Personal determinants of trust in Arctic ships’ crews

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Abstract. The article discusses some theoretical aspects of the psychology of trust in groups and organizations and contains a review of several studies devoted to the influence of personal attributes on trust in communication. It discusses the results of an empirical study concerning a topical issue that has been little studied, namely the personal determinants of trust among members of ships’ crews operating in the Arctic. A comparison of crew members’ personality profiles showed that those demonstrating the same level of trust have particular attributes that make it possible to speak of a distinctive psychological type. The results of the study showed that among the characteristics which are regularly manifested by members of Arctic ships’ crews are emotional stability, self-control over behavior and emotions, low anxiety levels, courage, the strength of character, as well as a propensity for sociability, trustfulness, and conformity. Whether a person trusts other crew members depends on such personal attributes as trustfulness, sociability, emotional stability, self-confidence, and a propensity for compliance with group norms. Such values as belevolence and universalism prevail in the value structure demonstrated by crew members, which is reflected in goodwill, empathy, understanding, positive interaction in the group, and a propensity for fostering the well-being of the group. Crew members with a high level of trust are characterized by group values; they believe in the importance of traditions and their observance. Crew members with a low level of trust usually have individual values (a need for strong emotions and new impressions), with group values being less important to them. The results of the study show that there is a strong correlation between trustful interaction in a crew and the personal characteristics of crew members.

1. Introduction

In the modern world, representatives of different branches of knowledge give focused attention to the issue of trust. As the trend towards individualization is growing both in the world as a whole and in modern Russian society, it often results in the weakening of social ties, alienation, loneliness, and lack of mutual understanding. Such moral values as kindness, mutual aid, and mutual support are gradually lost. At the same time, cooperation, friendship, love, and mutual aid are impossible without mutual trust between partners in communication [1]. The role of trust in people’s lives is so significant that it acquires the status of a person’s social capital [24].

The study of trust has a long history in psychology. A. Maslow, one of the first to study trust between employees in an organization, argued that it was necessary to create an “atmosphere of freedom and trust” in organizations [13]. R. Shaw came to the conclusion that an organization with a high level of trust between the employees overcomes stressful situations easier and faster and has better performance while organizations with a low level of trust lack efficiency [23].

S. Covey and many other researchers in the field of trust argue that it is impossible to achieve success if there is no trust [10]. Employees that are not trusted have reduced motivation to work. A low level of
trust in an organization paves the way for interpersonal conflicts, hidden agendas, scheming, rivalries, and other phenomena which negatively influence the atmosphere in the organization. S. Covey gives organizations a recipe to achieve success in the 21st century: an organizational strategy which is competently implemented and enhanced by trust gives positive results [8].

The study of personal determinants of trust has been the subject of many works by researchers from Russia and other countries (Kramer, Rotter, P.A. Bychkov, A.B. Kupreychenko, T.P. Skripkina, and others). Yamagishi argues that due to the fact that people have varying levels of trust in similar situations, they can be classified into “low trusters” and “high trusters” [26]. Canadian sociologists N. L. Carter and J. M. Weber established the relationship between the inclination towards trust in a person and a high level of intelligence.

Studies conducted by T.P. Skripkina show that trust between people is based on a combination of similar values shared by those engaged in interaction. The author describes the traits of a person who has a pronounced tendency towards trusting others. Among them are a high level of self-esteem, self-confidence, self-acceptance, self-control, the ability to benefit from past experiences, independence, and achievement drive. Such a person is less likely to experience intrapersonal conflicts or become immersed in self-indulgence and introspection. However, if these personality traits are excessive, it can negatively influence the individual’s behavior and personal development, causing the person to lie or become suspicious, since those who are focused on realizing their ambitions and achieving their goals are ready to use other people for that end [21]. According to T.P. Skripkina, people with a low level of trust in themselves are characterized by low self-esteem, inability to make decisions independently, a poorly developed sense of responsibility, dependence on others, a tendency to seek support from other people, and constant self-revelation to others.

As T.P. Skripkina argues, one of the main characteristics of a person who is capable of manifesting trust in a harmonious way is a level of trust that allows an individual to be authentic and independent in setting goals in life, making decisions, being accountable for one’s actions, interacting with other people, and understanding who and what can be trusted [21].

