SECURITY, AUDIT AND LEADERSHIP SERIES

DIGITALIZATION AND WOMEN'S RIGHTS

VOLUME 1

Edited by
Muharrem Kılıç and
Sezer Bozkuş Kahyaoğlu

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Digitalization and Women's Rights

Technological advancements frequently hinder the progress of women in the business sphere. In our current landscape, the rapid evolution of technology—driven by digital transformation—has created significant barriers to women's participation. This has given rise to new forms of discrimination that often go unacknowledged and unaddressed. The unfortunate reality is that this issue is sidelined in discussions about the economy and broader implications for employment. We must recognize and confront the unique challenges women face in this technological age, as their exclusion not only impacts them but also stifles innovation and growth in our economy. It is time to advocate for a more inclusive approach that empowers women in the tech world.

In this vital context, it is essential to recognize the discrimination and emerging challenges that women will face, although these issues may not have been previously explored in sufficient detail. This work has been thoughtfully created to fill that gap, serving as a crucial reference about these matters. By shedding light on existing gaps in the research, this book promises to enrich future studies and provide invaluable insights for researchers who investigate and evaluate related works. One of the most pressing challenges ahead for women in the rapidly evolving digital landscape is understanding and navigating the economic opportunities available to them. As we enter this new era, women will undergo a transformative journey that demands adaptability and learning in the face of continuous innovation. This work aspires to contribute significantly to these conversations and empower women as they embrace the future.

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After completing his law studies at Marmara University Faculty of Law, Kılıç was appointed as Associate Professor in 2006 and as Professor in 2011. Kılıç has held multiple academic and administrative positions such as Institution of Vocational Qualification Representative of the Sector Committee for Justice and Security, Dean of the Law School, Vice-Rector, Head of the Public Law Department, and Head of the Division of Philosophy and Sociology of Law Department. He has worked as Professor, Lecturer, and Head of the Department of Philosophy and Sociology of Law at Ankara Yıldırım Beyazıt University Faculty of Law. His academic interests are philosophy and sociology of law, comparative law theory, legal methodology, and human rights law. In line with his academic interests, he has scientific publications consisting of many books, articles, and translations, as well as papers presented in national and international congresses.

Among a selection of articles in Turkish, 'The Institutionalization of Human Rights: National Human Rights Institutions'; 'The Right to Reasoned Decisions: The Rationality of Judicial Decisions'; 'Transhumanistic Representations of the Legal Mind and Onto-robotic Forms of Existence'; 'The Political Economy of the Right to Food: The Right to Food in the Time of Pandemic'; 'The Right to Education and Educational Policies in the Context of the Transformative Effect of Digital Education Technology in the Pandemic Period'; and 'Socio-Politics of the Right to Housing: An Analysis in Terms of Social Rights Systematics' are included. His book selections include *Social Rights in the Time of the Pandemic: The Socio-Legal Dynamics of Social Rights* and *The Socio-Political Context of Legal Reason*. Among the English article selections, 'Ethico-Juridical Dimension of Artificial Intelligence Application in the Combat to Covid-19 Pandemics' and 'Ethical-Juridical Inquiry Regarding the Effect of Artificial Intelligence Applications on Legal Profession and Legal Practices' are among the most recently published academic publications.

He worked as a Project Expert in the 'Project to Support the Implementation and Reporting of the Human Rights Action Plan', of which

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He was appointed as the Chairman of the Human Rights and Equality Institution of Turkey with the Presidential appointment decision numbered 2021/349, published in the Official Gazette on 14 July 2021. He currently serves as Chairman of the Human Rights and Equality Institution of Turkey.

