

HEALTH PSYCHOLOGY RESEARCH FOCUS

MARITIME WELLBEING

NIHAN SENBURSA
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EDITORS



NOVA

Health Psychology Research Focus



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Health Psychology Research Focus

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Nihan Senbursa
and Leyla Tavacioglu
Editors

Maritime Wellbeing



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*This book is dedicated to Hayreddin Barbarossa
who was a conqueror of the seas...*

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Preface

This edited book aims to handle and discuss the human element issues from different perspectives of the maritime industry. The International Maritime Organization defines the human element as "...a complex multi-dimensional issue that affects maritime safety, security and marine environmental protection involving the entire spectrum of human activities performed by ships' crews, shore-based management, regulatory bodies and others". The maritime industry is growing and improving day by day. The human element is the key factor in the developing maritime industry. Hence, it is a requirement to address human element issues effectively. Although many studies in the maritime field have been focused on the human element, there are still many challenges. More studies are needed, not only on maritime safety, security, and marine environmental protection but also on maritime human resource management, maritime wellbeing, maritime ergonomics, maritime psychology, and future trends for the maritime industry.

The current book intends to provide its readers with a wide perspective on the human element in maritime industry, discussing the present and future challenges from a different perspective. Authors are invited to submit their original work or systematic reviews of relevant areas. The book focuses on maritime wellbeing, organizational psychology, behavioral sciences, organizational behavior, human factor in shipping, positive psychology & work attitudes. Therefore, the book hosts nineteen chapters that cover crucial subjects related to maritime workers. In conclusion, we hope that this book will bring some new knowledge of maritime wellbeing and enable readers to have a comprehensive knowledge about what does maritime wellbeing means for maritime employees. We would like to express our sincere thanks to these contributing authors for overcoming many inconveniences to support and complete the chapters. We also thank the editors of Nova Science Publishers for their hard work. We would like to express our gratitude to all of them. Finally, we are also grateful for the publication of this book with the support of scientists who work on psychological and managerial concepts of organizational behavior and industrial psychology from the perspective of maritime employees. We hope to have more publications on seafarers and land-based employees of the maritime industry in the near future.

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Chapter 1

Maritime Employees' Happiness with Internal Marketing Strategies

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Abstract

One of the biggest responsibilities of human resources managers is to provide the right workforce. However today, in addition to employing the workforce, ensuring that talented employees are happy in the organization is another responsibility of human resources. The happiness of the employees in the workplace is very important for the sustainability and profitability of the organizations. Therefore, this study is evaluated from a marketing and managerial perspective so that companies can be more sensitive about the happiness of their employees. For this reason, it is aimed to examine the relationship between internal marketing activities and the happiness of the employees and to determine whether the working time causes a significant difference on the happiness of the employees. The research data was obtained from the employees of a maritime enterprise operating in Turkey, by means of an electronic questionnaire as a result of the convenience sampling method. As a result, in this study, internal marketing emerged as a 3-dimensional structure. It has been determined that there is a positive and significant relationship between internal marketing dimensions and employee happiness. In consequence of the regression analysis, it was determined that “education and development” and “vision and communication” dimensions had a positive effect on employee happiness, while the “performance measurement and rewarding” dimension did not have a significant effect. In addition, it was concluded that the working time did not cause a significant difference to the happiness of the employees.

Keywords: employee happiness, internal marketing, maritime business management, work outcomes, maritime industry

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Introduction

Today, many companies dream of having happy employees. In order to realize this dream, they look for different ways. As a result of these searches, companies that realize how important employee happiness is, want to do whatever it takes to increase the satisfaction and motivation of their employees. Because, when large companies are considered, leaders and managers realize that it is necessary to have happy employees for success and profit. In today's global world, organizations work in an intensely competitive environment. For this reason, organizations need to develop themselves in order to adapt to the competitive environment. Therefore, it is vitally important that employees, who are important resources for the success of organizations, are knowledgeable, responsible, able to establish good relations in the working environment and are happy. Employee happiness (EH) can increase productivity by resulting in a good attitude towards the organization (Chaiprasit & Santidhirakul, 2011: 190; Joo & Lee, 2017: 207). Various studies have been conducted to measure happiness at work. However, it is seen that most of the research concentrates on job satisfaction rather than evaluating the happiness of employees (Elnanto & Suharti, 2021: 312). The happiness of the employees is very important for the success of the enterprises. Happy employees can increase the profitability of institutions by showing high performance in their workplaces (Chaiprasit & Santidhirakul, 2011: 190; Joo & Lee, 2017: 207; Othman et al., 2018: 863). EH concept in the working place is important for organizations. However, it can be said that the studies carried out in this context are limited (Joo & Lee, 2017: 207; Elnanto & Suharti, 2021: 312). As per Bakker et al., (2008), vigor is defined by a high level of energy and adaptability, which motivates employees to strive for results even in difficult situations. The authors define dedication as a type of enthusiasm, inspiration, or pride that causes employees to see the value in their work. Absorption is defined as a happy feeling that employees experience when they are absorbed in their work to the point where they believe time passes quickly while working.

