) tested within the last 12 months” were “taken out of use”, and “faulty lights in the gents’ toilets, which was leading the toilets obviously to be in complete darkness ... so the toilets were closed until we could replace the light bulbs”. No managers in the retail context reported incidents that could lead to single-loop learning.

Double-Loop Learning

Double-loop learning events were much less common than first-order problem solving incidents (Table 10). Overall, only 13 of these events occurred compared to 48 first-order problem solving events (Table 8). With two exceptions these 13 events were all reported either by managers or front-line workers with a responsibility for safety, because they were either nominated Health and Safety Champions or the union representative.

Table 10: Number of reports of incidence of double-loop learning by different categories of staff in retail and logistics organizations

	Role Category			Total
	Front-Line worker	Supervisor	Manager	
Retail	3	2	0	5
Logistics	5	0	3	8
Total	8	2	3	13

In the logistics context, managers reported an incident where some of the boxes returned from a retail store contained human excrement. They had raised this with the retail customer and UK Mail, the delivery service, and both organizations were “going to do an audit”, while the logistics company was going to “start an internal investigation”. These managers were also exploring alternative options for disposing of waste from the floor scrubber with the site management agency. Both examples involved interactions with other organizations.

In contrast, front-line workers typically reported issues to superiors in the hierarchy anticipating that they would resolve the problems. For example, the Health and Safety Champion in one of the retail stores reported that “we would like a mirror installed on our services yard because it has been used as a rat-run, people coming up the wrong way and there’s a blind turn where the forklift prongs would be at engine height for any car coming up there. It’s an issue that [the manager] will raise with the landlord, as we can’t actually do anything outside of what we’ve already done in the yard”.

Similarly, the union representative in the warehouse raised “an issue in regard to drivers being sent out on vehicles that haven’t been risk assessed for the outlets that they’ll be delivering to. This has been brought up in different ways, i.e. with managers, team leaders and operation controllers”. But, “the desired outcome hasn’t occurred”. He also raised a training issue with HR where concern was “raised by some people in regards to chemical spillages and not having a fuller understanding on how to deal with them”, despite them having been trained.

Learning from Violations

Violations of organizational safety rules were more often reported by the nine respondents from the logistics company than the 12 respondents from the retail context. Moreover, with one exception reported by a supervisor, all other violations were reported by front-line staff and never by managers.

In the logistics company the violations typically centred on the interaction between people and equipment. First, individuals were wrongfully present in the same space as equipment. The supervisor “caught a forklift driver talking to a pedestrian in the aisle and she was sitting on the actual truck I explained that no-one sits on the trucks whilst they are talking and the other person should be at least six to eight feet away”. One front-line worker “saw pickers entering the racking system where the drivers are in operation, instead of waiting until drivers have left the aisle”, while another at the same warehouse on a different day noted that “there was an operator stood with a forklift truck in the racking aisles whilst retrieving [an item] from a high location”.

Second, individuals were operating equipment apparently without regard for co-workers. One front-line worker reported “a prime case today with a guy being ignorant on his truck and ignoring the signs of having to beep his horn when coming through the doorways, nearly hitting someone”. A similar incident occurred at a different warehouse where one front-line worker “witnessed one person enter and exit ... on their reach truck not using their horns to alert people that they’re coming through.”

Other types of violations were apparently related to attempts by workers to accelerate the processes. In one warehouse a front-line worker “found the person who is booking the stock actually when the double-stack pallets arrive, instead of taking pallets down and scanning the labels from the pallet, she jumped on the pallet and doing this actually to get from one to another pallet”. At the same warehouse

on an earlier occasion a front-line worker *“noticed that one of the operatives had to stand on the pallet to retrieve the stock”*. At a different warehouse the union representative observed that safety guards were not being used, *“we have straps for the FLT (fork-lift truck) drivers to use when putting away and replenishing. These aren’t being used because it slows down the process”*. He concluded, *“managers are aware of this occurring and are quite happy for it to continue because it meets the customers’ requirements”*.

In the retail company, the violations were often situations immediately resolved by the respondent. Some situations involved equipment. For example, one worker noticed that *“the ladder had already been opened and left out”*. According to an earlier interview, ladders were supposed to be closed and hung up when not in use. The same worker also noticed that the door on one of the stock cages *“wasn’t pinned back correctly”*. If they are open, doors on cages are supposed to be pinned back to prevent injuries particularly cuts. In both instances this respondent corrected the mistake. Other circumstances involved stock. At a different store a front-line worker noticed that *“a fairly large item, possibly a wardrobe in a flat pack, had been propped up next to the fire door It has been stacked in such a way that it is essentially blocking the fire door. It is only one item but under regulations all fire doors must be kept clear at all times”*. This was subsequently moved.

