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Filipino Cadets' Attitudes and Expectations Toward Safety in Work at Sea

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Abstract

The majority of seafarers employed within the Norwegian-controlled fleet are from the Philippines. Consequently, the Norwegian Shipowners' Association (NSA) initiated a training program in the Philippines for Filipino cadets. In order to match the training with cadets' needs, a study was conducted to map their attitudes toward and expectations of safety at sea. The study explores two research questions: (1) What are the NSA cadets' attitudes toward and expectations of safety at sea? (2) How do the cadets with shipboard training differ from the cadets without shipboard training? Data were derived from a survey carried out in 2012, in which 618 responses were collected from two maritime educational institutions belonging to the NSA Cadet Program. The data were subjected to explorative factor analysis and independent *t*-tests in order to compare two groups—namely, cadets with or without seafaring experience. The results suggested that the Filipino cadets' attitudes toward operational safety are, overall, in line with the NSA and they have high expectations toward ship management in relation to safety. One of the most interesting findings is in relation to the factor violation of safety rules. Between 36% and 53% stated that it is acceptable to violate safety rules if others do, if the captain demands it or if doing so improves the quality of their work. It is suggested that shipping companies, through their local ship management, place more emphasis on these attitudes toward the violation of safety rules.

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Filipino Cadets' Attitudes and Expectations Toward Safety in Work at Sea

Norway has a long tradition as an international maritime nation. On October 1, 2011, the Norwegian-controlled fleet totaled 1,756 vessels (Norwegian Shipowners' Association, 2011). The latest employment statistics from the Norwegian Shipowners' Association (NSA) show that a total of 53,250 persons are employed on Norwegian-controlled vessels, of which the majority—20,990persons—are from the Philippines. The number of seafarers employed on ships and distribution of nationalities are given in Table 1 (Norwegian Shipowners' Association, 2010).

Table 1.

Crew Employed on Ships by Country of Domicile

Country of domicile	No.	Country of domicile	No.
Philippines	20,990	Sweden	490
Norway	10,370	UK	455
Russia	4,020	Bangladesh	380
Poland	3,085	Estonia	320
Ukraine	1,140	Brazil	285
Latvia	960	Canada	190
Romania	920	Portugal	160
China	660	Spain	150
Croatia	580	Other countries	1,960
		Total	**53,250**

Due to the high number of Filipino seafarers serving on Norwegian ships, the NSA initiated the NSA Philippine Cadet Program in 1993. At present the program is collaborating with six maritime academies in the Philippines: (1) DMMA College of Southern Philippines; (2) University of Cebu; (3) John B. Lacson Colleges Foundation; (4) Philippine

Merchant Marine Academy; (5) Maritime Academy of Asia and the Pacific; and (6) John B Lacson Foundation Maritime University. Cadet statistics from 2011[1] indicate that three of the academies currently enroll cadets taking part in the NSA Philippine Cadet Program—namely, (1) DMMA College of Southern Philippines; (2) University of Cebu; and (3) John B. Lacson Colleges Foundation. According to the Norwegian Training Centre in Manila, approximately 1,600 officers serving on Norwegian-controlled vessels have graduated from the NSA Cadet Program. The minimum requirements for certification of an officer in charge is approved seagoing service of not less than 12 months as a part of an approved training program in accordance with the international convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) requirements.

The research literature concerning Filipino cadets' perception and attitudes toward safety is relatively scarce. However, a few research articles addressing Filipinos' attitudes and behaviors in relation to safety in the maritime industry were identified. The Seafarers International Research Centre (SIRC) developed a profile of Filipino global seafarers (Amante, 2003), highlighting that the quality of maritime education and training directly affects the seafarers' competencies and skills, which in turn reflects on the performance of their work. SIRC also noted that more research within this area is required. For example, Amante (2003) found that the majority of the Filipino seafarers in general are satisfied with the on board conditions, but the research does not indicate whether seaboard practices have a negative or positive influence on the safety-related conditions. A Danish study found that seafarers from Southeast Asia, mainly the Philippines, may have a lower risk of occupational accidents compared to European seafarers (Hansen, Laursen, Frydberg, & Kristensen, 2008). Although there is some uncertainty regarding the reliability of the data and the differences in accident rates may be the result of underreporting,

[1] Internal statistics provided by the Norwegian Training Centre in Manila.

