DOI: 10.7251/JTTTP2502138U
UDC: 316.334.55-055.2:004.738.5

ORIGINAL SCIENTIFIC PAPER

Stochastic analysis of gender-differentiated ethical patterns in the function of optimizing traffic and work processes

Nina Uremović
Associate Professor, Faculty of Business Economics, Pan-European University Apeiron, Banja Luka, Republic of Srpska, Bosnia and Herzegovina, nina.d.uremovic@apeiron-edu.eu; ORCID ID: 0000-0001-5445-2262

Radmila Pejić
Assistant Professor, Faculty of Business Economics, Pan-European University Apeiron, Banja Luka, Republic of Srpska, Bosnia and Herzegovina, radmila.v.pejic@apeiron-edu.eu; ORCID ID: 0009-0003-8742-6003

Mirjana Landika
Full Professor, Faculty of Business Economics, Pan-European University Apeiron, Banja Luka, Republic of Srpska, Bosnia and Herzegovina, mirjana.f.landika@apeiron-edu.eu; ORCID ID: 0000-0002-1495-2462

Received: December 9, 2025
Accepted: December 18, 2025

Abstract: Ethical behavior in traffic and the workplace exhibits noticeable gender differences, which are not determined solely by biological characteristics but also by social norms, roles, and expectations. This study analyzes the stochastic relationship between gender and expressed ethical attitudes using appropriate statistical methods, aiming to identify behavioral regularities. The results indicate statistically significant differences, with women showing greater consistency in applying ethical norms both in traffic and in work environments. The findings can serve as a basis for developing targeted educational and regulatory measures to improve traffic safety and efficiency in work processes while considering gender-specific characteristics.

Key words: ethics, gender differences, traffic, work environment, binary logistic regression.

INTRODUCTION

Ethical behavior forms the foundation for building trust, safety, and efficiency in modern traffic systems and work environments. In societies characterized by complex interpersonal relationships and increasing demands for responsible conduct, understanding patterns of ethical decision-making becomes crucial for enhancing system functionality, preventing risks, and establishing sustainable standards.

A particular challenge lies in identifying and analyzing gender differences in ethical behavior, as gender—as a social construct—shapes the ways individuals perceive norms, make decisions, and respond to ethical dilemmas. Numerous studies in the field of traffic indicate differences in risk perception and compliance with traffic regulations between men and women. In the work context, these differences manifest in terms of professional responsibility, communication, and attitudes toward rules and authority. Due to the complex relationships between gender and ethical behavior, stochastic analytical models were applied in this study to measure variable behavioral patterns. The aim of the research is to identify patterns of ethical behavior that differ by gender and to examine how these patterns can be utilized to improve traffic and work processes. Particular emphasis is placed on the use of statistical methods that help better understand ethical decision-making in real-world circumstances. A multidisciplinary approach integrating sociological, psychological, and statistical perspectives enables a comprehensive analysis of the complex relationships between ethics and gender, with the potential to contribute to the enhancement of professional standards, safety, and organizational efficiency.

LITERATURE REVIEW

The study of ethical behavior in modern societies is gaining increasing importance due to the dynamic changes in work and social relationships. Ethical conduct in traffic and the workplace has long been the subject of interdisciplinary research. Existing literature indicates that ethical behavior is not determined solely by individual traits but also by broader social, cultural, and structural conditions, which often vary depending on gender.

Research in the field of traffic shows that men and women differ in risk perception and ethical behavior. On

average, women are less likely to violate traffic regulations and less frequently involved in traffic accidents caused by aggressive behavior. These differences have significant implications for ethical and safety practices in traffic. According to studies by Özkan and Lajunen (2006), men are more likely to exhibit risky driving behavior and are less inclined to comply with traffic rules, while women demonstrate higher levels of caution and adherence to moral norms. These differences are often interpreted through the lens of gender socialization – women are taught caution and responsibility, whereas men are encouraged to be confident and risk-taking.

Sociological approaches, particularly those inspired by gender theory, indicate that traffic behavior does not stem from biological differences but from accepted social norms regarding "feminine" and "masculine" behavior (Connell, 2005). In parallel, moral development theories suggest that women may be more inclined toward an ethic of care and interpersonal responsibility, which is reflected in more careful behavior in traffic (Gilligan, 1982). Such approaches highlight the need to analyze ethical behavior not only at the level of individual choices but also in terms of deeper social and psychological patterns.

In the workplace, gender differences in ethics are also well documented. The work environment represents a complex setting in which ethics manifests through professional norms and interpersonal relationships. Gender differences in professional ethics are often reflected in varying styles of communication, decision-making, and conflict management. According to numerous studies, women more frequently demonstrate sensitivity to moral dilemmas, show greater adherence to rules, and are more willing to report unethical actions (Loo, 2003).

