International Journal of Innovation, Creativity and Change. www.ijicc.net
Volume 7, Issue 10, 2019

Antecedents and Consequences of Employee Safety Climate in the Small Manufacturing Enterprises: Translation, Validation and Application of the Generic Safety Climate Questionnaire

Nor Azma Rahlin[a], Zainudin Awang[b*], Asyraf Afthanorhan[c], Nazim Aimran[d], [a,b,c]Faculty of Economics and Management Sciences, UniSZA, Malaysia, [d]Faculty of Computer and Mathematics, UiTM Shah Alam, Malaysia, Email: [b*]zainudinawang@unisza.edu.my

Safety climate evaluation is increasingly recognized as an important factor in the Small Medium Enterprise improvement. One of the most frequently used and rigorously validated instruments to measure safety climate is the generic safety climate questionnaire. This study presents the validation of the small manufacturing enterprise version of the generic safety climate questionnaire for use in Malaysian Small Manufacturing Enterprises. The original English version of the generic safety climate questionnaires was translated and adapted to the Bahasa Malaysia. A number of experts have been used to assess the content validity, face validity and criterion validity and Exploratory Factor Analysis (EFA) applied for construct validity. The EFA and its Kaiser-Meyer-Olkin and Bartlett's Test is significant, Total variance explained, indicated items in every construct explained more than 60% of the construct. Orthogonal Variance Rotation Matric found that factor loading every item of respective construct was more than 0.6 which is satisfying good measurement. The results of internal reliability reveal that construct representing test yielded values above than 0.8 shows great internal consistency. Conclusion: The Bahasa Malaysia version of generic employee safety climate reveals good psychometric properties for studying the employee safety climate. Like other studies, this measurement seems to be an acceptable tool to evaluate the antecedent and consequence of employee safety climate in Malaysian small manufacturing enterprise.

Key words: *Behaviour-based safety performance, employee safety climate, EFA, Islamic work ethic, work ownership, pre-test.*

Introduction

Employee SC refers to individual perceptions (Silla & Gamero, 2018) or individual different perceptions of work environment characteristics as they affect safety matters and individual behaviour safety at work, while group climate safety consists of the work group, team, and organizational level share perception of work environment (Christian, Bradley, Wallace, & Burke, 2009; Neal & Griffin, 2002; Zohar & Luria, 2005). A shared employee perception or group-level SC occur when they have similar perception on a particular work environment (Huang et al., 2013; Yueng-hsiang Huang, Lee, McFadden, Rineer, & Robertson, 2017; Kwon & Kim, 2013). Many researchers used the term SC to define the individual SC level (Dollard, Tuckey, & Dormann, 2012; Huang et al., 2013; Lee et al., 2014; Mohd Awang, Dollard, Coward, & Dormann, 2012), while others used the term "individual difference" to explain SC at the individual level (Collins, 2008; Hogan & Foster, 2013; Khdair, 2013). At the individual level, safety climate represents an employee's evaluation of the importance one's organization places on safe work practices. Group safety climate which occurred at various hierarchical levels of the organization, refers to the emergence of a set of employee perceptions on safety at the work place (Jimmieson et al., 2016).

Employee SC has been found to be similar to the individual SC concept, where a construct centres on the subscale of a single dimension (Yueng-hsiang Huang et al., 2017; Silla & Gamero, 2018). Psychological safety climate (SC) falls under the management commitment themes such as management safety practices, safety values, and safety communication (Christian et al., 2009). Christian et al., (2009) divided SC into two levels of analysis; individual SC and shared group- SC level. Besides that, a safety related study in Iranian power plant proof that the implementation of safety programs especially that of integrated with management system has a significant impact on improving as well as monitor safety performance during study period (Laal, Pouyakian, Madvari, Khoshakhlagh, & Halvani, 2018). In case of this study, employee safety climate focuses on a single leading or higher order safety climate dimension which is known as "management commitment" (Lee et al., 2014). Researcher described management commitment as employee attitude-based perception on management commitment toward safety in their organization. General safety climate is the previous work of Zohar and Luria (Zohar & Luria, 2005) on small to medium manufacturing containing 32 generic safety climate sub scale items that can be grouped under three themes; 1) active practices, 2) proactive practices, and 3) declarative practices.

Empirical support of generic safety climate has been successfully validated (Yueng-hsiang Huang et al., 2017; Lee et al., 2014; Liu et al., 2015; Zohar, Huang, Lee, & Robertson, 2014), in many industries such as electrical and utility industry-specific (Huang et al., 2013), across

different industries and companies (Lee et al., 2014), manufacturing (Liu et al., 2015), and transportation companies (Huang et al., 2017; Zohar, Huang, Lee, & Robertson, 2015). Eventually, (Dollard & Neser, 2013) referred SC as culture that arises from workplace environment containing policies, practices, and procedures for the protection of workers' well-being in term of psychological health and safety, dominantly driven by management. While. (Mohd Awang et al., 2012) extended previous safety climate definition by Dollard with adding the protection of workers' psychological health and safety.

Several past studies focus on employee safety climate rather than group safety climate—shared perceptions among employees in a various work environment such as health care, public organization, and transportation industry —in accordance with other studies based on employee perception (Alfayez, Subramaniama, & Mohd Zin, 2017; Nguyen, Teo, Grover, & Nguyen, 2017; Silla & Gamero, 2018; Zohar et al., 2015).

