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Development and Validation of Psychological Capital Scale for Dual Role Individuals: Further Evidence of Psychometric Properties

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Abstract

The current study aimed to develop and validate the measure of psychological capital (Pychological Capital Scale; PCS)) for dual roles individuals. A conceptual referent theory of positive psychological capital anticipated by Luthans et al. (2004) guided for development of the instrument. Further, factor analysis and reliability of PCS were determined on the sample of 150 dual-role individuals belonging to various educational institutes, government and private organizations, hospitals, software houses, and private firms of Punjab. Additionally, 21 items of the PCS were subjected to principal component analysis and emerged four factors. Each item loaded at above .45 on four factors, labeled as Goal orientation (7 items; 31.07% variance), Optimism (6 items; 8.09% variance), Self-efficacy (5 items; 7.17% variance), and Resilience (3 items; 6.08% variance). The scale items exhibited a high level of internal consistency, which was supported by the reliability estimates of the alpha coefficient (α=.89) and item-total correlation (ranging from .29 to .62, p<.05). The construct validity of the instrument was established with a Positive Psychological Capital (PPC) Scale (Luthans et al., 2004) and a Stress Scale (subscale of Depression, Anxiety, and Stress Scale-21 (DASS-21) (Osman et al., 2012) on the sample of dual-role individuals. Additionally, confirmatory factor analysis of the measurement model indicated a four-factor solution for measuring psychological capital. Furthermore, the reliability and validity analyses of the scale demonstrated its high reliability and validity in assessing the level of psychological capital in individuals with dual roles. The scale's psychometric properties are further examined, along with limitations and suggestions.

Keywords: Goal Orientation, Optimism, Psychological Capital Scale, Resilience, Self Efficacy

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Introduction

In today's dynamic and evolving world businesses survive, thrive, and grow by leaning into their competitive advantages, such as cost leadership and value-added services. Despite the positive impact competitive advantages have had on the economic standing of a business, they were accompanied by unsatisfactory outcomes; such as increased workplace stress, job burnout, employee dissatisfaction, pessimism, and organizational withdrawals. These factors lead to counterproductive work behavior and a toxic workplace environment. However, these undesirable consequences can be controlled (Butt & Yazdani, 2021; Naseem & Ahmed, 2020). Therefore, several organizations are spending their imperative resources for the betterment and well-being of their employees because employees are considered to be the human capital of any organization. Hence, in the area of industrial

advancement, organizations are specifically emphasizing the development of psychological capital of their employees because employees with a high level of psychological capital have high job performance, better well-being, are less likely to experience job burnout, have unique leadership skills with highly goal-oriented, resilient and optimistic attitudes to their job demand. The construct of psychological capital has gained prominence in the research of leadership and the industrial revolution. Organizations can achieve their respective goals through the development of the psychological capital of their employees (Slatten et al., 2020). Luthans et al. (2011) explained the construct of psychological capital as a positive sense of being which constitutes four main components; confidence, resilience, optimism, and hope, which eliminate these undesirable factors among employees by enhancing their job satisfaction and organizational commitment. Moreover, psychological capital has a positive impact on competitive advantages. Contemporary research indicates that organizations that invest in the development of their employees' psychological capital reap the benefits of competitive advantages and have a greater sense of cohesion in their workplace (Alquicira et al., 2022; Mondragon et al., 2022).

Psychological capital is defined as a positive psychological state of growth and development in individuals, which encompasses key constructs such as "self-efficacy," which involves having the confidence to take on challenging tasks and putting in the necessary effort to achieve success; "optimism," which involves anticipating positive outcomes in the present and future; "hope," which involves redirecting paths towards goals and persevering through difficulties; and "resilience," which involves staying motivated and resisting setbacks (Luthans et al., 2007). These dimensions were further explained as *(i) Self-Efficacy/Confidence* is described as the individuals' abilities and beliefs to achieve success or desired goals in certain situations. Furthermore, an individual's sense of self-efficacy plays an important role to accomplish their desired goals and trying for better outcomes (Bourne et al., 2021). Confidence is an individual's specific act, capabilities, or skills that activate their cognitive capital, motivation, methodologies, and their rules expected to effectively actualize a particular undertaking about the situation (Boldureanu et al., 2020). (*ii) Hope* combines the individuals' beliefs and abilities. Those beliefs and abilities can develop pathways for them to achieve their desired goals and also motivate them to keep following these pathways (Roulin et al., 2021). Hope is comprised of different strategies that are expected the best and working to achieve it. It is also found to be a motivational state having three basic elements i.e., *"goal management" "agency"* and *"pathways"* (Shorey et al., 2007). (*iii) Optimism* is a set of positive developments in an individual's personality toward the future (Laranjeira & Querido, 2022). People who appreciate good things are optimistic, which has become a growing source of mind. Optimism is a good activity and a general desire for positive results. In addition to that is a steady attribute consistently connected with the enhanced physical and psychological well-being of the human being. Furthermore, optimistic people encounter larger amounts of positive feelings, have high adaptability to cope with a variety of health crises, and largely report physical and psychological well-being (Purol & Chopik, 2021). *(iv) Resilience* is the state of flexibility when one is exposed to challenges or difficulties and is also defined as how quickly one overcomes a stressful condition or a trauma. Resilience is the skill to manage capable performance in the presence of key life stressors (Hartwig et al.,

