

Psychometric Assessment of the Three Barriers Women's Career Progression Scale (TBWCPS)

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Abstract

This study explores the psychometric properties of the Three Barriers Women's Career Progression Scale (TBWCPS), which measures barriers that prevent women from progressing at work. This instrument was designed to measure barriers specific to women, unlike other alternative measures within the literature that are designed to measure employment career experiences whilst using data from samples of both men and women. Data from a sample of 2,515 UK women workers was used to test the factor structure of the TBWCPS. Both Exploratory and Confirmatory Factor Analysis extracted an eventual 25-item three factor solution with positive significant results showing a good fit to the data with reliable internal consistencies. The three-factors generated are Organisational Barriers, Societal Barriers and Personal Barriers. Tests of measurement invariance for age was also conducted. Further regression analysis revealed the three barriers to be strong statistically significant predictors of outcome measures (working long hours, line manager gender fair treatment and intention to leave). The authors recommend that the psychometrically robust TBWCPS can be confidently used by employers to assess career barriers women experience in the workplace.

Keywords: Three Barriers Women's Career Progression Scale (TBWCPS), Psychometric, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFI)

Introduction

Although women increasingly contribute to the labour market, barriers remain to prevent career progression in the workplace. Barriers are related to employment as well as additional social and personal factors. The pandemic has contributed further to the division of opportunity between men and women. The International Labour Organization (2021) report that during the pandemic 5% of women have lost their jobs compared with 3.9% of men. The gender gap has widened from a worrying 99 years in 2020 to an alarming 135 years in 2021 (World Economic Forum insight Report, 2021). There are several factors that are helping close the gender gap. For example, the #MeToo movement provided an important momentum for change, plus gender pay gap reporting and gender quotas for boardrooms (voluntary or statutory) started to drive the agenda across different countries (Deloitte, 2024), including The European Women on boards Directive. However, in 2024, the Global Gender Gap Index from the World Economic Forum insight Report shows that progress has stalled predicting 134 years away from gender parity around the world (Pal et al., 2024).

Considering gender inequalities, organisations need to be aware of the types of barriers created that prevent equal employment opportunities for women. By doing so, this will create a sustained focus on gender equality which is important for both society and business. McKinsey Global Institute (2020) have estimated that increasing women's participation in the global workforce is worth \$13 trillion to global GDP by 2030. Furthermore, the United Nations position Gender Equity as a key influencer for the remaining 16 Sustainable Development Goals (SDGs) (UN, 2023).

The Lighthouse Programme insights report (World Economic Forum, 2023) highlights that a common success factor for organisations to have a real impact in EDI is about identifying specific root causes that are triggering attrition, blocking the pipeline and disengaging women for example.

It is thus essential that organisations are provided with robust psychometrically reliable means of collecting data from employees to measure the barriers to career progression that women experience at work. Actions can therefore be implemented within organisations to remove barriers for women, so to uphold gender equality across the workplace. Most recently, Da Silva et al. (2022) developed the Scale of Barriers and Facilitators of Female Leadership using a sample of 627 Brazilian workers. The scale consisted of 33 items distributed across six factors representing both barriers and facilitators: social, organisational and individual.

Other alternative scales have been developed to measure the barriers women experience in the development of their careers. For example, the Careers Barriers Inventory (CBI) was developed by Swanson and Tokar (1991) using a sample of 558 college students which consisted of 102 items across 18 factors. The CBI produced a cumulative variance of 61% and an internal consistency ranging from 0.53 to 0.94. The CBI was further developed by Swanson, Daniels and Tokar (1996) using a lesser sample size of 222 college students. The newly named Career Barriers Inventory-Revised (CBI-R) consisted of two new factors with some items either deleted, rewrote, or reassigned to the scale. The final version of the CBI-R consisted of a reduced set of 70 items and 13 factors, with an internal consistency ranging from 0.64 to 0.86. cumulative variance of 0.86.

