What does safety commitment mean to leaders? A multi-method investigation

Abstract

Perceived management safety commitment as an aspect of safety climate or culture is a key influence on safety outcomes in organisations. What is unclear is how perceptions of management commitment are created by leaders. To address this gap in the literature, we position safety commitment as a leadership construct viewed from the perspectives of the leaders who experience and demonstrate it. In this paper, an established multidimensional commitment framework is applied to leaders’ safety commitment (consisting of affective, normative and calculative commitment). Via an exploratory sequential mixed methods design combining interviews (n = 40) and surveys (n = 89), we investigate the applicability of this theoretical conceptualisation to safety commitment. The results indicate the multiple dimensions captured leaders’ safety commitment well, safety commitment can be demonstrated via a range of behaviours, and the dimensions’ association with behavioural demonstrations aligned with those of other types of commitment reported in the literature. Only affective safety commitment was consistently associated with demonstrations of safety commitment. The link between high levels of affective and normative safety commitment and demonstrations was more pronounced when participants perceived their company’s safety climate more positively. Adopting a focus on leaders’ experience of safety commitment offers opportunities for new research into the way in which safety commitment perceptions are shaped by leaders.

Practical application

The findings can support leaders’ reflection about their personal mindset around safety and support them in fostering strong safety climates and cultures. It further encourages organisations in creating work environments that in particular foster affective and normative safety commitments in leaders.
Keywords: safety commitment; leadership; management; exploratory sequential mixed methods; design; organisational safety
Highlights

- Leaders experience multiple dimensions of safety commitment and demonstrate it through various behaviours.
- Affective and normative, but not calculative safety commitment are linked with demonstrations.
- Leader perceptions of positive safety climate enhance the link of safety commitment dimensions with demonstrations.
- Reflection on their safety commitment can support leaders in developing stronger safety commitment demonstrations.
What does safety commitment mean to leaders? A multi-method investigation

Employees are often asked to describe the degree to which their management are committed to safety as a key aspect of their perceptions of safety climate. A high level of perceived management safety commitment is an established indicator that the organization has a positive safety climate (Cigularov, Lancaster, Chen, et al., 2013; Flin, 2003; Flin, Mearns, O’Connor et al, 2000; Guldenmund, 2000, 2007; Zohar, 2008; Frazier, Ludwig, Whitaker et al., 2013). A positive safety climate produces better safety outcomes such as higher rule compliance and fewer work injuries (e.g. Beus, Payne, Bergman, et al., 2010).

Employee perceptions of management commitment are clearly important. The concept is typically defined as “the extent to which management is perceived to place a high priority on safety and communicate and act on safety issues effectively” within the concept of safety climate (p. 27, Neal & Griffin, 2004). Meta-analyses identify employee perceptions of managerial safety commitment as one of the most common and influential components of safety climate (Beus et al., 2010; Christian, Bradley, Wallace et al., 2009; Clarke 2010). However, little attention has been paid to the source of these perceptions (Reiman and Rollenhagen, 2014). By source, we mean the ways in which leaders view safety and the various things that they do that lead employees to perceive their leaders as committed to safety. Surprisingly, little research has directly assessed what is meant by management safety commitment from the perspective of leaders. This lack of direct focus on this important concept is likely to have contributed to it being described as abstract and nebulous (O’Dea and Flin, 2001), with definitions that are broad and inconsistent across studies (Hamid, Abdullah, Asmoni et al., 2015). This is an important gap because it limits the information available to organisations and leaders about how to improve perceptions of management commitment.
We address this gap in two ways. First, we ask what does it mean for leaders to be committed to safety? We draw on organizational commitment theory to propose that leaders can experience different forms of safety commitment and this experience is an internal psychological state that shapes how they enact their commitment. For example, leaders who feel a personal responsibility for the safety of all employees are likely to experience an emotional commitment to safety that guides their subsequent actions. The safety literature’s focus on safety commitment via others’ perceptions is somewhat detached from established conceptualisations of commitment in other domains, which predominantly focus on the individual’s experience of commitment (Meyer & Allen, 1991), and shows that different dimensions of commitment influence behaviors and outcomes in different ways (e.g. Meyer & Herscovitch, 2001). The safety literature generally assumes that more safety commitment is better, without differentiating different dimensions of safety commitment. Thereby, the specific nature of safety commitment experiences is overlooked.

Second, we ask what are the behaviours that leaders engage in to convey their commitment to safety to employees? We propose, based on social information processing theory (Salancik & Pfeffer, 1978) that perceived management commitment is an inferential judgment made by employees about leaders’ internal psychological states based on the perceived actions of the leaders. This inferential process, rooted in individual leaders’ attributes and actions, has been recognised in the safety climate literature as key sources of employee perceptions of management commitment (Zohar, 2000, 2010; Zohar & Luria, 2005), yet it has not been studied directly.

We expect that employees base their perceptions of management commitment on observable actions that managers undertake in their role. For example, managers who speak
positively about the importance of safety, or make decisions that allocate resources to improving safety, are likely to be perceived by employees as being committed to safety.

Figure 1 summarizes the main constructs we use to address these two questions, the process we stipulate, and highlights how this process is linked with key aspects of the frequently used concept “perceived management commitment”. The Figure also shows that perceived management commitment leads to employee behaviours such as safety compliance. We do not elaborate this connection further because it is already well-established in the safety literature.

![Figure 1](image)

**Figure 1**

Managerial safety commitment as a psychological state in managers

1.1 Developing a theory of leader safety commitment

The limited direct focus on leaders in relation to safety commitment means that there is no theoretical framework for understanding how leaders themselves experience safety commitment. There are several benefits in building a theory of safety commitment from the individual leaders’ perspectives. The prevailing approach to leader safety commitment does not clearly articulate the leadership implications of safety commitment. Investigating commitment with a specific focus on safety, addresses recent calls for context specific considerations of safety leadership (e.g. Willis, Clarke, & O’Connor, 2017). While the evidence around these effects of safety leadership behaviors is accumulating fast, what is less understood are the differential driving forces behind behaviors and actions of individual leaders. A model of leader safety
commitment addresses this gap. In doing so, it contributes to the safety literature through a critical refinement of one of its key concepts.