2020; Hillmann & Guenther, 2021; Rees et al., 2015).

Psychological capital is a complex multivariate procedure that, impacts a person in several ways and leaves durable impacts. The need for the measurement of psychological capital has been increasing over a decade as the working environment is becoming more complex, dynamic, and goal-oriented rather than people-oriented due to excessive workload and time pressure. A concept without any means to measure or standardize it is useless. Formerly, different scales have been used to measure the psychological capital of the employees. These scales assess the intellectual, social, traditional, physical, and psychological capital of the single-role individuals (only working-class) *i.e.,* employees, capitalists, managers, and teachers. Though, in the previous literature, there was no scale available to measure the level of psychological capital of the individuals performing dual roles (individuals who are studying and working simultaneously). Now, postgraduate students are working in organizations as teachers, government employees, engineers, bankers, doctors, nurses, and IT experts. Therefore, there was a need to develop a scale, which can assess the psychological capital of individuals performing dual roles in multiple institutions and organizations. Besides, no indigenously developed scale was available on this phenomenon. Therefore, this study was carried out for the development and validation of the Psychological Capital Scale (PCS) for dual-role individuals.

Objectives of the Study

1. To develop and validate an instrument of Psychological Capital in the English language.
2. To determine the psychometric properties of the newly constructed assessment tool.

Method

Research Design

The existing research followed the mixed-method approach that incorporated both qualitative and quantitative research methodologies. The techniques of qualitative research design involved initial in-depth individual interviews of the participants, focus groups, and thematic analysis of the content. Furthermore, the quantitative research design included: mean, actual, and potential ranges, standard deviations, regression, and correlations. The reliability, validity, factor structure, and psychometric properties of the PCS scale were established using Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and analysis of variance.

Procedure

The study consisted of four phases:

Phase I: *Interview Schedule*

In the first phase, open-ended questions were designed for conducting the focus groups based on available literature (Choi & Lee, 2014; Harms & Luthans, 2012; Luthans et al., 2007; Newman et al., 2014; Youssef-Morgan & Luthans, 2015). The lecturers, campus students, and the students who are working in the psychology department were asked to suggest questions to explore the underline phenomenon of psychological capital for the dual role of individuals. Following are the exemplary interview questions:

1. How would you describe yourself?
2. What are the situations that you face in your workplace while completing your tasks with the study?
3. How would you manage your job with your studies?
4. How would your study give to help you with your work-related tasks?
5. Anything else that you would like to talk about yourself and your job responsibilities?

Phase II: *Focus Groups*

For conducting the three separate focus groups, students who are working were

selected through purposive sampling technique from the different departments of the three universities. The core purpose of these focus groups was to generate the initial item pools for the psychological capital scale (PCS). In the first phase, the information about the topic, definition of the psychological capital, and open-ended questions were designed to use in focus groups separately. Each group considered seven to eight BS (Hons) and M.Phil. students who are doing jobs and paid internships in different government and private organizations. The departmental research committee, consisting of subject matter experts, supervised the focus groups to minimize errors and ensure quality control. The subject experts also gathered information related to the constructs from the participants. Participants were provided with an explanation of the nature of the focus groups and provided informed consent. The researcher also ensured confidentiality and the right to withdraw from the study. The participants of the focus groups were asked to talk about their self-representation and self-description. Furthermore, statements addressing the psychological capital of the dual role individuals formed in the first phase with the help of a literature review and views obtained from the participants. Their verbatim was recorded and noted.

"After the elicitation of the verbatim, the commonalities were excluded from the data, and the remaining were retained. Additionally, this verbatim was then evaluated based on the face as well as construct validity by the researcher. Expert validation was also carried out on these items. A table was used to see the experts' opinions related to the scale's items. Moreover, League tables indicated that each item got more than 70% agreement from the experts on its content. Finally, a list of 49 items indicating the construct of psychological capital was retained which was then transformed into the form of a scale ranging from 1 as *"Strongly Disagree"* to 5 as *"Strongly Agree"*. In try out phase, a list of 49 items was administered to 50 dual-role individuals to evaluate the readability and comprehensibility of the items. Following are the example items that were selected for the final scale:"

1. I am a strong person when dealing with difficulties.
2. I am hopeful to be rewarded for the hard work.
3. I avoid giving my opinion during meetings.
4. I can find my way out of difficult situations.
5. I am confident in my abilities.
6. I can handle multi-tasking.