Employee safety climate models have been developed and validated not only for diverse industries, but also for different country populations (e.g., Sweden (Morillas, Rubio-Romero, & Fuertes, 2013), Norway (Dahl & Kongsvik, 2018), Korean (Kwon & Kim, 2013), Saudi Arabia (Noweir, Alidrisi, Al-Darrab, & Zytoon Mohamed A., 2013), Turkish (Cemil Akyuz, Yıldirim, & Gungor, 2018), Thailand (Kongtip, Yoosook, & Chantanakul, 2008), Australia (Clarke, 2010, 2013) and Malaysia (Bahari & Clarke, 2013; Mashia, Subramaniama, & Joharia, 2017; Mohd Awang et al., 2012; Tang, Ho, Dawal, & Olugu, 2018). Nevertheless, a study on current status of occupational safety point out that several low middle income countries such as Southern Africa using case studies of South Africa, Zimbabwe, Botswana, and Zambia have a bundle of unsettle safety related issues (Ncube & Kanda, 2018).

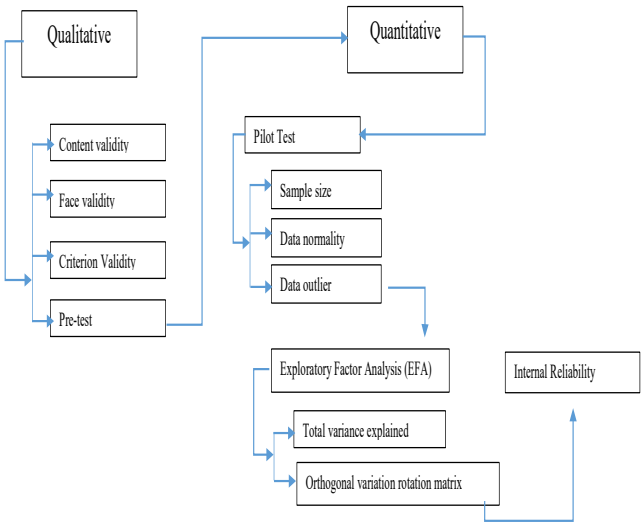
A number of methods are usually used to assess the validity of a measurement instrument. The content validity of an instrument can be inspected in pre-test and pilot test stages. The pre-testing stage is qualitative approach usually carried out through performing several types of validity, namely: a content validity, face validity, criterion validity and pretesting to a small number of respondents. In the qualitative approach only depends on the opinion of experts in the research area (Hardesty & Bearden, 2004; Haynes, Richard, & Kubany, 1995). Many researchers have tested the content validity of safety climate measurements using a qualitative method (Barbaranelli, Petitta, & Probst, 2015; Beus, Payne, Arthur, & Muñoz, 2017). In contrast, the quantitative analysis of the useable response from pilot study is determined by the application of statistical methods (Beus et al., 2017; Bronkhorst, Tummers, & Steijn, 2018; Hsu et al., 2010; Khdair, 2013; Kudo et al., 2008). The construct validity is examined using statistical methods. A huge number of scholar have employed the exploratory factor analysis (EFA) to examine the construct validity of the safety climate measurements (Alolah, Anthony Stewart, Panuwatwanich, & Mohamed, 2014; Casey & Krauss, 2013;). Thus, the mix method of qualitative and quantitative examination of the validity is a common practice for analysis of the safety climate measurements.

Many instruments have been developed to measure the safety climate in various industries worldwide. However, many researcher suggested that different sets of safety climate evaluation measures required for different ethnic population (Dahl & Kongsvik, 2018) as well as measurement tools are poorly adapted to (Tremblay & Badri, 2018). This is in line with argument that the unique nature of safety climate is accordance to their context culture in countries, industries, companies, and even different sectors of an organization (Bahari & Clarke, 2013; Mohd Awang et al., 2012; Nor Azma, Abdul Halim, & Munauwar, 2016). Additionally, some authors found there is lack of empirical evidence on the link antecedents, ESP that predict employee related safety behaviour (Nguyen et al., 2017). The authors also recognized the need for specific employee safety climate measurement for SMEs industry.
To the researchers' knowledge, this study is the first initial initiative to validate the antecedents, consequence of employee safety climate measurement for small manufacturing industry in Malaysia. Previous study identified the necessity to produce a standard safety climate questionnaire to collect appropriate data (Kudo et al., 2008). Therefore, it is important to validate an adapted and translated measurement to measure the employee safety climate in Malaysian small manufacturing enterprises. In this study, researchers explored the validity and the reliability of the measurement.

Methodology

The qualitative evaluation of the antecedents and consequence of employee safety climate measurements by a number of experts is a common approach to assess the content validity, face validity and criterion validity of the measurements. The application of a quantitative method for conducting such analysis facilitate the decision-making process regarding retention or rejection of the items of the measurement. Step by step of the mix method generic safety climate validation procedures illustrated in Fig. These were conducted to consider the recommendation given by Zainudin Awang, (2012) and Ghahramani and Khalkha (2015) in order to validate them before it can be employed in the real study.

Fig 1. Steps in Preliminary Study of Generic Safety Climate



The Employee Safety Climate Questionnaire-Small Manufacturing Enterprise versions

The employee safety climate questionnaire of small manufacturing enterprises was adapted to measure employee's attitudes-based perception on management commitment towards safety. The employee safety climate is a refinement of the generic safety climate Questionnaire and the full version of the antecedent and consequence of employee safety climate comprises 41 items, whereas the version comprises employee safety climate version contains 12 items adopted from (Lee et al., 2014), work ownership adopted (Van Dyne & Pierce, 2004) (6 items), Islamic work ethic (10 items) adapted from (Yousef, 2001) and behaviour-based safety performance (6 items) (Neal & Griffin, 2002) in Table 1. The questionnaire takes approximately 15–20 min to complete and each item is answered using a 10-point interval scale Disagree Strongly (1) to, Agree Strongly (10) for exogenous: WO, IWE and SC construct, while endogenous construct applied 10-point interval scale Almost Never (1) to Almost Always (10).

