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**WOMEN LEADERS IN LOGISTICS
FOR THE ECONOMY 5.0****Marta Brzozowska**

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ABSTRACT. The complexity of the technologized socioeconomic reality poses a number of challenges for today's managers. Many times their actions are a test of their leadership. A particularly interesting area of research in this regard is the logistics sector, which so far has been regarded as typically male and which has been undergoing a transformation in favor of an increasing representation of women for some years now. The authors sought to answer questions such as: what qualities, skills and competences will enable women working in logistics to pursue their careers and achieve their goals in the face of the challenges of a 5.0 economy. The aim of the article is to identify those leadership skills and competences of women in logistics that predispose them to lead on their way to business success in enterprises. In the research process, mixed research methodologies were used, combining the results of secondary source analysis obtained from Scopus and Web of Science databases with information obtained from a quantitative survey based on the CAWI diagnostic survey method. The analyses resulted in a model of an exemplary image combining traits, skills and competencies, as well as attributes of effectiveness, which may be helpful for women in shaping their leadership position in the management structures of companies in the logistics industry. The resulting material complements the existing body of research on the role and importance of women in business including, in particular, the inclusion of women in logistics. The main strength of the work is to identify areas that women should improve in order to increase their participation in managerial positions in the logistics industry.

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Introduction - Leadership as the essence of enterprise management in the digital economy

Economy 5.0 is a human-centric approach and means collaboration between people and machines, supporting a more efficient, resilient and innovative work environment (Alves et al., 2023, Sulkowski et al., 2021). In this context, the European Commission (2022) identifies economy 5.0 as a means of supporting social goals beyond employment and economic growth. It has a profound impact on civil society, governance structures and worker identity. It proposes a transition from technology to a just transformation for employees based on socially and environmentally sustainable forms of production and consumption (Dixson-Decleve et al., 2022). In order to build success, Economy 5.0 enterprises must redefine the approach to human capital management, which is a guarantee of companies' competitive advantage. Management based on the new dimension of leadership can have a significant impact as a sine qua non for modern organizations that meet new economic, social, technological and economic requirements.

Leadership is a key element building a company's success, and at the same time it is perceived as the most important tool for achieving company goals in the digital economy. Effective leaders are often able to prepare the company for the challenges of the environment, while the lack of leadership in certain situations or inappropriate leadership can even in the short term lead a well-functioning company to a crisis, the effects of which will be extremely difficult to overcome. The results of the WorkForce 2020 research, conducted by Oxford Economics on behalf of SAP (Plucińska, 2020), indicate symptoms of a leadership crisis in the current economy. Due to the development of the digital economy, there is a need to redefine the role of leaders in enterprises and to make changes in the process of managing a company in the face of new requirements and restrictions, which constitutes a kind of barrier. The concept of leadership, although very often analyzed, still seems incomplete and leaves a lot of room for additional interpretations, and also opens the possibility of building new theories. The literature on the subject presents a rich output of authors such as J. Adair (1983), G.C. Avery (2009), K. Blanchard (2016), S.R. Covey (2019), F. Fiedler (1967), J. P. Kotter (1990), B. Kożusznik (2010), A. Koźmiński (2006), J. C. Maxwell (2019), R. Mrówka (2010), S.P. Robbins (2001), R.M. Stogdill (1974), W. Walczak (2011), whose research proves many difficulties in clearly defining the concept of leadership. As noted by R.M. Stogdill (1974), "there are almost as many different definitions of leadership as there are people who have tried to formulate them." According to A. Chaudhry and H. Javed (2012),

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leadership is considered one of the most outstanding and least understood phenomena in the field of management. The analysis of the definitions indicates a variety of approaches and allows us to conclude that leadership is perceived as a process (Hoch, 2013) and a social role (Karaszewski et al., 2019), which is inextricably linked to people and their cooperation (Giuseppe et al., 2023) to create a competitive and efficient economy. Leadership creates a set of team members' goals and values morally focused on their and the company's development (Blanchard, 2016), which modify their ideals and values (Pieterse et al., 2010). It is a process related to people and their dynamics, which are constantly changing. It involves influencing others to achieve individual, team and organizational goals (Fu and Yukl, 2000). In this case, the leader's task will be to create changes and inspire development (Kołodziej 2018). In this regard, leadership studies contribute to understanding the links between organizational social capital and competitiveness (Mishchuk et al., 2023; Łucjan et al., 2023). It is also an organizational practice that focuses on the construction of identity (Driver, 2013). Moreover, there is a connection between leadership and power, which is a form of influencing other people and focuses not only on gaining obedience, but also concerns the compliance of goals between the superior and subordinates (Robbins, 2001). A good leader creates a team with the best people in each field and allows smart people to do what they do, and his task is to remove barriers, share the work (Saffari et al., 2023). In a positive approach, leadership is the ability to influence a group in pursuit of specific goals (Laberschek, 2020). According to G. C. Avery, there are four dimensions of leadership (classical, transactional, visionary and organic) (Avery, 2009). In visionary leadership, the leader appeals to emotions and inspires group members to greater achievements. A common vision and individual approach to group members, as well as the leader's charisma, are the source of their dedication and commitment (Lindert et al., 2023). The leader's function in this paradigm is described as creating useful change, as well as creating a culture and focusing on achieving long-term goals or acting ethically. A leader motivates followers by actions such as increasing their awareness of the importance of the tasks they perform, encouraging them to go beyond their own interests and focus on the goals of the group and organization, and by influencing their higher-order needs.

Modern changes have forced companies that want to survive and thrive in the volatile, uncertain and complex environment of the digital economy to quickly adapt to constant change, develop new capabilities, engage in upskilling of leaders and implement turnkey human resources solutions to prepare employees for digital activities (Malhotra, 2021; Bilan et al., 2023). The digital economy enables close leadership engagement in real time and promotes culture and governance through better communication. This new reality of digital transformation is supported by new technologies (such as artificial intelligence, augmented reality, big data analytics, blockchain, cloud computing, machine learning, Internet of Things and robotics), resulting in significant changes in the process of enterprise management (Bresciani et al., 2021; Kumar et al., 2022; Sarker, 2022; Sineke, Potwana & Chikosha, 2023; Spencer, 2018; Verhoef et al., 2021). The development of digital technologies increases the awareness of this factor as one of the key elements of enterprise competitiveness and as an important tool for adaptation in a complex and dynamic environment (Annarelli et al., 2021; Varlamova & Larionova, 2020; Rapaccini et al., 2020; Bikse et al., 2021; Klein & Todesco, 2021; Proksch et al., 2021; Skare et al., 2023).

