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Factors Affecting Academics' Perceptions of Glass Ceiling Barriers

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Abstract

Aim: This paper investigated academics' perceptions of glass ceiling barriers and the factors affecting those perceptions.

Methods: This study adopted a descriptive, comparative, and correlational research design. The sample consisted of 225 academics from a university in Ankara/Turkiye. Data were collected using a personal information form, the "Glass Ceiling Barriers Scale (GCBS)", and the "Perception of Gender Scale (PGS)". The data were analyzed using the student's t-test, Mann Whitney-U, One Way Analysis of variance (ANOVA), Welch Anova, Kruskal Wallis, and Pearson correlation tests.

Results: Participants had a mean GCBS and PGS score of 74.93±17.62 and 102.74±16.99, respectively. There was no significant difference in GCBS scores between male and female participants ($p > 0.05$). However, male participants had significantly higher mean GCBS "multiple roles" and "stereotyped prejudices" subscale scores than their female counterparts, while female participants had significantly higher mean GCBS "informal communication" and "professional discrimination" subscale scores than their male counterparts ($p < 0.05$). Female participants had a significantly higher mean PGS score than their male counterparts ($p < 0.05$). There was a negative correlation between GCBS total and "multiple roles," "personal preference," and "stereotyped prejudices" subscale scores and PGS total scores (respectively, female, r= -0.429, r= -0.382, r= -0.441, r= -0.523, $p < 0.05$; male, r= -0.542, r= -0.678, r= -0.324, r= -0.663, $p < 0.05$). There was a positive correlation between GCBS total and "multiple roles" and "stereotyped prejudices" subscale scores and the number of siblings in male participants (respectively, r= 0.191, r= -0.232, r= -0.313, $p < 0.05$).

Conclusion: How academics view gender determines how they perceive glass ceiling barriers. Academics who believe more in gender equality are more aware of glass ceiling barriers. However, how academics perceive the glass ceiling needs to be examined from multiple perspectives.

Keywords: Academics, Glass ceiling, Barriers, Gender, Gender inequality.

Akademisyenlerin Cam Tavan Algısı ve Etkileyen Faktörlerin İncelenmesi

Özet

Amaç: Bu çalışma, akademisyenlerin cam tavan algısı ve bu algıyı etkileyen faktörlerin incelenmesi amacıyla yapılmıştır.

Yöntem: Bu çalışma, tanımlayıcı, karşılaştırmalı ve ilişki arayıcı niteliktedir. Araştırmanın örneklemini Ankara'da bir devlet üniversitesindeki 225 akademisyen oluşturmaktadır. Araştırma verileri; "Bireysel Bilgi Formu", "Cam Tavan Engelleri Ölçeği (CTEÖ)" ve "Toplumsal Cinsiyet Algısı Ölçeği (TCAÖ)" ile toplanmıştır. Verilerin analizinde; Student t testi, Mann Whitney-U testi, One Way Anova testi, Welch Anova testi, Kruskal Wallis testi ve Pearson korelasyon analizi kullanılmıştır.

Bulgular: Çalışmamızda akademisyenlerin CTEÖ skoru 74,93±17,62, TCAÖ skoru 102,74±16,99'dur. Cinsiyetlere göre CTEÖ toplam skoru arasındaki fark istatistiksel olarak anlamlı değildir ($p>0,05$). Bununla birlikte kadın akademisyenlerde erkeklere göre "çoklu roller" ve "kalıplaşmış önyargılar" CTEÖ alt boyutları düşük, "informal iletişim" ve "mesleki ayırım" CTEÖ alt boyutları ise yüksektir ($p<0,05$). TCAÖ skoru kadın akademisyenlerde erkeklere göre yüksektir ($p<0,05$). Akademisyenlerde her iki cinsiyette CTEÖ toplam skoru ile "çoklu roller", "kişisel tercih", "kalıplaşmış önyargılar" alt boyutları açısından TCAÖ toplam skoru arasında negatif yönde bir ilişki saptanmıştır (sırasıyla, kadın, r=-0,429, r= -0,382, r= -0,441, r= -0,523, $p < 0,05$; erkek, r= -0,542, r= -0,678, r= -0,324, r= -0,663, $p < 0,05$). Erkek akademisyenlerde kardeş sayısı ile CTEÖ toplam skoru, "çoklu roller" ve "kalıplaşmış önyargılar" alt boyutları arasında pozitif yönde bir ilişki saptanmıştır (sırasıyla, r= 0,191, r=-0,232, r= -0,313, $p < 0,05$).

Sonuçlar: Cam tavan engelleri açısından akademisyenlerde toplumsal cinsiyet algısı önemli bir belirleyicidir. Akademisyenlerde toplumsal cinsiyet eşitliği algısı arttıkça cam tavan engelleri azalmaktadır. Bununla birlikte akademisyenlerde cam tavan engelleri cinsiyetlerinde ötesinde çok yönlü incelenmesi gereken bir sorunsaldır.

Keywords: Akademisyenler, Cam tavan, Engeller, Cinsiyet, Toplumsal cinsiyet eşitliği.

