

Developing of career basic psychological needs scale: Measurement invariance of intergenerational comparison

Ahmet Ayaz^{1*}  Esra Eker Durmuş²  Yaşar Özbay³ 

^{1,2,3}Psychological Counselling and Guidance, Faculty of Education, Hasan Kalyoncu University, Gaziantep, Türkiye.

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Abstract

This study aimed to develop a scale to determine the basic psychological needs of a career based on Glasser's Choice Theory and examine its psychometric properties. The sample was composed of 1260 people from X, Y, and Z generations living in the provinces of Ankara, Gaziantep, and Antalya. In the development phase of the scale, expressions reflecting the basic psychological needs at work based on Choice theory were returned to the scale item. The pool of 57 items was formed. Six items were removed from the form and submitted to five academicians for expert opinion, and validity-reliability studies were conducted on 51 items. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used to examine the scale's construct validity. Also, parallel analysis was used. The Psychological Need Scale was used to examine the validity of the criterion. As a result of the construct validity analysis of the scale, a five-factor structure, namely survival, love and belonging, power, freedom, and fun, consisting of 25 items in total (five items each), was obtained as explained in Glasser's Choice Theory. The fit indices of the confirmatory factor analysis confirmed the structure explored in exploratory factor analysis. Cronbach's α coefficient for all five subscales was found as .85, love and belonging were .78, freedom .76, fun .66, power .74 and survival .65. Results of the measurement invariance for X, Y, and Z generations show that the scale has configural, metric and scalar invariance. Overall results show that Choice Theory-based Career Basic Psychological Needs Scale can be used as a valid and reliable scale.



1 Introduction

Psychological needs, defined under different theoretical structures (Ansbacher & Ansbacher, 1956; Deci & Ryan, 2001; Glasser, 1998; Maslow, 1987; Murray, 1938), are the fundamental human development motivation. Glasser's Choice Theory (2003) postulates that individuals have psychological needs: survival, love and belonging, power, freedom, and fun. Survival is physiological, while love and belonging, power, freedom, and fun are of psychological origin (Glasser, 1998). These needs, which guide all our behaviors throughout our lives, are essential to the growing body of choice theory research across various life domains, including work.

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*  Contact: ahmet.ayaz@hku.edu.tr

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The basic assumption of this model is that the five needs in choice theory constitute the basic source of one's career-related behaviors. With this assumption, the desire to meet the basic needs enables the determination of the person's priorities in career choices. This model parallels Maslow's hierarchy of needs, which also identifies physiological and psychological needs as fundamental drivers of behavior, with physiological needs at the base, followed by safety, love/belonging, esteem, and self-actualization (Maslow, 1987). Similarly, Deci and Ryan's Self-Determination Theory (SDT) emphasizes the importance of autonomy, competence, and relatedness as basic psychological needs that motivate human behavior (Deci & Ryan, 2000).

In the work context, Maslow's hierarchy suggests that individuals first seek to fulfill their physiological and safety needs before moving on to higher-order psychological needs such as belonging, esteem, and self-actualization. This progression is reflected in workplace behavior as employees strive for job security, social connections, recognition, and personal growth. Deci and Ryan's SDT further elaborates that fulfilling the needs for autonomy, competence, and relatedness enhances intrinsic motivation and overall well-being, which are critical for job satisfaction and productivity.