Table 1: Antecedents and consequence of employee safety climate and definition

Role	Construct	Definition
Mediator	employee safety climate	Employee safety climate in this present study is attitude based-perception of individual employee on management commitment toward safety
Consequence	behaviour-based safety performance	Behaviour based-safety performance has been defined as employee safety compliance and employee safety participation
Antecedent	work ownership	An occupational circumstance in which one feels as though an aspect of one's work has become part of, or an extension of the self. Example; work becoming "mine" or "ours"
Antecedent	Islamic work ethic	Islamic work ethic includes the application of real Islamic concepts in the workplace such as hard work, commitment, justices and generous, cooperation, punctuality and competitiveness in accordance Islamic understanding, trust and confidence by not neglecting duties as Muslim

Pre testing

Content validity

Content validity offer some insight on the holistic structures is based on the review of the evaluation elements, and designated in the supporting theoretical contextual (Sgourou, Katsakiori, Goutsos, & Manatakis, 2010). On the other hand, content validity deals with the comprehensive and representative of the items were measure the measurement (Sehhat, Mahmoudzadeh, Ashena, & Parsa, 2015). Measuring content validity in this study therefore involves a number of experts from academician and industrial. In the content validity process, questionnaires has also been examined through clause-by-clause review using content-analysis techniques as it was suggested by many researchers (Redinger, Levine, Blotzer, & Majewski, 2002). Experts' feedbacks on content validity were then discussed as well, noticeable differences, less probable than it would be, as well as not relevant to that construct were found. Last question in WO has been removed as it was suggested by expert. After a consensus was reached and a final Bahasa Malaysia of employee safety climate version contained 40 items was established.

Data collection (quantitative method-pilot study)

Quantitative approach of data collection, data measurement and data analysis will be employed. The unit of analysis examined in this current study is individual employee in small manufacturing enterprises (SMEs). Individuals who are working as part-time or full-time under a contract of employment with SMEs in East Coast Region of Peninsular Malaysia are considered as members of the study population. Self-administrative questionnaires were

distributed to 130 samples of employees in the population using Stratified Random sampling. The data collection was conducted with 130 employees in May 2018. The 130 employees were mainly involved in various manufacturing industries, which are the representative SMEs industries of Malaysia. Respondent who are employee from selected company are belong to their workplaces that are voluntarily participate in this study. At each company, the self-administrative questionnaire was distributed to employees who are selected randomly according to their company name lists, and the completed forms from company were sent to the researchers by mail. Employee has been informed that all answered given in the surveys were keeping confidentially and only used for research purposes.

Statistical analysis

Descriptive statistics were used to describe the general information of the respondent and the antecedents, consequence and employee safety climate item and measurement-level results on the units. Commonly, researchers provide several general information of interest as a partial picture of the respondent distributions (Huff & Tingley, 2015). According to Aziz et al. (2019) and Asnawi et al. (2019), pre-test is compulsory to validate on adapted, and modified instrument accordingly to unsure that new version instrument fit neatly with current study, while useable response of amend questionnaires version shall go through Exploratory Factor Analysis (EFA) before it can be employed in the real study. The statistical analyses were performed using IBM-SPSS software version 22 as used for conducting EFA.

Table 2: Constructs and number of items

Factor	Construct	No. of item (N_a)
F_1	Work ownership	5
F_2	Islamic work ethic	10
F_3	Employee safety climate	12
F_4	Behaviour-based safety performance	6

N_i=110, N_p =4

Factor analysis refers on the idea that observable and measurable constructs can be reduced to small number of latent constructs that share a mutual variance and are unobservable, which is identified as factor reduction (Bartholomew, Knott, & Moustaki, 2011; Yong & Pearce, 2013). Factor analysis is generally used in several areas such as, behavioural, social sciences, geography, economics, (Yong & Pearce, 2013), education, psychology and medicine (Williams, Brown, & Onsman, 2012) (Kim et al., 2018), as a consequence of the technological innovations of computers. Indeed, (Williams et al., 2012) specified that exploratory factor analysis (EFA) commonly uses for three purposes as follow. Firstly, factor analysis reduces a large number of variables into a smaller set of constructs or variables (also referred to as factors or elements). Secondly, it creates fundamental dimensions between measured constructs and

latent constructs, thereby allowing the development and modification of theory. Thirdly, it provides construct validity evidence of measurement. In this context of this study, EFA is applied to verify the number of underlying components or dimension of the instrument and the pattern of item–factor loadings.

Result

In this study some of important general information of the respondents, such as race, gender, and age of the 110 useable responses have been examined and presented in Table 25. The respondents' ages were sorted into seven age categories. All respondents were at range of aged between 0-25 years and 51-60 years. A large number of respondents were aged below than 30 years. It is clearly shown that the highest frequency of employee age is below than 25 years old where there were 25.5 % employees from the total of 110 useable respondents. The results show that small manufacturing enterprise recorded small number of the high-risk groups, which is referred to employee who is above than 50 years old. According to Yi, (2018) the trends and characteristics of fatal occupational increases due to increasing specific age group injuries in Korean employee aged 50 years and above.