Hansen et al. (2008) ascribed the differences to a variation in safety attitudes. However, their research was not very specific and failed to provide a detailed understanding of what these attitudes are and how they are generated. Several authors (e.g., Håvold, 2007; Helmreich & Merritt, 1998; Lu & Tsai, 2010; Lu, Lai, Lun, & Cheng, 2012) have claimed that national culture influences how people behave with respect to safety matters, but again these claims are generic, leaving us with little detail and understanding of how culture influences safety.

Improved understanding of the expectations and attitudes of the NSA cadets toward shipboard conditions would be useful for the shipping companies that take part in the NSA Philippine Cadet Program, enabling them to effectively adjust and model the onboard conditions (e.g., training program, management style). For the same reasons, it would be useful to acquire information on how seafaring experience influences the cadets' expectations and attitudes. Thus, we decided to explore the following two research questions:

(1) What are the NSA cadets' attitudes and expectations toward safety at sea?

(2) How do cadets with shipboard training differ from cadets without shipboard training?

The overall aim of the study is to explore and analyze the generic safety attitudes of Filipino cadets trained for Norwegian vessels in order to improve the training and identify potential questions for future research.

Methodology

Questionnaire Development

In order to investigate our research questions, we developed a questionnaire based on a previous questionnaire developed to measure the safety culture in shipping (Oltedal, 2011). The original questionnaire was adjusted to fit cadets with no seagoing experience. Some of the questions were also altered in collaboration with crewing personnel and officers employed in a shipping company in order to improve the relevance of the questions. The final questionnaire

consisted of eight sections: background, responsibilities, management, safety rules and procedures, working environments, training and education, learning from accidents and incidents, and job motivation. All constructs were measured on six-point Likert scales, ranging from "strongly disagree" to "strongly agree."

Sampling Technique

To collect data for this study, we conducted a questionnaire survey among NSA cadets belonging to two of the three participating maritime academies (i.e., DMMA College of Southern Philippines and University of Cebu. The data collection was carried out by the main author in February 2012.

The maritime education consists of four years: two years at school, one year at sea, and a final year at school. All NSA cadets present at the school at the time the survey was administrated—namely, those in the first, second, or fourth year—were invited to participate in the study. The cadets were informed that participation was voluntary and anonymous. The total number of cadets is given in Table 2.

Table 2

Survey Population

	DMMA College of Southern Philippines	University of Cebu
First-year students	71 (deck)	234 (deck and engine)
Second-year students	23 (deck)	207 (deck and engine)
Fourth-year students	27 (deck)	257 (deck and engine)
Total	**121 (deck)**	**698 (deck and engine)**
Grand total	**819**	

The survey was administered during a visit to the two institutions; it is not known how many of the cadets were present at the time.

Demographics

Questionnaires were returned from 618 cadets (75% response rate): 506 from the University of Cebu (72% response rate) and 112 from DMMA College of Southern Philippines (93% response rate). Of those returning the questionnaire, 48.5% were first-year students, 35.1% were second-year students, and 16.3% were fourth-year students. A total of 107 cadets (18%) had experience from work at sea. The sample was male dominated, with only 14 (2.3%) female responses. Just over 85% of the respondents were 17 to 20 years old.

Results

The Statistical Package for the Social Sciences (SPSS) v.19.0 was used to perform the analyses, which included descriptive statistics, an exploratory principle components analysis (PCA), a scale reliability analysis, and independent *t*-tests. Effect sizes (Cohen's *d*) and their confidence intervals were computed in R version 2.15.1 (64-bit) by means of the compute.se- and MBESS packages.

