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Psychometric Properties of Basic Needs Scale Based on Choice Theory (BNSBCT)

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Abstract

Choice Theory, which is a well-established psychological framework that emphasizes the importance of meeting basic psychological needs for human well-being and optimal functioning. The use of a reliable and valid measure like the BNSBCT can lead to more accurate and meaningful research findings, which can inform the development of interventions or policies aimed at improving individuals' basic psychological needs fulfillment in various contexts especially in education. The aim of this study was to develop a measurement instrument to find out the satisfaction levels of basic needs in adult population and to test the psychometric properties of the scale. Individuals aged 18 and older, who were reached with convenience sampling method, participated in the study. Exploratory Factor Analysis was conducted with the data obtained from 381 participants, while Confirmatory Factor Analysis was conducted with the data obtained from 194 participants and goodness of fit indices were found to be χ^2/df= 1.64; GFI=.85; IFI=.91; TLI=.90; CFI=.91; PNFI=.71; PGFI=.69; SRMR=.64 and RMSEA=.06. The 25-item scale includes five factors. Face validity of the scale is .91, while convergent validity value is .70. In terms of reliability, McDonald's Omega coefficient was found to be .92, while test-retest correlation coefficient was found to be .83. The results show that Basic Needs Scale based on Choice Theory is a valid and reliable measurement instrument. As a result, it can be stated that the scale can be used to determine the level of meeting the basic needs of adults.

Keywords

Choice theory, Basic needs, Validity, Reliability.

Ethics Committee Approval: Ethics committee permission for this study was obtained from Sakarya University Ethics Committee with the decision dated 11.05.2022 and numbered 45/08.

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INTRODUCTION

William Glasser is the founder of Choice Theory (Wubbolding, 2017). In Choice Theory, Glasser argues that individuals have the power to choose over their thoughts, feelings and behaviors (Glasser, 1998). This approach emphasizes that individuals are free and responsible for their choices (Jusoh, 2018). Choice Theory is the conceptualization of human behavior that promotes the focus of internal control. According to this theory, all we do from birth to death is the attempt to match our needs with the images in our world of quality to meet one or more of our needs (Patkar, 2018).

Even if behaviors are influenced by factors outside the individual, the power that drives them is within the individual. Individuals choose their form of behavior, and the purpose of this choice is to meet their needs at that moment (Corey, 2015). In short, according to Choice Theory, all behaviors are intentional. They are motivated by a desire to satisfy one or more of our basic needs, especially in relationships with others and/or ourselves (Glasser, 1998). It can be stated that individuals' behaviors are triggered by needs.

Choice Theory is based on the principle that all motivation for human behavior stems from innate needs and more specifically from individuals' wishes (Glasser, 1998). Human needs and wants give energy to behavioral system to influence the world in a personally and internally satisfying way (Wubbolding, 2017). Choice Theory explains in detail that all happiness and suffering result from the effort to satisfy the five basic needs inherent in individuals' genes –survival, freedom, fun, power, love and belonging (Glasser, 1998). The need to love and belong refers to individuals' building satisfying relationships with family members, friends, neighbors, individual/s they have romantic relationships with, spouses and children (Glasser, 2003). The genetic program of all living beings is encoded on the need to survive. Another aspect of this need is the desire for the survival of species (Glasser, 1999). Depending on the need to survive, some of the superior living beings want love. Many living beings seek for freedom. Most play games when they are young and it can be seen that they have fun in these games. On the other hand, the need for power is different from other needs. This need is specific to humans. The power humans seek is a need only seen in their kind (Glasser, 2003). Glasser (1999) states that fun is a feature in the genetic structure of sophisticated living beings. There may be many things to do for fun and only laughing can contribute to meeting this need; however, problems in relationships have a negative effect on having fun. As stated by Glasser (1998), "freedom concerns us mainly when we perceive it to be threatened". When individuals perceive themselves under threat, their first concern is to lose their freedom. The more individuals have the freedom to satisfy their needs in a way that does not conflict with the needs of others, the more they can use their creativity (Glasser, 2003). Any behavior that tries to meet one or more of these needs but fails is painful. Mental health problems occur when any of these are not met (Wubbolding, et al, 2004).

According to Wubbolding and Brickell (1999), the most basic source of human motivation is the internal system of human needs. Since the system is internal, it can be controlled neither by external forces nor by past experiences. In this context, it can be said that individuals' needs and accordingly their behaviors are under their own responsibility. Needs, along with individual and specific wants, serve as motivators or sources of all human behavior (Wubbolding et al., 2004). Considering the effects of needs on individuals' behaviors, it can be said that determining the level of five basic needs revealed in the approach will provide important data to understand the behavior of individuals.