Discussion

Learning is widely regarded as being purposeful, leading to improvements in efficiency, productivity and innovation (Dodgson, 1993)¹⁷⁹, which indirectly may impact organizational safety by shaping organizational goals and priorities. Learning may also affect organizational safety directly through the attention given to the processes of incident analysis and impact (Drupsteen and Guldenmund, 2014)¹⁵². However, Drupsteen and Guldenmund (2014)¹⁵² also report that the processes of learning from safety incidents has limited empirical foundation and that Argyris and Schön’s theory of single and double-loop learning has relevance for safety improvement. Adopting Argyris and Schön’s perspective on learning we have investigated empirically the types of learning that may be apparent from different self-reported safety incidents.

Single-loop learning is considered to be more common in organizations than double-loop learning (Argyris and Schön, 1978)¹⁴⁴. While the latter challenges assumptions underpinning policies and practices and encourages more radical change, the former seeks to achieve pre-determined goals, making only minor adjustments to practise, based on feedback to achieve them and to maintain organizational stability. In this study single-loop learning is evidenced in reports by respondents of how they fixed a presenting problem either single handed (e.g. moving misplaced and therefore unsafe stock) or with others using a standardised procedure (e.g. cleaning up a spillage). This was the more common learning event across all staff. In these cases no information was shared with others. Organizational change to effect improvements to safety practices was unlikely and incidents inevitably recurred as evidenced by the respondent who noted the incorrect juxtaposition of a suitcase and microwave, also a few days later reporting another problem with stock; a potential trip hazard.

Single-loop learning from safety incidents has been found to dominate within the high hazard energy sector (Lukic et al., 2012)¹⁴⁰, potentially driven by a focus on increasing efficiency (Carroll et al., 2002)¹⁴⁸. This was an organizational priority for the retail and logistics companies involved in the current study. Carroll et al. (2002)¹⁴⁸ suggest that a centralised bureaucratic structure, where control is exercised by strict adherence to standardised rules and procedures, precludes challenge and encourages single-loop learning. Furthermore, Tucker et al. (2002)¹⁴⁷ argue that an emphasis on first-order problem solving (or single-loop learning) limits or even prevents organizational learning. Nevertheless, single-loop learning may be effective and efficient for individuals and groups undertaking routine tasks to achieve their objectives in stable environments. However, it may be detrimental to the individual (Tucker and Edmondson, 2003)¹³⁹ and organization in the longer term (Carroll et al, 2002)¹⁴⁸ if small-scale incidents are indicative of a wider organizational malaise that will trigger a larger event if they remain unattended too.

Double-loop learning occurs when individuals have the opportunity to challenge the assumptions upon which organizational policies and practices are based and to feed-forward to influence them (Crossan et al., 1999)¹⁴³. Inevitably, this requires communication with others who are often in senior positions within

the organization or sometimes with external agencies. Both of these types of events were evident in the data but not extensively. Carroll et al. (2002)¹⁴⁸ note that it is difficult for many organizations to maintain the necessary openness to allow this internal dialogue and furthermore, it may be wasteful of resources to do so. There is a tendency for organizations to impose controls and so constrain learning. Nevertheless, following an incident, individuals may engage purposefully with organizations, for example, by escalating issues to senior management. Lukic et al. (2013)¹⁸⁰ suggest that active engagement of individuals may be fostered by organizational factors that encourage participation, solicit input and provide feedback. In this study, employees with responsibility for safety communicated with others, including external organizations, offering the possibility for double-loop learning (Tucker and Edmondson, 2003)¹³⁹. Predictably, these individuals were the managers and supervisors who were accountable for organizational safety and who, perhaps, had more time for discretionary activity in their roles. Surprisingly, however, a number of front-line workers also reported communicating with senior colleagues or external agencies. One explanation for this was that these front-line workers had a particular interest in health and safety because of their additional roles, which permitted them to raise safety concerns with their superiors or with external organizations and to more confidently challenge the status quo. Challenge is one of several individual characteristics identified by Edmondson (2004)¹⁵¹ that contributes to organizational learning.