### 1.1.1 Conceptualising safety commitment via multiple dimensions

The workplace/organisational commitment literature has frequently investigated commitment concepts as personal drives or mindsets in individuals and has developed more complete theoretical frameworks for understanding the psychological bases of commitments (e.g. Meyer, Becker & Vandenberghhe, 2004; Meyer, Stanley, & Herscovitch et al, 2002). This literature provides a basis for conceptualising the psychological attributes associated with safety commitment. Recent calls in the commitment literature promote a move towards action commitments directed towards a specific goal or target instead of commitment to an entity (i.e. organisations or professions; Meyer & Anderson, 2016; Neubert & Wu, 2009), a suggestion highly applicable to safety commitment. Meyer and Anderson (2016) define action commitment as a “psychological state that reflects an attitude, bond, or mindset and characterizes “an individual’s orientation towards a course of action that contributes to persistence in that course of action” (p. 179). Following this definition we define a leader’s safety commitment as an action commitment that reflects their mindset and drive to support organisational safety (see also Reason, 1997). In fields outside of safety research, a range of studies have taken a refined approach towards leader commitment and show that leaders’ commitment influences a range of outcomes. Studies have for example investigated the concept of leader commitment to their subordinates (Atwater, Waldman, Atwater et al, 2000; Landry & Vandenberghhe, 2012; Landry, Vandenberghhe & Ayed; 2014). Others investigate leader commitment to specific outcomes such as sales automation technologies (Cascio, Mariadoss, & Mouri, 2010), or health care innovation...
These papers conceptualise leader commitment as a mindset that affects leaders’ actions specific to a commitment target.

The dominant model of workplace commitment (Meyer & Allen, 1991) identifies three dimensions of commitment, namely affective, normative and continuance commitment. Affective commitment describes employees’ emotional attachment to an organisation, normative commitment represents a sense of obligation, and continuance commitment is rooted in the awareness of the costs associated with leaving the organization. The distinction between these three dimensions of commitment has been applied and supported by the majority of studies on various types of work related commitments (e.g. Birken et al 2013; Landry & Vandenberghe, 2012; Lee, Carswell & Allen, 2000; Meyer, Becker & Vandenberghe, 2004; Meyer, Stanley, & Herscovitch et al, 2002; Solinger, Van Olffen, & Roe, 2008). Meta-analyses report affective commitment to be the strongest predictor of positive work behaviour, such as performance, attendance, and extra-role behaviour, followed by normative commitment. Continuance commitment is usually found to be unrelated or negatively related with such outcomes (e.g. Meyer et al, 2002; Rhoades, Eisenberger & Armeli, 2001).

Safety commitment as a leader mindset has not been considered in such detail in the safety literature. A small number of papers conceptualise safety commitment by referring to related constructs such as safety attitudes, core values, priorities and interests, without going into detail about its specific nature (e.g. Christian et al., 2009; Cigularov et al., 2013; Huang, Verma, Chang et al., 2012; Törner, 2011; Vinodkumar & Bhasi, 2011; Wei, Chen, & Li, 2015). Most studies approach the psychological aspects of safety commitment as uni-dimensional. Nevertheless, across these studies indirect references to the three commitment dimensions established by Meyer and Allen (1991) emerge, suggesting that these may be applicable to the
concept. For example, Griffith, Livesey and Clayton (2010) allude to an underlying drive as a personal responsibility for safety, resonating with normative safety commitment. Huang et al. (2012) describe safety commitment as managers’ concern for employees well-being, while Michael, Guo, Wiedenbeck et al. (2005) reflect on it as a form of caring, referring to features akin to affective safety commitment dimensions. Further studies associate safety commitment with genuineness and sincerity (e.g. Barling, Loughlin & Kelloway 2002; Michael et al, 2006), implying the absence of a safety specific form of continuance commitment as positive for safety commitment.

Based on the theoretical distinction between different dimensions of commitment, we propose an adaptation of Meyer and Allen’s (1991) commitment model to leaders’ safety commitment, with the adaptation of labelling continuance commitment as calculative commitment. In the original model continuance commitment reflects the tendency to stay with an organization due to lack of alternatives and perceived costs of leaving. We propose that such a form of attachment does not directly apply to safety and that being calculative around safety issues, as defined below more accurately captures this aspect of safety commitment. The following structure is proposed:

- **Affective commitment to safety:** reflects an emotional and sometimes passionate sense of personal care for keeping individuals in and outside of the organisation safe.

- **Normative commitment to safety:** reflects a moral obligation for safety as a core human and social value and as the right thing to strive for

- **Calculative commitment to safety:** reflects a transactional or rational requirement to prioritise safety as an obligation to business survival as well as other external pressures (e.g. regulations, job security, KPIs).
A similar structure has recently been applied to safety commitment in employees more generally by Delegach et al (in press). Apart from our specific focus on leader safety commitment, rather than general employee safety commitment, our conceptualization further differs from theirs in two ways. First, Delegach et al (in press) only focus on affective and calculative safety commitment, as they argue the effects of normative commitment are not sufficiently distinct from affective commitment. We include normative commitment because commitment to safety can be based on a moral imperative or responsibility in leaders. Ethical or moral behaviour has been associated with leadership, in general (Brown, & Treviño, 2006) and has been argued to be particularly important for safety leadership (Barling et al, 2002). Further, our inclusion of all three dimensions of safety commitment is consistent with more recent developments in the commitment literature, which identifies the profile of commitment dimensions as a predictor of important work outcomes (Gellatly, Meyer, & Luchak, 2006). This research shows that normative commitment plays an important role when considered in combination with affective and calculative commitment. In line with this research, we do not conceptualise the underlying dimensions of leader safety commitment to be mutually exclusive. Second, Delegach et al (in press) conceptualise calculative, or continuance safety commitment solely via a focus on prevention of losses. In our conceptualisation we also include strategic gains that leaders might strive for, such as promotions. Incorporating positive outcomes as part of calculative safety helps to distinguish the construct from avoidance motivation, which is characterised by the drive to avoid negative outcomes (Elliot & Trash, 2010). We propose:

**H1:** Leader safety commitment can be captured via the three dimensions of affective, normative and calculative safety commitment.
1.1.2. Safety commitment demonstrations

The safety climate literature describes that employees derive their perceptions of management commitment to safety from the priority that management assigns to safety (Neal & Griffin, 2004). Following a social information processing perspective (Salancik & Pfeffer, 1978), which suggests that individuals make sense of their work environments by processing social information, perceptions of management safety commitment are most likely to be rooted in observable actions of leaders.

The behaviours by which an individual expresses commitment are generally considered to be specific to the target of the commitment concerned (Meyer & Herscovitch, 2001). Similarly, we expect that safety commitment will be demonstrated by specific actions that, at least in part, contribute to employees’ perceptions of management safety commitment (Zohar, 2000, 2010; Zohar & Luria, 2005). The actions through which leaders demonstrate safety commitment have not been defined systematically in the research literature. However, studies of safety climate that focus on employee perceptions of management safety commitment provide insights into the actions through which individual managers demonstrate their commitment to safety.

Therefore, in a preliminary step, we conducted a systematic review of the literature and we identified six categories of behavioural safety commitment demonstrations that are applicable to individual manager’s actions (see Appendix for details on literature search and Table 1 for behaviour categories). Table 1 shows that four of the categories involved interactions with employees, including the way leaders communicated about safety issues, participation and
visibility at the worksite and in safety activities, providing support and guidance, and involving workers in safety matters by encouraging suggestions and considering employee input.