SEZER BOZKUŞ KAHYAOĞLU

Sezer Bozkuş Kahyaoğlu (Associate Professor) graduated from Bosporus University with a BSc degree in Management. Kahyaoğlu obtained an MA degree in Money, Banking, and Finance from Sheffield University and a Certification in Retail Banking from Manchester Business School, both with a joint scholarship from the British Council and the Turkish Bankers Association. After completing her doctoral studies, Kahyaoğlu earned a PhD degree in Econometrics from Dokuz Eylul University in 2015. Kahyaoğlu has worked in finance sector in various head office positions and at KPMG Risk Consulting Services as Senior Manager. Subsequently, Kahyaoğlu joined Grant Thornton as the founding partner of advisory services, working in Business Risk Services. Later, Dr. Kahyaoğlu worked in SMM Technology and Risk Consulting as Partner responsible for ERP Risk Consulting. During this period, Kahyaoğlu was a lecturer at Istanbul Bilgi University Accounting and Auditing Program and at Ankara University Internal Control and Internal Audit Program. Kahyaoğlu has been working as Associate Professor at Izmir Bakircay University since October 2018. Kahyaoğlu more recently joined the University of Johannesburg, Department of Commercial Accounting, School of Accountancy in the University of South Africa (UNISA), Financial Governance Department in South Africa as an associate professor to engage in more international joint academic works. Her research interests mainly include applied econometrics, time series analysis, AI-based financial markets and instruments, AI, Blockchain, energy markets, corporate governance, risk management, fraud accounting, auditing, ethics, coaching, mentoring, and NLP. Kahyaoğlu has various refereed articles, books, and research project experiences in her professional field. She was among the 15 leading women selected from the business world within the scope of the 'Leading Women of Izmir Project', which was sponsored by the World Bank and organized in cooperation with Aegean Region Chamber of Industry (EBSO), Izmir Governor's Office, and Metropolitan Municipality.

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Abbreviations

ABA	American Bar Association
ADAS	Advanced Driver Assistance Systems
ADM	Automated Decision-Making
ADR	Alternative Dispute Resolution
AGFI	Adjusted Goodness of Fit Index
AI	Artificial Intelligence
AI HLEG	High-Level Expert Group on Artificial Intelligence
AIC	Akaike Information Criterion
ANOVA	Analysis of Variance
ASC	Adaptive Speed Control System
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CEPEJ	European Commission for the Efficiency of Justice
CFI	Comparative Fit Index
ECVI	Expected Cross-Validation Index
EIGE	European Institute for Gender Equality
ENNHRI	European Network of National Human Rights Institutions
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization of the United Nations
FCW	Forward Collision Warning
GDPR	General Data Protection Regulation
GEM	Global Entrepreneurship Monitor
GFI	Goodness of Fit Index
GREVIO	Group of Experts on Action against Violence against Women and Domestic Violence
HRBDT	Human Rights, Big Data and Technology
HRC	Human Rights Council
HREIT	Human Rights and Equality Institution of Türkiye
ICTs	Information and communication technologies
IFI	Incremental Fit Index
ILO	International Labor Organization
IMF	International Monetary Fund
IoT	Internet of Things

ITU	International Telecommunication Union
IVIS	In-Vehicle Information Systems
LDW	Lane Departure Warning
LFPR	Labor Force Participation Rate
LKS	Lane-Keeping System
METU	Middle East Technical University
MFI	McDonald Fit Index
ML	Machine Learning
NDP	National Development Plan
NEB	National Equality Bodies
NetzDG	Network Enforcement Act
NFI	Normed Fit Index
NGOs	Non-Governmental Organizations
NHRIs	National Human Rights Institutions
NLP	Natural Language Processing
OECD	Organization for Economic Co-Operation and Development
PDPL	Personal Data Protection Act
PGFI	Parsimony Goodness of Fit Index
PIUS	Problematic Internet Use Scale
RLR	Red-Light Running
SABIC	Sample-Size Corrected Bayesian Information Criterion
SDGs	Sustainable Development Goals
SMMEs	Small, Medium, and Microenterprises
STEM	Science, Technology, Engineering, and Mathematics
TAM	Technology Acceptance Model
TBV	Turkish Informatics Foundation
TFGBV	Technology-Facilitated Gender-Based Violence
TPB	Theory of Planned Behavior
TÜİK	Türkiye İstatistik Kurumu- Turkish Statistical Institute
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UTAUT	Unified Theory of Acceptance and Use of Technology
WEF	World Economic Forum
WHO	World Health Organization
WiMLDS	Women in Machine Learning and Data Science
WSIS	World Summit on the Information Society

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Chapter 16

Algorithmic discrimination against women in the recruitment process

Yeliz Bozkurt Gümrükçüoğlu and Fatma Burcu Savas# Kutsal

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INTRODUCTION

Prohibition of Discrimination in Employment

Although it is accepted that as a requirement of the principle of freedom of contract the employer has the freedom to choose the other party to the contract, modern legal systems have imposed certain limitations on this freedom. Indeed, one such limitation is the prohibition of discrimination. Therefore, employers cannot refrain from concluding an employment contract on the basis of discrimination (Yıldız 2008, Türe 2021, Bozkurt Gümrükçüoğlu and Yakacak 2023).