Recognising safety violations necessarily indicates that the observer has been taught and has learnt the required procedures that govern safe behaviours and actions. The organization has thus influenced the individual (Crossan et al., 1999)¹⁴³. Furthermore, violations of safety rules are deemed to be opportunities for organizational learning (Alper and Karsh, 2009¹⁸¹; Desai, 2010¹⁴⁹) because they reveal potential problems with existing organizational practices. Many of the reported incidents appear to correspond to Lawton's situational violations (Lawton, 1998)¹⁶⁰, where organizational pressures override safety considerations. These instances may also indicate heedlessness (Weick and Roberts, 1993)¹². Individuals failed to pay attention to their immediate surroundings, by driving without sounding their horn to warn others. In this study the violations have been restrictively ascribed to incidents observed by others where individuals were 'caught in the act'. Nevertheless, some of the incidents caused by errors and defined here as single-loop learning opportunities may also indicate earlier violations of standard operating procedures confirming the observation that the distinction between violation and errors may not always be clear (Reason, 1990)¹⁸². For example, in several cases the presenting problem (ascribed here as an error with potential for single-loop learning) was a situation created by the violation of a known standard operating procedure by another person, e.g. the failure to close and replace a stepladder in the retail store or a pump truck left in the walkway of the warehouse. These observations of violations of a policy or a practice by another person also present the opportunity for single-loop learning, as indicated in Sanne's study (2008)¹⁵⁹ of Swedish railway technicians.

Problems, errors and violations are the focal incidents for learning in this study. Many of these constitute 'near-misses' defined as an event that has the potential to cause harm (Health and Safety Executive, 2004)¹⁸³. For example, blocking a fire door, leaving a ladder unattended on the shop floor and driving a reach truck through doors without sounding a horn to warn nearby workers all constitute 'near misses'. However, the numbers of near miss incidents formally reported in these organizations at the time of the study were small. None of the retail stores reported a near-miss incident during the period of study, but we identify six incidents from the data that could be described as near-misses. Similarly, in the logistics company, four respondents at one warehouse observed a total of four incidents yet the records for the whole warehouse employing almost 900 people in the same period revealed only eight accidents and six near-misses. It seems likely therefore that actual numbers of incidents exceed the reported numbers. This finding directly challenges the veracity of near-miss data. If near-miss data form the foundation for guiding safety policies and practices in organizations then greater emphasis needs to be placed upon accurate reporting. Zhao and Olivera (2006)¹⁸⁴ provide three broad categories of reasons why errors may not be reported: emotional reasons; situational ambiguity and lack of awareness. Awareness of near miss reporting systems and their ease of use, especially in target driven environments, like retail and logistics, are considered to be significant factors in the design of accessible error reporting systems (Pfeiffer et al., 2010)¹⁸⁵. The audio recorders used in this study encouraged respondents to remain attentive to safety issues and potentially provide an effective and accessible means of reporting near misses.

As far as we are aware, diary methods have not been used in safety research. On the basis of this study, audio diaries have the potential to make a significant contribution to safety research in three areas. Firstly, they may help to develop our understanding of the actual practices of safe working by revealing how employees respond to circumstances around them. Secondly, drawing on Snook's (2000)¹⁸⁶ theory of practical drift, the use of diaries may help to reveal where 'actual practices' in the work place differ from the 'espoused practices' of the documented safety policy and written procedure. This might also allow a more in-depth study of safety violations complementing the time-intensive, costly ethnographic approach adopted by Sanne (2008)¹⁵⁹, Mascini (2005)¹⁶¹ and Iszatt-White (2007)¹⁶⁶. Thirdly, diaries such as those in the current study can reveal when safety becomes salient to employees. The high reliability organization literature indicates that mindfulness is critical for safe operations in high hazard settings (Weick and Sutcliffe, 2001)¹⁸⁷. The use of audio recorders which are convenient to carry, simple to operate, unobtrusive and potentially permitting 'real-time' reflection, allows an examination of mindfulness in a variety of organizational settings.

The study has a number of limitations associated with the method and the analytical framework. Recording the responses of 21 respondents to identify learning from safety related incidents is a small sample dictated by access to and availability of volunteers so caution should be exercised in extrapolating beyond these contexts. A two week time frame for the duration of data collection may be insufficient to gather sufficient data. Other diary studies, albeit in different contexts, have longer durations. This was a compromise decision reached after discussion with line managers and participants in the organizations. It sought to avoid the task becoming too onerous and the consequent participant response rate diminishing to unacceptably low levels. Despite the clear written and oral instructions prior to commencing the study, participants provided a wide variety of responses ranging from a brief observation (of a few words only) to a more lengthy observation and reflection. While we used template analysis to examine the responses, alternative analytical methods for short sound-bites may be more appropriate. Crucially, we were dependent upon the respondents remembering to make recordings. Some were more diligent than others despite reminders. The nature of these 'missing data' and whether they resemble captured data is unknown.