Purpose of the Present Study

Testing the basic needs put forward in Choice Theory has attracted many researchers (Türkdoğan & Duru, 2012). It can be said that measurement instruments for different age groups have been developed in various cultures to determine basic needs and the level of meeting these needs. In this context, it can be seen that Basic Needs Survey (Harvey and Retter 1995), Students Need Survey (Burns et al., 2006) and Scale of Filipino Students Need (Elnar, 2015) have been developed for children and adolescents; The Contextual Needs Assessment (Brown and Swenson, 2005) has been developed for university students and Choice Theory Basic Needs Scale (LaFond, 2000) and Basic Needs Inventory (Huffstetler et al., 2004) have been developed for adults. In Turkish culture, based on the Choice Theory, İkinci (2003) has developed Basic Needs Scale for adolescents, Türkdoğan and Duru (2012) have developed Basic Needs Scale for University Students and Eşici (2021) has developed Basic Psychological Needs Scale for individuals in emerging adulthood. On the other hand, no measurement tool has been found measuring the level of meeting basic needs in adults in Turkish culture.

The level of meeting basic needs can affect individuals' physiological and social health. Covid-19 pandemic that started as of February 2020 caused the death of 6.266.324 people worldwide (World Health Organization, 2022). Due to Covid-19 pandemic that affected the whole world, problems occurred in meeting the basic needs (Matias, Dominski, & Marks, 2020; Su, Rao, Li, Caron, D'Arcy, & Meng, 2022; Traoré, Combary, & Zina, 2022). Satisfaction of basic needs, even during extraordinary conditions such as pandemics and epidemics, can guide individuals' behaviors. For this reason, determining to what extent the basic needs of adults are met can be a guide in finding solutions to possible problems that may occur. According to the Ecological System Approach, the individual is at the centre of many systems that surround him/her. These systems are microsystem, mesosystem, exosystem and macrosystem from the closest to the individual to the furthest (Bronfenbrenner, 1979; 2001). These systems are in mutual interaction, and they have the potential to affect the individual positively or negatively (Bronfenbrenner, 1979). Microsystem and exosystem are important for student development. Microsystem includes parents, teachers, school administrators and school personnel, while exosystem includes neighbors, relatives, and friends of the parent (Bronfenbrenner, 1976). These are adults who can influence the development of children and adolescents. Therefore, determining the level of meeting the basic needs of adults and further research on this subject may allow obtaining scientific findings to support the development of students. In this context, the aim of the study is to develop a Basic Needs Scale based on Choice Theory, specific to Turkish culture and for adults, and to test the validity and reliability of the scale.

METHOD

Participants

The participants were selected via convenience sampling method. A total of 575 (383 female, 192 male) individuals between the ages of 18 and 65 ($\bar{X}$=31.14; *SD*=9.81) participated in the study which was conducted to test the psychometric characteristics of BNSBCT. It was found that 19.2% of the participants had postgraduate degree, 53.6% had bachelor's degree, 13.6% were high school graduates, and 7.1% were middle school or primary school graduates. 40.6% were single and 59.4% were married.

Within the scope of the study, the scale was applied to 381 (253 female, 128 male, $\overline{X}_{age}$=32,18 SD_{age}=9.97) participants between the ages of 18 and 65 and EFA was performed on these data. The scale was later applied to 194 (130 female, 64 male, $\overline{X}_{age}$=30.78, SD_{age}=8.43) individuals between the ages of 18 and 64 and CFA was performed on these data.

Data Collection Process and Ethical Considerations

The study was conducted with the 45/08 numbered permission as specified in the 12.05.2022 dated and 130478 numbered letter of the Ethics Committee of Sakarya University. Participation was provided on a voluntary basis. The data were collected online via Google Forms. Before applying the scale, the researchers asked the individuals whether they approved to participate in the study and data collection process was continued with those who ticked the "Yes" option. An informed consent form was also presented to the participants.

Instruments

Basic Needs Scale based on Choice Theory (BNSBCT)

A literature review was first conducted to develop BNSBCT. A temporary item pool was created based on the literature review. A team of experts in the field, two professors and two assistant professors in the field of psychology and the field of guidance and psychological counselling evaluated the items in the pool. Fleiss Kappa value was calculated to determine the consistency between the experts' evaluations of the items in the item pool and it was found to be .90. In addition, the views and suggestions of three language experts, one of whom had a master's degree in Turkish Language Teaching and two of whom had a master's degree in Turkish Language and Literature, were received. The pilot form prepared in line with the opinions of experts was applied to 36 adults (21 females, 15 males; $Range_{age}$=18-54, $\overline{X}_{age}$=28.57, SD_{age}=10.23). With the feedback from these individuals, the parts which were difficult to understand were revised and a 42-item trial application form was created. The form has 9 items for need for survival and 9 items for need for love and belonging, 8 items for need for power, 8 items for need for freedom and 8 items for need for fun. It is stated that making units smaller in a measurement process increases sensitivity and this increases the reliability of the measurement tool (Şekercioğlu, 2019). It was also determined that the 7-point rating offers a closer assessment to reality for the property to be measured (Finstad, 2010). Accordingly, 7-point Likert-type answering strategy was preferred instead of 3 or 5 points in order for the BNSBCT to make more sensitive and truthful measurements. During the process of developing a measurement instrument, the researcher should determine whether suitable sample size has been reached, which is a maximum of 250-300 individuals in factor analysis (Heppner, Wampold, & Kivlighan, 2008). While Tinsley and Tinsley (1987) suggested that the number of participants should be 10 times the number of items in the scale, Gorsuch (1990) stated that the number of individuals in the sample should not be fewer than the number of variables in the scale, in other words, the number of items. In line with this information, the measurement instrument prepared was transferred to "Google Forms" and applied online to 381 adults aged 18 and older. BNSBCT was applied to more than 9 times of the number of items in the scale for EFA.