In service-oriented economy, businesses need to attach importance to service quality to gain long-term competitive advantage. Kotler et al., (2005) emphasized that service quality is the most crucial element of the competitive advantage of organizations. The rapid development of the service sector has revealed current marketing approaches. In this context, one of the most crucial approaches is internal marketing (IM). In the IM approach, employees are seen as internal assets of organizations (Yeniçeri et al., 2020: 477). IM considers employees as internal customers, businesses as a kind of product and an organization as a market (Tsai & Tang, 2008: 118). The concept of internal customers, expressed as employees working in the organization, is important in terms of improving the efficiency of an organization's production and service delivery process. Because the quality of the service provided in the service sector largely depends on the attitudes and behaviors of the employees who provide the service (Varinli, 2006: 108). It is not possible for unhappy employees who have constant problems with the organization they work for to provide quality service to external customers (Demir et al., 2008: 137). IM aimed at improving the quality of service, provides training to its employees for development and motivating actions in order to increase the quality of service provided by an organization to its customers (Ahmad & Al-Borie, 2012: 87). It can be said that improvements made in management processes as a result of investments in human capital will increase the quality of services. In this sense, human resources are vitally important for businesses to gain competitive advantage (Safari et al., 2017:2). It is stated that IM is a sub-title of both marketing and human resources management (Cioclov et al., 2016: 68). Therefore, when the literature is

examined, it can be seen that each study deals with the subject of IM from a different perspective. IM aims to establish a better bond between the employees and the organization by increasing the job satisfaction, happiness, performance and service quality of the employees (Akyüz & Yazıcı, 2022: 85). Job satisfaction is regarded as a good predictor of employee well-being (Grant et al., 2007) or as a dimension of workplace happiness (Ho & Kuvaas, 2019). Businesses in the maritime sector, which try to provide quality and effective services, offer supportive, complementary and facilitating services. They have important responsibilities for effective service delivery (Baran & Arabelen, 2017: 27). The maritime sector, which forms the basis of international trade and world trade, is of critical importance for business management. The maritime industry therefore requires highly trained individuals and teams to lead the development, implementation and control of contemporary management practices (Chen et al., 2018: 268). IM is presented as a useful tool for service-oriented businesses in establishing beneficial results (e.g., job satisfaction, organizational commitment, work attitude/behavior) in frontline employees; however, few empirical studies have been conducted to date to determine whether IM activities promote EH (Tang et al., 2020). For this reason, in this study, the effect of IM on EH, who are seen as the internal assets of the organizations, is tried to be determined. It is thought that the results of this research will contribute to both the maritime sector and literature.

Employee Happiness and Internal Marketing

There has been a significant increase in research on happiness in recent years. Interest in the subject has increased both in terms of the frequency of evaluation of this subject in research and in terms of the diversity of research areas that deal with this subject. Happiness is a serious issue that needs to be addressed not only from a philosophical point of view but also from a management point of view. However, studies in the field of management do not pay enough attention to happiness and this creates an important research gap (Yozgat & Bilginoğlu, 2020). Internal marketing is concerned with the relationship between management and front-line employees (Kaurav et al., 2015). The recent improvements in employee-friendly strategies by organizations have profoundly influenced employee's work activities. Especially after COVID-19, the gaining importance of human capital has seriously forced organizations to have strong IM activities such as CSR, in-house employee-oriented activities, company benefits, perks, and work-life balance initiatives, training, learning, development sessions and applications to make employees happy. Previous studies have stated that the goal of IM is to identify and satisfy employees' needs and desires to improve the service quality provided by internal customers to external customers (Rafiq and Ahmed, 2000; Dabholkar and Abston, 2008; Lings and Greenley, 2005). IM concept is based on the goal of satisfying employee needs and improving organizational commitment and performance prior to executing marketing mix in the external environment. Thus, the basic requirements for external marketing are the maintenance and satisfaction of HRs as internal customers (Taştan & Davoudi, 2020). According to Soderlund and Sagfossen (2017), happiness is positively associated with customers' evaluations of both service encounters and service firms. As a result, service employees' happiness should be treated as a business operations goal. Vasconcelos (2008) argued that working condition can be portrayed as a major source/channel shaping how happy or unhappy an individual feels in his/her live. Another research examined the effect of IM on EH and discovered that IM aspects

such as internal product, pays, workplace, and internal promotion had a significant positive impact (Isfahani et al., 2012). As a result, Howard and Gould (2000) proposed that organizations create an employee-centered working environment and culture, as well as an organizational structure, in order to develop happiness among service employees. They stated that in order to increase EH, organizations should apply effective methods of understanding employees' needs, such as enabling two-way and open communication activities (e.g., interviews, surveys) between staff and the chief executive officer. Based on the job demands-resources (JD-R) model, job resources stimulate positive workplace sentiments, resulting in increased work-related welfare for employees. Job resources are found at four levels: (1) organizational (e.g., career prospects, salary, job security); (2) interpersonal (e.g., leader and coworker support, team climate); (3) position (e.g., role clarity, decision-making participation); and (4) task (e.g., skill variety, task identity, task significance, autonomy, performance feedback) (Demerouti and Bakker, 2011). According to the revised (JD-R) model developed by Schaufeli and Taris (2014), positive job resources result in higher levels of employee health and wellbeing at work (e.g., happiness, perceived health, life satisfaction, organizational commitment, positive work-home interference).

Regardless of how good the technological facilities of organizations are, their most important resources are human capital. Human resources are the basis of the success of businesses operating in the service sector. It is also vital for businesses to gain competitive advantage. IM, on the other hand, is seen as an approach that can increase the performance, happiness, and service quality of employees. Organizations adopt an internal marketing approach to increase the value of people, an important resource. In this context, feeling good and happiness, which is directly related to the workplace and society, is an issue that should be considered for businesses. There are studies that have determined that there is a significant relationship between IM and EH in different service sectors (Nasrisfahani et al., 2012; Safari et al., 2017). In this study, it is aimed to determine the relationship between the IM approach and the happiness of the employees in a business operating in the maritime sector. Another aim of the research is to determine whether the working time in the institution causes a significant difference in the happiness of the employees. The research hypothesis created in this context is as follows:

H1: There is a positive and significant relationship between internal marketing and employee happiness.

H2: Working time causes a significant difference in employee happiness.