Given that technological advances in the digital economy are spreading at an accelerated pace (Lim, 2021; Tiutiunyk et al., 2021), there is a need to understand what leadership skills and competencies need to be developed to meet the challenges of digitalization. Urgent adjustments to the required skills and competencies of digital leaders are leading to a gap between the professional profiles available in the labor market and what companies need (Goulart et al., 2022). An entrepreneurial mindset and practice can help

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leaders develop their digital capabilities. Essentially, the digital economy increases the complexity and abstraction of problems, requiring increasingly greater skills and competencies from leaders. Research conducted so far shows that the digital economy significantly influences the path of digital transformation of companies, and companies managed by a professional leader will achieve better results on the path to digital transformation (Malodia, 2023; Knezevic, 2023). But this raises the question: To what extent is leadership different in the digital age?

This question is particularly important from the point of view of the concept of economy 5.0 and the role of women in enterprise management. Therefore, the authors decided to address this issue. The aim of the article is to indicate the importance of women's leadership in shaping the business success of logistics companies in the face of the challenges of the 5.0 economy.

The main purpose of paper is description of the role of women's leadership in developing business success in leading logistics companies, realizing their full potential in a 5.0 economy. The paper rationalizes the acute importance of effective leadership in business governance and, therefore, pays special attention to the ways that women leaders can contribute to overcoming the challenges of technological progress and the digital transformation of the economy. It also seeks to establish the desirable qualities, skills, and competencies that the woman manager in the logistics industry has to embrace in order to prosper within these new economic realities.

1. Literature review - Women managers - leaders in new era logistics enterprises

The concept of a manager has been associated with the male domain of activity for quite a long time (Powell & Butterfield, 2017). However, although the topic of women's participation in management is not new, it has been gaining a slightly different meaning for several years (Wibbeke & McArthur, 2021). Most often, women's activity is associated with a key premise - the economic aspect related to the functioning of households. Recent years indicate that, in addition to these reasons, there are many more and complex motives for increasing women's participation in professional life (Shen & Joseph, 2021). These include social, ethical and political conditions. Additionally, the debate regarding women's participation in management ranks is increasing (Zhang & Basha, 2023; Azizi et al., 2022).

A. Titkow points out that extremely important in building women's professional careers are the features that constitute specific psychological capital, which significantly supports the performance of managerial functions. This capital is associated with women's experience and includes, among others: sensitivity, emotionality, willingness to participate in the development of others, cooperation, and creative skills. It should be emphasized that for years this potential has been recognized not as an attribute or strength, but as a weakness, which may adversely affect women's performance of managerial roles (Keohane, 2010).

In the debates on managerial predispositions determined by gender, two approaches can be distinguished: one indicating that the feminized and masculinized styles differ significantly, and the other, on the contrary, that they are very similar. Referring to H. Mizgalska (2007), it can be noted that the female style is not so much different from the male one as from the entrepreneurial one, and this style is definitely partly dedicated to the male concept of a manager.

The analysis of selected features shows that the feminine approach to management is more characteristic of managerial approaches emphasizing that the purpose of the organization is not profit in itself. Research shows that women holding managerial positions are more empathetic, which translates into, for example, more effective communication, a

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much better understanding of how teams operate and build relationships, and this helps them effectively manage employees. However, their lower self-confidence may result in problems in the area of decision-making at strategic moments in the company's operation. For this reason, there will be less focus on profit (Gatewood et al., 2002). The entrepreneurial approach is more correlated with trends in which the dominant assumption is that the so-called expansive profit is the company's main focus. This approach to entrepreneurship is close to Schumpeter's vision of this process, which in turn is more characteristic of areas of male activity. Here, it is controversially pointed out that entrepreneurship is a masculinized feature.

It is worth emphasizing that, according to the authors of the Hays Poland report (2022), 53.0% of women and 28.0% of men encountered gender-related barriers in their professional careers. Women acting as specialists and managers are much more likely to point out the impact of unconscious biases, stereotypes or discriminatory practices during their professional careers. The respondents emphasized that they had encountered actions favoring men (55.0%), being guided by stereotypes in decisions about employment and promotion (53.0%), assuming their lower availability (48.0%) and lack of trust in qualifications (42.0%). According to the respondents, the so-called a feminine management style stereotypically perceived as too emotional, with an excessive tendency to compromise and a lack of obedience among subordinates.

Observation of women's activity in the professional field indicates their increasing share in the market and in holding managerial positions. According to research by the Polish Economic Institute, the share of women performing managerial roles in Poland was 43%. The authors of the report indicate a decreasing disproportion in the share of women in managerial positions. Most women managers work in trade, public administration and industry (28.0%). (Polish Economic Institute, 2023) Data from the Central Statistical Office of Poland (2022) indicate that in 2022 the share of professionally active women - in the total number of people of working age - was 74.0%.

The increasing participation of women in the market and the increase in their employment in managerial positions is influenced by good substantive preparation, appropriate qualifications, competences and skills, as well as women's great determination to pursue professional careers. A trend that has an additional impact on shaping employment policy is the Diversity, Equality, Inclusion (DEI) approach. Until recently, it was only a process discussed behind the scenes, in expert groups and at universities. However, nowadays, this approach is increasingly treated as a standard business management practice that assumes diversity, equality and integration in the workplace, and is intended to promote fair treatment, lack of discrimination and proportional representation of various groups (Rao, 2022). This policy is most noticeable in those sectors that until recently were perceived or even reserved for men.

One of such industries is the broadly understood transport, forwarding and logistics sector. It is worth emphasizing that the globalization of the economy, the development of international trade, and the growing interest in shopping, including online, guarantee a high demand for employees in logistics. Due to this fact, it can be assumed that this is an industry with a future that provides employment opportunities, a sense of security and employment stability, and provides opportunities for professional development. For this reason, the logistics industry is of great importance in shaping the professional positions and fulfilling managerial roles of women.

The logistics industry was seen as a major provider of masculinized jobs. However, as indicated by TSL Employer Friendly Research 2022, the number of women working in the logistics industry is 47.0% of all employees. According to the report, most women work in

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road transport – 18.0%, and a significant part – 60.0% - in strictly logistics services. Unfortunately, however, the percentage of women working in leadership and management positions does not exceed 20.0% (TSL Employer Friendly Research 2022).

According to the "Leadership of Women 2021" report, 41.0% of respondents had no chance for professional advancement to managerial or leadership positions. The main reason was the lack of recognition of their competences compared to men. 34.0% of respondents experienced discrimination during professional development. The research results indicate that significant disadvantages are related to professional development opportunities and are embedded in the realities of the implemented human resources policy. 34.0% of respondents emphasize that they have encountered discriminatory behavior during their professional development or job promotion. This is disturbing because such actions are contrary to the promoted policy of equal opportunities.

The report draws a rather interesting conclusion regarding the willingness of 86.0% of respondents to regularly improve their education, especially in the field of soft skills. The main areas indicated are: leadership, mentoring, communication, self-presentation and public speaking, foreign languages. 41.0% of respondents develop their hard skills in areas such as: change management, project management, legal changes, industry knowledge (e.g. training in forwarding, warehouse operations). It is worth emphasizing that 11.0% have double education, including, for example: technical and humanities, technical and economic.

