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Original article

The Role of Safety Silence Motives to Safety Communication and Safety Participation in Different Sectors of Small and Medium Enterprises
Investigation Results on Two Kinds of Industries in Indonesia

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ABSTRACT

Background: A number of accidents have occurred in small and medium enterprises (SMEs). Efforts in reducing accidents have been undertaken through the implementation of safety behaviors. Unfortunately, few studies have examined motives behind unsafe behaviors, such as safety silence motives. This study aimed to observe the motives underlying safety behaviors, namely safety silence motive (SSM) (SSM-relation, SSM-climate, SSM-issue, and SSM-job) and to evaluate the effect of SSM and safety communication on safety participation in different industrial sectors and scales.
Materials and Methods: Eighty workers from two industrial sectors and scales of SMEs were involved. They were instructed to fill out a set of questionnaires. A five-Likert scale was used to respond. An independent t test was applied to find any significant differences. The partial least square-structural equation modeling for multigroup was used to develop a model on relations among the variables.
Results: The results showed that SSM scores were high in SMEs, and the scores were different across industrial sectors and scales. SSM had a negative influence on safety communication, and safety communication positively influenced safety participation.
Conclusion: The study of SSM, safety communication, and safety participation in different sectors and scales should be separated in SMEs.

1. Introduction

Previous studies have shown that small and medium enterprises (SMEs) are associated with high occupational safety risks. Compared to large-scale enterprises, SMEs seem to have higher occupational safety risks. A higher risk in SMEs might result from workers' low education, workers' lack of safety awareness, informal safety procedures, and poor implementation of safety management [1].

Although a higher occupational safety risk is associated with SMEs, unfortunately, lack of reports on accidents in SMEs is available [2]. This condition appears to be contrary to large-scale enterprises in which they have to apply safety management systems and comply with safety regulations [3].

There are several reasons for a high number of unreported accidents found in SMEs. Probst et al. [4] found that a high number of unreported accidents correlate with poor safety climates (defined as a set of perceptions by workers regarding the organizational safety aspects of the workplace). Other studies found that unreported accidents are due to the fear of negative consequences given by the management. This fear and unwillingness to report refer to safety silence [4,5].

Safety silence is defined as a type of silence when workers do not talk to supervisors about safety issues [6]. According to Manapragada and Bruk-Lee [6], safety silence might be triggered by some factors called safety silence motive (SSM), which refers to the motive of workers' safety silence to their working environments. SSM explains the reasons of why workers do not talk to their superiors about safety issues experienced in the workplaces. The SSM

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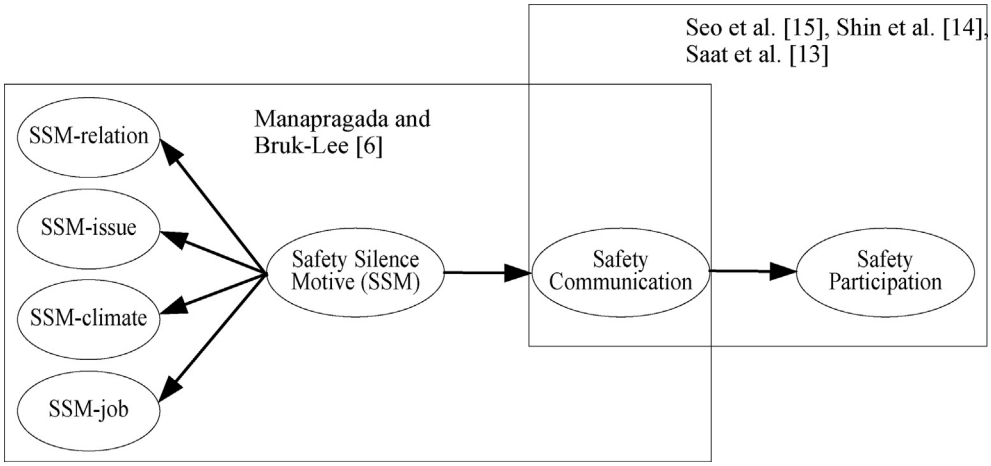

Fig. 1. The conceptual model of safety behavior.

can be evaluated based on the dimensions of relations, climates, issues, and jobs. SSM of relations deals with the silence in regard to a good relationship between coworkers and superiors. SSM of climate refers to the silence due to organizational shared perceptions in safety. SSM of issues refers to the silence because of the evaluation risks of safety. Moreover, SSM of job relates to the silence concerning with the job characteristics.

Manapragada and Bruk-Lee [6] stated that SSM is negatively related to safety communication (Scom). Communication, both formal and informal, is a critical factor for enhancing organizational effectiveness [7]. Scom deals with the degree to which workers are open to convey to their superiors about safety issues, ideas, concerns, or perceptions of superiors as motivators, and in return supervisors accept workers' advice to improve work safety [8]. Good Scom is a must because it represents a worker's desire to actively participate in a communication aimed at improving workplace safety [9]. An increase in Scoms is expected to improve safety behavior.