Material and Method

A questionnaire was used as a data collection tool in the research. In order to ensure the validity and reliability of the research, first of all, a literature review was made, and the resources related to the subject were used in the design of the questionnaire. As a result of the literature review, the internal marketing scale was adopted from Foreman and Money (1995) and the employee happiness scale was from Elnanto and Suharti (2021). In the literature, there are limited studies on both internal marketing and employee happiness. However, it is seen that studies in this context for maritime organizations, which form the basis of the economy, are extremely limited. For this reason, the sample of the research consists of randomly selected participants from

among the employees of a maritime business operating with approximately 450 employees in Turkey. Since it would be difficult and costly to reach the whole of the main mass, the convenience sampling method was preferred in the research. There are 21 questions in the survey. The research data were obtained as a result of the electronic questionnaire applied with a 5-point Likert Scale to 226 employees between February 15, 2022 and February 23, 2022. According to Tabachnik and Fidell (2007), the study ($n > 50 + 8m$) meets the minimum sample size criterion. The first part of the questionnaire is on a 5-point Likert scale (1: Strongly disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree). The second part consists of questions about the demographic characteristics of the participants. The demographic characteristics of the participants in the study are shown in Table 1.

Table 1. Demographic information about participants

Educational Status	N	%	Gender	N	%
Elementary education	2	0.9	Female	67	29.6
High school	4	1.8	Male	159	70.4
College/University	200	88.5	Marital Status	N	%
Postgraduate	20	8.8	Married	107	47.3
Age	N	%	Single	119	52.7
18-25	6	2.7	Term of employment (year)	N	%
26-33	65	28.7	1-9	153	67.7
36-41	122	54.0	10+	73	32.3
42-49	23	10.2	Total	226	100
50 +	10	4.4			

As it is seen in Table 1, approximately 30% of the participants are women and 70% are men, and their marital status rates are close to each other. It is seen that 88% of the participants in the study are university graduates and the majority of the participants are between the ages of 36-41. Another result of the demographic analysis of the research is that approximately 68% of the participants have been working in the relevant institution for 1-9 years, and 32% of them have been working in the relevant institution for 10 years or more.

Results

The data were analysed with the IBM SPSS Statistics 24 package program. Reliability analysis was applied to measure the reliability of the questionnaire questions. Reliability analysis needs to be first applied to each factor separately, and then the whole needs to be looked at (Yaşlıoğlu, 2017: 78). For this reason, reliability analysis was applied to each factor created with the Likert scale. According to the analysis, the internal marketing scale was found to be 0.918 and the employee happiness scale was found to be 0.893. Afterwards, reliability analysis was applied to all questions and the overall Cronbach's Alpha coefficient was determined as 0.936. The fact that the alpha coefficient is in the range of 81%-100% indicates that the research is very reliable (Nakip, 2013: 205). Principal components analysis and varimax transformation were used in factor analysis. As a result of factor analysis, internal marketing was grouped under 3 factors. Therefore, in our study, the dimensions that form the internal marketing variable were determined as "education and development," "vision and communication" and "performance measurement and rewarding." The results are shown in Table 2:

Table 2. Results of factor analysis

Variable	Question	Factor Load				Eigenvalue	Cumulative%
Education and Development	IM1	0.679				9.324	44.401
	IM2	0.649					
	IM3	0.778					
	IM4	0.795					
	IM5	0.685					
	IM6	0.654					
	IM7	0.622					
Vision and Communication	IM8		0.537			1.649	52.255
	IM11		0.755				
	IM12		0.522				
	IM14		0.810				
Performance Measurement and Rewarding	IM15		0.853			1.005	57.042
	IM9			0.855			
	IM10			0.876			
	IM13			0.909			
Employee Happiness	EH1				0.679	2.120	67.138
	EH2				0.649		
	EH3				0.778		
	EH4				0.795		
	EH5				0.685		
	EH6				0.654		

KMO: 0.888; Approx. Chi-Square: 3217.580; Bartlett's Test of Sphericity: df 210; Sig: 0.000.

Bartlett's sphericity test results in Table 2 show that there is a sufficient level of relationship between variables for factor analysis ($p < 0.05$). The KMO Sampling Adequacy Test is an index that compares the size of the partial correlation coefficients with the observed correlation coefficients and shows the suitability of the data set for factor analysis. Since the KMO value is 0.888, it is considered to be good (Kaiser, 1974: 35). The total Eigen value of each variable used in the study is greater than 1. Cumulative variance is 67.138%. It is also seen that the factor load in each scale in the study is 0.50 and above.

Analysis Results

Within the scope of the research, correlation analysis was used to determine the relationship between internal marketing dimensions and employee happiness, and multiple regression analysis was used to determine the effect. In addition, determining whether the working time causes a significant difference on employee happiness was analysed with the t test. Analysis results are given in the tables below:

As seen in Table 3, as a result of the correlation analysis, it was determined that there was a positive 1% level significant relationship between the variables. It has been concluded that the most related dimension of internal marketing with employee happiness is "education and development." In this context, other related variables were "vision and communication" and "performance measurement and rewarding," respectively. Therefore, it was determined that there is a positive relationship between internal marketing and employee happiness and H1 was supported.

Table 3. Results of correlation analysis

Mean	Standard Deviation		Education and Development	Vision and Communication	Performance Measurement and Rewarding	Employee Happiness
4.20	0.639	Education and Development	1	0.582	0.561	0.618
4.22	0.678	V Vision and Communication		1	0.700	0.539
4.25	0.626	Performance Measurement and Rewarding			1	0.469
4.30	0.697	Employee Happiness				1

* Correlation is significant at the 0.01 level.

Table 4. Multiple regression analysis results

Variable	B	Standard Deviation B	β	t	p
Constant	0.964	0.272		3.544	0.000
F1 – Education and Development	0.490	0.070	0.449	6.965	0.000
F2 – Vision and Communication	0.254	0.077	0.247	3.305	0.001
F3 – Performance Measurement and Rewarding	0.048	0.082	0.043	0.590	0.556

p: 0.000 Dependent Variable: Employee Happiness.

