Received 1 September 2018
Revised 4 January 2019
2 March 2019
Accepted 10 April 2019

Comparing the safety climate of the Indonesian and Australian construction industries

Cultural and institutional relativity in safety research

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Abstract

Purpose – The purpose of this paper is to assess, compare and explain safety climate differences between the Indonesian and Australian construction industries.
Design/methodology/approach – The paper reports a comparative safety climate survey of 415 construction personnel working in the Australian and Indonesia construction industries.
Findings – Surprisingly, the results show that the safety climate in Indonesia and Australia are similar and that the differences in safety performance, safety climate must be interpreted within the context of wider health and safety norms, regulations, awareness, knowledge and typical work environments to make any sense.
Research limitations/implications – This research contributes a missing international comparative dimension to the emerging research on construction safety climate. Indonesian studies are notably absent from this literature, despite the size of the country and the poor health and safety record of its construction industry. Similar comparisons between safety climate in other countries need to be made.
Practical implications – This research allows construction managers operating across international boundaries to better understand the cultural and institutional context in which safety climate is developed. This will assist in the development of more culturally sensitive safety management strategies.
Social implications – The construction industry's poor safety record has serious implications for both individuals working in the industry, their immediate families and the communities in which they live. By improving the safety record of the industry these impacts can be reduced.
Originality/value – This research reveals, for the first time, the cultural and institutional complexities of comparing safety climate across different countries. The results contribute to safety climate research by highlighting the importance of cultural and institutional relativity in making international comparisons of health and safety research.

Keywords Australia, Indonesia, Culture, Safety climate, Institutional relativity
Paper type Research paper

Introduction

Indonesia is the world's fourth-largest country in terms of population size and the largest economy in Southeast Asia with an annual growth rate exceeding 5 per cent and a construction industry expanding even faster at 8.1 per cent in 2017 (Epifany and Scopacasa, 2017). As a developing country, the construction industry plays a critical role in facilitating this economic growth through the development of the country's social and economic infrastructure and the infrastructure budget has been increased by 30 per cent annually on average since 2015 (Kementrian Keuangan Republik Indonesia, 2018). However, the occupational safety and health record of the Indonesian construction industry is poor with official records showing over 50,000 recorded workplace accidents across Indonesian industries in 2015, of which nearly a third happened in the construction industry (BPJS Ketenagakerjaan, 2016). Annually there are also about 2000 recorded work-related

Engineering, Construction and Architectural Management
Vol. 26 No. 10, 2019
pp. 2206-2222

0969-9988
DOI 10.1108/ECAM-08-2018-0340

fatalities in Indonesia and about 10 per cent of those fatalities occur in the construction industry (Rochmi, 2016).

Recognising the need to improve its construction safety record during this rapid economic development, the Indonesian Government issued Government Regulation No. 50 on Occupational Safety and Health Management Systems in 2012 to require the establishment of OSH management systems in every organisation employing 100 workers or more or that has a high level of potential hazard (Indonesian Government, 2012). While Occupational Safety and Health legislation has existed in Indonesia since the 1970s, in 2015, Indonesia also ratified the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187). Convention No. 187 is one of the International Labour Organization's essential instruments related to health and safety at the workplace (ILO, 2015). The focus of this convention is to progressively achieve a safe and healthy working environment through a national system of Occupational Safety and Health.

Despite these initiatives, the Indonesian construction industry's occupational health and safety (OHS) record remains poor and health and safety is considered an unnecessary cost burden in many businesses (Rochmi, 2016). The economic and human costs of this poor safety performance for the Indonesian economy and society are significant since there is a long-standing body of research in OHS which shows that poor OHS has detrimental effects on project cost, time and quality performance, worker morale and productivity and business reputation (Musa *et al.*, 2015; Zou and Sunindijo, 2015).

Although Australia is a developed nation with very different institutional and cultural traditions, it faces the same development pressures with over $150bn of infrastructure spending planned over the next three years (Infrastructure Partnerships Australia, 2017). The safety of Australia's construction industry is also of concern with poor health and safety performance costing an estimated $5.8bn in 2012/2013 alone (Safe Work Australia, 2015b). Nevertheless, in contrast to Indonesia there has been evidence of significant improvement in OHS performance since the introduction of the National OHS Strategy in 2002 (National Occupational Health and Safety Commission, 2002). According to Safe Work Australia (2015a), the incidence rate of serious claims in the Australian Construction Industry has fallen 31 per cent from 2002 to 2013, while the fatality rate has declined 36 per cent. Focus on safety climate has contributed to these improvements in health and safety performance (WorkCover Queensland, 2017).

Within the above context of contrasting OHS performance improvements, the aim of this paper is to assess and compare safety climate in the Indonesian and Australian construction industries. More specifically, this paper addresses the following research questions:

RQ1. Is there any significant difference between safety climate in Indonesia and in Australia?

RQ2. What are potential factors that explain their differences or similarities?