In discussions about women's leadership, including in the logistics industry, it is worth referring to the "Leadership of Women 2021" report, which shows that the ongoing changes in the area of management systems require a new vision of management, leadership and leadership. When describing themselves, the surveyed leaders indicated the need to have such features as: decision-making (43.0%), proactivity (44.0%), risk-taking (27.0%), inspiring and motivating (48.0%), energy (47.0%), seeing potential in others (51.0%), assertiveness (31.0%). The new dimension of leadership is therefore more focused on compassion, responsibility, balanced being and these features are more characteristic of a female leadership style (Leadership of Women 2021). These findings are aligned with the results obtained by Kristinsson et al. (2022), who emphasize that female leadership style is tend to be more ethical comparing with male.

It may be necessary to change the system of approach to leadership in organizations from the so-called VUCA (volative, uncertain, complex, ambiguous), which defines leadership styles for variability, uncertainty, complexity and lack of clarity towards the model developed by J. Cascio (2020), the so-called BANI (brittle, anxious, nonlinear, incomprehensible). Modern leadership is based on courage, fighting against adversities, solving important and diverse problems, and overcoming completely impossible matters. In turn, the BANI approach indicates a new way of looking at organizational problems. This model emphasizes an even greater need or even obligation to permanently improve qualifications, but in order to share them. Developing a new approach to leadership is possible in a culture of high organizational maturity and cooperation based on new principles: the need to analyze all competence resources in the organization, cooperation, support, empathy, listening skills, developed emotional intelligence, perseverance in pursuing the goal, courage, ensuring stability in organization and extraordinary openness (Westfall, 2019). Brown emphasizes that the new type of leadership should further increase the decentralization of power and influence on decisions in organizations. This, in turn, necessitates a change in the approach to competition and domination by those managing organizations. Thanks to this, organizational efficiency can be increased with lower expenditure.

There should be an emphasis on shared responsibility and interdependence among stakeholders building business success (Brown, 2017).

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These are features of a feminized management style, so perhaps the potential of women managers will allow for the significant development of their careers, especially in sectors such as the logistics industry, and the development of an alternative way of fulfilling managerial roles by men.

2. Methodological approach - Women Leaders in logistics in the light of primary research

In late October/early November 2023, researchers from the Jagiellonian University and the Cracow University of Economics conducted a study entitled 'The Female Face of Logistics - Female Business Leaders Facing the Challenges of Economy 5.0'. The study was the basis for collecting empirical material on the importance of women as managers and leaders in the logistics industry. The outcome of the project was to create a model for the construction of an exemplary image of a business woman indicating qualities, competences and leadership skills in logistics. After the conception and implementation of the research, the researchers compiled the results. The material obtained from the research carried out as part of the project was the basis for presenting the results of the analysis carried out later in this article.

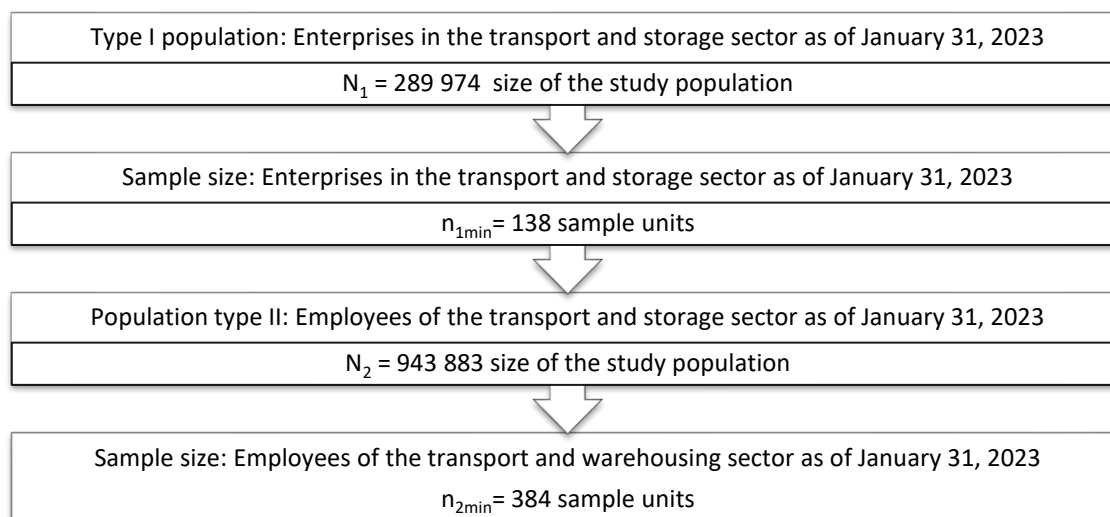
The primary objective of the research was to identify those leadership qualities as well as the skills and competences of women managers that are highly desirable due to the technologicalization of the economy. The subject of the measurement were the desired skills and competences that should be possessed by women managers operating in the logistics industry in the era of challenges of the 5.0 economy.

Due to the research subject defined in this way, it can be called explanatory and of a descriptive and explanatory nature. The researchers' task was to create a model image of women managers-leaders in logistics by identifying the required qualities, skills and competencies and identifying the strengths of female logisticians as entrepreneurial bosses, as well as identifying the adversaries and slowdowns of women's careers in logistics from the perspective of employees in the logistics industry.

In the research process, after conducting an initial qualitative study including a study of secondary sources, a quantitative study was carried out using the diagnostic survey method with the "us-er-centric" CAWI (Computer Assisted Web Interview) Internet survey technique. The research tool was a questionnaire consisting of 14 closed questions, including 8 based on the Rensis Likert scale of attitudes. Due to the scope of the measurement method, this study can be considered fragmentary, as it did not cover the whole population, but only a part of it (the research sample) and deterministic, which is in line with the assumption of surveying employees only in the transport and storage sector.

The quantitative study covered the population consisting of employees employed in enterprises with Polish and foreign capital operating in the transport and storage sector in Europe, including Poland, as of January 31, 2023. Due to time and cost constraints, not the entire population was examined, but only its representation.

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Graph 1. Scheme of selecting units for the sample

Source: *own elaboration*

The study participants were recruited using a two-stage sampling method. First of all, referring to the number of 289,974 (CSO, 2023) logistics enterprises operating in the transport and storage sector in Poland as of January 31, 2023, including 283,351 representing the private sector, the minimum sample size was determined.

A formula was used to calculate the minimum sample size:

$$n_{min} = NP(\alpha^2 f(1-f)) / (NP \cdot e^2 + \alpha^2 f(1-f))$$

where:

n_{min} - means the minimum sample size

NP – size of the study population

α - confidence level for the results

f - fraction size

e - assumed maximum error

The calculations assume the fraction size of 0.977 for private enterprises in the transport and storage sector and 0.023 for public enterprises as of January 31, 2023, with a random error of 5.0% and a confidence level of 0.95. Finally, after performing the calculations, $n_{1min} = 138$ units were obtained (Graph 1).