Regression coefficient results in Table 4 are considered acceptable at the 0.05 significance level. When we look at β , it is seen that the most important internal marketing variable for the employee happiness scale is “education and development,” and the other variable is “vision and communication.” On the other hand, “performance measurement and rewarding” dimension did not have a significant effect on employee happiness.

$$\text{Employee Happiness} = 0,964 + 0,449 F_1 + 0,247 F_2$$

According to the regression equation created for employee happiness, 1 unit increase in Education and Development (F1) increases employee happiness by 0.449, and 1 unit increase in Vision and Communication (F2) increases employee happiness by 0.247 units.

Table 5. Employee happiness - results of t-Test

Operation Time	N	Mean	t	p
1-9	153	4.36	1.74	0.084
10+	73	4.19		

In Table 5, the p value, which shows whether there is a significant difference between the working hours of the participants and the happiness of the employees, was found to be 0.084. Since $p < 0.05$ is required for a significant difference between the two samples averages were compared, no significant difference could be found between the working time and the happiness of the participants. Therefore, H2 is rejected and Figure 1 can be seen as follows:

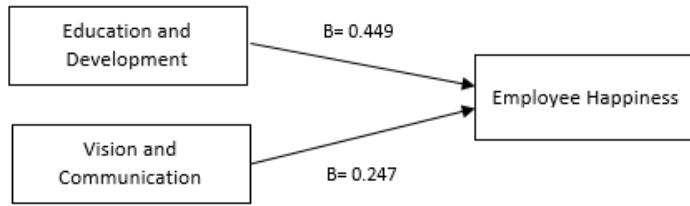


Figure 1. Result model.

Discussion

In the literature, studies on EH and IM may be encountered; however, there is still a scarce number of studies in this field, even less in the maritime sector. In the research of Tang et al., (2020) on flight attendants, the authors use affective event theory (AET) to show the connection between IM, the work-family interface, and EH. Only one internal marketing dimension (compensation) has no significant relationship with happiness. Other dimensions of internal marketing, such as communication, welfare systems, training, and management support, have been found to be significant predictors of flight attendant happiness (Tang et al., 2020). An airline that is ranked second best in the United States highlighted that happy employees establish happiness for both their shareholders and their clients (O'Reilly and Pfeffer, 2000). Demerouti et al., (2019), in their study on pilots, discussed that the personal development possibilities, along with access to support from colleagues or the organization, are useful occupational resources that moderate the pilot's level of happiness. Leaders are viewed as a crucial defining factor of internal marketing success (To et al., 2015) and employee happiness (Howard and Gould, 2000; Sallas-Vallina et al., 2018). Frijda (1993) observed that a single emotion is not caused by a single environmental feature/event, but rather by a series of emotional transactions in response to various relevant features/events. Furthermore, Carbonell and Gowdy (2005) conducted research on the impact of environmental awareness part of Corporate Social Responsibility on employee well-being (happiness) and concluded that environmental awareness strongly correlates with well-being. Employees who are aware of the environment will be keener to use it if their organization has a higher level of well-being. On the other hand, to further scientific progress on the topic, Ravina-Ripoll et al., (2019) conducted a microanalysis of the level of employee happiness among those actively implemented in the Spanish industrial sector. A correlational study was conducted using primary data from the Center for Sociological Research's barometer (CIS). An ANOVA analysis was carried out on this data, and the results show that the overall rate of happiness for employees is still quite high. Individual employee happiness is also straightforwardly related to personal income, rather than aspects relevant to family life, according to the findings.

Practical Implications

- Be transparent to your employees about what's going on in your company.
- Organizing events and social contacts for employees will increase their happiness. Working with managers they cannot reach creates dissatisfaction in them.

- It's important not to miss evaluating a company's employee satisfaction surveys.
- Respect and appreciate employees.
- The leader should set a good example. Being able to successfully balance work and life in today's busy working conditions has become a very difficult struggle. For this, managers/leaders should support their work-life balance instead of hindering them.
- It is necessary to create an excellent work environment.
- It is necessary to offer good bonuses.
- Employees should be given the opportunity to work independently.
- Because employees play an integral role in the internal marketing efforts, it's important for them to feel safe sharing positive or constructive feedback. By holding roundtable discussions, it can be ensured that they also express their demands and dissatisfaction with the business. In a roundtable discussion, employees can agree to disagree by expressing their opinions openly and remaining respectful.

A happy employee always clings to his work more tightly and embraces it more, and this creates an increase in the efficiency of that employee's job. Motivated employees perform their assigned tasks on time and happily. At the same time, the highly motivated employee takes the initiative and is willing to take on additional responsibilities. It can be said concretely with the studies and outputs that there is an absolute relationship between the person who works happily and the performance he provides. In addition, the happiness of the employees emerges as a direct determinant of customer happiness.

Limitations and Future Research Directions

By acknowledging the limitations of this study, insights for future research can be recognized. First, this study focused on maritime employees working in a ship management company based in Turkey, which may restrict the findings' generalizability. To clarify how well different internal marketing activities influence different types of customer-contact employees, future investigations should repeat this study using other samples, such as seafarers, ship agents, and port area specialists, in other countries. Second, at a specific point in time, the employee's happiness level is assessed, which may vary depending on the different timing of survey answering.

Conclusion

Overall, it is possible to say that the biggest goal of human resources is to create happy and committed employees. Therefore, human resources departments need to review all their processes and implement employee-oriented policies. If corporations want to create value for their employees and achieve their goals within this framework, they must first invest in a well-designed internal communication system. The findings obtained within the scope of the research showed that there is a positive relationship at 0.01 significance level between IM dimensions, which emerged as "education and development," "vision and communication," and "performance measurement and rewarding," and the happiness of the employees. Since

internal marketing emerged as a multidimensional structure in our research, it was also tested whether the variables were effective on EH. As a result of the analysis, it has been determined that the most important IM variable for EH scale at the 0.05 significance level is “education and development,” and the other variable is “vision and communication.” On the other hand, the “performance measurement and rewarding” dimension did not have a significant effect on EH. In addition, it was concluded that the working time did not cause a significant difference in the happiness of the employees. In maritime, one of the most basic sectors of world trade, management and marketing have critical importance. For this reason, organizations need to adopt an IM approach and strive for their happiness to ensure that their employees can fulfil their responsibilities in providing quality services effectively. Happy employees mean happy customers for organizations. To summarize, employee happiness includes many options along with happiness, satisfaction and commitment in order to progress in a successful and sustainable way. In this context, it is thought that the current study will provide information to organizations, in the maritime sector, and contribute to future studies.