Component Analysis

All 618 responses were submitted to an explorative PCA with Varimax rotation in order to identify the latent underlying dimensions of safety. The data were deemed appropriate for analysis, according to the Kaiser-Meyer-Olkin measure of sampling value of .880, and a significant Barlett's test of spericity: $x^2(351) = 8590.172$, $p < .001$. Components were extracted based on three analytical criteria: (1) pairwise deletion, (2) eigen value more than 1.0, and (3) component loading more than .50. Items that failed to attain a minimum loading of .50, or which loaded significantly on more than one component, were omitted (Field, 2005; Hair, 1998; Pett, Lackey, & Sullivan, 2003). This resulted in the extraction of 7 components, explaining 69.56% of the total variance. Only components with a minimum of three items were retained for further analysis. The component solution is presented in Table 3 along with each item's factor loading.

Table 3

Seven Components Rotated Solution with Component Loadings

Items	C1	C2	C3	C4	C5	C6	C7
The captain/ship management will listen carefully to different point of views amongst the crew.	**.84**	.01	.09	.08	.12	.04	.13
The captain/ship management will encourage everyone to speak their mind.	**.78**	-.02	.14	.13	.12	.16	.04
The captain/ship management will admit his/her own mistakes when they are made.	**.76**	.00	.18	.11	.06	.02	.18
The captain/ship management will seek feedback from the crew on his/her own actions.	**.75**	.01	.09	.15	.11	.10	.11
The captain/ship management will be a good role model when it comes to safety.	**.63**	-.03	.05	-.01	.21	.24	.03
The captain/ship management will tell me the hard truth on my performance.	**.58**	.09	.08	.08	.20	-.01	.16
It would be acceptable to breach the safety rules in order to get a job done quickly.	-.01	**.94**	.03	.06	-.03	-.01	.01
It would be acceptable to breach the safety rules if it improves the quality of the work.	.04	**.92**	.05	.04	-.01	.02	.00
It would be acceptable to breach the safety rules if the rest of the crew does it.	-.01	**.92**	.04	.01	.00	-.08	.04
If the captain demands efficiency, it would be acceptable to breach the safety rules.	.02	**.87**	.05	-.01	.01	.00	.05
The captain takes responsibility for my safety.	.14	.04	**.86**	.11	.17	.11	.05
The manning agency takes responsibility for my safety.	.17	.09	**.85**	.09	.14	.10	.11
The shipping company takes responsibility for my safety.	.11	.03	**.81**	.13	.02	.18	.13
My colleagues take responsibility for my safety.	.13	.03	**.81**	.06	.19	.02	.06
My fellow cadets have received the training and education necessary in order to work safely.	.18	.03	.12	**.87**	.10	.11	.07

I have received the training and education necessary in order to handle critical or hazardous situations.	.15	.07	.12	**.86**	.12	.05	.13
I have received the training and education necessary to work safely.	.10	.01	.11	**.80**	.18	.15	.08
I am confident that the captain will always prioritize my safety.	.26	.03	.22	.12	**.79**	.03	.09
I am confident that my shipping company will always prioritize my safety.	.23	.00	.25	.07	**.75**	.15	.10
My co-workers should correct me if I perform my job incorrectly.	.13	-.07	.03	.16	**.59**	.21	.25
My co-workers do their jobs in a way that makes me feel safe.	.22	.00	.12	.20	**.54**	.22	.25
It is the role of the captain/ship management to form and influence the safety rules.	.06	.04	.10	.10	.12	**.82**	.06
I will have the opportunity to influence and form the safety rules.	.13	-.03	.20	.03	.11	**.72**	.21
The safety rules will be as detailed as possible.	.25	-.11	.07	.20	.21	**.67**	.02
I would speak up to the ship management if I noticed that a co-worker is doing his work in a risky manner.	.16	.14	.13	.09	.12	.02	**.77**
I would speak up to a co-worker if he was doing his work in a risky manner.	.17	-.06	.12	.06	.13	.11	**.74**
If I felt that safety was threatened, I would tell the captain/ship management.	.16	.04	.05	.10	.19	.15	**.67**

Note. Component loadings > .50 are in boldface. C1 = ship management; C2 = violation of safety rules; C3 = responsibility; C4 = training and education; C5 = operational safety; C6 = design of safety rules; C7 = operational risk.