Safety behavior can be indicated by safety participation. Safety participation is a set of activities related to helping coworkers and supporting safety programs, initiatives, and efforts to improve workplace safety [10]. In the end, safety participation can decrease the number of accidents in the workplace [11]. This is supported by Widyanti et al. [12] that the safety behavior approach can decrease work accident rates in the oil and gas company in Indonesia.

A number of previous studies have been conducted to investigate the effect of Scom on safety participation (SB-P). The research has been focused on both SMEs [13] and large-scale enterprises [14,15]. However, considering the influence of safety silence on Scom, only few studies have looked at these three factors as the whole. The exception includes a study by Manapragada and Bruk-Lee [6] who observed the effect of SSM on Scom of nurses in a large hospital enterprise.

A higher occupational safety risk and unreported accidents in SMEs are also found in Indonesia. Among the manufacturing sectors of Indonesian SMEs [refers to Indonesian Statistical Bureau (Badan Pusat Statistik/BPS in Indonesia [16])], the craft and metal are two enterprises suffering from high hazards and risk accidents (see Agustina et al. [17] and Harncharoen et al. [18] for examples of accident in batik and metal enterprises, respectively). In detail, most of the safety risks found in craft industries are low back pain due to the unergonomic work position [19] and injuries relate to material contact with the body such skin irritation due to chemical exposure [17,20], whereas in metal industries, the most common injuries are related to musculoskeletal disorders because of the awkward posture while operating the equipment [21], material fraction, and electrical shortcut especially for grinding and welding processes [22,23].

Limited studies have reported a high number of accidents that happen in metal industries and craft industries. In metal industries, for example, Ansori et al. [21] observed 45% of accidents experienced by 150 workers. In addition, Suprianto and Evendi [23] reported 66.7% of accidents experienced by the workers in metal workshops. In craft industries, several studies found low safety performance in craft industries in Madura Island [20] and high safety risk in those industries [24]. Interestingly, a special attention has been paid by the Indonesian government to both craft and metal enterprises. A craft enterprise—batik—is acknowledged by the United Nations of Educational, Scientific, and Cultural Organization as Indonesian heritage [25] and has contributed to the national economy especially in persisting the global economic crisis in 1997 [26]. Meanwhile, metal SMEs have economically been growing dramatically in Indonesia up to 11.97% in 2016 [27].

Indonesian Statistical Bureau [28] defines small enterprises (SEs) as industries that employ 5 up to 19 workers, whereas medium enterprises (MEs) employ 20 up to 99 workers. However, SEs and MEs have different styles in managing safety. The safety standards, such as formal operation and safety practices, in SEs seem to be worse than MEs [29]. Besides, Legg et al. [2] stated that human resources in SEs are worse than MEs such as work divisions and support professions.

This study aimed to observe the SSM, Scoms, and SB-P in two industrial sectors (craft and metal) and two scales (SEs and MEs) in Indonesia. In addition, this study investigates relationships among these three factors as seen in Fig. 1. The two important sectors are observed in this study because they are giving great national economic supports for Indonesia and, simultaneously, have high risks in terms of accidents. Meanwhile, the reason to examine the two scales of enterprises is due to different characteristics between them [21,30].

2. Materials and methods

2.1. Sample

In this study, a survey was conducted in two industrial sectors, namely craft and metal enterprises. The craft enterprise in this present study refers to a batik industry (patterned fabric industry having a certain character which is made specifically by writing or applying wax to the fabric and processed in a certain way by using

chemicals). Twelve SEs and four MEs of Indonesian craft enterprises were involved in this study. The enterprises are located in Madura Island as the center of batik as a creative industry in East Java, Indonesia. It should be noted that the average number of employees in each SME in Indonesia is limited (small enterprise: 5–19 workers; medium enterprise: 20–99 workers, according to Indonesian Statistical Bureau/BPS [16]). Representing those SEs and MEs, a total of 25 respondents of SEs and 15 respondents of MEs (mean age = 40.88 years, SD = 10.26 years, average experience = 9.10 years for SEs and mean age = 37.07 years, SD = 13.73 years, average experience = 7.90 years for MEs) participated in this study. Meanwhile, fifteen SEs and three MEs of metal in Gresik (East Java of Indonesia) were engaged in the study, with a total of 27 respondents of SEs and 13 respondents of MEs (mean age = 40.37 years, SD = 9.70 years, average experience = 10.67 years for SEs and mean age = 34.85 years, SD = 7.74 years, average experience = 6.92 years for MEs). The metal's SMEs in Gresik were chosen because of the high development of metal industries. The metal enterprise in this present study included cutting, welding, bending, drilling, and machining metal materials. Both industries and the workers were selected based on the convenience sampling method.