Antidiscrimination rules in recruitment protect human dignity (Straker 2024) and require that the entire process, commencing with the job advertisement, is conducted without risk of discrimination. For this reason, the language used in job advertisements should be independent of gender or other discriminatory elements (Karb 2024), and the selection process of candidates should be conducted in accordance with antidiscrimination laws. Since the prohibition of discrimination also constitutes a limit to the employer's right to information, the employer's right to ask questions cannot exceed the limits of this prohibition (Karb 2024). The same limit should be observed with regard to information obtained through methods that don't involve asking the candidate, such as social media scans. The criteria used to select candidates should also not contain discriminatory elements. It should be noted that the prohibition of discrimination in access to employment should not be limited to the conclusion of the contract but should be evaluated together with other legal requirements. In this context, the employer must comply with the prohibition of discrimination, in particular when determining wages and work conditions (Karb 2024).

Discrimination against Women

Discrimination against women in employment is one of the forms of discrimination that has been fought against for many years around the world, 279but which is still difficult to prevent. It is known that historically women's skills were perceived to be limited to cooking, sewing, childcare, and housework, and that their participation in the labor force was realized at a very late period and initially restricted to certain professions (Jackson 2021). It is a long-held belief that women's muscular strength and intellectual capacity are insufficient to perform many jobs (Jackson 2021). It is not yet possible to say that this prejudice has disappeared or that it can be eliminated in the near future. Although women are now active in sectors that were dominated by men in the past, it is still difficult to express that they have equality of opportunity. Discrimination against women is a general problem in the area of employment. According to the Global Gender Gap Report 2024, 146 countries have a global gender gap score of 68.5%. Based on current data, it will take 134 years to achieve gender parity in employment (Global Gender Gap Report 2024). According to data from LinkedIn, in 2024, women's participation in the workforce remains lower than men's in almost every sector and

economy. Women make up 42% of the global workforce and 31.7% of senior executives (Global Gender Gap Report 2024). There are also significant differences between sectors, with the gap widening in some sectors such as technology and IT. In fact, women make up only 28.2% of the STEM workforce, compared to 47.3% in non-STEM sectors (Global Gender Gap Report 2024). According to Eurostat data, the proportion of men employed as ICT specialists in the EU in 2023 was 80.6%, while the proportion of women was 19.4% (Eurostat ICT specialists in employment 2024). Women are still underrepresented in managerial positions. In fact, in 2024, the proportion of women in senior positions dropped below from that in 2021 (36.4%) (Global Gender Gap Report 2024). Although ensuring equality of opportunity in employment has long been the subject of national and international legislation, it is still no more than a utopian ideal. In Türkiye, it has been observed that a significant proportion of the applications submitted to HREIT in 2018–2020 regarding discrimination in employment are related to discrimination on the grounds of being female or pregnant.[1]

The picture for fair working conditions and promotion opportunities is similar to that for access to employment. The gender pay gap persists (Jackson 2021). 'Equal pay for equal work' is still just a slogan. Unfortunately, the situation is no different in developed countries. EU Directive 2023/970, which entered into force on 6 June 2023, in our view, is a clear indication of this fact.

While discrimination against women in terms of women's participation in the workforce, as well as in the determination of starting salaries and other working conditions, is an age-old problem; new issues and problems have recently arisen due to the use of artificial intelligence technologies. In this context, it is argued that artificial intelligence technologies are blind to historical gender inequalities (Thoms and Mattheus 2024), and even that 280if no action is taken, the use of these technologies risks a more systematic and widespread application of existing discrimination against women (O'Connor and Liu 2023). Below, we will discuss the causes of algorithmic bias in general and its impact on the emergence of discrimination in the recruitment process.

USE OF ARTIFICIAL INTELLIGENCE AND ALGORITHMS IN RECRUITMENT

'Algorithmic recruitment' refers to algorithms, tools, and systems that automate or support human resource decisions in the recruitment process (Fabris et al. 2024). Artificial intelligence and machine learning (ML) algorithms are created and used to rank or eliminate candidates in order to save cost and time and to increase efficiency and impartiality. These algorithms can be constantly modified and updated by artificial intelligence (Andrews and Bucher 2022, Köchling and Wehner 2020).