Although similar to Da Silva et al. (2022), the current paper explores the psychometric makeup of a scale that focusses specifically on barriers for women, whilst using a UK

sample of workers. Shape Talent, an UK based gender equity consulting firm, have produced a white paper (2021) which explores three barriers to women's progression and looks at what organisations can do about them. The research for this white paper was conducted by an academic who holds a PhD in Gender Studies, and an experienced quantitative researcher. Both academics reviewed over 80 academic and corporate sources on women's career progression and gender equity in the workplace to identify key themes, which served as the theoretical framework for developing the Psychometric Assessment of the Three Barriers to Women's Career Progression Scale (TBWCPS).

The first barrier in the white paper relates to societal and cultural cues and messages women receive which reinforce the ways in which men and women think, behave, and feel (Societal Barriers). This barrier relates to gender role expectations, women as primary caregivers, unequal distribution of unpaid work and the political gender representation gap. The second barrier relates to experiences in the workplace. This can be systemic, such as key experiences and networks which are more difficult for women to access, and others relate to organisational cultures and norms which disadvantage women (Organisational Barriers). This barrier consists of women's lack of access to critical experiences, role models, sponsorship, informal networks and flexible working. Organisational Barriers are also associated with cultural barriers such as gender stereotyping and discrimination. The third barrier relates to how women present in the workplace and how they manage the work-family interface. This may be associated with their workplace visibility, profile, presence at meetings and how they manage work-family spillover (Personal Barriers). These barriers also relate to the gender confidence gap, negotiation penalty and the leadership likeability penalty.

The present paper impacts the field of research by specifically measuring women's barriers to career progression, not simply measuring employment experiences (belonging and inclusion) like most corporate settings. Alternative measures to the TBWCPS are also limited to using statements and questions that are designed for both men and women, so not directly relating to women in relation to career progression (e.g. da Silva et al., 2022). They don't explore the root causes driving exclusion in career progression for women, and they don't focus on career advancement. They assume that inclusion will lead to career progression and using a measurement that is designed for men and women will give enough insights to inform action. We know due to embedded social structures that this is not the case. For example, part-time working mothers might feel included within their employment but yet they might not progress because of childcare responsibilities (Shape Talent, 2021). Furthermore, results are presented alongside dominant groups (men), and even if intersectional analyses are carried out, the overall results tend to dilute the issue of minoritised genders.

The focal aim of the current paper is to explore the factor structure of the new TBWCPS using a large sample of UK women workers. The internal consistency of the scale shall also be explored. Measurement invariance techniques shall also be performed. An additional aim is to examine the relationship between the TBWCPS and a group of three organisational outcome measures: working long hours, line manager gender fair treatment and intention to leave. These measures provide organisations with insights into the impact of the barriers on:

1. Self-selection from career progression: women may self-deselect from advancement opportunities or opt for part-time work due to a long-hours culture that shapes leadership performance expectations
2. Organisational commitment: perceptions of unfair treatment based on gender can diminish women's sense of belonging and engagement.

3. Talent retention: women leaving the organisation altogether, resulting in a weakened gender balanced talent pipeline.

The overarching aim is to provide a rigorous psychometric scale that measures women's career barriers which can be used by organisations to identify the roots causes of gender disparity so initiatives can be impactful while quantifying the risks associated with retention of women in leadership in the workplace.

Material and Methods

Item Generation

The initial items generation was created in English by Shape Talent. A deductive approach was adopted in the development of a three barriers women's scale, as a theoretical framework is considered a critical step in the development of a reliable and valid measure (DeVellis, 2012). The second edition of Three Barriers to Women's Progression (Shape Talent, 2021) was used as the theoretical framework underpinning the scale construction.

Item generation was established following mapping out contexts within the employment cycle where exclusion happens the most according to the Shape Talent white paper (Shape Talent, 2021). Content and face validity was then tested via a separate panel to identify whether each item measures the intended construct. This process of scale development follows the guidelines by Hinkin (1998). Participants were presented with the list of all question items for the scale and were asked to indicate which barrier they thought the item represents. Any items that did not meet the minimum correct item classification of agreement between 75% of participants were removed. An approximate equal number of selected items were reversed scored, as this is good practice during scale design and development.