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1. INTRODUCTION

Although women constitute half of the population (Turkish Statistical Institute, TURKSTAT, 2024a), they do not participate in working life at the same rate as men. The employment rate of women (32.5%) is about half that of men (66.9%) (TURKSTAT, 2024b). Higher education is one of the sectors with the highest female employment rate (TURKSTAT, 2024a). Universities are the most important representatives of higher education institutions. Turkish universities employ 181,498 academics. The rate of female academics is 46.3%. Of the female academics, 12,216 are professors (34.3%), 9,947 are associate professors (41.8%), 20,728 are assistant professors (47.4%), 18,444 are lecturers (51.6%) and 22,792 are research assistants (53.8%) (Council of Higher Education, CoHE, 2024). There are as many female academics as male academics who are PhD graduates and faculty members. However, this ratio diverges in the later stages of the academic career. This difference is noticeable in professorship and senior management (Yıldız, 2018). In Australia, female representation in senior positions and decision-making mechanisms is declining despite adequate resourcing (Diezmann & Grieshaber, 2010). The Council of Higher Education reports that the proportion of female faculty members in Turkiye is higher than in many European and OECD countries (CoHE, 2024). Although women are equally represented in academic life, there are far fewer women in senior management positions (such as rector and deanships) than men (CoHE, 2021). In other words, these positions are not evenly distributed in the academic hierarchy. Gender inequality in academic promotions, leadership, and senior management is still a major challenge (Roberto et al., 2020).

Women are underrepresented in senior positions in higher education due to cultural and social roles. Women juggle between their social roles and responsibilities and working life. Those roles and responsibilities sometimes act as barriers in academia (Yıldız, 2018; Ehtiyar et al., 2019). As a field where social values are reproduced, academia perpetuates gender inequality. Therefore, women are underrepresented in managerial positions in academia (Roberto et al., 2020). The limited representation of women in managerial positions and decision-making mechanisms is explained by the “glass ceiling syndrome.” The “glass ceiling” is a metaphor for women's limited advancement to prestigious, high-paying, and leadership positions despite entering fields traditionally held by men (Carnes et al., 2008). In patriarchal societies, the “glass ceiling” is an invisible barrier that prevents women from holding managerial positions regardless of their abilities and achievements (Yıldız, 2018).

Compared to their male counterparts, female academics occupy significantly fewer senior positions and have limited participation in decision-making mechanisms, indicating that they face glass ceiling barriers (Diezmann & Grieshaber, 2010, Roberto et al., 2020; Suğur & Cangöz, 2016; Yıldız, 2018; Yavuzer & Özkan, 2020). The glass ceiling syndrome experienced by female academics is affected by various factors. Yavuzer and Özkan (2020) argue that while men have higher perceptions of glass ceiling barriers than women, women have intense perceptions of artificial barriers that prevent them from holding senior management positions. Suğur and Cangöz (2016) stress that female academics keep a distance from senior management positions due

to gender-based difficulties. Ehtiyar et al. (2019) show that female academics associate being a female academic with the themes of "having to struggle," "multitasking," "being hindered," "sacrificing," "having to adapt," and "having to balance." Segovia-Saiz et al. (2019) list gender inequality, individualism, lack of collaboration, gender inequality in access to employment, discrimination, and problems in combining work and family life as barriers that prevent women academics from being promoted in biomedical sciences. Mueller et al. (2017) underline that male academics in surgery publish more articles and have higher H-indexes compared to female academics. They argue that this difference is more noticeable in associate professorship rankings. These findings suggest that publication productivity prevents women from advancing in surgery compared to men. Social roles and patterns, queen bee syndrome, lack of role models and mentors, low diversity, learned helplessness and discrimination affect how academics perceive glass ceiling barriers (Yıldız, 2018). Both female and male academics have high perceptions of the glass ceiling (Yavuzer & Özkan, 2020). Social roles and responsibilities determine how women perceive the glass ceiling (Suğur & Cangöz, 2016; Yıldız, 2018; Segova-Saiz et al., 2019).

There is a large body of research into the perception of glass ceiling in Turkiye. Those researchers focus on women's underrepresentation in decision-making mechanisms, social roles and responsibilities, and gender perceptions (Tahtalıoğlu & Özgür, 2020; Kılıç & Çakıcı, 2016; Çelik, 2018; Yıldız, 2018). Studies involving academics often concentrate on female academics (Suğur & Cangöz, 2016; Ehtiyar et al., 2019; Ehtiyar et al., 2019). In recent years, there has been a growing body of research on glass ceiling barriers covering both genders (Kaldık, 2018; Yavuzer & Özkan, 2020; Hocaoğlu et al., 2022; Aslan et al., 2024). However, there is a relationship between perceptions of glass ceiling and gender. This descriptive, comparative, and correlational study examined the factors affecting academics' perceptions of glass ceiling. We believe that this paper will contribute to the literature as it aims to examine glass ceiling barriers in a multidimensional manner across genders, fields of science, and academic titles.

1.1. Aim

This study examined the factors affecting academics' perceptions of glass ceiling.

