

Safety leaders: who are they?; what do they do?

Report submitted to the IOSH Research Committee

Dr Colin Pilbeam, Dr Ross Davidson, Dr Noeleen Doherty and Professor David Denyer

Cranfield University – School of Management

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EXECUTIVE SUMMARY

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, prioritizing 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 characterized by practices that align more closely with management than leadership. This includes the practices of setting goals, monitoring performance and rewarding appropriately.

Alternative conceptualizations 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.

INTRODUCTION

Safety Leadership: More or Less

Who is a safety leader? Where do they reside in an organization? What roles and practices are constitutive of safety leadership? These are important questions that affect organizational working environments and the safety of employees, yet academic and practitioner literatures provide no definitive answers. No unequivocal, unambiguous definition of a safety leader or safety leadership exists and the roles and practices signifying safety leadership vary with the focus of the particular study or guidance note which may be aimed at directors, managers, supervisors or front-line employees, making specification difficult.

The earliest references to the notion of safety leadership appear to be in a CBI publication, 'Developing a Safety Culture' (CBI, 1990)¹, where leadership is required to initiate, develop and sustain an organizational culture. A subsequent HSE publication, 'Organizing for Safety' (ACSNi, 1993)², noted the emergence of the following dominant themes:

- a. The crucial importance of leadership and the commitment of the chief executive;
- b. The executive safety role of line management;
- c. The involvement of all employees;
- d. Openness of communication; and
- e. The demonstration of care and concern for all those affected by the business.

Evidently, organizational leaders were being encouraged to embrace the consideration of safety as part of their role, with some initial suggestions for what they might do to perform this safety leadership role including employee engagement, effective communication and concern. Following the CBI publication¹, the Health and Safety Executive (HSE) produced a practical guide, 'Successful Health and Safety Management' (HSG65)³ in 1991, which has been revised subsequently. The latest version, 'Managing for health and safety'⁴ published in 2013 adopts a 'Plan, Do, Check, Act' model for safety and notes that leaders should focus attention on risk profiling, demonstrate commitment to safety by providing a safe working environment, set goals and monitor performance, engage the workforce and challenge behaviours. These and similar guidance notes for particular industry sectors, for example construction (HSE, 2012)⁵ or major hazard industries (HSE, 2004)⁶ and briefing documents (The IET, 2012)⁷ encourage organizational leaders to embrace safety as part of their wider responsibility, a point emphasized in the annual Rivers Lecture to the Worshipful Company of Company Secretaries and Administrators in 2009 by Judith Hackitt, Chair of the HSE (HSE, 2009)⁸. This approach is consistent with the view that safety leadership is broadly defined when safety is an integral part of the leader's wider role.

However, reading the specialist academic and practitioner literatures on safety and some guidance notes on safety provides a more restrictive view of safety leadership in practice focusing exclusively on those activities that promote safety and ensure safe working practices, to the exclusion of other activities. For example, INDG343 'Directors' responsibilities for health and safety' (HSE, 2002)⁹, the HSE's guidance note for Directors considers the Board's formal role in providing Health and Safety leadership and the responsibilities of individual members in delivering Health and Safety leadership without acknowledging their other responsibilities or the integration of safety into these other functions. Similarly academic studies (e.g. Hofmann and Morgeson, 1999¹⁰; Zohar, 2002a¹¹; Kapp, 2012¹²) focus solely on those aspects of individual leadership practice by supervisors that deliver safety outcomes for employees. In these examples, the leader's attention is detached from the consideration of wider organizational issues (e.g. managing shareholder value, setting organizational strategy at a senior level or operational matters including, for example, scheduling at a supervisor level). It is possible that these issues are less important for the safety leader, or simply not part of the safety leader role. This narrow focus on safety encourages the tendency to consider safety leadership as a specialist activity detached and separate from other aspects of organizational life, similar perhaps to sales leadership, or IT leadership. This orientation easily allows the formation of a unit or team of specialist Occupational Safety and Health (OSH) practitioners within the organization

responsible for overseeing safety for the whole organization. As a consequence OSH may be seen perhaps as a cost and beyond the resources available to many smaller organizations, or may be marginalized and given low priority. It should also be noted that effective safety leadership has no tangible outcomes, to be effective nothing happens. Consequently it is not obviously self-reinforcing, unlike the leadership of other activities, such as sales growth, where there are positive tangible outcomes.

The alternative broader view, where safety is an integral part of the leader's wider role, places safety in the mainstream of issues that are to be considered by organizational leaders. Safety then becomes a senior management team responsibility creating or making visible the perceived tensions between organizational performance and organizational safety, noted, for example, by Zohar (2002b)¹³. This perspective encourages us to review the wider literature on leadership and to consider how this may inform the practice and delivery of safety for individuals and to the organization.

Recognizing these alternative perspectives, this review seeks to address the three opening questions. To do this we will first present a survey of the specialist safety academic literature, policy reports and some practitioner articles devoted exclusively to safety leadership. This will reveal current conceptualizations of safety leadership, which include transactional-transformational approaches and leader-member exchange (LMX). Safety leadership practices deemed pertinent to each of these leadership approaches are documented. Attention will then turn to the wider academic literature on leadership drawing principally on several recent reviews of leadership to reveal newer conceptualizations, specifically authentic leadership, adaptive-technical leadership and 'plural' leadership. These alternative conceptualizations of leadership provide a critique of the existing safety leadership perspectives. The implications of this for future research on this topic are considered. The review will conclude with a discussion that draws attention to the fragmented and disparate nature of safety leadership research and particularly to differences in the status of the focal safety leader in the different sources. It will provide a synthesis of the safety practices, bundling them together according to safety control, safety care and safety coaching as suggested by Wu et al., (2008)¹⁴. Drawing on the wider leadership literature and highlighting the limitations of existing safety leadership research the review outlines suggestions for future work.

METHODOLOGY

A literature review based on the systematic literature review methodology developed for management and business studies (Tranfield et al., 2003¹⁵; Denyer and Tranfield, 2009¹⁶) was deployed. The steps in the review process are explained below.

Searching and Screening

A series of key words were developed in relation to each of the primary terms of interest in the study, namely safety, leadership and role (Table 1). These keywords were combined to make strings using the Boolean character 'OR' and different strings were combined using the Boolean character 'AND' as shown in Table 2 and applied to five different electronic databases (ABI-Proquest, EBSCO Host – Business Source Complete, SCOPUS, Science Direct and PsychInfo) in February and March 2013. Table 2 indicates the number of items appearing at that time in scholarly peer reviewed academic journals in the different databases in relation to the different search string combinations. An initial screen of these titles permitted a substantial reduction in apparently relevant articles (Table 2). Titles were excluded on the basis of perceived relevance. These exclusion criteria included book reviews and non-English language articles. Other topics or themes warranting exclusion for articles identified from the Safety + Leadership + Role string are shown in Table 3.

After the removal of duplicates occurring in each of the databases, the string for 'Safety + Leadership + Role' was reduced from 112 to 54. A three member panel then reviewed the abstracts of each of these 54 articles for relevance. Once consensus was reached seven articles pertinent to safety leader practices remained (see Appendix 1). Using these as a foundation, the reference lists of these seven articles were scanned for additional potentially relevant articles. The citations of these seven articles were also reviewed. A further 14 articles relevant to safety leader practices were identified (see Appendix 1).

As a complement to this search of academic literature, a review was undertaken of policy and practice literature from both the IOSH (Institute of Occupational Safety and Health) and HSE (Health and Safety Executive) websites. At the time of the review (June 2013) the IOSH website contained 47 publicly available reports. The titles of these were screened for safety, leadership and low hazard environments. The HSE website contained many more research reports (c. 1000). The titles of these reports were screened for leadership, management and/or low hazard. A manual search of the titles was performed because of the nature of the search engine on the website; typing a relevant phrase or word would return multiple copies of the same document. These searches of practitioner and policy literature generated 18 research-based reports for further investigation (see Appendix 1). A further two international reports (OECD, 2012¹⁷; European Agency for Safety and Health at Work, 2012¹⁸) were identified by members of our Advisory Group. Practical guides and manuals were excluded at this stage. Manual searching also allowed the identification of apparently relevant reports, which would not have appeared through searching on the key words (e.g. "What practitioners do: A survey of UK Registered Safety Practitioners to determine their roles and tasks", Jones R. (2005)¹⁹).

Some practitioner literature was also surveyed. All of the back issues of the journal of the American Society of Safety Engineers - Professional Safety were reviewed and 18 articles dealing with safety leadership were identified (see Appendix 1).