**Table 1**

*Demonstrations of safety commitment in the literature*

<table>
<thead>
<tr>
<th>Demonstration</th>
<th>Descriptors</th>
<th>References</th>
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<tbody>
<tr>
<td></td>
<td>• Talking to employees about working safely</td>
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<td></td>
<td>• Communication about safety policies</td>
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<td></td>
<td>• Expressing concerns about safety</td>
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<td></td>
<td>• Expressing safety values</td>
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<td></td>
<td>• Listening to safety concerns</td>
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<td></td>
<td>• Open communication</td>
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<tr>
<td>Managerial participation</td>
<td>• Visibility at the work site</td>
<td>Gilkey et al (2003); Mearns et al (2003); O’Dea &amp; Flin (2001); O’Toole (2002); Rundmo &amp; Hale (2003); Simard &amp; Marchand (1997); Vecchio-Sudus &amp; Griffiths (2004); Wu et al. (2008); Yeung &amp; Chan (2012); Zohar (1980); Zohar &amp; Luria (2005)</td>
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<tr>
<td></td>
<td>• Participation in safety activities and safety related work tasks</td>
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<td></td>
<td>• Involvement in safety promotion, inspections, safety analyses of critical tasks, working methods, accident investigations, safety trainings, accident prevention and safety goal setting</td>
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<td></td>
<td>• Participation in safety meetings and committees</td>
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<td>• Vigilance to rule violations during site visits</td>
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<td></td>
<td>• Conducting site visits, face-to-face meetings with employees, scheduled tours and briefings</td>
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<td>• Support and appreciation of employees</td>
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<td></td>
<td>• Corrective actions in response to unsafe acts</td>
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<td></td>
<td>• Rewarding safe behaviour</td>
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<td></td>
<td>• Provision of equipment</td>
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<td></td>
<td>• Designing jobs</td>
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<td></td>
<td>• Spending time on safety</td>
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<td></td>
<td>• Investment in safety training, education and safety programs</td>
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<td></td>
<td>• Devising written safety policies</td>
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<tr>
<td></td>
<td>• Implementation of safety policies and procedures</td>
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<td></td>
<td>• Defined safety objectives</td>
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<td></td>
<td>• Acting quickly and decisively on safety issues</td>
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<td></td>
<td>• Open door policy</td>
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<tr>
<td></td>
<td>• Involving employees in planning and decision-making, including safety goal setting</td>
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</table>
Two of the categories involved actions that do not necessarily require direct contact with employees, but nonetheless are likely to be perceived either directly or indirectly by employees as ways in which individual leaders show their commitment to safety (akin to the safety systems leadership conceptualisation by Griffin & Talati, 2014). These categories were resource allocation in terms of finances, equipment and time by leaders, and policy development, decision making, and implementation.

Our review of leader safety commitment demonstrations provides a framework for differentiating the actions through which individual managers might convey their commitment to safety. To date, these demonstrations of commitment have not been investigated systematically, and the prevalence of the different demonstrations is not known. Therefore, we propose an exploratory hypothesis in which the six categories are applicable to the ways in which leaders demonstrate safety commitment. **H2:** Leader safety commitment demonstrations can be captured via six categories of behaviours.

### 1.3 Linking safety commitment with demonstrations

The three dimensions of safety commitment (affective, normative, and calculative) might be linked to demonstrations of safety commitment in individual leaders as follows. Affective and normative safety commitment are likely to be associated with higher levels of engagement in safety commitment demonstrations, as they reflect an appreciation of safety as an inherent value, thereby promoting a strong and sincere focus on safety issues. In contrast calculative safety commitment is likely to either have no effect or even a detrimental impact on demonstrations of safety commitment, as it reflects a utilitarian approach towards safety as a means to other ends. The proposed relationships are in line with findings on other types of commitment, which show
affective commitment, in particular, is a predictor of positive work behaviour. Normative commitment is also associated with such behaviours, but to a lesser extent. Calculative commitment is usually found to be unrelated or negatively related with such outcomes (Meyer et al, 2002; Rhoades, Eisenberger & Armeli, 2001). We hypothesise:

**H3:** Affective, and normative safety commitment, but not calculative safety commitment, are positively associated with demonstrations of safety commitment in leaders.

Finally, we expect the work context to influence the extent to which safety commitment affects leaders’ behaviour. In particular the overall safety climate is expected to facilitate the demonstration of safety commitment. Safety climate captures perceptions of norms and actions that help to prevent unsafe actions (Zohar, 2000). Generally, a positive overall safety climate is indicated by the perceived emphasis on and priority for safety in an organisation or a team.

Norms have generally been paraphrased as ‘standards’, ‘frames of references’ or ‘common sense’ (Sherif, 1936). Armitage and Conner (2001) define a subjective norm as an “individual’s perceptions of general social pressure to perform (or not to perform) the behavior” (p. 474). In line with these general descriptions of norms, perceptions of safety climate have been shown to critically influence safety behaviours and other outcomes (e.g. Flin, Mearn O’Connor & Bryden, 2000; Neal & Griffin, 2002; Zohar, 2000; Zohar & Luria, 2005). When the environment supports the expression of safety commitment, leaders with stronger affective and normative commitments to safety will be able to express their safety commitment. They are likely to perceive safety climate as ‘standards’, or a ‘frame of reference’ (Sherif, 1936), and their high safety commitment will be highly consistent with those standards. Thus perceptions of positive
safety climates are likely to encourage leaders, who also have strong normative or affective
commitment to safety to act consistently with their own personal safety commitment as well as
the high priority of safety that is assigned by the context in which they operate. When the
environment does not support expressions of safety commitment, the demonstration of
commitment will be constrained regardless of the leader’s affective or normative commitment.
Accordingly, we hypothesise:

**H4:** The association of affective and normative safety commitment with safety
demonstrations will be moderated by perceived safety climate in a way that more
positive perceptions enhance the association of these safety commitments with demonstrations in
leaders.

1.3 Study overview

We approach the concept of safety commitment in individual leaders via an exploratory sequential
mixed methods design (Cameron, 2009). Following this type of study design, a combination of qualitative
and quantitative studies allows us to explore the concept’s content and to test to what extent our
conceptualisation captures it in its entirety with some degree of triangulation. Both study types
complement each other and in doing so overall strengthen the robustness of the evidence presented
(Creswell & Plano Clark, 2011; Onwuegbuzie, Bustamante, & Nelson, 2010). In keeping with the
unexplored nature of safety commitment in leaders, Study 1 (interview study) tests the applicability of the
proposed conceptualisation of safety commitment to leaders’ experiences (Hypotheses 1), and their
demonstrations of safety commitment (Hypothesis 2), including the specific content of these different
dimensions and demonstrations. It also explores the link of the safety commitment dimensions with
behavioural demonstrations (Hypothesis 3). The first study’s findings are then employed to inform
measurement development in Study 2 (following a “building” strategy for integration (Creswell & Plano
Using this measure, Study 2 provides a quantitative test of the content of leader safety commitment, by examining the factorial structure of a leader safety commitment measure (Hypothesis 1). Further, it tests the associations of the different dimensions of leader safety commitment with the leaders’ overall level of safety commitment demonstrations (Hypothesis 3) and the extent to which this association is moderated by perceptions of safety climate (Hypothesis 4). The second study tests how specific safety commitment dimensions are related to the overall level of safety commitment demonstrations rather than the specific behaviours identified in Study 1. This approach provides insight into the dimensions’ of commitment and their relationship with an independently developed measure of demonstrations of safety commitment. This study also reports the safety commitment dimensions’ association with the level of safety commitment demonstrations, and to what extent this link is shaped by the individual leaders’ perception of their company’s safety climate (addressing Hypotheses 3 and 4).

