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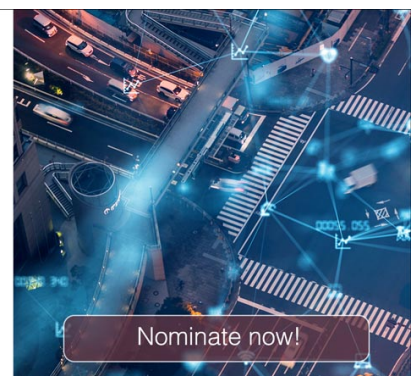


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# Professional Adjustment Variables Onboard the Seagoing Ships

**Carmen Luminita COJOCARU<sup>1</sup>, Catalin POPA<sup>2</sup>, Taner ALBAYRAK<sup>3</sup>, Alecu TOMA<sup>4</sup>**

<sup>1</sup> Mircea cel Batran Naval Academy, Romania, [carmen.cojocaru@anmb.ro](mailto:carmen.cojocaru@anmb.ro)

<sup>2</sup> Mircea cel Batran Naval Academy, Romania, [catalin.popa@anmb.ro](mailto:catalin.popa@anmb.ro)

<sup>3</sup> Piri Reis University, Turkey, [talbayrak@pirireis.edu.tr](mailto:talbayrak@pirireis.edu.tr)

<sup>4</sup> Mircea cel Batran Naval Academy, Romania, [alecu.toma@anmb.ro](mailto:alecu.toma@anmb.ro)

**Abstract.** *The professional activity carried in the maritime sector requires not only a broadly educated and intensively trained human resources, but also a very strong psychosocial profile on individual and crew level, for onboard team members, for the sake of economic efficiency and effectiveness of transportation services. In this complex environment, the paperwork is depicting a statistical study on the major factors influencing the professional adjustment and adaptation variables to be considered on a professional level for seagoing personnel as following: the "human factor", the "working conditions onboard" and "cultural diversity". Using a questionnaire applied on 58 subjects, men and women gender seafarers, the authors had carrier a statistical analysis of the chosen item impact on both genders, reflecting the major differences, in any, in between. Conclusions have shown that both genders will perform properly onboard, with no significant difference, but assuming the assigned onboard role in the team, transcending from an individual perception to the collective rationales and imperatives. The present research has been carried out by the authors within MENTORESS project - Maritime Education Network to Orient and Retain Women for Efficient Seagoing Services.*

## 1. Introduction

The professional activity carried in the maritime sector requires not only broadly educated and intensively trained human resources, but also a strong psychosocial profile on individual and crew level. Onboard the ships, in the center of this psychosocial entity, can be found specific mixtures among social multicultural micro-groups, defined in particular by diversity. The crew diversity is not only a determined by culture, religion, customs, traditions or gender but also by the educational, training or experience background of the individuals, aggregated on a complex interactive manner as crew, on different ship services (A. Tabachiu, 2003, Gh. Iosif, 2001).

On the other hand, the professional activity in the naval sector can be oriented toward efficiency and effectiveness taking into account both major aspects of the environment of activity, namely physical labour conditions and the psycho-organizational environment embedded by the professional and behaviour features of the professional activity onboard, carried out within a high risk and uncertainty climate. In regard of onboard particularities, the risk is essentially a subjective psychological resort that refers to the possibility of negative events to interfere in a certain situation, causing a certain loss. The way of how the crew members perceive this potential threat and how they



would react to this threat is depending on several factors as following: personality structure, personal attitudes, actual disposition, context specificity or cognitive biases. (Hăvârneanu, 2015, pp. 16)

In this context, the work security and safety and the success of the carried mission become the major focusing objective to the crew management, all of other psychosocial variables being considered subordinated, including here the inventory of individual factors (i.e. as the inter-individual differences on gender) and situational factors (i.e. onboard working conditions, environmental risk, cultural diversity) that would affect behavioural adjustment and its effectiveness.