Algorithmic recruitment, which gained momentum during the COVID-19 pandemic (Waas 2022), has become increasingly preferred (Steege 2019, Waas 2022, Meyer 2023). It is possible to use artificial intelligence technology in almost all steps of the recruitment process (Alpagut and Karaca Yağcı 2023, Engin and Ozan Özparlak 2022, Bozkurt Gümrükçüoğlu and Yakacak 2023, Chen 2023). The algorithm can make a prediction about the candidate's suitability for the job and hence cause the candidate to be eliminated or accepted. In this context, candidate data can be compared with existing employee data; candidate data from social networks can be analyzed, initial interviews can be conducted, and a personality profile (human analytics) can be created by analyzing speech or video (Meyer 2023). The aim is to select the most suitable candidate(s) for the vacant position.

In algorithmic recruitment processes, certain 'algorithmic decisions' are made by artificial intelligence systems devoid of human supervision and intervention or with only partial human intervention (Aksoy 2022). The use of artificial intelligence systems in recruitment should be addressed from a legal perspective from the dimension of human rights, in particular within the context of nondiscrimination and protection of personal data (Bozkurt Gümrükçüoğlu and Yakacak 2023, Türe 2024). There are certain risks in terms of fundamental human rights, in terms of both nondiscrimination and violation of personal data (Borgesius 2020). In fact, these risks are not only limited to legal risks. It is also stated that they may lead to irrational and dysfunctional decisions, thus not saving costs and time, and that no universal criteria can be determined to identify the 'perfect' candidate in recruitment. Another criticism is that the use of algorithmic decision systems in recruitment can lead to the selection of candidates with similar characteristics to existing employees, as they are fed by retrospective data, thus condemning the company to stagnation (Andrews and Bucher 2022).281

ALGORITHMIC BIAS AND DISCRIMINATION AGAINST WOMEN IN RECRUITMENT AND ITS CAUSES

At first glance, while it may seem as if algorithmic decision-making systems are less biased or neutral compared to a human decision-maker in the recruitment process (Steege 2019), algorithms can also be discriminatory (Dzida and Groh 2018, Chen 2023, Waas 2022, Bozkurt Gümrükçüoğlu and Yakacak 2023). This is because machine learning and decision-making processes, despite their ascribed objectivity, carry various risks of discrimination (Holthausen 2023).

Whereas the use of algorithmic decision-making systems at the recruitment stage can prevent race and gender discrimination and claims of potential discrimination (Andrews and Bucher 2022), it also carries the risk of disadvantaging a particular individual or different groups or leading to discriminatory practices (Sesing and Tschech 2022). The White Paper on Artificial Intelligence published by the EU Commission clearly states that artificial intelligence carries the risk of discrimination. Therefore, while it can be used to prevent the risk of discrimination, it can also be used to hide discrimination (Geißler 2023, Bozkurt Gümrükçüoğlu and Yakacak 2023). Algorithms that may reflect the opinions of their creators are in conclusion not objective or neutral (Thoms and Mattheus 2024). On the other hand, studies conducted in Türkiye show that human resource professionals are under the misconception that the use of artificial intelligence technologies will lead to more objective decisions (Özyılmaz Misican 2020).

It is important to note that although algorithmic bias poses various discrimination risks, not every algorithmic bias leads to a discriminatory outcome (Bozkurt Gümrükçüoğlu and Yakacak 2023). The use of algorithms in making decisions that lead to discriminatory outcomes is referred to as ‘algorithmic discrimination’. Algorithmic bias and discrimination can be due to different reasons such as the use of incomplete or outdated datasets, flawed algorithms, inappropriate decision-making processes, lack of transparency, deliberate masking, etc. (Bozkurt Gümrükçüoğlu and Yakacak 2023). In order to combat these reasons, it is important to understand them and the ways in which they arise. The fact that algorithmic discrimination is more difficult to detect and prove when compared to discriminatory practices carried out by humans is also an important issue (Waas 2022, Doğan 2023, Güzel et al. 2023). In fact, the number of research and studies on algorithmic discrimination is increasing daily (Doğan 2023). Due to the subject matter of our study, the discussion on the causes of algorithmic bias and its forms of emergence will be limited to cases against women in employment.