The remaining 60 items were tested to further refine the scale. A sample of 2,338 employees (1,438 males, 898 females) completed a survey in English split across 20 global locations from the same company (a global medical device manufacturer). Locations included Austria, Belgium, Czech Republic, Denmark, France, Germany, Ireland, Italy, Lebanon, Netherlands, Poland, Portugal, Russian Fed., Saudi Arabia, South Africa, Spain, Sweden, Switzerland, Turkey and United Kingdom. Responses to the questions were recorded on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Univariate statistics (including outliers) for the sample were first examined and normality was screened. Cronbach's alpha was also tested to check the reliability of the remaining items and identify any further items for deletion. Each item was examined for Cronbach's alpha using a cut-off point of 0.7> (Tabachnick & Fidell, 2001). Based on this analysis, the best-performing items were retained, which resulted in a 30-item scale. Since then, this scale has been subject to further fieldwork and refinement, as detailed below.

Participants

The current sample of the most recent data sets consists of 2,515 working women from two samples of data. Participants from sample one is from various organisations across several different industries (e.g. primarily manufacturing, professional services, technology, media and telecom). Participants from sample 2 (an operations management consulting firm) were from one single organisation across global regions.

Age group ranged from 24 to 60+, with the majority of women aged between 30-39 years old (41%). 55% of women worked full-time and had non-managerial or junior manager/supervisor job roles (74%). 39% of participants have caring responsibilities, with 73% reporting their ethnicity as White British. The highest percentage of the sample described themselves as heterosexual/straight (89%).

Analytic Procedure

A series of psychometric tests was conducted to test the component structure of the TBWCPS: Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Measurement Invariance Analysis (MIA) and Cronbach's alpha tests were also performed.

The association between the TBWCPS and outcome measures long working hours, line manager gender fair treatment and intention to leave was further conducted to test the consequences of the barriers scale.

The above analysis occurred using the Statistical Package for the Social Sciences (SPSS) Statistics 24 and SPSS Analysis of Moment Structures (AMOS) 29.

Results

The same sample of data was used for all the following analysis (n = 2,515).

Exploratory Factor Analysis

Principal Components Analysis (PCA) and Cronbach's alpha reliability analysis was conducted to explore the factor structure of the 30 items generated to measure barriers that prevent women's progression. The analysis extracted three factors (R = 45%), however, four items produced weak factor loadings and reliability alphas (<0.70), so were removed from the analysis.

PCA was re-run and this time produced a strong 26 item three-factor solution with eigenvalues above 1.0 (7.6, 3.5, and 1.2). Cumulative variance across the three factors was 47%. A number of items cross-loaded across the factors, so the strongest loading item for that particular factor was chosen. All three scales produced good Cronbach's alphas (0.7>).

Polychoric Correlations (PC) method using Parallel Analysis (PA) techniques was further used to test the robustness of the scale factor structure configuration (Ferrando & Lorenzo-Seva, 2018; Timmerman & Lorenzo-Seva, 2011). Producing a PC matrix allows the assessment of correlated latent factors. KMO Bartlett's Test measure of sampling adequacy produced a statistically significant result ($p < 0.05$). The Kaiser-Meyer-Olkin (KMO) test also produced a very good value = 0.925 confirming that the matrix is appropriate to conduct factor analysis. Following a discrete number of factor iterations using PC and PA, eigenvalue results revealed a three-component solution as the most appropriate and best fitting to the data, which produced a 50% cumulative proportion of variance.

Component label analysis was performed to explore and describe the theoretical and practical basis of the factors extracted from the EFA, which revealed the labelling of the following three constructs:

Organisational Barriers (Factor 1):

The strongest factor with an eigenvalue of 7.6 contained 16 items. This factor was extracted first, which accounts for more of the variance than the other two factors (Tabachnick & Fidell, 2001). The high number of items associated with this barrier is not unexpected considering that the TBWCPS is primarily a work-based measurement instrument. Questions from this factor are related with Organisational Barriers for women. For example, 'I believe my career prospects are aided by support from senior leadership' and 'I believe I can progress within my organisation'. Factor loadings across the 16 items range from 0.44 to 0.78. Cronbach's alpha produced was very strong at 0.90.

Societal Barriers (Factor 2)

Five items represent the second factor extracted from the EFA, which produced an eigenvalue of 3.5. Questions associated with this factor measure Societal Barriers experienced by women. For example, 'I felt the transition between my most recent work routine and home life was difficult' and 'I feel that my home circumstances reduce my time and energy to perform at work'. Factor loadings for this scale range from 0.52 to 0.84 and produced a strong Cronbach's Alpha value of 0.80.