University Students Basic Needs Scale – Short Form (USBNS-SF)

USBNS is a 7-Likert type measurement instrument developed for university students. The scale aims to determine to what extent the needs to be free, to love and belong, to have power, to have fun and to survive are met (Türkdoğan & Duru, 2012). The 19-item short form of the scale was created in 2020

by the researchers who developed the original form. 1150 students attending a university in the Western Anatolia region during the fall semester of 2016-2017 academic year participated in the development process of the short form. As a result of the EFA performed with the data obtained from the participants, it was determined that the scale had a five-factor structure and explained 67.40% of the total variance. Goodness of fit values of the 5-factor structure were examined with CFA. CFA results were as: χ^2/df=3.36, RMSEA=.045, CFI=.96, GFI=.96, AGFI=.94, SRMR=.034. Internal consistency reliability of the factors in USBNS-SF was calculated with Cronbach Alpha coefficient. In this context, it was found that Cronbach Alpha values were *.83 for need for freedom factor, .90 for love and belonging, .81 for power, .80 for fun and .81 for need for survival*. Higher scores from the scale indicate that the needs are met without problems and students have high need satisfaction (Türkdoğan & Duru, 2020). In Turkey, there is no measurement instrument that can determine the basic need level based on Choice Theory for adults. University Students Basic Needs Scale – Short Form was used in the present study to test criterion validity since it measures the five needs specified in the Choice Theory and since the present study included university students.

FINDINGS

Face validity

The aim of face validity is to evaluate the clarity and comprehensibility of the items in the measurement instrument. It is a type of validity which is calculated based on the views of individuals in the target group (Holden, 2010; Nevo, 1985) and it is calculated by taking the views of at least 10 participants (Yusoff, 2019). In this study, the scale was applied to 36 individuals to find out the face validity of BNSBCT and the individuals were asked to evaluate the clarity and comprehensibility of the items in the instrument between 1 (Not clear and comprehensible at all) and 4 (Totally clear and comprehensible). Scale-Face Validity Index/Average (S-FVI/Ave) value of the scale was found to be .91. The values obtained show that the scales have a sufficient level of face validity (Polit, Beck & Owen; 2007).

Exploratory Factor Analysis

Kurtosis and Skewness coefficients were calculated to find out whether the data obtained from applying BNSBCT to 381 individuals were normally distributed. Büyüköztürk (2002) stated that the value of the solution will decrease when normality is not met in Likert scales. He also stated that even if all linear combinations of the variables cannot be tested, normality of single variables can be evaluated with Skewness and Kurtosis coefficients. In this study, it was found that the Kurtosis and Skewness values of some items of the scale were not within the range of +1.5 and -1.5 suggested by Tabachnick and Fidell (2013). Mahalanobis values were calculated in order not to include outliers in the analysis (Karaman, 2015) and outliers were excluded. After excluding the outliers, it was found that the calculated Skewness coefficient of the remaining 369 data was -.64, (se=.13), while the Kurtosis coefficient was .39, (se=.25). Therefore, it was evaluated that the data met the assumptions of normal distribution (Tabachnick & Fidell, 2013), and EFA was started. Before EFA, Bartlett Sphericity test results were examined to find out whether the data set was suitable for analysis. In addition, in order to determine the adequacy of the number of individuals in the sample, Kaiser-Meyer-Olkin (KMO) index (Dziuban & Shirkey, 1974) was calculated and examined. The analyses conducted showed that the Bartlett Sphericity Test result (Approx. Chi-Square=4262.34; df=300) was significant ($p < .05$) and

the KMO value was .92. These results show that the data come from multiple distribution and the sample size is sufficient for EFA (Field, 2009). Suitability of the data for factor analysis can also be determined by calculating the correlation between the items (Tabachnick & Fidell, 2013). Can (2018) stated that factor analysis can be performed when the correlation coefficients between the items are .33 and above. In this context, the correlation between the scale items was calculated and EFA was started in line with the results obtained. EFA was conducted in line with these results. According to Büyüköztürk (2021), initially it is considered that there are as many factors as the number of items in the measurement instrument. For example, the trial form of BNSBCT has 42 items and therefore, it can be said that there were 42 factors initially. The aim of factor analysis is to reveal fewer factors that represent items with high correlation. There are different criteria about the number of factors (Karagöz, 2016; Tavşancıl, 2002). In this study, Principal Axis Factors (Costello & Osborne, 2005; Şencan & Fidan, 2020) method, which is widely used because it is not based on multivariate normality assumption and which is strong enough in factor extraction, was preferred. The explained variance values that emerged as a result of the analysis are presented in Table 1.