Research by A.B. Kupreychenko found the greatest number of correlations between the level of trust and personal values: active lifestyle, the beauty of nature and art, knowledge development, rationalism, open-mindedness, an interesting job, public recognition, productive life, personal effectiveness, the happiness of others, love, a happy family life, strong will, independence, diligence, politeness, self-confidence, tolerance, and sensitivity [10; 11].

I.V. Antonenko, who made a theoretical analysis of an individual’s levels of trust and conformity, claims that trust manifests itself in a specific situation of interaction that requires the manifestation of trust in a particular environmental condition [1]. Trusting relationships in a group can result in both internal conformity (I trust the group, therefore I accept its norms, values, and decisions) and independence (I trust the group, therefore I am not afraid to have my own views and express them openly and I am sure I will be understood). Conformity can be both trusting (based on trust) and independent of trust (based on other reasons). I.V. Antonenko concludes that “trust can be conformal (based on conformity) and non-conformal (determined by other factors)” [1].

Despite the fact that a lot of studies have been devoted to the issue of trust in various professional groups and organizations, Arctic ships’ crews have not been studied yet. Meanwhile, in the 21st century, the Arctic is growing in its geopolitical importance due to climate change that opens up the prospect of the region’s development in terms of its socioeconomic characteristics. As a result, countries are gradually becoming rivals in gaining access to and control over Arctic resources. Russia, being one of the leading maritime countries, actively explores and develops resources located in the oceans and uses Arctic maritime routes for military and commercial purposes [5; 25; 27].

Obviously, a combination of numerous stress factors influences the behavior and well-being of crew members operating ships in a region characterized by an unstable geopolitical situation and severe climatic conditions. It is known that when an organism is trying to adapt to extreme conditions, its resistance to stress factors is accompanied by spending a lot of inner resources, mental exhaustion, fatigue, and difficulties in adapting both psychologically and socially (A.L. Matusov, 1971). Numerous
macro- and microenvironmental factors have a stress-inducing nature and negatively affect the person, due to which crew members can suffer from tension and fatigue and the atmosphere in the crew may start worsening.

Macroenvironmental factors stem from the environment (the sea) in which the ship is operating. They include the mobility of the ship, navigation circumstances (the presence of and actions made by other ships located nearby), ship motions, and complicated hydrometeorological conditions (storms, ice, fogs, etc.) [5; 9; 12]. Crew members operating ships in the Arctic are greatly affected by a lack of sunshine during the long polar night [12]. Experimental studies established that a lack of sunshine leads to a number of significant deviations in physiological processes and mental states. When navigating the Arctic Ocean, the monotony of work and a lack of impressions onboard are significantly worsened by the homogeneity (“the white silence”) of such landscape elements as ice and snow, which affects the mood and performance of the crew [2]. As the workload is heavy and the conditions are often insufficient for adequate physical and psychological restoration, work capacity and performance deteriorate, which leads to overloads and a decrease in the quality of work.

Microenvironmental factors stem from the immediate environment, which is an autonomous technical system (a ship), and include limited spaces, the levels of noise, vibration, electromagnetic radiation, natural and artificial lighting, etc. The fact that ships’ crews are isolated, to an extent, from family, friends, and other social groups when they are at sea and the fact that they have to communicate with each other for long periods of time, along with other circumstances, make it difficult for crew members to adapt professionally and mean that a greater emphasis is put on the quality of relationships in the crew, including such issues as psychological compatibility, camaraderie, harmony, etc. The need for mutual trust in such groups is generated by shared living conditions, difficulties, and dangers. If crew members trust each other, it fosters camaraderie and mutual aid and enhances the atmosphere in the crew. There is no doubt that studying the issue of trust in ships’ crews is of significance and relevance.

2. Materials and methods
The main goal of this study is to find personal determinants of trust in Arctic ships’ crews.

The study is based on data from three crews operating ships in the Arctic. In total, it covered 172 people aged 19 to 54 (all males). In terms of socio-demographic characteristics, the crews did not differ significantly between themselves.