The result illustrated that more than 50% of the respondent have a low education levels (O level and below): namely SPM and PMR, 18 respondents and 54 respondents, respectively. The next general information was length of service. The length of service made up of three large groups, where the first group had 5 years and fewer years of services which represents 46% of the total participants in the pilot study.

Table 3: General Information of Respondent

		Frequency	**Percent**
Age	0-25 years	28	25.5
	26-30 years	22	20.0
	31-35 years	13	11.8
	36-40 years	13	11.8
	41-45 years	13	11.8
	46-50 years	16	14.5
	51-60 years	5	4.5
Education level	PMR (below than O level)	18	16.4
	SPM (O level)	54	49.1
	DIP/STPM/Matriculation	26	23.6
	Degree	11	10.0
	Higher than Degree	1	0.9
Gender	Male	78	70.9
	Female	32	29.1

Accident experience	Yes	24	21.8
	No	86	78.2
Job designation	Operator and equivalent	77	70.0
	above than operator and supervisor and equivalent	33	30.0
Length of Services	0-5 years	51	46.4
	6-10 years	26	23.6
	11-15 years	23	20.9
	16-20 years	7	6.4
	21-30 years	1	.9
	More than 30 years	2	1.8

Note: n=110 respondents

In this study, three job designation has been regrouped into two job designation; 1) employee groups represents any employee fall under operator and equivalent and 2) supervisor group represents those employees who are above than operator, comprise of supervisor or equivalent and manager and equivalent. The composition of employees and supervisors in the firm is 70% and 30%, respectively. Moreover, 22 % of them had an occupational accident experienced within service time in the firm.

In this section, it has been explained that respondent's general information. The section that follows moves on to consider the results of 5 steps Exploratory Factor Analysis (EFA) procedure for WO, IWE, SC and SP.

The Exploratory Factor Analysis (EFA) procedure for antecedences and consequence of employee safety climate constructs

(EFA-Steps 1)

The antecedences and consequence of employee safety climate constructs have 40 measuring items renamed as W1 until BBSP6 (Table 4). Every item in exogenous construct was measured using and interval scale between 1 and 10 with 1 = strongly disagree and 10 = strongly agree with the item statement. While items in endogenous construct was measured using and interval scale between 1 and 10 with 1 = almost never and 10 = almost always. The mean score and standard deviation for every item is presented in Table 1 shows the consistency in the score distribution since the standard deviation for every item is less than 1.0.

Table 4: The mean and standard deviation for Antecedence and consequences of employee safety climate (n=110)

	Mean	Std. Deviation
W1	9.23	.738
W2	9.57	.550
W3	9.33	.731
W4	9.40	.638
W5	9.25	.744
I1	8.99	.953
I2	9.33	.949
I3	9.05	.990
I4	9.15	.855
I5	8.97	.981
I6	9.06	.960
I7	9.16	.934
I8	9.12	.955
I9	8.98	.967
I10	8.58	.952
S1	9.48	.674
S2	8.97	.913
S3	8.82	.979
S4	8.88	.843
S5	9.15	.756
S6	9.25	.693
S7	9.50	.701
S8	9.35	.698
S9	9.03	.784
S10	9.20	.764
S11	9.11	.746
S12	9.11	.734
BBSP1	9.48	.674
BBSP2	8.97	.913
BBSP3	8.82	.979
BBSP4	8.88	.843
BBSP5	9.15	.756
BBSP6	9.25	.693

(EFA-step 2)

Table 5
The Value for KMO Bartlett's Test

Work Ownership				Islamic Work Ethic				Employee safety climate				Behavior-based safety performance			
	Bartlett's Test				Bartlett's Test				Bartlett's Test				Bartlett's Test		
KMO	Approx. Chi-Square	df	Sig.	KMO	Approx. Chi-Square	df	Sig.	KMO	Approx. Chi-Square	df	Sig.	KMO	Approx. Chi-Square	df	Sig.
0.75	146.66	10	000	.87	919.38	45	0.00	.802	597.57	66	0.0	.818	318.97	15	.00

KMO: Kaiser-Meyer-Olkin Measure of Sampling Adequacy.
Bartlett's Test: Bartlett's Test of Sphericity

The EFA using principal component analysis with varimax rotation method resulted in the retention of four constructs with 39 items. Table 3 shows the value of Bartlett's Test which is significant (P-Value < 0.05) indicating that correlations exist among the constructs. The measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO) is between 0.757 and 0.872 which is higher than the minimum requirement of 0.6. Both values (Bartlett Test which is significant and KMO > 0.6) reflect the current data is adequate to proceed into the next steps in the Exploratory Factor Analysis (EFA). One item from work ownership construct were removed from the scale because there were fewer than 0.6 loaded items for each factor (Zainudin Awang, 2015). Bartlett's Test of sphericity was significant (p<0.001), which indicates that the data were appropriate for next steps in exploratory factor analysis.