Phase III: *Establishing the Psychometric Properties of the Psychological Capital Scale*

Sample. In this research participants (*male*=104*, female*=46) having an age range from 21 to 36 years (*M*=26.88, *SD*= 3.62) were participated. The total sample was comprised of N=150 students (dual-role individuals) from different universities and organizations (i.e., GC University, The University of Punjab, Lahore General Hospital, PEL, Corporate Sector, Simplified Chinese, Traditional Chinese, Japanese and Korean (CCJK) software house, Nishaat & Al-Raheem Electronics Corporation Company). Data were collected through the purposive sampling technique, *n*=78 students who are working were selected from both universities 52 from GC University and 26 from Punjab University. The remaining data of *n*=72 dual-role individuals were collected from the other different working sector organizations.

Instruments. The Following research instruments were used to establish the psychometric properties of the Psychological Capital Scale (PCS) and the sample characteristics:

1- The newly developed psychological capital scale was developed and

administered in the first two phases of this study to assess the level of psychological capital of the dual-role individual.

2- Positive psychological capital (PPC) (Luthans et al., 2004) was used to establish the convergent validity of the newly developed instrument. The scale has four subscales i.e., Self-efficacy, Hope, Optimism, and Resilience. The alpha coefficients (internal reliability) of the scales ranged from α= .74 to α= .81
3- The stress scale (sub-scale of depression, anxiety, and stress scale-21) (DASS-21) (Osman et al., 2012) was used to establish the discriminate validity of the measure. The established Cronbach's alpha coefficients of the scale ranging from α= .74 to .81 indicated that it is a valid measure to use.
4- A few different demographic variables were also selected for this research i.e., age, gender, organization, degree program, university, and qualification.

Procedure. The permission and consent forms were taken in advance for the data collection from the higher authorities. The participants were approached at their university departments and workplaces. Further, the confidentiality of the responses was ensured and they were given the right to withdraw at any time. Newly developed Psychological Capital Scale (PCS), Positive Psychological Capital Scale (PPC), Stress Scale sub-scale of Depress Anxiety Stress Scales (DASS-21), and demographic form including *i.e.,* age, gender, organization, degree program, university, and qualification, were administered on the selected population. The instructions about filling out the questionnaire were written at the start of the questionnaire and verbal instructions were also given. The participants took 20 to 30 minutes to fill out the questionnaire. They were also asked different questions during this process and the queries were resolved.

Ethical Considerations

Written and verbal consent was taken from higher authorities in advance. Consent was also taken from the university students for the data collection by ensuring confidentiality and by the right to withdraw at any stage. Instructions about the research protocols were given at both written and verbal levels so that the individuals can easily understand the importance of the research questions. Extra queries from the participants were also entertained to facilitate the participants in filling out the questionnaires.

Results

Item Analysis. The main purpose of the pilot study was to assess the practicability of the scale and to make the final selection of the items for factor analysis. Reliability analysis was applied as a pre-analysis check for all items. The column *Corrected item-total correlation* showed many items with poor correlation were the indication of a potential problem. *As a first step*, items having negative correlations were dropped from the analysis resulting in improved alpha reliability of the items (*i.e.,* from .90 to .92 with 49 items). *In the second step*, items less than <.1 were deleted again and also showed improved alpha reliability of the items (*i.e.,* from .92 to .93 with 42 items). The same procedure was repeated with criteria of items less than <.2 and <.3 enhanced the reliability of the items (i.e., from .93 to .93 with 35 items). *In the third step,* deleting more items showed a decline in alpha coefficient estimates. Thus, results indicated 35 items were retained for further data collection, each item is strongly correlated (p<.01) with the total score of the measure that shows the high internal consistency of the scale.

Table 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Psychological Capital Scale (*N*=150)

KMO"	Bartlett's Test of Sphericity	*df*	*p*
.85	1069.84	210	.001

Note. **$p < .01$, KMO = *Kaiser-Meyer-Olkin Measure*

The Kaiser-Meyer-Olkin's (KMO) measure of sampling adequacy was .85, indicating good suitability for factor analysis. Bartlett's Test of Sphericity was also highly significant (χ^2 (*df* = 210, *n* = 150) = 1069.84, $p < .001$), indicating that the variables were interrelated and suitable for factor analysis. Therefore, the psychometric properties of the data confirmed that factor analysis was a suitable analysis for this study.