Data Extraction

These academic articles, policy reports and practitioner literature were read and analysed and the following information extracted from each item (where appropriate):

- Author, title and year;
- Study type;
- Sample;
- Type of Industry;
- Key Findings;
- Limitations;
- Research questions;
- Theoretical perspectives;
- Locus of leadership.

Reporting

These data indicated in detail in the tables throughout the review then permitted the compilation of a narrative overview of academic and non-academic literature that explores safety leadership, how it is understood, what outcomes are consequent upon leadership and what practices safety leaders engage in to secure these outcomes. This literature is augmented by a selection of reviews from the wider leadership literature known to the authors that is used to inform how both the study and practice of safety leadership could develop.

Table 1. Keywords used to create search strings

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

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

Database					
Search String	ABI	EBSCO	SCOPUS	Science Direct	PsycInfo
Safety + Leadership	1192	1169	6486	1949	577
Safety + Role	1263	1533	20425	6124	2250
Safety + Leadership + Role	90 (12)	100 (21)	480 (37)	134 (18)	66 (24)

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

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

FINDINGS

Transformational – Transactional Leadership: An Academic Perspective

According to the HSE sponsored literature review of effective leadership behaviours for safety conducted by Lekka and Healey (2012)²⁰ current safety leadership research is focused on either transactional-transformational leadership or leader-member exchange. Our review of the current literature published in academic journals would support their assertion.

Transformational leadership may be defined as leader behaviours that transform and inspire followers to perform beyond expectations while transcending self-interest for the good of the organization (Avolio et al., 2009²¹; pg 423). Transformational leadership comprises four leader behaviours (Bass, 1985²²) namely; idealized influence, inspirational motivation, intellectual stimulation and individual consideration and is characterized by value-based and individualized interaction, which results in better exchange quality and greater concern for welfare (Zohar, 2002a¹¹). **Idealized influence** is based on trust and occurs when leaders demonstrate high standards of moral conduct in their own behaviour, becoming role models for their subordinates. **Inspirational motivation** occurs when leaders provide clarity, communicating a positive value-based vision for the future state of the organization and its employees and challenging employees to go beyond their personal interests and focus their attention on the goals of the collective. Leaders exhibit **intellectual stimulation** when they encourage employees to share their perspectives on issues, to challenge organizational norms, question assumptions and to think creatively. Leaders draw on a variety of opinions in order to make decisions. Leaders displaying **individual consideration** recognize the unique needs and abilities of the followers and by adapting their approach seek to coach or mentor them in order that they might reach their full potential. Each of these four dimensions of transformational leadership has implications for safety leadership (see Kapp, 2012¹² or Hoffmeister et al., 2014²³).

In contrast, transactional leadership is based on non-individualized hierarchical relationships and comprises three dimensions (constructive leadership, corrective leadership and laissez-faire leadership) (Zohar, 2002a¹¹). **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.

Transformational leaders create a positive supportive environment, act as role models to others, articulate a clear vision, show concern for the welfare of employees, act as mentors and inspire and challenge employees (Lekka and Healey, 2012²⁰).

Transactional Leadership

Based on an ABC (Antecedents-Behaviours-Consequences) model, Zohar and colleagues' studies of transactional safety leadership (see Table 4 for details) show that safety leadership attempts to encourage safe working behaviours through modification of antecedents or consequences. In these three longitudinal studies safe working by employees was indicated through observations of working practices, in particular the use of Personal Protective Equipment (PPE) by workers or through official accident reports of minor injuries. Each of these studies focused on the content of the interaction between supervisor and worker and whether safety considerations were part of these conversations. Those supervisors who interacted with workers and discussed safety matters were commended by their superiors on a weekly basis. They were also informed of their performance relative to other supervisors. Over a period of several weeks employees adopted safer working behaviours, as the safety content of interactions with supervisors increased in response to supervisors receiving feedback on their performance from their superiors. These studies demonstrated that more senior

managers can more effectively implement safety policy and can encourage safe working behaviours in the workforce through effective engagement on a one-to-one basis between supervisors and workers on a daily basis.

In terms of the ABC model, supervisors were providing verbal and non-verbal feedback (both positive and negative) to workers on their performance of safe working practices. These consequences (feedback) were set in the context of prior training and goal setting (the antecedents) to the desired behaviours. The leadership practices of these supervisors therefore included:

- Monitoring;
- Communicating; and
- Rewarding (through giving feedback).

These three items compare with the transactional safety leadership practices noted by Kapp (2012)¹² and Zohar (2002a¹¹, b¹³) namely:

- Establishing appropriate safety goals;
- Monitoring performance towards these goals; and
- Rewarding behaviours that sustain or improve safety performance.

These studies of improvements in worker safety through supervisor-worker exchanges were conducted only in a manufacturing setting. While these findings might also apply in supervised service settings, like call centres or picking and packing in distribution centres, this requires testing. Furthermore, their applicability in other settings (e.g. professional service firms) where direct supervision is less frequent remains to be explored.

Table 4. Academic studies examining leadership in a safety context from a transactional leadership perspective

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Luria, Zohar and Erev ²⁴	2008	How do situational factors (i.e. visibility) influence the effectiveness of supervisory-based safety interventions to encourage safe working? Worker safety behaviour (wearing PPE).	Manufacturing companies producing ice cream, chemical products, milk products, processed baked goods and salads in Israel. Supervisors and shop floor workers.	955 shop floor workers and 57 supervisors in five manufacturing plants.	Longitudinal interventionist quantitative data of behaviour change and effectiveness of supervision. Survey instrument captured safety-related supervisory interactions, worker safety behaviour and a rating of visibility of activities.	Greater frequency of supervisory exchanges improved safety behaviour. Frequency and ease of giving feedback promotes safer working.
Zohar ¹³	2002b	Can safety-specific supervisory interactions improve safe working practise? Official accident reports of minor injuries.	Regional maintenance centre for heavy-duty equipment in Israel. Worker-supervisor relationships.	381 line workers and 36 supervisors.	Longitudinal experimental interventionist quantitative data. Surveys measured safety-oriented supervisory role episodes and group safety climate. Injury data came from official records.	Supervisory safety practices (i.e. frequent safety-oriented interactions with workers) can be changed by feedback from their superiors. These changes can result in improvements in worker safety behaviours and in improvement in perceived safety climate.

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Zohar and Luria ²⁵	2003	Can on-going interactions between supervisors and workers modify worker safety behaviour? Worker safety performance, supervisory interactions.	3 Manufacturing companies (an oil refinery, processing baked goods, processing milk products). Primarily worker and supervisor, but also includes supervisor – senior manager relationships.	Oil Refinery: 121 front-line workers and 13 supervisors. Baked goods: 248 front-line workers and 23 supervisors. Milk products: 187 front-line workers and 13 supervisors.	Longitudinal interventionist quantitative data. Survey instrument measured safety-related supervisory interactions. Worker safety behaviours were observed. Safety climate was measured in the oil refinery only.	Encouraging supervisors to frequently address safety issues with workers (through corrective and supportive exchanges) can reduce the incidence of unsafe working in employees. This requires prioritization of safety by senior management to supervisors.

Transformational Leadership

Studies focusing solely on transformational safety leadership come from the work of two groups (see Table 5 for details). The group based in Canada (Barling et al., 2002²⁶; Kelloway et al., 2006²⁷; Mullen and Kelloway, 2009²⁸; Innes et al., 2010²⁹) studied safety leadership (presumably of supervisors, although this is not explicitly stated) mainly in service sector settings, while the UK-based group (Conchie and Donald, 2009³⁰; Conchie et al., 2012³¹) studied the role of trust in the relationships between supervisors and workers in high hazard settings. Unlike the studies of transactional safety leadership these studies were mainly cross-sectional using surveys based on existing scales to collect data on leadership, safety climate (Zohar, 1980³²), safety compliance (Neal, et al., 2000³³; Neal and Griffin, 2006³⁴), safety participation (Neal et al., 2000³³; Neal and Griffin, 2006³⁴; Mearns et al., 2003³⁵; Silva et al, 2004³⁶) and safety conscientiousness (Costa and McCrae, 1992³⁷). Safety outcomes were injuries and other safety-related events, or safety performance, including compliance or participation. The leadership behaviours under scrutiny focused principally on encouraging open communication with workers and encouraging workers to work safely. While many of the studies refer to Barling et al., (2002)²⁶ as a source of 10 items indicating transformational safety leadership, they are not specified in that paper. The constituent activities of transformational leadership are however found in Kelloway et al., (2006)²⁷ and 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; and
- Listening to safety concerns.

These six studies suggest that transformational leadership increases safety participation and so enhances safety outcomes, reducing injuries. Safety climate and trust may influence (by either moderating or mediating) the relationship between leadership and safety participation. These works explore transformational leadership in the context of a supervisor-worker relationship. Future work could investigate this relationship between other dyads, for example, senior managers and their subordinate middle managers and in other organizational contexts such as manufacturing which has been the context for studies of transactional leadership (see Table 4).