1.2. Research Questions

- How do male and female academics perceive glass ceiling barriers?
- Are glass ceiling barriers affected by factors related to academic employment?
- Are glass ceiling barriers affected by socio-demographic factors?
- Is there a relationship between male and female academics' perceptions of glass ceiling barriers and gender perception?
- Is there a relationship between male and female academics' perceptions of glass ceiling barriers and age?

- Is there a relationship between male and female academics' perceptions of glass ceiling barriers and the number of siblings?

2. METHODS

2.1. Research Design

This study adopted a descriptive, comparative, and correlational research design

2.2. Study Population

The study population consisted of 1300 academics from Ankara Yıldırım Beyazıt University. The research was conducted between March 15, 2022, and August 15, 2023. Participants were recruited using random sampling, which is a non-probability sampling method. A power analysis (G*Power 3.1.9.7.v) was performed based on the Glass Ceiling Barriers Scale (GCBS) mean scores of female and male academics. Prior power analyses were performed based on the difference between the two independent mean GCBS scores reported by Yavuzer and Özkan (2020) [female, mean(M)±standard deviation (SD)= 77.81±16.85; male, M±SD= 85.94±18.95]. The results showed that a sample of 212 (Female= 106, Male= 106) would be large enough to detect significant differences (0.45 effect size, 0.05 level of error, and 95% power). The sample comprised 225 academics (female= 114, male= 111). The inclusion criteria were (1) speaking Turkish and (2) volunteering.

2.3. Data Collection Tools

2.3.1. Personal Information Form

The personal information form was developed by the researchers in the line with the literature (Altınova & Duyan, 2013; Hoşgör et al., 2016; Yıldız, 2018; Kaldık, 2018; Gönenç et al., 2018; Yavuzer & Özkan, 2020; Tahtalıoğlu & Özgür, 2020). The form consisted of 20 items on socio-demographic characteristics and employment status (age, employment status, marital status, family type, etc.). The level of development of the settlement where academics lived until the age of 12 was categorized (Ministry of Industry and Technology, 2019).

2.3.2. Glass Ceiling Barriers Scale (GCBS)

The Glass Ceiling Barriers Scale (GCBS) was developed by Yavuzer and Özkan (2020). It assesses academics' perceptions of artificial barriers concerning senior management levels. It consists of 30 items rated on a five-point Likert-type scale ("1=strongly disagree" to "5=strongly agree"). It has six subscales: i) multiple roles (5 items), ii) personal preference (7 items), iii) informal communication (3 items), iv) professional discrimination (4 items), v) mentoring (3 items) and vi) stereotyped prejudices (8 items). The total score ranges from 30 to 150 (Table 1), with higher scores indicating higher perceptions regarding artificial barriers that prevent women

from reaching top management positions. The original scale has a Cronbach's alpha score of 0.90 (Yavuzer & Özkan, 2020), which was also 0.90 in the present study.

2.3.3. Perception of Gender Scale (PGS)

The Perception of Gender Scale (PGS) was developed by Altınova and Duyan (2013). It assesses individuals' perceptions of gender. It consists of 25 items rated on a five-point Likert-type scale ("1=strongly disagree" to "5=strongly agree"). Fifteen items are reverse-scored (2, 4, 6, 9, 10, 12, 15, 16, 17,18, 19, 20, 21, 24, and 25). The total score ranges from 25 to 125, with higher scores indicating more positive perceptions of gender. The original scale has a Cronbach's alpha score of 0.87 (Altınova & Duyan, 2013), which was also 0.94 in the present study.

2.4. Procedure

The university has campuses in the districts of Ankara. Therefore, the data were collected online. The researcher emailed all academics with a link to the study and briefed them on the research purpose and procedure. Since the researcher could not reach the target sample size, they also collected data face-to-face. Each participant took about 15 minutes to fill out the data collection tools.

2.5. Ethical Approval

The study was approved by the Social and Human Sciences Ethics Committee of Ankara Yıldırım Beyazıt University (Date: 08.02.2022, No: 02) and the General Secretariat of University (Date: 09.05.2022, No: 115302). Participation was voluntary. The first page of the survey informed each academic about the research purpose and procedure. Those who agreed to participate clicked on the "Agree" button and then filled out the data collection tools. The researcher also obtained verbal and written consent from participants for face-to-face data collection. The research adhered to the principles of Helsinki.

2.6. Data Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS, IBM Corp. Released 2012. Armonk, NY, Version 21.0). Normality was tested using the Shapiro-Wilk test as well as skewness and kurtosis values. Parametric tests [student's t-test, one-way analysis of variance (ANOVA), and Welch ANOVA] were used to analyze the data with skewness and kurtosis values between ±1.5 (Tabachnick and Fidell, 2013). Since the distribution of scale scores in the variables of academic title, science categories, siblings, mother's and father's employment status did not meet the normality assumptions, the data were analyzed using Mann Whitney-U test and Kruskal Wallis test. Pearson's correlation was used to assess the relationship between scale scores, age, and the number of siblings. Numbers, percentages, means, medians, standard deviations, and minimum and maximum values were used for descriptive statistics.