Table 2

Factor Loadings, Eigenvalues, Cumulative Percentages, and Variance of the Items of PCS by using Varimax Rotation (*N*=150)

Item #		F1 Goal Orientation	F2 Optimism	F3 Self-efficacy	F4 Resilience
24	I plan before starting a task.	**.67**	.18	.24	-.28
25	I can complete my tasks before the deadline.	**.65**	.00	.00	.00
34	I believe that I can overcome any challenging situation.	**.60**	.32	.17	.20
23	I can easily adjust to my surroundings.	**.57**	.15	.18	.23
28	I can easily achieve my goals.	**.56**	.23	.01	.39
30	I can overcome the adverse situation.	**.54**	.09	.14	.29
13	I have good control over myself.	**.51**	.16	.34	.09
27	I am hopeful to be rewarded for the hard work.	.12	**.74**	.08	.02
29	I am hopeful to get good opportunities for professional growth.	.19	**.70**	.19	-.04
8	I try to help my colleagues.	-.15	**.60**	.26	.18
31	I appreciate others' achievements.	.26	**.59**	.02	.23
33	I have the willpower to achieve my goals.	.36	**.56**	.16	.09
15	I am hoping to get success in the future.	.34	**.48**	.38	.09
3	I try alternative techniques to solve the problems.	.20	.07	**.75**	.00
19	I try to make the best use of my abilities.	.34	.03	**.67**	.10
5	I want to achieve professional success.	-.13	.27	**.66**	.25
7	I feel confident at the workplace.	.07	.22	**.64**	.29
2	I pursue my goals.	.26	.23	**.60**	.16
4	I can easily revive after the illness.	.05	-.15	.29	**.69**
14	I am ever ready to accept challenges.	.16	.38	.15	**.67**
6	I am a strong person while dealing with difficulties.	.24	.23	.18	**.64**
Eigen		6.53	1.70	1.51	1.28

% Variance	31.07	8.09	7.17	6.08
Cumulative Percentage	33.50	41.50	48.98	55.12

Note. Factor loadings > .45 are in bold. The solution was obtained by Orthogonal rotation with the varimax method., PCS= *Psychological Capital Scale.*

To determine the factor structure of PCS, an Exploratory Factor Analysis with Principal Component Analysis (PCA) and orthogonal rotation (varimax method) was performed. The sub-scales were considered only if their factor loadings were greater than .45. The results revealed four factors labeled as *"Goal Orientation," "Optimism," "Self-Efficacy,"* and *"Resilience,"* with eigenvalues ranging from 6.53 to 1.28, respectively. Furthermore, the eigenvalues of these four factors accounted for 55.12% of the total variance (Table 2).

Table 3

Factor Labels and Items of Psychological Capital Scale (PCS) (*N*=150)

Factor No	Factor Label	Items
1	Goal Orientation	13, 23, 24, 25, 28, 30, 34
2	Optimism	8, 15, 27, 29, 31, 33
3	Self-efficacy	2, 3, 5, 7, 19
4	Resilience	4, 6, 14

"Note. PCS = *Psychological Capital Scale"*

Factor-1 (Goal Orientation). A maximum number of variables loaded on factor-1. Items 13, 23, 24, 25, 28, 30, and 34 loaded independently on factor-1 and showed high factor loadings of .51, .57, .67, .65, .56, .54, and .60 respectively. These items typically showed the tendency to be towards goal achievement and contented with life, so factor-1 was named *"Goal Orientation"*. Factor-1 includes seven goal orientation items and accounts for 31.07% of the total variance.

Factor-2 labeled as ***"Optimism"*** includes items 8, 15, 27, 29, 31, and 33, which are independently loaded on the factor with high loadings of .60, .48, .74, .70, .59, and .56, respectively. As the items loaded indicated this factor, thus it was decided to be labeled this factor as *"Optimism"*. Factor-2 comprises six items and 8.09% of the variance is explained by this factor.

Factor-3, named **"Self-Efficacy"** includes items 2, 3, 5, 7, and 19, which independently loaded on the factor with high loadings of .60, .75, .66, .64, and .67, respectively. All items demonstrated the tendency to be trustworthy and reliable. This factor accounts for 7.17% of the total variance and includes five self-efficacy items.

Factor-4, labeled as **"Resilience"** is composed of items 4, 6, and 14, which are independently loaded on the factor with high loadings of .69, .64, and .67, respectively. All items represented the tendency to bounce back after facing a stressful situation at the workplace while dealing with physical and psychological health issues thus, factor-4 was labeled as *"Resilience"*. It comprises three items and 6.08% of the variance is accounted for by this factor.