Table 5. Academic studies examining leadership in a safety context from a transformational leadership perspective

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Barling, Loughlin and Kelloway ²⁶	2002	Can transformational leadership improve occupational safety? Occupational injuries and safety related events.	Customer-focused service sector organizations in Canada. Supervisor level.	174 restaurant workers (study 1). 164 young workers in diverse jobs (study 2).	Cross sectional quantitative data. Self-report survey using MLQ leadership scale, perceived safety climate, safety consciousness, and safety-related events.	Positive safety climate and high safety consciousness reduce injuries. While transformational leadership enhances safety climate and safety consciousness, role overload undermines them.
Conchie and Donald ³⁰	2009	What is the role of trust in the relationship between leadership and safety behaviour? Safety citizenship behaviours.	UK construction company. Supervisors of front-line employees.	33 supervisors and 139 workers.	Cross sectional quantitative data. Self-reported survey of dyads between supervisors and workers. Survey includes measures of safety-specific transformational leadership, safety specific trust and safety citizenship behaviours.	Trust moderates relationship between leadership and employee safety behaviour. When trust is high, leadership promotes safety behaviours, when trust is low, it does not.
Conchie, Taylor and Donald ³¹	2012	How does transformational leadership encourage employee safety voice? What is the nature and role of trust? Safety voice.	UK oil refinery. Supervisors of employees.	150 employees and 29 supervisors.	Cross sectional quantitative data using a questionnaire. The measures included safety-specific transformational leadership, trust beliefs, trust intentions, safety voice behaviour.	Transformational leadership encourages safety voice. This effect was mediated by affect-based trust not cognition-based trust.

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Innes, Turner, Barling and Stride ²⁹	2010	How does transformational leadership affect employee safety performance? and does effect carry over to another occupation? Safety performance (compliance and participation)	Variety of sectors. None dominant. Not clear leadership position.	159 individuals with concurrent jobs in different organizations.	Cross-sectional quantitative data. Survey questionnaire measured generalized transformational leadership, safety compliance, safety participation, safety concern, conscientiousness.	Safety leadership affects safety participation but not compliance. Limited evidence of carry-over from one job to the second, so leadership is context and person specific.
Kelloway, Mullen and Francis ²⁷	2006	How does the type of leadership affect workplace safety? Safety events and injuries.	Mixed service sector jobs in Canada. Not clear who the leaders are, presumably immediate supervisors.	158 young temporary workers.	Cross sectional quantitative data. Self-reported questionnaire containing measures of safety leadership, injuries, safety-related events and safety climate.	Engaged managers (transformational leaders) positively influence safety outcomes. They impact safety consciousness and safety climate directly, and injuries and safety events indirectly. Disengaged managers (passive leaders) diminish levels of safety consciousness and weaken safety climate.

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Mullen and Kelloway ²⁸	2009	How does transformational leadership training affect leader and employee safety outcomes? Safety compliance and safety participation, safety related events and injuries.	21 Canadian healthcare organizations. Nurse managers and their direct reports.	54 nurse managers and 115 employees.	Participating managers randomly assigned to groups receiving different training. Outcomes measured 1 week before and 3 months after training using a different survey for managers and employees that cover safety attitudes, self-efficacy, transformational leadership, safety climate, safety participation, safety compliance, injuries and safety related events. Longitudinal quantitative data.	Safety specific transformational leadership training improves safety attitudes and self-efficacy of leaders and reduces perceived safety-related events and injuries amongst employees.

Transformational – Transactional Leadership

A number of studies (see Table 6 for details) investigate the co-occurrence of both transactional and transformational safety leadership. With the exception of the study by Dahl and Olsen (2013)³⁸, these were survey-based cross sectional studies conducted in high hazard settings, for example, UK manufacturing (Clarke and Ward, 2006³⁹), US construction (Hoffmeister et al., 2014²³) and container terminals in Taiwan (Lu and Yang, 2010⁴⁰). The focal relationship in each of these studies was that between worker and supervisor, although Dahl and Olsen's (2013)³⁸ study of a Norwegian oil platform may have involved other relationships between managers and workers too.

Zohar (2002a)¹¹ alone used reported injuries as safety outcomes. All of the other studies focused on safety compliance (Dahl and Olsen, 2013³⁸) or safety participation (Clarke and Ward, 2006³⁹), or a combination of the two (Kapp, 2012¹²; Lu and Yang, 2010⁴⁰). These studies mainly used scales developed by Griffin and Neal (Griffin and Neal, 2000⁴¹; Neal et al, 2000³³; Neal and Griffin, 2006³⁴), although Dahl and Olsen (2013)³⁸ developed their own Leadership Compliance Tool (LCT). Safety climate (where assessed) was most often measured using all or part of the scale developed by Zohar (2000)⁴². Leadership scales typically built on the Multi-Factor Leadership Questionnaire (MLQ) (Bass and Avolio, 1990⁴³; 1997⁴⁴; 2002⁴⁵; Avolio and Bass, 2004⁴⁶) either using different versions of the scale (Hoffmeister et al., 2014²³; Kapp, 2012¹²; Zohar, 2002a¹¹), or in the case of Lu and Yang (2010)⁴⁰, using the MLQ scale in conjunction with other scales to develop a scale measuring three dimensions of safety leadership, namely safety motivation, safety policy and safety concern. Dahl and Olsen (2013)³⁸ measured leadership involvement in planning and preparing work, in monitoring work performance and in encouraging inter-unit cooperation.

Positive safety leadership by supervisors encourages safety behaviours and safety performance of workers. Safety performance (i.e. the use of PPE and safety compliance) is positively related mainly to transactional safety leadership practices (e.g. planning, monitoring and reward). Safety behaviours (i.e. safety participation) are encouraged by transformational safety leadership (e.g. concern and motivation).

Table 6. Academic studies examining leadership in a safety context from both transformational – transactional leadership perspectives

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Clarke and Ward ³⁹	2006	What are the influence tactics used by leaders to achieve employee safety participation? Safety participation.	UK glassware manufacturer. Supervisors of front-line employees.	105 useable responses from two sites.	Cross sectional quantitative data. Survey including measures of safety climate, leader influence tactics and safety participation.	Safety participation influenced directly by coalition, and partially by rational persuasion and consultation. Safety climate mediated the effects of rational persuasion and consultation too, and also mediated inspirational appeals.
Dahl and Olsen ³⁸	2013	How does leadership involvement in day-to-day activities affect worker safety compliance? Safety compliance.	Norwegian oil platform. Not clear leadership position.	More than 10,000 responses from employees on 28 platforms between January 2009 and October 2010.	Longitudinal survey of off-shore workers (received questionnaire 6 times in period). Survey items included leadership involvement, worker competence and involvement, role clarity and safety compliance.	Leadership involvement affects safety compliance both directly and indirectly through effects of work climate. Direct effects are achieved through planning and preparation, monitoring, ensuring cooperation between team members. Indirect effects are achieved by ensuring role clarity, worker competence and involvement, monitoring third parties (contractors).

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Hoffmeister, Gibbons, Johnson, Cigularov, Chen and Rosecrance ²³	2014	How do the different facets of leadership affect employee safety? Safety outcomes (including safety climate, safety compliance, safety participation, work- related injuries and work-related pain).	US Construction industry. Relationship between apprentices or journeymen and their supervisors.	1167 construction pipefitters and plumbers from 5 organizations in 3 regions of US.	Cross sectional quantitative data. Survey contained questions relating to transactional and transformational leadership, and measures of supervisor support, safety communication, safety compliance and safety participation, and work- related injury or pain.	All facets of leadership influence safety climate, but only some influenced safety participation and compliance. Idealized attributes and idealized behaviours are key but especially to a positive safety climate and high safety participation. Inspirational motivation, individualized consideration, intellectual stimulation and contingent rewards are less influential and relate to different outcomes.
Kapp ¹²	2012	What leadership practices affect front-line worker safety participation and compliance? Safety compliance and safety participation.	US construction and manufacturing companies. First line supervisors and their employees.	153 employees from different construction companies. 402 employees from two manufacturing companies.	Cross-sectional quantitative data. Survey instrument contained items on leadership practices, group safety climate, safety compliance, and safety participation.	Both transformational and transactional leadership positively affect safety participation. Both also positively affect safety compliance, but only in a strong group safety climate. Compliance is unaffected by leadership in a weak safety climate.

