

Examination of Psychometric Properties of the Need for Closure Scale-Short Form among Turkish College Students

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ABSTRACT

Introduction: The need for cognitive closure (NFC), defined as the desire for "an answer on a given topic, any answer ... compared to confusion and ambiguity," is a topic that has become increasingly important in behavioral neuroscience. The present study aimed to assess the applicability of a measure of need for cognitive closure, the "Need for Closure Scale-Short Form" (NFC-SF), for Turkish college students.

Methods: Data from a total of 219 participants aged 19–29 years (male n=61, 27.9%; female n=158, 72.1%; Meanage=23.6 years, SD=3.06 years) were used to conduct validity and reliability analyses. Of the participants, 138 (63.0%; Meanage=22.62 years; SD=2.45 years) were university students, and the remainder had graduated from university (n=81; 37%; Meanage=24.16 years; SD=3.24 years).

Results: Language validity ($r=0.94$, $p=0.00$), confirmatory factor analysis results ($\chi^2/Df=4.07$, $GFI=0.90$, $IFI=0.89$, $CFI=0.90$, $AGFI=0.88$, $NNFI=0.90$, and $RMSEA=0.011$), item analysis, and convergent validity results indicated that a single factor solution with 15 items met the criteria for adequacy of fit among Turkish young people. The internal consistency ($r=0.74$) revealed a moderate to acceptable reliability.

Conclusion: The results demonstrated that the NFC-SF can be used in studies that evaluate the need for closure among Turkish young people.

Keywords: Need for closure, validity, reliability

INTRODUCTION

The need for cognitive closure (NFC) has recently gained importance in behavioral neuroscience. In recent years, the impact of motivation in social psychology and personality psychology on cognition has begun to be examined, and the need for cognitive closure was explained by a detailed theory (1). The Theory of Daily Scientificism (Epistemology) put forward by Kruglanski and Ajzen (2) examines how individuals constitute their knowledge in everyday life, how they change this knowledge, and in what ways they change it from a cognitive-motivational point of view. Epistemological beliefs are subjective beliefs about what information is available about individuals in general and about how knowledge and learning are carried out. These beliefs influence the ways in which individuals approach and learn about the subject and in the future, learning "how" (3). Epistemological beliefs seem to have a decisive influence on the teaching-learning approaches that individuals prefer, the learning strategies they use, and the way they perceive and interpret certain learning experiences and various knowledge (4). According to this theory, the individual has an intrinsic-cognitive motivation to search for knowledge in everyday life and to search for the most appropriate knowledge for solving problems (2,5,6). In this process, the individual has to come up with a problem definition for the solution of the problem, and while making this definition they create some hypotheses and test these hypotheses. As a result, some hypotheses become stronger as some hypotheses are eliminated. This hypothesis-building and testing process is influenced by three factors– the need to achieve a definitive result, concern for invalidity of consequence, and the need for cognitive closure (7). The need for cognitive closure is shaped by the situation and at the same time affects the process of acquiring knowledge (2,5).

The concept of need for closure was put forward by Kruglanski (7) to develop a theoretical framework of cognitive-motivational aspects of decision-making. The need for cognitive closure is seen as a process that affects the responses of individuals to their social environment (8). The need for cognitive closure is the need for the individual to reach a certain knowledge rather than confusion and ambiguity in a particular context (1,6,8,9). Kruglanski (7) defines the need for closure as "an answer on a subject, any answer when encountered confusion and uncertainty" (page 337). In other words, the need for cognitive closure is the simplification of complex knowledge and the motivation to avoid uncertainty when the individual meets a problem about "knowledge" (10). The word "need" in the concept is not a lack, but rather an attribution to an inner motivation (1,7,8). This motivation also refers to the cognitive differences of the individual in the information-processing process (7,8). According to Kruglanski (7), individuals prefer to avoid uncertainty in a situation, to complete the state of mental uncertainty (cognitive completeness/closure) and to focus on precise, fixed, and predictable situations. These choices increase the individual's need for cognitive closure (8).



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When the individuals meet with a "missing" situation, there are two options—cognitive closure or avoidance. In other words, while the cognitive complement process requires strong cognitive closure at one end, the other end needs to avoid cognitive closure (1). The decisions of individuals to continue or avoid cognitive closure vary according to the benefit-loss situation of their choice (1,8). The advantages of closure include the ability to act immediately in a situation and the possibility of gaining the benefits associated with that action. The disadvantages of closure include the expense of cognitive energy, the risk of making judicial mistakes, and the reduction of options and freedom after the decision is made (1,7). For this reason, the need for closure of an individual might vary according to time and situation.