RQ3. What are the factors that should be considered when assessing safety climate across countries?

This is important research for several reasons. First, there is a lack of organisational climate research in construction (Phua, 2018) and especially comparisons of safety climate across international boundaries since most research dealing with OHS management system has been single country-focussed (Rocha, 2010). This is despite safety climate being identified as a robust and valid indicator of construction OHS performance (Lingard *et al.*, 2014). Second, by comparing how OHS climate differs between Indonesia and Australia, this research also contributes a missing international comparative dimension to the emerging research on construction safety climate which according to Hecker and Goldenhar (2014) are focussed on specific countries like Hong Kong and Taiwan, UK, Scandinavia and Australia. Indonesian studies are notably limited from this literature, despite the size of the country and the poor health and safety record of its construction industry.

Safety climate in the construction industry

As Lingard *et al.* (2014) pointed out, the concept of safety climate is critically important to organisational safety performance yet is often confused with the closely related concept of safety culture. While the concept of safety culture remains poorly specified and inconsistently used, it is widely understood to be the pattern of shared basic assumptions about safety that are learned by members of a group over time which serves as a frame of reference that guides behaviour within a society, industry or organisation. In contrast, climate is a surface level expression of the culture at a given point in time which is less stable and prone to change. Zohar (1980, p. 96), who first coined the term safety climate, defined it as "a summary of molar perceptions that employees share about their work environments". In a construction context, Phua (2018) recognised the importance of organisational climate to organisational behaviour in a sustainability context and drawing on the seminal work of Schneider and Reichers (1983) defined climate as "a set of shared perceptions regarding the policies, practices and procedures that an organisation rewards, supports and expects". According to Phua (2018), organisational climate is epistemologically, theoretically and methodologically distinct from the concept of organisational culture in that it reflects more observable, dynamic and consciously perceived shared aspects of an organisation that are psychologically important to, meaningful for and impactful on its individual members. Arguing that much construction research confuses the concepts of organisational culture and climate, Phua (2018) notes the importance of construction industry researchers differentiating between the visible and accessible aspects of climate and the more invisible aspects of organisational culture. As explained by Moran and Volkweln (1992), organisational climate exhibits behavioural and attitudinal characteristics of organisation participants, more accessible to observers, while organisational culture is not readily observed, and represents the foundation of social relations and the underlying deep-structures of meaning, belief, assumptions and expectations on which interaction depends.

Safety climate has been a focus of health and safety research for many years starting with Zohar's (1980) formative work. As Hecker and Goldenhar (2014) point out, one of the greatest appeals of the safety climate construct is its potential to act as a leading indicator for safety outcomes with research correlating common safety climate factors with lower rates of workers' compensation claims, better safety behaviour, less injuries and incidents and higher incident reporting rates. As Hecker and Goldenhar's (2014) review of safety climate research in construction shows, research into safety climate within and outside the construction industry has progressed considerably. It is now widely recognised that safety climate is dynamic and can change over time depending on work conditions and environments and that there can be more than one level and type of safety climate in an organisation. For example, there can be one type of safety climate at the organisational level and another type at the project level (Choudhry *et al.*, 2007; Zou and Sunindijo, 2015). Safety climate research in construction has also found that different construction project stakeholders such as workers (unionised and non-unionised), different trades and managers tend to perceive safety climate differently (Dedobbeleer and Béland, 1991; Gillen *et al.*, 2002; Cigularov *et al.*, 2010), while the group-based nature of safety climate as a collective concept was supported by the findings of Pousette *et al.* (2008) and Lingard *et al.* (2009) who found high levels of "within workgroup" homogeneity on safety climate dimensions.

Due to the potential benefits of an effective safety climate, there has been considerable research into the development of safety climate dimensions and safety climate measurement tools (e.g. see Beus *et al.*, 2019; Dedobbeleer and Béland, 1991; Mohamed, 2002; Zohar, 1980). Zohar and Luria (2004) categorised different types of safety climates using two parameters: strength and level. In a strong safety climate there is very high consensus between members about the priority placed on safety, whereas in a weak safety climate there is a low level of

consensus concerning commitment to safety. Using a different approach, Hecker and Goldenhar (2014) propose four theoretically distinct types of safety climate positioned according to their strength and level: Type 1 – an indifferent safety climate which is weak strength and low level; Type 2 – an obstructive safety climate which is strong strength and low level; Type 3 – a contradictory safety climate which is weak strength and high level; and Type 4 – a strongly supportive safety climate which is strong strength and high level. More recently, Zou and Sunindijo's (2015) review of safety climate research in a construction context found that it is generally measured in relation to six key factors:

(1) Management commitment: it is important for employees to believe that managers are committed to safety and consider safety as equally important as other measures of organisational performance such as productivity and profit (Zohar, 1980).

(2) Communication: there should be regular informal and formal communication between managers and the workforce about health and safety issues and the need to work safely (Clarke, 2006).