2. Study 1 – Interview study

2.1 Method Study 1

2.1.1 Sample and recruitment

We interviewed 40 participants (middle managers (superintendents and site managers; n = 21) and frontline managers (team supervisors; n = 19) from 13 organisations operating in Australia. The participants worked in construction in mining (n = 22) and the oil and gas sector (n = 18; all sample sizes fulfil saturation criteria identified by Francis, Johnston, Robertson, et al 2010). These industries play significant roles in the Australian economy and are safety critical (NOPSEMA, 2011; Safe Work Australia, 2014). Participants had a median experience of 8 years in their role (Md frontline managers = 10 years, Md middle managers = 6.5 years). They were all in leadership functions and their median number of direct reports was 12 (Md frontline managers = 14.5 and Md middle managers = 12).

2.1.2 Interview procedures
Individual interviews were conducted in person. Participation was voluntary and participants received detailed information about the purpose of the study, the topics and questions involved. With the consent of the participants all interviews were recorded and subsequently transcribed. One well experienced interviewer conducted all the interviews (>100 research interviews conducted). The average interview duration was 19 minutes. The interviews started with questions concerning the participants’ role to familiarise the interviewer with each participant’s work and to establish their position within the organisation (i.e. middle manager or frontline manager). It was then focussed on participants’ safety commitment via open questions and critical incident technique (Flanagan, 1954); see Appendix A for complete interview schedule).

2.1.3 Coding and analysis of interviews

The interviews were deductively coded via the pre-defined dimensions of safety commitment (following guidelines by Mayring, 2000; using the analysis software Atlas.Ti). This coding procedure allowed pre-defined categories to be applied and for additional categories to emerge when interview content did not fit within the existing coding categories. Coders were instructed to identify segments in the text that represent standalone meaning units (as defined by Graneheim & Lundman, 2004) and to allocate each meaning unit into only one categories, treating them as mutually exclusive (Krippendorff, 2013).

Initial coding was conducted by two coders on a subset of interviews (n = 8). The two coders first coded four interviews and then discussed their coding results. This discussion indicated that an “other” category needed to be carried forward as a small number of meaning units described safety commitment dimensions more broadly, so that these responses could not be allocated clearly into the three dimensions. Following these refinements of the coding
scheme, the coders independently reviewed their so far coded interviews and co-coded the remaining four interviews. Sufficient inter-rater agreement of $\alpha = 0.79$ (95% CI LL 0.72 to CI UL 0.86) was achieved (computed with a syntax by Hayes & Krippendorff, 2007). Consequently, the remaining interviews were coded by one coder using the refined coding scheme.

The coding results were analysed via the construct frequency, an indicator of relevance (Namey, Guest, Thairu et al, 2007). Second, illustrative quotes for the content of each coding category are provided. Third, to explore the link between safety commitment dimensions and demonstrations, the frequency of the dimensions and demonstrations was identified for each participant. To control for interview length a ratio of each concept’s frequency and interview length was computed, resulting in ordinal values for each participant (based on Fruhen et al, 2014). Only the calculative safety commitment and decision and policy-making frequency were indicated as normally distributed across the participants ($D_{\text{calculative safety commitment}} (40) = .09, p > .20$; $D_{\text{decision and policy making}} (40) = .12, p > .20$). Thus correlations were analysed using Kendall’s Tau.

2.2. Results and Discussion Study 1

2.2.1 Safety commitment - content analysis results

A total of 182 meaning units were identified as representing dimensions of safety commitment, the majority of which ($f = 171$) reflected the three dimensions defined in the introduction (see Table 2). Only 11 meaning units could not be classified into the three dimensions. These units did not represent a coherent theme and thus were not classified further.

Table 2

<table>
<thead>
<tr>
<th>Frequencies of the safety commitment dimensions by position and industry</th>
<th>Frequency</th>
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</table>
Table 3 shows example meaning units reflecting each of the three dimensions. Meaning units identified as calculative commitment often referred to safety commitment as driven by the consideration of consequences for production if safety was not maintained, implications for the participants’ and their companies’ reputation, as well as the value of safety for future contracts and employability.

Table 3

Example quotes for safety commitment dimensions

**Calculative Safety Commitment**

“If we get safety and process safety right we’re doing our job because everything else will happen, not just making a lot of barrels.” (Middle manager, oil and gas)

“There is loss of personal reputation and loss of reputation to the company.” (Frontline manager, oil and gas)

“They [employees who get injured] are not available for work. So that in turn, if they don’t come back for the next swing, it puts more pressure on the other guys and it just compounds itself having an injury to one of your key guys. It’s just bad business.” (Middle manager, oil and gas)

“If you go out incident free you’re pretty well assured of getting another job.” (Frontline manager, construction)

**Affective Safety Commitment**

“It’s a caring thing, I don’t want to see people get hurt.” (Middle manager, construction)

“With the personnel in the field, I could not imagine having to go and tell someone, that their husband, or their wife is not going to come home. That would affect me pretty badly.” (Frontline manager, construction)

“I couldn’t think of anything worse than seeing a mate that I work with get hurt.” (Frontline manager, oil and gas)

“I mean I get to the point where I’m reading out notices in the morning and someone has been killed in a work accident. I tend to take it a bit deeper and there are times when I’ve done that and I’ve got emotional.” (Frontline manager, construction)

**Normative safety commitment**

“Well you are the responsible person, the buck stops with you, you are not just legally accountable you are morally responsible.” (Middle manager, oil and gas)

“My workers ought to be able to go home safely.” (Frontline manager, construction)

“Everyone has a right to come to work and go home in the same way they came to work and it is possible in this day and age, you know what I mean?” (Middle manager, construction)

“For me that’s the personal thing, it’s the right thing to make sure that everybody’s safe and not put anybody at risk.” (Middle manager, oil and gas)

**Other**
Meaning units identified as representing affective commitment often reflected the sentiment of care for employees and the emotional load associated with having to deal with accidents and injuries. To a lesser extent themes in the affective commitment meaning units reflected on the consequences of a potential safety occurrence from the perspective of the employees’ families and the desire to not wanting to harm or hurt employees. Most of the of the meaning units identified as representing normative commitment dimensions referred to a personal, and moral responsibility to look after the workers’ safety. Participants also reflected on the wider impact of their actions on others and indicated that safety should be a norm, as it is the right thing to do in relation to normative safety commitment.