Phase IV: *Convergent and Discriminate Validity*

Positive psychological capital (PPS) and stress scale (sub-scale of DASS-21) was used to establish the convergent and discriminate validity of the Psychological Capital Scale.

Table 4

Inter-correlation Matrix for Psychological Capital, Positive Psychological Capital, and Stress Scale (*DASS*=21) (*N* =150)

Variable	*k*	*α*	2	3	4	5	6	7
1. Psychological Capital Scale	21	.89	.88**	.78**	.81**	.72**	.68**	-.20
2. Goal Orientation	7	.79	-	.52**	.61**	.56**	.63**	-.13
3. Optimism	6	.73		-	.51**	.47**	.55**	-.05
4. Self-Efficacy	5	.77			-	.48**	.53**	-.23*
5. Resilience	3	.65				-	.38**	-.20*
6. Positive Psychological Capital	12	.75					-	-.14
7. Stress Scale	7	.83						-

Note. *k* = no. of items, *α = Cronbach's Alpha,* PPC= *Positive Psychological Capital,* $^{**}p < .01$, $^{*}p < .05$

Table 4 indicates Cronbach's alpha reliability estimates along with the convergent and discriminate validity of the scale. Results of reliability analysis showed that the newly developed Psychological Capital Scale (*α* = .89), its sub-scales (*i.e.,* Goal Orientation *α* = .79, Optimism *α* = .79, Self-Efficacy *α* = .83, and Resilience *α* = .65), positive psychological capital scale (*α* = .75), and stress scale of DASS-21 (*α* = .83) were found be reliable and valid measures.

Furthermore, Table 4 also shows the results of convergent and discriminate validity. Results suggested that the psychological capital scale (PCS) (r=.68, p<.01) and its sub-scales (*i.e.,* goal orientation r=.63, optimism r =.55, self-efficacy r=.53, and resilience r =.38) positively correlated with positive psychological capital (PPC). In contrast, these scales were negatively correlated with the stress scale (sub-scale of DASS=21).

Table 5

Inter-Item Correlations for the 21-item PCS (*N*=150)

Sr. No.	Item (Finalized 21-item)	*r*
1	I plan before starting a task.	.43**
2	I can complete my tasks before the deadline.	.32*
3	I believe that I can overcome any challenging situation.	.60**
4	I can easily adjust to my surroundings.	.51**
5	I can easily achieve my goals.	.52**
6	I can overcome the adverse situation.	.47**
7	I have good control over myself.	.51**
8	I am hopeful to be rewarded for my hard work.	.44**
9	I am hopeful to get good opportunities for professional growth.	.50**
10	I try to help my colleagues.	.37**
11	I appreciate others' achievements.	.49**
12	I have the willpower to achieve my goals.	.55**
13	I am hopeful to get success in the future.	.62**
14	I try alternative techniques to solve the problems.	.48**
15	I try to make the best use of my abilities.	.53**
16	I want to achieve professional success.	.44**
17	I feel confident in the workplace.	.53**
18	I pursue my goals.	.58**
19	I can easily revive after the illness.	.29*

20	I am ever ready to accept challenges.	.51**
21	I am a strong person when dealing with difficulties.	.55**

Note. All correlations were $p < .01$

An item-total correlation analysis was conducted on 21 items of the scale. The analysis determined the correlation between each item and the total score of the scale. The table presented in the results showed that all items of PCS had a significant correlation (p<.01) with the sum of total items, with correlation coefficients ranging from .29 to .62. The overall reliability of the scale was α=.89 on the sample of N= 150. The result findings indicated that PCS is a highly reliable and valid measure.

Table 6

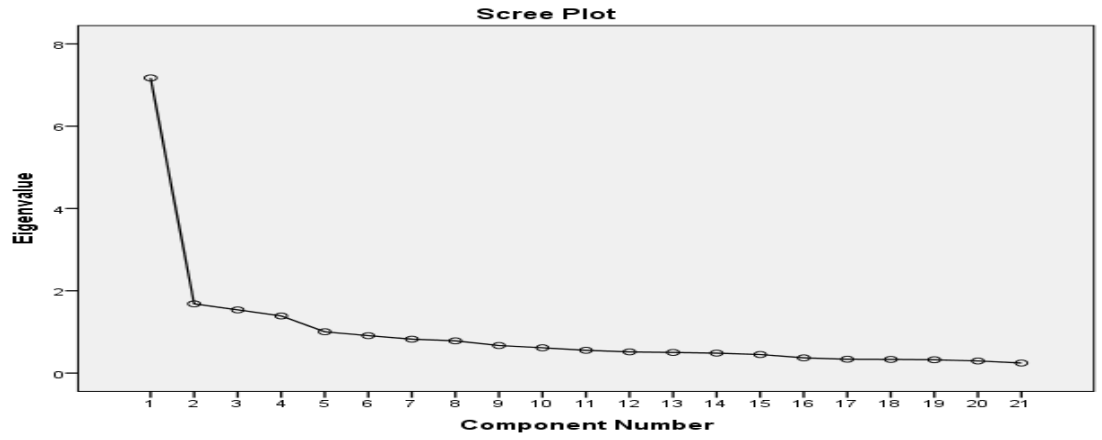
Item-Total Correlations for the 21-item Psychological Capital Scale (N=150)