By integrating these theoretical perspectives, Glasser's Choice Theory can be more comprehensively applied to work settings, offering a nuanced understanding of how various psychological needs influence career choices and workplace behavior. The Career Basic Psychological Needs Scale developed in this study incorporates elements from these theories to provide a robust tool for assessing the fulfillment of these needs in professional environments. The needs in the choice theory are summarized below in the light of the literature (Glasser, 1998; Glasser, 1999; Glasser, 2000). The need for survival is a need associated with one's encountering physiological needs. Factors such as safety, health, and nutrition are included in the need for survival. The only physiological need is survival among these basic needs. The need for love and belonging is met by the feeling that the person is loved and cared for in his/her social environment and close relationships. Glasser describes the need to love and belonging as the most important psychological need. People must be in contact with others to meet their needs. The need for love and belonging extends to everyone we communicate with, starting from our immediate surroundings, like family and friends. At the source of the need for power are our wishes to be successful in our work, influence other people, get appreciation and approval from others, and feel important. The need for freedom is about feeling that one's life is in control. Individuals who can make healthy decisions, use their creativity, and feel free and independent can be considered to meet the need for freedom. The need for entertainment constitutes our need to enjoy something, relax, laugh, and learn. Individuals become eager to learn new things by meeting the need for entertainment.

The desire to satisfy needs is a common phenomenon. Satisfying these needs differentiated each person (Corey, 2015; Glasser, 1999). The person will want to meet their needs regardless of their career development stage. The importance given to the need and the balance formed by meeting this need will bring the person to career satisfaction. Within the scope of the research, it aims to create a measurement tool based on the equivalents of the five needs defined in the theory of choice in working life.

Individuals who care about the need for survival give importance to having a working environment where they can feel safe and meet their physiological needs easily. It is important for these people to guarantee their future through the institution for which they work. Meeting their safety and

health needs is among their priorities. Individuals who care about meeting the need for love and belonging take care to establish close relationships with their colleagues. These individuals who feel they belong to the institution they work for also expect their institutions to adopt themselves. At the same time, they want to see themselves as a family member in the institution they work for (Filstad et al., 2019). The workplace is also a crucial factor that affects people's career choices. The need for belonging in the workplace is fundamental for employers. Positive interpersonal relationships and feelings of belonging to a workplace positively affect work performance (Balay, 2000; Dutton & Heaphy, 2003). This belonging is also related to work engagement, and many factors can affect it. One of these factors is fun at the workplace. Having fun and enjoying work can facilitate performance (Plester & Hunchiston, 2016). It is important for individuals who care about meeting their power needs to feel competent and receive praise for their work. A working environment in which they can use their talents is important for these people. These individuals, who attach importance to being successful, desire to appreciate the people around them with their success. McClelland's (1965) need theory suggests that the need for power can be acquired from the social environment and learning. Individuals who attach more importance to the need for power place greater emphasis on work values such as status and professional fulfillment. For example, these people want to earn more than their peers at work. Also, achievement and power needs are correlated with work-related activities and advancement in career steps (Parker & Chusmir, 1991).

On the other hand, individuals who attach importance to meeting the need for freedom attach importance to having flexible working hours, controlling their careers, and acting independently in the workplace. Being autonomous in working life and producing and evaluating their options are among the things that these people desire and attach importance to. Depending on the constant change in work-life conditions, flexibility in time is important for workers. Scholars argue that additional work hours can be managed when individuals have control over the time requested for the job and a flexible workplace (Barnett, 1994). Flexplace can be defined as giving employers control over where the work is done. It can be home-office work and telecommunicating. It is important to have fun and learn in the working life of individuals who care about meeting the need for fun. These individuals take care that the working environment is an entertaining environment for themselves, open to new experiences and learning, making and laughing at their colleagues and taking part in a humorous working environment.

The present study provides evidence of psychological needs based on choice theory. Glasser (1999) explains the nature of needs as universal and motivated by satisfaction. Employees can become more satisfied with their jobs by meeting basic psychological needs in the workplace. Using the career psychological needs model based on choice theory, it will be possible to make predictions and develop strategies about the person's job placement processes, job satisfaction, and career renewal processes. We address the inconsistency of psychological needs such as power, freedom, fun, and belonging, which are studied separately under different works. This provides theoretical conceptualization of psychological needs at work.