(3) Rules and procedures: safety policy, rules and procedures must be perceived as practical, realistic and appropriate (Clarke, 2006; Zou and Sunindijo, 2015).

(4) Supportive environment: this refers to the degree of trust and support in the workplace, including relationships with superiors, relationships with co-workers and overall work conditions that are conducive to health and safety (Mohamed, 2002).

(5) Personal accountability: the workforce should be actively involved in developing health and safety initiatives rather than being passive recipients of safety policy and procedures from the top (Williamson *et al.*, 1997). Furthermore, they need to value health and safety so that they are motivated to implement and improve health and safety initiatives (Neal *et al.*, 2000).

(6) Training: health and safety training for new employees and regular training for existing employees have been associated with a positive safety climate and lower incidence rates (Mearns *et al.*, 2003). It is crucial for this training to be effective in providing sufficient knowledge for employees to identify safety risks and perform their works safely. Trained and experienced workers report fewer stress symptoms and are less prone to hazards (Laukkanen, 1999). A high level of competence, therefore, supports the development of positive safety climate (Mohamed, 2002).

Safety climate in the Australian construction industry

A number of studies have been undertaken into the safety climate of the Australian construction industry. For example, Mohamed's (2002) study of 19 construction sites in Australia found that the most important dimensions of safety climate are: management commitment, safety communication, worker's involvement, attitudes, competence, supportive environment and support from supervisors. Another research project in Australia which collected data from an organisation that constructs and maintains roads and bridges identified six dimensions of safety climate: communication and support, adequacy of procedures, work pressure, personal protective equipment, relationships and safety rules (Glendon and Litherland, 2001). Lingard *et al.* (2010) tested a multi-level safety climate model in a hospital construction project in Australia, and found that the perceived level of safety climate of the main contractor predicts the level of safety climate of subcontractors. Lingard *et al.* (2009) also found the existence of workgroup safety climates within a road construction and maintenance organisation, causing some workgroups to work safer than others despite having similar risk exposure. Likewise, discrepancies also exist not only horizontally, but also vertically, between different management levels.

More recent research in Australia by Zou and Sunindijo (2013) hypothesised that project personnel skills are needed to implement safety management tasks, which then promotes the development of safety climate. They also found that there are different safety climate levels between managers and supervisors, in which the managers perceive higher level of safety climate than the supervisors.

Other research in Australia has investigated the relationship between safety climate and safety performance. For example, Mohamed (2002) confirmed that safety climate is related to safe work behaviour, while Glendon and Litherland (2001) failed to find any relationship between safety climate and safe behaviour. In contrast, Lingard *et al.* (2010) revealed that subcontractors' safety climate predicts the rate of lost-time and medical treatment incidents, showing the relationship between safety climate and safety performance.

Safety climate in the Indonesian construction industry

In contrast to Australia and other countries where climate research has been focussed, safety climate studies in the Indonesian construction industry are limited. One notable exception was Andi (2008), who developed a tool to assess safety climate in the Indonesian construction industry. The tool has six dimensions: top management commitment, safety rules and procedures, communication, worker competence, work environment and worker involvement. In terms of finding the relationship between safety climate and performance, another study in Indonesia found that positive safety climate decreases work pressure and barriers to work safely and promotes safe behaviour (Sutalaksana and Syaifullah, 2008). The influence of safety climate on performance in high-rise building projects in Indonesia was also investigated by Irawadi (2016) who found that safety climate predicts safe behaviour and that both safety climate and safe behaviour positively influence project performance in terms of time, cost, quality, health and safety, environment and satisfaction. Most recently, Machfudiyanto *et al.* (2017) conducted a survey in state-owned construction organisations in Indonesia and identified nine dimensions of safety climate, including leadership, behaviour, value, strategy, policy, process, employee, safety cost and contract system.

Research method

While there have been examples of safety climate research in both Australia and Indonesia, there have been no direct comparative studies. To this end, safety climate data were collected in both countries at project level using an identical survey of construction personnel working on construction sites in both Australia and Indonesia (translated into Indonesian for the Indonesian context). The survey comprised two sections. The first section sought to collect data about respondent demographics, including age, gender, level of education and years of working in the construction industry. The second section mobilised Zou and Sunindijo's (2015) construction safety climate framework and consisted of 58 questions against each of the six dimensions of safety climate discussed above. The questionnaire has been previously used and validated in the Indonesian context. It was then reviewed by Indonesian and Australian practitioners to ensure that the items are not ambiguous. As a result of this review, the wording of some items was revised, some items were removed because they were assessing similar phenomena, and some items related to safety training were added. A six-point forced response Likert scale format ranging from "strongly disagree" to "strongly agree" was used to minimise the risk of respondents choosing the midpoint which is a risk in safety research (Johns, 2005).