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Chapter 2

Cognitive Studies in the Maritime Domain

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Abstract

In our technological world, the human factor plays a key role in many industrial and civil operations, and is likely to cause more accidents than those caused by technical malfunctions. Solving problems and completing assigned tasks require the capacity to process information. This capacity is referred to as "cognitive ability." The International Maritime Organization has decided that "human element issues" have a high priority in the organization's work program since they play an imperative role in preventing maritime accidents." Cognitive abilities are the capacities to receive input, interpret information, and turn results into action to produce information from the external environment. At the same time, cognition is the system formed by these capacities.

Ships are complex systems, and stressors that accompany life onboard can directly impact the cognition process and information cycle of personnel. Studies have identified that errors onboard can arise from the "human factor," highlighting the importance of considering the cognitive processes of onboard personnel. As a result, alterations in an individual's psychological and physiological state, as well as changes in the ship's environment, can significantly impact cognitive processes involved in information acquisition. Therefore, it is critical to consider the impact of these factors on cognitive processes when investigating information acquisition. Considering the ecological, psychological, and physiological changes that crew members experience onboard a ship, stress factors are one of the most significant causes of loss of cognition. It is essential to recognize this and take steps to minimize stress levels for onboard personnel to maintain optimal cognitive function.

Most of the cognitive studies on seafarers found in literature are based on experiments conducted in simulator environments, highlighting the need for more research in natural environments. As such, this section of the book will explore the concept of cognition and its relationship with the maritime industry. Topics to be discussed include cognitive applications in maritime settings, comparative cognitive models, and the role of motivation and development in cognitive performance. By delving into these areas, this book aims to provide a comprehensive understanding of the cognitive processes involved in maritime operations and how they can be improved for better outcomes.

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Introduction

Cognitive psychology is the study of the human mind, which encompasses not only thinking and reasoning but also language and memory. These and other topics related to cognition serve to illustrate, explain, and shed light on various aspects of cognitive neuroscience in a variety of diverse ways. Cognition is another word for psychology (Solso, 2016).

The word "cognition" refers to both the mind and the activities that take place inside it.

Cognition covers "knowledge," "memory," "reasoning," "problem-solving," and "thinking." A person's level of cognition may be directly correlated with how much they think about things. The term "cognition" refers to the intellectually accomplished action of information that has been gained via intuitions, emotions, or occurrences (Li, 2008). Cognition is the mental process through which a person makes sense of the information that they have gleaned from their interactions with the outside world. The process of taking in and making sense of information from the environment is what we mean when we talk about cognition. Cognition also may be defined as a system of knowledge, belief, or thinking that is processed by a person in connection to his or her internal circumstances as well as the physical and social world in which the individual resides. It might be anything that a person knows or observes in their environment. Cognitive structure and perception comprise cognition (Ucak & Guzeldere, 2006). Cognitive sciences have a significant impact on the occupational belongingness, job satisfaction, and internal customer satisfaction of seafarers. Although the links between organizational outcomes in the marine industry are essential for the proper functioning of relationships on board, they have not received much attention until now (Ozdemir et al., 2022). Cognition is the result of complex mental processes. Brain functions include attention, perception, memory, language development, reading, and writing, problem-solving, remembering, thinking, intelligence, and creativity, among other things. It is a broad term that encompasses anything from (MEB, 2009). The process of cognition evolves and expands. Cognitive development is the process by which a person's mental activities changes in thinking, reasoning, memory, and comprehension systems evolve over their lifetime, allowing them to understand and acquire knowledge of their surroundings. This process begins in infancy and continues into adulthood. Piaget's theory of cognitive development posits that it occurs concurrently with the maturity of an individual's brain and nervous system, as well as the accumulation of life experiences that facilitate the individual's adjustment to their surroundings (Piaget, 1976).

The Psychological Toll of Seafaring

MacLachlan (2017) has described maritime psychology as “the study and practice of the interplay between human behavior and the maritime environment”. Ships often go through traffic-heavy routes, in narrow and dangerous waterways, which can be considered as demanding cognitively and ask for precise judgment, extensive team management, teamwork, and a considerable amount of skill. The destructive and restorative aspects of onboard life have

been accepted as putting a psychological toll on seafarers dramatically (MacLachlan, 2017). Seafaring has various combinations of paradoxes for instance exclusion from social life, confinement in open spaces, and multicultural working environment inside of a sole organizational culture. Invariabilities just as isolation from social life and delimitation of the same shipmates are evident onboard a ship as regular living conditions even though social changes have been obvious in recent years (Alderton et al., 2004). On top of the harsh working and living conditions, the regular tasks of officers and crew onboard a ship have increased, including ensuring the safe functioning and operation of a ship's machinery and equipment (Borodina, 2013). Lipowski et al. (2014) stated that seafarers are included in a professional group highest risk for stress and other researchers stated the mental well-being of seafarers (Jeżewska et al., 2006) while stating that the mental health of seafarers to be properly studied, and measured and investigated (Carotenuto et al., 2012). Doyle et al. (2016) and Oldenburg et al. (2013) suggested the need for assessment of the complex work lives of seafarers while onboard particularly the psychosocial aspect of their lives and Schager (1997) emphasized that modern scientific psychology application could benefit the maritime industry. The Compendium of Maritime Labor Instruments has summarized how the maritime industry is supposed to be working in its revised second edition published in 2015, which contains the MLC 2006; the Seafarers' Identity Documents (Revised) Convention (2003); and the Work in Fishing Convention and Recommendation (2007). These instruments are about relationships between people both working and living in compelling and complex conditions that would require a high degree of teamwork, dialect, physical and cognitive skills, and human interaction (ILO, 2006). Although the degree of requirements and effects of onboard life on twelve seafarers are considered high MacLachlan (2017) notes that the conventions that are addressed in the context of human factors omit the term "psychology". Indnani (2013) have detailed a range of problems considering psychological factors that are stated to be important in maritime. These include job descriptions, working hours and manning ratios, piracy and other crimes with their associated trauma and caused reactions, incidents with high severity, drowning, injury and/or suicide of seafarers, various health hazards caused by working environment associated not only to working conditions but also with carriage of dangerous cargoes which require precise handling, safety, and security requirements, motion sickness and fatigue. In the literature, psychological factors of individual conditions caused by the onboard working environment are affecting seafarers considerably. Being homesick, loneliness, isolation onboard ships, and asocial living tendencies are the most distinct psychological factors (Carter, 2005; Caronuto et al., 2012).