3. RESULTS

Participants had a mean GCBS score of 74.93±17.62. Male and female participants had a mean GCBS score of 76.93±18.65 and 72.98±16.41, respectively. There was no significant difference in the mean GCBS scores between male and female participants ($p > 0.05$). However, male participants (14.42±5.08) had a significantly higher mean GCBS "multiple roles" subscale score than their female counterparts (12.30±4.33). Female participants (10.42±3.01) had a significantly higher mean GCBS "informal communication" subscale score than their male counterparts (8.90±2.93). Female participants (13.30±4.29) had a significantly higher mean GCBS "professional discrimination" subscale score than their male counterparts (11.69±4.13). On the other hand, male participants (18.99±7.71) had a significantly higher mean GCBS "stereotyped prejudices" subscale score than their female counterparts (14.01±5.83). What is more, female participants (110.61±9.77) had a significantly higher mean PGS score than their male counterparts (94.66±18.96) (Table 1).

Table 1. The Distribution of Scale Scores by Gender (n=225)

Scales and Subscales	Total Scores	Female (n=114)	Male (n=111)	Test/p	d	Post-hoc Power
	M±SD	M±SD	M±SD			
GCBS	74.93±17.62	72.98±16.41	76.93±18.65	t= 1.685, p= 0.093	0.22	0.51
Multiple roles	13.35±4.82	12.30±4.33	14.42±5.08	**t= 3.369, p= 0.001**‡	0.45	0.95
Personal preference	15.17±4.78	15.03±4.80	15.32±4.78	t= 0.466, p= 0.642	0.06	0.11
Informal communication	9.67±3.06	10.42±3.01	8.90±2.93	**t= 3.826, p= 0.000**†	0.51	0.98
Professional discrimination	12.51±4.28	13.30±4.29	11.69±4.13	**t= 2.854, p= 0.005**‡	0.38	0.88
Mentoring	7.76±2.85	7.93±2.91	7.59±2.78	t= 0.881, p= 0.379	0.11	0.22
Stereotyped prejudices	16.47±7.25	14.01±5.83	18.99±7.71	**t= 5.475, p= 0.000**†	0.73	0.99
PGS	102.74±16.99	110.61±9.77	94.66±18.96	**t= 7.959, p= 0.000**†	1.11	1.00

MD: Median; Min: Minimum; Max: Maximum; M: Mean; SD: Standard deviation. GCBS: Glass Ceiling Barriers Scale. PGS: Perception of Gender Scale. t= Student t test. d= Effect size. † $p < 0.001$, ‡ $p < 0.01$.

Participants had a mean 15.30±9.43 years of work experience. Male participants in social sciences and humanities (80.98±16.24) had a significantly higher mean GCBS score than their female counterparts (77.57±11.00). However, there was not any other significant difference ($p > 0.05$) (Table 2).

Table 2. The Distribution of Scale Scores by Occupational Characteristics (n=225)

Occupational Characteristics	**GCBS**				**Test/p**
	Female		**Male**		
	n(%)	**M±SD**	**n(%)**	**M±SD**	
Work experience (M±SD=15.30±9.43; Min=1.0 – Max= 41)					
1 month – 10 years	45(39.5)	71.24±19.44	42(37.8)	77.14±22.45	t= 1.312, p= 0.193
11 – 20 years	45(39.5)	75.02±15.65	31(27.9)	77.35±13.42	t= 0.676, p= 0.501
≥21 years	24(21.1)	72.42±16.41	38(34.2)	76.34±18.15	t= 0.955, p= 0.343
Test/p	F^*= 0.586, p= 0.559		F^*= 0.036, p= 0.964		
Academic title					
Professor	7(6.1)	70.57±11.66	23(20.7)	78.96±17.34	t= 1.192, p= 0.243
Associate Professor	23(20.2)	73.96±13.33	20(18.0)	72.40±16.46	z= 0.585, p= 0.558
Assistant Professor	27(23.7)	70.15±16.09	26(23.4)	80.04±20.23	t= 1.973, p= 0.054
Lecturer and Expert	21(18.4)	71.48±11.86	13(11.7)	76.92±21.12	t= 0.850, p= 0.407
Research Assistant	36(31.6)	75.83±21.07	29(26.1)	75.66±19.01	t= 0.035, p= 0.972
Test/p	KW= 1.117, p= 0.572		F= 0.568, p= 0.687		
Science categories					
Health-Medical Sciences	83(72.8)	73.77±17.42	43(38.7)	73.05±20.27	t= 0.209, p= 0.835
Engineering-Science	3(2.6)	64.33±31.21	28(25.2)	77.11±18.68	z= 0.535, p= 0.635
Social-Humanities	28(24.6)	77.57±11.00	40(36.0)	80.98±16.24	**t= 2.663, p=0.010**§
Test/p	KW= 1.427, p= 0.839		F= 1.904, p= 0.154		

M: Mean; SD: Standard deviation; Min: Minimum; Max: Maximum. GCBS: Glass Ceiling Barriers Scale. F= One Way Anova, F^*=Welch Anova. KW= Kruskal-Wallis H. t= Student t-test. z= Mann-Whitney U test. § $p < 0.05$.