In turn, the minimum sample size of employees in the transport and warehousing sector was calculated assuming representativeness of the population of working Polish residents of working age, i.e. men aged 15-64 and women aged 15-59, whose number as of 31 January 2023 was 943,883 people (CSO, 2023). For the purposes of calculating the minimum sample size, the fraction size was assumed to be 0.5 both for people potentially working directly in the implementation of logistics processes and 0.5 for people not working directly in logistics processes, with a random error of 5.0% and a confidence level of 0.95. After calculations, the minimum sample size was $n_{2min} = 384$ units (Graph 1).

After determining the minimum number of enterprises that should be subject to the survey and the minimum number of employees, first of all, using the contact list of enterprises purchased from the data broker <https://www.infobrokering.com.pl/> with 3,080 addresses, the required number was collected using the method systematic sampling with a sampling interval of $k=22$. Representatives of 138 enterprises, i.e. owners and/or managers, were sent a request

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to participate in the study, as well as selected employees of at least 4 employees working in the field of logistics, to randomly selected addresses. Therefore, in the last stage of the study, non-random selection of typical units was used.

The survey prepared and implemented in this way allowed us to finally obtain data from a larger number of respondents than initially expected. 708 people responded, which exceeded the quota n_{2min} . The obtained data were anonymized and coded in SPSS (Statistical Package for the Social Sciences). Then, they were verified and validated to check and assess the suitability of the material for statistical processing. After passing this stage, the material could be subjected to a proper three-stage analysis.

The first stage of the analysis of primary data was to define the distributions of variables, i.e. the values of response variants obtained from individual questions included in the questionnaire. Then, in the second stage of the analysis, the tested sample was verified and its representativeness was determined based on the consistency test based on the χ^2 statistic written:

$$\chi^2 = \sum_{i=1}^r \frac{(n_i - np_i)^2}{np_i}$$

where:

p_i — is the probability that feature X has a value belonging to the interval of class "i"

np_i — is the number of units that should be in the i -th interval assuming that the feature has a distribution consistent with the hypothesis

Assuming that the statistics has a χ^2 α distribution with $k = (r - 1)$, where: k is the number of degrees of freedom and r is the number of class intervals. In turn, the empirical value of the χ^2 statistic is calculated from the data obtained from the study. Form of the critical set: $P(\chi^2 < \chi^2_{\alpha}) = \alpha$ where χ^2_{α} is the critical value determined from the tables of χ^2 distributions for $k = r - 1$ degree of freedom and $p = \alpha$. Taking into account such verification assumptions, two hypotheses were adopted in accordance with the procedure: the null (H0) that the distributions of selected variables (gender, number of employees in the enterprise) obtained from the sample are consistent with the distributions characterizing the population of employees in the transport and warehousing sector, and the alternative (H1) that there is no the existence of such compliance.

Table 1. Verification of the tested sample against the population based on the χ^2 significance test

Variable	Value χ^2 Real	Value χ^2_{α} Theoretical	Test Realization $\chi^2 < \chi^2_{\alpha}$
Gender	3.133	6.635	concordance
Number of employees in TSL enterprises	0.552	9.210	concordance

^a α – confidence level

Source: *own data*

As a result of the calculations, the data presented in Table 1 were obtained. Carrying out the verification analysis allowed us to confirm the null hypothesis (H0), which means that the distribution of variables characterizing the studied sample is consistent with the studied population in terms of gender and the number of employees in enterprises from the transport and storage sector.

After determining the representativeness of the surveyed sample, in the third stage of the analysis, reference was made to the answers to the basic questions and data, compiling the results in the form of contingency tables. Wherever it was possible and made logical sense

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and was statistically significant, hypothesis verification was carried out, indicating the existence of stochastic independence of random variables X and Y (H0) or their dependence in the form of an alternative hypothesis (H1). For this purpose, the χ^2 test of independence was used. The right-sided area of rejection of the null hypothesis (H0) was assumed in the analysis, depending on the significance level α of $\leq 0,05$. In turn, the critical values of the χ^2 distribution were calculated for $(r-1) \cdot (s-1)$ degrees of freedom. In the verification process for $\chi^2_{\text{emp}} > \chi^2_{\alpha}$, the null hypothesis (H0) was rejected in favor of the alternative hypothesis (H1). Then it was possible to indicate the mutual dependence of the variables. To measure the verification value, the V-Cramér coefficient calculated based on the formula was used:

$$V = \sqrt{\frac{\chi^2}{n \cdot \min(r-1, k-1)}}$$

where:

V - is the Cramér V coefficient between two variables

χ^2 - χ^2 test result for a pair of variables

n - number of observations

r - number of levels of one variable

k - number of the second variable

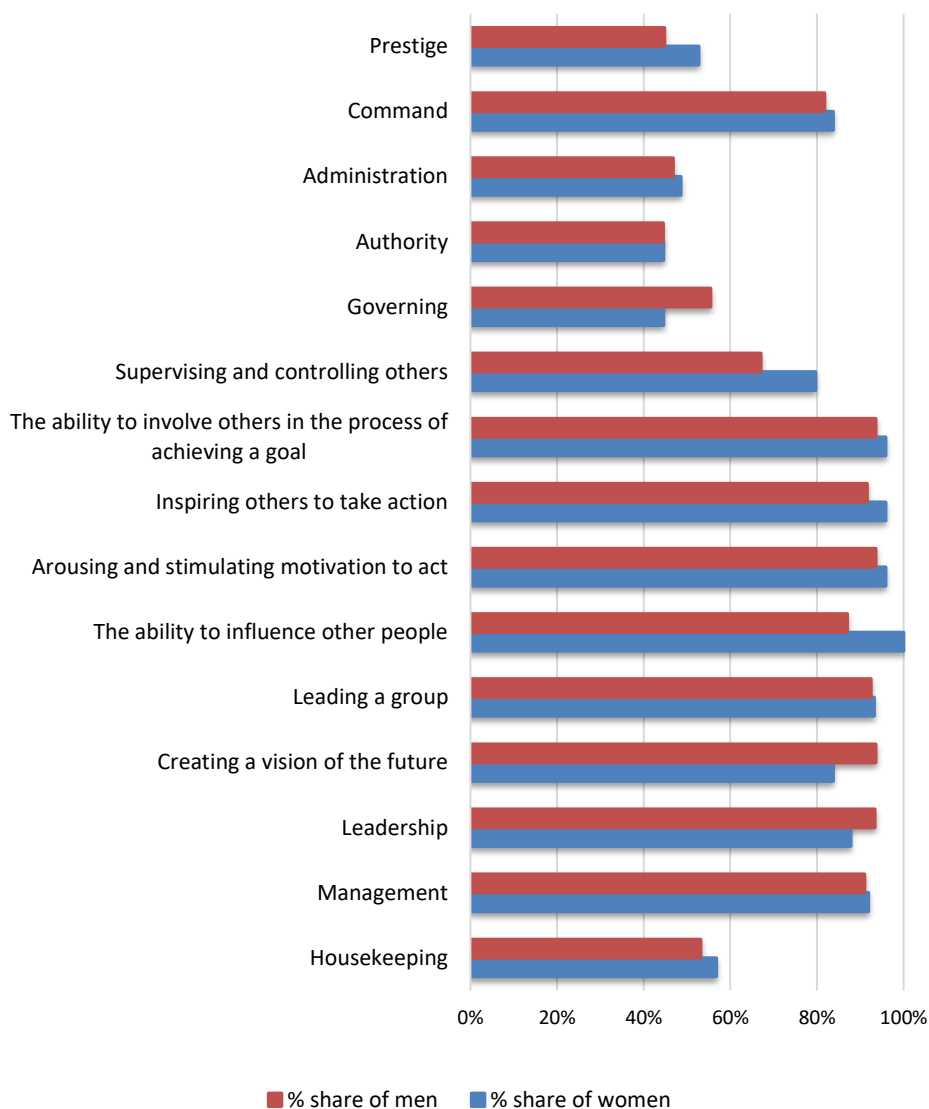
$\min(r-1, k-1)$ – the smaller value of the two $(r-1)$ or $(k-1)$ is selected