The existence of different theoretical explanations in the literature on determining basic psychological needs and need satisfaction at work has led to the emergence of scales with different theoretical foundations during the scale development processes (Brien et al., 2012; Baard et al., 2004; Gillet et al., 2012; Longo et al., 2016; Tafvelin & Stenling, 2018; Van Der Broeck et al., 2010). When these scales developed based on the Self-Determination Theory were examined, The Basic Need Satisfaction at Work scale, which consists of 21 items developed by La Guardia et al. (2000)

and measures the level of satisfaction of employees' psychological needs at work, consists of the dimensions of autonomy, competence, and relatedness. Need Satisfaction at Work Scale (NSa-WS), which consists of 13 items that examine the satisfaction of employees' psychological needs at work under three dimensions: autonomy, competence and relatedness (Tafvelin & Stenling, 2018).

The existence of different theoretical explanations in the literature on determining basic psychological needs and need satisfaction at work has led to the development of scales with varying theoretical foundations (Brien et al., 2012; Baard et al., 2004; Gillet et al., 2012; Longo et al., 2016; Tafvelin & Stenling, 2018; Van Der Broeck et al., 2010). Among these, scales based on Self-Determination Theory (SDT) are notable. For instance, the Basic Need Satisfaction at Work scale by La Guardia et al. (2000) includes 21 items measuring autonomy, competence, and relatedness. Similarly, the Need Satisfaction at Work Scale (NSa-WS) consists of 13 items covering the same dimensions (Tafvelin & Stenling, 2018). However, these scales have limitations. They do not account for the needs of survival and fun, which are emphasized in Glasser's Choice Theory. Our study aims to address these gaps by developing a comprehensive scale that incorporates these overlooked dimensions. By doing so, it provides a more holistic assessment of career psychological needs, ensuring that factors such as job security (survival) and workplace enjoyment (fun) are also considered.

The aim of this research is clearly stated as the development of a comprehensive Career Basic Psychological Needs Scale based on Glasser's Choice Theory, incorporating the often overlooked dimensions of survival and fun. This study makes a unique contribution by addressing the limitations of existing scales and providing a more holistic tool for assessing psychological needs in the workplace. For example, by assessing the need for survival, the scale can help identify how job security impacts employees' career choices and development, as those who feel secure in their jobs are more likely to pursue career advancement opportunities and engage in long-term career planning. Additionally, the inclusion of the fun dimension allows the scale to measure how workplace enjoyment contributes to job satisfaction, with employees who find joy and satisfaction in their work environment likely to experience higher overall job satisfaction and motivation. By highlighting these practical applications, the study demonstrates the value of the new scale for career counselors and human resource professionals in enhancing both career development and job satisfaction. In this context, the following questions are sought to be answered within the scope of the research conducted.

1. What is the factor structure of the Career Basic Psychological Needs Scale as determined by exploratory factor analysis?
2. What are the reliability levels (internal consistency) of the Career Basic Psychological Needs Scale?
3. Can the factor structure of the Career Basic Psychological Needs Scale be confirmed through confirmatory factor analysis?
4. How does the Career Basic Psychological Needs Scale perform across different generations?

2 Method

2.1 Participants and procedure

Criterion sampling method, one of the purposeful sampling methods, was used in the study. In the first stage, data were collected from 722 people for exploratory factor analysis. Generation X included 131 people born before 1980 (77% female), Generation Y included 326 people born between 1980 and 2000 (58% female), and Generation Z included 265 high school students born

after 2000 (51% female). The study group's participants were selected to ensure diversity, including white-collar and blue-collar employees. Additionally, university students from five different programs were included to enhance diversity. In the second stage, data were collected from 538 participants for confirmatory factor analysis. This included 178 participants from Generation X (58% female), 216 from Generation Y (61% female), and 144 from Generation Z (53% female). The sampling strategy aimed to cover a range of professions and sectors to ensure a comprehensive workforce representation. To achieve maximum variation within the study group, participants from the education, law, healthcare, and engineering sectors were included in the research. The criterion sampling method was carefully designed to include participants from various occupational groups and industries, such as healthcare, education, manufacturing, and services. This approach ensured that the sample was representative of different sectors, providing a broad perspective on the psychological needs in diverse working environments.