Table 1

BNSBCT Total Variance Values Explained

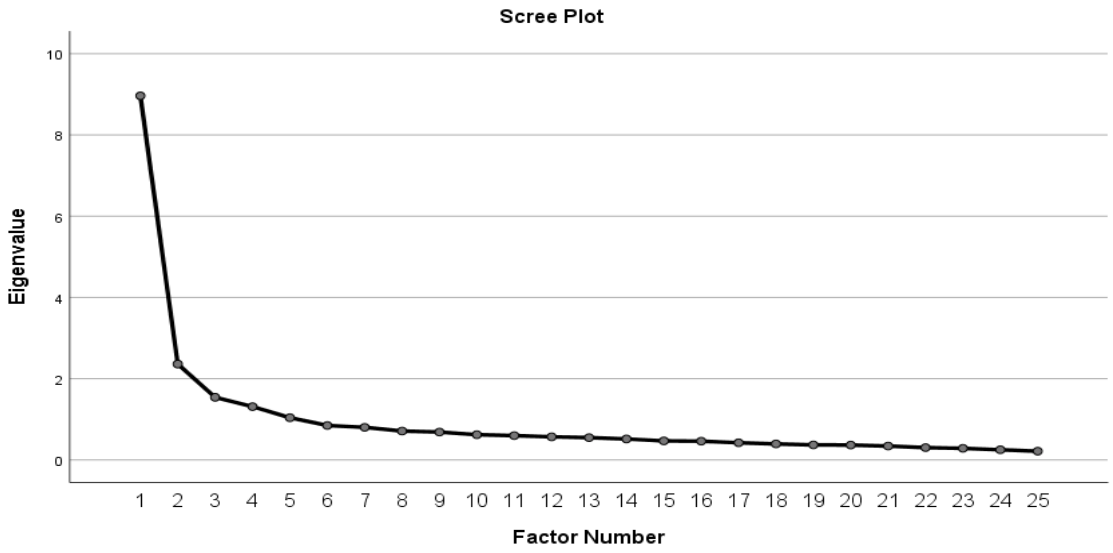
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.964	35.855	35.855	8.491	33.962	33.962	7.026
2	2.360	9.440	45.295	1.915	7.658	41.620	5.778
3	1.541	6.166	51.461	1.065	4.261	45.882	3.647
4	1.312	5.247	56.708	.837	3.349	49.230	6.577
5	1.039	4.157	60.865	.532	2.128	51.359	6.014
6	.849	3.394	64.259				
7	.803	3.211	67.470				
8	.710	2.841	70.312				
9	.687	2.747	73.058				
10	.621	2.486	75.544				
11	.598	2.394	77.938				
12	.569	2.275	80.213				
13	.549	2.195	82.407				
14	.516	2.065	84.472				
15	.469	1.876	86.348				
16	.462	1.846	88.194				
17	.423	1.694	89.888				
18	.394	1.578	91.466				
19	.370	1.481	92.947				
20	.366	1.464	94.411				
21	.342	1.368	95.779				
22	.304	1.216	96.995				
23	.286	1.144	98.139				
24	.250	.999	99.138				
25	.216	.862	100.000				

The first of the methods used in deciding the number of factors in the measurement tool is to take into consideration the factors with an eigenvalue of at least 1 (Özdamar, 2002; Thompson, 2008). When Table 1 is examined, it can be seen that there are five factors in BNSBCT with an eigenvalue above 1. It can be said that this 5-factor structure designated to measure the five basic needs is suitable for the theoretical basis of BNSBCT. Total variance explained by the five factors is 60.64.

The factor structure of BNSBCT that emerged as a result of EFA can be seen more clearly in the scree plot. While interpreting the plot, the factors up to the point where the vertical line becomes horizontal are included in the solution (Karagöz, 2016). Scree plot of the scale is shown in Figure 1.

Figure 1

Scree Plot of BNSBCT



When Figure 1 is examined, it can be said that the vertical line becomes horizontal after five factors. When the scree plot, rotated component matrix and total variance explained in EFA were examined, it was found that 25 items of BNSBCT were gathered under five factors. The correlations between the Pearson product-moment correlation coefficient and the five factors of BNSBCT were calculated and the results are presented in Table 2.

Table 2

Correlations between the factors of BNSBCT

Factors	1	2	3	4	5
Power					
Fun	.56**				
Survival	.35**	.33**			
Love & Belonging	.59**	.55**	.40**		

Freedom	.56**	.50**	.36**	.57**

N=369, **p< .01

As can be seen in Table 2, there is a positive and significant (p<.01) correlation between the factors of BNSBCT. While there is a moderate level of correlation between love and belonging and power, there is a poor correlation between survival and fun. Tabachnick and Fidell (2013) state that rotation is required to interpret the factors. The authors also suggest that oblique rotation method should be preferred in cases where the correlation values between factors are 0.32 and above. As can be seen in Table 2, there is a correlation higher than 0.32 between the subscales of BNSBCT. Büyüköztürk (2002) recommends "Promax", one of the oblique techniques, because it is more applicable in the future compared to other techniques. For this reason, “Promax” was used in factor rotation. Tabachnick and Fidell (2013) advocate that the factor load of an item should be higher that 0.32. On the other hand, Stevens (2002) states that when the same item has loads in more than one factor, the loading difference between the two factors should not exceed 0.1. Another point that should be considered here is that a stable factor should not contain less than three items (MacCallum et al.,1999). In the EFA of BNSBCT, factor load of an item was found to be 0.40. The calculated Pattern Matrix results are shown in Table 3.