The Impact of Maritime Work on Cognitive Processes and the Importance of Human-Related Factors in Ensuring Safety

Since the beginning of time, people have been aware of the psychological consequences that being a sailor may have on crew members. The fast development of transportation infrastructure and the rising demand for marine transportation are both reflections of the consequences that globalization has had on the individuals who work aboard ships. There are a lot of impacts that may be displayed, some of which include an increase in the number of working hours, frequent and uninterrupted port times, frequent and uninterrupted voyages, and

a reduction in the number of ship workers working on board. In the field of cognitive science, mental processes like thinking, learning, memory, decision-making, dialectic, and response time are addressed. Additionally, cognitive functioning and the working efficiency of the brain are studied, as are system dynamics and structural order. Changes in one's state of mind, such as arousal and stress, brought on by circumstances outside of oneself may have an impact on cognitive processes. When one considers the psychological challenges of working on the ship, as well as the fact that the working environment on the ship is a complex structure consisting of stress-inducing factors that affect the ship's people psychophysiological, one can see that the ship's people are experiencing a decline in their cognitive abilities. In contrast to this circumstance, the cognitive performance and situational awareness of the people working on the ship need to be high for them to be able to complete tasks that involve major financial, environmental, and health risks. Some examples of these types of tasks include ship management and cargo operations. According to the International Maritime Organization (IMO), the majority of accidents in maritime transport that cause damage to the environment, human life, and the economy are the result of human error. The IMO also stated that it is necessary to focus on human-related activities to ensure a safe working environment. In addition to this, in order to maintain high safety standards, reduce the number of accidents, and safeguard the environment, it is essential to concentrate on the human component. The International Maritime Organization (IMO) emphasized that human-related concerns are accorded a high priority in its work programs. The ship's design, as well as its systems and operations, are all significantly influenced by the human element. The human component of a ship's operation does not begin the moment the vessel enters the water; on the contrary, it is a key factor in every stage of the ship's lifecycle, beginning with the design phase and continuing through its construction in the shipyard and its operation on the water itself. The environment that a person is in has a significant bearing on the frequency with which they make errors. This atmosphere is contingent on a wide range of elements, including working hours, workload, levels of weariness, and psychological considerations. The gravity of the mistakes may rise in tandem with these circumstances. Errors caused by humans may be traced back to disruptions in the processing of information or to an inaccurate or insufficient understanding of that information.

A person's cognitive capacity may be described as their ability to process and perceive information. Cognitive talents involve interpreting data from the environment and translating it into action, with the process occurring in the brain. Studies on seafarers are mainly conducted in simulator environments, and more research is needed to understand cognitive performance in natural settings. This book section will discuss cognition in the maritime industry, cognitive applications, and factors affecting cognitive performance. Ultimately, the goal is to improve safety and performance in maritime operations. The system that they form, which includes everything that can be sensed, is known as consciousness. The encoding of cognitive capacities in the brain occurs as a direct result of previous experiences. The following are the four subheadings that may be used to characterize these capabilities:

- Ability to obtain information,
- Ability to learn quickly,
- Ability to adapt to unknown situations,
- Ability to generate knowledge for future use.

Consequently, the performance assessment of cognitive processes is critical not only for the workers who are employed by marine enterprises but also for their employers. The essential qualities may be used to classify distinct types of cognitive processes. The acquisition of cognitive capacity is influenced by changes in the environment, mind, and body. The effects of changes in the environment, psychological state, and physiological condition are crucial factors in cognitive processes when studying the acquisition of information. Cognitive processes begin when a person is presented with stimuli or information from their environment. Therefore, it is important to consider how changes in these factors affect cognitive processes involved in information acquisition. Only a small portion of the data collected by the different sensory registers is retained, while the vast majority of it is lost. It is possible to retain information from the senses in short-term memory if you pay attention to anything and pay attention to what you are seeing. There is a limit to the amount of data that can be temporarily kept in one's short-term memory. This location is responsible for the archiving of data as well as its processing. Knowledge is successfully stored in long-term memory thanks to the cognitive processes that are responsible for doing so. The literature has been enlightened by Lazarus' Transactional Stress Theory (TST), which throws light on the tension that exists between stressors and stressors. This tension has been called "the tension that exists between stressors and stressors." According to this point of view, a person's life is put in jeopardy by some factors in their surrounding environment that may be categorized as stresses. One of these hypothetical situations that might endanger a person's safety is when they are concerned that they do not have the means to fulfill the essential needs that they now have. When seen from the perspective of a person, a situation is said to be stressful if it causes that individual to have the perception that they are in danger as a direct consequence of the circumstances. The one-of-a-kind characteristics that make up each person result in a wide range of reactions from individuals when confronted with these threats.