Female participants who got married by mutual consent (86.33±22.43) had a significantly lower mean GCBS score than those who had an arranged marriage (72.28±15.47) ($p < 0.05$). Female participants who lived in a district/town/village until the age of 12 (66.00±16.48) had a significantly lower mean GCBS score than their male counterparts (78.56±17.47). Female participants who lived in a district/town/village until the age of 12 also had a significantly lower mean GCBS score than their female counterparts who lived in the city/metropolis (74.27±16.24). There was not any other significant difference regarding other socio-demographic characteristics ($p > 0.05$) (Table 3) and characteristics related to family structures ($p > 0.05$) (Table 4).

Table 3. The Distribution of Scale Scores by Sociodemographic Characteristics (n=225)

Characteristics	GCBS				Test/p
	n(%)	Female M±SD	n(%)	Male M±SD	
Age (year) (M±SD=39.45±9.11; Min=24.0 – Max= 64.0)					
24 – 34	43(37.7)	70.98±20.26	38(34.2)	75.97±21.47	t= 1.077, p= 0.285
35 – 44	50(43.9)	74.66±14.39	34(30.6)	80.00±15.11	t= 1.635, p= 0.106
≥45	21(18.4)	73.10±11.70	39(35.1)	75.18±18.64	t= 0.464, p= 0.644
Test/p	F*= 0.501, p= 0.609		F= 0.678, p= 0.510		
Marital status					
Married	81(71.1)	73.36±16.23	90(81.1)	78.18±17.88	t= 1.837, p= 0.068
Single	33(28.9)	72.06±17.06	21(18.9)	71.57±21.29	t= 0.093, p= 0.926
Test/p	t= 0.381, p= 0.704		t= 1.469, p= 0.145		
Type of marriage§					
Mutual consent	74(92.5)	72.28±15.47	70(82.4)	77.43±19.22	t= 1.774, p= 0.078
Arranged but mutual consent	6(5.3)	86.33±22.43	15(13.5)	81.73±10.53	t= 0.651, p= 0.523
Test/p	**t= 2.067, p= 0.042**§		t= 0.838, p= 0.404		
Place of residence until the age of 12†					
City/metropolitan	93(81.6)	74.27±16.24	63(56.8)	76.08±19.83	t= 0.624, p= 0.533
District/town/village	19(16.7)	66.00±16.48	45(40.5)	78.56±17.47	**t= 2.669, p=0.010**§
Test/p	**t= 2.017, p= 0.046**§		t= 0.353, p= 0.503		
The level of development of the place of residence until the age of 12†					
Tier 1	56(49.1)	75.14±16.25	42(37.8)	74.86±21.15	t= 0.076, p= 0.940
Tier 2-3	34(29.8)	71.24±18.30	32(28.8)	79.63±16.86	t= 1.933, p= 0.058
Tier 4-6	22(19.3)	69.59±13.87	34(30.6)	77.53±17.76	t= 1.774, p= 0.082
Test/p	F= 1.134, p= 0.325		F= 0.589, p= 0.557		
Family type					
Nuclear	102(89.5)	72.71±16.43	100(90.1)	76.55±18.65	t= 1.555, p= 0.122
Extended	12(10.5)	75.33±16.79	11(9.9)	80.36±19.21	t= 0.670, p= 0.510
Test/p	t= 0.523, p= 0.602		t= 0.642, p= 0.522		
Spouse's education‡					
Bachelor's degree and below	39(34.2)	75.31±14.60	43(38.7)	79.56±19.22	t= 1.118, p= 0.267
Master's and above	42(36.8)	71.55±17.60	47(42.3)	76.91±16.67	t= 1.476, p= 0.143
Test/p	t= 1.042, p= 0.301		t= 0.698, p= 0.487		
Spouse's employment status‡					
Public employee	35(30.7)	75.49±15.57	51(45.9)	76.73±18.06	t= 0.330, p= 0.742
Private sector employee	29(25.4)	70.76±17.69	7(6.3)	80.14±19.48	t= 1.236, p= 0.225
Other (retired, unemployed, housewife etc.)	15(13.2)	72.00±15.50	29(26.1)	81.86±16.23	t= 1.939, p= 0.059
Test/p	F= 0.701, p= 0.499		F= 0.814, p= 0.446		

M: Mean; SD: Standard deviation; Min: Minimum; Max: Maximum. GCBS: Glass Ceiling Barriers Scale. §60 participants (single=54, other (n=6) were removed from the analysis. †Those living abroad (n=5) were excluded from the analysis. ‡ Those who were single (n=54) were excluded from the analysis. F= One Way Anova, F*=Welch Anova. t= Student t test. § $p < 0.05$.