Scale	Mean Inter-Item Correlation	Mean Item-Toral Correlation
Goal Orientation	.21	.31
Optimism	.34	.42
Self-Efficacy	.29	.41
Resilience	.30	.52
Positive Psychological Capital total	.20	.25

Note. p<.001

Mean inter-item correlation and is a method used to directly measure internal consistency, it is typically calculated as the average of the correlations between each pair of items. A cut-off value range of .15 to .5 is often used to interpret the mean inter-item correlation, particularly for newly created constructs (Clark & Watson, 1995). Based on the results, it can be concluded that the Psychological Capital Scale (PCS) demonstrates strong internal consistency.

Figure 1



Note. The scree-plot for the Psychological Capital scale for dual role individuals shows a 4-factor solution, with an elbow shape indicating the factors to retain in the study, i.e., those with Eigen values greater than 1.0.

Phase-IV: *Confirmatory Factor Analysis (CFA)*

The confirmatory factor analysis was carried out to determine the construct validity of the Psychological Capital Scale for dual-role individuals. The responses were analyzed using AMOS-20 to verify the model that emerged from the exploratory factor analysis, factor structure, and dimensionality of the Psychological Capital Scale (PCS). In this study, CFA model fit indices were accepted by following the standardized well-fitted model criteria by Hair et al. (2012).

Participants and procedure. Participants for the confirmatory factor analysis were selected through a purposive sampling strategy. The final sample consisted of *N*=320 dual-role individuals (*males*=226, *females*=94), recruited from the different public/private sectors universities, and organizations of Lahore (aged from 20 to 36 years $M = 26.46$, $SD = 3.44$). All the research protocols were followed before the commencement of the data collection procedure (*i.e.,* the purpose of the study was clearly explained to the participants, and after assuring confidentiality of the information and informed consent, participants were asked to fill in the questionnaire honestly and independently). Before conducting confirmatory factor analysis *"maximum-likelihood"* estimation, and the *"data normality"* were screened out for outliers. Thus, 320 responses out of 371 were found appropriate for further analysis.

The confirmatory factor analysis model fit was analyzed on 21 items of the PCS scale on the sample of *N*=320 to assess the factorial structure of the scale. Figure 1 demonstrated the loading on each factor and resulted in the support of our initial EFA loadings of a 4-factor solution.

Figure 1.

CFA Four Factors-Solution for Psychological Capital Scale (PCS)