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Lu and Yang ⁴⁰	2010	How does worker perception of managers' safety leadership affect their safety performance? Safety compliance and safety participation.	Container terminal companies in Taiwan. Senior managers in relation to workers.	336 employees from 5 major terminals at international ports.	Cross sectional quantitative data. Self-reported questionnaire containing measures of safety motivation, safety policy and safety concern (each developed from other scales), safety compliance, safety participation.	If leaders are perceived to be concerned and motivated about safety then safety compliance and participation of workers will be greater.
Zohar ¹¹	2002a	How do different leadership styles affect safety outcomes? Is this relationship mediated by safety climate? Reported injuries.	Regional maintenance centre for heavy-duty equipment in Israel. Worker-supervisor relationships.	411 production workers at metal processing plant.	Cross sectional quantitative data. Survey instruments measured safety climate and leadership at a single point by workers. Supervisors recorded assigned safety priorities. Injury records were kept over 6 months.	Transformational leadership characterized by concern for worker welfare (i.e. close relationships) promotes supervisory safety practices, creates higher safety climate, better safety behaviours and less accidents. Transactional supervision (through monitoring and rewards) encourages safety performance.

Transformational – Transactional Leadership: Policy Reports

18 research reports mainly published by the HSE were identified, the exceptions being the study by Conchie and Moon (2010)⁴⁷ for IOSH and the two international reports (OECD, 2012¹⁷; European Agency for Safety and Health at Work, 2012¹⁸) (see Table 7 for details). Six of the reports reviewed existing academic and policy literature (e.g. Lekka and Healey, 2012²⁰; Wright and James, 2006⁴⁸; Shearn and Miller, 2005⁴⁹; Ward et al., 2004⁵⁰; O'Dea and Flin, 2003⁵¹; Gadd and Collins, 2002⁵²) and the remainder were empirical studies investigating how a particular group of individuals (e.g. directors or supervisors) might affect safety within an organization. Typically the organizations were found in high hazard industries in the UK, including construction (Healey and Sugden, 2012⁵³; Cummings, 2006⁵⁴), oil industry (Busby and Collins, 2009⁵⁵) and chemical and allied industries (Fuller and Vassie, 2005⁵⁶; Brazier et al., 2004⁵⁷).

The empirical studies identified a number of leadership practices that are perceived generally to deliver positive safety outcomes, although none of these studies, with the exception of Conchie and Moon (2010)⁴⁷, explicitly identified and assessed safety outcomes. The general lack of longitudinal data in most empirical studies, with the exception of Healey and Sugden's (2012)⁵³ report on the construction of the Olympic Park, hampers the direct attribution of changes in safety outcomes to particular practices, leaving authors to point to associations between specific actions and derived, often perceived, safety outcomes. All of the empirical studies, except for Brazier et al., (2004)⁵⁷, suggest that leaders in many cases supervisors (e.g. Fleming, 1999⁵⁸; Conchie and Moon, 2010⁴⁷; Healey and Sugden, 2012⁵³) or occasionally more senior managers (e.g. Ernst and Young, 2000⁵⁹; King et al., 2010⁶⁰) are individuals rather than teams or collectives. These studies suggest that individual leaders engaged in activities that either indirectly or directly impacted others, most commonly front-line workers (e.g. Fleming, 1999⁵⁸; Conchie and Moon, 2010⁴⁷; Healey and Sugden, 2012⁵³).

Indirect effects of leaders were achieved through role modelling appropriate safety behaviours to others (Poxon et al., 2007⁶¹), or setting agendas or safety goals and targets for others to follow (e.g. King et al., 2010⁶⁰). More direct effects of leaders on others occur through direct challenge (Cummings, 2006⁵⁴) or through engaging with the workforce (Healey and Sugden, 2012⁵³; Cummings, 2006⁵⁴; Busby and Collins, 2009⁵⁵) demonstrating the value of the employee to the leader ((Poxon et al., 2007⁶¹), ensuring effective two-way safety communication (Fleming, 1999⁵⁸) and motivating employees (King et al., 2010⁶⁰). Direct effects also occur through empowering employees to problem solve and to make decisions (Fuller and Vassie, 2005⁵⁶). Finally, these direct effects might occur through developing skills, especially in independent and inter-dependent working (Poxon et al., 2007⁶¹) and knowledge of safety practices (Lekka and Healey, 2012²⁰).

Table 7. Policy reports examining leadership in a safety context

Author	Date	Focal Question	Sample Context + Leadership level	Method	Key findings relating to leadership
Lekka and Healey ²⁰	2012	How does leadership deliver safety? What are the leadership styles and practices?	Level- not applicable.	Literature Review of 40 papers.	Transformational leadership promotes safety participation and safety compliance, and fosters a positive safety climate. Transactional leadership is associated with positive safety climate, safety behaviour and lower accident rates. High quality leader-member exchange relations encourage safety communication and reduce safety-related events.
Healey and Sugden ⁵³	2012	Is it possible to develop high standards for H&S and a strong safety culture in the construction industry?	Construction Industry – building the Olympic Park. Multiple levels.	Interviews and focus groups to generate 8 case studies, one for each dimension of Safety Climate Tool (which covers organizational commitment, H&S oriented behaviours, H&S trust, usability of procedures, engagement in H&S, peer group attitude, resources for H&S, accidents and near-miss reporting).	Engagement, worker involvement and organizational commitment are key elements to achieving high standards of H&S.
OECD ¹⁷	2012	How can senior leaders ensure effective safety process governance?	Chemical, Oil and Gas industries (High hazard process industries). Senior leaders (CEOs, Presidents, Board members).	Guidance note.	Leadership practices include: encouraging safety voice; prioritizing safety; consistent application of safety policy; set goals; monitor performance; open communication; ensuring alignment between policy and practice.

Author	Date	Focal Question	Sample Context + Leadership level	Method	Key findings relating to leadership
European Agency for Safety and Health at Work ¹⁸	2012	What are the leadership factors that promote OSH behaviours among employees?	Multiple contexts. Multiple levels.	Literature Review of 46 papers. Analysis of 16 case studies.	17 practices categorised into 5 guiding principles: Take responsibility for safety seriously; prioritise OSH and be consistent; ensure board commitment and involvement; open two-way communication; value employees and encourage participation.
Conchie and Moon ⁴⁷	2010	What are the antecedents of leadership behaviours that emphasize safety, encourage employee involvement and challenge poor practice?	Construction Industry. Supervisor – worker.	2 Steps: 10 focus groups with 69 supervisors and questionnaire with 82 supervisors and 285 workers.	Direct effects on active safety leadership include freedom of supervisor to operate (role autonomy), and number of hours with workers. Indirect effects include extent of colleague support for safety and organizational constraints (e.g. foreign labour skills, contractors). Context is a key determinant of active safety leadership.
King, Lunn and Michaelis ⁶⁰	2010	To what extent are directors aware of safety responsibility?, and how do they demonstrate it?	Cross-sector representation and also variation in terms of risk. 30 organizations responded from 153 organizations that were approached. Multiple levels but not related.	75 face-to-face interviews with directors, H&S managers and shop floor workers in 30 organizations.	Leadership on safety is demonstrated by setting examples, setting goals and targets, motivating staff and earning respect. Some show care and generate loyalty.

Author	Date	Focal Question	Sample Context + Leadership level	Method	Key findings relating to leadership
Busby and Collins ⁵⁵	2009	How does an organization manage itself to ensure safe working?	Off-shore oil industry in UK. Multiple levels.	Review of accident reports. 77 interviews with HSE inspectors and a range of staff from technicians to production directors in 5 case study organizations newly entered the UK oil industry.	Leadership requires engagement with workers to socialize them in to organizational practices and procedures, which may not be adhered to through logical argument or lack of technical expertise. Rigour is part of leadership, and leadership is required to achieve rigour.
Poxon, Coupar, Findlay, Luckhurst, Stevens and Webster ⁶¹	2007	Does worker involvement improve H&S?	Cross-sectoral positioning organizations on a 2x2 matrix of (i) unitary/pluralist culture (degree of consensus), (ii) extent of hierarchical control. Managers and employees.	Organizational documentation. Semi-structured -interviews with different functional groups. Employee focus groups.	Leaders define issues, set and share agendas. Model appropriate behaviours. Empower employees to problem-solve. Value expertise in others. Develop soft skills in others, especially around independent and interdependent working..
Cummings ⁵⁴	2006	What constitutes effective health and safety management?	Construction industry. H&S Industry. Level – not applicable.	10 Semi-structured interviews with experts (4 from construction, 3 H&S professionals, 3 academics).	Encourage worker commitment through engagement. Challenge behaviours.
Wright and James ⁴⁸	2006	How do directors exercise their responsibility for H&S?	Level – not applicable.	Review of 3 HSE commissioned reports.	No clear outcomes for leader behaviours.