2.2 Measures

2.2.1 Career basic psychological needs scale

The Career Basic Psychological Needs Scale developed within the scope of the research consists of five dimensions and 25 items. Survival, love and belonging, power, freedom and fun dimensions consist of five items. Information about the validity and reliability analyzes of the measurement tool is given in the findings section.

The scale development process started with defining the theoretical and empirical domains of the construct. In this context, the basic needs in the Choice Theory have been redefined to reflect psychological needs at work. Then, the item pool, which reflects each basic need, was generated. Also, interviews were conducted with the people in the X, Y, and Z generations, along with the studies in the literature. The opinions of academicians working in the field of career counseling were consulted. After completing the item writing process, a pool of 57 items was obtained. The 57 item form was submitted to the preliminary opinion of an academician working in the field of guidance and psychological counseling. After recommendations were made, expert opinion was obtained from five academicians, three of whom were career counseling and two were experts in measurement and evaluation. Six items were removed from the scale form in line with the recommendations. After expert opinions were received, the Turkish language proofreading of the scale was carried out by an academician specialized in Turkish Language and Literature. Five items were rewritten by language proofreading. Data collection studies were started on X, Y, and Z generations over a 51-item scale form.

2.2.2 Psychological needs scale

The Psychological Needs Scale developed by Eşici (2021) consists of 25 items and four sub-dimensions which are love and belonging, freedom, power and fun. In order to determine the validity of the scale, firstly, exploratory factor analysis was performed and a 25-item structure consisting of four sub-dimensions was obtained. Four factors together account for 48.21% of the total variance. Confirmatory factor analysis was performed to test the structure of exploratory factor analysis. The fit indices for the four-factor structure of the scale were found to be high ($\chi^2/sd = 2.03$, RMSEA = .05, RMR = .04, NFI = .83, CFI = .91, GFI = .90). In order to test the reliability of the scale, Cronbach Alpha internal consistency coefficient was calculated, and test-retest coefficients were examined. Cronbach Alpha coefficients of the sub-dimensions ranged from .66 to .87. Test retest coefficients ranged from .66 to .91.

2.3 Data analysis

In the first stage of the data collection process, data were collected from 722 participants within the scope of exploratory factor analysis. The forms of the participants with multiple and incomplete answers in the scale forms were excluded from the data set. In the missing data determination process, when the missing data was below 1%, and it was determined that it was not distributed according to a certain systematic, missing data assignment was made using the expectation maximization (EM) technique. Outliers in the measurement tool were examined using unidimensional outliers and standard z points, and 21 respondents outside the -3, +3 range were excluded from the data set. Mahalabonis coefficient (Mahalabonis coefficient measures the distance of a point from the mean of a distribution, accounting for correlations between variables) was calculated to determine multivariate outliers. The measurement tool removed 14 participants with multivariate outliers from the data set. As a result, the validity and reliability analyses of the measurement tool were conducted on 687 participants. Exploratory factor analyses were conducted to explore the structure of the scale. In this context, principal component analysis was used to determine the scale's factor structure. The Varimax vertical rotation method was used. In addition, parallel analysis and criterion validity were conducted to provide additional evidence for scale validity. The correlation between the developed scale and the Psychological Needs Scale was examined for criterion validity. Cronbach's alpha coefficients were calculated for each subscale to determine the internal consistency of the subscales. In the second stage of the scale development process, confirmatory factor analysis was conducted on 538 participants. In addition, measurement invariance between generations X, Y, and Z was examined. While descriptive statistics, correlation analysis, and exploratory factor analysis used in the scale development process were performed with the SPSS 22.0 program, confirmatory factor analysis and measurement invariance were performed with the MPlus 8.0 program.