Table 4. The Distribution of Scale Scores by Family Structure (n=225)

Characteristics	GCBS				Test/p
	n(%)	Female M±SD	n(%)	Male M±SD	
Type of marriage (parents)[§]					
Mutual consent	42(36.8)	71.50±16.84	27(24.3)	73.37±22.87	t= 0.391, p= 0.697
Arranged but mutual consent	49(43.0)	73.24±17.23	58(52.3)	77.10±16.20	t= 1.192, p= 0.236
Arranged	21(18.4)	76.19±13.47	22(19.8)	81.41±20.50	t= 0.981, p= 0.332
Test/p	F= 0.570, p= 0.567		F= 1.090, p= 0.340		
Mother's education level (degree)					
High school and below	87(76.3)	73.43±16.14	88(79.3)	76.85±17.58	t= 1.342, p= 0.181
Bachelor's and above	27(23.7)	71.56±17.50	23(20.7)	77.22±22.73	t= 0.994, p= 0.325
Test/p	t= 0.515, p= 0.607		t= 0.083, p= 0.934		
Father's education level (degree)					
High school and below	62(54.4)	73.66±16.93	71(64.0)	75.34±18.09	t= 0.549, p= 0.584
Bachelor's and above	52(45.6)	72.17±15.90	40(36.0)	79.75±19.53	t= 2.051, p= 0.043
Test/p	t= 0.480, p= 0.632		t= 1.199, p= 0.233		
Mother's employment status					
Housewife	71(62.3)	74.14±16.22	72(64.9)	79.28±18.86	t= 1.745, p= 0.083
Retired	22(19.3)	70.55±15.83	24(21.6)	71.17±21.02	t= 0.112, p= 0.911
Other (self-employed, private sector etc.)	10(8.8)	75.10±21.68	3(2.7)	73.00±7.00	z= 0.085, p= 0.937
Mother is deceased	11(9.6)	68.45±14.26	12(10.8)	75.33±11.57	t= 1.275, p= 0.216
Test/p	F= 0.608, p= 0.611		KW= 3.019, p= 0.389		
Father's employment status					
Retired	71(62.3)	72.89±16.61	66(59.5)	76.64±19.43	t= 1.216, p= 0.226
Public employee	10(8.8)	73.50±21.83	9(8.1)	86.22±20.59	t= 1.303, p= 0.210
Other (Self-employed, private sector etc.)	8(7.0)	74.38±13.22	6(5.4)	75.00±23.09	z= 0.000, p= 1.000
Father is deceased	25(21.9)	72.60±15.25	30(27.0)	75.17±15.29	t= 0.621, p= 0.538
Test/p	KW= 0.262, p= 0.967		KW= 3.196, p= 0.362		
Siblings (M±SD=2.40±1.96; Min=0 – Max= 12.0)					
No sibling(s)	4(3.5)	68.25±11.44	11(9.9)	75.45±14.22	z= 0.719, p= 0.489
Sister(s)	34(29.8)	72.35±18.55	32(28.8)	77.44±20.84	t= 1.048, p= 0.299
Brother(s)	32(28.1)	74.34±17.80	18(16.2)	72.89±15.75	t= 0.289, p= 0.774
Brothers and sisters	44(38.6)	72.91±14.23	50(45.0)	78.38±19.24	t= 1.549, p= 0.125
Test/p	KW= 1.296, p= 0.730		F= 0.406, p= 0.749		

M: Mean; SD: Standard deviation; Min: Minimum; Max: Maximum. GCBS: Glass Ceiling Barriers Scale. [§] Those who selected "other" (n=6) were excluded from the analysis. [†]The number of parents with postgraduate education is 28 (Mother=9, Father=19). [‡]The number of illiterate parents is 10 (Mother=9, Father=1). F= One Way Anova, t= Student t test. KW= Kruskal-Wallis H. t= Student t test. z= Mann-Whitney U test.

In female participants, there was a moderate negative correlation between GCBS and PGS total scores (r= -0.429, $p < 0.001$). While there was a moderate negative correlation between GCBS "multiple roles" and "personal preference" subscale scores and PGS total score, there was a strong negative correlation between GCBS "stereotyped prejudices" subscale score and PGS total score (respectively, r= -0.382, r= -0.441, r= -

0.523, $p < 0.001$). Moreover, there was a weak positive correlation between GCBS "professional discrimination" subscale score and age in female participants ($r = 0.246$, $p < 0.01$) (Table 5).

In male participants, there was a strong negative correlation between GCBS and PGS total scores ($r = -0.542$, $p < 0.001$). While there was a strong negative correlation between GCBS "multiple roles" and "stereotyped prejudices" scores and PGS total score, there was a moderate negative correlation between GCBS "personal preference" subscale score and PGS total score (respectively, $r = -0.678$, $r = -0.663$, $r = -0.324$, $p < 0.01$). There was a weak negative correlation between GCBS "professional discrimination" subscale score and age (respectively, $r = -0.286$, $r = -0.288$, $p < 0.01$). Moreover, there was a weak positive correlation between GCBS total and "multiple roles" subscale scores and the number of siblings (respectively, $r = 0.191$, $r = 0.232$, $p < 0.05$). There was also a moderate positive correlation between GCBS "stereotyped prejudices" subscale score and the number of siblings ($r = 0.313$, $p < 0.01$) (Table 5).