Personal Barriers (Factor 3)

The third factor also produced a 5-item solution, with an eigenvalue of 1.2. Five questions from this scale reflect personal barriers. For example, 'I worry about the consequences of asking for a pay rise and being unsuccessful' and 'I worry about how I come across to others during meetings'. Factor loadings range from 0.35 to 0.78. Cronbach's alpha for this factor is good at 0.73.

The above factor structure derived from the EFA forms the newly constructed TBWCPS. See Table 1 which shows descriptive statistics, number of items associated with each of the three scales and Cronbach's alpha values.

Table 1: Means, standard deviations and Cronbach's alpha coefficients obtained from the 26-item Three Barriers Women's Career Progression Scale

Scale	Mean	No. Items	Alpha
Organisational Barriers	3.44	16	0.90
Societal Barriers	3.24	5	0.80
Personal Barriers	2.78 (2.71)	5 (4)	0.73 (0.74)

Confirmatory Factor Analysis

First-Order CFA was conducted using AMOS software (Arbuckle & Wothke, 1999) to further test the factor structure of the TBWCPS. This Structural Equation Modelling (SEM) statistical technique is used to test hypothesized models. Conducting CFA allows factor structure models to be driven both statistically and theoretically, which goes an advanced step further than traditional multivariate procedures like EFA. The Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Normed Fit Index (NFI) and Root Mean

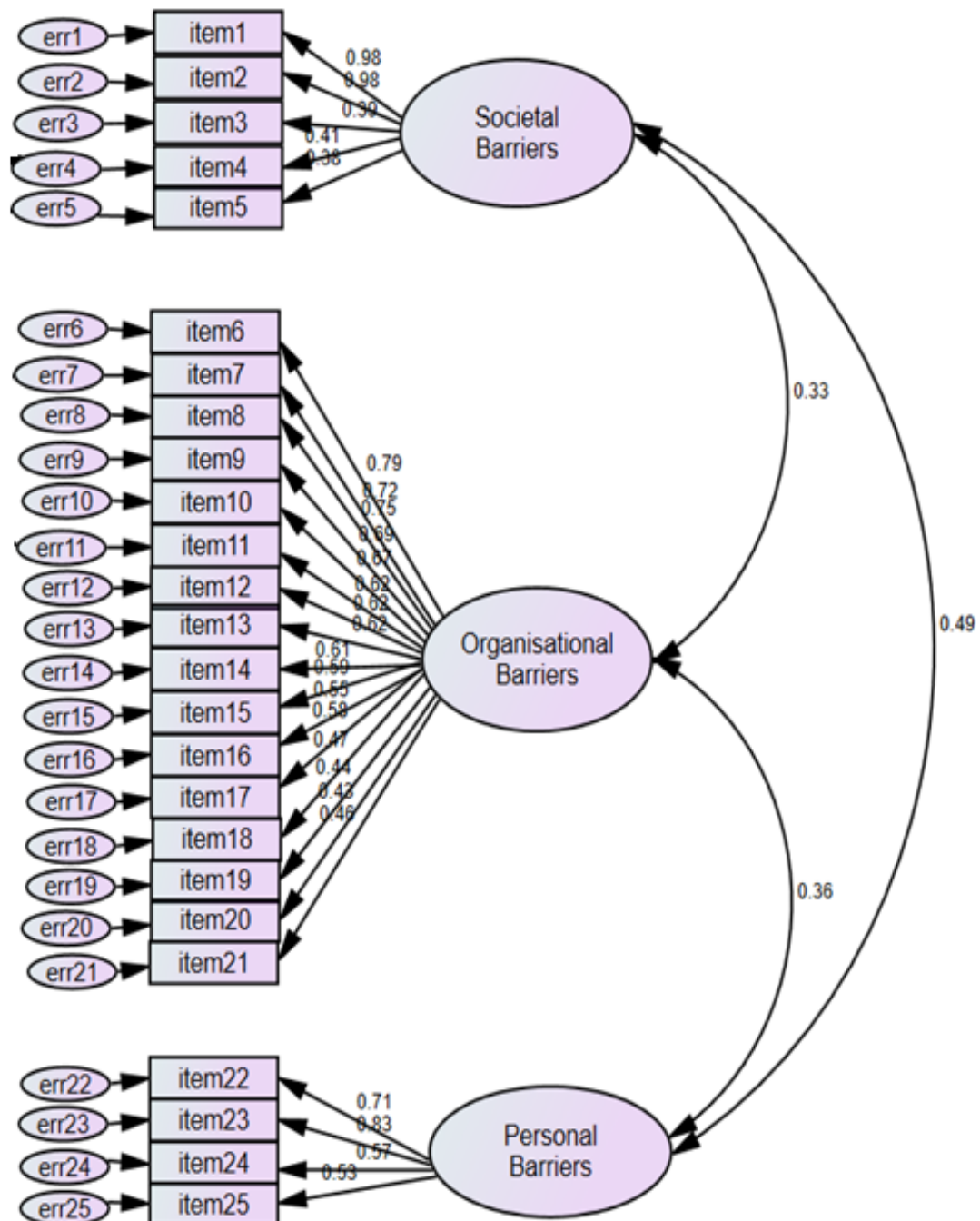
Square Error of Approximation (RMSEA) were used to test the TBWPS model fit (Tabachnik & Fidell, 2001). The criterion for establishing good model fit for the CFI, GFI and NFI are values around 0.90 and above and for RSEA 0.05 or less (Bentler & Bonett 1980). To run the CFA using AMOS, missing values from the data were removed.