3 Findings

3.1 Explanatory factor analysis

Exploratory factor analysis was performed to provide evidence for the validity of the instrument and to explore the factor structure. In the first step, Kaiser-Mayer-Olkin (KMO) coefficient and Bartlett sphericity test results were examined to determine the suitability of the data for factor analysis. KMO coefficient was found to be 0.86. If KMO coefficient is close to 1, data are suitable for factor analysis. The Bartlett sphericity test was found to be 4469,915 ($p < 0.01$) significant. This result supports the hypothesis that the data show a multivariate normal distribution.

In the first stage of the analysis, as seen in figure 1, six-factor structure with an eigenvalue greater than 1 was found, explaining 53.88% of the total variance. By examining the results of the parallel analysis and the scree plot graph it was decided to limit the number of factors to five. After Varimax vertical rotation, items with a difference between the load values under different factors less than 0.10 and which do not give a load value to any item were removed from the data set.

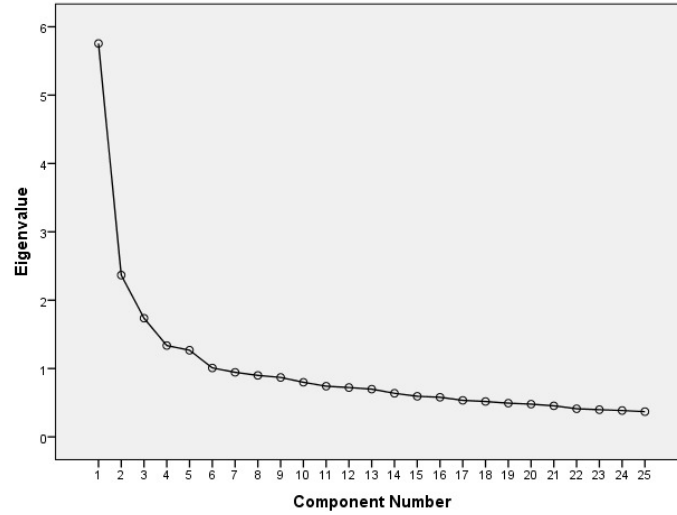


Figure 1 Scree-plot graph

As a result, a 25-item scale with five factors and five items in each factor was obtained. The factor loadings of the scale range between .44 and .78. In addition, there are no items that give a value in more than one factor among the scale items.

Table 1 Total variance explained

Rotated Totals of Factor Load			
Factors	Sum	Variance%	Total %
1	5.75	23.02	23.02
2	2.36	9.46	32.49
3	1.73	6.94	39.43
4	1.33	5.34	44.78
5	1.26	5.07	49.85

As a result of the Varimax vertical rotation technique, the distribution of substances to factors is determined in Table 2. When Table 2 is examined, it is seen that each item is separate from the others, and no substance is transmitted between them.

Table 2 Matrix of rotated components after explanatory factor analysis

Items	Factors				
	Love/Belonging	Freedom	Power	Survival	Fun
1	.71				
2	.71				
3	.69				
4	.68				
5	.65				
6		.78			
7		.74			
8		.70			
9		.65			
10		.59			
11			.73		
12			.72		
13			.66		
14			.57		
15			.55		
16				.65	
17				.63	
18				.62	
19				.59	
20				.56	

21	.71
22	.66
23	.51
24	.51
25	.44

3.2 Parallel analysis results

In order to provide evidence of the scale's validity, parallel analysis was performed in addition to the analysis with the basic component. In parallel analysis, the eigenvalues obtained from the measurement tool are compared with the eigenvalues obtained from the same number of people in a random manner with the same number of factors. In this analysis, the acceptance criterion of the factor is that the eigenvalue obtained from the measurement tool is higher than the random eigenvalue. As a result of the parallel analysis, it was found that the first five dimensions in the scale were higher than the random eigenvalues. However, the sixth dimension was lower than the random eigenvalues. This result supports the five-factor structure of the scale. Table 3 shows the comparison of the eigenvalues calculated by the parallel analysis.