Women are among the groups most likely to experience algorithmic bias and algorithmic discrimination. Algorithmic discrimination against women may arise from the preferences of employers or system designers, or it may occur independently (Holthausen 2023, Güzel et al. 2023). In 282fact, artificial intelligence systems intentionally designed to discriminate are rarely seen (Lang and Reinbach 2023, Chen 2023). However, it is possible that people with explicitly discriminatory intentions, such as not hiring women who are likely to become pregnant, may have hidden these intentions through a complex algorithm that produces the same result (Doğan 2023, Güçlütürk 2022). Nevertheless, it is not correct to treat the problem completely independent of the developers (Chen 2023, Jackson 2021 , Bozkurt Gümrükçüoğlu and Yakacak 2023). Many studies in psychology and cognitive science have demonstrated the existence of cognitive biases in the decision-making process. Therefore, the biases of artificial intelligence are mostly due to its creators (Bertail et al. 2019).

As it has been rightly pointed out, ensuring diversity in programming teams is also effective in selecting the right training data or in identifying the causes of discrimination. Compared to a team of programmers with the same or similar qualifications in terms of perspective, gender, age, and origin, a team that is nourished by diversity is more likely to make accurate determinations (Thoms and Mattheus 2024, Güçlütürk 2022). However, despite an increase in recent years, the representation of women in programming and information technology is still lower than that of men (Global Gender Gap Report 2024). According to the World Economic Forum, only 22% of team members working in the field of artificial intelligence worldwide are women (Nations Unies [ONU Info] 2024).

Withholding information also causes disadvantages for women. For example, if an employer places a job advertisement only in the men’s room, it is not possible for female candidates to see the advertisement (Straker 2024). This analog example can also be applied by employers using algorithms (Jackson 2021, Straker 2024). For example, discriminatory entries in job advertisements prepared by artificial intelligence systems can lead to discrimination by preventing or limiting access to the labor market by virtue of discouraging a certain type of labor candidate, for example, women, from applying to the advertisement. Such situations can also occur in the display of job advertisements through mass-targeting applications (Türe 2024). Indeed, research shows that even when women have

similar or better qualifications, algorithms can work against them and direct new job opportunities to men rather than women. For example, LinkedIn has found that due to men being more likely to search for new job opportunities, men are shown open positions more frequently than women (Andrews and Bucher 2022, Huet 2022).

In addition, algorithms can also perpetuate the existing perception of 'women's work–men's work'. This can be seen in simple tests. For example, upon a search in the Google image search engine (in Turkish) for general manager, director, manager, engineer, lawyer, doctor, surgeon, pilot, captain, architect, cook, driver, dean, or rector, most of the images that one comes across, especially those in the first few rows, belong to men. On the other hand, in conducting a similar search for assistant, executive 283assistant, secretary, cashier, or nurse, most of the images that appear are that of women. Since gender stereotypes have infiltrated the 'lexical embedding framework' used in natural language processing (NLP) techniques and machine learning (Chen 2023, Bertail et al. 2019), they also affect the learning processes of artificial intelligence systems and may cause artificial intelligence to develop biases against women. For example, job advertisements for 'truck drivers' may be almost exclusively shown to men, whereas job advertisements for 'educators' may be almost exclusively shown to women (Fröhlich 2024). Similarly, the association of the word 'engineer' with men can lead to the exclusion of female engineering candidates. In fact, Facebook has been accused of displaying third-party job ads to users according to gender stereotypes. Although it can be argued that in such cases there can be no specific victim of discrimination, according to the CJEU case law in the Feryn case, even in the complete absence of an identifiable complainant, it cannot be said that there is no direct discrimination within the meaning of Directive 2000/43. In this judgment, the CJEU clarified that discrimination does not require a specific victim, i.e., an individual complainant (Straker 2024).

Another reason for algorithmic discrimination is related to training data. The quality of the decisions made by artificial intelligence systems depends on the underlying algorithm and the quantity and quality of the data. Because these systems make different predictions based on the datasets, they are provided (Meyer 2023). For this reason, if the historical data (training data) used in the development of recruitment algorithms is biased and no preventive action is taken, the algorithm may learn and reproduce them without realizing it. In this case, algorithmic bias is due to the nature of the technology (Holthausen 2023, Sesing and Tschech 2022). If certain groups are underrepresented in the training data, 'representation bias' (Lang and Reinbach 2023) comes to the fore and disadvantageous results for that group may occur. For example, if an algorithm is trained on data from male candidates, the algorithm may disfavor women when selecting new candidates (Lang and Reinbach 2023). This possibility was initially highlighted by the Amazon case (Chang 2023, Bozkurt Gümrükçüoğlu and Yakacak 2023, Güzel et al. 2023). The fact that the recruitment algorithm of Amazon, one of the leading companies in the use of artificial intelligence, rejected qualified female candidates before they even reached the interview stage showed that algorithms learn to imitate the biases in the data used to create them (Andrews and Bucher 2022). This poses a significant risk to female candidates since recruitment algorithms are mostly fed with data from existing employees. The fact that the current workforce is predominantly male leads recruitment algorithms to infer that it is preferable to select male candidates, gradually leading to gender discrimination (Andrews and Bucher 2022).