There are two intertwined trends that determine the need for closure. The first one, urgency tendency, means "seizing" the closure as soon as possible and the tendency of the individual to arrive at the most frequent and fastest basic judgments. The individual is uncomfortable with the postponement of the cognitive closure process. The second is the tendency to permanence, which is used for maintenance of closure, or "freezing." The individual is a proponent of preserving their own knowledge and the knowledge they gained in a similar situation against new and contradictory knowledge (5,8,11). Both tendencies help to avoid the inconvenient lack of closure, including quickly ending the situation and avoiding repeating it. While the tendency to urgency expedites the lack of cognitive closure, the continuity tendency involves using the old information that has been obtained for use in similar situations. These two tendencies are treated as a fixed but subjective realization of an uncertain situation and the manifestation of beliefs (5,11). The need for closure might instantaneously increase with situational changes (e.g., noise or time pressure), but people also vary greatly in terms of "spiritual closure." Individuals with a high need for spiritual closure avoid confusion and irregularity because they prefer order and complement in their lives. At the same time, they prefer predictability with a desire for stable and robust knowledge that is reliable in all cases and unchanged from expectations. Individuals with a high need for closure also want immediate access to rapid decision-making that reflects their need for stability. They also find uncertainty to be uncomfortable by considering situations where there is lack of closure as repellent. Finally, they are conservatives because they are reluctant to be influenced by alternative thinking or inconsistent evidence (5).

In Uncertainty-Identity Theory, it is expressed that individuals with a high need for closure tend to simplify and regulate social relations in order to reduce differences and ambiguities in their environment, to constantly need continuous rules, and to approach their surroundings with a prejudice involving these strict rules (12,13). In the context of Uncertainty-Identity Theory, the need for closure is reduced when individuals are members of a group and feel belonging to the group (14). Thus group identification reduces individual uncertainty and tells the individual what they should think, feel, and do (1). Several studies that examine the relationship between ambiguity and identity in the literature show that the sense of identity is strengthened as uncertainty disappears (11,15,16,17,18). Uncertainty-Identity Theory also suggests that uncertainty is contextually influenced (18). For example, people are worried when they want to underline the words or phrases when they feel uncertain about their place or future in the world while they are reading a statement or a newspaper (11).

In addition, it is important to have the ability to make effective decisions in order to overcome the problems of the individuals. Decision-making is defined as a complex set of steps in which the individual chooses, evaluates, and enforces one of these alternatives, and this is directly related to the need for cognitive closure (19). According to Bar-Tal (13), decision-making can be defined as an orientation to eliminate the distress that is experienced

when there is more than one way to lead to a result that is thought to meet a need. Multi-choice decisions make it more difficult for individuals. At the same time, this complexity affects the individual's decision-making negatively (16). It is a cognitive and complex process in which the person is directed to one of the many options. These cognitive processes need to be processed to make effective and healthy decisions. In addition to individual differences, different values of culture, social characteristics, and attitudes also influence the need for decision-making and closure (6).

Individual differences are important, although the need for closure varies depending on the situation. In the literature, social-cognition researchers found that certain conditions for the rapid reduction of uncertainty (the need for cognitive closure) are a source of motivation for knowledge (1). The need for closure is influenced by culture. In this context, some studies have shown that the high need for closure among North Americans is related to individualistic characteristics, while in the Chinese it is related to collectivism (20).

Very similar to the Uncertainty-Identity Theory, literature on the need for closure also associates uncertainty with intra-group prejudice and the level of identification. According to Webster and Kruglanski (1), the need for closure can be described as "a desire to give a clear and specific response to a question rather than ambiguity, confusion or irregularity." The need for completion is theoretically continuous and focuses on the diagnostic knowledge and stereotypical judgment rather than the prototype to trigger decreased processing of knowledge and increasing judicial confidence, as well as increasing identification (1). In addition, the need for closure is associated with time pressure, physical discomfort, or situations in which a clear decision is needed and with many psychosocial variables (21). For example, it was found that individuals with low need for closure had flexible thinking, took longer to decide, and had greater tolerance for ambiguity (8,22). In addition, when looking at the literature, the need for closure might be said to be associated with many characteristics such as information processing, making possible hypotheses, the tendency to reject different views, values, enculturation, personality traits, and political choices (8,9,18,22,23,24,25).