CONCLUSION

Learning for safety was indicated in this study of retail and logistics organizations in three ways. First, employees adopted a single-loop model of learning in response to safety incidents, which echoes other work and suggests that organizational learning from the more common-place and frequently occurring safety incidents was limited. A propensity for single-loop learning may help to explain why incidents regularly recur. Second, a model of double-loop learning was apparent to a more limited extent and then only by those who were accountable for safety because of their formal roles. Providing pathways for participation, encouraging input and giving feedback may informally enable a greater number of individuals to engage more effectively in double-loop learning (Lukic, et al., 2013)¹⁸⁰ rather than relying on role specifications to stimulate safety learning in organizations. Third, the observation of violations indicates the influence of prior learning of standard operating procedures through organizational training. This suggests strongly that while learning has occurred for some it is either not universally embedded or that there has been a drift in day-to-day practice away from that prescribed in the standard operating procedure.

Two other conclusions may also be drawn from this study. The data were drawn from a small number of people over a short period of time, yet they contain a number of near-miss incidents that exceed the numbers officially recorded. The accuracy of near-miss data to guide the development of safety policy and practice may therefore be questionable. Finally, audio diaries may be used to effectively gather data on safety practices in real time within organizations, providing rich qualitative data to support our understanding of safe working.

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APPENDIX 1: Project Dissemination Activities

Journal Submissions:

Pilbeam, C.J., Davidson, R., Doherty, N. and Denyer, D. What learning happens? Using audio diaries to capture learning in response to safety-related events within retail and logistics organizations. *Safety Science* (Revisions Submitted 30 April 2015).

Conference Presentations:

Colin Pilbeam, David Denyer and Noeleen Doherty (2015). Achieving safety compliance through safety leadership. Working on Safety Conference 2015. 23-25 September 2015. Porto, Portugal.

Ross Davidson, Colin Pilbeam, Noeleen Doherty and David Denyer (2014). Capturing safety awareness through diaries. Working on Safety Conference 2014. 30 September – 3 October, 2014, Glasgow.

Colin Pilbeam, David Denyer, Noeleen Doherty and Ross Davidson (2014). Defining low hazard environments for Common Safety: Common Sense isn't it? Working on Safety Conference 2014. 30 September – 3 October, 2014, Glasgow.

Davidson, R., Pilbeam, C., Denyer, D., and Doherty, N. (2014). Capturing safety awareness through diaries. BAM2014, Belfast, 9-11 September 2014.

Colin Pilbeam, Ross Davidson, David Denyer and Noeleen Doherty (2014). Networks of influence: safety leadership in service organisations". XX World Congress on Safety and Health at Work. Frankfurt, Germany. 24-27 August, 2014.

Practitioner Events:

Launch Event for IOSH Project Cranfield School of Management 10th June 2013.

HQN Health and Safety Summit 2013 "Putting it into practice – the importance of safety leadership in the workplace. What is a good leader ?" Marriott Hotel, Kensington, London 3 December 2013.

IOSH Midland Branch East District networking event. "The Leadership Research" Project Dunchurch Park Hotel, Dunchurch, Warwicks. 12 March 2014.

CILT "Safety culture & safety practices" Cranfield School of Management, 23 September 2014.

"Safety Leadership in Service Organizations". Finale Event for IOSH Project, Cranfield School of Management, 27 January 2015.

NOSHEA 60th Anniversary Dinner "Safety Leadership and learning" Grendon Hall, Grendon, Northants 9 June 2015.

APPENDIX 2: Project Advisory Group

Membership:

Mr Carl Foulkes-Williams – Safety Consultant, Houses of Parliament

Ms Hayley Saunders – Senior Associate, Shoosmiths LLP

Mr Glenn Sibbick – Safety Consultant in Energy Sector. Honorary Fellow of IOSH.

Mr David Wallington – Safety Director, BT

Meeting Schedule:

Advisory Group meetings were held at Cranfield School of Management on:

- 30th April 2013
- 4th September 2013
- 12th December 2013
- 9th April 2014
- 8th July 2014
- 16th September 2014

IOSH is the Chartered body for health and safety professionals. With over 50,000 members in more than 130 countries, we're the world's largest professional health and safety organisation.

We set standards and support, develop and connect our members with resources, guidance, events and training. We're the voice of the profession and campaign on issues that affect millions of working people.

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