Table 3 Eigenvalues after parallel analysis

Factors	Random Eigenvalue	Eigenvalue in Measurement Tool
1	1.36	5.75
2	1.30	2.36
3	1.26	1.73
4	1.23	1.33
5	1.19	1.26
6	1.16	1.00

As a result of the basic components analysis, it was determined that it consists of 5 factors depending on the theoretical foundations of the measurement tool. These factors were named survival, love/belonging, power, freedom, and fun. The results of the parallel analysis support this finding.

3.3 Criterion validity

The correlation table displays the relationships between the Career Needs Scale and the Psychological Needs Scale. The results indicate significant correlations across various dimensions. The career-survival need shows a strong positive correlation with career-love/belonging ($r = .57, p < .01$) and career-fun ($r = .58, p < .01$), suggesting that those who prioritize survival in their careers also place high importance on belonging and enjoyment in their work. Career love/belonging is highly correlated with career freedom ($r = .58, p < .01$) and career fun ($r = .51, p < .01$), indicating that individuals who value relationships at work also seek autonomy and enjoyment. Career freedom shows significant positive correlations with career power ($r = .30, p < .05$) and career fun ($r = .46, p < .01$), suggesting that autonomy is associated with a sense of power and enjoyment in one's career. Additionally, career power correlates positively with career fun ($r = .30, p < .05$), implying that those who feel empowered at work also find it enjoyable.

Significant correlations are also observed when examining the relationship between the Career Needs Scale and the Psychological Needs Scale. Career-love/belonging correlates positively with love/belonging ($r = .30, p < .05$), power ($r = .24, p < .05$), freedom ($r = .21, p < .05$), and fun ($r = .30, p < .05$). Career-freedom shows significant correlations with love/belonging ($r = .25, p < .05$), power ($r = .38, p < .01$), freedom ($r = .45, p < .01$), and fun ($r = .35, p < .05$). Career-power correlates with love/belonging ($r = .19, p < .05$), power ($r = .45, p < .01$), and fun ($r = .34, p < .05$).

Lastly, career-fun shows significant correlations with love/belonging ($r = .38, p < .01$), power ($r = .15, p < .05$), freedom ($r = .20, p < .05$), and fun ($r = .45, p < .01$). These results indicate that the psychological needs assessed by the Career Needs Scale are consistently related to the corresponding dimensions of the Psychological Needs Scale, supporting the validity of the new scale in measuring career-related psychological needs.

Table 4 Correlation coefficients between career needs scale and psychological needs scale

Variables	1	2	3	4	5	6	7	8	9
Career-survival (1)	-								
Career-love/belonging (2)	.57**	-							
Career-freedom (3)	.36*	.58**	-						
Career-power (4)	.29*	.36*	.30*	-					
Career-fun (5)	.58**	.51**	.46**	.30*	-				
Love/belonging (6)	.33*	.30*	.25*	.19*	.38**	-			
Power (7)	.10*	.24*	.38*	.45**	.15*	.26*	-		
Freedom (8)	.23*	.21*	.45**	.43*	.20*	.18*	.21*	-	
Fun (9)	.36*	.30*	.35*	.34*	.45*	.43**	.20*	.16*	-

Note. * $p < .05$, ** $p < .01$

3.4 Reliability analysis

The internal consistency coefficients of the sub-dimensions were calculated within the scope of reliability studies of the scale. Table 5 shows the internal consistency coefficient for each sub-dimension. When Table 5 is examined, it is seen that the internal consistency coefficients of the sub-dimensions of the scale are .78 for love and belonging, .76 for freedom, .74 for power, .65 for survival, and .66 for fun sub-dimension.