In Australia the survey was distributed online for four main reasons. First, given that we were enquiring about safety issues, an online survey afforded anonymity to our respondents, maximising our response rate and minimising social desirability bias (a common problem in construction research concerning corporate social responsibility (CSR)

issues as workplace safety – Loosemore and Phua, 2011). Second, the online format suited the wide geographical distribution of our populations (described below). Third, the online format suited the busy lives of our target respondents (described below) who were operating under significant time and resource constraints. Finally, the online survey method has been successfully used in previous safety climate research (Hecker and Goldenhar, 2014).

Like all methods, it is recognised that electronic surveys have their limitations. For example, although one may have access to greater numbers of participants, there is no way to determine whether targeted respondents complete the survey and whether the resultant sample is representative (Couper, 2000). However, Couper's (2000) research into the merits and disadvantages of online surveys shows that self-selection is no more problematic in online surveys than in mail and telephone surveys and Gosling *et al.*'s (2004) research showed that in terms of sample representativeness, they also compare favourably to research using other methods.

In Australia, respondents were selected using non-probability purposive sampling by approaching project managers of tier-1 contractors as represented by membership of the Australian Constructors Association (the peak body in Australia for tier-1 contractors). Project managers were requested to distribute the link to the survey to project personnel along with an ethics statement which explained the purpose of the research, guaranteed anonymity and allowed the respondents to withdraw their data at any time during or after the survey.

In Indonesia, the survey was administered face-to-face because of poor access to internet compared to Australia. Data were collected from three construction sites managed by tier-1 contractors in Indonesia. Here, as in the Australian survey, potential problems of social desirability bias were controlled by ensuring that the survey was anonymous. The surveys were also administered by independent researchers with no influence from the respondent's supervisors and as in the Australian survey respondents were provided with full confidence that their responses would be treated with strict confidentiality and not seen by their employers and superiors. Ethics clearance was also secured in both Australian and Indonesian contexts and respondents were provided with the opportunity to stop their participation and withdraw their data at any time during or after the study.

In Australia, a total of 104 valid responses were obtained. It is impossible to calculate the response rate because the number of potential respondents reached through the online platform is not identifiable. In Indonesia, a total of 311 valid responses were obtained, a response rate of 100 per cent since no respondents refused to participate in the research. Table I shows the profile of the respondents.

The Australian sample closely reflects the proportion of females in Australia which is about 12 per cent of the total construction workforce (Galea *et al.*, 2015). Construction industry gender data in Indonesia are not available although gender imbalance in the Indonesian construction industry is likely to be worse than that in Australia due to the absence of gender diversity policies compared to Australia. Both sets of respondents had an average age of 32 years although it is notable that the samples differ considerably in terms of education. This again is representative of each industry. In terms level of education, more than 50 per cent of construction workforce in Australia have completed either certificate III or certificate IV or undergraduate degree (Toth *et al.*, 2015). In Indonesia, on the other hand, levels of education are typically lower than Australia. In 2017/2018 only 81.50 per cent of Indonesian students continue into secondary education (Ministry of Education and Culture Republic of Indonesia, 2018). In terms of years of work experience in construction, the Australian respondents had considerably more experience than the Indonesian counterparts (8.73 vs 4 years).

Analysis and discussion

Table II compares the levels of safety climate between the Australian and Indonesian construction industries by presenting the mean scores and ranks for each item in the 58-item

Profile	Classification	Australia Number	Australia %	Indonesia Number	Indonesia %
Gender	Male	87	83.65	302	97.11
	Female	17	16.35	9	2.89
Age (years)	18–24	34	32.69	93	29.90
	25–34	35	33.65	105	33.76
	35–44	16	15.38	74	23.79
	45–54	15	14.42	29	9.32
	55 and above	4	3.85	10	3.22
	Average	32 years		32 years	
Education	Primary school or no formal education	0	0.00	104	33.44
	High school	18	17.31	64	20.58
	Non-degree	23	22.12	78	25.08
	Undergraduate	38	36.54	60	19.29
	Postgraduate	25	24.04	5	1.61
Years of experience in construction	0–4	42	40.38	213	68.49
	5–9	29	27.88	57	18.33
	10–14	9	8.65	20	6.43
	15–19	12	11.54	9	2.89
	20–24	3	2.88	7	2.25
	25 and above	9	8.65	5	1.61
	Average	8.73 years		4.00 years	

Table I.
Sample details

instrument we used to measure safety climate. Both sets of data can be assumed to be normally distributed because each group has more than 30 responses. A two-sample independent *t*-test was used to analyse whether the difference between the mean scores of each item for the Australian and Indonesia samples were statistically significant or not. This parametric test is robust and commonly used to compare the means of two unrelated groups on the same variables. Levene's test was used to assess the equality of variances of the two sets of data. SPSS 25 was the software used to analyse the data. In addition, Table II also presents the rank for each safety climate item so that the lowest items requiring improvements can be determined. For negatively worded items in the questionnaire, the means for these items have been adjusted.