Cognitive Performance Assessment and Evaluation of Performance in Severe Weather Circumstances for Seafarers

Lack of situational awareness is one of the reasons accidents are caused by the human component, and when the studies on the causes of stress are considered, this is another cause of accidents that are caused by the human component. At the moment when the concept of situational awareness is considered, it is stated as the meeting point of the human component and cognitive psychology. The definition of this model, which was developed by Endsley (1995), can be described as the observation of assets in a particular setting, as well as the comprehension of their significance or the forecasting of their position in the not-too-distant future. It has been defined as the consciousness of the current condition, when it comes to optimization, there is a significant link that exists between the amount of work being done and a person's knowledge of their current condition. The circumstance in which one can achieve the maximum possible degree of situational awareness is the workload that is considered ideal. There is an inverse link between the amount of work being done and one's ability to remain aware of their surroundings when one considers circumstances that do not involve this junction point. It is essential to have ship employees who are qualified to operate at sea to protect the environment, the lives of people, and the economic stability of the country in the maritime

industry, which is expanding at a rapid rate. This is done to protect the economic stability of the country.

Sailors engage in a wide range of mental tasks that require them to process the information on a myriad of distinct levels. Hence, the performance assessment of cognitive processes is critical not only for the workers who are employed by marine enterprises but also for their employers. The essential qualities may be used to classify several types of cognitive processes.

These are organized under the following categories:

- Attention
- Perception
- Coding
- Repetition

Regarding these criteria, the following parameters are used in the measurement of cognitive performance:

- Attention
- Concentration
- Reaction time
- Memory
- Information processing
- To decide
- Administrative functions
- Tongue
- Arithmetic abilities

Under the vast literature on maritime transport, there have been some studies conducted on human factors, stresses, and situational awareness; however, cognitive performance assessment and evaluation of performance in severe weather circumstances have not been discovered. In addition, there is a deficiency in the assessment of numerous psychophysiological symptoms in marine travel that may be found in the literature. Some of these symptoms include anxiety, motion sickness (seasickness), and impaired cognitive function.

In Koseoglu (2018), the cognitive performances of seafarers were evaluated utilizing a pre-test and a post-test approach while under the influence of stress-inducing factors such as seasickness, noise, and anxiety, which occur during severe weather conditions. The pre-test was given before the post-test, and the post-test was given after the pre-test. The scenarios had been created using realistic bridge simulators. The outcomes of the application, had been assessed in real-time considering cognitive performance criteria. To determine the participants' levels of cognitive ability, the study had made use of a test known as CoPeT (Developed by Zorluoglu, et al). This test comprises of question groups that are structured in a manner that is consistent with the cognitive performance criteria. The participants who had volunteered to take part in the application of the CoPeT test had been selected among the seafarers who had at least more than nine months of onboard experience Throughout the first stage of the procedure, their reaction times had been measured using a stopwatch. The overall scores of the participants on the tests, in addition to the total length of time it took each of them to complete

the tests, had been recorded to be evaluated. Each participant who had answered a question or completed an exercise correctly earned one point at the end of the exercise. The second portion of the experiment consisted of putting the participants through the bridge simulator scenario. Following the presentation of the scenario that had been exhibited to the participants, they were instructed to enter the Bosphorus after a model chemical tanker had been positioned adjacent to Burgaz Island. The scenario that had been constructed take traffic separation scheme into accounts as well as general wind direction and wind speed averages as well as set and drift regime of Istanbul Strait. The participants had started the scenario under conditions of 7 Beaufort weather and sea, and during the simulation, which lasted for a total of 40 minutes, the weather had been made increasingly worse every 10 minutes. Various ships were arranged in such a way as to cross the bow and stern sides of the ship that was being used by the participants in the simulation by the path that was taken while the simulation was being carried out. The increase in traffic density contributed to stress and to express the high traffic in a way that was as realistic as it could be. In the third and final stage, the CoPeT application had been carried out with each participant once again, and their completion times as well as their test results were recorded. During the fourth phase of the process, the data that were obtained were subjected to statistical analysis with the aid of the SPSS 25. Because of the participants' increased situational awareness and the fact that the exam was given to them a second time, the overall amount of time it took them to finish the test was cut by 17.56 percent, as shown by the author's findings. Despite the participants' exposure to stressful situations, their situational awareness improved as a result of the high traffic and the restricted navigation in the narrow waterways. There was a 0.07% increase in the participants' overall score when it was taken into account. It was determined that stressor variables were to blame for the lack of this increment. The percentage of people who pass the attention test has been also observed to be increasing. When cognitive criteria were investigated, an improvement in information processing performance was seen (Koseoglu et al., 2019)

Psychological and Physical Factors Affecting Seafarers' Performance and Safety

The most distinct psychological factors of all seafarers have been stated as being away from their families and loved ones in various the studies (Thomas et al., 2003; Oldenburg et al., 2013; Rengamani and Murugan, 2012). Gregorio (2012) has stated that loneliness causes seafarers to become more courageous in sexual intercourse and more open to sexual infections. Day et al. (2012) carried out a questionnaire on seafarers to analyze the relationships between maritime accidents and psychological conditions. It has been found that the major causes of cognitive errors were anxiety and stress, and it has been observed that seafarers that had experienced an incident before had done more cognitive errors. As a result, anxiety and individuals with anxiety tendencies may experience more cognitive errors and this may cause incidents.

International Ergonomics Association (IEA) have defined the human element as; a scientific subject explaining the relationship between humans and environmental parameters and other humans. Principles, theories, and applications of methods for enhancing human effectiveness and work performance are included in this subject. (IAE, 2014) In recent years while a considerable number of studies and applications have been carried out, it has been

aimed to standardize and limit working conditions. According to the literature, the effects of long working hours can be seen on physical, emotional, and cognitive performance.