Table 3

Pattern Matrix of BNSBCT

	Subscales				
Items	Power	Fun	Survival	Love & Belonging	Power
I39	.887				
I41	.788				
I30	.736				
I26	.656				
I28	.597				
I35	.565				
I8	.538				
I32		.849			
I12		.746			
I42		.656			
I40		.645			
I23		.521			
I18		.401			
I9			.832		
I3			.787		
I17			.687		
I7			.519		
I24				.871	
I14				.707	
I33				.634	
I27				.620	
I21				.531	
I16					.777

I1	.728
I22	.467

When Table 3 is examined, it can be said that BNSBCT includes 25 items and five factors. As can be seen in the Table, need for "power" consists of seven items, "fun" consists of six items, "survival" consists of four items, "love and belonging" consists of five items and "freedom" consists of three items.

Confirmatory Factor Analysis

It was decided to conduct CFA to evaluate the EFA results of the scale and the 25-item scale was applied to 194 individuals. Before moving on to CFA, Skewness and Kurtosis values of the data obtained were examined. Since it was found that the specified values were not in the range of +1.5 and -1.5 recommended by Tabachnick and Fidell (2013), Mahalanobis values (Karaman, 2015) were calculated and the outliers were not included in the analysis. After the outliers were excluded, it was found that Skewness coefficient was -.70 (se=.18) and Kurtosis coefficient was .52, (se=.36). Based on this result, it was accepted that the data met the normal distribution assumptions (Tabachnick and Fidell, 2013) and CFA was performed via SPSS AMOS 23.00 (IBM, 2015) with the data of 186 participants. It can be said that Chi-square statistics (χ^2/df) and RMSEA, CFI, GFI values are mostly used to test the model fit in CFA (Karagöz, 2016). Kelloway (1998) states that a Chi-square (Chi-Square Goodness) value of <3 indicates acceptable fit, while a Chi-square value of <2 indicates perfect fit. On the other hand, Byrne (2016) advocates that Root Mean Square Error of Approximation (RMSEA) should be < .080, while Comparative Fit Index (CFI) should be > .90. Jöreskog and Sörbom (1993) stated that a model can be considered as acceptable when Goodness of Fit Index (GFI) is ≥.85. The present study also calculated SRMR (Gürbüz, 2021) which tests the residual covariances between the covariance matrices of the population and sample and the parsimony fit indices of PGFI and PNFI values. Values of SRMR< .08; PGFI≥ .50 and PNFI≥ .60 are considered as the indicator of acceptable fit (Byrne, 2016; Gürbüz, 2021).

When CFA was applied to the five factor and 25-item structure of the model obtained as a result of EFA, fit indices of the initial model were found to be χ^2/df = 1.76; RMSEA=.06; SRMR=.67 CFI=.89; TLI=.88; IFI=.90; GFI=.84; PNFI=.70 and PGFI=.69. While some authors consider these values within acceptable limits, some interpret that they are outside acceptable limits (Byrne, 2016; Çokluk et al., 2021; Gürbüz, 2021). Karagöz (2016) stated that required modifications can be made by examining modification indices and the model can show better fit with this method. Modifications made here should be suitable for theoretical structure. In this context, modification indices of BNSBCT were examined and a covariance was created between I24 and I14 in the love and belonging subscale and the analysis was repeated; however, it was found that some fit values were still not acceptable; therefore, modification indices were examined again and a covariance was created between I1 and I16 in the freedom subscale and the analysis was repeated; the goodness of fit values found in the analysis are shown in Table 4.