Using data from current employees who are performing well can lead to 'retrospective bias'. This is because an algorithm may assume that the 284characteristic identified lead to success rather than being successful and that it will lead to success in the future. And in turn this can lead to discrimination against women who have been historically excluded from the workplace. For example, if most of the managers in a company are male and have played football at university, the algorithm may identify and consider playing football as an important performance criterion (Andrews and Bucher 2022).

Algorithms can sometimes make discriminatory correlations without the programmer's knowledge and may base their decisions on them (Lang and Reinbach 2023). This is because these systems do not distinguish between correlations and causality (Fröhlich 2024). At this point, it is not necessary for the data to be consciously selected in a biased way. In some cases, apparently neutral evaluation criteria can produce discriminatory results. For example, the use of seniority as a proxy value in the algorithmic model may indirectly discriminate against women because they have had to interrupt their careers in order to have children (Lang and Reinbach 2023, Türe 2024). Similarly, algorithmic discrimination can sometimes be applied by determining a proxy basis that is different from, but related to, the prohibited grounds of discrimination. It is also possible to identify and ultimately recruit candidates on the basis of another criterion that is not explicitly protected, such as gender, but has the same effect because of its relationship to gender. Although no explicit selection is made on the basis of gender, discrimination is still present because another

criterion related to gender is coded and a selection is made. In this context, in a situation where the aim is to not recruit women, this aim can be achieved by using biological differences between men and women such as height and weight instead of gender, for example, requiring a height of more than 1.75 m (Büyükçalık 2023, Değer and Tunca 2023, Türe 2024).

Another use of artificial intelligence in recruitment is video-interviewing. In these interviews, the candidate's face, voice, body language, or emotions can be analyzed (Bozkurt Gümrükçüoğlu and Yakacak 2023), and speech patterns can be used to determine whether the candidate is suitable. The use of artificial intelligence in video interviews can similarly lead to the risk of discrimination against women. In particular, algorithms that are trained on a workforce that is predominantly male pose a risk in this respect. This is because masculine characteristics such as short hair, use of ties, a certain style of dress, masculine language, etc. can be determined as good performance indicators (Andrews and Bucher 2022). Although not involving gendered questioning, the assessment of physical responses in relation to gender is also problematic. For example, as a significant proportion of women experience shortness of breath during pregnancy, differences in breathing can lead to discrimination by being used to determine that a female candidate is pregnant (Andrews and Bucher 2022). On the other hand, it is also possible for such software to detect whether the candidate is lying or not. This possibility offered by artificial intelligence has raised the 285following question in the doctrine: Has the right of candidates to lie during job interviews lost its function? Because during job interviews employers may ask certain questions due to their interest in obtaining information about the candidate, it is accepted that where the employer does not have a legitimate interest in obtaining such information, in other words, in case of illegitimate questions, the candidate is not obliged to answer truthfully or to provide explanations on such issues (Türe 2024). In some countries, including Türkiye, female candidates are subjected to questions which are asked by employers without any legitimate interest, such as whether they are in a relationship, whether they will get married in the near future, whether they are planning to have children, whether they are pregnant. Therefore, it can be said that the answer to this doctrinal question can have consequences, especially against women.

In the application process, video games can be used to analyze qualities that cannot be observed through CV analysis. In this context, candidates take exams or play games that allow the assessment of their qualifications, work ethics, problem-solving skills, and motivations. Although some studies argue that video games allow for a nondiscriminatory assessment of all candidates in the early stages of the recruitment process because they eliminate human bias and only performance in the game counts (Köchling and Wehner 2020), discriminatory practices can be similarly observed in video game testing in the recruitment process.

Algorithms that systematically bias and discriminate against certain groups, in this case women, can eventually have feedback effects. Women may be discouraged by lack of being preferred and may stop applying to certain companies or certain types of jobs. Even more damaging from a social point of view, women may no longer invest in the development of their human capital. It should therefore be noted that biased data models run the risk of creating feedback loops that further exacerbate inequality (Kim 2018).