Author	Date	Focal Question	Sample Context + Leadership level	Method	Key findings relating to leadership
Fuller and Vassie ⁵⁶	2005	What are the key inputs and outputs from the supervisory process?	Chemical industry. Supervisor- worker.	Questionnaire distributed to 400 organizations in the UK chemical industry. 84 usable responses.	Hierarchical approach to leadership is common with the deployment of supervisors irrespective of risk-level. Leadership should encourage motivation, problem-solving and decision-making.
Shearn and Miller ⁴⁹	2005	How involved are directors with Health and Safety?	Context not specified. Directors.	Literature review.	While guidance encourages H&S leadership from the top of the organizations, 26% companies do not. Motivations for involvement include compliance, moral responsibility, protection of reputation, financial benefits, employee morale.
Ward, Brazier and Lancaster ⁵⁰	2004	What is supervision and how does it affect safety performance?	Level – not applicable.	Literature review.	Define supervisor in relation to different forms of organizing on a continuum of control from team to single manager. Main elements of supervisory role: directing work of others, allocating workload, planning and scheduling, instructing and monitoring actions, maintaining discipline, taking responsibility, accountability.
Brazier, Gait and Waite ⁵⁷	2004	What is supervision and how does it affect safety performance?	Chemical industry. Supervisor – worker.	Nine case studies of supervision models in organizations working in UK chemical and allied industries.	Supervision is a management function that can be delivered by an individual or a team. Operations were more hierarchically managed. Maintenance teams were self-managed.

Author	Date	Focal Question	Sample Context + Leadership level	Method	Key findings relating to leadership
O'Dea and Flin ⁵¹	2003	How does managerial leadership affect organizational safety outcomes?	Level – not applicable.	Literature review contains 138 items.	Distinguishes 3 levels of management (senior, middle and front-line/team leader) each with unique responsibilities for safety. [Figure 6.1 and Table 6.1]
Gadd and Collins ⁵²	2002	What are the features of safety culture and how do they affect safety performance?	Level – not applicable.	Literature review of safety culture focussing on research from 1998 onwards. It refers to 78 items.	Management is a key determinant of safety culture, especially observed commitment and actions towards safety.
Ernst and Young ⁵⁹	2000	How could senior managers influence improvements in managing H&S?	Multi-sector (incl. oil and gas, chemical, aerospace and mining) study to develop a model and resource pack.	26 interviews with senior figures in 9 leading organizations.	Leadership in 7 areas: business case, accountability, behaviour, integration, prioritisation, monitoring/measuring, learning.
Fleming ⁵⁸	1999	How does the supervisor role affect safety outcomes?	UK Oil industry. Supervisor- worker.	Questionnaires sent to (i) 140 front-line supervisors, on 9 installations (ii) work groups of supervisors on same installations.	Significant positive supervisor behaviours were: valuing workers, visiting worksite, worker participation in decision making and effective safety communication.

Table 8 indicates the leadership practices identified in these empirical research reports and categorizes the practices according to the four dimensions of transformational leadership and transactional leadership. Communication may be incorporated across a number of dimensions.

These safety leadership practices are strongly characteristic of transformational leadership. Many of these practices are echoed in the findings of the literature reviews studied here. Lekka and Healey (2012)²⁰, 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)⁵² 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)⁵¹ 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;
 - prioritizing 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).

Table 8. 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 ⁵³	Consistent implementation Role Modelling	Clarity Develop a safe environment Team working Prioritize safety	Involve others Listen Empower others	Train	Reward Set goals Monitor Give feedback
Conchie and Moon ⁴⁷		Communicate	Voice Communicate	Coach Show concern	
King, Lunn and Michaelis ⁶⁰	Set an example Be visible	Motivate others Prioritize safety Communicate	Seek feedback Consult Communicate	Care	Set goals Monitor
Busby and Collins ⁵⁵	Consistency	Prioritize safety	Engage others	Develop working relations	Provide resources
Poxon, Coupar, Findlay, Luckhurst, Stevens and Webster ⁶¹	Model behaviours	Define issues Share agenda	Empower others Communicate	Value others Develop others	Set goals
Cummings ⁵⁴			Encourage commitment		Challenge behaviours
Fuller and Vassie ⁵⁶	Be responsible	Motivate others	Communicate Engage others Problem solving Decision making	Train	
Brazier, Gait and Waite ⁵⁷			Involve others Communicate		Plan Monitor performance
Fleming ⁵⁸	Be visible	Prioritize safety	Participative decision making	Value others	

Limitations of Transactional-Transformational Safety Leadership and Opportunities for Further Work

Existing empirical studies of safety leadership adopting a transactional-transformational leadership perspective typically investigate supervisor-worker relationships in high hazard settings (manufacturing, oil and gas, construction) using a cross-sectional approach. With the exception of the work of Barling and colleagues (Barling et al., 2002²⁶; Kelloway et al., 2006²⁷) there has been no empirical study of leadership in service sector organizations, including retail or office environments. How transactional-transformational leadership will affect safety outcomes in these low hazard service industry settings is unclear. This is a striking omission when more than 80% of the UK workforce is employed in service industries. It is also unclear whether the nature of transactional-transformational leadership will differ in these settings from that found in high hazard settings where work groups may possibly be more close knit and cohesive, creating different relationships between supervisor and worker.

The focus of existing empirical studies on supervisors and workers reveals a further research opportunity to examine the effects of leader-follower relationships between other dyads in the organization, most obviously between senior and middle managers. While some of the policy reports have considered the role of directors on safety (King et al., 2010⁶⁰), noting the importance of their relationships with other workers (O'Dea and Flin, 2003⁵¹), in ensuring safety outcomes, more remains to be done. Crucially, safety policies and practices must be communicated effectively from board-level to front-line workers in any organization. How the relational dyads within this communication chain affect the communication and implementation of safety practices and so organizational safety outcomes is unclear. Moreover, the effects of leadership at each of these points in the chain may also differ and consequently impact the overall delivery of organizational safety.

Although some of the policy reports adopted qualitative methods, most of the empirical studies were based on the quantitative analysis of survey data. Furthermore, with few exceptions, the studies were cross-sectional in nature. There is an opportunity therefore to take a case-based approach to examine leadership of safety and the associated practices across the hierarchies within a single organization. Moreover, using a longitudinal approach it will be possible to investigate the development of the leader-follower relationship from transactional to transformational and how such changes affect safety outcomes.

Finally, there appears to be a dearth of studies outside the UK and N. America. Comparative cross-country studies of safety leadership may help to reveal internationally recognised best-practices for safety leadership. These studies would also show how different policy contexts may affect the relationship between safety leadership and safety outcomes.

Leader-Member Exchange (LMX): Academic Literature

LMX focuses on the dyadic social exchange processes between leader and follower, acknowledging that leaders develop different exchange relationships with their followers thereby impacting differentially important leader and member outcomes (Graen and Uhl-Bien, 1995⁶²). As dyadic relationships develop the early social exchanges, essentially between strangers or acquaintances, which are more 'transactional' in nature, change to become more 'transformational' in nature as the relationship develops into a partnership (Graen and Uhl-Bien, 1995⁶²). Thus, low LMX relationships align more closely with descriptions of transactional leadership, while high LMX relationships align more closely with the descriptions of transformational leadership (Graen and Uhl-Bien, 1995⁶²). Leadership occurs when leaders and followers develop effective relationships based on trust, respect and mutual obligations, resulting in mutual and incremental influence to meet shared interests (Uhl-Bien, 2006⁶³). This exchange relationship may take one of two general forms (Graen and Uhl-Bien, 1995⁶²) namely relationships with an 'in-group' characterized by high degrees of trust, respect and obligation or with an 'out-group' where trust, respect and obligation are low. In the former case, special exchange relationships develop with a small number of trusted subordinates who serve as assistants or advisors, while in the latter case other exchange relationships are more formalized, based on role requirements and job descriptions.

Six studies investigated the relationship between leaders and subordinate and its impact on safety outcomes (see Table 9 for details). Most often the relationship was between a supervisor and a worker, rather than exchanges between more senior dyads within the organization, for example, between members of a senior management team and the middle managers. The study by Yagil and Luria (2010)⁶⁴ explored the relationship between managers and employees, although this is also a relationship between positions lower in the organizational hierarchy. Hofmann et al., (2003)⁶⁵ also studied relationships between lower ranked members in a military hierarchy but in the context of teams. The safety outcomes examined in these studies differed for each study. Some focused on accidents and near-misses (Hofmann and Morgeson, 1999¹⁰; Michael et al., 2006⁶⁶). Others explored LMX relationships with safety citizenship behaviours (Hofmann et al., 2003⁶⁵; Credo et al., 2010⁶⁷), including participation and communication (Kath et al., 2010⁶⁸). Yagil and Luria (2010)⁶⁴ investigated safety compliance.