Table 4 shows that a total of 456 meaning units represented demonstrations of safety commitment. Notably, all the demonstrations mentioned by the participants were captured by those identified in our safety literature review and no additional themes emerged. Further, the demonstrations’ relevance was mostly consistent across the different job roles and industry contexts. Overall demonstrations that require direct interaction with employees, in particular communication and offering guidance and support were identified most frequently, followed by decision-making, policy making and planning.

**Table 4**

**Frequencies of the safety commitment demonstrations by position and industry**

<table>
<thead>
<tr>
<th>Safety commitment demonstrations</th>
<th>Overall</th>
<th>Frontline managers</th>
<th>Middle managers</th>
<th>Oil and gas industry</th>
<th>Construction industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>108</td>
<td>48</td>
<td>60</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>Guidance and support</td>
<td>99</td>
<td>49</td>
<td>50</td>
<td>30</td>
<td>69</td>
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</tbody>
</table>
Table 5 illustrates the content of the behavioural demonstrations of safety commitment.

Meaning units identified as reflecting communication, the most frequently identified theme, were often concerned with exchanging information and talking to others about safety more generally.

Other more specific themes within communication included openness in communication, using different ways to communicate the importance of safety, talking about rules and procedures, listening, as well as expressing concern.

**Table 5**

Safety commitment demonstrations by frontline and middle managers

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<tr>
<td><strong>Communication</strong></td>
<td>78</td>
<td>38</td>
<td>40</td>
<td>44</td>
<td>34</td>
</tr>
<tr>
<td><em>It’s the way to speak to people, the way you give instructions.</em> (Frontline manager, oil and gas)</td>
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</tr>
<tr>
<td><em>And you don’t belittle people no matter how silly you may think it is. You listen to everybody’s concerns and you address them.</em> (Frontline manager, oil and gas)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Guidance and Support</strong></td>
<td>61</td>
<td>25</td>
<td>36</td>
<td>32</td>
<td>29</td>
</tr>
<tr>
<td><em>By stopping jobs and doing things like that, when I say “I don’t think that is right” then I’ll stop the job and so people can see that we don’t just talk about it, we actually do it and it’s important sometimes for people to see that”</em> (Middle manager, oil and gas)</td>
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<tr>
<td><em>I will submit that I think there’s a better way of doing the job and try and get them to look at the job from a different angle and then I might give them leading questions to prompt them the way I think that it should be done.</em> (Frontline manager, construction)</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Decision-Making, Policy-Making and Planning</strong></td>
<td>59</td>
<td>25</td>
<td>34</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td><em>It’s part of the procedures. Let’s follow them. Let’s do it right. If something goes wrong here we need to be aware.</em>” (Frontline manager, construction)</td>
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<tr>
<td><em>It’s one thing saying we should be safe – we should be safe but I mean I have to demonstrate that on a day to day basis by making decisions based on the information I’m getting about what’s safe and what’s unsafe and acting upon those type of things.</em>” (Middle manager, oil and gas)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Allocating Resources</strong></td>
<td>51</td>
<td>16</td>
<td>35</td>
<td>20</td>
<td>31</td>
</tr>
<tr>
<td><em>We also give them the time to produce the documentation. So never putting people under pressure to do something. You always give them ample time to do the safety side of things.</em>” (Middle manager, construction)</td>
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<td></td>
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</tr>
<tr>
<td><em>The engineers can say, “It will be okay with a patch on it” but for me it’s not and I would rather just spend that extra money and go through the job of actually shutting down the tray and replacing the spool.</em>” (Middle manager, oil and gas)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Involving Workers</strong></td>
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</tr>
<tr>
<td><em>And I think at the same time, I mean you must show people that you are caring and listening so that people, you know, know that if there is a situation or any unsafe thing they can come and talk to you rather than if you were to shut people down and close your ear to the peoples’ view or complaint then I think that it’s likely things will happen.</em>” (Middle manager, construction)</td>
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</tbody>
</table>
“Being prepared to interrupt what you’re doing at your desk to deal with someone that comes in and wants to talk to you about a health and safety issue, I think, is an important way to, you know, be able to demonstrate that you’re taking an interest in what they think is important and very easy to earn that interaction that you get with people.”
(Middle manager, oil and gas)

**Participation**

“Having awareness and then walking, you know, sort of, I mean, you go around the site walking, going to the site and visiting the people, you know, take the initiative of going around the site and meeting up with the people is important.”
(Middle manager, construction)

“I suppose it is making sure that I attend hazards or pre-start meetings to impart my knowledge and my experience.”
(Middle manager, oil and gas)

The results indicate a good overall fit of the proposed conceptualisation of safety commitment, supporting Hypothesis 1. Out of the three dimensions of safety commitment, calculative safety commitment was identified most frequently, and this was found across both positions and industries (see Table 2). It is possible that the leaders’ focus on calculative safety commitment stems from organisational management systems that encourage framing the importance of making safety a priority along such transactional lines (for example through KPIs and other incentives).

The results for the demonstrations of safety commitment suggest that the conceptualisations available in the literature capture the managers’ demonstrations well and that their relevance did not differ to a large extent between the positions and industries included in this study. Overall the results indicate the wide breadth of safety commitment demonstrations that managers engage and are in support of Hypothesis 2.

### 2.2.2 The link between safety commitment dimensions and demonstrations

The results of the correlations of the scores obtained for each participant (Table 6) indicated that only affective and normative commitment dimensions were correlated with any of the demonstration categories.

#### Table 6

**Correlations Study 1**

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
<th>10.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time in position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Affective safety commitment was positively correlated with guidance and support (r = .23, p < .05) and with policy-making, decision-making and planning at the .10 probability level (r = .19, p < .10). Normative commitment also had a weak association with guidance and support (r = .20, p < .10). These findings provide preliminary support for Hypothesis 3 and are in line with research on other commitments that finds affective and normative commitment, but not calculative commitment (i.e. continuance commitment to an organisation or profession), to be associated with positive workplace outcomes (e.g. Meyer et al, 2002). It should also be noted that both normative (r = -.29, p < .05) and affective (r = -.25, p < .05) safety commitment dimensions were negatively correlated with calculative commitment, providing some further insights into the internal structure of safety commitment.