2.2. Measure

SSM was measured using a set of questionnaires developed by Manapragada and Bruk-Lee [6]. SSM consists of four dimensions, namely SSM-relation (SSM-R), SSM-climate (SSM-C), SSM-issue

Table 1
The items of the study (in Bahasa Indonesia)

Constructs and its related items		Code
Semua pertanyaan SSM diawali dengan pernyataan "Saya tidak akan berbicara perihal keselamatan dengan atasan saya jika …"		
SSM-relation		SSM-R
1	… Hal tersebut dapat menimbulkan persepsi negatif terhadap saya	SSM-R1
2	… Hal tersebut dapat menimbulkan perselisihan antar teman kerja	SSM-R2
3	… Hal tersebut dapat menyebabkan teman kerja tidak menghormati saya	SSM-R3
4	… Dapat menimbulkan kesalahpahaman pada saya	SSM-R4
5	… Akan menyulitkan hubungan dalam bekerja sama dengan rekan kerja	SSM-R5
6	… Dapat menyakiti perasaan rekan kerja	SSM-R6
7	… Tidak ingin orang lain berpikir bahwa saya mengganggu	SSM-R7
8	… Dapat menyebabkan rekan kerja saya menjadi tertekan	SSM-R8
SSM-climate		SSM-C
1	… Atasan saya tidak terbuka untuk mendengarkan perihal keselamatan kerja	SSM-C1
2	… Atasan saya tidak memprioritaskan keselamatan kerja	SSM-C2
3	… Atasan saya tidak akan mengambil tindakan terkait keselamatan kerja	SSM-C3
4	… Perusahaan tempat kerja saya tidak menjadikan keselamatan sebagai prioritas	SSM-C4
5	… Saya merasa tidak dapat berbicara dengan jujur dan terbuka terkait keselamatan kerja di perusahaan tempat kerja saya	SSM-C5
6	… Tidak ada panduan kerja yang jelas untuk melaporkan perihal keselamatan di tempat kerja saya	SSM-C6
7	… Atasan saya tidak menjalankan fungsinya berkaitan dengan keselamatan kerja	SSM-C7
8	… Saya merasa kurang nyaman dengan atasan saya dalam hal keselamatan kerja	SSM-C8
SSM-issue		SSM-I
1	… Aktivitas keselamatan tidak menyebabkan risiko kerja	SSM-I1
2	… Aktivitas keselamatan tidak membahayakan siapapun	SSM-I2
3	… Aktivitas keselamatan tidak memengaruhi keselamatan kerja orang lain	SSM-I3
4	… Tidak ada dampak negatif dari permasalahan keselamatan	SSM-I4
5	… Tidak ada hasil kerja yang buruk akibat aktivitas keselamatan	SSM-I5
6	… Aktivitas keselamatan tidak membebani keberlangsungan pekerjaan	SSM-I6
SSM-job		SSM-J
1	… Saya memiliki beban kerja yang berlebih	SSM-J1
2	… Kesibukan kerja saya menjadikan tidak ada waktu untuk berbicara tentang keselamatan	SSM-J2
3	… Saya bekerja dengan batasan waktu yang ketat	SSM-J3
4	… Saya tidak merasa keselamatan kerja merupakan bagian pekerjaan yang harus saya lakukan	SSM-J4
Safety communication		Scom
1	Perusahaan menjalankan kebijakan perihal keselamatan kerja secara terbuka	Scom1
2	Ada kesempatan untuk mendiskusikan dan memutuskan perihal keselamatan kerja dalam pertemuan	Scom2
3	Target dan tujuan kinerja keselamatan di perusahaan saya jelas bagi pekerja	Scom3
4	Terdapat komunikasi yang terbuka terkait keselamatan di tempat kerja	Scom4
Safety participation		SB-P
1	Saya mendukung program keselamatan dalam perusahaan tempat kerja	SB-P1
2	Saya berusaha lebih untuk meningkatkan keselamatan kerja di tempat kerja	SB-P2
3	Saya secara sukarela mengerjakan tugas atau aktivitas yang dapat membantu dalam memperbaiki keselamatan tempat kerja	SB-P3

SSM, safety silence motive.

(SSM-I), and SSM-job (SSM-J). In total, the SSM questionnaires consist of twenty-six items. Scom was measured with four items developed by Vinodkumar and Bhasi [31]. SB-P was observed with three items [32]. In this study, all items were measured using a Likert scale, starting from 1 (strongly disagree) to 5 (strongly agree). The items can be seen in Table 1.

2.3. Procedure

Workers in craft and metal enterprises in both SEs and MEs were asked to fill out questionnaires. If they found any difficulties, the surveyor would help to fill out the questionnaire on behalf of the workers. The permission to conduct the research was granted by the owner of the SEs and MEs. The workers filled out the questionnaires during rest breaks.

2.4. Data analysis

A t test was used to evaluate the differences in mean perceptions of workers based on the sectors and scales. The possible relationships among variables were assessed using the partial least square-structural equation modeling (PLS-SEM) algorithm, while the multigroup analysis (MGA) was observed by the procedure of measurement invariance of composite models (MICOM).

3. Results

3.1. Demographic data of respondents

The demographic data of respondents as a function of different sectors of industries (craft and metal enterprises) and different industry scales (SEs and MEs) can be seen in Table 2.