Table II shows that overall there was no significant difference found between the level of safety climate in the Australian construction industry and the level in the Indonesian construction industry (4.50 vs 4.45). This means that overall, Indonesian and Australian respondents perceive safety to carry the same priority in their projects which was surprising given the relative difference in legislative focus, history and safety performance record in both countries. Nevertheless, since safety climate reflects the surface level perceptions attached to safety, rather than actual safety culture, the results must be interpreted within the wider context in which they are measured. In other words, relative to the legislative and historical environment in which safety is embedded, the results show that safety climate is just as developed in Indonesia as it is in Australia and that managers responsible for implementing safety standards in both countries, are equally effective in instilling this into their workforce, within the institutional context in which they work. As explained by Rocha (2010), all economic activities are embedded within a national institutional context of social norms, rules and expectations which define socially acceptable economic behaviour. Since construction organisations are embedded within these institutional orders, they tend to conform to what is considered as appropriate within the environment that they operate. It seems that the implementation of safety practices, which is driven by the need to conform, may be responsible for the similar safety climate levels in the two countries.

Item	Australia Mean	Australia Rank	Indonesia Mean	Indonesia Rank	p (t-test)
Management commitment					
My project manager considers the safety of employees a top priority	5.03	4	5.07	3	0.736
My project manager turns a blind eye to safety issues	4.99	=6	4.79	24	0.180
My project manager always implements corrective actions when told about unsafe behaviour or conditions	4.99	=6	4.85	=19	0.292
My project manager acts quickly to correct safety problems	4.96	9	5.02	5	0.663
My project manager expresses concern if safety procedures are not adhered to	*4.88*	*=15*	*4.36*	*38*	*0.000*
My direct supervisor pays attention to my safety	4.82	=20	4.80	23	0.923
My direct supervisor allows work to continue even when unsafe	4.74	25	4.93	=13	0.189
My direct supervisor often asks employees to begin the work even though working conditions are not safe	4.66	29	4.85	=19	0.211
My project manager focusses on safety only after accidents have occurred	*4.25*	*43*	*4.73*	*27*	*0.004*
Average	4.81	17.4	4.82	19.0	0.920
Communication					
My project manager is available for discussion when it comes to safety	4.95	10	4.82	=21	0.306
Safety communication is effective	4.84	=18	4.98	9	0.227
Safety communication makes me pay attention on safety	*4.84*	*=18*	*5.11*	*2*	*0.022*
My direct supervisor never discusses safety issues with me	*4.82*	*=20*	*4.25*	*41*	*0.000*
I receive a lot of information about safety	4.77	=23	4.96	=10	0.120
I receive constructive suggestions if I work unsafely	*4.56*	*33*	*4.93*	*=13*	*0.003*
Safety information is always up to date	*4.45*	*36*	*4.91*	*15*	*0.001*
Safety information is always brought to my attention by my direct supervisor	*4.26*	*42*	*4.99*	*8*	*0.000*
Methods used to communicate safety information are inadequate	*4.02*	*47*	*3.69*	*50*	*0.039*
Average	4.61	27.4	4.74	18.8	0.120
Rules and procedures					
Sometimes it is necessary to ignore safety requirements to get a job done	*4.40*	*=37*	*3.97*	*45*	*0.005*
Some safety rules and procedures do not need to be followed to get the job done safely	4.38	39	4.61	=32	0.120
Safety procedures are carefully followed by all	*4.13*	*46*	*5.01*	*6*	*0.000*
Some safety rules and procedures are difficult to understand	3.97	50	4.01	44	0.776
Sometimes safety procedures are overlooked to meet production targets	*3.38*	*56*	*4.06*	*43*	*0.000*
Some safety procedures are difficult to implement	*3.22*	*57*	*3.67*	*51*	*0.006*
Average	*3.91*	47.5	*4.22*	36.8	*0.002*
Supportive environment					
Employees are always encouraged to focus on safety at their workplace	5.02	5	4.94	12	0.500
Employees who report safety issues will be punished by their colleagues	*4.91*	*=13*	*3.90*	*47*	*0.000*
I am strongly encouraged to report unsafe conditions in my workplace	4.88	=15	4.64	30	0.097
It is hard for me to work safely at my workplace	*4.68*	*28*	*4.14*	*42*	*0.000*
My co-workers do not care whether I am working safely or not	*4.65*	*=30*	*4.35*	*39*	*0.035*
My co-workers often give tips to each other on how to work safely	*4.36*	*40*	*4.96*	*=10*	*0.000*
No one criticises me if I remind someone to work safely	*4.31*	*41*	*4.70*	*28*	*0.014*
I think my work environment increases the possibility of accidents	*4.21*	*44*	*3.29*	*56*	*0.000*
There is no punishment for behaving unsafely	*4.15*	*45*	*4.66*	*29*	*0.005*
I cannot always get the tools or equipment I need to do the job safely	4.01	48	3.88	48	0.450
I receive praise for working safely	*3.89*	*51*	*4.37*	*37*	*0.002*

(*continued*)

Table II.
Safety climate comparison between Australian and Indonesian construction industries