Overall, the findings of Study 1 support the proposed structure of leader safety commitment (in support of Hypothesis 1) and illustrate the applicability of the behavioural categories identified from the literature (in support of Hypothesis 2). The meaning units identified for each dimension further illustrate the content of the three dimensions of commitment and in particular support the notion that distinct aspects of safety commitment operate in leaders. Finally, in relation to Hypothesis 3, the study gives preliminary support for the proposed links between safety commitment demonstrations and affective and normative safety commitments, but not calculative safety commitment.
3. Study 2 Questionnaire Study

3.1. Method Study 2

3.2 Sample and Procedure

A survey was distributed to attendees at an aviation industry meeting (response rate 25%; n = 50) and an online version of the survey was distributed via industry mailing lists of an Australian national safety association and a newsletter by the Australian Department of Mines and Petroleum (n = 58). Because of the particular research focus on leaders, only participants in managerial positions with leadership responsibility were included in the main analysis (senior, middle and operational management; n = 89).

The sample consisted of 68 males and 21 females. The majority of participants indicated to have worked in their current position either between 1 and 5 years (n = 26) or between 6 and 15 years (n = 25). The majority of participants worked in the aviation industry (n = 47), followed by the mining sector (n = 17) and the oil and gas industry (n = 14).

3.3. Measures

All constructs were assessed via self-reports from the participants. All scales had sufficient reliability at Cronbach’s α = .77 or higher (see Table 8 for details).

Safety commitment dimensions were assessed via self-developed items. The items were developed based on measures of organizational commitment (e.g. Meyer, Allen, & Smith, 1993) and the themes identified in Study 1. Table 7 reports the final nine item measure.

Table 7

<table>
<thead>
<tr>
<th>Items</th>
<th>Normative safety commitment</th>
<th>Calculative safety commitment</th>
<th>Affective safety commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I make safety a priority because...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am passionate about safety</td>
<td>.55</td>
<td>.10</td>
<td>-.03</td>
</tr>
<tr>
<td>Safety has a great deal of personal meaning to me</td>
<td>.75</td>
<td>.06</td>
<td>.06</td>
</tr>
</tbody>
</table>
I care about safety
It will help me get promoted
I don’t want to lose my reputation
I might lose my job if I don’t
My moral compass tells me to do so
I feel a sense of moral obligation to support safety
Safety is my moral responsibility

Note: Extraction method Maximum Likelihood, rotation method: Oblimin with Kaiser Normalization; analysis based on all returned surveys independent of participant position; n = 104

Items were evaluated through a two-stage validation process following Anderson and Gerbing (1991), starting with 15 items. Subject matter experts working in organizational psychology and safety management (n=8 during step 1 and n=11 during step 2) categorised items into the three safety commitment dimensions based on the extent to which they perceived the items to represent the three dimensions of safety commitment. Following the first step, items that were identified as not clearly representing one of the safety commitment dimensions were refined. After the second step, nine items were retained that all had a $C_{SV}$ score of 0.82 or higher, indicating good content validity. Factor analysis of survey responses showed that the items load on three factors representing the three safety commitment dimensions as intended (see Table 7), thereby supporting hypothesis 1. Scores for each safety commitment form were computed via mean scores of the relevant items. Participants responded via a five point scale ranging from strongly disagree to strongly agree.

Demonstrations of safety commitment were measured via a nine-item scale by Rundmo and Hale (2003) to assess the extent to which participants show safety is important to them (example item: I personally often talk to employees about working safely). Items were rated on a five-point scale ranging from strongly disagree to strongly agree.

Perceptions of safety climate were measured using three-items by Neal and Griffin (2006; example item: Safety is given a high priority by management). Items were rated on a five-point scale ranging from strongly disagree to strongly agree.
**Time in position** was used as a control variable to account for participants’ level of experience.

### 3.4 Analysis and Results Study 2

The Kolmogorov–Smirnov test indicated that scales were not normally distributed (D (86) ranging between 0.12 and 0.27; all p < .005). Accordingly, nonparametric tests were used, namely Spearman’s rank correlation and hierarchical regression (entering control variables in the first step) with bootstrapping 5000 bootstrapped samples (Efron and Tibshirani, 1993).

Bootstrapped regression has been described by Field (2009) as a suitable alternative to standard regression analysis in cases when data are non-parametric. It generates a number of samples by re-sampling the initial sample with replacements, based on which it estimates the standard errors of the standard deviations and calculates confidence intervals (Hayes, 2009). When the confidence interval does not cross zero, the effect is identified as significant.

Correlations, shown in Table 8, indicate affective and normative commitment, but not calculative commitment, were significantly related to demonstrations of safety commitment ($r_{affective} = .67; p < .01; r_{normative} = .56; p < .01; r_{calculative} = -.08; p > .10$). Further, demonstrations of safety commitment were associated with perceived safety climate ($r = .31; p < .01$). It should also be noted that the mean score of calculative safety commitment ($M = 3.14$) was lower than those of the other two commitment dimensions ($M_{affective safety commitment} = 4.55; M_{normative safety commitment} = 4.40$), which is not consistent with the frequencies from Study 1, where calculative commitment was identified most frequently.

### Table 8

**Descriptive statistics and correlations Study 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>M (SD)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time in position</td>
<td>3.12 (1.57)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Affective safety commitment</td>
<td>4.55 (0.52)</td>
<td>-.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.77</td>
</tr>
</tbody>
</table>

The regression analysis (see Table 9) indicated that affective (β = .60; p < .001), but neither normative (β = .14; p > .05) nor calculative (β = -.05; p > .05) safety commitment dimensions were linked with demonstrations of safety commitment. Accordingly, Hypothesis 2 was partially supported. Together, the three safety commitment dimensions explained 47% of the variance in demonstrations of safety commitment.

### Table 9

*Regression analysis of safety commitment demonstrations on safety commitment and interaction effects*