The seven extracted components in Table 3 were labeled as follows. Component 1 (C1), *ship management*, reflected cadets' perception of the ship management's behavior in relation to promoting safety on board. Component 2 (C2), *violation of safety rules,* reflected under which circumstance—if any—cadets would violate the safety rules. Component 3 (C3), *responsibility*, reflected cadets' perception of safety responsibilities. Component 4 (C4), *training and education*, reflected cadets' perception of the quality of their training and education in relation to safety.

Component 5 (C5), *operational safety*, reflected cadets' perception of how safety is prioritized in daily operations. Component 6 (C6), *design of safety rules*, reflected cadets' perception of how safety rules are designed. Component 7 (C7), *operational risk*, reflected how cadets would react to operational risk

This was followed by a scale-reliability test. Each component was evaluated based on three criteria: (1) Cronbach's alpha coefficient > .70, (2) item-total correlation > .40, and (3) inter-item correlation > .30. <.80. However, these cut-off points are rules of thumb as no clear consensus exists with regard to where the cut-off points exist (Field, 2005; Hair, 1998; Pett et al., 2003). Each item's theoretical significance was also taken into account. Each component's scale reliability test, number of variables, and explained variance are presented in Table 4.

Table 4.

Component Scale Reliability Test: Number of items and explained variance

Component	N items	R^2	α	Inter-item range	Item-total range
C1	6	13.66	.857	[.310, .651]	[.508, .762]
C2	4	12.66	.937	[.724, .892]	[.793, .895]
C3	4	11.56	.896	[.551, .748]	[.716, .821]
C4	3	8.90	.865	[.661, .768]	[.677, .800]
C5	4	8.27	.776	[.385, .687]	[.488, .672]
C6	3	7.31	.717	[.393, .493]	[.510, .587]
C7	3	7.21	.692	[.370, .475]	[.475, .552]

The overall evaluation of the scales in Table demonstrates good internal consistency and, hence, a good representation of their underlying safety dimensions. All components returned a scale reliability estimate close to or above .70. All inter-item statistics are also between the recommended levels of .30 and .80, and the item-total is above .40, with the exception of component C2, with inter-item statistics as high as .892. This suggests that two of the items are

duplicates of one another. However, the items were still retained as their subject is considered important for the overall study.

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The component items' descriptive statistics are presented in Table 5.

Table 5.

Component Items Descriptive Statistics

Component items	Response category						*N*	M(SD)
	1	2	3	4	5	6		
				Component 1:				
The captain/ship management will listen carefully to different point of views amongst the crew.	.2	.3	1.5	10.6	35.5	51.9	603	5.37(.78)
The captain/ship management will encourage everyone to speak their mind.	.0	.2	1.0	8.6	34.7	55.6	603	5.44(.71)
The captain/ship management will admit his/her own mistakes when they are made.	.3	1.0	4.1	20.1	38.8	35.7	603	5.03(.93)
The captain/ship management will seek feedback from the crew on his/her own actions.	.2	.8	1.8	11.6	40.8	44.9	606	5.27(.82)
The captain/ship management will be a good role model when it comes to safety.	.2	.2	1.8	3.0	28.0	66.9	604	5.59(.68)
The captain/ship management will tell me the hard truth on my performance.	.0	.3	1.5	12.6	40.1	45.4	603	5.29(.77)
				Component 2:				
It would be acceptable to breach the safety rules in order to get a job done quickly.	29.6	20.1	13.8	11.6	14.0	10.8	601	2.93(1.74)
It would be acceptable to breach the safety rules if it improves the quality of the work.	24.2	18.7	12.9	14.5	16.7	13.0	599	3.20(1.76)
It would be acceptable to breach the safety rules if the rest of the crew does it.	32.3	19.6	10.6	10.1	15.3	12.0	601	2.93(1.81)
If the captain demands efficiency, it would be acceptable to breach the safety rules.	18.6	14.8	13.3	15.1	24.1	14.0	601	3.53(1.73)
				Component 3:				
The captain takes responsibility for my safety.	.3	1.5	2.3	13.0	34.4	48.5	602	5.25(.91)