## 2. Research methodology and study hypothesis

The null hypothesis ( $H_0$ ) of the study postulates that there are no statistically significant determinations caused by the gender issue against the factors that could influence the success and safety of the professional performance on board the vessels. Under the conditions of the rejection of the null hypothesis, the following alternative assumptions could become plausible:

- $H_1$ : There are statistically significant differences between women and men in terms of the **human factor** involved in achieving the success and safety of the work mission on board ships;
- $H_2$ : There are statistically significant differences between women and men in terms of **cultural diversity** as supporting factor in achieving the success and safety of the professional performance on board ships;
- $H_3$ : There are statistically significant differences between women and men in terms of **working conditions** provided in order to achieve the success and safety of the mission on board ships;

The verification of these hypotheses is based on a simple factorial design, including the following variables:

- Biological gender (nominal independent variable with 2 levels: male and female);
- Human factor (scalar dependent variable);
- Cultural diversity (scalar dependent variable);
- Working conditions on the ship (scalar dependent variable).

The minimal size of the research group in order to meet the parametric analyzes assumptions should consist of 60 observations at least, equally divided into the two groups determined by the independent variable.

## 3. Research methodology

### 3.1. Collecting data instrument

The study is to be conducted using the questionnaire survey method, the research instrument having the following structure, drafted on Likert type of scale consisting 4 steps of qualitative responses measurement (1-Very important, 2-Important, 3-Less Important, 4-Not important):

- **Human factor** - contains 16 items, the theoretical amplitude of the scale being between 16 and 64 points maximum, with the average theoretical scale of 24 points;
- **Cultural Diversity** - contains 8 items, the theoretical amplitude of the scale being between 8 and 32 points, with the average theoretical scale of 12 points;
- **Working conditions** onboard the ship - contains 13 items, the theoretical amplitude of the scale being between minimum 13 and max 52 points, with the theoretical average of 19.5 points.

The research procedure involves undergoing the following steps:

- Analyzing the consistency of the measurement scales to decide about the relationships between the items and the measured factor;
- Total score calculation and descriptive analyzes to verify the basic assumptions;
- Analysis of the general tendency of the responses comparing to the theoretical mean of the scales as referential;
- Verification of postulated hypotheses by comparing the two groups determined by the independent variable.

### 3.2. Research batch of participants

Regarding the independent variable, the research group will comprise 58 subjects, cadets and seafarers (3<sup>rd</sup> deck officers), graduates of the "Mircea cel Batran" Naval Academy in Constanta of the last 5 years, 37 (63.8%) of them having as male biological gender, and 21 (36.2 %) female gender, assuming the volume not being procedurally fulfilled (figure no. 1). We consider in this context that, assuming the other assumptions about the distribution of the scalar variables will be met, we could use the parametric analysis in which the "biological gender" variable will determine the research groups.

### 3.3. Analysis of instrument quality

The instrument quality analysis was carried out by studying the internal consistency of the items with Cronbach's internal Alpha coherence coefficient.

The initial values of the internal consistency coefficients for each of the three factors were 0,686 (0,554 - 0,792) for the "Human factor" scale, 0,826 (0,748 - 0,886) for the Cultural "Diversity scale" and 0,750 (0,645 - 0,836) in the case of "Working conditions onboard ship" scale.

The last two factors have a suitable consistency of items for the present research, while for the first factor case the correlation of 4<sup>th</sup> item (Management of emotions) presents an extremely small total score (0,05), its elimination leading to an increase of the consistency of the scale "Human Factor" at 0.747. Therefore, the "Human Factor" scale will lose one item, the theoretical amplitude in this simplified case becoming on a range between 15 and 60 points, with a theoretical mean of 22.5 points.

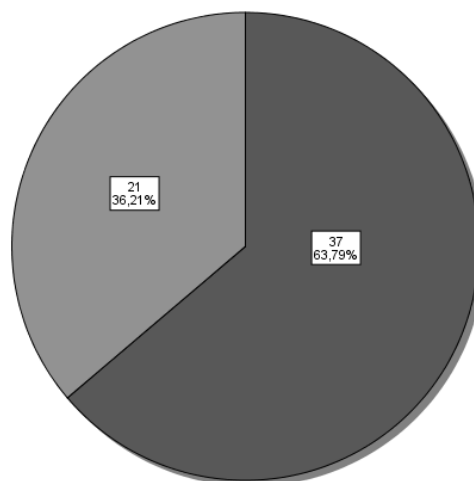


Figure no. 1: *The research group structure on gender criterion (63,79% males, 36,21%)*

### 4. Single varied descriptive analysis

As figured in the table no. 1 values, the "Human factor" presents a score distribution with the average of 23.76 points and a standard deviation of 4.31 points, the median being at the score of 24, but there are more modal values (20, 21 and 26). The empirical amplitude of the distribution is 20 points, ranging from a minimum of a theoretical minimum (15 points) to a maximum of 35 points (compared to a theoretical maximum of 60 points). However, the distribution is symmetric (Skewness = 0,388, Skewness error = 0,314) and normally arched (Kurtosis = 0,198, Kurtosis error = 0,618), the variable being suitable to be used in parametric analysis.