3. Results

The study resulted in obtaining research material from 708 respondents, most of whom were men (73.7%) compared to women (26.3%). In terms of age, every third respondent (35.7%) declared that they were aged 18-30, every fourth (44.1%) that their age was between 31-45, and every second respondent indicated that they were over 45 years. The vast majority of respondents indicated that they had significant experience in logistics having worked for more than 5 years (77.3%). Respondents were employed as line workers (30.2%), middle managers (37.0%) or senior managers (21.9%). Few respondents indicated that they were owners (10.9%). And due to the area of specialization of logistics activities, the respondents represented transport (13.3%), supply (11.2%), logistic customer service (10.7%), supply chain management (10.9%), warehousing (8.6%) and other logistic activities (45.3%). Nearly half of the respondents (46.0%) declared that they worked in enterprises employing less than 50 people, and every fourth respondent (39.4%) indicated that they worked in an enterprise employing over 250 people. The respondents represented enterprises with various capital: Polish (80.6%), British (4.7%), French (4.0%), German (6.8%) and others (4.0%).

In the face of the challenges of the 5.0 economy, for most survey participants, leadership is definitely arousing and stimulating motivation to act (93.2%), leading a group (92.8%), inspiring other people to act (91.2%), management (92.1%) and the ability to involve others in the process goal achievement (92.1%). Slightly fewer respondents believe that leadership means directing (89.0%), the ability to influence other people (89.0%), creating a vision of the future (88.3%), commanding (81.6%) and supervising and controlling others (70.5%). The minority of respondents equates leadership with governance (53.1%), management (52.1%), administration (48.7%), power (46.9%) and prestige (46.0%). The essence of the terminological meaning of leadership is similar in interpretation by both men and women participating in the study (Graph 2).

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Graph 2. The essence of leadership in the face of the challenges of economy 5.0 in terms of gender (% of responses)

Source: *own data*

Most respondents believe that managers should be good leaders (91.3%) for their employees, especially in the face of the challenges of the 5.0 economy. To meet the challenges of the future, according to the respondents, managers should have the following features: communicativeness (97.9%), authenticity (95.2%), courage (93.6%), diligence (93.5%), optimism (92.7%), openness (92.5%) and enthusiasm (90.7%). In terms of skills, they should be responsible (96.8%), specific (95.9%), reliable (94.6), creative (94.5%), factual (94.2%), reliable (94.2%), consistent (92.7%), disciplined (90.3%).) and patient (90.1%). In turn, in terms of competences, a good manager - leader in the era of economy 5.0 should, according to respondents, have causative power by initiating events and processes (97.0%), lead and take care of the team (94.6%), manage crisis and conflict situations (93.6%), support in the development of team members (92.5%), take care of the flow of

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information in the team (91.5%), and take care of good relationships and create bonds within the team (91.2%).

Respondents indicate that the gender of the manager - leader who is to lead employees in enterprises operating in the structures of the 5.0 economy with which the respondents work is not important for the vast majority of them (86.7%). Despite such a declaration, some respondents admit that the factor of the gender of the manager, leader, is important to them, especially in the era of challenges of the 5.0 economy. These are some of the male respondents (15.7%), some of the respondents acting as middle (5.7%) and higher (12.3%) managers and business owners (19.5%), as well as some of the respondents (9.03%) with work experience in logistics over 5 years. The existence of the indicated relationships is confirmed by the χ^2 independence test with the strength of the relationship determined by V-Cramer (Table 2).

Table 2. Gender of the manager with whom respondents work for employee relations in relation to selected variables (n=704)

Variable	Gender			Position			Seniority		
	χ^2 ^a	p ^b	V ^c	χ^2	P	V	χ^2	p	V
The importance of the manager's gender	12.856	0.001	0.153	92.063	0.001	0.208	134.803	0.001	0.252
Possibility to choose the gender of the manager	9.216	0.010	0.114	26.313	0.001	0.136	11.890	0.156	0.092

^a χ^2 – test value at $\alpha=0.05$ ^b p – asymptotic significance ^c The strength of the relationship calculated using V-Cramer