3.2. The value of constructs

The results of data collection in both sectors and scales are shown in Table 3. Meanwhile, the statistical values of SSM (SSM-R, SSM-C, SSM-I, and SSM-J), Scom, and SB-P can be seen in Table 4. Independent t test was applied to observe the possible different values of SSM, Scom, and SB-P between different industrial sectors and scales. Based on the sectors, SSM-R, SSM-C, SSM-I, and Scom were significantly different. Meanwhile, based on the scales, the only SSM-I was significantly different.

There were significant differences in SSM (i.e., SSM-R, SSM-C, and SSM-I) as well as Scom in different sectors (craft and metal) and SSM-I in different scales (SEs and MEs) as per independent t test in Table 4. Therefore, a MGA was proposed to evaluate the construct influences, and the multigroup evaluation was conducted based on both of industrial sectors and scales. This result was supported by Ansori et al. [21] that safety outcomes (i.e., injury, accident, and day off) between SEs and MEs were different; hence, safety outcomes were used to see how well safety behavior was performed [33].

3.3. Empirical model

The constructs evaluated in the measurement model were SSM-J (three indicators), SSM-R (five indicators), Scom (three indicators), and SB-P (three indicators). Meanwhile, the construct of SSM-C (all indicators), SSM-I (all indicators), one indicator of SSM-J (i.e., SSM-J2), three indicators of SSM-R (i.e., SSM-R4, SSM-R5, SSM-R8), and one indicator of Scom (i.e., Scom3) were removed from the model because all indicators had a loading factor less than 0.4. It was suggested by Chin [34] and Hair et al. [35] that loading below 0.4 was removed to increase the value of composite reliability (CR) and

Table 2
Demographic data of workers in two industrial sectors and two industrial scales

Industrial sectors and industrial scales	Craft						Metal					
	SEs		MEs		Total		SEs		MEs		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Number of subjects	25	(100)	15	(100)	40	(100)	27	(100)	13	(100)	40	(100)
Gender												
Male	5	(20)	0	(0)	5	(12)	27	(100)	13	(100)	40	(100)
Female	20	(80)	15	(100)	35	(88)	0	(0)	0	(0)	0	(0)
Age group (year)												
16–29	4	(16)	7	(47)	11	(28)	3	(11)	4	(31)	7	(17)
30–39	6	(24)	1	(7)	7	(17)	12	(44)	4	(31)	16	(40)
40–49	8	(32)	4	(27)	12	(30)	7	(26)	5	(38)	12	(30)
50–59	6	(24)	2	(12)	8	(20)	4	(15)	0	(0)	4	(10)
60–69	1	(4)	1	(7)	2	(5)	1	(4)	0	(0)	1	(3)
Work Experience (year)												
Less than 3	2	(8)	2	(13)	4	(10)	0	(0)	2	(16)	2	(5)
3 to 7	2	(8)	6	(40)	8	(20)	8	(30)	6	(46)	14	(35)
More than 7	21	(84)	7	(47)	28	(70)	19	(70)	5	(38)	24	(60)
Education												
No formal education	0	(0)	1	(7)	1	(3)	2	(6)	0	(0)	2	(5)
Elementary school	19	(76)	10	(66)	29	(72)	1	(4)	0	(0)	1	(3)
Junior high school	5	(20)	4	(27)	9	(22)	5	(19)	4	(31)	9	(22)
Senior high school	1	(4)	0	(0)	1	(3)	18	(67)	8	(61)	26	(65)
College/university	0	(0)	0	(0)	0	(0)	1	(4)	1	(8)	2	(5)
Social relation												
Family	17	(68)	4	(27)	21	(52)	14	(51)	0	(0)	14	(35)
Friend	1	(4)	0	(0)	1	(3)	5	(19)	3	(23)	8	(20)
Neighbor	5	(20)	6	(40)	11	(28)	1	(4)	0	(0)	1	(3)
Other (no relation)	2	(8)	5	(33)	7	(17)	7	(26)	10	(77)	17	(42)

MEs, medium enterprises; SEs, small enterprises.