<table>
<thead>
<tr>
<th></th>
<th>B(SE)</th>
<th>β</th>
<th>R²</th>
<th>LL 95% CI</th>
<th>UL 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time in position</td>
<td>-.01 (.04)</td>
<td>-.03</td>
<td>.00</td>
<td>-.07</td>
<td>.06</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time in position</td>
<td>-.01 (.03)</td>
<td>-.01</td>
<td>-.06</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Affective safety commitment</td>
<td>.63 (.10)</td>
<td>.60**</td>
<td>.41</td>
<td>.82</td>
<td></td>
</tr>
<tr>
<td>Normative safety commitment</td>
<td>.11 (.08)</td>
<td>.14</td>
<td>-.04</td>
<td>.28</td>
<td></td>
</tr>
<tr>
<td>Calculative safety commitment</td>
<td>-.03 (.05)</td>
<td>-.05</td>
<td>.47</td>
<td>-.18</td>
<td>.08</td>
</tr>
<tr>
<td><strong>Interaction Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time in position</td>
<td>-.02 (.06)</td>
<td>-.03</td>
<td>.00</td>
<td>-.12</td>
<td>.09</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time in position</td>
<td>-.01 (.04)</td>
<td>-.01</td>
<td>-.08</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Affective safety commitment</td>
<td>.42 (.05)</td>
<td>63**</td>
<td>.28</td>
<td>.58</td>
<td></td>
</tr>
<tr>
<td>Perceived safety climate</td>
<td>.08 (.05)</td>
<td>.14</td>
<td>.01</td>
<td>.16</td>
<td></td>
</tr>
<tr>
<td>Affective safety commitment X perceived safety climate</td>
<td>.17 (.07)</td>
<td>.20*</td>
<td>.50</td>
<td>.05</td>
<td>.31</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time in position</td>
<td>-.02 (.06)</td>
<td>-.03</td>
<td>.00</td>
<td>-.12</td>
<td>.08</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time in position</td>
<td>.05 (.05)</td>
<td>.09</td>
<td>-.05</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>Normative safety commitment</td>
<td>.32 (.07)</td>
<td>.53**</td>
<td>.18</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>Perceived safety climate</td>
<td>.08 (.06)</td>
<td>.13</td>
<td>-.04</td>
<td>.20</td>
<td></td>
</tr>
</tbody>
</table>
Normative safety commitment X perceived safety climate  
\[
\begin{array}{cccccc}
\text{Step 1} & & & & & \\
\text{Time in position} & -.02 (.06) & -.03 & .00 & -.12 & .08 \\
\text{Step 2} & & & & & \\
\text{Time in position} & .00 (.06) & -.01 & -.10 & .10 \\
\text{Calculative safety commitment} & -.02 (.06) & -.03 & -.11 & .10 \\
\text{Perceived safety climate} & .21 (.06) & .36** & .12 & .32 \\
\text{Calculative safety commitment X perceived safety climate} & .03 (.05) & .07 & .13 & -.06 & .01 \\
\end{array}
\]

Note: \( n = 89 \) ** \( p < .01 \); * \( p < .05 \)

Analysis of the hypothesized moderation effects indicated that normative (\( \beta = .21; p < .05 \)) and affective safety commitment (\( \beta = .20; p < .05 \); see Table 9) interacted with perceptions of safety climate in their link with safety commitment demonstrations. Interaction effects (Figure 1) show that both safety commitments’ associations with demonstrations were more pronounced when safety climate was perceived more positively only in leaders with high levels of normative and affective safety commitment. The tendency of those scoring low on these safety commitments to engage in safety commitment demonstrations was not affected by their perceptions of safety climate to such an extent. Accordingly, Hypothesis 4 was supported.

**Figure 1**
Interaction of affective and normative safety commitment with perceived safety climate

4. Overall Discussion
This paper approaches management safety commitment from the views of individual leaders’ themselves and approaches the concept via an exploratory sequential mixed methods design involving two studies (Creswell & Plano Clark, 2011). Building on an established theory of workplace commitment, we show that affective, normative and calculative dimensions of commitment apply to the way safety commitment is experienced by leaders, supporting Hypothesis 1. Both studies indicate this structure to be applicable, thereby confirming fit of integration (Onwuegbuzie et al, 2010). Rooted in propositions of social information processing theory (Salancik & Pfeffer, 1978), we further explored how managers demonstrate safety commitment via behavioural expressions. Findings from both studies concerning the demonstrations of safety commitment complement each other, and provide an expansion view of the concept as follows (Onwuegbuzie et al, 2010). Interviews supported a distinction between different demonstrations of safety commitment and enabled us to explore their content, supporting Hypothesis 2. In partial support of Hypothesis 3, only affective but not normative safety commitment were found to be consistently associated with demonstrations of safety commitment across the two studies. Moreover, calculative safety commitment was not associated with demonstrations in both studies. Although calculative commitment was not linked to behavioural demonstrations in our studies, it might be associated with other outcomes. For example, safety commitment can for example also be expressed relative to the priority given to other organisational goals, such as productivity or cost (Mearns et al, 2003). The relative focus on safety may for example be negatively associated with calculative safety commitment as this type of dimension may be more prominent in individuals who simultaneously favour organisational goals other than safety to a larger extent. It is further possible that a pronounced focus on safety due to transactional requirements, rather than moral or affective reasons, may be
associated with leader authenticity (Borgersen, Hystad, Larsson, & Eid, 2014) with regards to
their value for safety, as well as employee cynicism (Stanley, Meyer & Topolnytsky, 2005).
Finally, the effects of affective and normative safety commitment on demonstrations were found
to be stronger when leaders perceived a more positive safety climate in their work environment,
thereby supporting Hypothesis 4.

The present approach towards leaders’ safety commitment complements and extends the
existing safety literature in two ways. First, our research contributes to the safety literature
through a refinement of one of its key concepts. Our research shifts the focus on safety
commitment away from employee perceptions onto its roots in individual leaders’ experiences
and demonstrations of safety commitment. It explores the specific dimensions of safety
commitment and how these may manifest themselves in behavioral demonstrations. In doing so,
it integrates safety commitment with concepts of leadership. Our results show that viewing safety
commitment in leaders as proposed in this study can help explain how they experience safety
commitment and how this might translate into leadership actions that support safety. Notably, the
safety leadership research has mostly focused on the role of leadership styles and behaviours
(e.g. Clarke, 2013), and not considered the sources of these observable leader actions. Our results
provide insights into leaders’ mindsets that underpin the behaviours through which they support
safety.

Second, our multi-dimensional conceptualisation of safety commitment integrates the
established theory of work-related forms of commitment by Meyer and Allen (1991) into the
safety commitment literature. The focus on safety as a commitment target answers recent calls
for an extension of commitment theory via action commitments (Meyer & Anderson, 2016). Our
findings align with those observed for other forms of workplace commitments (e.g. Meyer et al,
and show that the different dimensions of commitment are also applicable to leaders’ safety commitment and that this view provides refined and extended understanding.

### 4.1 Limitations

This study combines qualitative and quantitative research methods via an exploratory sequential mixed method design. The combination of qualitative and quantitative research methods complement each other and are well suited to the stage of the research process and the conceptual and measurement development that is carried out (Creswell & Plano Clark, 2011).

While the mixed method approach supports the robustness of our findings across two studies, each studies’ limitations should be considered when interpreting the findings. First, both studies involved leaders themselves reflecting about their own work, and their safety commitment. We adopted a view from the leaders’ own perspective to gain insights into their introspections related to safety commitment, which aligns with the theoretical propositions explored. We evaluate this approach as suitable for the stage of the research process as it can support an initial exploration of the internal structure of safety commitment and its functionality. However, because we asked participants about their own behaviour and views, they might have presented themselves in a desirable way to make a good impression in the interviews and surveys, so responses might not reflect their actual actions and motives (Gardner & Martinko, 1988). Podsakoff and Organ (1986) describe such a tendency to present oneself in a better light as not necessarily detrimental to research findings as it should only lead to an upward shift in the distribution of the responses. Further, Christian et al. (2009) evaluate data based on self-reports an unlikely area of concern for safety related research. However, it needs to be considered that the responses to each of the dimension of safety commitment may have been affected to varying extent. In particular a bias
may have obscured the importance of calculative safety commitment as reported via the items and questions that were used. Leaders may not want to be perceived, or think of themselves, as being interested in safety for calculative reasons, and this may have affected their responses and may have contributed to underreporting on this dimension in Study 2.