The manning agency takes responsibility for my safety.	.5	.8	2.0	14.1	34.1	48.5	604	5.26(.89)
The shipping company takes responsibility for my safety.	.3	.8	1.5	8.9	27.1	61.4	606	5.46(.83)
My colleagues take responsibility for my safety.	.8	1.3	4.7	20.6	37.0	35.5	604	4.98(1.00)
			Component 4:					
My fellow cadets have received the training and education necessary in order to work safely.	.2	.5	1.2	10.1	44.5	43.5	602	5.29(.76)
I have received the training and education necessary in order to handle critical or hazardous situations.	.5	.5	3.2	12.0	47.0	36.9	602	5.15(.85)
I have received the training and education necessary to work safely.	.2	.0	.7	8.3	43.5	47.3	602	5.37(.69)
			Component 5:					
I am confident that the captain will always prioritize my safety.	.2	.7	2.1	14.9	36.6	45.5	606	5.24(.85)
I am confident that my shipping company will always prioritize my safety.	.0	.5	1.8	10.2	33.6	53.9	607	5.39(.78)
My co-workers should correct me if I perform my job incorrect.	.2	.0	.7	8.3	43.5	47.3	607	5.52(7.4)
My co-workers do their jobs in a way that makes me feel safe.	.0	.3	.5	13.7	41.5	44.0	607	5.28(.74)
			Component 6:					
It is the role of the captain/ship management to form and influence the safety rules.	.2	.5	1.0	8.0	35.4	54.9	599	5.43(.75)
I will have the opportunity to influence and form the safety rules.	.2	.3	1.8	9.2	34.1	54.4	601	5.40(.80)
The safety rules will be as detailed as possible.	.0	.2	.8	4.0	27.0	68.0	604	5.62(.62)
			Component 7:					
I would speak up to the ship management if I noticed that a co-worker was doing his work in a risky manner.	.7	1.2	5.1	20.1	40.7	32.3	607	4.96(.97)
I would speak up to a co-worker if he was doing his work in a risky manner.	.8	.8	.7	10.9	46.4	40.3	605	5.22(.84)
If I felt that safety was threatened, I would tell the captain/ship management.	.2	1.2	4.6	19.4	40.9	33.8	604	5.01(.92)

Comparison of Cadets With and Without Seagoing Experience

Independent sample *t*-tests and effect sizes were performed in order to compare the results for the two groups: cadets with seafaring experience and those without. For the analysis, mean sum scores were calculated using SPSS. The effect size convention for parameter *d* was "small, *d* = .2," "medium, *d* = .5," and "large, *d* = .8."

Table 6.

Comparison of Cadets With and Without Seagoing Experience: Seven components

	Total sample		No experience		Sea experience					
Comp.	N	M(SD)	n	M(SD)	n	M(SD)	t	Df	d^a	95% CI[a]
C1	610	5.33(.60)	480	5.38(.54)	105	5.07(.78)	3.855***	126	.42	[.20, .63]
C2	605	3.15(1.62)	479	3.24 (1.66)	101	2.64(1.34)	3.929***	172	.43	[.21, .65
C3	606	5.24(.79)	478	5.26(.77)	104	5.14(.89)	1.391ns	580	.15	[-.06, .36]
C4	602	5.27(.68)	474	5.28(.68)	103	5.19(.67)	1.246ns	575	.14	[-.08, .35]
C5	608	5.36(.58)	478	5.40(.54)	105	5.17(.67)	3.667***	581	.40	[.18, .61]
C6	603	5.48(.57)	478	5.48(.57)	101	5.51(.51)	-.390ns	577	-.04	[.00, .25]
C7	609	5.06(.72)	479	5.12(.70)	105	4.78(.75)	4.427***	582	.48	[.26, .69]

[a] See method section for calculation. * $p < .05$, ** $p < .01$, *** $p<.001$,

The results in Table 6 indicate that seagoing experience has a small to medium-sized moderating effect on respondents' perceptions and attitudes in relation to four of the components—namely, ship management (C1), violation of safety rules (C2), operational safety (C5), and operational risk (C7). The effect size ranges from .40 to 0.48.