Table 3
Result of data collection

Construct/associated items	Industrial sectors				Industrial scales			
	Craft		Metal		SEs		MEs	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
SSM-R	4.16	0.81	3.28	1.04	3.68	1.10	3.80	0.96
SSM-R1	4.75	0.44	3.25	1.13	3.90	1.22	4.18	0.94
SSM-R2	4.35	0.70	3.48	1.13	3.94	1.07	3.86	0.97
SSM-R3	4.15	0.86	2.93	0.97	3.48	1.15	3.64	1.03
SSM-R4	3.75	0.78	3.40	1.17	3.60	1.07	3.54	0.88
SSM-R5	4.00	0.75	3.75	1.06	3.94	0.94	3.75	0.89
SSM-R6	4.33	1.02	3.58	1.06	3.88	1.10	4.07	1.12
SSM-R7	3.85	1.03	3.10	0.90	3.37	1.12	3.68	0.82
SSM-R8	4.13	0.91	2.80	0.88	3.33	1.13	3.71	1.05
SSM-C	3.23	1.05	3.84	0.97	3.50	1.09	3.61	1.03
SSM-C1	3.15	1.12	3.45	0.99	3.25	1.10	3.39	0.99
SSM-C2	2.95	1.22	3.85	1.00	3.38	1.19	3.43	1.23
SSM-C3	2.90	0.96	4.03	1.19	3.48	1.21	3.43	1.23
SSM-C4	3.08	0.92	3.98	0.83	3.54	0.94	3.50	1.07
SSM-C5	3.35	0.86	3.60	1.03	3.40	0.98	3.61	0.92
SSM-C6	3.78	0.77	3.93	0.92	3.79	0.87	3.96	0.79
SSM-C7	2.98	1.05	4.05	0.78	3.56	1.09	3.43	1.03
SSM-C8	3.68	1.53	3.83	0.98	3.56	1.38	4.11	0.99
SSM-I	2.93	1.40	3.66	1.04	3.49	1.21	2.94	1.33
SSM-I1	3.23	1.48	3.85	0.95	3.69	1.20	3.25	1.38
SSM-I2	3.38	1.53	3.90	1.17	3.81	1.30	3.32	1.49
SSM-I3	3.00	1.30	3.75	1.08	3.63	1.24	2.89	1.13
SSM-I4	2.63	1.48	3.53	0.96	3.35	1.25	2.57	1.32
SSM-I5	2.75	1.48	3.58	0.98	3.40	1.22	2.71	1.38
SSM-I6	2.63	1.10	3.38	1.08	3.06	1.07	2.89	1.29
SSM-J	3.28	1.32	3.05	0.97	3.11	1.17	3.27	1.14
SSM-J1	3.15	1.29	3.03	0.86	3.17	1.12	2.93	1.05
SSM-J2	2.85	1.35	2.90	1.01	2.81	1.16	3.00	1.25
SSM-J3	3.10	1.37	2.70	0.97	2.73	1.25	3.21	1.03
SSM-J4	4.03	1.27	3.58	1.03	3.73	1.14	3.93	1.25
Scom	2.46	0.99	3.01	0.91	2.67	1.12	2.84	0.94
Scom1	2.70	1.20	3.00	0.91	2.67	1.08	3.11	0.99
Scom2	1.88	0.72	3.03	0.89	2.38	1.01	2.57	0.96
Scom3	3.20	1.07	2.55	0.99	2.98	1.20	2.68	0.77
Scom4	2.05	0.96	3.48	0.85	2.63	1.19	3.00	1.05
SB-P	2.88	1.12	3.10	0.86	2.94	0.99	3.10	1.06
SB-P1	2.65	1.12	3.03	0.92	2.77	1.00	2.96	1.10
SB-P2	3.10	1.30	2.85	0.89	2.87	1.17	3.18	0.98
SB-P3	2.90	0.96	3.43	0.78	3.17	0.81	3.14	1.08

MEs, medium enterprises; SEs, small enterprises.

average variance extracted (AVE). The result of the measurement model can be seen in Table 5.

The measurement model showed that all indicators were valid in Table 5. The results of the measurement model based on both sectors and scales obtained that all loading factors for the entire construct consisted of SSM-J, SSM-R, Scom, and SB-P had a value of more than 0.4. Then, the construct had fulfilled convergent validity which had CR more than 0.7 and AVE more than 0.5 for both groups

Table 4
The value of SSM, safety communication, and safety participation both industrial sectors and scales

Safety construct	Sectors		Scales		Independent t test	
	Craft	Metal	SEs	MEs	Based on sectors	Based on scales
SSM-R	Mean = 4.17 (SD = 0.51)	Mean = 3.29 (SD = 0.76)	Mean = 3.68 (SD = 0.82)	Mean = 3.81 (SD = 0.72)	6.063**	-0.671
SSM-C	Mean = 3.23 (SD = 0.59)	Mean = 3.84 (SD = 0.69)	Mean = 3.50 (SD = 0.70)	Mean = 3.61 (SD = 0.72)	-4.220**	-0.673
SSM-I	Mean = 2.93 (SD = 1.05)	Mean = 3.66 (SD = 0.79)	Mean = 3.49 (SD = 0.91)	Mean = 2.94 (SD = 1.05)	-3.523*	2.445*
SSM-J	Mean = 3.28 (SD = 1.11)	Mean = 3.05 (SD = 0.73)	Mean = 3.11 (SD = 0.98)	Mean = 3.27 (SD = 0.86)	1.102	-0.712
Scom	Mean = 2.44 (SD = 0.46)	Mean = 3.01 (SD = 0.67)	Mean = 2.67 (SD = 0.65)	Mean = 2.84 (SD = 0.61)	-4.411**	-1.141
SB-P	Mean = 2.88 (SD = 0.94)	Mean = 3.10 (SD = 0.73)	Mean = 2.94 (SD = 0.83)	Mean = 3.10 (SD = 0.87)	-1.154	-0.807

*$p < 0.05$, **$p < 0.01$.
MEs, medium enterprises; SEs, small enterprises; SSM, safety silence motive.

