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Don't forget about seafarer's boredom

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ABSTRACT

Background: The question we asked was whether it is worthwhile screening for seafarers who are prone to boredom, and whose mental health might deteriorate on board because of the particular character of life at sea.

Materials and methods: We used the Farmer and Sundberg Boredom Proneness Scale (BPS), validated in French, as well as the Zigmond and Snaith Hospital Anxiety and Depression Scale (HADS). The survey was voluntary and responses were collected by means of questionnaires which were returned by post.

Results: Eighty seafarers (40 officers and 40 crew) as well as 63 office staff from the same shipping company were included in the survey. We found a significant difference between officers and operational personnel: average score of 8.4 ± 5 (median = 7) for officers and 10.2 ± 4.8 (median = 10) for operational personnel. 21% of the officers have scores greater than or equal to 12 compared with 41% of the crew. There is a significant correlation between the BPS and HADS test scores, in terms of depression, for the office staff and the seafarers taken as a whole; this correlation being highly significant among officers ($r = +0.85$), but only marginally significant among crew members ($r = +0.54$).

Conclusions: The BPS may be useful in screening for seafarers prone to boredom and depression for their fitness for embarkation.

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Key words: boredom, anxiety, hopelessness, seafarers, fitness, stress

INTRODUCTION

Modernisation and automation in shipping impose a monitoring and maintenance culture on seafarers, leading to certain monotony in their work. However, the monotony of the work, increased in the maritime environment by isolation and remoteness, is the breeding ground of boredom at work. This boredom at work is a source of stress and addiction, according to data from the literature (Fisher [1], Kass et al. [2], Todman [3], Vodanovich et al. [4]). Cummings et al. [5] recently mentioned boredom as a major problem ahead due to the growing industrial automation. Similar studies begin to be undertaken among aircraft pilots and heavy-duty drivers (Bhana [6], Cummings et al. [7]). The question for us is whether it is worthwhile screening for seafarers who are predisposed to boredom, and whose

mental health might deteriorate on board because of the particular character of life at sea.

MATERIALS AND METHODS

Boredom at work has been studied, particularly in Anglo-Saxon countries, since the 1980s (Mikulas and Vodanovich [8], Thackray [9], Vodanovich et al. [10], Watt and Hargis [11]). At its most pronounced, it causes a lack of interest and vigilance (Cummings et al. [5], Eastwood et al. [12]) that can lead to mistakes and accidents (Barling et al. [13]). Some jobs with a large number of monotonous, repetitive tasks and no intellectual stimulus can be linked directly to the onset of boredom, especially in road and air transport (Cummings et al. [7], Casner et al. [14]). Finding out whether some people are likely to be bored more easily than others,

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and therefore, when placed in a monotonous environment, could become bored with harmful consequences for the quality of work done, has become a dominant part of studies of boredom at work. Boredom is generally considered an emotion which has a different definition depending on whether we are philosopher, psychologist or psychiatrist. In our work, we adopt the Hill and Perkins (1998) [15] definition which says that boredom occurs when we are faced with a monotonous life combined with frustration. This combination is often found among seafarers, because of the monotony of work on board, routine deck-work or using machinery, being on watch, or doing maintenance tasks, especially at sea. It therefore seemed useful to study this aspect of the psychology of seafarers and draw from it a number of recommendations.

In our study, we used three validated questionnaires: the Boredom Proneness Scale (BPS), the Hospital Anxiety Depression Scale (HADS), and the Job Content Questionnaire (JCQ).

Farmer and Sundberg (1986) [16] have developed a scale known as BPS. This 28-item scale was validated in French by Gana and Akremi [17] in 1998. The internal consistency of the testing is excellent (Cronbach's alpha is calculated at 0.82). One primary component relating to *internal stimulation* (the ability to keep busy, to amuse one's self or be creative) comprises 14 items, a second relating to *external stimulation* (the stimuli of life, the need for diversity and change) has 12 items. We carried out the survey as part of a larger study of stress among seafarers and office staff of a French oceanographic research company. The office staff were at engineer level (a level comparable to that of the officers) or technicians and travelled more or less regularly aboard the same vessels as the seafarers.