Second, the sample size of the interview study amply fulfilled saturation criteria for qualitative content analysis (Francis et al., 2009), representing a strength of the study. However, the sample in the survey study is indicated by power analysis as being sufficient for detecting only large effect sizes ($f^2 = .35$; requiring a sample of $n = 48$ in regressions as conducted in the study), and falling short of the required sample size for medium effect sizes ($f^2 = .15$; requiring a sample of $n = 107$; power analysis conducted using G*Power; Faul, Erdfelder, Buchner, & Lang, 2009). While the combination of interview and survey methods in this study is a strength that provides a basis for the conceptual development conducted in this study and adequately supported the conceptual refinement achieved, in the future, a wider test involving a larger sample can help further establish the nature of the concept.

**4.3 Future research**

The repositioning of safety commitment with a focus on individual leaders developed in this paper opens up several opportunities for future research. First, to complement the focus on the leaders’ own perspective adopted in this paper, going forward it will be important to consider the subordinates’ perspective on their leaders’ experience and demonstrations of safety commitment. Research concerning other forms of commitment shows that leaders’ own perceptions of their commitment are not necessarily aligned with their followers’ perceptions (Landry, Vandenbussche, & Ayed, 2014), suggesting that it will be of interest to study to what extend leader and subordinate perceptions of the leader’s safety commitment relate to each other.
Connected to this issue, it will be relevant to identify what factors contribute to a leader’s effectiveness in conveying their personal commitment to safety and may drive more or less alignment of leader and followers’ views on the leaders’ safety commitment. Such factors can be inherent in the leaders, followers, or the environments in which both operate. Further, research can examine to what extent safety commitment in leaders in turn shapes their employees’ safety commitment and how the dimensions of safety commitment relate to safety outcomes as well as the subordinates’ safety behaviours.

Second, to overcome some of the concerns raised above related to self-reporting of the dimensions of safety commitment and in particular calculative safety commitment, measurements via other types of assessments could be considered. For example, the use of implicit association tests to assess the different safety commitment dimensions may overcome this issue and provide a measure of leaders’ underlying automatic evaluations of safety commitment drivers via response times (Greenwald, McGhee, & Schwartz, 1998).

Third, to build on this study’s findings, future research can explore to what extent the different safety commitment dimensions shape leadership style. For example, it can be proposed that normative safety commitment can support leaders in developing stronger visions for safety (as an aspect of transformational leadership; Rafferty & Griffin, 2004), rooted in their sense of moral value in safety. It is further possible that affective safety commitment may be linked to more engagement in leader support directed towards individual employees, which can be reflected in consideration of employee needs and care for employees (Rafferty & Griffin, 2004). This consideration and care can be rooted in the concern for employee wellbeing and care inherent in affective safety commitment. Further, calculative safety commitment may contribute to leaders’ to engage in management by exception leadership, with a focus on establishing
performance standards and managing inadequate performance (i.e. management by exception – passive; Judge & Piccolo, 2004), driven by a focus on safety via externally determined standards and as a means of obtaining other role related goals (e.g. promotion).

Finally, going forward, more research is needed to investigate the antecedents of the safety commitment dimensions, both in terms of the personal attributes of leaders and their work contexts. For example, the reward and promotion structure attached to safety might influence the level of calculative safety commitment if it orientates individuals toward other rewards that might be gained by encouraging safety. Further, because the concept is not necessarily a stable disposition, a longitudinal investigation of its development and effects over time can provide further insights into leaders’ safety commitment.

4.4 Practical implications

This paper introduces a new perspective on safety commitment in leaders. The repositioning of the concept via a focus on leaders and a multidimensional structure provides understanding of safety commitment beyond employee perceptions. By examining how leaders experience and demonstrate their commitment to safety the roots of subsequent employee perceptions of safety commitment can be uncovered. Currently most leaders will have been made aware of the importance of their safety commitment, but receive little guidance on what it means to be committed to safety and how to best demonstrate it. Leaders can use the insights presented in this study to reflect about their safety commitment and how it affects the ways in which they personally convey importance of safety. In particular a more detailed reflection about their safety commitment may support them in developing stronger visions for safety that are rooted in their own personal mindset for making safety a priority. Further, based on our findings, organisations may look to shape their leaders’ safety commitment to increase affective and normative safety
commitment. This can also be considered in the design of KPIs and reward structures as well as the formulation of organisational safety values. Our results also show that the ways in which organisations communicate the value of safety for their operations can be critical in shaping the extent to which leaders’ safety commitment translates into behavioral demonstrations.

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References


Appendix

Literature review

We applied the Boolean search term “safety commitment” in the available databases of academic journals. The search engines were Scopus, PubMed, Web of Knowledge, Psycinfo, PsycArticles and Science direct. No date limitations were set for articles, books or chapters.

Subsequently, it was inspected whether the papers referred to managerial or leader safety commitment in the text (Stage 3) and references used in these papers in relation to managerial safety commitment were identified and subsequently inspected (Stage 4). An inductive coding procedure of the output of the literature search was carried out to structure the identified descriptions (using N-Vivo). This procedure is described as suitable for theory building and has previously been used in literature reviews (e.g. Henrickson Parker, Yule, Flin et al., 2011).

Conceptualisations of behaviours that demonstrate safety commitment were identified in 36 papers. A psychologist inductively grouped the descriptions into themes using a bottom-up technique, matching similar descriptions to each other (resulting in six unnamed themes for behavioural demonstrations of safety commitment). Each description was assigned to only one theme. Finally, two organisational psychologists were given the sets of safety commitment themes and asked individually to identify a common topic or meaning in each set of descriptions.

This exercise suggested the themes in the descriptions of safety commitment as highly robust, as both psychologists identified almost identical topics to be reflected by each theme and found all descriptions to match their theme.
Interview questions

Role related questions

- What is your official role title and can you give a brief outline of your usual activities?
- How big is the team that you manage? (i.e. direct reports)
- How long have you been in that role?

Safety commitment questions

- In your view, what are the behaviours through which you personally demonstrate your commitment to safety? (to your team, others)
- What are your personal/ inherent motivations or drivers that make you focus on safety? Why is it important to you?

Critical incident questions

- Can you tell me about a time or situation (a project, meeting or similar) that you remember well where you demonstrated a strong commitment to safety?
- How would you describe the sense of safety commitment in that situation? What was your personal driver that led you to maintain your focus on safety in that situation?
- How was your safety commitment reflected in the way you approached the situation? How was it reflected in your own thinking? Your actions? How did you communicate it to your team?
- In that situation, were there any issues that made it difficult to make safety a priority?