Gender differences in workplace ethics and behavior are further influenced by women's position within organizational hierarchies. Research by Eagly and Carli (2007) indicates that women in leadership positions are more likely to consider the opinions of others, and their leadership style is based on mutual trust, dialogue, and collective responsibility. At the same time, however, they face double standards and higher moral expectations (Catalyst, 2020).

The application of stochastic models in the study of ethical behavior allows for a quantitative assessment of the probability of certain reactions or deviations, without relying on strict deterministic laws, but by modeling behavioral patterns useful for prevention and process optimization.

In the domestic literature, this topic remains insufficiently explored. Existing studies primarily address traffic safety and issues of gender equality in work environments but rarely include the ethical dimension in both contexts. Therefore, this study aims to contribute to this gap through an interdisciplinary, empirical, and statistically grounded approach.

RESEARCH METHODOLOGY

The empirical basis of this study rests on the hypothesis that there is a causal relationship between an individual's behavior in two distinct environments—namely, the workplace and the traffic environment—as well as a gender-conditioned causal relationship.

A quantitative-statistical approach based on stochastic analysis was applied in this research, enabling the examination of the probability of ethically relevant behavioral patterns occurring in different contexts. The study was conducted on a sample of 104 respondents, evenly distributed by gender, employment status, and age. The questionnaire, presented below, was administered electronically. A sufficient number of respondents completed the survey, allowing the research results to be formed on the basis of collected empirical data, with the structure of responses enabling further research procedures and the drawing of valid conclusions.

Illustration 1. Example of the survey questionnaire (authors)

ETHICS

Category	Options
1. Age	Up to 25 years / 25–40 years / 41–65 years / Over 65 years
2. Place of upbringing	Village / Suburban area / City
3. Gender	Male / Female
4. Highest level of education completed	Primary school / Secondary school / College or university / Master's degree / Doctorate
5. Highest level of education of your mother	Primary school / Secondary school / College or university / Master's degree / Doctorate
6. Highest level of education of your father	Primary school / Secondary school / College or university / Master's degree / Doctorate
7. Employment status	Student / Employed / Unemployed / Homemaker / Entrepreneur / Retired
8. Position at work	Assistant worker / Executive worker / Lower management / Middle management / Senior management / Entrepreneur
9. Marital status	Married / Cohabiting / Single / Divorced / Widowed / Living with family of origin
10. Driver status	No / Yes, passive (licensed but rarely drives) / Yes, active
11. Knowledge of ethics	Yes / Heard of the concept but not certain / No
12. Do you consider yourself an ethical person?	Yes, completely / Partially, everyone deviates sometimes / No, why should I, most people aren't

13. Express your attitude towards behavior in traffic

Answer / Question	I agree	I agree, but sometimes allowed	Every rule has exceptions	If it does not endanger anyone, deviation is allowed	If there is no possibility of punishment, then not	I disagree
Seat belt should be fastened						
Right of way should be respected						
Pedestrians crossing at un marked locations should be allowed						
Overtaking on a solid line is not allowed						
Speed limits should be respected						
Parking bans should be observed						
Mobile phone should not be used, except as permitted						

14. Express your attitude towards behavior in the workplace

Answer / Question	I agree	I agree, if circumstances require	Only if necessary	If there will be no sanctions, why bother	I am not valued at work anyway, why bother	No
Arrive on time and stay until the end of working hours						
Working hours should be used exclusively for work-related activities						
Workplace resources should be used rationally (as if we bought them ourselves)						
Colleagues should be treated respectfully						
Superiors should be obeyed						
Work as if you are work ing "for yourself"						
Help others when needed						
Stay longer at work if the job requires it						

The structure of responses regarding behavior in traffic and workplace environments can be illustrated as shown below.

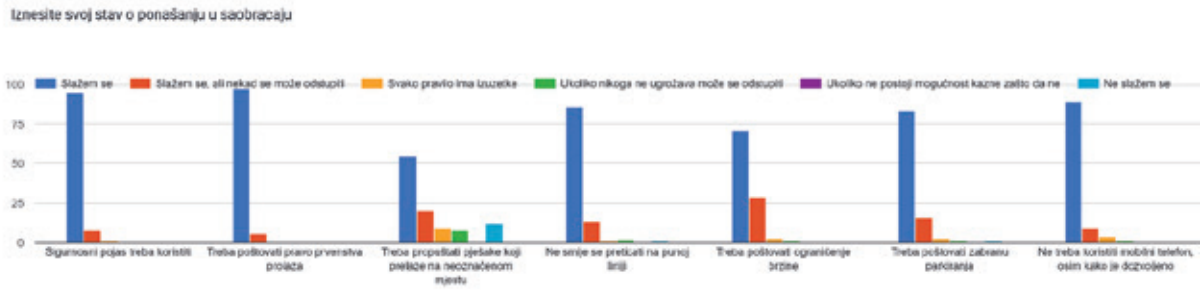

Figure 1. Respondents' attitudes toward traffic ethics (authors)