(EFA Step-3)

Table 6: Total Variance Explained contributed by every component

Rotation Sums of Squared Loadings								
	WO		IWE		ESC			BBS
	1	2	1	2	1	2	3	1
Total	2.274	1.307	5.754	1.266	2.991	2.663	2.343	3.642
% of Variance	45.475	26.143	57.541	12.655	24.924	22.193	19.529	60.705
Cumulative %	45.475	71.618	57.541	70.196	24.924	47.117	66.646	60.705
Extraction Sums of Squared Loadings								
Total	2.569	1.012	5.807	1.213	4.622	2.441	1.935	3.642
% of Variance	51.384	20.233	58.071	12.126	38.514	20.344	7.788	60.705
Cumulative %	51.384	71.618	58.071	70.196	38.514	58.858	66.646	60.705
Initial Eigenvalues								
Total	2.569	1.012	5.807	1.213	4.622	2.441	1.935	3.642
% of Variance	51.384	20.233	58.071	12.126	38.514	20.344	7.788	60.705

Cumulative %	51.384	71.618	58.071	70.196	38.514	58.858	66.646	60.705

Extraction Method: Principal Component Analysis

Another measures namely Total Variance Explained is very important as an indicator to reflect how much the items used in the study manage to estimate the respective latent construct. Table 5 shows the total variance explained to measure the latent construct of antecedences, consequence and employee safety climate. The values in Table 5 show that, the measuring items of endogenous constructs such as WO, IWE, and ESC fall into 2, 3 components respectively. The Total Variance Explained of exogenous construct (BBS) is 60.75 % fall into a single component. Total Variance Explained latent constructs are: WO (71.618%), IWE (70.916%), ESC (66.646%) and BBSP (60.705%). According to (Zainudin Awang, 2012), total variance explained more than 60% show that the existing items are adequate to measure the construct. The Total Variance Explained for the latent constructs is satisfactory since it was achieved more than 60%.

(EFA-steps 4)

Table 7: The Factor Loading for every item and their component

Rotated Component Matrix[a]			
Items	Component		
	1	2	3
Employee safety climate			
S1			.787
S2		.688	
S3		.832	
S4		.855	
S5		.601	
S6			.675
S7			.842
S8	.778		
S9	.728		
S10	.752		
S11	.739		
S12	.799		
Work Ownership			
W1	.727		
W2		.923	
W3	.868		
W4	.874		

W5		(Deleted) .575	
Islamic Work Ethic			
I1	.876		
I2	.779		
I3	.873		
I4	.859		
I5	.820		
I6	.867		
I7	.808		
I8		.777	
I9	.893		
I10		.770	
Behaviour-based safety performance			
BBSP1	.660		
BBSP2	.780		
BBSP3	.803		
BBSP4	.793		
BBSP5	.820		
BBSP6	.807		

(EFA-steps 5)

The researcher also needs to assess the factor loading for items measuring the construct and also its dimensionality. The factor loading for each item indicates the importance of the respective item in measuring its construct. Table 6 shows the factor loading for every item in respective constructs is above than minimum acceptable value 0.6 However, item WO5 (0.575) have been deleted due to low factor loading as proposed by (Zainudin Awang, 2012) and (Hoque et al., 2017). As has been mentioned earlier, item with low factor loading (less than 0.6) are not retained since these items do not contribute in measuring the intended construct.

Table 8: Cronbach α values, mean and standard deviations for the antecedent, consequence and employee safety climate constructs

	No. of items	Mean	Std. Deviation	Cronbach Alpha
Employee safety climate	12	9.15	0.77	0.85
Islamic Work ethic	10	9.04	0.95	0.87
Work ownership	4	9.36	0.68	0.72
Behaviour-based safety performance	6	9.09	0.81	0.87
Overall				0.83

Finally, the researcher needs to compute Cronbach Alpha using the internal reliability statistics test. Cronbach alpha (α) used to measure the internal consistency reliability of the selected items in measuring the construct. The α coefficient for the overall measurement used in the present study was 0.83, representing great internal consistency. However, Cronbach's alpha does come with some limitations: scores that have a low number of items associated with them tend to have lower reliability, and sample size can also influence your results for better or worse. Besides that, Cronbach's α values are also affected by the number of items and inter correlations of items (Cemil Akyuz et al., 2018). Therefore, Cronbach alpha value for this study will be based on construct not a component of construct. Cronbach's α value for the four constructs between 0.72 and 0.87. A lower value of α values (e.g., 0.72 and above) can be accepted due to a recently developed measurement or a translated measurement is used. Table 8 shows the Cronbach Alpha value for every construct. Four constructs have the Cronbach Alpha greater than 0.7, which indicate the selected items are reliable and can be used for the field study as according to rule of thumb.

Conclusion

The results of this study recommend that the generic safety climate measure can be used across different small manufacturing enterprises. Similar to a previous study by (Guo, Yiu, & González, 2017), it found that safety climate measure is not required to be matched to specific groups, while that meaningful data can be collected by utilizing the safety climate measure from diverse size companies. Another contribution is that it adds to the scientific knowledge of difference of safety climate between small manufacturing companies in different industries. The results of validity and exploratory factor analysis provided strong support for the meaningful use of the safety climate measure in small manufacturing enterprises companies. As safety climate has extensively been established as a prominent indicator of safety, a meaningful study of antecedent and consequence of employee safety climate in small manufacturing enterprises can offer early indicators and precautions for preventing accidents and injuries. In addition, results of a part of EFA suggested that employee safety climate

promotion strategies based on the integrative model may be suited for employees from Malaysian small manufacturing enterprises.

REFERENCES

Alfayez, B., Subramaniama, C., & Mohd Zin, M. L. (2017). The effect of management commitment and workers involvement on construction workers safety behaviro in Saudi Arabia: The modeling role of social upport. *International Business Mangement*, *11*(11), 1719–1727.