Table no. 1: *Unvaried descriptive values measurement*

Indicators		Human Factor	Cultural diversity	Working conditions onboard
N	Valid	58	58	58
	Absent	0	0	0
Mean		23,76	19,72	21,38
Median		24,00	19,50	21,00
Module (val ce mai mare)		20 <sup>a</sup>	18 <sup>a</sup>	20
Standard Deviation		4,314	4,340	4,167
Skewness (simetrie)		,388	-,378	,368
Skewness Standard Error		,314	,314	,314
Kurtosis		,198	,562	,074
Kurtosis Standard Error		,618	,618	,618
Amplitude		20	22	18
Minimum		15	8	13
Maximum		35	30	31

The "Cultural diversity" factor presents a distribution of scores averaging 19.72 points and a standard deviation of 4.34 points, the median being at 19.5, but there are more modal values (18 and 19). The empirical amplitude of the distribution is 22 points, ranging from a minimum equal to the theoretical minimum (8 points) and a maximum of 30 points (compared to a theoretical maximum of 32 points). However, the distribution is also symmetric (Skewness = -0,378, Skewness error = 0,314) and normally arched (Kurtosis = 0,562, Kurtosis error = 0,618), the variable being suitable to be used in parametric analysis.

The "Working conditions onboard the ship" factor shows a distribution of the scores averaging 21.38 points and a standard deviation of 4.16 points, the median being at 21, with the modal value 20. The empirical distribution amplitude is 18 points, a minimum equal to a theoretical minimum (13 points) and a maximum of 31 points (compared to a theoretical maximum of 52 points). However, the distribution is symmetric (Skewness = 0.368, Skewness error = 0.314) and normally arched (Kurtosis = 0.074, Kurtosis error = 0.618), the variable being also suitable to be used in parametric analysis.

### 5. Global analysis of trends by comparison with the mean of the scale

The global trend analysis involves comparison on the basis of the statistical values of the mean value resulted for each factor applied on the research group with the theoretical average of the respective scale. Following the analysis conclusion, statistical significant differences in all three factors analyzed can be observed. Thus, in the case of the "Human factor" variable, it was found that the average of the subjects' answers on the research group ( $m_{(H1)} = 23,76$ ) is statistically significantly higher than the theoretical mean of the scale ( $m_{(H0)} = 22,5$ ) in the sense that the subjects tend to give high overall values to this factor ( $t_{(57)} = 2.22$ ;  $p < 0.05$ ), but the significance of the high values indicates a rather unimportant appreciation of the human factor ( $d = 0.2923$ ), the effect being medium to weak.

Regarding the "Cultural diversity" factor, it could be noticed the same overall trend. The average of the responses in the research group ( $m_{(H1)} = 19.72$ ) is statistically significantly higher compared to the theoretical mean of the scale ( $m_{(H0)} = 12.0$ ), the effect being much stronger ( $d = 1,77$ ). Thus, we observe a general propensity to appreciate cultural diversity as not having an important role in the adaptation process ( $t_{(57)} = 13.55$ ;  $p < 0.05$ ).