Confirmatory factor analysis results from the TBWCPS 26-item three factor model structure that was derived from the initial EFA produced a scale that was not good fitting to the data. Results revealed χ^2 value of 3278.284 ($df = 296$), with goodness-of-fit statistics of 0.85 (CFI), 0.86 (GFI), 0.84 (NFI) and .07 (RMSEA). These results show that the model was not a particularly good fit to the data. Modification indices were inspected for model misspecification and showed that the lowest loading item in the scale could be removed in order to improve model fit. The item identified to be removed was item 26 (0.38), which was also found to be the lowest loading item during the EFA (0.35). Further inspection of modification indices also revealed a degree of misfit in the error covariance matrix between items 4 and 5 (Societal Barriers.) and items 7 and 11 (Organisational Barriers). These two pairs of items that both represent the same factor are considered similar enough with highly overlapping content to be correlated in the next stage CFA. This SEM statistical approach is supported by Byrne (2001).

A new 25-item TBWPS was respecified and tested by removing item 26 and including two additional error covariances. Results from the re-run CFA show an improved good-fitting model: χ^2 value of 2201.582 ($df = 270$), with goodness-of-fit statistics of 0.90 (CFI), 0.90 (GFI), 0.90 (NFI) and .05 (RMSEA). Model comparison analysis was undertaken to test if there was a difference between the original 26-item model and the respecified 25-item model. A chi-square difference test revealed a significant improvement for the respecified model (with one item removed and two added error covariances) over the original model: χ^2 value of 1076.702 ($df = 26$). Figure 1 shows the final good-fitting 25-item three factor TBWCPS CFA model, with five items representing Societal Barriers, 16 items representing Organisational Barriers and four items representing Personal Barriers.

Since item 26 ('I feel that I have sacrificed my career for the sake of my family life') was removed from the TBWCPS model that represents the Personal Barriers factor, reliability analysis was further conducted to test the 4-item factor structure. Cronbach's alpha produced a slightly improved internal consistency, with a value of 0.74. See Table 1 (in parenthesis) with newly effected means, number of items and Cronbach's alpha values for the now 4-item Personal Barriers factor.

Figure 1. 25-item three factor Three Barriers Women's Progression Scale Confirmatory Factor Analysis



Measurement Invariance Analysis

The next series of analysis tests the measurement invariance of the good fitting 25-item TBWCPs. Age has been chosen as the sociodemographic characteristic of interest to explore the equivalence of the factor structure across different categories. Age was considered an important demographic to test women's key life stages (e.g. career building,

family building and menopause etc). This powerful statistical approach is supported by leading authors in the field of invariance analysis (Vandenberg & Lance, 2000).