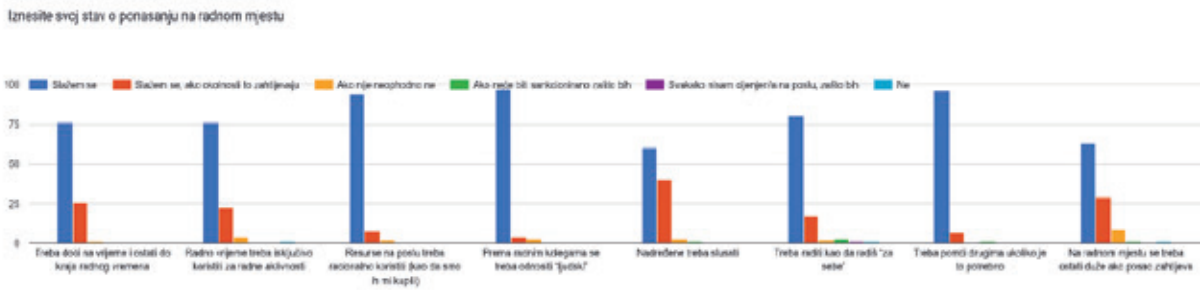

Figure 2. Respondents' attitudes toward workplace ethics (authors)

The aim of the methodology is to identify the probabilities and regularities that show to what extent and in what way ethical behavior varies depending on gender, with a special focus on interactions between the work and traffic contexts. This approach enables a deeper understanding of gender-conditioned behavioral patterns and contributes to the foundation for recommendations regarding ethics in traffic, the workplace, and regulations governing specific behaviors.

For the analysis, the binary logistic regression method was used, which predicts the likelihood of an individual exhibiting certain behavior in traffic based on gender and workplace ethical components.

The binary logistic regression model uses empirical data to explain the probability of a specific outcome occurring. In the model, the dependent variable is the likelihood that an individual exhibits a particular behavior as a participant in the traffic process, while the independent variables include gender and the individual's ethical code in the workplace.

The binary logistic regression model allows us to answer the question of the probability that an individual will exhibit a certain behavior during the traffic process, considered a traffic violation, taking into account their gender and ethical code in the workplace.

The odds represent the ratio between the probability of an event occurring and the probability of that event not occurring, which can be expressed in the following form:

$$\xi = \frac{\pi}{1-\pi}$$

The above relation refers to the population (the full set), whereas in empirical research the probability values of a random event are not directly available. Instead, the research is based on relative frequencies, i.e., estimated probabilities of the occurrence of a given random variable:

$$\check{s} = \frac{p}{1-p}$$

It is important to note that the probability of an outcome ranges from 0 to 1, while the odds range from 0 to +∞.

To adapt the survey results, the collected responses are transformed into binary variables, based on the assumption that all responses except "Strongly agree" indicate the possibility of "Rule violation" concerning the stated statement. The transformation into a binary variable is therefore performed in this manner.

After conducting the procedure to form the binary logistic regression model, we obtain the following results.

The dependent variables in the binary logistic regression models are listed below.

Table 1. Binary logistic regression coefficients obtained from empirical data analysis in IBM SPSS

Dependent variable / Indepedent variable	Xp1	Xp2	Xp3	Xp4	Xp5	Xp6	Xp7
Arrive on time and stay until the end	1,340	-1,688	-,218	,002	-,111	-,509	-,169
Working hours for work only	,076	1,657	1,165	1,427	1,733	1,308	,742
Use resources rationally	1,221	1,793	-,034	,017	-1,480	-,270	-,837
Treat colleagues humanely	-1,649	1,559	,318	-,139	-,287	-,021	-,643
Obey supervisors	1,086	2,409	,590	,992	1,585	,823	1,287
Work as if for oneself	-,481	-,897	-,267	1,695	1,822	2,154	1,609
Help others if necessary	1,209	-18,582	-,158	-19,485	-,530	-19,112	-18,914
Stay longer if required	-1,415	,820	,607	-,327	-,854	-,406	,214
Gender	-1,014	-,827	,168	-1,510	,305	-,549	,517
Constant	-1,502	-3,697	-1,087	-,542	-2,552	-1,674	-4,107

Table 2. Dependent variables in the binary logistic regression model

Variable	Meaning
Xp1	Seatbelt should be fastened
Xp2	Right of way should be respected
Xp3	Pedestrians at unmarked crossings should be allowed
Xp4	No overtaking on solid lines
Xp5	Speed limits should be observed
Xp6	Parking restrictions should be respected
Xp7	Mobile phones should not be used except as allowed

The coefficients in the binary logistic regression model indicate how each variable contributes to increasing the likelihood of the corresponding traffic "violation," with a positive sign indicating an increase and a negative sign a decrease in the probability of the analyzed traffic violation.