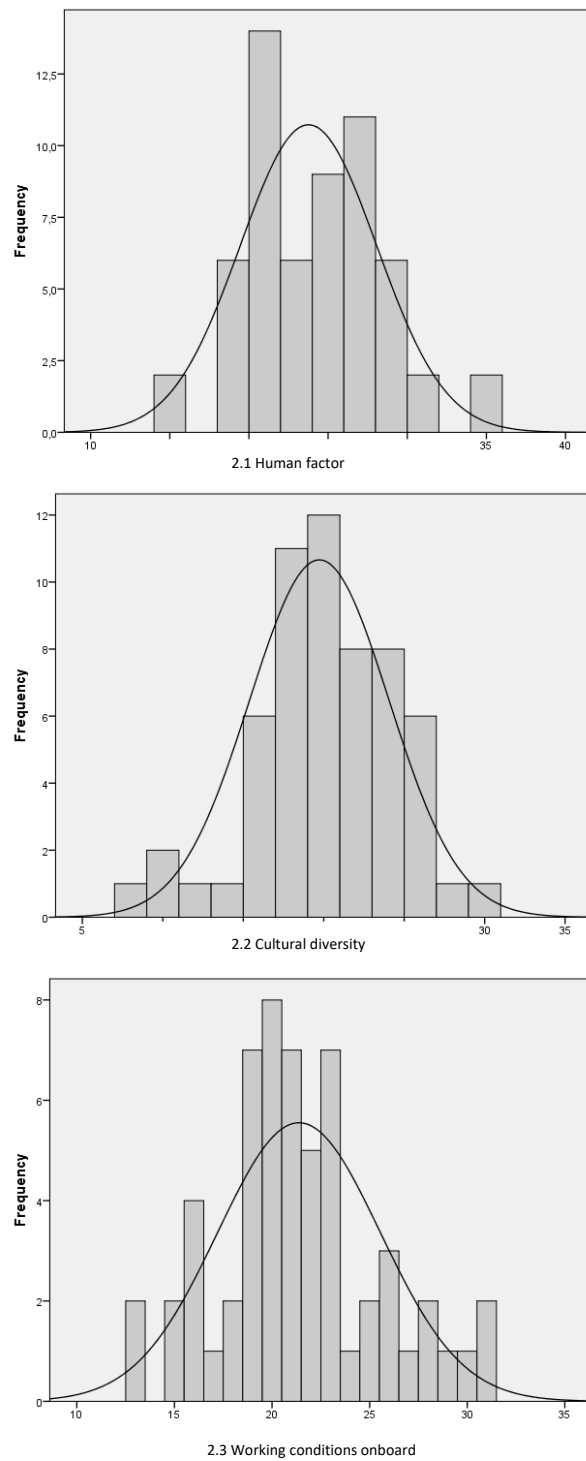


Figure no. 2: *Variable distributions on descriptive values*

In the case of "Working conditions onboard ships" factor, the distance between the theoretical mean of the scale ( $m_{(H0)} = 19.5$ ) and the average of the subjects' answers ( $m_{(H1)} = 21.38$ ) shows the

same tendency to minimize the work conditions importance throughout the adjustment and adaptation processes onboard ( $t_{(57)} = 3.43$ ;  $p < 0.05$ ), this factor impact proving a medium-strong intensity ( $d = 1$ ).

Comparing and sizing the differences in terms of impact magnitude, it can be asserted that alongside the process of professional adaptation onboard the ship, the strongest lack of valorisation is encountered in the "Cultural Diversity" factor case, followed by "Working Conditions onboard" and the "Human factor" respectively.

## 6. Verifying the research hypothesis

The analysis of the statistical average of male and female responses has reflected that is no significant changes in the role of the three studied factors in the adjustment and adaptation processes, with no statistically significant differences. Therefore, the null hypothesis cannot be rejected, the perceptions of adaptation following the general trend described above without being influenced by the biological gender becoming feasible.