Table 4

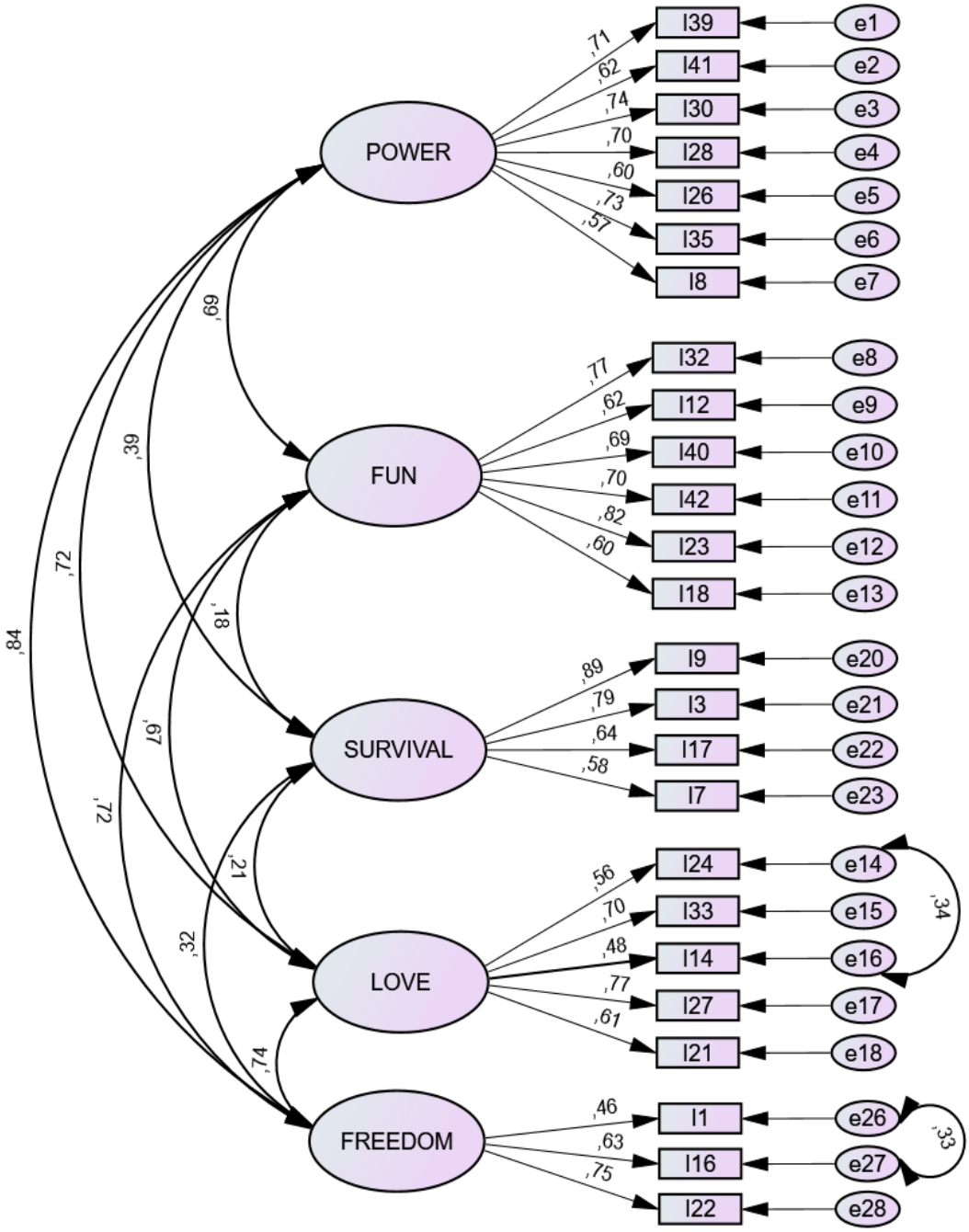
Confirmatory Factor Analysis Results of BNSBCT

χ^2	p	χ^2/df	RMSEA	SRMR	CFI	IFI	TLI	GFI	PNFI	PGFI
431.03	.00	1.64	.06	.64	.91	.91	.90	.85	.71	.69

When Table 4 is examined, it can be seen that BNSBCT has an acceptable fit in a five-factor and 25-item model. This model found with CFA is shown in Figure 2.

Figure 2

Confirmatory Factor Analysis Model of BNSBCT



As can be seen in Figure 2, five-factor and 25-item construct of BNSBCT was confirmed. According to the "Assessment of Normality" results revealed in the CFA and presented in Appendix-1, the Kurtosis

and Skewness values of the majority of the items in the BNSBCT are in the range of +1 to -1. On the other hand, since the Kurtosis and Skewness coefficients of the five items of the scale (I1, I16, I17, I14 and I24) are between the critical values of +3 and -3, it can be said that the multiple normality index is on the borderline (Gürbüz, 2021). Table 5 presents the item contents of the scale, the distribution of the items to the subscales, and the standard factor loads resulting from the CFA.

Table 5

Factor Loads for the Items of BNSBCT

Number	Items	Subscale	Factor Load
I39	I am considered as a successful person.	Power	.710
I41	I shape others' lives with my suggestions.	Power	.618
I30	I impress those around me with the things I do.	Power	.737
I26	I am a person consulted on many issues.	Power	.598
I28	After I accomplish something, I look for other accomplishments.	Power	.704
I35	I know that my position is good in my environment.	Power	.730
I8	People know me in the environments I enter.	Power	.573
I32	Regardless of how busy I am, I take time to have fun.	Fun	.773
I12	I play fun games.	Fun	.618
I42	I take care to spend time in environments where I can laugh and have fun.	Fun	.700
I40	I make time for my hobbies.	Fun	.695
I23	I do activities I can enjoy.	Fun	.816
I18	I get fun out of the situations I am in.	Fun	.603
I9	I try to consume healthy food.	Survival	.890
I3	I take care to have a balanced diet.	Survival	.788
I17	I stay away from habits that can endanger my health.	Survival	.642
I7	I take care of my sleep pattern.	Survival	.585
I24	I establish friendly relationships with my family.	Love	.561
I14	I feel like my family misses me when I am not with them.	Love	.495
I33	I can take the support of those around me about important issues.	Love	.698
I27	I feel like people around me don't like me.	Love	.768
I21	I know that there are enough people around me that I can share with.	Love	.607
I16	I can make my own choices about what is right and wrong for me.	Freedom	.631
I1	I can decide according to my own choices.	Freedom	.459
I22	I can choose who to work with in cooperative work to be done.	Freedom	.751