Table 5 Eigenvalues after parallel analysis

Factors	Cronbach's Alpha
1. Love and belonging	.78
2. Freedom	.76
3. Power	.74
4. Survival	.65
5. Fun	.66

3.5 Confirmatory factor analysis

In order to determine the compatibility of the five-factor structure obtained in exploratory factor analysis, confirmatory factor analysis was performed for each group separately. As a result of exploratory factor analysis, it was found that the structure with five factors was well adapted for the individuals in the X, Y, and Z generations. When the fit indices in Table 6 are examined, it is seen that the fit indices are good for each generation. No modification of the measuring instrument was required in all three groups.

Table 6 Confirmatory factor analysis results for individuals in generations X, Y, and Z

Generations	RMSEA	CFI	SRMR
X	.03	.95	.07
Y	.06	.96	.05
Z	.05	.93	.06

3.6 Testing measurement invariance for x, y, z generations

In order to determine whether the structure of the Career Values Scale works in the same way for the X, Y and Z generations, multiple group confirmatory factor analysis was performed on the

data obtained from these three generations. Measurement invariance is tested in four stages: configural invariance, metric invariance, scalar invariance, and strict invariance. The adaptation index obtained at each level is compared with the one obtained at the next stage, and the magnitude of the difference gives information about whether the criterion is met. The next invariance criterion is not met if the detected difference is above .01. When Table 7 is examined, it is found that the Career Values Scale meets configural, metric, and scalar invariants but does not meet strict invariance.

Table 7 Results of measurement invariance for individuals in generations X, Y, and Z

Level	RMSEA	CFI	SRMR
Configural invariance	.06	.94	.06
Metric invariance	.06	.93	.07
Scalar invariance	.06	.93	.07
Strict invariance	.07	.91	.10

4 Discussion

This study presents findings related to the development process of the Psychological Needs Scale in Career based on Choice Theory and the validity and reliability analyses conducted within this scope. The scale development process started with the determination of dimensions within the framework of theoretical structure and item writing process. Interviews with the participants, expert opinion, and language proofing procedures were performed during the item writing process.

In the validity analysis of the scale, exploratory factor analysis was performed first, and a five-dimensional structure explaining 50% of the total variance was obtained. It is expected to be over 60% of the variance explained (Stevens, 1996; Hair et al. (1998). Henson and Roberts (2006) accept that the variance between 40% and 50% explained in the scale development studies in the field of social sciences is sufficient. The factor eigenvalues obtained from the five-factor structure were compared with the eigenvalues obtained from the parallel analysis, and the scale's five-factor structure was supported. In addition, the fact that the theoretical structure of the developed scale is clear and that the scale was developed with all five factors eliminates the question mark that there is a factor that cannot be explained by the items written.

Within the scope of parallel analysis, the factors in the scale were compared with the values obtained from a data set containing random values (Horn, 1965). Parallel analysis results allow testing of the structure of the measuring tool obtained as a result of the exploratory factor analysis (Akbaş et al., 2019).

After the exploratory factor analysis, the fit indices of the five-factor structure were calculated separately for the X, Y and Z generations and good fit indices for the three groups were obtained. Afterwards, measurement invariance for X, Y and Z generation was examined and configural, metric and scalar invariance criteria were met. The X, Y, and Z generations differ from each other in terms of their structures, their characteristics, their growth and developmental conditions (Bencsik et al., 2016; Berkup, 2014; Mahmoud et al., 2020). Despite this differentiation, the fact that the Psychological Needs Scale in Career works in the same way in three generations is an indicator of the universality of the basic needs theoretically stated by Glasser (1999; 2000).

Finally, the correlation coefficients between the Psychological Needs Scale and Psychological Needs Scale in Career were calculated within the scope of the criterion validity and moderate positive correlations were obtained. This data shows the link between psychological needs that

form the basis of the Choice Theory Based and Psychological Needs Scale in Career (Glasser, 1999; 2000).

In the reliability analysis of the scale, internal consistency coefficients of the sub-dimensions were calculated. The internal consistency coefficients of the dimensions ranged from .66 to .78. While the internal consistency coefficients are generally expected to be above .70 (Büyüköztürk, 2019), values above .50 are acceptable as the number of items in the scale or factor decreases.