Long working hours in the maritime industry are one of the most important parameters creating sleep depravity and exhaustion (Smith, 2006; Wadsworth et al., 2008; Xhelilaj & Lapa, 2010). The impact of long working hours on personnel injuries and ship mishaps has been identified as a significant issue in accident investigation reports and related analyses (Russo et al., 2020). Various studies have demonstrated the negative effects of extended shifts and shift structures on psychophysiological wellbeing (Cook & Shipley, 1980; Brown, 1994; Lal et al., 2000; Gundel et al., 2007; Wilson et al., 2007; Jackson et al., 2006; Rai et al., 2012). Moreover, (Lutzhof et al. 2010; Hansen and Holmen, 2011) found that watchkeepers with 6 to 6 schedules suffered from more sleep deprivation and longer reaction times compared to those with 4-8 watches. Insomnia and excessive workload were highlighted as factors that not only cause fatigue but also affect cognitive performance (Yılmaz et al., 2013). Veasey et al. (2002) noted that long working hours leading to sleep deprivation can reduce cognitive and procedural learning by 50%. Fatigue was defined as the decline in working capacity, attention, perception, reaction, and decision-making performance (Cercarelli and Ryan., 1996; IMO, 2001). According to the IMO, physical, mental, and emotional strain can decrease physical and/or cognitive skills such as decision-making, perception, reaction, speed, balance, and coordination.

The Effects of Stress Factors on Seafarers' Cognitive Performance: A Study Using EEG Technology

In maritime transportation, many studies on stressor factors had established stress criteria for seafarers. A considerable amount of thesis, articles have studied errors originating from human factors and measured stressor factor levels of seafarers focused on fatigue (Bal, 2011; Yuksekıldız, 2012; Kircher and Lutzhof, 2011, Tac and Tavacioglu, 2012). On the other hand, Koyuncu and Tavacioglu (2017) examined human factor accidents caused by communication. As an alternative, they evaluated that the use of sign language would be beneficial to the maritime language and to reduce human-induced accidents. In the study carried out by Ozsever and Tavacioglu (2018), fatigue has been stated as a symptom of the working period and a stressor factor for shipboard safety and personnel health. There are studies in the international literature that address fatigue level as a dimension of the human factor. Horizon Project, which is a European Union Project, in terms of fatigue and cognition, is an important contribution to the international literature. One of the stressor factors stated above while living onboard is working in a moving environment and adverse weather conditions, which forms an imbalance on seafarers and creates a working environment that is both dangerous and causes motion sickness. Motion sickness was described as "sickness induced by motion (as in travel by air, car, or ship) and characterized by nausea" (Motion Sickness). Although motion sickness occurs depending on multiple parameters such as environmental conditions, gender, psychological, etc., motion is the main parameter. These motions usually are physical and stimulate the balance organ located inside the inner ear (Mackinnon, 2005).

In research regarding motion sickness often, the effect of vision has been neglected. Considering naval activities, motion sickness is also ascertained when the visual setting moves

with the subjects. As explained by Mackinnon (2005), Even in conditions where physical motion is non-existent, visual motion can also cause motion sickness because the receptors of the eyes receive the signal which converges with balance organs in vestibular nuclei. This convergence creates the illusion of physical self-motion and generates nausea or motion sickness. In this state, vision may also generate sickness alleviation, which affects individuals' performing daily activities, or may reduce their cognitive performance. In his study on ship simulators and motion sickness, it has been found that vision is effective while being inside of a structure similar to a bridge of a ship with limited vision of surrounding areas. Effects of sickness on task performance have not been observed.

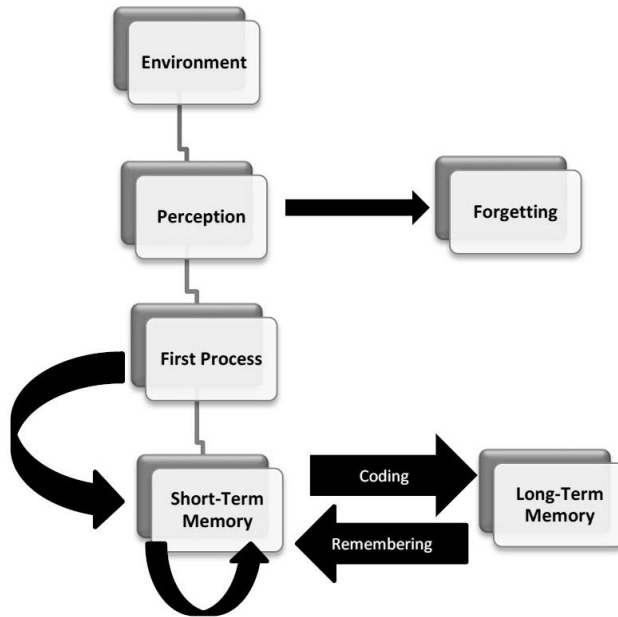


Figure 1. Information processing theory.

Cognitive processes, as mentioned above (Figure 1), are the processes that are able transferring of information from sensory recordings to short-term memory, information storage in short-term memory, and information transfer to long-term memory (Woolfolk, 1997). In order to measure the cognitive performance of seafarers; Tac (2012) had been used "Automated Neuropsychological Assessment Metrics (ANAM4™)" application, which consists of 22 different computer-based cognitive tests. In addition, EEG technology had been used to evaluate the changes in the brains of seafarers under stress factors during the operational processes they carried out on the ship. Research sample had consisted of 140 seafarers in three strata: 37 oceangoing masters (aged from 33 to 54), 47 oceangoing chief officers aged from 28 to 39) and oceangoing watchkeeping officers (aged from 22 to 31). These seafarers had the same education level (graduate) and no significant history of neurologic injury or disease. All participants were volunteers and received no immediate benefits from participating in this study. The collection of qualitative and quantitative data for hypotheses was provided in five steps (Tac., 2018). The cognitive study of Harris (2003) on soldiers had been used to evaluate the effects of fatigue and insomnia on cognitive performance regarding operations performed during navigational shifts. A battery consisting of five different ANAM4™ tests had been