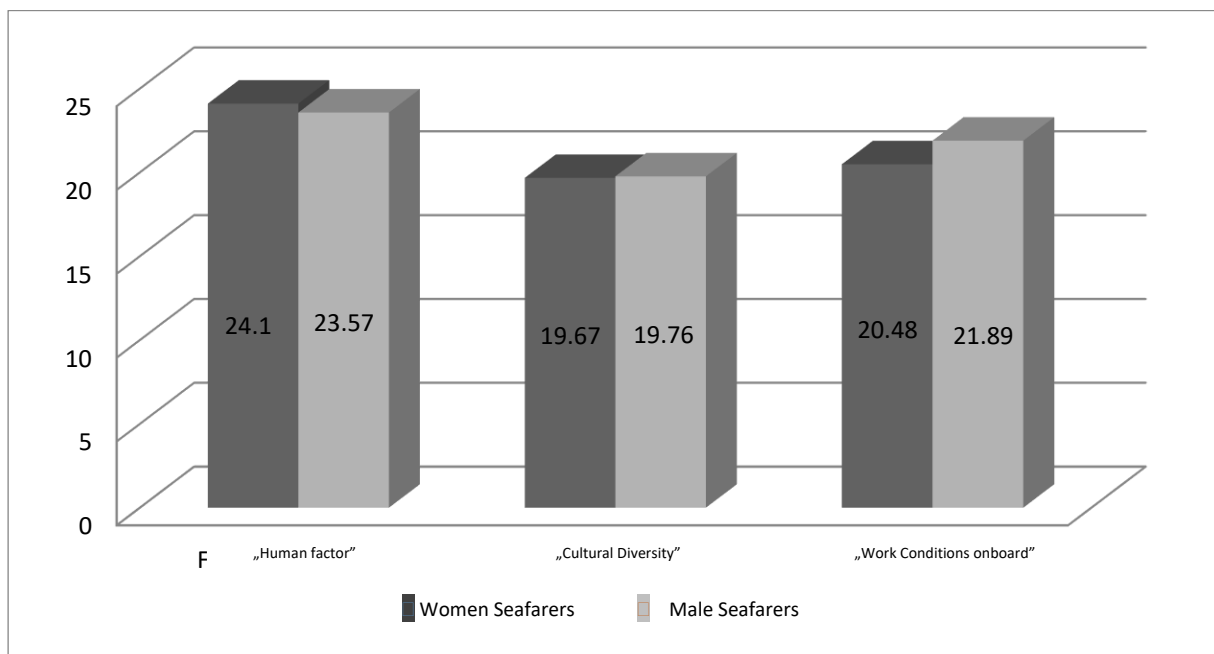


Figure no. 3: *Statistical average of male and female responses on each studied factor impact against the adjustment and adaptation onboard*

For a more detailed analysis, there were used non-parametric analyzes based on the U Mann-Whitney test at each item level. The results indicated significant statistical differences for items 5 ("Status awareness") and 12 ("Attitudes in interpersonal relationships"). Also, without being able to talk about statistical significance yet, there were noticed significant differences for Items 6 ("Decision making"), 26 ("Management") and 36 ("Environmental conditions").

In terms of "situation awareness", "decision making" and "management" factors, male seafarers had considered the variables to be significantly more important in adjusting and adapting processes onboard working conditions than women ( $z_{(awareness)} = -2.05$ ,  $p = 0.04$ ); ( $z_{(decision\ making)} = -1.65$ ,  $p = 0.098$ ); ( $z_{(management)} = -1.83$ ,  $p = 0.067$ ). The situation is reversed in regard of attitudes in "interpersonal relationships" and "environmental conditions". In this case, women consider the factors significantly more important in the process of professional adjusting and adaptation compared to men ( $z_{(attitudes)} = -2.18$ ,  $p = 0.02$ ); ( $z_{(conditions)} = 1.79$ ,  $p = 0.07$ )