In each of these studies quantitative data obtained through surveys was used to correlate aspects of relationship quality measured using the 7-point LMX scale (Graen and Uhl-Bien, 1995⁶²) with particular safety outcomes. The surveys collected other data using existing scales for different measures. Measures of perceived organizational support were derived from Eisenberger et al., (1986)⁶⁹. Safety climate was captured using Zohar's (1980)³² scale, but often with modifications (e.g. Credo et al., 2010⁶⁷; Yagil and Luria, 2010⁶⁴) or augmentation (Kath et al., 2010⁶⁸) to investigate different outcomes like safety peer pressure, management safety attitudes or management safety concerns. A scale for safety communication was developed by Hofmann and Morgeson (1999)¹⁰ and employed by Kath et al., (2010)⁶⁸ and Michael et al., (2006)⁶⁶. Barling et al.'s (2002)²⁶ scale for safety related events was used to investigate safety related events by Michael et al., (2006)⁶⁶ and employee safety involvement by Credo et al., (2010)⁶⁷. Single studies investigating specific dimensions like perceived organizational ethics (Credo et al., 2010)⁶⁷, safety compliance (Yagil and Luria, 2010)⁶⁴, safety citizenship behaviours (Hofmann et al., 2003)⁶⁵ or safety commitment (Hofmann and Morgeson, 1999)¹⁰ developed their own scales.

Apart from communication (e.g. Hofmann and Morgeson, 1999¹⁰) none of the six empirical studies identify specific leadership practices that correlate with safety outcomes. They rely on practices implicit within the 7-point LMX scale that contribute to trust, respect and obligation. The items in the scale suggest at least the following leadership practices: giving feedback, problem solving, providing personal support, decision-making, providing direction and clarity.

While each study investigated a different question, our primary conclusion is that improving the quality of the relationship between leader and subordinate reduces accidents and improves safety. What is less clear is how this may be achieved.

Table 9. Academic studies examining leadership in a safety context from a Leader-Member Exchange perspective

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Credo, Armenakis, Feild and Young ⁶⁷	2010	What influences employee safety involvement?, specifically how do LMX, perceived organizational support and perceived organizational ethics mediate management safety concerns? Safety knowledge and safety behaviours of employees.	International drilling company in US. Supervisor-worker relationship.	188 employees (64 project personnel + 124 field technicians) at 6 sites.	Cross sectional quantitative data. On-line survey with measures of LMX, perceived organizational support, perceived organizational ethics, management safety concerns, employee safety involvement.	Management concerns to achieve positive employee safety knowledge and behaviours mediated by quality of relationship and employee perception of managerial and organizational support for safety.
Hofmann and Morgeson ¹⁰	1999	How do different forms of social exchange affect the raising of safety concerns, safety commitment and accidents? Safety commitment and accidents.	Manufacturing plant producing commercial heating and air conditioning systems. Supervisor-work group leader.	64 leaders of work groups and their supervisors.	Cross sectional quantitative data. The work group leader survey incorporated measures of LMX, perceived organizational support, and safety communication. Supervisors reported on safety commitment. Archival records provided accident data.	Higher quality relationships between employees and supervisor (LMX) improve safety communication, increase safety commitment and reduce accidents.

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Hofmann, Morgesson and Gerras ⁶⁵	2003	In the face of conflicting objectives how do individuals decide whether to behave safely or not? Safety citizenship behaviour.	US military moving heavy equipment. Team leader – team member relationship.	127 team members and 29 team leaders in 25 teams.	Cross sectional quantitative data. Survey with measures of LMX, safety climate, safety citizenship role definitions and safety citizenship behaviour.	Climate moderates relationship between leaders and subordinate and safety citizenship role definition. Where there is a positive safety climate, employees view safety behaviours as part of their formal role responsibilities. Leaders create effective working relationships and climate that emphasizes safety.
Kath, Marks and Ranney ⁶⁸	2010	What influences employee safety communication with managers? Safety communication.	Canadian Pacific Railways. Supervisor – worker relationship.	636 mechanical employees.	Cross sectional quantitative data. Pencil and paper survey incorporating measures of upward safety communication, LMX, Perceived organizational support, and safety climate.	Employees discuss safety concerns with supervisors/managers when (i) relationship quality is high, (ii) they perceive that management are serious about safety, and (iii) job demands interfere with safety.
Michael, Guo, Wiedenbeck and Ray ⁶⁶	2006	Do fewer safety related incidents occur if workers and supervisors have (1) open relationships? and (2) good safety communication? Perceived and actual safety related events – accidents/near misses.	Wood product manufacturing in US. Supervisor – worker relationship.	598 workers in 5 plants.	Cross sectional quantitative data. Pencil and paper survey with measures of LMX, job satisfaction, safety communication, safety related events. Archival records of safety-related events also included.	Inverse relationship between relationship quality and number of self-reported incidents, but not actual incidents. No relationship between safety communication and self-reported incidents; communication is dependent on climate.

Author	Date	Focal Question + Focal safety outcome	Sample Context + Leadership level	Sample Population	Method	Key Findings
Yagil and Luria ⁶⁴	2010	Can quality of relationship between worker and supervisor compensate for poor safety climate? Employee safety compliance.	Manufacturing industries (food, plastics, chemicals and metal) in Israel. Manager – employee relationship.	673 employees and 46 managers in 11 organizations.	Cross sectional quantitative data. Questionnaire with measures for safety climate (organizational and group level), quality of relationship with co-workers and with supervisor (LMX), and employee safety compliance.	Workers follow supervisor's perception of safety. Social support (with colleagues and supervisors) and climate combine to create the highest levels of safety behaviour.

Limitations of LMX Studies of Safety Leadership and Opportunities for Further Work

There are a number of limitations with these existing studies of safety leadership from an LMX perspective. First, as noted above, the investigated relationships characteristically focus on supervisor-subordinate relationships. The relationship between other non-supervisor safety leaders and their subordinates and the impact of this on organizational and individual safety outcomes warrants investigation, especially if safety policies and practices are developed at more senior levels in the organization before being implemented by middle managers.

Secondly, the studies occur in high hazard settings, principally manufacturing. The effect of relationship quality on safety outcomes may be equally important in low hazard settings that describe many service sector organizations and civil service occupations. Future research could investigate these environments.

Thirdly, all of the studies are based on cross-sectional survey designs. Longitudinal studies using qualitative methods to investigate how changes in relationship quality affect safety outcomes would provide more definitive explanations of effect outcomes, which are unachievable through correlations alone.

Fourthly, Graen and Uhl-Bien's (1995)⁶² original work notes that studies taking a relationship-based approach to leadership have evolved through a series of four stages from consideration of differentiated dyads within a work unit, through validation of differentiated relationship for organizational outcomes and exploration of dyadic relationship development, to investigating the assemblage of dyads into larger collectives. The studies of safety leadership from an LMX perspective have largely remained at the second stage (the validation of differentiated relationships for organizational outcomes). The cross-sectional nature of the empirical studies precludes the exploration of the development of the leader-follower dyad and its impact on safety outcomes. No studies have yet explored how differentiated dyads between a leader and different followers develop within a network of relationships and how they mutually influence each other to create safety outcomes. Mapping task interdependencies and leadership relationships (using social network analysis) may enable the investigation of patterns of relationship quality and how these dyadic relationships might influence each other to generate safety outcomes.

Finally, the studies have been conducted in a mainly N. American and non-European context. National cultural differences affect the ways in which relationships are established and developed. Such differences may have a significant effect on whether relationship quality affects safety outcomes. Furthermore, the simple conclusion that improving relationship quality positively affects safety outcomes may be simplistic, especially in settings that cross national or cultural boundaries. At an organizational level, businesses within the same organization may be located in different countries (e.g. MNCs). How relationships between leaders and subordinates influence safety outcomes even in the same organization with the same policies may be different in Asia than in Europe for example and perhaps even between countries within Europe. A further complication arises when employees come from different ethnic backgrounds. How these individuals interact to establish relationships and how these differences in ethnicity impact safety outcomes has not been reported even in those studies examined in the initial stages of literature reviewing for this report.