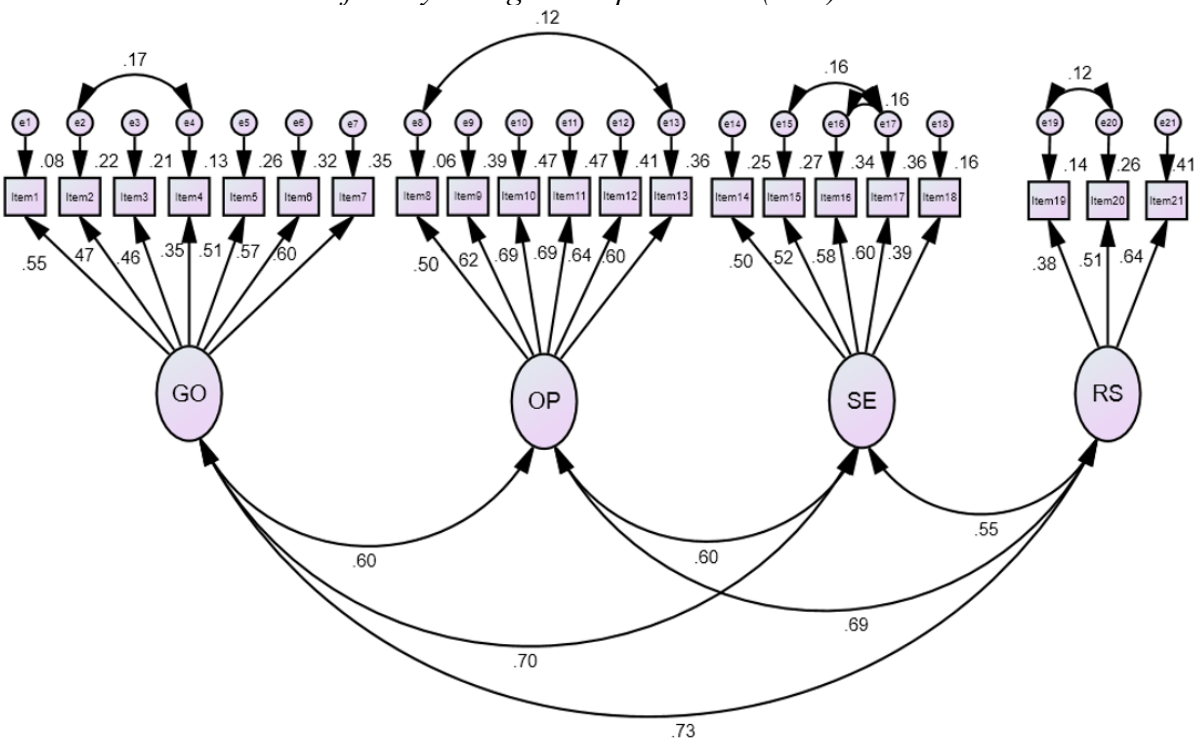


Table 7

Model-Fit Indices of Psychological Capital Scale for Dual Role Individuals (*N*=320)

Indexes	CMID	*df*	χ^2/df	CFI	RMSEA	GFI
Final Model	425.77	181	2.35	.91	.05	.90

*Note: *p*<.05=*RMSEA*=.10

The CFA model-fit indices (maximum likelihood) of newly developed psychological capital scale (PCS). Findings indicated the adequate fit to the model for the 4-dimension structure, χ2 = 425.77 (*df*=181, *N*=320), *p* <.05, CMIN/DF= 2.35, GFI= .90, CFI = .91, and RMSEA =.05. The findings from the confirmatory factor analysis were consistent with the four-factor solution that was identified through exploratory factor analysis. Although the chi-square value was significant and acceptable for the model-fit indices, this was due to the greater degree of freedom (χ2 /*df*) = 2.35 (Iftikhar & Malik, 2014) (Table 7).

Table 8

Factor Loadings of CFA Model for the 4-Factors Solution of PCS (*N*=320)

Item #		GO	OP	SE	RS
1	I plan before starting a task.	.55			
2	I can complete my tasks before the deadline.	.47			
3	I believe that I can overcome any challenging situation.	.46			
4	I can easily adjust to my surroundings.	.35			
5	I can easily achieve my goals.	.52			
6	I can overcome the adverse situation.	.57			
7	I have good control over myself.	.59			
8	I am hopeful to be rewarded for the hard work.		.50		
9	I am hoping to get good opportunities for professional growth.		.63		
10	I try to help my colleagues.		.68		
11	I appreciate others' achievements.		.68		
12	I have the willpower to achieve my goals.		.64		
13	I am hoping to get success in the future.		.61		
14	I try alternative techniques to solve the problems.			.47	
15	I try to make the best use of my abilities.			.57	
16	I want to achieve professional success.			.64	
17	I feel confident in the workplace.			.69	
18	I pursue my goals.			.34	
19	I can easily revive after the illness.				.38
20	I am ever ready to accept challenges.				.50
21	I am a strong person when dealing with difficulties.				.64

Note. *p* < .05, GO= *Goal Orientation*, Op= *Optimism*, SE=*Self-Efficacy*, RS= *Resilience*

The confirmatory factor analysis (CFA) of the 4-factor solution of PCS yielded standardized factor loadings ranging from .27 to .69 (Table 8).

Table 9
CFA Sample Maximum Likelihood Solution: Factors Correlation (*N*=320)

Factor	GO	Op	SE	RS
GO	--	.61**	.63**	.73**
Op	--	--	.55**	.70**
SE	--		--	.52**
RS	--			--

Note. ***$p < .001$, GO= *Goal Orientation*, Op= *Optimism*, SE=*Self-Efficacy*, RS= *Resilience*

Table 9 indicated that goal orientation, optimism, self-esteem, and resilience were positively and significantly associated ($p < .05$) with each other.