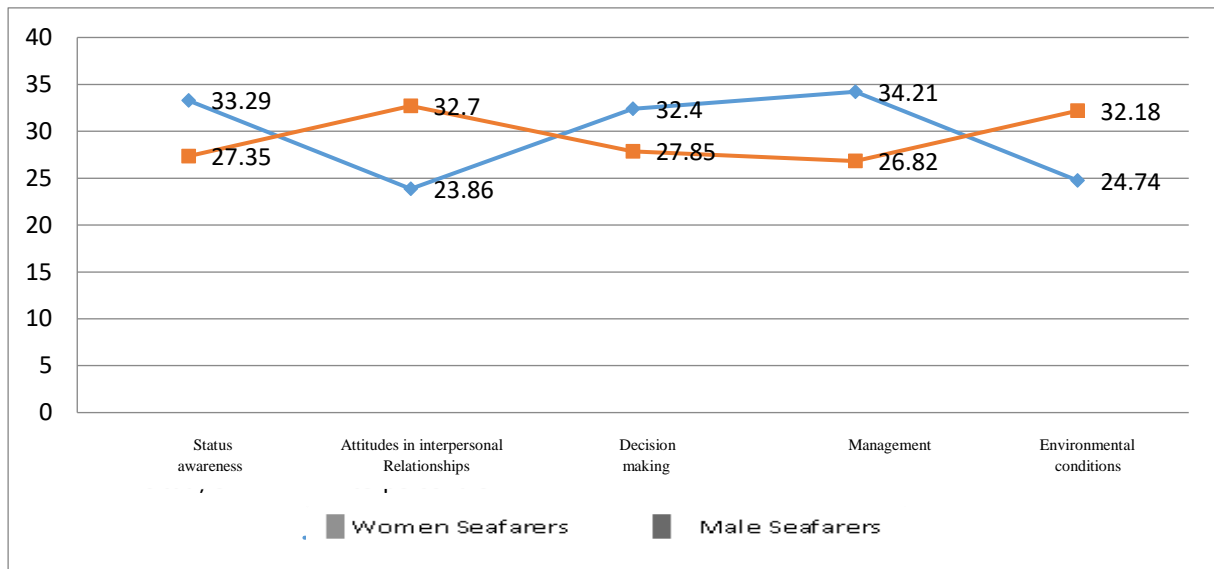


Figure no. 4: *Statistic differences on non-parametric analyzes*

## 7. Interpretation of results. Conclusions and remarks

The psychosocial interpretation of the results obtained by statistical processing of the data collected from the subjects undergoing the investigation - women and men - is not at all as simple as it might seem at first glance. That is why the authors aimed to seek for the most scientifically plausible interpretations drawn from the analysis carried against the specificity of onboard work, group dynamics and the particular characteristics of the onboard crew, considered as a multicultural social group on a smaller scale.

A first observation is that there are no significant differences, statistically supported, in the scale of the individual impact, depending on the gender, deducted from the assessment of the three dimensions studied based on the applied questionnaire, in case of onboard environment. In this sense, it can be sought for the similarities and consonance of male and female gender responses, once the seagoing crew looks more like a homogeneous structure focused on the assign tasks and responsibilities, as a unitary group, whose dynamics is influenced by the interaction of the two substructures: formal and informal.

From this perspective, within the seagoing crew the formal substructures dominates, which implies the mainly existence of procedural and routine activities, a hierarchical functionality, a well-articulated network of statuses and roles, clear and precise regulations to be followed up. Thus, a double coercion is exerted against the members of the naval group: on the one hand, the formal structure of the group requires the compliance with the rules, procedures stimulating the cold interpersonal relationships settlements, and, on the other hand, the informal organizational culture of the group of sailors will inquiry the adherence to traditions, maritime values, being defined by "face to face", affective-sympathetic and direct interpersonal relations.

In these specific conditions regarding the working environment onboard the ship, three distinct categories of psychosocial phenomena will be developed: a) conformism and non-conformism; b) the affective life of the group materialized in the tensions among the crew members and c) the cohesion and the dissociation of the group" (Zlate, 2004, pp. 466). Considering the compliance tendency of each individual crew member, by accepting the group rules as the essential factor for group survival, regardless of the compositional structure of the group related also to gender, as proved by the present study conclusions, we will assist to the unification and harmonization of the various psychological



manifestations within the group, in regard of individual perceptions, affective states or behaviours. For the sake of a good functionality of the onboard crew, the individuals will seek for compliance to the rules and procedures, contributing to the consensus enforcement among the group members, adopting afterwards similar attitudes and behaviours, related to the same cause of object (Zlate, 2004, pp. 468). In the maritime seagoing context, where the normality and rules/roles conformity are praised, the preferential interpersonal relationships, seduction or attractiveness promoted among genders different ones are diluted and transformed progressively onboard, into working relationships whose dynamics describe much accurate, the interactions based on cooperation, mutuality, competition and conflict.

In this way, it can be found a proper explanation for the extremely low score obtained by the "Emotion Management" item, included applied questionnaire, in "Human factor", in regards of the gender issue assessment, where both women and men have intellectualized the emotions transforming them into a facilitator vector of self-control and self-discipline, useful for the sake of onboard activity efficiency and effectiveness.

Although the professional adjustment and adaptation of the crew members involves personality factors such as: emotional balance, motivational variables, aspiration level, need for self-reliance, risk attitudes or resilience to monotony, it could be noticed that within the dimensions of the "Human Factor", male seafarers are looking more to the "situation awareness" and "decision-making" variables, while the women use to attach a greater importance to "attitudes in interpersonal relationships". On the other hand, within the "Working conditions onboard" dimension, placed on the second place in test participants' opinion, men value more the item "management" while women are inclined to value the "environmental conditions" (Tabachiu, 2003, pp. 72).