The Zigmond and Snaith's [18] HADS, validated in French, studies the anxio-depressive component. Seven questions rating anxiety and depression from 0 to 3 constitute this test. We considered that scores greater than or equal to 11/21 for anxiety and depression were pathological, as recommended by Zigmond and Snaith [18].

The used version of the JCQ is the one validated in French. It is based on the *Job demand-control-support model* of Karasek [19]. It contains 9 questions about *job demand*, 8 questions about *job control*, and 8 questions about *social support*. Responses were rated: -2 for "strongly disagree", -1 for "somewhat disagree", +1 for "somewhat agree" and +2 for "strongly agree". Crossing the data of the *job demand* and *job control* make it possible to classify the subjects in four categories according to whether they are subjected to a strong or weak job demand and according to whether they have a strong or a weak job control in their work. Workers are then categorised as "active" (strong job demand and strong job control), "low strain" (low job demand and strong

job control), "passive" (low job demand and low job control) and "high strain" (strong job demand and low job control).

All the seafarers (officers and crew members), as well as the office staff (all male) are French nationals and the vessels operate under the French flag. The oceanographic vessels frequently, but not exclusively, carry out offshore missions (distance greater than 150 nautical miles from a medical facility) lasting from 2 to 5 weeks. Responses were obtained voluntarily by completion of the questionnaire returned by mail to the medical service.

STATISTICAL ANALYSIS

The data collected were processed using the specialised software, SPHINX[®]. Statistical treatment was conventional: Student t-test for mean comparisons and χ^2 test for population comparisons. Multivariate studies were performed by variances analysis, ANOVA, using the Fischer test. We considered that the threshold for a significant p-value was less than 0.05.

RESULTS

Eighty seafarers (40 officers and 40 crew) and 63 office staff were included in the survey. All are male, the few women seafarers not being included in the survey. The average age is 40.3 ± 7.9 for the officers, 42.3 ± 7.5 for crew members, and 43.6 ± 9.6 for the office staff (no significant difference). Of the crew, 46% are deckhands, 13% are mechanics and 41% are general service staff. At the time of the investigation, all of them were fit for embarkation according to the medical standards in force in France for merchant seamen. There is a significant difference in smoking between officers ($40 \pm 15.2\%$ are smokers), crewmen ($48.7 \pm 15.7\%$) and office staff ($17.5 \pm 9.3\%$) ($\chi^2 = 12.22$, dof = 2, $p = 0.002$). 21.5% of the seafarers take medication, as opposed to 27.4% of the office staff (non-significant difference). But only 12.5% of the officers are on medication while the figure is 30.8% for the crew ($\chi^2 = 3.9$, dof = 1, $p = 0.04$, significant difference). 2.5% of the officers take anxiolytics and 2.5% take antidepressants, 10.3% of the crew take anxiolytics and 5% take antidepressants, while 6% of the office staff take anxiolytics and 8% take antidepressants.

The results of the Gana and Akremi BPS [17] test are similar for the officers (8.43 ± 5), for the crewmen (10.23 ± 4.77) and for the office staff (9.02 ± 4.92) ($F = 1.41$, $p = 0.24$, $p = \text{NS}$). 25% of the officers, 41% of the crewmen and 27% of the office staff have a BPS score greater than or equal to 12/28 ($\chi^2 = 2.99$, dof = 2, $p = 0.22$, $p = \text{NS}$). On the other hand, if we compare the officers and crew members, a significant difference is noted: mean scores of 8.4 ± 5 (median = 7) for the officers and 10.2 ± 4.8 (median = 10) for the crewmen ($F = 5.02$, $p = 0.02$).