Item	Australia Mean	Australia Rank	Indonesia Mean	Indonesia Rank	*p* (*t*-test)
There are always enough people available to get the job done safely	*3.84*	*52*	*4.50*	*34*	*0.000*
Sometimes I am not given enough time to get the job done safely	3.78	53	3.63	52	0.383
Work targets often conflict with safety measures	3.55	54	3.49	53	0.695
Sometimes workplace conditions hinder my ability to work safely	3.52	55	3.48	= 54	0.772
Average	4.25	38.3	4.20	38.1	0.444
Personal accountability					
A safe place to work is very meaningful for me	5.22	1	5.31	1	0.384
A continuing emphasis on safety is important for me	5.19	2	5.00	7	0.116
I am clear about my health and safety responsibilities	4.98	8	4.78	25	0.104
I do what I am told to do and do not want to be bothered with safety policy	*4.94*	*11*	*3.91*	*46*	*0.000*
I can influence safety performance in my workplace	*4.92*	*12*	*3.73*	*49*	*0.000*
I am involved in implementing safety at work	*4.91*	*= 13*	*4.62*	*31*	*0.043*
When people ignore safety procedures, it is not necessary to report them	4.87	17	4.61	= 32	0.062
Safety is the number one priority for me when completing a job	4.80	22	5.03	4	0.058
I understand all the safety rules	4.77	= 23	4.89	= 16	0.275
My responsibility is to work safely, and not to report co-workers who do not work safely	*4.69*	*27*	*3.48*	*= 54*	*0.000*
I feel that my workplace has met the required safety standards	4.65	= 31	4.82	= 21	0.185
It is only a matter of time before I am involved in an accident	4.40	= 37	4.42	35	0.950
I am worried about being injured on the job	*3.98*	*49*	*3.18*	*57*	*0.000*
There is always a possibility that I will have an accident in my workplace	2.81	58	3.00	58	0.222
Average	*4.65*	22.2	*4.34*	31.1	*0.000*
Training					
I am capable of identifying potentially hazardous situations	*5.13*	*3*	*4.32*	*40*	*0.000*
Potential risks and consequences are identified in safety training	4.72	26	4.87	18	0.227
The safety training provided is practical	*4.64*	*32*	*4.89*	*= 16*	*0.048*
The company invests a lot of time and money in safety training	4.56	34	4.38	36	0.246
I received adequate training to perform my job safely	4.53	35	4.74	26	0.109
Average	4.72	26	4.64	27.2	0.405
Total average	4.50		4.45		0.489

Notes: 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree = indicates more than one items within this rank. Significant items in italic

Table II.

This finding highlights the importance of cultural relativism in international comparisons of safety research which Loosemore and Phua (2011) argue in their critique of CSR research in construction is too often ignored in international construction management research. The following subsections discuss the comparison results within each safety climate dimension with a focus on the influence of institutional context and cultural relativism.

Management commitment

Although overall the safety climate levels of this dimension are similar, two items are significantly different, and the influence of institutional context and cultural relativism is apparent. First, Indonesian project managers were perceived not to express concern as strong as their Australian counterparts when safety procedures are not adhered to. There are a number of possible explanations for this finding. First, there may be a higher expectation among project managers in Australia about working safely and a higher level of expectation about rule compliance and penalties for non-compliance than in Indonesia. Second, the Indonesian construction industry is more labour intensive than Australia and

employs a high proportion of unskilled workers (Pablo, 2018). Coupled with the high power distance in Indonesia (Hofstede *et al.*, 2010), this work environment may make it less likely that project managers express concerns directly to them on any issues, including safety.

The other area of significant difference in results was in the extent to which project managers focus on safety only after accidents occur. The differences here are not surprising given the above and may be explained by a more matured safety culture in Australia. OHS in Australia is more highly regulated than in Indonesia with a focus on proactive risk management. In contrast, the extent and enforcement of OHS regulations are weak in Indonesia, giving Indonesian project managers less incentive and tools for being proactive in managing safety risks.

Communication

Generally, the Indonesian respondents gave higher scores on questions about receiving regular up-to-date safety information and communication than the Australian respondents. This is somewhat surprising given the higher scores for management commitment to safety in Australia discussed above. In Australia, safety consultation is a legal requirement, compelling supervisors to regularly discuss safety issues with their team members with the aim to use their knowledge and experience to achieve a healthier and safer workplace (SafeWork NSW, 2019). In contrast, the weaker institutional legal context in Indonesia is likely to make safety communications more informal than in Australia and the respondents less aware of requirements governing communication to measures their responses against. Ironically, this informality may also result in more regular communications with our respondents because it is done as and when it is needed rather than simply in compliance with safety regulations.