MEASURES THAT CAN BE ADOPTED AGAINST ALGORITHMIC DISCRIMINATION

In General

Given the point to which technology has brought us, despite all the risks we have mentioned above, it is virtually impossible to oppose the use of artificial intelligence. However, it is also indisputable that these technologies should be used in accordance with human rights and ethical principles. Two basic principles that stand out in ethical studies on artificial intelligence to prevent algorithmic discrimination are 'algorithmic transparency' and 'accountability' (Nachbar 2021, Bozkurt Gümrükçüoğlu and Yakacak 2023). Algorithmic transparency refers to the clear and understandable 286disclosure of how the algorithm works, what data it uses, and what results it achieves with this data (Grimmelikhuijsen 2023). In this way, external stakeholders or third parties can understand how the algorithm works and check the decision-making processes. Transparency is very important in order to assess whether processes using algorithms are fair and nondiscriminatory (O'Neil 2016, Bozkurt Gümrükçüoğlu and Yakacak 2023). Algorithmic accountability refers to the determination of responsibility in decision-making processes (Nachbar 2021, Bozkurt Gümrükçüoğlu and Yakacak 2023).

Transparency and accountability are among the ethical principles listed in the Ethical Guidelines published by High-Level Expert Group on Artificial Intelligence (AI HLEG) in 2019. Other principles are human will and control; technical robustness and security; privacy and data management; diversity, nondiscrimination, and fairness; and social and environmental well-being. We believe that compliance with these principles is closely linked to transparency and accountability. Although these principles are nonbinding, they provide a basis and benchmark for policymakers, investors, etc. (Thoms and Mattheus 2024).

Ensuring transparency and accountability will be possible through technical measures, audit mechanisms, and legal provisions. It should be noted that, among the risks posed by algorithms, discrimination is more difficult to understand and prove than when faced in the analog domain. Moreover, it can also be applied much more systematically. For this reason, it is important to continuously monitor algorithms and ensure their compliance with ethical standards. Regarding recruitment algorithms, it is stated that specific legislation is necessary, and an independent audit mechanism should be developed (Chen 2023).

Technical and Legal Measures

Measures to prevent algorithmic discrimination are generally analyzed under two headings: technical and legal measures. Briefly, technical measures can be expressed as ensuring reliability by carefully selecting training data, regularly auditing algorithms, and being open to user feedback (Wang et al. 2022). Today, there are also bias detection tools in artificial intelligence. Some examples are What-If Tool (Google), AI Fairness 360 Open Source Toolkit (IBM), and Fairness Flow (Facebook).

That which is to increase the functionality of technical measures adopted for the prevention of discrimination are legal measures. Since technical measures are a cost factor, it seems impossible to expect them to be implemented without a coercive factor (Bozkurt Gümrükçüoğlu and Yakacak 2023). Whether discriminatory tendency becomes systemized depends on the creators of the said algorithm questioning the model by virtue of receiving error feedback, searching for the source of the error, and correcting it. 287However, it is a well-known fact that these models are not revised unless a major negative situation arises (Güzel et al. 2023).

The prevention of discrimination against women in employment is the subject of many international conventions. The Universal Declaration of Human Rights, the International Covenant on Economic, Social and Cultural Rights, the Convention on the Elimination of All Forms of Discrimination against Women, the ILO Discrimination (Employment and Occupation) Convention No. 111, and the Maternity Protection Convention No. 183 can be mentioned as examples. There are also provisions introduced into European Union law through directives. In addition to directives, Article 14 of the European Convention on Human Rights, Chapter 5 of the Revised European Social Charter, Chapter 3 of the Charter of Fundamental Rights of the European Union, and Articles 7, 37, and 48 of the Treaty establishing the European Community are regulations aiming to prevent discrimination in employment.

In terms of the provisions in Turkish law, equality before the law has been constitutionalized (Article 5 of the Constitution) and gender discrimination in recruitment is sanctioned under Article 5 of the Labour Law, Article 6 of the Law on the Human Rights and Equality Institution of Türkiye, and Article 122 of the Turkish Penal Code. Yet, there is no specific regulation for artificial intelligence systems. While whether the existing regulations are sufficient in preventing discrimination in the analog field is still debated, it is also necessary to separately evaluate whether they will find an area of application in the case of algorithmic discrimination, and if they do, how functional they will be. The above-mentioned negative aspects are not unique to Türkiye, nor are they limited to regulations aimed at preventing discrimination. The inadequacy of existing regulations and the problem of their applicability in the field of artificial intelligence have led international organizations and countries to strive for regulation. We also believe that there is a need for specific regulations for our country. In this context, we will try to briefly discuss below the current developments in comparative law.