A prerequisite of measurement invariance is to run individual models across different age groups of data (24-39 and 40-59). Results show the unconstrained model is good fitting for both age groups of data, with goodness-of-fit statistics all above the threshold of 0.90 (CFI), 0.90 (GFI), 0.90 (NFI) and below .05 (RMSEA).

This model was then examined simultaneously for invariance across samples with no parameter constraints imposed to serve as a baseline to test more restricted constrained tests of invariance (Model 1). Model 2 with factor loading constraints imposed for the TBWCPS was tested to explore if loadings are simultaneously consistent across different age groups. The chi-square difference test ($\Delta\chi^2$) found that there was a significant difference between Models 1 and 2 indicating that not all the TBWCPS factor loadings are invariant across age groups.

Regression Analysis

Three series of linear regression was performed to explore the relationship between the 25-item TBWCPS and three outcome measures (working long hours, line manager gender fair treatment and intention to leave). The following analysis allows close inspection of the predictive influence of the three factor barriers individually upon the three outcome measures, and by doing so reveal the consequences of barriers in preventing women from progressing at work.

Working Long Hours

Evidence shows that when women perceive that working long hours is necessary for progression, they tend to self-deselect for career progression due to the influence of engrained social structures associating women to taking the primary role to care for their families (Shape Talent, 2021). Therefore, if barriers to career progression leads to the perception that working long hours is necessary to career advancement, the female talent pool for leadership roles can reduce accordingly.

The following question in this study measures working long hours: 'I feel that working beyond my contractual hours is expected'. This dependent variable was regressed on the independent predicting variables of Organisational Barriers, Societal Barriers, and Personal Barriers. The independent variables significantly predict working long hours ($F = 221.456$, $\text{Sig.} = < 0.001$), which shows that the three barrier factors have a significant impact on expected working long hours. The R-Square indicates that the model explains 21% of the variance in working long hours.

Coefficients were assessed to ascertain the influence of each of the three barriers on the criterion variable working long hours. Results show that Organisational Barriers has a significant and positive impact on working long hours ($B = 0.240$, $t = 6.981$, $\text{Sig.} = 0.001$). Societal Barriers has the strongest significant and positive impact on working long hours ($B = 0.471$, $t = 15.167$, $\text{Sig.} = 0.001$). Personal Barriers also produced a significant and positive influence on working long hours ($B = 0.144$, $t = 4.910$, $\text{Sig.} = 0.001$). The results are presented in Table 2.

Results overall show that all three barriers from the TBWCPS have a significant influence on working long hours expectations for career progression, indicating that the

greater the positive scores for the three barriers that indicate presence of barriers, the greater respondents feel that working beyond contractual hours is expected to get ahead.

Table 2: Regression analysis showing the predictive relationship between the Three Barriers for Women's Career Progression Scale and outcome measure Long Working Hours

Independent Variable	B	t	Sig.
Organisational Barriers	0.240	6.981	0.001*
Societal Barriers	0.471	15.167	0.001*
Personal Barriers	0.144	4.910	0.001*
R-Square	0.21		
F	221.456		

Note. *Sig = < 0.001

Line Manager Gender Fair Treatment

Line Managers have a strong influence on career advancement for women. Evidence shows that gender stereotypes influence line managers behaviours toward supporting their direct reports in relation to career development disadvantaging women (Shape Talent, 2021).

The following question in this study measures line manager gender fair treatment: 'I feel that my line manager treats me fairly compared to my colleagues of other genders'. Similarly to the analysis above for working long hours, the dependent variable measuring line manager fair treatment was entered into a regression model with Organisational Barriers, Societal Barriers, and Personal Barriers as independent predictor variables. The three barriers significantly predict line manager fair treatment ($F = 220.918$, $\text{Sig.} = < 0.001$). This shows that the three barriers have a significant influence on line manager gender fair treatment compared to colleagues of other genders. The R-Square shows again that the model explains 21% of the variance in the dependent variable.