The following methods were chosen for the study: the “Trust” methodology (L.G. Pochebut, M.I. Kiloshenko, A.L. Sventsitsky, T.V. Kazantseva), the theory of values (S. Schwartz), and the multifactorial personality questionnaire by R. Cattell (Form C). This combination of methods made it possible to find the integral index of trust in the crew, the levels of trust demonstrated by crew members, and the structure of their personal traits and values.

Using the “Trust” methodology (L.G. Pochebut et al.), the integral index of trust was calculated using the data collected from the crews under study (the maximum value of the index is 50 points). As the arithmetic mean values of the integral index of trust in the crews did not significantly differ from each other, we conducted a level analysis, i.e. we divided the entire sample of crew members participating in the study according to the number of points into three approximately equal groups: crew members with high, average, and low levels of trust. The group with a high level of trust included 60 respondents, the group with an average level of trust included 62 respondents, and the group with a low level of trust included 50 respondents.

The results were obtained using the Statistica program for Windows (Table 1). A comparison of the average values of the level of trust using Student’s t-test revealed that the differences in the groups described above are significant and have a high significance level (p ≤ 0.001).

| Levels of trust | Arithmetic mean | Standard deviation | Sample size | t    | p    | t    | p    |
|----------------|-----------------|--------------------|-------------|------|------|------|------|
| high           | 44.57           | 3.46               | 60          | 17.46| 0.001| -    | -    |
3. Results and Discussion
A comparison of the average results of Cattell’s personality test in the samples of respondents with high, average, and low levels of trust showed that the main personality traits which representatives of these groups have make them similar in many aspects. The leading indicators (Figure 1) demonstrate a high degree of manifestation of one of the two poles of the personality traits being analyzed.

The average personality profile of respondents with a high level of trust is characterized by high values (a sten score of 8 to 9) of such factors as MD (self-esteem), A (sociability), C (emotional stability), G (normative behavior), H (courage), Q3 (self-control), and lower than average values (a sten score of 3 to 4.5) of such factors as L (suspicion), Q4 (tension), Q2 (nonconformity), and B (intelligence).

The average personality profile of respondents with an average level of trust has the same prominent factors – MD (self-esteem), A (sociability), C (emotional stability), G (normative behavior), and H (courage) – but their values are somewhat lower (a sten score of 7 to 8). The values of such factors as L (suspicion) and Q4 (tension) are slightly higher compared with the personality profile of respondents with a high level of trust.

The average personality profile of respondents with a low level of trust has the same set of prominent traits as the ones in the previous two groups. However, the values of such factors as MD (self-esteem), A (sociability), C (emotional stability), G (normative behavior), H (courage), and Q3 (self-control) are lower. Compared to the profiles described above, the values of such factors as L (suspicion), Q1 (radicalism), and Q4 (tension) are higher, but they are still below average (Figure 1).

|               | high       | medium    | low        |
|---------------|------------|-----------|------------|
| average       | 35.72      | 1.45      | 62         |
| low           | 28.89      | 3.22      | 50         |
| F(2, 62)      | 15.72      | 0.001     |            |

Figure 1. The average personality profiles of respondents with high, average, and low levels of trust (based on Cattell’s methodology).
Note: * – significant differences at p ≤ 0.05; ** – significant differences at p ≤ 0.01; *** – significant differences at p ≤ 0.001.
When comparing the personality profiles of respondents with high, average, and low levels of trust using one-way analysis of variance, differences having a high level of statistical significance were found between the groups in such factors as MD (self-esteem; p = 0.001), C (emotional stability; p = 0.018), H (courage; p = 0.026), L (suspicion; p = 0.001, and Q2 (nonconformity; p = 0.002).

This proves that people who demonstrate the same level of trust fall under a particular psychological type based on their traits. Crew members with a high level of trust are characterized by emotional stability, social courage, trustfulness, greater sociability, calmness, high self-control levels, normative behavior, discipline, self-sufficiency, and compliance with group norms of behavior. Crew members with a low level of trust are characterized by caution, tension in contacts, and being guided by their own opinions. Crew members with different levels of trust significantly differ from each other in terms of emotional stability, courage, self-esteem, trustfulness, and conformity.