The authors have observed that on the formal perspective of the onboard crew, where there is a higher need for observing and complying with the norms, codes or standards, more pragmatic males' personality structure, push them to believe that several items as "situation awareness", "decision making" and "management" are most likely to contribute to the proposed objectives achievement. The perceptive responses replied by women suggest that in the formal operation of the seagoing crew, there will be mechanisms interfering to compensate rigidity, formal relations, normality being represented by informal relations, subjective, affective, sociometric structures, where the female personality structure recognizes easily its reference frame. It can be stated that while men resonate more with the axiological-normative structures, close to active side and power dimension, women resonate more with the socio-affective and communicational structures, aiming the collective affective phenomenon, that energize the life of the group. These different affinities within the group will determine tensions, that can be defined as latent and collective emotional states that occur within the group, facilitating or disrupting their work and their harmony (Zlate, 2004, pp. 474).

These gender differences, as observed in the questionnaires' answers on different applied items, reflect in fact the differences between the personality attributes established between men and women as a result of the pressure towards conformism, from the primary socialization, by the membership groups, with the explicit purpose of developing socially desirable behaviours, according to the onboard standards.

Considering the human being as a complex biological, psychosocial and cultural entity, the recalled onboard adjustment and adaptation process come close as part of the "enculturation" process, which is defined as everything that individuals will acquire in a lifetime because it is available and socially valorised (Gavreliuc, 2011, pp. 53) or viewed as the process by which a cultural group incorporates to their descendants specific axiological elements for an optimal integration into community life (Cucos, 2000, pp. 118).

A surprising aspect residing from the investigated subjects' perspective is about the "Cultural Diversity" lower impact on individual adjustment and adaptation to onboard working conditions and to the life at sea hardships, when dealing with multinational and multicultural crews. This is due most probably, to the fact that the authentic cultural identity is changeable, structurally adaptive and, self-constructively, since the personality is organized around relatively stable axiological cores. Therefore on board ships, the seafarers will appreciate that there are no individual valuable judgments

formulated as results of a specific culture, but there are only different cultures that must be respected as such. (Cucos, 2000, pp.147)

By carrying out the onboard activities in a restricted physical area, for a short time horizon (3 to 6 months), seagoing crew members learn to co-exist with the "others" by developing non-valid identity adaptation strategies by sharing the language used in communication, other than their native language, and also by values and work procedures, axiological neutral. This organizational culture of onboard work within a multicultural crew is defined by coherence, unity, continuity, safety because the multicultural environment describes the specificity of the interaction between the social actors living with each other (Gavreliuc, 2011, pp. 37).

In the multicultural seagoing crew, the process of integration into the particular life and activity conditions at sea, supports certain characteristics determined by successive adjustments and adaptations to new, unfamiliar stimulus, that confer vulnerability to human psychic. In order to restore the balance of the human psychic system and to reduce cognitive-emotional dissonance, the stages of socialization should be described by some defining patterns. First, in the tripartite "self ↔ working environment ↔ the others" interaction, due to cultural heterogeneity, there is a superficial assimilation, the individual preserving his original culture in order to avoid his identity disaggregation, on a surface conformism by adhering to rules and to the imposed language (Gavreliuc, 2011, pp. 57).

In other words, the personality supports permanent adjustments and readjustments between the contents of his own culture and the new stimulus, unfamiliar as issued from a different social and cultural environment, following to integrate with exigency into a socio-cultural environment with various new cultural references. These fine retouching are in line with the external requirements, producing what is so called "to cope with", implying the new situational stage of dealing with the uncertainties, situational risks and ambivalences. In this conjuncture, judging this specific context of work and life, it can be considered that the crew members will undergo a "re-socialization" phase passing through the onboard adjustment, whereby individuals, through a competition of circumstances, are in part or totally isolated from their previous social and cultural background. (Achim, 2008, pp. 215)

Far from being exhaustive, the psychosocial interpretations considered on his study as explanatory, in regard of how our male and female subjects had assessed the importance of human factors, working conditions and cultural diversity alongside the professional adjustment and adaptation onboard ships, incite to other questions, other answers, other more demanding scientific searches, more in-depth on this topic or other related topics.

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