As can be seen in Table 5, the factor loads of the items in the power subscale of BNSBCT ranged from .573 to .737; the load of the items in the fun subscale is between .603 and .816; the factor load of the items in the survival subscale varies between .585 and .890; the factor load of the items in the subscale of love and belonging was between .495 and .768 and the factor load of the items in the freedom subscale varies between .489 and .792.

Convergent validity

In addition to construct validity, criterion dependent validity of the scale was also examined. In this context, convergent validity was performed. Türkdoğan and Duru's (2020) University Students Basic Needs Scale – Short Form (USBNS-SF) was used for convergent validity of BNSBCT. Both measurement instruments were applied successively to 64 adults aged 18 and older. Skewness and Kurtosis coefficients of the data obtained from the application of BNSBCT and USBNS-SF were calculated. Skewness coefficient of the data obtained from BNSBCT was found to be -.93 (se=.30) and the Kurtosis coefficient was found to be .76 (se=.59). Skewness coefficient of the data obtained from USBNS-SF was found to be -.44 (se=.30) and the Kurtosis coefficient was found to be .09 (se=.59). Based on these results, it was considered that the data met normality distribution assumption (Tabachnick and Fidell, 2013), the correlation between the results of both scales was calculated with Pearson's Product-Moment correlation coefficient and was found to be .71. Convergent validity of BNSBCT was examined by calculating Combined Reliability (CR) and Average Variance Extracted (AVE) values. According to the literature, for convergent validity, CR values should be higher than AVE value, AVE should be ≥.50 and CR should be ≥.60 (Bagozzi & Yi, 1988; Fornell & Larcker, 1981; Yaşlıoğlu, 2017). Table 6 shows the AVE and CR values of BNSBCT subscales.

Table 6

AVE and CR Values

Subscales	AVE (≥.50)	CR (≥.60)
Power	.45	.85
Fun	.50	.82
Survival	.54	.82
Love & Belonging	.40	.76
Freedom	.41	.56

As can be seen in Table 6, AVE and CR values of fun and survival subscales of the BNSBCT are above the theoretically specified limits. On the other hand, AVE value of the power and love and belonging subscales are below .50, while CR values are above theoretically specified .60. Both AVE and CR value of the freedom subscale is below the theoretically specified limits. In addition, CR values calculated for each of the subscales is higher than the AVE value.

Reliability of BNSBCT

BNSBCT was applied to 73 participants twice, with 21 days in-between. Skewness and Kurtosis coefficients of the data obtained from the applications were calculated. Skewness coefficient of the data obtained from the first application was found to be -.80 (se=.28), while Kurtosis coefficient was found to be .69 (se=.56). Skewness coefficient of the data obtained from the second application was found to be -.81 (se=.28), while Kurtosis coefficient was found to be. 33 (se=.56). Based on these results, it was accepted that the data met the normality distribution assumptions (Tabachnick and Fidell, 2013) and the correlation between the first and second application was calculated with Pearson Moments Correlation coefficient. The correlation coefficient calculated was. 83. Internal consistency reliability of the overall scale was calculated with McDonald's Omega coefficient (ω) and was found to

be .92. Internal consistency of BNSBCT subscales was calculated with Cronbach Alpha coefficient. In this context, Cronbach Alpha coefficient was found to be .77 for survival subscale, .82 for love and belonging subscale, .81 for fun subscale, .85 for power subscale and .66 for freedom subscale. Hinton, McMurray & Brownlow (2014) stated that a Cronbach Alpha coefficient between .50 and .70 could be interpreted as moderate reliability, a Cronbach Alpha coefficient between .70 and .90 could be interpreted as high reliability, and a Cronbach Alpha coefficient of .90 and higher could be interpreted as perfect reliability. In this context, it can be stated that the subscales of the BNSBCT have medium and high level of reliability. It can be stated that the overall scale has perfect internal consistency. Sencan (2005) stated that when correlation coefficient obtained with test retest reliability is between .80 and .100, it should be interpreted as "high" correlation. In the light of this information, it can be said that BNSBCT is a highly reliable scale.

Scoring and Interpretation of BNSBCT

In scoring BNSBCT, options ranging between 1 and 7 are taken into account for each item. One item of the scale is reverse scored. Positiveness of the response given to items in BNSBCT increases from 1 to 7. BNSBCT does not give a total score. An evaluation is made with the scores obtained from the subscales. Higher scores from each subscale show that the satisfaction for the need measured by that subscale increases.