Coefficients results show that Organisational Barriers has by far the strongest significant and positive impact on line manager gender fair treatment ($B = 0.704$, $t = 24.015$, $\text{Sig.} = 0.001$). Societal Barriers produced a significant and positive impact ($B = 0.079$, $t = 2.989$, $\text{Sig.} = 0.002$). Personal Barriers also showed an influence on the dependent variable, but this was a significant negative relationship ($B = -0.078$, $t = -3.083$, $\text{Sig.} = 0.003$). See the results in Table 3.

Results reveal that the TBWCPS factors have a significant impact on line manager gender fair treatment, showing that the greater the positive scores for Organisational Barriers and Societal Barriers, the greater respondents feel that their line manager treat them fairly compared to colleagues of other genders. In contrast, results show a negative association between Personal Barriers and the dependent variable, so for example, lower scores for questions relating to Personal Barriers, the higher the scores for how respondents feel their line manager treats them fairly when compared to other genders. An

alternative interpretation of this finding could be women experiencing lower personal barriers are less likely to depend on their manager to get ahead and therefore notice less any difference in treatment.

Table 3: Regression analysis showing the predictive relationship between the Three Barriers for Women's Career Progression Scale and outcome measure Line Manager Gender Fair Treatment

Independent Variable	B	t	Sig.
Organisational Barriers	0.704	24.015	0.001*
Societal Barriers	0.079	2.989	0.003
Personal Barriers	-0.078	-3.083	0.002
R-Square	0.21		
F	220.918		

Note. *Sig = < 0.001

Intention to Leave

Career retention for women can be problematic particularly in industries that are male dominated. With increasing pressure from investors, employees and customers for gender balanced representation in decision making roles, a talent pipeline leak can have a negative economical and reputational impact on organisations. Evidence shows that women are leaving at speed when they work for organisations that are not designed for them to succeed. (Deloitte, 2024).

The following outcome question measures intention to leave: 'I would not leave tomorrow even if I had another job'. For this regression analysis, data from only one sample will be used, this is because only one sample of data includes this question in that particular study. The TBWPS independent variables significantly predict intention to leave ($F = 48.276$, $\text{Sig.} = < 0.001$). This indicates that the three barriers have a strong significant impact on intention to leave. The R-Square shows that the model explains 48% of the variance in the dependent variable.

Coefficients findings shows that Organisational Barriers again has by far the strongest significant and positive impact on the dependent variable intention to leave ($B = 1.305$, $t = 10.940$, $\text{Sig.} = 0.001$). Societal Barriers exhibited a non-significant and negative effect ($B = -0.208$, $t = -1.830$, $\text{Sig.} = 0.069$). Personal Barriers also showed a non-significant result, but this time with a positive effect on intention to leave ($B = 0.042$, $t = 0.441$, $\text{Sig.} = 0.660$). Refer to Table 4 for results.

Findings show that Organisational Barriers have a very strong significant influence on intention to leave. For example, the greater the positive scores for Organisational Barriers, the greater the scores for less intention to leave for another job. However, neither Societal Barriers nor Personal Barriers have a significant impact on intention to leave. This finding could suggest that women experiencing more societal and personal barriers might feel concerned to move jobs because they might get worse conditions to combine work and life

or even feel less confident to make the move. However retention alone is not a factor securing career progression, particularly if personal barriers might compromise their confidence in progressing in their careers.

Table 4: Regression analysis showing the predictive relationship between the Three Barriers for Women's Career Progression Scale and outcome measure Intention to Leave

Independent Variable	B	t	Sig.
Organisational Barriers	1.305	10.940	0.001*
Societal Barriers	-0.208	-1.830	0.069
Personal Barriers	0.042	0.441	0.660
R-Square	0.48		
F	48.276		

Note. *Sig = < 0.001

Discussion

This study contributes to the literature by introducing a new psychometrically robust and reliable instrument to measure barriers that prevent women from progressing at work. The TBWCPS provides an essential diagnostic tool to assess the extent to which these barriers are in place across organisations and the effect they have on employee workplace outcomes. Results from the initial EFA revealed a 26-item three factor barriers scale with good Cronbach's alpha values. Modification indices via CFA suggested removing one low loading item to improve model fit. The final 25-item three factor structure exhibited a strong fit to the data along with reliable internal consistencies. Additional regression analysis showed that the TBWCPS has a strong predictive impact on outcome measures working long hours and line manager gender fair treatment. Organisational Barriers produced a significant and strong positive impact on outcome measure intention to leave, however, Societal and Personal Barriers did not show a significant influence on intention to leave.