Safety Leadership: Practitioner Literature

19 articles were identified from the American Society of Safety Engineers (ASSE) practitioner journal – Professional Safety – that had material pertaining to safety leadership. According to these articles safety leadership is fraught with difficulty, not only because of the commonly perceived tension between safety and productivity (Carillo, 2005)⁷⁰, which creates ambiguity, but also because safety leaders are commonly squeezed between senior leaders and operations (Forck, 2012⁷¹). These difficulties are exacerbated because leading on safety is equated with organizational change (Pater, 2012⁷²), presuming that organizations must transition from a low level of safety performance to a higher level of safety performance and that this transition will be resisted. Consequently, several articles link safety leadership to the development of a safety culture (e.g. Pater 2012⁷²; 2011⁷³; Petersen, 2004⁷⁴; Krause and Weekley, 2005⁷⁵).

Other papers document a variety of leadership practices that may affect safety outcomes. These are synthesized across articles and summarized in a list of 8 practices in Table 10. Some of these practices, like communication, contain multiple elements which could be disaggregated. Others, like setting goals and monitoring performance, could be combined to create a new practice of ensuring accountability, which was mentioned by Krause and Weekley (2005)⁷⁵ only.

Table 10. Leadership practices identified in articles published by different authors in the practitioner journal “Professional Safety”

Leadership Practices	Drennan and Richey ⁷⁶	Krause and Weekley ⁷⁵	Kapp ⁷⁷	Geller ^{78,79}	Mathis ⁸⁰	Williams ⁸¹	Forck ⁷¹	Petersen ⁷⁴
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

Developments in Leadership Theory and Implications for Safety Leadership

The relationship established between the leader and follower is vital to understanding 'traditional' forms of leadership, two of which (Transactional-Transformational and LMX) are described above. Gordon (2002)⁸² presents a chronological outline of leadership theories through the 20th Century, beginning with trait theories focusing on the attributes and qualities that distinguished leaders from followers and style theories that examine leader behaviours. These were followed by theories of leadership that focused particularly on the relationship between leader and follower. These included transactional leadership, which viewed leaders through the eyes of the follower, explaining leadership in terms of the transaction, or exchange between the two parties. Alternatively transformational leadership reached beyond tangible inducements seeking to inspire and motivate followers through vision, persuasion and support. LMX (Graen and Uhl-Bien, 1995⁶²) integrated these two relational approaches to account for the evolution of relationships between leader and followers.

Authentic Leadership

A more recent development of transformational leadership is authentic leadership, which Lekka and Healey (2012)²⁰ suggest is the way forward for safety leadership. In their review of authentic leadership Gardner et al., (2011)⁸³ list 13 definitions of the construct. Avolio et al., (2009)²¹ define it as "a pattern of transparent and ethical leader behaviour that encourages openness in sharing information needed to make decisions while accepting followers inputs, pg. 423". Four elements form the core of authentic leadership (Walumbwa et al., 2008)⁸⁴:

1. **balanced processing**, where relevant data are analyzed objectively before decisions are made;
2. **internalized moral perspective**, where a personal moral compass guides and regulates personal behaviour. Shamir and Eilam (2005)⁸⁵ describe authentic leaders as being "true to themselves" rather than reflecting the views of others. They are motivated by convictions not personal benefit and act according to personal values and conviction;
3. **relational transparency**, describes behaviours that promote open sharing of information and feelings; and
4. **self-awareness**, which describes individual awareness of strengths and weaknesses as well as how others in the organization view them and their leadership.

Although authentic leadership shares many of the components of transformational leadership Avolio and Gardner (2005)⁸⁶ highlight a crucial distinction. "Authentic leaders are anchored by their own deep sense of self, pg 329", and communicate their values and principles through their actions while transformational leaders, while perhaps also have this deep sense of self, also transform others by casting a vision, inspiring through ideas or attending to needs (Avolio and Gardner, 2005)⁸⁶.

Little research has conceptualised safety leadership as authentic leadership. The work of Eid et al., (2012)⁸⁷ is an exception. They suggest that authentic leadership could directly influence safety outcomes in safety critical organizations, but this has not been tested empirically. Adopting this perspective, two questions pertaining to safety leadership are immediately evident. The first would explore the values and beliefs of individual safety leaders around safety and their importance to that individual leader. This may help to understand better the prioritization of safety amongst the competing tensions of organizational life. The second focuses on how organizational data are analysed objectively in relation to safety and how personal biases are minimized in this process and alternative perspectives elicited.

Importance of Context: Contextual Leadership

In general, leadership theories have focused on the relationship between leader and follower. However, recent reviews of leadership have emphasized the importance of context (Osborn et al., 2002⁸⁸; Porter and McLaughlin, 2006⁸⁹; Drath et al., 2008⁹⁰) and the "process of leadership" (Gordon, 2002⁸²; Denis et

al., 2012⁹¹). According to Porter and McLaughlin (2006)⁸⁹ in their overview of 16 years of leadership research, organizational context had largely been ignored, despite calls to give this greater attention. Osborn et al., (2002)⁸⁸ noted that the effectiveness of leadership was largely dependent on context. Seven dimensions of organizational context were reported by Porter and McLaughlin (2006)⁸⁹ to influence leadership, in alphabetical order these were: culture/climate; goals/purposes; people/composition; processes; state/condition; structure; time. From the perspective of safety leadership, future studies could compare leader behaviours, roles and practices in organizations differing according to, for example, organizational structures (size or degree of formalization), organizational processes (mode of governance, technologies used), people/composition (variation in demographics or skills) or time (tenure of leadership).

While supporting this view that organizational context may affect leadership, Osborn et al., (2002)⁸⁸ demand a more radical change in perspective on leadership seeking to understand how changes in the macro-environment might affect leadership. Acknowledging that the environment surrounding organizations is no longer stable, but may be better characterized as volatile, uncertain, complex and ambiguous (VUCA) (Bennett and Lemoine, 2014⁹²; Horney et al., 2010⁹³), Osborn et al., (2002)⁸⁸ consider how leadership at different levels in an organization might be affected in four different hypothesized scenarios (stability, crisis, dynamic equilibrium and edge of chaos). They note that future leadership studies in contexts that are not stable should emphasize collective rather than individual leadership and the dynamics and process of leadership.

Technical – Adaptive Leadership

Prior work by Heifetz and Laurie (1997)⁹⁴ contrasts the work of the leader in technical (or routine) situations with that in adaptive situations, or alternatively the differences in the responsibilities of leaders operating in stable or dynamic organizational environments. In dynamic contexts demanding adaptability and flexibility they contend that leaders should identify challenges and frame issues, should involve everyone throughout the organization leveraging their capabilities, should challenge established norms, should encourage alternative perspectives to emerge and should not prescribe solutions. These clearly differ from the dominant principles of current safety leaders, which typically would seek to clarify roles and responsibilities and maintain norms and offer solutions (Zohar, 2002b)¹³.

From existing academic safety literature it is unclear how safety leadership should be conducted in dynamic organizational environments. Existing understanding of safety leadership is largely derived from studies conducted in stable environments. This may not reflect current and future organizational realities; the contexts in which future safety leadership will be required.

‘Plural’ Leadership

More recent reviews of leadership (e.g. Thorpe et al., 2011⁹⁵) consider perspectives on leadership that reach beyond the earlier unitary views of leaders as individuals. 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, 2002⁸²). Denis et al., (2012)⁹¹ describe these leadership forms as ‘plural leadership’ and identify four distinct streams of scholarship which make sense of a confusing array of leadership studies, where terms such as “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 groups where a team of group 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, 1955⁹⁶). 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. This stream assumes that individuals within the organization

are motivated to share leadership responsibilities. It also assumes an absence of opportunism or 'free riding' by team members. It also anticipates formal management intervention to encourage its adoption and practice. This perspective could be adopted to examine safety leadership in team-based organizations where the skill level of team members is often high. These have not commonly been the subject of safety research, perhaps because they are more typical of low risk environments. It is unclear whether these contexts are necessarily low risk or simply that shared leadership mitigates the inherent risk (Black and Baldwin, 2012⁹⁷). The applicability of this perspective to teams of less skilled workers or to heterogeneous teams comprising managers and other employees is unexplored.

A second stream of 'plural' leadership research 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 specialized (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)⁹⁸ suggested that they conjointly exert leadership, having a collectively agreed and common purpose, characterized by reciprocal influence. This however is not unproblematic, particularly if members adhere to different logics as may occur for example between a doctor and a manager in a healthcare setting. In an organizational context the interplay between members of the senior management team or board, especially if they champion different logics, may have implications for the effective leadership and delivery of organizational safety. A case study approach could be used to investigate these interactions.