Although the internal stimulation tests yield the same results for officers, crew and office staff, the external stimu-

Table 1. Main results of the Boredom Proneness Scale and the Hospital Anxiety Depression Scale tests (ANOVA)

	Population			Fischer test	P
	Officers	Crew	Office staff		
Average age [years]	40.3 ± 7.9	42.3 ± 7.5	43.6 ± 9.6	1.77	0.17
Boredom disposition score	8.4 ± 5	10.2 ± 4.8	9.02 ± 4.9	1.41	0.75
Internal stimulation score	2.6 ± 2.6	2.9 ± 2.6	2.8 ± 2.7	0.23	0.80
External stimulation score	4.6 ± 2.6	5.8 ± 2.6	4.8 ± 2.4	2.58	0.77
Anxiety score	8 ± 3.7	8.3 ± 3.8	8.4 ± 3.7	0.11	0.88
Depression score	4.3 ± 3.9	5.4 ± 3.1	5.9 ± 3.4	2.35	0.97

Table 2. Results of the Boredom Proneness Scale and Hospital Anxiety Depression Scale tests for seafarers (Officers and crewmen only)

	Seafarers		Fischer test	P	Significance
	Officers	Crew			
Average age [years]	40.3 ± 7.9	42.3 ± 7.5	4.8	0.02	Significant
Boredom disposition score	8.4 ± 5	10.2 ± 4.8	5.02	0.02	Significant
Internal stimulation score	2.6 ± 2.6	2.9 ± 2.6	0.84	0.35	Non-significant
External stimulation score	4.6 ± 2.6	5.8 ± 2.6	8.19	0.05	Significant
Anxiety score	8 ± 3.7	8.3 ± 3.8	0.29	0.59	Non-significant
Depression score	4.3 ± 3.9	5.4 ± 3.1	5.97	0.01	Significant

lation test results show a significant difference between officers and crew. The results are recorded in Tables 1 and 2.

The HADS test results demonstrate the differences in the non-significant scores between seafarers and office staff. Among seafarers only, the depression average is significantly different between officers and crewmen.

Lastly, if we find a significant correlation between the BPS and HADS test scores for depression among the office staff and the seafarers taken as a whole, this correlation is highly significant for the officers ($r = +0.85$), but only marginally significant for crew members ($r = +0.54$) (Fig. 1). Regarding correlation with the HADS test for anxiety, this is also significant between office staff and seafarers taken as a whole, but there is a difference between the officers where the boredom/anxiety correlation is significant ($r = +0.69$) and crew members where the boredom/anxiety correlation is not significant ($r = +0.15$).

The results of the JCQ of Karasek [19] are significantly different for the averages of the *job demand* and the *job control* (Table 3) whereas there is no difference for the social support. Compared to the officers and the staff office, the crew is significantly with low *job demand* and *job control* results, which ranks them in the “passive” category (51%). On the other hand, the percentage of “actives” is significantly higher among officers (30% vs. 5.1%), which is logical (Table 4).

DISCUSSION

According to Gana and Akremi [17], boredom proneness is “a tendency to feel a certain lack of interest, enthusiasm and personal commitment, and a tendency to sustain a lack of interest in the surrounding world”. If this proneness to boredom is, in a certain number of individuals, a personality trait that could be regarded as endogenous, a propensity for boredom, as described by Gana and Akremi [17], it is important to ascertain whether for other individuals it is not a reactive state related to the perception of monotony at work linked to frustration, as per the definition of boredom offered by Hill and Perkins [15]. The two commonly accepted factors in boredom proneness (Vodanovich et al. [4, 10, 20], Gana and Akremi [17]), internal stimulation and external stimulation, could represent the two aspects impacted by the two definitions we have just discussed. Internal stimulation gauges general internal support, such as being able to remain interested, and tends more to reflect the endogenous aspect of proneness to boredom. External stimulation gauges the need for excitement, challenge and change with respect to the external environment and would thus be more sensitive to the reactive context.

A “macroscopic” comparison of our seafarer sample (officers and crew combined) yields the same results on the BPS (a mean of 9 ± 4.9 in the two populations and a percentage of subjects with a score ≥ 12 at about 30%).