Alolah, T., Anthony Stewart, R., Panuwatwanich, K., & Mohamed, S. (2014). *Developing a comprehensive safety performance evaluation framework for Saudi schools*. *International Journal of Productivity and Performance Management* (Vol. 63). https://doi.org/10.1108/IJPPM-05-2013-0096

Asnawi, A., Awang, Z., Afthanorhan, A., Mohamad, M., & Karim, F. (2019). The influence of hospital image and service quality on patients' satisfaction and loyalty. *Management Science Letters*, *9*(6), 911-920.

Aziz, M., Adnan, A., Afthanorhan, A., Foziah, H., Ishak, S., & Rashid, N. (2019). The influence of employer value proposition in talent demand towards talent shortage in the Malaysian Islamic banking institutions: A SEM approach. *Management Science Letters*, *9*(6), 843-850.

Bahari, S. F., & Clarke, S. (2013). Cross-validation of an employee safety climate model in Malaysia. *Journal of Safety Research*, *45*. https://doi.org/10.1016/j.jsr.2012.12.003

Barbaranelli, C., Petitta, L., & Probst, T. M. (2015). Does safety climate predict safety performance in Italy and the USA? Cross-cultural validation of a theoretical model of safety climate. *Accident Analysis and Prevention*, *77*, 35–44. https://doi.org/10.1016/j.aap.2015.01.012

Bartholomew, D. J., Knott, M., & Moustaki, I. (2011). *Latent variable models and factor analysis: A unified approach*. (S. David J. Balding, Noel A.C. Cressie, Garrett M. Fitzmaurice, Harvey Goldstein, GeertMolenberghs, DavidW. Scott, Adrian F.M. Smith, Ruey S. Tsay, Ed.) (3rd ed.). United Kingdom: A John Wiley & Sons, Ltd., Publication.

Beus, J. M., Payne, S. C., Arthur, W., & Muñoz, G. J. (2017). The development and validation of a cross-industry safety climate measure: Resolving conceptual and operational issues. *Journal of Management*, *XX*(X), 1–27. https://doi.org/10.1177/0149206317745596

Bronkhorst, B., Tummers, L., & Steijn, B. (2018). Improving safety climate and behaviour through a multifaceted intervention: Results from a field experiment. *Safety Science*, *103*(May 2017), 293–304. https://doi.org/10.1016/j.ssci.2017.12.009

Casey, T. W., & Krauss, A. D. (2013). The role of effective error management practices in increasing miners' safety performance. *Safety Science*, *60*, 131–141. https://doi.org/10.1016/j.ssci.2013.07.001

Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *The Journal of Applied Psychology*, *94*(5), 1103–1127. https://doi.org/10.1037/a0016172

Clarke, S. (2010). An integrative model of safety climate: Linking psychological climate and work attitudes to individual safety outcomes using meta-analysis. *Journal of Occupational and Organizational Psychology*, *83*(3), 553–578. https://doi.org/10.1348/096317909X452122

Clarke, S. (2013). Safety leadership: A meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours. *Journal of Occupational and Organizational Psychology*, *86*(1), 22–49. https://doi.org/10.1111/j.2044-8325.2012.02064.x

Collins, S. (2008). Statutory social workers: Stress, job satisfaction, coping, social support and individual differences. *British Journal of Social Work*, *38*(6), 1173–1193. https://doi.org/10.1093/bjsw/bcm047

Dollard, M. F., & Neser, D. Y. (2013). Worker health is good for the economy: union density and psychosocial safety climate as determinants of country differences in worker health and productivity in 31 European countries. *Social Science & Medicine (1982)*, *92*, 114–123. https://doi.org/10.1016/j.socscimed.2013.04.028

Dollard, M. F., Tuckey, M. R., & Dormann, C. (2012). Psychosocial safety climate moderates the job demand-resource interaction in predicting workgroup distress. *Accident Analysis and Prevention*, *45*, 694–704. https://doi.org/10.1016/j.aap.2011.09.042

Guo, B. H. W., Yiu, T. W., & González, V. A. (2017). Does company size matter? Validation of an integrative model of safety behaviour across small and large construction companies. *Journal of Safety Research*. https://doi.org/10.1016/j.jsr.2017.12.003

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (2010). *Multivariate data analysis*. *International Journal of Pharmaceutics* (Vol. 1). https://doi.org/10.1016/j.ijpharm.2011.02.019

Hair, J. F., Babin, B. J., & Krey, N. (2017). Covariance-Based Structural Equation Modeling in the Journal of Advertising: Review and Recommendations. *Journal of Advertising*, *46*(1), 163–177. https://doi.org/10.1080/00913367.2017.1281777

Hair, J. J. F., Celsi, M., Money, A., Samouel, P., & Page, M. (2015). *The essentials of business research methods* (3rd ed.). New York: Routledge.

Hardesty, D. M., & Bearden, W. O. (2004). The use of expert judges in scale development.