A third stream of 'plural' leadership research embraces much of the work on distributed leadership (Bolden, 2011⁹⁹; Fitzsimmons et al., 2011¹⁰⁰; Spillane, 2006¹⁰¹), where leadership roles are dispersed or spread across organizational levels over time, so that multiple actors take on leadership roles at appropriate moments exerting influence jointly. Empirical studies are typically case-based (e.g. Buchanan et al., 2007¹⁰²). Distributed leadership, insofar as it is seen to be democratic, encouraging collective capacity-building and increasing efficiency and effectiveness by better utilizing expertise (Mayrowetz, 2008¹⁰³) can assume a normative position in the leadership of organizations, although this assumption has been challenged by the work of Currie and colleagues (Currie et al., 2009¹⁰⁴; 2011¹⁰⁵; Martin et al., 2008¹⁰⁶). Studies of how leadership is spread across people, within organizations and over time, to achieve organizational goals needs to be enriched. This could be achieved by exploring how practices are shaped by organizational situations and processes, perhaps by considering how objects and artefacts mediate linkages between people (Denis et al., 2012⁹¹). Safety studies for example could explore the role of IT in distributing safety leadership throughout a dispersed organization with multiple sites.

A fourth stream of 'plural' leadership research arises from a social constructionist epistemology and views leadership as arising from interactions and relationship between organizational members (Uhl-Bien, 2006⁶³). Leadership is constituted in the process of relating and does not reside in the individual. Consequently, communication is central to this stream. This may encourage an exploration of how safety leadership is enacted and produced between two (or more) people, for example, a supervisor and a worker. The focus would be on the *in situ* "performance" of leadership. Moreover, it could build on existing work focused on safety communication (Conchie et al., 2012³¹).

DISCUSSION

Legally everyone in the workplace is responsible for safety and so safe working is integral to every job role, including those of organizational leaders. However, research studies of safety leadership reported in academic literature or policy reports invariably encourage a narrow view of safety leadership, focusing exclusively on the roles and practices of an individual, and how the individual promotes safety and encourages safe working practices. This view separates these practices from their wider responsibilities within an organization. Specialist practitioner literature, by its very nature, also reinforces this narrow view. This view makes it difficult to discern those leadership practices that contribute solely to safety outcomes from those leadership practices that influence organizational outcomes more generally and consequently impact safety albeit indirectly. For example, effective communication between supervisor and worker is widely espoused in the safety leadership literature as an important leadership practice for promoting safe working. It is probable that effective communication will affect other organizational outcomes too. It is unclear therefore whether the practices associated with the delivery of different safety outcomes by safety leaders identified from the reviewed literature are particular to safety leadership or simply reflect good leadership practices in general, as the HSE advocates.

In order to provide a coherent structure, the practices have been bundled into 3 categories (safety coaching, safety controlling and safety caring: see Table 11) corresponding to a framework developed in an empirical study of Taiwanese Universities by Wu et al., (2008)¹⁴. Bundling practices together is not uncommon in other managerial fields, for example, Human Resource Management (HRM) uses the Ability-Motivation-Opportunity (AMO) framework (Appelbaum, et al., 2000¹⁰⁷) combining HR practices according to whether they influence an individual's ability, motivation or opportunity. This bundling of safety leader practices into safety controlling, safety coaching or safety caring may help researchers to explore particular aspects of safety leadership and practitioners to develop a diagnostic tool kit to challenge specific aspects of safety leadership in organizations.

Table 11. 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 Prioritize safety Encourage open discussions Talk about values and beliefs Provide direction Problem solve	Role model Set an example Be visible Prioritize safety Motivate others Involve others Empower others Coach	Role model Educate Train Involve others / Participation	Role model Prioritize 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

HSE guidelines (e.g. HSE, 2012⁵) 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' (HSE, 2013⁴). 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)⁵¹ 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 characterize managerial work (Hales, 1986¹⁰⁸; 1999¹⁰⁹) reveals considerable overlap between the two lists, implying that what is often described as safety leadership practices is actually management practice. Those practices that, in this review, are bundled together as safety controlling, including setting goals, monitoring and rewarding are management practices and resemble those features associated with transactional leadership (Bass, 1985²²) and with the technical leadership dimension of technical-adaptive leadership (Heifetz and Laurie, 1997⁹⁴). There are some practices, especially those associated with safety coaching or safety caring that more closely resemble transformational leadership characteristics (see Table 8) or the adaptive dimension of technical-adaptive leadership and which, perhaps, might be described as safety leadership rather than management.

Most of the academic studies on safety leadership are cross-sectional preventing an investigation of the causal relationship between particular leadership activities and safety outcomes. This is compounded by the absence of any systematic study of safety leadership (O'Dea and Flin, 2003⁵¹). The focal questions in the academic literature and policy reports vary from study to study so that there is no coherent evidence base linking leadership practices to particular outcomes. This review has attempted to piece the diverse sources of evidence together. Safety outcomes at an individual level comprise safety participation and safety compliance, which are asserted to lead to reductions both in injury rates and in the occurrence of safety-related incidents. How these benefits are achieved is unclear. Safety outcomes occur also at an organizational level, for example, in the creation of a safety culture. Safety leadership is perceived to be a necessary pre-cursor for creating a safety climate, as the earlier CBI (1990)¹ and ACSNI (1993)² reports assert. However it is unclear which specific safety leadership practices create a safety culture.

It is noteworthy that many of the studies reported in the academic literature use quantitative data seeking to draw correlations between measures of leader activity and measures of outcomes. In contrast the studies reported in the policy reports are characteristically qualitative in nature seeking often to investigate the diversity of practices used by specific groups in different contexts. This suggests that a mixed methods approach may be more appropriate for investigating safety leadership in detail.

While the guidance emphasizes leadership in general, or acknowledges leadership at different hierarchical levels in an organization (for example, four levels of hierarchy are implicit in HSG65⁴), empirical studies focus mostly on a single level, characteristically, supervisors or occasionally Directors on Boards (Smallman and John, 2001¹¹⁰). There is very little empirical investigation of safety leadership at middle or senior management levels or of leader-follower relationships other than between supervisor and front-line worker. The extent to which the proposed bundles of leadership practices (Table 11) apply to these different managerial levels and whether they need to be augmented with other practices or adapted to better fit other dyadic relationships is unknown.

Many of the studies have investigated safety leadership in hierarchical organizations in high hazard settings, with the exception of the work of Barling and colleagues²⁶ in Canada. The relevance of the proposed bundles of leadership practices (Table 11) to less hazardous settings remains to be investigated. Similarly their applicability to less formally hierarchical organizations also requires investigation. These latter contexts may also be better suited to the application of alternative conceptualizations of leadership such as shared or distributed leadership rather than transformational-transactional leadership or LMX. These alternative views may allow the exploration of whether or not safety outcomes are a shared concern of multiple actors either working separately or collectively (Currie and Lockett, 2011¹¹¹).

CONCLUSION

Operational safety in organizations and the safety behaviours of employees is characteristically attributed to a positive safety culture, which in turn reflects positive safety leadership. Two principal groups of individuals responsible for safety leadership are evident in the literature. The first group identified only in the policy reports comprise members of the senior management team, mainly Directors. The second group investigated mainly in the academic literature are supervisors of front-line workers. The role played by other managers in leading on safety issues and how it may be similar or different to either of these groups is not considered.

Interestingly, the leadership practices identified for these two groups are remarkably similar, even though one focuses solely on front-line workers and the other has a wider remit. The practices may be summarized into three broad categories. Safety controlling covers those practices involved with setting goals, monitoring performance and rewarding behaviours, which are focused on current circumstances and are more managerial in nature. Safety caring covers more relational practices including showing concern and care, listening, supporting, creating and developing a safe working environment and valuing others. These practices are focused on other people. Safety coaching has a future orientation and the practices include role modelling, prioritizing safety, empowering and involving others, training and coaching and being visible. Such practices more clearly demonstrate leadership.

All of the studies of safety leadership reviewed have taken a relational perspective between the leaders and their followers. Often this is through a transformational - transactional perspective or LMX theory. These relational perspectives consider leaders as individuals. However there are other conceptualizations of leadership in the wider leadership literature that include 'plural' leadership or technical-adaptive leadership. These may have application for safety and might consequently reveal different safety leaders beyond Directors and supervisors and alternative leadership practices. Current narrow conceptualizations of safety leadership may constrain the breadth of practices identified as part of the safety leader's arsenal, leaving more to be discovered.

Many of the studies fail to define safety leadership assuming that those leadership practices that deliver the measured employee safety outcomes, principally safety compliance and safety participation, are the key constituents. How these practices substantively differ from conventional leadership practices is unclear. Safety leadership therefore may be defined simply by those outcomes that are the focus of leader attention and their practices to achieve those outcomes, in this case safety. Safety then becomes another item on the agenda of an organization's leaders and must compete for attention with other strategic issues like productivity, customer service and share-holder value. To avoid this pitfall safety must be incorporated into the satisfactory delivery of these other strategic deliverables.

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Appendix 1.

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