The current study goes a substantial step further compared to other work within the literature in developing a valid and reliable career barriers for women measurement instrument with strong psychometric properties. For example, Da Silva et al. (2022) produced the Scale of Barriers and Facilitators of Female Leadership using a sample of 627 Brazilian employees. The scale consists of six factors incorporating 30-items. The current TBWCPS uses a much larger sample of 2,515 UK female employees, with a preferred shorter scale consisting of 25 items across three factors. Shorter self-report instruments take less time to complete, contain fewer missing data values and produce higher response rates (Stanton, Sinar, Balzar, & Smith, 2002). The current research also produces additional strong data evidence to support the predictive influence of the three barriers on a selection of outcome measures. The TBWCPS also has a better quality sample and exhibits greater internal consistency compared to other barriers for women scales within the literature. For example, Swanson, Daniels and Tokar (1996) CBI-R study used a small sample of 222 college students, which produced Cronbach's alpha values as

low as 0.64. The TBWCPS 25-item structure produced greater reliability alphas of 0.90, 0.80 and 0.74.

Limitation associated with the current study relate mainly to the CFA results. Although the 25-item TBWCPS overall produced a good fitting factor structure to the data, the fit indices results are marginal at 0.90 (CFI), 0.90 (GFI), 0.90 (NFI) and .05 (RMSEA). These findings can be improved in future studies by replicating the CFA using a different and larger data set, with perhaps including men. This way the factor structure of the TBWCPS can be re-tested and differences in responses can be explored between men and women. Future research may also want to consider conducting a longitudinal study incorporating the TBWCPS to investigate differences in scores over time. For instance, intervention activities could be implemented within organisations based on the data following time point one and then checked at time point two to explore if the barriers scores have improved. It is further recommended that future research develop a barriers for women benchmark data set so that employers can compare their organisational TBWCPS average scores against national benchmarks.

It is also recommended that future studies test for correlations between measures of stress and TBWCPS, as both constructs relate to UK legal obligations under the Health and Safety at Work Act (1974) to address the problems associated with work-related stress. Organisations have a duty to safeguard their workers' health (Health and Safety Executive, 2001) and barriers such as discrimination can be a great source of stress. For this reason, a recommendation would be to use the HSE Management Standards Indicator Tool in the future alongside the TBWCPS to examine the relationship between the two constructs.

The following provides recommendations for future analytic approaches using data from the TBWCPS. Firstly, using SEM statistical techniques, test the model structure incorporating second-order CFA. This technique establishes whether the TBWCPS contains a higher order factor component, which can be used to measure a single overall composite score for the whole of the three factors across 25-items. This higher order factor score can be used in the future for benchmarking purposes for comparison analysis. Secondly, further tests of measurement invariance are recommended, to build upon the analysis within the current paper. Multiple different samples of data could be used simultaneously to test the factor structure of the TBWCPS. This measurement invariance approach can be used to explore further if the scale is consistent across groups of data that contain different employee characteristics. Thirdly, SEM could be used to test the causal relationship between the TBWCPS and other variables of interest, such as stress, well-being, performance etc. This technique is a stronger statistical approach than regression analysis and can be used to show direct causal pathways between variables. All of these advanced statistical techniques could be implemented within future studies to further examine and strengthen the psychometric properties of the TBWCPS.

Considering that most gender targets, both legal and voluntary, are based on career advancement for women, the development of a measurement tool that addresses barriers to career progression for women is critical. The TBWCPS could potentially bridge the gap between women's sense of inclusion and their actual promotion to leadership roles. Then, from a policy response perspective and action, it is much easier to remove barriers to career progression when you know what barriers are most present in a specific organisational setting. As opposed to assuming that inclusion is a predictor of career advancement.

Conclusion

The current study provides strong psychometric evidence to support the factor structure of a 25-item TBWCPS. Organisations are encouraged to use this valuable and practical instrument to locate and assess the barriers that prevent women from progressing in the workplace. These results can then inform action to be more impactful toward meeting gender balance targets in leadership roles.

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