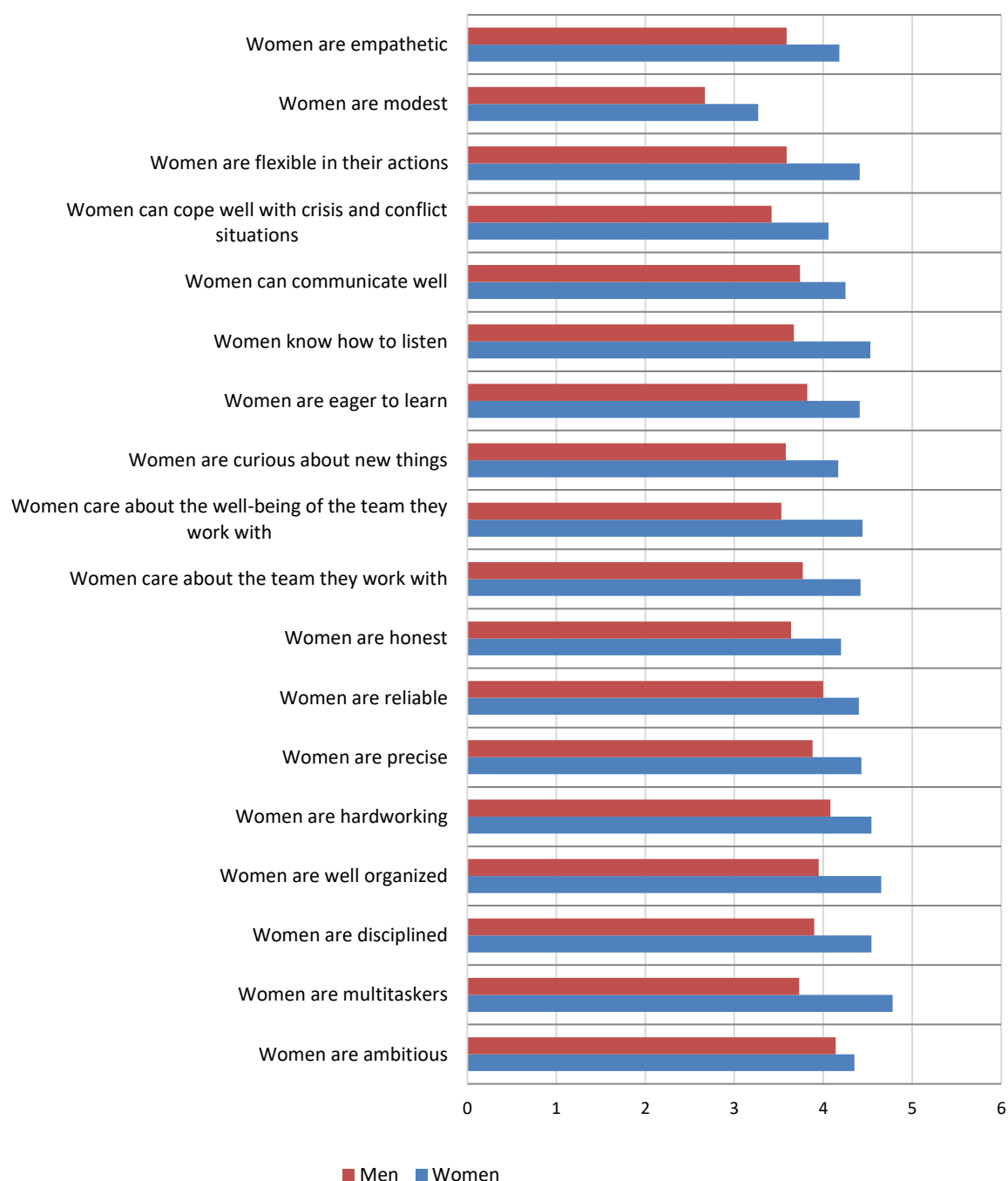
Source: *own data*

The respondents also referred to the potential possibility of choosing the gender of the supervisor with whom the respondents would work. More than half maintain their position, claiming that gender does not matter to them (66.2%) and they did not take advantage of the opportunity to choose a supervisor taking gender into account. However, for some people this issue would be important (43.8%). Of this group of respondents, the majority of women indicated men (60.7%), while the majority of men indicated women (69.7%). Despite this indication, there is no statistical relationship between the ability to choose gender and the gender of respondents. Similarly in the case of seniority. However, in the case of a variable such as the position held by the respondent, a pattern is visible. Namely, the higher the position (middle manager, senior manager, owner), the more often a woman was preferred as a manager-leader (Table 2).

The assessment of the effectiveness of women working in logistics in managerial positions as leaders in the era of challenges of the 5.0 economy varies depending on the gender of the respondents. Women respondents gave a significantly higher average rating to women than men (Graph 3).

Women respondents definitely appreciate the effectiveness of women in managerial positions because women managers are multi-tasking (4.78), well-organized (4.65), disciplined (4.54), hard-working (4.54) and they can listen (4.53). In turn, male respondents appreciate the effectiveness of women in managerial positions because women managers are ambitious (4.14), hard-working (4.08), reliable (4.00), well-organized (3.95) and disciplined (3.9).

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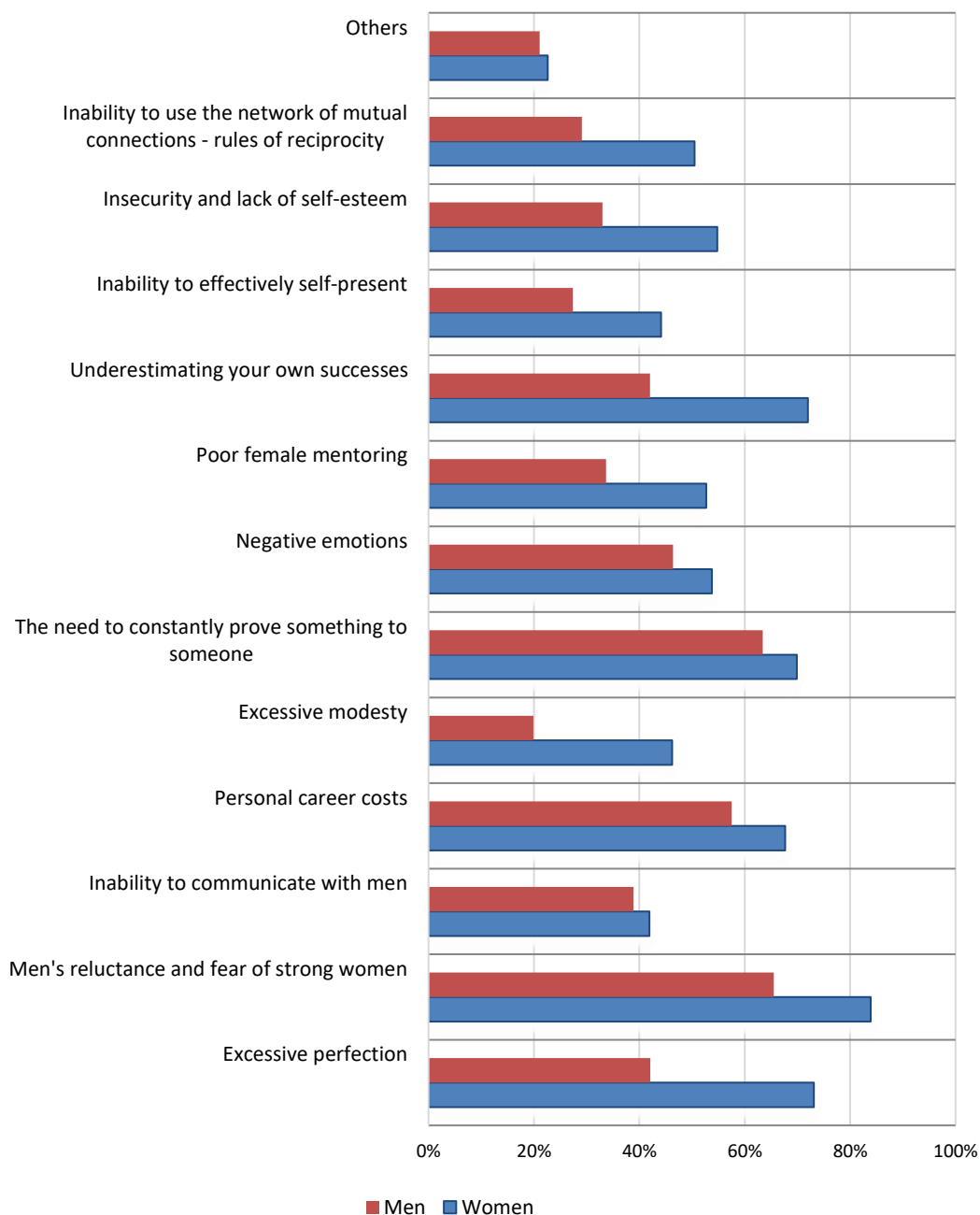


Graph 3. Characteristics of the effectiveness of the activities of women working in logistics in managerial positions (\bar{X} indications)

Source(s): *own data*

In the era of challenges of economy 5.0, women working in logistics in managerial positions have to struggle with many adversities, but the point of view of women and men is different (Graph 4).