Sailing experience lowers the respondents' expectations toward their captain/ship management. A higher standard deviation (.78 compared to .54) among respondents with sailing

experience also indicates variation with respect to how ship management is performed on board the vessels. Sailing experience also increases the acceptability of violating safety rules. After sailing, more of the respondents accept that safety rules should be violated, no matter the reason. The variation is also less among those with sailing experience with a standard deviation of (1.34 compared to 1.66) for those without seagoing experience; indicating that the various vessels and shipping companies do have a common approach toward the violation of safety rules.

When it comes to operational safety, respondents with sailing experience to a lesser degree perceive that the captain and shipping company prioritize safety, indicating that other factors (e.g., efficiency) have priority in operational decisions. The variation is larger among those with sailing experience, indicating that the prioritization of safety versus other factors also varies across vessels and shipping companies.

Sailing experience also decreases the respondents' willingness to come forward if they notice that work is performed in a risky manner or if safety is threatened. It is indicated that respondents with seagoing experience are less likely to speak up to their co-workers or ship management.

With respect to the remaining three factors—responsibilities (C3), training and education (C4), and design of safety rules (C6)—seagoing experience did not significantly influence the respondents' perceptions.

Discussion and Conclusion

The overall aim of the study is to explore and analyze safety characteristics of Filipino cadets trained for Norwegian vessels in order to identify directions for future studies. With the exception of C2, violation of safety rules, all responses indicated that the Filipino cadets have an overall good approach toward operational safety as compared to attitudes in the Norwegian-controlled fleet (Oltedal, 2011). However, the Filipino cadets' perceptions of safety practices show signs of a lack of practical experience. Previous research suggests that all these factors (i.e.,

responsibility, operational safety, and operation risk) are mediated by the local ship management (Oltedal, 2011); thus, local management does play a vital role in forming the cadets' perceptions and safety behavior. The majority of the respondents do expect their captain/ship management to have high standards in relation to their conduct as leaders. Through sincere safety engagement, involvement, and follow-up, the management style on the vessels is assumed to convey to the crew the importance of safety in their work on the vessel and for the organization as a whole. The management orientation will affect the shipboard safety by creating a shipboard atmosphere—namely, whether it is possible to report all kinds of experience data without being sanctioned (Dekker & Dekker, 2006; Reason, 2001). However, at sea, most department leaders—or the captain, for that matter—do not have managerial training or education as this was first included in the international STCW regulations on January 1, 2012 (International Maritime Organization, 2011). Onboard management style is therefore left to each individual and may vary substantially from vessel to vessel or from one sailing period to another, which is supported by the comparison of the two groups of cadets with versus without sailing experience.

The results suggest that shipping companies should strive to further educate their ship managers in order to keep up with cadets' expectations and prevent large variations in management style. In the construction industry, also considered a high-risk occupation, it has been found that successful managers use the following management practice: conduct new worker orientation, watch out for vulnerable crew members, analyze productivity problems with the crew, respond to good work, and create a calm and friendly job atmosphere (Håvold, 2010; Oltedal & Wadsworth, 2010). Although the present study suggests that shipboard management should strive for more uniformity in leadership style, previous research has suggested that effective management should be adjusted to the situation (Oltedal & Wadsworth, 2010). When leading and working in a team, the management's shifting role may be challenging. However, team leaders can be trained to shift their role from supervisor to a team member engaging in

command-and-control activities or a facilitator who helps teams diagnose and discuss their own performance in an open, trusting, and constructive manner (Barnett, Gatfield, & Habberley, 2010).

One of the most interesting findings in the present study is in relation to the component violation of safety rules. Between 36% and 53% of the respondents stated that it is acceptable to violate the safety rules if others do so, if the captain demands it, or if doing so improves the quality of the work. The shipping company should strive to establish a clear line between acceptable and unacceptable behavior and delineate which safety rules should be followed strictly regardless of the situation and which are more flexible (Reason, 2001). As our results indicate that shipboard conditions moderate the willingness to violate safety rules, it is suggested that shipping companies—through their local ship management—place more emphasis on this condition.

Limitation of the Study

The overall positive result could be a result of the questionnaire design, thereby not giving a true reflection of the cadets' perceptions and attitudes. For future studies, it is suggested that some of the items with limited variation be altered.

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