When the validity and reliability analyses were examined, it was found that the Psychological Needs Scale in Career was a valid and reliable measurement tool for individuals in the X, Y, and Z generations. With this measurement tool, the psychological needs that individuals in the X, Y, and Z generations attach importance to and want to be met in their careers can be analyzed in the context of their career needs. The expectations of the person about his / her working life can be learned, as well as the needs that he/she has met in working life. The measurement tool developed with this function can be used in psychological counseling and guidance services of schools, university career centers, and human resources departments of private and public institutions. Through the scale, it is expected that individuals who are provided with career counseling services by psychological counselors will be better known, and the quality of the services to be provided will increase. Similarly, the scale is expected to contribute to the counselee's career option creation and evaluation processes by actively using it in their career exploration and decision processes. Career counseling professionals determine the needs that are important to the individual through the scale results and can evaluate the saturation of these needs within the institution they work/plan to work in. With such studies, it will be possible to contribute to satisfying the psychological needs of people in a healthy way in their working life.

4.1 Limitations and future directions

One limitation of this study is the reliance on self-reported data, which may be subject to social desirability bias. Participants may have responded in ways they believed were expected rather than providing their genuine perceptions. Future research could address this limitation by incorporating objective measures or third-party evaluations to validate self-reported data. Additionally, employing techniques such as triangulation or mixed-method approaches could help mitigate the biases inherent in self-reported data. Another limitation is the cross-sectional design of the study, which restricts our ability to draw causal conclusions about the relationships between career psychological needs and career satisfaction. Longitudinal studies are needed to examine these relationships over time and to establish causality. Implementing experimental designs where interventions are tested could also help in establishing causal links.

The study sample, although diverse in terms of generational representation, was geographically limited to the provinces of Ankara, Gaziantep, and Antalya in Turkey. This limits the generalizability of the findings to other cultural or regional contexts. Future studies should aim to include more diverse samples from different regions and countries to enhance the external validity of the scale. Moreover, incorporating a wider range of professional fields and sectors can provide a more comprehensive understanding of career psychological needs across various contexts.

4.2 Conclusion

In conclusion, the Career Basic Psychological Needs Scale, based on Glasser's Choice Theory, provides a valid and reliable measure for assessing the psychological needs of individuals in their careers. The scale's five-factor structure—survival, love and belonging, power, freedom, and fun—

was confirmed through rigorous exploratory and confirmatory factor analyses. The findings of this study suggest that meeting these psychological needs is essential for career satisfaction and well-being. The scale can be used by career counselors, human resource professionals, and researchers to better understand and support individuals' career development processes. By addressing the psychological needs identified in this study, organizations and career counselors can develop targeted interventions to enhance employee satisfaction and performance.

This study makes significant contributions to the development, validity, and reliability analyses of the Career Basic Psychological Needs Scale. The discussion section comprehensively addresses the findings and elaborates on their theoretical and practical implications. However, the study's value could be further enhanced by detailing certain methodological aspects and practical application challenges more thoroughly. For instance, addressing potential difficulties in implementing the scale in diverse work environments would provide a more holistic view.

Future research should continue to refine and validate the scale across different populations and settings. Longitudinal studies and experimental designs are recommended to further explore the causal relationships between psychological needs and career outcomes. Additionally, incorporating diverse cultural perspectives will be crucial in understanding the universal and context-specific aspects of career psychological needs. Overall, this research contributes to the growing body of literature on career development by providing a robust tool for assessing psychological needs in the career context. The Career Basic Psychological Needs Scale holds significant potential for advancing theory, research, and practice in the field of career counseling and development. The recommendations for future research are well-founded and provide valuable guidance for further studies in this field, serving as an important reference for ongoing and future research efforts.

5 Statement of Researchers

5.1 Researchers contribution rate statement:

The authors equally contributed to this overview.

5.2 Conflict statement

The authors declare no potential conflicts of interest.

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