It appears in the literature that a measuring tool was developed in order to measure the need for closure. Webster and Kruglanski (1) developed a five-factor, 42-item scale that measures the need for closure. Roets and Van Hiel (5) developed the short form of this scale. The scale, which measures the need for closure, consists of 15 items and one dimension. The items are marked on a 6-point Likert assessment scale, ranked from "totally agree" to "never agree." Possible scores range from 1 to 90. There is only one-factor in the scale, and as a result of the factor analysis carried out with the dataset obtained from 1,584 participants (36% male, 64% female, mean age 34.04 years, SD 15.62 years) with an age range of 16–86 years, the scale explains 36.7% of the total variance. According to confirmatory factor analysis (CFA) of the 15 items ($\chi^2_{(75)}=446.06$, SRMR=0.038, RMSEA=0.058, CFI=0.98), the factor structure of the scale was verified. The Cronbach's alpha for internal consistency of the scale was 0.88. The test-retest reliability of the scale was 0.79 as a result of the test-retest reliability study using 93 participants with a one-month interval. Increasing scores on the scale are interpreted as an increase in the need for closure. Examples of items belonging to the scale are "I do not like uncertain situations," "I enjoy a clear and structured way of life," and "I am uncomfortable when I do not understand the cause of an incident." This scale is currently available only in the Dutch version (5).

Within the scope of the available literature, it can be stated that there is no tool developed to measure the need for closure in Turkey. However,

er, the 42-item Need for Cognitive Closure Scale appears to be adapted to Turkish culture (26). CFA, Cronbach's alpha reliability coefficient, and Pearson product-moment correlation coefficients were calculated on the dataset obtained from 721 university students. The validity and reliability of the scale were found to be sufficient. While the internal consistency coefficients of the subscales of the scale ranged from 0.60 to 0.78, the test-retest coefficients ranged from 0.74 to 0.92. In the study, it was found that the Turkish form of the scale is valid and reliable. However, when the characteristics of the measuring tool are taken into consideration, it is necessary that a measuring tool should be useful as well as being valid and reliable (27). For example, Burisch (27) notes that short scales do not only provide for time savings, but also protect the participant from boredom and extreme fatigue, and also suggest that there is no individual for whom the desired correct responses can be obtained if the scale is too long. The usability dimension of the measurement tool includes such features as economy, application time, ease of application, ease of scoring, and ease of interpretation of scores. In this context, the shortness of the NFC-SF makes it more useful.

According to Roets and Van Hiel (5), because the NFC-SF is short and understandable, it is more advantageous than measuring the need to closure according to other scales. Adapting the scale to Turkish conditions can provide a short and understandable scale that can be used in cognitive psychology studies, as well as contribute to the literature related to the need for cognitive closure. In this context, this study aimed to adapt the NFC-SF to Turkish conditions.

METHODS

This research is a descriptive study questioning the current situation. The data were obtained from individuals of different ages, and a cross-sectional research method was used. In the validity study, language validation was followed by CFA. A criteria-based validity study was performed on another dataset. Item analysis was then carried out. For the reliability study, the internal consistency coefficient was calculated and test-retest reliability was measured.

Participants

The study population consisted of a total of 219 participants, all of whom are selected with a purposive sampling method from the students who attend universities in Ankara. The data collection tools used in the study was applied to 250 participants. Prior to data analysis, the responses of the participants to the data collection tools were examined. As a result of this examination, a total of 31 persons who left most of the scale items blank (at least 5%) or who had center-shift errors were excluded from the dataset. As a result, the analyses were performed on 219 participants (158 female (72.1%) and 61 male (27.9%)) between the ages of 19 and 29 years. The participants in the study had a mean age of 23.6 years and a standard deviation of 3.06 years. While 138 (63.0%) of the participants were university students, 81 (37.0%) were university graduates. The average age of university students was 22.62 years (SD=2.45 years), and the average age of university graduates was 24.16 years (SD=3.24 years). While 158 (72.1%) of the participants were unemployed, 61 (27.9%) were employed. It was reported that 187 (85.4%) of the participants were single, 30 (13.7%) were married, and 2 (0.9%) were divorced.

Data Collection Tools

Personal information form: Information on the demographic characteristics of the participants, such as gender, education status, and age, was obtained through a personal information form.

Need for Closure Scale-Short Form (NFC-SF): Developed by Roets and Van Hiel (5), this scale measures the need for closure and consists of 15 items and one dimension. The items are marked on a 6-point Likert scale from "totally agree" (6 points) to "never agree" (1 point). Total scores range from 1 to 90, and higher scores are interpreted as greater need for closure. As a result of the factor analysis, the scale explains 36.7% of the variance. The factor structure of the scale was verified according to the CFA results obtained from 15 items. The Cronbach's alpha value for the internal consistency of the scale was 0.88.

Multi-Measure Agentic Personality Scale (MAPS): The "Short Form of Multi-Measure Agentic Personality Scale" developed by Cote (28), which measures the level of agentic personality, was adapted by Atak et al. (29). This scale consists of 5 items measuring self-esteem, 5 items measuring life purpose, 5 items measuring internal audit focus, and 5 items measuring self-efficacy for a total of 20 items and four sub-factors. In the Turkish version of the scale, explanatory factor analysis revealed 15 items and four sub-factors explaining 57.43% of the variance. As a result of CFA, path coefficients ranged from .41 to .77, and high goodness-of-fit values (AGFI=0.92, GFI=0.94, RMSEA=0.052, P=00) were obtained. In the reliability study, Cronbach's alpha was 0.76 for self-esteem, 0.72 for life purpose, 0.74 for internal audit focus, 0.72 for self-efficacy, and 0.81 for the overall scale.