Table 5. Correlation of glass ceiling barriers scale with perception of gender scale, age and number of siblings (n=225)

Female (n=114)	**PGS**		**Age**		**Number of siblings**	
	r*	**p**	**r***	**p**	**r***	**p**
GCBS	**-0.429**	**0.000**†	0.052	0.584	0.004	0.964
Multiple roles	**-0.382**	**0.000**†	-0.100	0.288	-0.065	0.493
Personal preference	**-0.441**	**0.000**†	-0.014	0.879	-0.086	0.365
Informal communication	-0.078	0.408	0.031	0.745	0.143	0.129
Professional discrimination	0.034	0.719	**0.246**	**0.008**‡	0.060	0.527
Mentoring	-0.042	0.655	0.097	0.303	0.130	0.169
Stereotyped prejudices	**-0.523**	**0.000**†	-0.013	0.887	-0.052	0.582
Male (n=111)	**PGS**		**Age**		**Number of siblings**	
	r*	**p**	**r***	**p**	**r***	**p**
GCBS	**-0.542**	**0.000**†	-0.060	0.531	**0.191**	**0.045**§
Multiple roles	**-0.678**	**0.000**†	0.166	0.081	**0.232**	**0.014**§
Personal preference	**-0.324**	**0.001**‡	-0.039	0.681	0.132	0.166
Informal communication	0.015	0.874	-0.153	0.109	-0.028	0.770
Professional discrimination	-0.020	0.831	**-0.286**	**0.002**‡	-0.081	0.396
Mentoring	0.017	0.858	-0.113	0.238	0.087	0.364
Stereotyped prejudices	**-0.663**	**0.000**†	0.022	0.818	**0.313**	**0.001**‡

GCBS: Glass Ceiling Barriers Scale. PGS: Perception of Gender Scale. *Pearson correlation analysis. † $p < 0.001$, ‡ $p < 0.01$, § $p < 0.05$.

4. DISCUSSION

Although female employment rates in higher education are high (TURKSTAT, 2024a), there are very few female academics in senior positions and decision-making mechanisms (Roberto et al., 2020). In higher education, women are disadvantages as they experience gender-based discrimination. Artificial, unconscious, and stereotypical barriers to women's career advancement are referred to as "glass ceiling syndrome" (Atay et

al., 2022; Roberto et al., 2020; Yıldız, 2018). The "glass ceiling" is also a reflection of gender inequality (Yıldız, 2018). Academics should examine the glass ceiling in all aspects and predict it in terms of genders (Tahtalıoğlu & Özgür, 2020). This study yielded important results in terms of academics' gender categories and gender perception towards the glass ceiling. This study also examined the relationship between the glass ceiling and gender. Our results show that the glass ceiling is related to various factors beyond gender differences.

Our participants had a mean GCBS score of 74.93±17.62. Male and female participants had similar scores. However, female participants had significantly lower mean GCBS "multiple roles" and "stereotyped prejudices" subscale scores than their male counterparts. On the other hand, female participants had significantly higher mean GCBS "informal communication" and "professional discrimination" subscale scores than their male counterparts. While Aslan et al. (2024) reported similar GCBS scores, they found that female academics had lower perceptions of glass ceiling barriers than their male counterparts. Yavuzer and Özkan (2020) documented that female academics had a GCBS total score similar to our female participants, while male academics had a higher GCBS total score than our male participants. They detected a significant difference in GCBS total scores between male and female academics. They also reported similar results regarding GCBS "multiple roles" and "stereotyped prejudices" subscale scores. Hocaoğlu et al. (2022) found that female academics had higher "personal preference," "informal communication," "professional discrimination," and "stereotyped prejudices" subscale scores than male academics. Our results did not point to a significant difference in GCBS total scores between male and female participants, which might be attributed to the variability of the mean subscale scores. Our findings and the literature show that glass ceiling barriers mean different things for male and female academics. They also suggest that glass ceiling barriers need to be predicted multidimensionally beyond the gender factor.

Our female participants (110.61±9.77) had a significantly higher mean PGS score than their male counterparts (94.66±18.96). These findings show that female academics have higher perceptions of gender equality than their male counterparts, which is consistent with the literature (Yıldırım et al., 2017; Kaldık, 2018). Yıldırım et al. (2017) state that educated people also do not have high perceptions of gender equality, and therefore, stress that gender inequality is a fundamental human rights issue. In this way, they underline that we need to raise the awareness of all individuals, including academics, regarding gender equality. Female academics perceive gender on a more egalitarian plane outside the patriarchal structure. On the other hand, male academics act in a more traditional and male-dominated manner (Kaldık, 2018). Our most notable finding regarding this traditional pattern in male academics is the positive correlation between GCBS total and "multiple roles" and "stereotyped prejudices" subscale scores and the number of siblings. This finding shows that male academics with more siblings encounter more glass ceiling barriers. Having siblings has been associated with traditional attitudes (Özçelik & Koyuncu Şahin, 2023). Our result is also related to family structures with dominant patriarchy. Ertan and Türkmen (2023) point out that having no siblings is associated

with egalitarian gender perceptions. This result also shows that family characteristics are noticeable in male academics.