Rules and procedures

In terms of safety rules and procedures, it is interesting that Australian respondents are less likely to think that safety rules are practical and followed by all. It is important again to consider the influence of institutional context when interpreting this result. Health and safety in the Australian construction industry is heavily regulated and there is a perception in some quarters that work health and safety (WHS) is being compromised by burdensome bureaucracy, paperwork and overregulation (Schriever, 2014). There are also excessive time and cost pressures on many projects and as Safe Work Australia (2015c) has noted, many Australian construction workers feel that questioning safety rules in some instances is appropriate, indicating that they perceive that some safety rules are impractical to implement in practice. The highly unionised nature of the Australian construction industry also creates a climate where safety rules and regulations are closely scrutinised in the context of the industry's drive for greater productivity and profit (Dai *et al.*, 2009). In contrast, unionisation is low in the Indonesian construction sector and health and safety regulations are not strictly enforced and are also not as extensive as those in Australia. The consequence is that respondents are likely to appreciate any form of health and safety intervention on site because they feel that the organisation goes beyond industry and societal norms to take care of their well-being. Furthermore, culturally, Indonesians usually do not question their superiors due to the high power distance of Indonesian society, which is in stark contrast to the relatively low power distance of Australian society (Andi, 2008).

Supportive environment

In Indonesia, it seems that it is more common for co-workers to remind each other to work safely and that they are more caring, positive and helpful towards each other in improving safety compared to their Australian counterparts. The collectivist culture of the country

may facilitate this interaction because in a collectivist society, individuals belong to in-groups that take care of them in exchange for loyalty. Australia, on the contrary, is a highly individualistic community, where individuals are expected to be self-reliant and to display initiative (Hofstede *et al.*, 2010). As a result, in Indonesia it is frowned upon when an individual reports another worker's unsafe conduct because this should be solved within the "family" instead of involving a person in authority, which is considered as an external party. In contrast, reporting safety issues or any work-related issues in Australia is highly encouraged and a normal practice in society.

Cultural relativism also makes punishment more common in Indonesia for those behaving unsafely (Sukapto *et al.*, 2016), while in Australia the so-called "blaming culture" is discouraged. As a result, workers are likely to conceal problems and work together to resolve them rather than report them to management for action than they are in Australia.

Indonesian respondents also perceived that it is difficult to work safely in their workplace and that the workplace itself increases the probability of accidents. These results indicate that construction sites in Indonesia were perceived as dangerous, proving the poor OHS performance in the Indonesian construction industry.

Personal accountability

The results for this subscale show a higher degree of personal accountability for safety in the Australian sample than in the Indonesian sample. This can be explained by a number of factors. For example, the WHS Act 2011 in Australia places considerable focus on workforce consultation and stakeholder engagement in identifying health and safety issues and in co-creating WHS procedures (Australian Government, 2011). In contrast, Indonesian OHS legislation takes a more autocratic top-down approach which does not include any clause on workforce consultation, probably due to the relative lack of union lobbying for worker's rights in the OHS arena and the lack of focus on OHS compared to Australia. There are also significant differences in the levels of OHS education in Australia and Indonesia, which plays a significant empowering role in enabling employees to contribute to effectively to OHS regulation.

Training

The Australian respondents were significantly more confident in identifying potential hazardous situations than the Indonesian respondents. This item is ranked number 3 among the Australian respondents, while among the Indonesian respondents this item ranked 40. This is not surprising given the focus on proactive risk management in Australian OHS legislation. Furthermore, in Australia, OHS training is comprehensive and mandatory. Project personnel are required to undergo training before working on site. There are also specialised training and licences for specific construction activities. All this provides better knowledge for Australian project personnel to confidently identify hazardous situations in the workplace. In contrast, OHS training in Indonesia is minimal and its implementation depends on individual companies without clear guidelines. Many workers have a low level of education, are unskilled and only work temporarily in the sector as many of them are farmers (Kaming *et al.*, 1997; Pablo, 2018). As such, they are not adequately equipped with safety knowledge to identify hazards.

On the other hand, the climate score for the practicality of OHS training in Indonesia is higher than Australia. As stated earlier, this may be explained by the fact that there is a perception that WHS in Australia is being compromised by burdensome bureaucracy, paperwork and overregulation (Schriever, 2014).

In Australia, items in the rules and procedures dimension were generally ranked lowly indicating that respondents perceived that safety procedures are difficult to be implemented and that they are sometimes overlooked to meet production targets. This finding supports

other research which indicates that safety rules and procedures compete with those associated with other performance objectives (Mackenzie and Loosemore, 1997, Zohar, 2010; Jia *et al.*, 2017). OHS implementation, therefore, should not be undertaken in isolation and should be integrated with other policies.