Regarding respondent gender, it is observed that for women, the likelihood of committing the following violations increases:

- Allowing pedestrians at unmarked crossings
- Parking violations
- Mobile phone use while driving

For other violations, the likelihood decreases. Additionally, a significantly higher coefficient value for Xp7 ("Help others if necessary") reduces the chances of committing traffic violations in four of seven variables, with a magnitude of almost 20, while other coefficients are below 3 in absolute value.

RESEARCH RESULTS

The analysis of the collected data clearly indicates significant gender differences in the perception and application of ethical norms, both in traffic and in the workplace. These differences are not only statistically significant but also have practical implications for human resource management and policy-making aimed at promoting responsible and safe behavior.

Women, to a significantly greater extent, demonstrated adherence to basic traffic rules, such as wearing seat belts, respecting speed limits, and avoiding the use of mobile phones while driving. They also showed more consistent attitudes regarding the importance of observing working hours, maintaining professional relationships with colleagues, and rational use of workplace resources.

In contrast, men more frequently displayed a flexible or pragmatic approach to certain ethical issues, reflected in a lower level of strict compliance with rules and regulations, particularly in traffic behavior.

The analysis revealed a significant relationship between gender and ethical attitudes, indicating that gender can influence the formation of ethical behavior. Furthermore, it was found that attitudes toward ethics in traffic are linked to workplace ethics, confirming that an individual's general ethical stance affects their behavior in different contexts.

Recognizing gender differences enables organizations and institutions to target educational and preventive activities more effectively. For example, traffic safety campaigns can be tailored to address risky behaviors more common among men, while workplace programs can be developed to promote equal responsibility and discipline, taking gender-specific characteristics into account.

Such an approach contributes to better organization of traffic and work processes, reducing potential risks, strengthening teamwork, and utilizing human resources more efficiently, ultimately resulting in higher productivity and increased safety.

Incorporating a gender perspective into the analysis of ethical behavior provides a deeper understanding of the factors influencing behavior in key social domains. This enables the creation of more precise and effective policies and measures that promote ethical responsibility among all participants in traffic and the workplace, reducing conflicts and insecurity, while contributing to stronger social cohesion and sustainable development.

CONCLUSION

The stochastic analysis of gender-differentiated ethical patterns indicates that gender differences in behavior are not only statistically observable but also deeply rooted in social norms, cultural patterns, and socialization processes. Ethical behavior, both in traffic and in the workplace, is shaped through a complex interplay between individual beliefs and societal expectations. Women, who on average demonstrate a higher degree of compliance with ethical norms, contribute to a safer, more stable, and more responsible social environment. This study confirms the necessity of considering gender-specific characteristics when planning measures to improve safety and efficiency in traffic and workplace settings. By integrating a gender perspective into policy development and educational programs, it is possible not only to optimize processes but also to foster a more inclusive, just, and responsible society. From a sociological standpoint, such an approach represents an important step toward dismantling stereotypes and enhancing social cohesion, which is a crucial condition for long-term social development.

REFERENCES

[1] Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin, 125*(3), 367–383. https://doi.org/10.1037/0033-2909.125.3.367

[2] Catalyst. (2020). *Why diversity and inclusion matter: Financial performance.* https://www.catalyst.org/research/why-diversity-and-inclusion-matter-financial-performance/

[3] Connell, R. W. (2005). *Masculinities* (2nd ed.). University of California Press.

[4] Eagly, A. H., & Carli, L. L. (2007). *Through the labyrinth: The truth about how women become leaders.* Harvard Business Review Press.

[5] Gilligan, C. (1982). *In a different voice: Psychological theory and women's development.* Harvard University Press.

[6] Loo, R. (2003). Are women more ethical than men? Findings from three independent studies. *Women in Management Review, 18*(4), 169–181. https://doi.org/10.1108/09649420310482367

[7] Radovanović, B. F., Brković, A., & Lalović, D. (2011). *Business ethics and social responsibility in human resources management.* Institute of Economic Sciences.

[8] Özkan, T., & Lajunen, T. (2006). What causes the differences in driving between young men and women? The effects of gender roles and risk perception. *Transportation Research Part F: Traffic Psychology and Behaviour, 9*(4), 269–277.