Our results showed a negative correlation between GCBS and PGS scores. There was also a negative correlation between PGS total and GCBS "multiple roles," "personal preference," and "stereotyped prejudices" subscale scores. This relationship shows that the less the academics believe in the glass ceiling, the more egalitarian gender perceptions they have. In other words, the more the academics believe in glass ceiling barriers, the more they view inequality between genders. A similar result for both genders is quite remarkable. Tahtalıoğlu and Özgür (2020) stress that "stereotyped prejudices" (related to social values) reveal gender inequality in academics. However, everyone is affected by this factor. Having multiple roles and experiencing role conflicts are independent of gender. Since most researchers consider the concept of "glass ceiling" as integrated with women, they ignore other factors that affect how it is perceived (Tahtalıoğlu & Özgür, 2020). Our findings and the literature also show that the glass ceiling and perceptions of gender inequality are problematic issues that need to be addressed in terms of both genders. Researchers should examine glass ceiling barriers in terms of gender as well as other factors.

We have similar findings in terms of academic title and GCBS scores by gender. However, their GCBS scores are noteworthy in terms of the science categories they are affiliated with. Our female participants from the social sciences and humanities had a lower GCBS total score than their male counterparts. This suggests that they have lower perceptions of glass ceiling barriers. Knowledge is reproduced in academia, where individuals are trained to help build a better society (Grangeiro et al., 2022). Social sciences are more dominated by women than natural sciences. Although there has been an increase in the number of female academics in academia, this increase is not reflected in male-dominated fields (Yıldız, 2018). While gender equality in social sciences is relatively higher than in natural sciences, male domination in academic leadership and management still persists. Female academics, especially those in mid-career stages, experience glass ceiling barriers much more intensely (van Veelen & Derks, 2022). The underrepresentation and systematic devaluation of women in natural sciences needs to be addressed. The undervaluation of women in natural sciences also lead to their underrepresentation in technology, engineering, and mathematics. This contributes to the scarcity of women in sciences and the lack of role models and representation (Grangeiro et al., 2022). Zhuge et al. (2011) report that female surgeons are subjected to much more discrimination than male surgeons. They also point out the lack of role models and mentors for women in surgical branches. The high representation of female academics in social sciences and the presence of female academics who can be taken as role models can eliminate glass ceiling barriers.

Female participants who got married by mutual consent had a significantly lower mean GCBS score than those who had an arranged marriage. Female participants who lived in a district/town/village until the age of 12 had a significantly lower mean GCBS score than their male counterparts. Moreover, female participants who lived

in a district/town/village until the age of 12 also had a significantly lower mean GCBS score than their female counterparts who lived in the city/metropolis. Where one is born and raised influences one's attitudes towards gender. It is inevitable for people growing up in small settlements to be affected by patriarchy (Kaldık, 2018). However, education shapes gender perceptions and promotes gender equality (Gönenç et al., 2018). Our results show that female academics who experience difficulties and face obstacles in a traditional society have lower perceptions of glass ceiling barriers. We can state that education helped female academics, who lived in small settlements until the age of 12, develop awareness of gender equality.

It is also noteworthy that academics' perceptions of glass ceiling barriers are affected by the type of marriage, place of residence, number of siblings and age. In female participants, there was a positive correlation between the GCBS "professional discrimination" subscale score and age. On the other hand, there was a negative correlation between the GCBS "professional discrimination" subscale score and age in male participants. While female academics face more glass ceiling barriers as they get older and have more work experience, this situation is reversed for male academics. Research shows that experienced academics have lower perceptions of glass ceiling barriers. This decrease is especially noteworthy in stereotypes, professional merit and informal communication networks (Tahtalıoğlu & Özgür, 2020). Hocaoğlu et al. (2022) reported that there were differences in "multiple roles," "personal preference," "professional discrimination," "stereotyped prejudices" subscales and that glass ceiling barriers decreased especially over the age of 40. Our findings regarding male academics are similar to the literature. However, as female academics get older and have more work experience, they face more glass ceiling barriers in terms of "professional discrimination". Çelik (2018) argues that as female employees get older, they assume multiple roles and become more vulnerable to burnout. Atay et al. (2022) claim that female academics are more disadvantaged than male academics. They note that three out of five female academics face gender-related disadvantages in senior management and administrative positions. They also stress that the perpetuation of the obstacles faced by female academics in their transition to senior management may also bring glass ceiling barriers (Atay et al., 2022). Therefore, researchers should investigate the factors that lead to those barriers.

4.1. Limitations

This study has two limitations. The first limitation is that the results are sample-specific and cannot be generalized to all academics. Second limitation, data collection took longer because the university has campuses in different locations. The researchers had originally envisioned conducting the study online, but due to low participation, they also collected data face-to-face.

5. CONCLUSION

Male and female academics perceive glass ceiling barriers differently. Academics who believe more in gender equality face fewer glass ceiling barriers. Male academics have higher perceptions of glass ceiling barriers

related to multiple roles and stereotypical prejudices. On the other hand, female academics have higher perceptions of glass ceiling barriers related to informal communication and occupational segregation. Occupational segregation is related to age, where barriers decrease with increasing age for male academics and increase for female academics. In addition, male academics with more siblings face more glass ceiling barriers associated with multiple roles and stereotypical prejudices. In other words, we can see the impact of patriarchy even in academia, where women are best represented. Therefore, we should address glass ceiling barriers in a multidimensional way, including categories of science, years of employment, and socio-cultural factors.

Conflict of Interest

Author declares no conflicts of interest.

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