Table 5
Results of the measurement model

Construct/associated items	Based on sectors						Based on scales					
	Loading		CR		AVE		Loading		CR		AVE	
	Craft	Metal	Craft	Metal	Craft	Metal	SEs	MEs	SEs	MEs	SEs	MEs
Safety silence motive (SSM)			0.890	0.855	0.509	0.436			0.897	0.885	0.525	0.511
SSM-J1	0.627	0.566					0.702	0.187				
SSM-J3	0.824	0.416					0.657	0.617				
SSM-J4	0.733	0.575					0.631	0.748				
SSM-R1	0.629	0.858					0.807	0.740				
SSM-R2	0.556	0.720					0.678	0.816				
SSM-R3	0.768	0.815					0.859	0.780				
SSM-R6	0.872	0.708					0.799	0.853				
SSM-R7	0.638	0.496					0.625	0.751				
SSM-job (SSM-J)			0.905	0.817	0.761	0.598			0.906	0.821	0.764	0.624
SSM-J1	0.800	0.788					0.891	0.446				
SSM-J3	0.918	0.760					0.893	0.898				
SSM-J4	0.895	0.772					0.836	0.930				
SSM-relation (SSM-R)			0.878	0.885	0.594	0.611			0.909	0.919	0.668	0.695
SSM-R1	0.744	0.880					0.864	0.870				
SSM-R2	0.668	0.798					0.796	0.850				
SSM-R3	0.861	0.851					0.903	0.855				
SSM-R6	0.868	0.763					0.815	0.833				
SSM-R7	0.690	0.580					0.691	0.755				
Safety communication (Scom)			0.850	0.892	0.654	0.733			0.885	0.882	0.719	0.715
Scom1	0.888	0.841					0.793	0.777				
Scom2	0.730	0.876					0.867	0.895				
Scom4	0.801	0.850					0.882	0.860				
Safety participation (SB-P)			0.871	0.878	0.695	0.707			0.870	0.859	0.692	0.673
SB-P1	0.942	0.872					0.916	0.921				
SB-P2	0.805	0.865					0.741	0.709				
SB-P3	0.742	0.783					0.829	0.816				

AVE, average variance extracted; CR, composite reliability; MEs, medium enterprises; SEs, small enterprises.

[36]. However, the AVE of SSM for metal based on the sector was lower than 0.5. It was still acceptable because the SSM was the second order [37], and its CR was more than 0.6 [38].

With multigroup (both industrial sectors and scales), the procedure of MGA was proposed. A procedure in evaluating MGA consisted of the Heterotrait–Monotrait (HTMT) and MICOM. The HTMT test aimed to assess discriminant validity, while MICOM was used to compare two groups whether the measurement model could determine the same attribute size under different conditions [39]. This was intended to assess configurated invariance, compositional invariance, and assessment of the composite equality means and variances needed to compare and interpret MGA group-specific differences.

The result of HTMT gained that all constructs both sectors and scales had HTMT values less than 0.9 that conformed to the HTMT requirement [36] as in Table 6. Then, the result of MICOM based on industrial sectors and scales as per Tables 7 and 8, respectively. Table 7 showed that the MICOM based on industrial sectors found that three constructs (i.e., SSM-J, Scom, and SB-P) fulfilled the compositional invariance. The assessment results informed that three constructs have fulfilled the partial measurement invariance based on the value of the equal mean assessment and equal variance assessment (i.e., SSM-J, SSM-R, and Scom), while one construct conformed to full measurement invariance (i.e., SB-P). Meanwhile, Table 8 showed the result based on industrial scales that SSM-J did not meet the compositional invariance; however, it still conformed to the equal mean assessment and equal variance assessment. The other constructs (i.e., SSM-R, Scom, and SB-P) were available for all invariance criteria measurements.

Finally, the result of MGA as per hypothesis testing (refers to path coefficients) could be seen in Table 9. The results showed that there was a significant path coefficient difference in effect on the SSM described by the SSM-J–based sector. Then, in both industrial sectors, the results informed a significant influence of Scom on SB-P (hypothesis 2), and also SSM significantly reflected by SSM-J and SSM-R in both industrial sectors. Based on the industrial scale, SSM had a significant effect on Scom (hypothesis 1), and in turn Scom had a significant effect on SB-P (hypothesis 2) in both industrial scales. Besides, the SSM reflected by the SSM-J and SSM-R were also significant.

Table 6
Heterotrait–Monotrait (HTMT)

Constructs	Based sectors						Based scales					
	Craft			Metal			SEs			MEs		
	SSM-J	SSM-R	Scom	SSM-J	SSM-R	Scom	SSM-J	SSM-R	Scom	SSM-J	SSM-R	Scom
SSM-R	0.624			0.476			0.531			0.556		
Scom	0.150	0.207		0.195	0.385		0.141	0.580		0.346	0.544	
SB-P	0.543	0.479	0.695	0.343	0.391	0.838	0.236	0.292	0.763	0.309	0.226	0.660

SB-P, safety participation; Scom, safety communication; SSM-J, SSM-job; SSM-R, SSM-relation; SSM, safety silence motive.