Discussion

The contemporary research yielded a reliable and valid tool of psychological capital, which was based on the description of four conceptual referents given by Luthans et al. (2004). The underlying reason for developing a Psychological Capital Scale (PCS) was to evaluate the psychological capital of dual-role individuals. Many Western psychological capital scales are available to measure the employee's level of psychological capital working in an organization but previously there was no scale available to assess the psychological capital of those individuals who are doing their post-graduation at the same time these are also working in an organization (dual role individuals). To that end, we developed and validated a scale named the psychological capital scale (PCS). The conceptual referent theory of positive psychological capital (PPC) as proposed by Luthans and Youssef (2004) was followed for the development of this instrument. To achieve the first research objective two phases (phase-I and phase-II) were followed for the development of the initial item pool, and selection of the items through a committee approach by using the content validity ratio (CVR) method (Ayre & Scally, 2014; Wilson et al., 2012). The second objective of the research was to establish the psychometric properties of the newly developed instrument which was achieved by following the third phase of the study, in this phase principal component factor analysis was implemented on the data to determine the factor structure of the scale. Four factors emerged which had a significant amount of variance (60%) (Hurley et al., 1997; Osborne et al., 2008). These included; goal orientation, optimism, self-efficacy, and resilience. The psychometric properties including convergent and discriminate validities of the PCS were established by finding the correlation between the newly developed psychological capital scale with positive psychological scales (Luthans et al., 2004) and with the stress scale (sub-scale of DASS=21) (Osman et al., 2012). Thus suggesting, that the psychological capital scale (PCS) has considerable convergent and discriminant validity. The results of the convergent and discriminate validity were consolidated with the study of Grobler and Joubert (2018). A newly developed instrument measures what it claims to measure. The current findings of exploratory factor analysis are consistent with the previously conducted validity and reliability evidence of the psychological capital scale by Santana-Cardenas et al. (2018) on the Mexican sample. Another main constituent of the study was to replicate and test the four-factor structure of the newly developed psychological capital scale with the confirmatory factor analysis model by using Amos. The results of the confirmatory factor analysis illustrated the existence of a four-factor structure through CFA proximate to an adequate fit of the model. Furthermore, these

findings were consistent with the previous studies that were directed to establish the factor structure, adaptation, validation, and measurement of the psychometric properties of the psychological capital scale by using SPSS and Amos (Grover et al., 2018). By achieving the complete objectives of the study, in conclusion, a reliable and valid instrument of psychological capital for the dual role of individuals was developed.

Conclusion and Implications

Concluding, the current results endorse the development and validation of the psychological capital scale (PCS) for individuals with dual roles. Additionally, these findings confirm the psychological capital scale's reliability and validity as a measurement tool. The study provided a 21-item reliable and valid measure of psychological capital (PCS) for dual-role individuals. Additionally, in organizations for more effective outcomes, this scale would be helpful to measure the level of psychological capital of the internees, in this way, organizations can retain good human capital and manage their turnover rate. This instrument would also be used in the organizations to recruit interns and trainees. By using this scale organizations would manage the process of talent hunting by recruiting motivated individuals to develop a future leadership pool. Apart from this, it would be used in colleges and universities for research purposes, and help the test constructors to establish the convergent and discriminant validity of a new test in the context. The newly developed instrument would be a significant addition to the literature regarding scale construction in Pakistan. However, further research on the psychometric properties/norming of the psychological capital scale with more diverse populations would be encouraged.

Limitations and Recommendations

The psychological Capital Scale (PCS) is a valid and reliable measure to assess the psychological capital of dual-role individuals. However, the research is not without its limitations. The scores of the psychological capital scale acquired from the sample were negatively skewed (-1.03, -1.12, -1.54, -1.48, -.80). The negative skew indicates that the rating on items of the psychological capital scale (PCS) clustered on the upper end of the 5-point scale and this might have decreased the variance in scores as well. This negative skew may be the result of the homogenous sample. One of the ways to overcome this problem is getting this scale tested against heterogeneous samples, especially the organizational and institutional samples. Future research, concentrating on this aspect, can develop a method to eradicate this possible limitation of the psychological capital scale. Although the PCS is a trustworthy and valid tool, its norms have not been established. Future research should focus on developing its norms and applying the scale specifically to working students to obtain more efficient results. The study's entire sample was recruited from educational institutions, industries, and software houses in Lahore, and given the scope of the study, the sample was sufficient. However, future research should consider including the entire Pakistani population to increase its generalizability.

Contribution of Authors

Iffat Batool: Conceptualization, Methodology, Writing - Reviewing & Editing, Supervision

Muhammad Zohaib Khan: Investigation, Methodology, Data Curation, Formal Analysis, Writing – Original Draft

Shah Rukh Tariq: Formal Analysis, Writing – Original Draft, Writing - Reviewing & Editing

Conflict of Interest

There is no conflict of interest declared by the authors.

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The datasets of the current study are not available publicly due to ethical reasons but are available from the corresponding author [M.Z.K] upon the reasonable request.

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