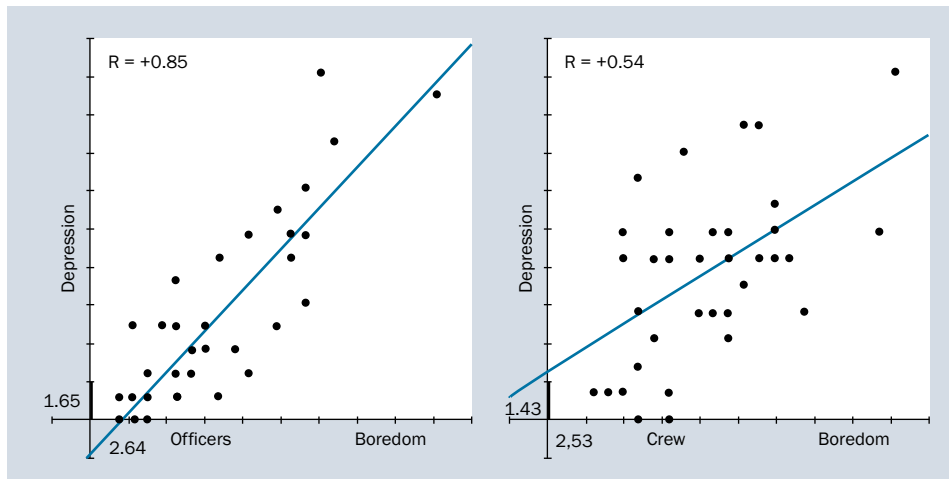


Figure 1. Correlation between depression and Boredom Proneness Scale scores for officers and crew

Table 3. Criteria of Karasek (ANOVA) [19]

		Mean	SD	Fischer	P
Job demand	Officers	0.90	8.29	5.22	0.006*
	Crew	-4.28	6.05		
Job control	Office staff	0.14	8.52	14.91	0.001*
	Officers	0.31	0.59		
	Crew	-0.23	0.56		
Social support	Office staff	0.40	0.59	1.77	0.17
	Officers	0.56	0.70		
	Crew	0.24	0.95		
	Office staff	0.28	0.87		

*Highly significant; SD – standard deviation

Table 4. Ranking in the categories of Karasek [19]

	Active	Passive	High strain	Low strain
Officers	30%*	17.5%**	15%	37.5%
Crew	5.1%*	51.3%**	17.9%	25.6%
Staff office	34.9%*	12.7%**	11.1%	41.3%

*Significant; **highly significant ($\chi^2 = 7.79$, dof = 2, p = 0.02)

These results are also found in other studies (2006 Culp [21] study: 9.01 ± 4.45).

The exact similarity of the internal and external stimulation scores (Table 1) might suggest individual profiles with the same boredom proneness among the seafarers and office workers. Detailed examination of the results serves to qualify this point of view. Indeed, among seafarers, the results on boredom proneness differ markedly between officers (which are closer to those of the office staff) and crew (deckhands, mechanics and general service staff) (Table 2). Although the internal stimulation scores are the same, there

is a clear-cut difference in the total BPS scores, especially in the external stimulation scores where there are many more crew who have a high score. For many of them, this would translate to the existence of a state of boredom due to a lack of external stimulation and, in particular, monotony and the routine nature of the work, a loss of a sense of the meaning of work, or a divergent perception of the passage of time (Table 5).

This difference in perception between officers and crew, aboard the same vessels under similar conditions, allows us to support the hypothesis that relationship with work

Table 5. Comparison between officers and crew (questions of Boredom Proneness Scale)

	Officers	Crew
Many things I have to do are repetitive and monotonous	27.5%*	47.4%*
Frequently when I am working I find myself worrying about other things	50%*	76.9%*
Time always seems to be passing slowly	5.6%**	32%**
I often find myself with nothing to do, time on my hands	5.4%*	21%*
I feel that I am working below my abilities most of the time	24.3%**	60.5%**
I am often trapped in situations where I have to do meaningless things	13.5%*	34.2%*
I have projects in mind all the time, things to do	95%**	71.8%**
I would like more challenging things to do in life	50%*	71.8%*