Table 7
Invariance measurement testing using permutation based on industrial sectors

Constructs	Compositional invariance (correlation = 1)		Partial measurement invariance established	Equal mean assessment			Equal variance assessment			Full measurement invariance established
	C = 1	Confidence interval		Differences	Confidence interval	Equal	Differences	Confidence interval	Equal	
SSM-J	0.995	[0.984, 1.000]	Yes	0.344	[-0.436, 0.453]	Yes	0.864	[-0.441, 0.452]	No	No
SSM-R	0.996	[0.997, 1.000]	No	1.158	[-0.438, 0.442]	No	-0.503	[-0.510, 0.503]	Yes	No
Scom	0.992	[0.992, 1.000]	Yes	-1.100	[-0.440, 0.439]	No	0.032	[-0.544, 0.511]	Yes	No
SB-P	0.995	[0.971, 1.000]	Yes	-0.359	[-0.443, 0.443]	Yes	0.470	[-0.463, 0.486]	Yes	Yes

SB-P, safety participation; Scom, safety communication; SSM-J, SSM-job; SSM-R, SSM-relation; SSM, safety silence motive.

Table 8
Invariance measurement testing using permutation based on industrial scales

Constructs	Compositional invariance (correlation = 1)		Partial measurement invariance established	Equal mean assessment			Equal variance assessment			Full measurement invariance established
	C = 1	Confidence interval		Differences	Confidence interval	Equal	Differences	Confidence interval	Equal	
SSM-J	0.969	[0.981, 1.000]	No	-0.162	[-0.457, 0.475]	Yes	0.297	[-0.438, 0.516]	Yes	No
SSM-R	0.999	[0.998, 1.000]	Yes	-0.191	[-0.457, 0.484]	Yes	0.259	[-0.481, 0.606]	Yes	Yes
Scom	1.000	[0.989, 1.000]	Yes	-0.355	[-0.452, 0.463]	Yes	0.192	[-0.491, 0.608]	Yes	Yes
SB-P	1.000	[0.962, 1.000]	Yes	-0.160	[-0.478, 0.440]	Yes	-0.180	[-0.469, 0.581]	Yes	Yes

SB-P, safety participation; Scom, safety communication; SSM-J, SSM-job; SSM-R, SSM-relation; SSM, safety silence motive.

The results configuration of constructs influenced by industrial sectors and scales could be seen in Figs. 2 and 3. It showed that the effect of Scom on SB-P was significant in both different sectors and scales. Meanwhile, the influence of SSM described by SSM-R and SSM-J affected Scom based on an industrial scale only. This informed that it is important to consider the effect of constructs based on industrial scale differences.

4. Discussion

This study aimed to observe SSM in different industrial sectors (craft and metal industries) and different industrial scales (small and medium enterprises) in Indonesia and evaluate the effect of SSM on Scom and Scom on SB-P. The results showed that SSM in Indonesian's SMEs is high. In addition, SSM was found to be different based on industrial sectors and scales. In general, SSM generally affects Scom, and Scom influences SB-P.

The general finding of high SSM in Indonesian SMEs might be due to the characteristics of SMEs, such as low worker's education, a lack of worker safety consciousness, informal safety rules as well as procedures, and poor basic safety management [1]. These characteristics give consequences as workers feel less motivated to speak up or share safety issue–related information to either owners or managers.

The different values of SSM are found between different scales (small and medium enterprises) and between different sectors (craft and metal industries). The differences in SSM values between industrial scales might be due to better safety management of MEs than in SEs. Previous studies by Legg et al. [2] showed that management in MEs is more professional than in SEs. The differences in SSM between industrial sectors might result from the different characteristics of the owners, the workers, and the jobs. The workers in the craft are reluctant and unwilling to open to the owner/management [40] as the relationships between the owners and the workers are mostly in family relation. Speaking directly about a safety issue is considered to be impolite and may influence the relationship. On the contrary, in the metal enterprises, workers are more open by communicating their concerns around safety. The openness might relate to the professional relation (employees and employers) in the enterprises. The job characteristics in the enterprises imposing high risks to the workers, such as high spins on the machine and sparks from the welding machine enforce the workers

Table 9
Results of hypothesis testing

Hypothesis	Relationship	Based sectors				Based scales			
		Path coefficient		Supported based sectors	Path coefficient difference based sectors (craft–Metal)	Path coefficient		Supported based scales	Path coefficient difference based scales (SEs–MEs)
		Craft	Metal			SEs	MEs		
Hypothesis 1	SSM → Scom	-0.027	-0.300	No	0.273	-0.401*	-0.455*	Yes	0.054
Hypothesis 2	Scom → SB-P	0.572**	0.682**	Yes	0.111	0.628**	0.531**	Yes	0.096
—	SSM → SSM-J	0.841**	0.683**	Yes	0.158*	0.760**	0.731**	Yes	0.029
—	SSM → SSM-R	0.913**	0.935**	Yes	0.022	0.929**	0.949**	Yes	0.019

*$p < 0.05$, **$p < 0.01$.
SB-P, safety participation; Scom, safety communication; SSM-J, SSM-job; SSM-R, SSM-relation; SSM, safety silence motive.