Implications for improving face validity of measures of unobservable constructs. *Journal of Business Research*, *57*(2), 98–107. https://doi.org/10.1016/S0148-2963(01)00295-8

Haynes, S. N., Richard, D. C. S., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment*, *7*, 238–247. https://doi.org/10.1037//1040-3590.7.3.238

Hogan, J., & Foster, J. (2013). Multifaceted personality predictors of workplace safety performance: More than conscientiousness. *Human Performance*, *26*(1), 20–43. https://doi.org/10.1080/08959285.2012.736899

Huang, Y.-H., Zohar, D., Robertson, M. M., Garabet, A., Murphy, L. A., & Lee, J. (2013). Development and validation of safety climate scales for mobile remote workers using utility/electrical workers as exemplar. *Accident Analysis and Prevention*, *59*, 76–86. https://doi.org/10.1016/j.aap.2013.04.030

Huang, Y. hsiang, Lee, J., Chen, Z., Perry, M., Cheung, J. H., & Wang, M. (2017). An item-response theory approach to safety climate measurement: The Liberty Mutual Safety Climate Short Scales. *Accident Analysis and Prevention*, *103*, 96–104. https://doi.org/10.1016/j.aap.2017.03.015

Huang, Y., Lee, J., McFadden, A. C., Rineer, J., & Robertson, M. M. (2017). Individual employee's perceptions of " Group-level Safety Climate" (supervisor referenced) versus " Organization-level Safety Climate" (top management referenced): Associations with safety outcomes for lone workers. *Accident Analysis & Prevention*, *98*, 37–45. https://doi.org/10.1016/J.AAP.2016.09.016

Huang, Y., Robertson, M. M., Lee, J., Rineer, J., Murphy, L. A., Garabet, A., & Dainoff, M. J. (2014). Supervisory interpretation of safety climate versus employee safety climate perception: Association with safety behaviour and outcomes for lone workers. *Transportation Research Part F: Traffic Psychology and Behaviour*, *26*, 348–360. https://doi.org/10.1016/j.trf.2014.04.006

Huff, C., & Tingley, D. (2015). "Who are these people?" Evaluating the demographic characteristics and political preferences of MTurk survey respondents. *Research & Politics*, *2*(3), 1–12. https://doi.org/10.1177/2053168015604648

Jimmieson, N. L., Tucker, M. K., White, K. M., Liao, J., Campbell, M., Brain, D., … Graves, N. (2016). The role of time pressure and different psychological safety climate referents in the prediction of nurses' hand hygiene compliance. *Safety Science*, *82*, 29–43. https://doi.org/10.1016/j.ssci.2015.08.015

Khdair, A. W. (2013). *The moderating effect of personal traits on the relationship between*

mangemant practices, leadership styles and safety performance in Iraq. Universiti Utara Malaysia.

Kim, K. W., Lim, H. C., Park, J. H., Park, S. G., Park, Y. J., & Cho, H. H. (2018). Developing a Basic Scale for Workers' Psychological Burden from the Perspective of Occupational Safety and Health. *Safety and Health at Work*, *9*(2), 224–231. https://doi.org/10.1016/J.SHAW.2018.02.004

Kongtip, P., Yoosook, W., & Chantanakul, S. (2008). Occupational health and safety management in small and medium-sized enterprises: An overview of the situation in Thailand. *Safety Science*, *46*(9), 1356–1368. https://doi.org/10.1016/j.ssci.2007.09.001

Kudo, Y., Satoh, T., Kido, S., Watanabe, M., Miki, T., Miyajima, E., … Aizawa, Y. (2008). A pilot study testing the dimensions of safety climate among Japanese nurses. *Industrial Health*, *46*(2), 158–165. https://doi.org/JST.JSTAGE/indhealth/46.158 [pii]

Kwon, O.-J., & Kim, Y.-S. (2013). An analysis of safeness of work environment in Korean manufacturing: The "safety climate" perspective. *Safety Science*, *53*, 233–239. https://doi.org/10.1016/j.ssci.2012.10.009

Laal, F., Pouyakian, M., Madvari, R. F., Khoshakhlagh, A. H., & Halvani, G. H. (2018). Investigating the impact of establishing integrated management systems on accidents and safety performance indices: A case study. *Safety and Health at Work*. https://doi.org/10.1016/J.SHAW.2018.04.001

Mashia, M. S., Subramaniama, C., & Joharia, J. (2017). The effect of management commitment, safety rules and procedure and safety promotion policies on nurses safety performance: The moderating role of consideration of future safety consequences. *International Business Management*, *11*(2), 478–489. https://doi.org/10.3923/ibm.2017.478.489

Mohd Awang, I., Dollard, M. F., Coward, J., & Dormann, C. (2012). Psychosocial safety climate: Conceptual distinctiveness and effect on job demands and worker psychological health. *Safety Science*, *50*(1), 19–28. https://doi.org/10.1016/j.ssci.2011.06.005

Morillas, R. M., Rubio-Romero, J. C., & Fuertes, A. (2013). A comparative analysis of occupational health and safety risk prevention practices in Sweden and Spain. *Journal of Safety Research*, *47*, 57–65. https://doi.org/10.1016/j.jsr.2013.08.005

Ncube, F., & Kanda, A. (2018). Current status and the future of occupational safety and health legislation in low- and middle-income countries. *Safety and Health at Work*. https://doi.org/10.1016/J.SHAW.2018.01.007

Nor Azma, R., Abdul Halim, A. M., & Munauwar, M. (2016). Mediating effect of psychological safety climate in the relationship between psychological factors and individual safety performance in the Malaysian manufacturing small enterprises. *International Academic Research Journal of Social Science*, *2*(2), 10–23. https://doi.org/10.5829/idosi.wjmbs.2016.4.1.1324

Nor Azma, R., Mustafa, M., & Abdul Majid, A. H. (2016). The Impact of Psychological Safety Climate on Individual Safety Performance in the Malaysian Manufacturing Small Enterprise : The Role of Psychological Factor and Psychological Work Ownership. *World Journal of Management and Behavioral Studies*, *4*(1), 8–19. https://doi.org/10.5829/idosi.wjmbs.2016.4.1.1324