RESULTS, DISCUSSIONS AND SUGGESTIONS

The aim of this study is to develop a measurement instrument for adults aged 18 and older to find out the satisfaction levels for five basic needs put forward in Choice Theory and to test the validity and reliability of the scale. For this purpose, face validity of the developed BNSBCT was first examined and the index calculated was found to be .91. This value shows that face validity of the scale is sufficient (Polit et al., 2007). Next, EFA was conducted to evaluate the factor construct of the measured structure. As a result of EFA, scale items were found to show a construct suitable for the five basic needs put forward by Glasser (1998). It was found that BNSBCT had a five-factor and 25-item structure. CFA was conducted for the five-factor structure obtained with EFA. As a result of CFA, it was found that the goodness of fit values obtained were within acceptable limits (Jöreskog & Sörbom, 1993; Hu & Bentler, 1999; Kline, 2011; Marsh, Balla, & McDonald, 1988). Convergent validity of BNSBCT was found to be as .70. Büyüköztürk (2021) stated that a correlation of ≥.30 is the indicator of the test's validity. In this context, it can be said that BNSBCT has high convergent validity. Cronbach Alpha coefficient of BNSBCT is .92, while test retest correlation coefficient is .83. Reliability values obtained with two different methods showed that the scale is a reliable measurement instrument (Nunnully & Bernstein, 1994). Psychometric properties of BNSBCT showed that this measurement instrument is a valid and reliable scale that can be used to find out the satisfaction levels of basic needs of individuals aged 18 and older. BNSBCT can be used to find out the satisfaction levels of needs for power, freedom, survival, fun, love and belonging in adults aged 18 and older.

Limitations and Recommendations

The results of the study should be evaluated by considering some limitations. The fact that there were fewer male participants in the study is one of the limitations of the study. According to educational statistics, 58% of the individuals between the ages of 25 and 64 have a primary education and/or lower degree. In the specified age range, the rate of undergraduates is 13.4% and the rate of graduate

students is 2% in Turkey (Organisation for Economic Co-Operation and Development [OECD], 2021). In other words, the rate of individuals with undergraduate and graduate degree are lower than the other educational levels. However, the fact that there was a higher rate of undergraduate and graduate students in the present study and the fact that the sample did not represent the individuals in lower educational level sufficiently is another limitation. Future research can be repeated in a sample representing individuals who graduated from secondary education or lower educational levels. The fact that AVE values of Power, Fun and Love & Belonging subscales and both AVE and CR values of the freedom subscale were not sufficient (Bagozzi & Yi, 1988; Fornell & Larcker, 1981) can be a limitation in terms of convergent validity. Finally, the research data were collected on online platform. The fact that the data were not collected from adults who were not on digital platform is also among the limitations of the study. Despite the aforementioned limitations, the results of the present study show that BNSBCT is a valid and reliable instrument to determine the basic needs of adult individuals. In this context, BNSBCT can be used to determine the level of meeting basic needs by professionals whose jobs are to help people and by researchers.

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APPENDIX-1

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
I22	1,000	7,000	-,899	-5,004	,885	2,464
I1	1,000	7,000	-1,353	-7,532	2,316	6,447
I16	2,000	7,000	-1,069	-5,954	,888	2,472
I7	1,000	7,000	-,354	-1,969	-,830	-2,311
I17	1,000	7,000	-1,098	-6,114	,604	1,680
I3	1,000	7,000	-,529	-2,945	-,032	-,089
I9	1,000	7,000	-,531	-2,959	-,045	-,124
I21	2,000	7,000	-,739	-4,117	-,098	-,272
I27	2,000	7,000	-,923	-5,137	,743	2,070
I33	3,000	7,000	-,631	-3,511	,041	,113
I14	1,000	7,000	-1,193	-6,641	1,074	2,990
I24	1,000	7,000	-1,536	-8,552	2,554	7,109
I18	1,000	7,000	-,476	-2,648	-,388	-1,081
I23	3,000	7,000	-,585	-3,259	-,382	-1,063
I40	2,000	7,000	-,213	-1,186	-,638	-1,777
I42	2,000	7,000	-,868	-4,831	,280	,779
I12	1,000	7,000	-,375	-2,087	-,737	-2,052
I32	2,000	7,000	-,139	-,776	-,605	-1,683
I8	1,000	7,000	-,241	-1,344	-,681	-1,895
I35	3,000	7,000	-,436	-2,428	-,188	-,524
I28	1,000	7,000	-,913	-5,083	,921	2,565
I26	1,000	7,000	-,646	-3,599	,575	1,600
I30	2,000	7,000	-,320	-1,782	-,635	-1,769
I41	1,000	7,000	-,628	-3,499	,573	1,595
I39	3,000	7,000	-,364	-2,028	-,616	-1,714
Multivariate					137,392	25,499

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The authors contributed equally for writing the article, conceptualization of the article, data collection, analysis and discussion.

Conflict of Interest

No potential conflict of interest was declared by the author.

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Ethical Approval and Participant Consent

Ethics committee permission for this study was obtained from Sakarya University Ethics Committee with the decision dated 11.05.2022 and numbered 45/08.

Plagiarism Statement

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Availability of Data and Materials

Not applicable.

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