*Significant; **highly significant

has an impact on the external stimulation factor – the external stimulation perhaps being influenced by the living and working conditions experienced by the individual – and the boredom found among the crew being a mixture of “situational” boredom, generated by the monotony of work and “dispositional” boredom directly related to a natural proneness to boredom. The boredom proneness test does not just appear to quantify a personality trait but is also influenced by the level of job satisfaction. Todman [3] has a similar opinion. This is also the opinion of Sawin and Scerbo [22] who consider that the state of boredom and a personality conducive to boredom provoke such an interaction that it is difficult to determine the cause and effect of boredom. It seems clear to us that the level of intellect and training, the interest one finds in the exercise of one’s profession, the level of responsibility and involvement in the course of events increase job satisfaction, and it is possible that certain professions generate natural selection leading to the elimination of subjects with a high tendency for boredom (the healthy worker effect). It is interesting to note that this boredom proneness test yielded very poor results for a cohort of 53 male oceanographic researchers and technicians who, for their research at sea, were aboard the same vessels as our seafarers. The test mean was found to be 5.3 ± 2.4 and only 2% had a score greater than or equal to 12.

The criteria of Karasek [19] (Demand-Control-Support model) confirm the results we defend. Indeed, the “passive” category is significantly higher among crewmen (51.3%) than officers (17.5%) and office staff (11.1%) (Tables 3, 4). In fact, the results of JCQ for the officers are quite close to those of the office staff, which is also the case for the boredom proneness.

The “passive” character found in more than half of the crew members confirms the problem with the prime work routine, which is today transformed on modern ships into watch and maintenance work, of no particular interest to these seafarers. In combining the familiar frustrations of separation from family, containment in a confined space, and poor relationships with people on board, we find our-

selves absolutely within Hill and Perkins’ [15] definition of the conditions for boredom (Table 5).

Many works (Van Hooft and van Hooft [23], Mikulas and Vodanovich [8], Saunders et al. [24]) have demonstrated a strong link between boredom proneness and depression. We find this significant link with depression and, to a lesser extent, with anxiety in our own study among seafarers and office staff. We note, however, that this link correlates strongly with officers ($r = +0.85$, HS), but does not correlate with crew ($r = +0.39$, $p = \text{NS}$) (Fig. 1). Among the officers, the two components of internal and external stimulation correlate significantly with the level of depression (respectively 0.85 and 0.65), whereas this is not the case for crew (respectively 0.39 and 0.47). These results confirm that among officers the proneness to boredom is very much related to their psychological state, especially depressive, but this is not the case for crew, whose proneness to boredom is influenced by external factors related to living and working conditions. Van Hooft and van Hooft [25] has recently shown that when task autonomy is low, state of boredom relates to more frustration than when task autonomy is high. When task autonomy is high, state of boredom relates to more depressed affect than when task autonomy is low.

The data in the literature clearly indicate that subjects with a high score for boredom proneness suffer lapses in attention and vigilance (Malkowsky et al. [26]), and stress (Thackray [9], Harju et al. [27]) – hence a possible impact on maritime accidents (collisions, inadvertent course changes) and the increased presence of alcoholism, smoking, drug addiction, gambling addiction and eating disorders (Sommers and Vodanovich [28]), which are also encountered to a significant extent in the maritime environment. Moreover, in our sample of seafarers we find a very high level of smoking, similar to recent data in the literature for French seafarers (Fort et al. [29]). Addiction problems, including alcohol, continue to be a major problem in the maritime environment. The backdrop of boredom that we have described can be considered to be a breeding ground for addictions.

CONCLUSIONS

The Farmer and Sundberg [16] BPS may be useful as part of the fitness for embarkation process, in order to screen for seafarers prone to boredom and depression, especially among crew, who are more susceptible because their living and working conditions on board are more monotonous and less rewarding than those of officers. Although the fitness of seafarers with a score greater than 12 should not apply systematically, other than in cases of obvious depression, we would strongly recommend that there is enhanced monitoring of these personnel.

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