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Graph 4. Adversities that women face in pursuing a professional career in logistics in managerial positions in the era of economy 5.0 (% of responses)

Source(s): *own data*

Female respondents are much more likely than male respondents to indicate such adversities as excessive perfection (73.1% of women than 42.1% of men), underestimating their own successes (72.0% of women than 42.0% of men), excessive modesty (46.2% of women than 19.9% of men), uncertainty and lack of self-esteem (54.8% of women than 33.0% of men) and inability to use the network of mutual connections (50.5% of women than 21.1% of men).

The situation is similar if we take into account the position held and the length of service of the respondents. Slightly more often, people holding higher positions and with

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longer work experience point to the challenges that women managers and leaders have to face. The existence of the indicated relationships is confirmed by the χ^2 independence test with the strength of the relationship determined by V-Cramer (Table 3).

Table 3. Adversities women face in pursuing a professional career in logistics in managerial positions in relation to selected variables (n=708)

Variable	Gender			Position			Seniority		
	χ^2 ^a	p ^b	V ^c	χ^2	P	V	χ^2	p	V
Excessive perfection	77.863	0.001	0.332	56.944	0.001	0.164	141.483	0.001	0.224
Men's reluctance and fear of strong women	34.131	0.001	0.220	78.926	0.001	0.193	121.702	0.001	0.207
Inability to communicate with men	11.226	0.024	0.126	117.730	0.001	0.235	157.549	0.001	0.236
Personal career costs	57.316	0.001	0.285	25.796	0.011	0.110	69.036	0.001	0.156
Excessive modesty	88.010	0.001	0.353	130.134	0.001	0.248	80.249	0.001	0.168
The need to constantly prove something to someone	72.218	0.001	0.319	79.897	0.001	0.194	74.639	0.001	0.162
Negative emotions	7.206	0.125	0.101	95.291	0.001	0.212	93.401	0.001	0.182
Poor female mentoring	24.886	0.001	0.187	58.419	0.001	0.166	153.663	0.001	0.233
Underestimating your own successes	103.538	0.001	0.382	61.714	0.001	0.170	158.797	0.001	0.237
Inability to effectively self-present	25.099	0.001	0.188	69.605	0.001	0.181	146.267	0.001	0.227
Insecurity and lack of self-esteem	43.822	0.001	0.249	53.152	0.001	0.158	63.086	0.001	0.149
Inability to use the network of mutual connections - rules of reciprocity	44.643	0.001	0.251	115.001	0.001	0.233	100.463	0.001	0.188

^a χ^2 – test value at $\alpha=0.05$ ^b p – asymptotic significance ^c The strength of the relationship calculated using V-Cramer

Source: *own data*

For women, the greatest dichotomy is visible between the average level of perceived satisfaction with the work performed and the average perception of it in the case of the following issues: bonus as a component for the work performed (-1.34), pay is adequate to the effort (-1.25), work provides the opportunity to improve qualifications (-1.18) and the work consists of varied tasks (-1.03). In turn, for men, there is a significant visible dichotomy in the case of good communication in the organization (-1.10). In the case of other representations, there are differences between the perceived level of satisfaction and the expectations, but they are not as significant as in the case of women.

It is worth noting that both men and women experience a higher average level of stress at work than they imagine (+1.18 in the case of men and +0.72 in the case of women), which means that the level of stress in the implementation of work in the area of logistics related to the challenges of the 5.0 economy is independent of gender.

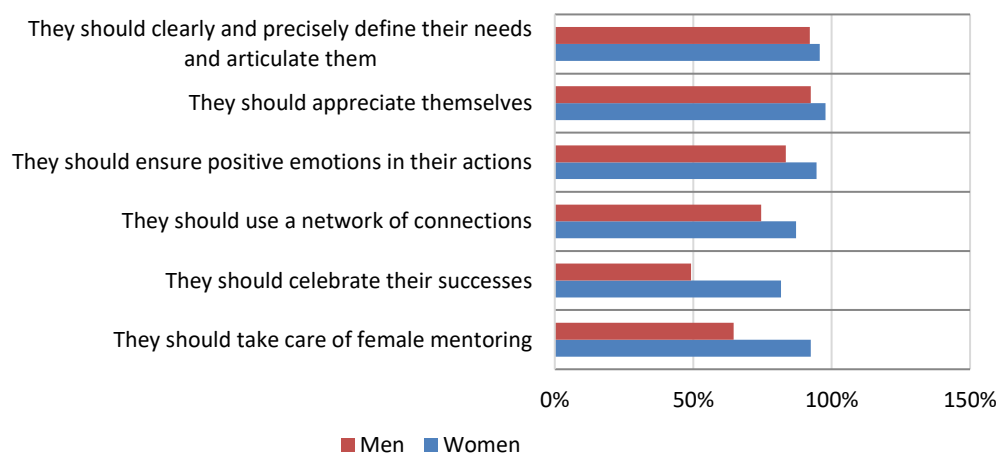
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Table 4. The level of perception and satisfaction with the work performed by women and men in the face of the challenges of economy 5.0 (\bar{x} indications)

	Women - idea of their work	Women - the level of satisfaction felt from the work actually performed	Men - idea of their work	Men - the level of satisfaction felt from the work actually performed
A sense of the importance of the work performed	4.6	3.86	4.36	3.66
The work is interesting	4.56	3.91	4.38	3.75
Good relationship with your superior	4.6	4.33	4.25	3.77
A sense of belonging to a team	4.67	4.03	4.22	3.89
Sense of employment stability	4.68	4.11	4.48	3.9
Good working conditions	4.68	4.01	4.33	3.69
The position has clearly defined responsibilities	4.2	3.78	3.73	3.66
Work is stressful	2.52	3.24	2.36	3.54
Work gives you the opportunity to improve your qualifications	4.63	3.45	4.17	3.36
The pay for work is adequate to the effort	4.62	3.37	4.19	3.25
Bonuses are a component of completing tasks	4.38	3.04	3.96	3.03
Use of working time	4.58	3.81	4.2	3.28
Diversifying the tasks performed	4.44	3.41	4.07	3.3
The ability to decide how the work will be done	4.17	3.94	4.11	3.43
Good communication in the organization	4.78	3.81	4.36	3.26
Possibility to reconcile work and private life	4.61	4.06	4.43	3.62
Good assessment of the company's image as an employer	4.28	4.06	3.92	3.47

Source: *own data*

Eliminating the adversities and reducing the dichotomy between ideas and reality in the evaluation of work in logistics and the condition for women in logistics to be appreciated as managers and leaders in the era of economy 5.0 is related to specific actions (Graph 5).