Theoretical and practical implications

When it comes to making judgements about OHS practices across international boundaries, our findings indicate that there are challenges involved. It is interesting and surprising that the results showed no significant difference between safety climate level in the two country samples. However, it is clear that this does not mean that health and safety implementation in Indonesia is comparable to that in Australia. Safety climate is assessed based on the attitudes and perceptions of employees towards health and safety in the workplace and once again, our results show the importance of cultural and institutional relativity in international safety research. In other words, safety climate must be interpreted within the context of wider health and safety norms, regulations, awareness, knowledge and typical work environments to make any sense. Such results would not have been apparent if the two countries compared were from similar cultural and institutional environments but by comparing two very different countries, we have been able to contribute to safety climate research by highlighting the importance of cultural and institutional relativity in this area. In this context, our results indicate that institutional theory and theories of cultural relativism may be of value in advancing future safety research (Jarvie, 1995; Helmke and Levitsky, 2004). Institutional theory is potentially valuable for highlighting the importance on both formal and informal rules on policy outcomes. Formal OHS institutions play a large part in countries like Australia and are consciously written down, designed and specified in formal policies, strategies, regulation, laws, contracts and operational guidelines and enforced and communicated through official channels. However, informal institutions play a greater role in countries like Indonesia and are unwritten and created, communicated and enforced outside of officially sanctioned channels. Whereas the enforcement processes of formal rules can be identified because they involve obvious actors such as managers, committees and even courts and tribunals, sanctions for violating informal institutions take place through often "subtle, hidden channels". However, our findings suggest that both can be equally effective in different cultural contexts.

The premise of cultural relativism theory, from a safety perspective, is that people's judgements of safety performance will always be based on experience as determined by their own enculturation. In other words, cultures are the ultimate authorities on what safety means and that these standards can vary from country-to-country and change over time. It therefore follows that there can be no singular absolute and "imposed" assessment of transcultural safety climate. Instead, every society has its own equally valid and culturally determined version of what constitutes an effective safety climate which is a product of the historical economic, political and social context in which these judgements are made. While cultural relativism theory has not yet been mobilised in construction safety research it has been usefully deployed in other related fields such as CSR. For example, Angus-Leppan *et al.* (2010) distinguish between explicit and implicit CSR activities: implicit CSR activities being driven by social and political norms and expectations which are unique to many countries, while explicit CSR activities tend to be more discretionary and strategic. According to Matten and Moon (2008), firms in developed countries tend to focus more on explicit than implicit CSR activities which may make it appear they are more advanced in their CSR practices, when they are not.

Finally, our findings also highlight a significant issue when assessing safety climate across cultures, especially for international companies that operate across international boundaries, and when attempting to improve safety performance. Even though the safety climate levels in two places are similar, this may not reflect the expected safety performance. Other indicators need to be used to complement the safety climate results so that the

complete picture of safety performance can be obtained. Therefore, attempts to improve safety should consider the influence of culture on the institutional context. An approach successfully implemented in one culture cannot be simply copied to another culture, but should be adjusted to ensure success in another (Rocha, 2010).

Conclusions

The aim of this paper was to assess and compare safety climate in the Indonesian and Australian construction industries. More specifically, this paper addresses the following research questions:

RQ1. Is there any significant difference between safety climate in Indonesia and in Australia?

RQ2. What are potential factors that explain their differences or similarities?

RQ3. What are the factors that should be considered when assessing safety climate across countries?

Overall the safety climate levels in the two contexts are similar. There are, however, differences when individual safety climate items are analysed. Mobilising Zou and Sunindijo's (2015) safety climate model through a comparative safety climate survey of 415 construction personnel working in the Australian and Indonesia construction industries, this paper explored the differences in climate across six dimensions (management commitment, communication, rules and procedures, supportive environment, personal accountability and training). Our findings indicate that the main differences in safety climate relate to: management commitment (managers acting proactively to mitigate risk and expressing concern if safety procedures are not adhered to); communication (safety communication frequency, effectiveness in changing behaviour, encouragement for good safety performance); rules and procedures (difficulty of implementation, willingness to bend rules to meet production goals; willingness to follow the rules); supportive environment (degree of peer support and sanctioning among workers, praise for safe working); personal accountability (ability to influence safety performance and involvement in safety decision making); training (practicality and relevance). However, despite these differences, our results show that measures of safety climate alone are not enough to provide a complete picture of safety performance in any context and that institutional and cultural context are important mediating factors in assessing effective safety climates across different countries. In other words, what is a safe organisational climate in one country may not be a safe climate in another. This has implications for the transfer of safety practices between countries by international regulators and by firms operating in an international context.

There are several research limitations that should be considered when interpreting our findings. First, although our sample was quite large, it differed in size between the two countries and the sample was also purposive and data were collected from large construction organisations in Australia and Indonesia. Second, this research used one safety climate survey to capture the perceptions of project personnel at different levels. We are conscious that Oswald *et al.* (2018) recommend that safety climate measurement tools should be developed to capture the prominent safety aspects at different organisational levels because safety climate perceptions are likely to take different forms at different levels of organisation. Therefore, we suggest further qualitative ethnographic research through techniques such as observations and interviews, to "get under the surface" of hoe climate manifests in reality and to understand how each component of safety climate is actually manifested in different cultural contexts. This may provide more insights about the role of informal institutions in driving safety climates and the differences in safety climate between countries rather than purely relying on quantitative results. This may also indicate what acceptable practices in one context may be considered as bad practices in another context.

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