Regulation 2024/1689, adopted by the European Union and referred to as the ‘Artificial Intelligence Law’, is a pioneer in this field. One of the objectives of the Regulation is to ensure the introduction of human-centered and reliable artificial intelligence which protects fundamental rights. The Regulation adopts a risk-based approach by classifying artificial intelligence systems into different risk categories (recital 26). Within this framework, the Regulation bans without exception certain artificial intelligence applications and for applications that it identifies as high risk, it imposes certain requirements and obligations in addition to those that exist for other artificial intelligence applications (recital 26). In this context, artificial intelligence systems used in employment relationships, and therefore

artificial intelligence systems used in the recruitment and selection of individuals, are also considered high risk. It is also explicitly stated that these 288systems may perpetuate historical patterns of discrimination (recital 57). In addition to the risk-based approach, the Regulation also emphasizes the importance of compliance with the ethical principles mentioned above developed by the AI HLEG.

Despite its pioneering nature, the applicability of the European Union's Artificial Intelligence Law and the extent to which it will guide technological development should be separately assessed (Lauscher and Legner 2022, Bozkurt Gümrükçüoğlu and Yakacak 2023). The extent to which it will be effective against the development of a significant part of artificial intelligence models by the United States and China should also be considered as an important issue (Hacker and Berz 2023).

Although there are various drafts under US law, currently there is no binding legislation on the subject matter. The Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence does not impose any obligations on private companies or individuals, it provides instructions to federal agencies such as steps to be taken by the government and the publication of comprehensive rules and guidelines to prevent algorithmic discrimination (Thoms and Mattheus 2024).

A recent example of ongoing regulatory efforts is the adoption of the Framework Convention on Artificial Intelligence, Human Rights, Democracy and the Rule of Law. The Council of Europe adopted the first international convention to ensure respect for human rights, the rule of law, and democracy in the use of artificial intelligence systems on 17 May 2024, after more than five years of preparatory work. The Framework Convention was opened for signature in Vilnius, Lithuania, on 5 September 2024.

CONCLUSION

Research conducted for many years has shown that gender discrimination at recruitment not only occurs but also continues to be at the present a widespread problem (Kubiak et al. 2023). However, according to the International Labour Organization, 75% of companies worldwide have adopted equal opportunity, diversity, and inclusion policies (Kubiak et al. 2023). As such, algorithmic recruitment has become increasingly favored for its ability to eliminate bias and ensure impartiality, among other benefits. However, the outcome has not changed. It is also clear that the solution will not come quickly.

Doctrine states that in a society that is fighting against the propagation of gender stereotypes and for gender equality, it seems essential that machines do not adopt the same bad habits that humans have for centuries (Lion 2021). Since all forms of discrimination are learned behaviors, artificial intelligence is not the owner of biases, but it is capable of learning, reproducing, and reinforcing human biases (Yargui 2018). Therefore, algorithms, often described as 'black boxes', can also be described as 'glass boxes' in the 289context of human resources management (Köchling and Wehner 2020). But if an algorithm only reflects patterns in the data, the preferences of its users, and economic behavior that occurs in its market, it is unfair to blame it for perpetuating our worst attributes (Lavanchy 2018).

The use of algorithm as a tool that guarantees fundamental rights and freedoms rather than a threat to them will only be possible by virtue of the functions and features that people provide it with. In other words, the choice of how algorithm works, for what purpose, and using which data is up to humans (Güzel et al. 2023). As a result, whether artificial intelligence will be a blessing or a curse in the fight against gender inequality will be determined not by the machine itself, but by the human being who constitutes the origin of bias (Santacreu-Vasut 2021). With the necessary technical and legal measures, it will be possible to use artificial intelligence in recruitment without gender bias. In this regard, we believe it is also important whether states will use their preferences in favor of that which is economic and fast or fundamental human rights. Ethical principles and fundamental rights should not be abandoned in order to keep up with the charm and speed of technological development.

NOTE

1. See, e.g., TİHEK Non-Discrimination Decisions 2018–2020, Application No.: 2019/2428, Decision dated 14.1.2020 and numbered 2020/08, 157–181; Application No.: 2019/3031, Decision dated 11.8.2020 and numbered 2020/176, 214–228, https://www.tihek.gov.tr/public/pdf/files/vfqfm4.pdf.Return to text.#

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