Noweir, M. H., Alidrisi, M. M., Al-Darrab, I. A., & Zytoon Mohamed A. (2013). Occupational safety and health performance of the manufacturing sector in Jeddah Industrial Estate, Saudi Arabia: A 20-years follow-up study. *Safety Science*, *53*, 11–24. https://doi.org/10.1016/j.ssci.2012.09.005

Redinger, C. F., Levine, S. P., Blotzer, M. J., & Majewski, M. P. (2002). Evaluation of an occupational health and safety management system performance measurement tool—II: Scoring methods and field study sites. *AIHA Journal*, *63*(1), 34–40. https://doi.org/10.1080/15428110208984689

Sehhat, S., Mahmoudzadeh, S. M., Ashena, M., & Parsa, S. (2015). Positive psychological capital : The role of Islamic work ethics in Tehran Public Organizations. *Iranian Journal of Management Studies (IJMS)*, *8*(4), 545–566.

Sgourou, E., Katsakiori, P., Goutsos, S., & Manatakis, E. (2010). Assessment of selected safety performance evaluation methods in regards to their conceptual, methodological and practical characteristics. *Safety Science*, *48*(8), 1019–1025. https://doi.org/10.1016/j.ssci.2009.11.001

Tang, D., Ho, K., Dawal, S. Z. M. D., & Olugu, E. U. (2018). Actual safety performance of the Malaysian offshore oil platforms: Correlations between the leading and lagging indicators. *Journal of Safety Research*. https://doi.org/10.1016/j.jsr.2018.05.003

Thompson, B., Lochmüller, C. H., Reese, C. E., Thompson, B., Confirmatory, S., Analysis, F., … Guilford, J. P. (2004). Confirmatory rotation and factor interpretation issues. *Exploratory and Confirmatory Factor Analysis: Understanding Concepts and Applications*. https://doi.org/10.1017/S0140525X00007020

Transportation Research Board US. (2016). *Strenthening the safety culture of the offshore oil 766 and gas industry (technical report).* Retrieved from https://www.nap.edu/catalog/767%0A23524/strengthening-the-safety-culture-of-the-offshore-oil-and-gas-

industry%0A

Tremblay, A., & Badri, A. (2018). A novel tool for evaluating occupational health and safety performance in small and medium-sized enterprises : The case of the Quebec forestry / pulp and paper industry. *Safety Science*, *101*(August 2017), 282–294. https://doi.org/10.1016/j.ssci.2017.09.017

Van Dyne, L., & Pierce, J. L. (2004). Psychological ownership and feelings of possession: Three field studies predicting employee attitudes and organizational citizenship behaviour. *Journal of Organizational Behaviour*, *25*(4), 439–459. https://doi.org/10.1002/job.249

Vinodkumar, M. ., & Bhasi, M. (2010). Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation. *Accident Analysis and Prevention*, *42*(6), 2082–2093. https://doi.org/10.1016/j.aap.2010.06.021

Vinodkumar, M. N., & Bhasi, M. (2009). Safety climate factors and its relationship with accidents and personal attributes in the chemical industry. *Safety Science*, *47*(5), 659–667. https://doi.org/10.1016/j.ssci.2008.09.004

Wang, X., Xing, Y., Luo, L., & Yu, R. (2018). Evaluating the effectiveness of Behaviour-Based Safety education methods for commercial vehicle drivers. *Accident Analysis and Prevention*, *117*(April), 114–120. https://doi.org/10.1016/j.aap.2018.04.008

Williams, B., Brown, T., & Onsman, A. (2012). Exploratory factor analysis : A five-step guide for novices. *Journal of Emergency Primary Health Care*, *8*(3), 1–13.

Yi, K. H. (2018). The high-risk groups according to the trends and characteristics of fatal occupational injuries in Korean workers aged 50 years and above. *Safety and Health at Work*, *9*(2), 184–191. https://doi.org/10.1016/J.SHAW.2018.01.005

Yong, A. G., & Pearce, S. (2013). A beginner ' s guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology*, *9*(2), 79–94. https://doi.org/10.20982/tqmp.09.2.p079

Yorio, P. L., & Wachter, J. K. (2014). The impact of human performance focused safety and health management practices on injury and illness rates: Do size and industry matter? *Safety Science*, *62*, 157–167. https://doi.org/10.1016/j.ssci.2013.08.014

Yousef, D. (2001). Islamic work ethic – A moderator between organizational commitment and job satisfaction in a cross-cultural context. *Personnel Review*, *30*(2), 152–169. https://doi.org/10.1108/00483480110380325

Zainudin Awang. (2012). *A handbook on structural equation modeling using AMOS*. Malaysia,

Universiti Technologi MARA Press.

Zainudin Awang. (2015). *SEM made simple: A gentle approach to learning structural equation modeling*. Bandar Baru Bangi: MPWS Rich Publication.

Zohar, D., Huang, Y. H., Lee, J., & Robertson, M. M. (2015). Testing extrinsic and intrinsic motivation as explanatory variables for the safety climate-safety performance relationship among long-haul truck drivers. *Transportation Research Part F: Traffic Psychology and Behaviour*, *30*, 84–96. https://doi.org/10.1016/j.trf.2015.01.014

Zohar, D., Huang, Y., Lee, J., & Robertson, M. (2014). A mediation model linking dispatcher leadership and work ownership with safety climate as predictors of truck driver safety performance. *Accident Analysis and Prevention*, *62*, 17–25. https://doi.org/10.1016/j.aap.2013.09.005.