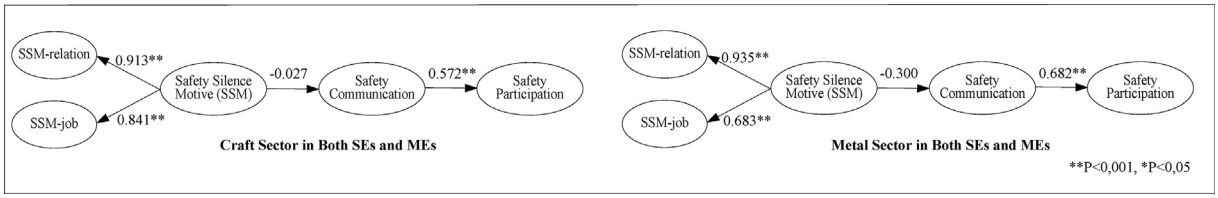

Fig. 2. The structural model based on industrial sectors. MEs, medium enterprises; SEs, small enterprises; SSM, safety silence motive.

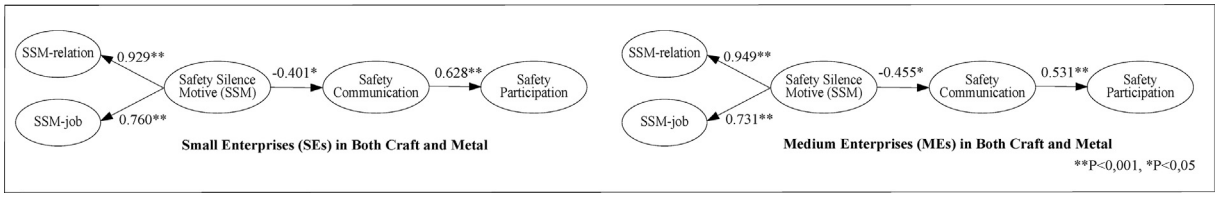

Fig. 3. The structural model based on industrial scales. MEs, medium enterprises; SEs, small enterprises; SSM, safety silence motive.

to communicate the necessary safety issues. Lastly, the different results (i.e., craft and metal industries) are might be because of the absence of government regulation regarding the standardization of the implementation of work safety in SMEs. The Indonesian government set a safety regulation for big companies for some reasons such as to comply with the international standard and regulations. In contrast, the regulation cannot yet be applied to SMEs because of the large number of Indonesian SMEs and the lack of monitoring and evaluation process.

In general, SSM negatively affects Scom. Workers are silent to speak up about safety issues if they feel uncomfortable discussing their ideas and concerns about workplace safety with their owner-manager. Therefore, the high SSM value of workers indicates the low Scom to share their ideas and concerns about workplace safety with their owner-manager [8]. These results are in line with the research by Manapragada and Bruk-Lee [6] that SSM negatively affects Scom in a case study of nurses in a hospital.

Scom significantly influences SB-P in both industrial sectors and scales. As stated by Neal et al. [10], SB-P is an activity related to helping coworkers and supporting safety programs, initiatives as well as efforts to improve workplace safety. The characteristics of workers' SMEs in the form of high intensity of interaction make it easier for workers to engage in communication [2,41]. Therefore, Scom in SMEs will ensure that workers will reveal their initiatives and efforts to SB-P. This result is supported by Amponsah-Tawaih and Adu [42], Al-Haadir et al. [43], Shin et al. [14] and Seo et al. [15] that Scoms support workers' safety performance, particularly, in SB-P.

This study has some limitations. First, the present study has a limited number of samples because of restricted permits. Even the number of samples is limited; however, the sample is considered to represent the number of SMEs involved in the study. Therefore, further study is suggested to collect more samples. Second, this study only evaluates two sectors of industries. Because there are twenty-three sectors of industries in Indonesia [16], further study is expected to do similar research for other sectors to generalize the result. Third, the next study should involve accident data to show the safety outcomes of the safety constructs relation, especially the association between SB-P and accidents. This suggestion is in line with the result of Wallace [44] that SB-P, as a part of safety behavior, has a significantly negative relationship with accidents.

Despite its limitations, this study generally gives a valuable novel contribution in the safety field SMEs and Indonesian SMEs in particular because this study provides empirical data on SSM, Scom, SB-P, and the relationships among them. This empirical study is also the first step in further comprehensive studies as an effort to maximize safety behavior and safety in SMEs.

5. Conclusion

SSM in both sectors (craft and metal) and scales (SEs and MEs) are high. SSM's values are different in both industrial sectors and scales. Therefore, in the next research, different sectors and scales should be separately analyzed. In general, SSM influences Scom, and Scom influences SB-P.

Conflicts of interest

All authors have no conflicts of interest to declare.

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