Graph 5. Women's activities towards strengthening their professional career in logistics in managerial positions (% of responses)

Source: *own data*

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The vast majority of both women and men admit that women should start to appreciate themselves (93.9%), they should clearly and precisely define their needs and articulate them (93.1%), and take care of positive emotions in action (86.4%). Women themselves indicate slightly more often that women should take care of female mentoring (92.5% of women compared to 64.6% of men), should celebrate their successes (81.7% of women compared to 49.2% of men) and use from the network of connections (87.1% women compared to 74.5% men).

Table 5. Women's actions towards strengthening their professional career in logistics in managerial positions in relation to selected variables (n=708)

Variable	Gender			Position			Seniority		
	χ^2 ^a	p ^b	V ^c	χ^2	P	V	χ^2	p	V
They should clearly and precisely define their needs and articulate them.	12.358	0.006	0.132	54.699	0.001	0.160	45.656	0.001	0.147
They should appreciate themselves.	33.870	0.001	0.219	38.584	0.001	0.165	43.619	0.001	0.176
They should celebrate their successes.	120.184	0.001	0.412	101.843	0.001	0.219	123.778	0.001	0.209
They should take care of female mentoring.	95.559	0.001	0.367	125.087	0.001	0.243	109.984	0.001	0.228
They should use a network of connections.	65.318	0.001	0.304	58.614	0.001	0.166	70.402	0.001	0.158
They should ensure positive emotions in their actions.	40.060	0.001	0.238	83.665	0.001	0.198	120.108	0.001	0.238

^a χ^2 – test value at $\alpha=0.05$ ^b p – asymptotic significance ^c The strength of the relationship calculated using V-Cramer

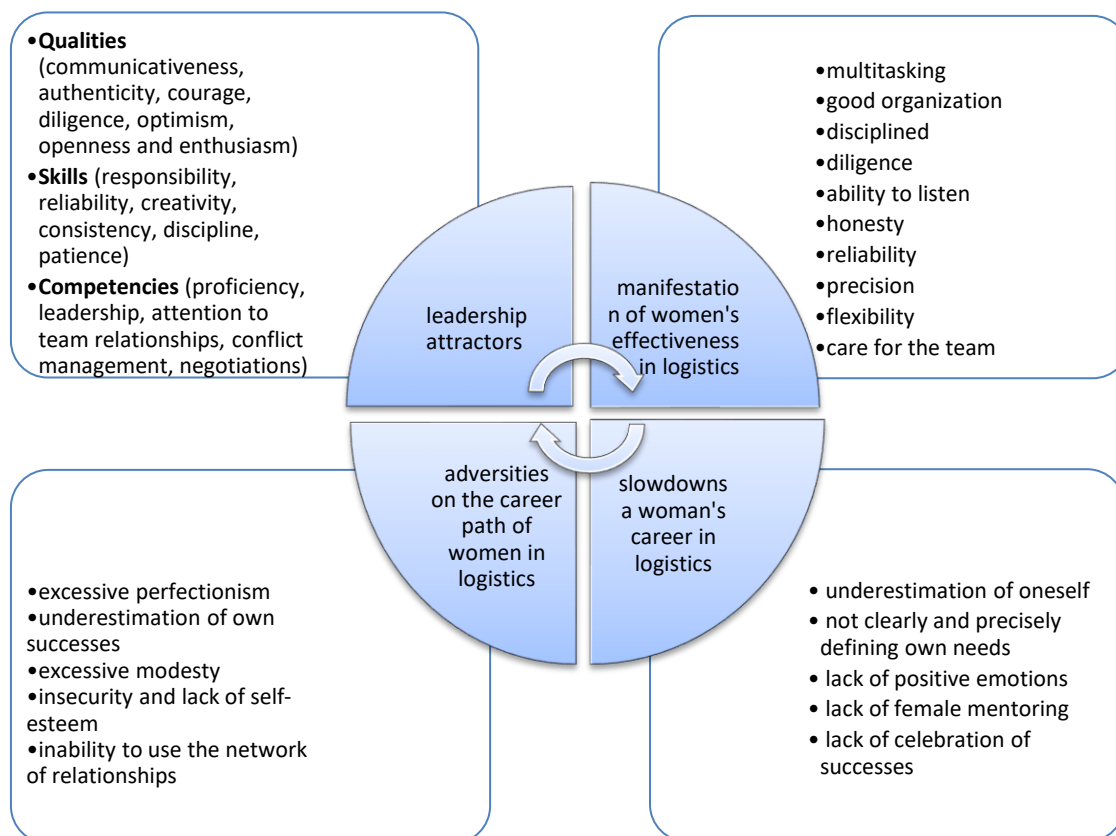
Source: *own data*

Analyzing the potential relationship between women's activities aimed at strengthening their professional career in logistics and the position held and work experience, respondents who declare holding higher positions and with longer work experience are more likely to believe that women should clearly and precisely define their needs and articulate them, appreciate themselves, celebrate successes, ensure female mentoring, use the network of connections and ensure positive emotions in activities. The existence of the indicated relationships is confirmed by the χ^2 independence test with the strength of the relationship determined by V-Cramer (Table 5).

Conclusions and implications for the future

To sum up, in the era of economy 5.0, according to the research results, women managers and leaders occupy an important place in the organizational structures of enterprises. Gender ceases to matter. Women managers are valued for their multitasking, organization, diligence, discipline, professionalism, communication skills, care for the team and flexibility. Respondents indicate that in the era of challenges posed by the 5.0 economy, in order to achieve success, women managers must overcome adversities, including excessive self-criticism in terms of men's reluctance towards strong women, career costs in the personal field and the need to constantly prove their value and underestimation of their own successes.

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Graph 6. Model image of woman leaders in logistics

Source: *own elaboration*

According to the respondents, they should clearly articulate their expectations, appreciate themselves, take care of positive emotions and use the network of relationships, while taking care of internal mentoring. As result of the research an model image of a woman leader in logistics has been created (Graph 6).

To summarize the contents of this article, it can be said that women working in logistics companies thrive in a demanding and changeable environment. They are more and more present in the group of people managing enterprises, and they also hold higher managerial positions. In their activities, they advocate changes and improvements in enterprises and are supporters of digitalization. They willingly use digital solutions and promote them in managed enterprises, and they appreciate technology for its improvements, usability and efficiency of process implementation. They are aware that the future belongs to those who follow and want to change even when they encounter adversities along the way. Substantive content, knowledge and experience are necessary, but not sufficient in achieving goals in the future. Team building and management is important. Striving for cooperation, caring for the team, discipline and good organization are important. These are the attributes that may become crucial for logistics managers in the era of challenges of the 5.0 economy.

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