Pearson’s correlation analysis revealed positive correlations between the integral index of trust in the crews and the following factors from Cattell’s questionnaire: MD (self-esteem; r = 0.262; p ≤ 0.01), C (emotional stability; r = 0.365; p ≤ 0.05). There is a negative correlation between the integral index of trust and Q2 (nonconformity; r = -0.355; p ≤ 0.05), and there are two more negative correlations with some of the factors from Schwartz’s questionnaire, namely stimulation (r = -0.357; p ≤ 0.05) and hedonism (r = -0.321; p ≤ 0.05) (at the level of individual priorities).

Figure 2 shows the relationship between trustfulness as a stable psychological trait of a person described using Cattell’s questionnaire (scale L; trustfulness – suspicion) and other individual psychological characteristics of crew members.

![Figure 2](image.png)

**Figure 2.** Correlations between different factors and trustfulness among crew members

Note: —— positive correlation, p ≤ 0.05; —— negative correlation, p ≤ 0.01; ——— negative correlation, p ≤ 0.05.

As it is known, a low value of Factor L (suspicion) indicates a trusting person. In the total sample of the crew members, a person’s trustfulness (at p ≤ 0.01) has a stable correlation with emotional stability, sociability, and self-confidence. At p ≤ 0.05, a person’s trustfulness is interconnected with a trend towards trust (the integral index of trust), courage, a low level of tension, the strength of character,
conservatism, and the need for security (in the value structure at the level of a person’s ideals concerning norms).

The study of the value structures of respondents with high, average, and low levels of trust using Schwartz’s questionnaire showed that there is a similarity between the groups in terms of their main values. As for differences, the indicators of the main values are slightly higher among the respondents with a high level of trust and lower among the respondents with a low level of trust. In the total sample, such values as universalism, benevolence, and security prevail at the level of a person’s ideals concerning norms; stimulation, hedonism, as well as power and achievement are not prominent. At the level of individual priorities, the main values are universality and security, with stimulation, hedonism, as well as power and achievement not being prominent.

One-way analysis of variance revealed statistically significant (at $p \leq 0.01$) differences in the value structures of respondents with high, average, and low levels of trust in the following values: conformism, universalism, and benevolence (at the level of both ideals concerning norms and individual priorities); security (at the level of ideas concerning norms) ($p = 0.037$). The respondents with a high level of trust seem to be geared towards understanding in interpersonal contacts, positive interaction, and security felt by both the group as a whole and its members as individuals. For them, such values as the need for new experiences, pleasure, prestige, and authority are not significant. The respondents with a low level of trust demonstrate the value structure which is dominated by the need for understanding others and empathy (at the level of ideas concerning norms) as well as the need for experiencing emotions and having new impressions (at the level of individual priorities). The values of security, conformity, independence, and hedonism are not significant.

4. Conclusion

As can be seen from the above, the study being discussed, which is based on data obtained from members of ships’ crews operating in the Arctic, made it possible to find and analyze personal determinants of trust that are demonstrated by crew members who are either inclined or not inclined to trust others. It has been revealed that the main personality traits of the crews under study are sociability, trustfulness, emotional stability, courage, self-control over behavior and emotions, a low level of emotional sensitivity, low anxiety levels, and conformity.

Crew members with high and low levels of trust differ from each other in such individual psychological characteristics as the level of self-esteem, trustfulness, courage, emotional stability, and conformity. The more pronounced the listed traits, the higher the level of trust shown by them.

Such values as benevolence and universalism prevail in the value structure of crew members, which indicates their inclination to empathy, understanding, goodwill, and fostering positive interaction in the group as well as its well-being. The main values in the value structure demonstrated by crew members with a high level of trust are group values (conformity, universalism, benevolence, and security), traditions, and their observance. Crew members with a low level of trust are characterized by individual values (the need for strong emotions and new experiences), with group values being less important to them.

Further research into the cultural, economic, socio-demographic, socio-psychological and other characteristics of trustful communication in Arctic ships’ crews will expand the understanding of the characteristics of trust and the mechanisms of its development in this professional group, which will help to foster a positive atmosphere in the group and to solve issues in staffing, crew management, and other areas.

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