Epistemological Beliefs Scale: In this study, the Scientific Epistemological Beliefs Scale developed by Pomeroy (30) and adapted to Turkish by Deryakulu and Bikmaz (4) was used to measure individuals' scientific epistemology. The scale covers more epistemological beliefs about science and aims to determine whether individuals believe in the traditional positivist/experimenter scientific understanding or the non-traditional Post-modern/constructive scientific understanding. Unlike the original scale, the Turkish scale showed a bipolar single factor structure and formed the 30 items differently. The scale shows a strong belief in the traditional and non-traditional understanding of science. A high score on the scale reflects the belief in the understanding of the traditional science, and a low score on the scale reflects the belief in the understanding of the non-traditional science. The Cronbach's alpha internal consistency coefficient of the scale is 0.91 (4).

Identity Styles Scale: In order to measure identity styles, we used the Identity Styles Scale composed of three dimensions and 40 items developed by Berzonsky (31) and adapted to Turkish by Derelioglu and Demir (32). Three styles expressed with the scale are rule orientation, knowledge orientation, and complex orientation. Scores that can be obtained from each identity style of the scale range from 10 to 50 for complex orientation, from 9 to 45 for rule orientation, and from 11 to 55 for knowledge orientation. The scale is a 5-point Likert-type measure ranging from strongly disagree to strongly agree. The high score obtained from each dimension indicates the height of the identity style orientation of the individual in that dimension, whereas the low score indicates the low orientation of the identity style in that dimension. In the Turkish version of the scale, internal consistency coefficients were 0.70 for rule orientation, 0.70 for knowledge orientation, and 0.72 for complex orientation. The test-retest correlation coefficients for the scale were 0.80 for rule orientation, 0.79 for knowledge orientation, and 0.91 for complex orientation.

Uncertainty Intolerance Scale (UIS-12): This scale is developed considering Freeston, et al. (33) 27-item scale by Carleton et al. (34) and adapted to Turkish culture by Erguvan et al. (35). The scale is a 5-point Likert-type scale for self-evaluation for adults. Item 1 of the scale is reverse coded. The total score of the scale ranges from 12 to 60. The

internal consistency coefficient of the scale was 0.91 in the non-clinical sample and 0.92 in the clinical sample. In the Turkish version of the scale, the scale explains 78.6% of the total variance, and the item load values range from 0.55 to 0.87. The internal consistency coefficient of the scale was 0.88, and the test-retest reliability coefficient was 0.74. The higher the score on the scale, the higher the level of intolerance to uncertainty in the individual.

Data Analysis

In the data analysis, the Pearson moment-product correlation coefficient was calculated for the language validity. Frequency and percentage analyses were used in the analysis of participants' demographics. CFA was performed for the construct validity. Two types of reliability have been examined for the reliability study, the internal consistency coefficient (alpha) and the test-retest method. All data analyses were performed using the Statistical Package for the Social Sciences 15.00 (SPSS Inc.; Chicago, IL, USA) and LISREL 8.71 programs. The confidence interval was taken as 95% in the data analysis.

Process

The scale was adapted to Turkish by contacting the authors (Roets and Van Hiel), and after obtaining permission for adaptation the validity and reliability studies were performed. In the study, data were collected as individual applications and group applications. The data were gathered from the university students with the permission and help of the course instructor during the course hours of the university, and the data from graduate participants were obtained at their workplaces. When the data were collected, the volunteer policy was taken as a basis, and the participants were given brief information about the purpose of the research and then the scales were given to the participants who chose to participate in the study. Identity information was not requested from the participants. The completion of the scales varied from 10 to 15 minutes. The data were collected in the province of Ankara between April 2015 and August 2015. This study was conducted considering The Helsinki Declaration. In this study, ethics committee approval was not needed because the data were collected from non-clinical sample and only through scales. In this study, patient consent was not needed because the data were collected from the non-clinical sample and only through scales.

RESULTS

Language Validity

Translation of the Need for Closure Scale-Short Form was performed after contact was established with the authors and approval was given to adapt the scale to Turkish culture. The original NFC-SF in English was translated into Turkish by four field experts. Then these translations were put together to search for common aspects of all of them, and the expressions that differed were put into a common expression by talking with the translators. The Turkish form, based on expert opinion, was translated into English by three different academicians. The original version of the scale and the version that was translated back into English were examined by three academics working in the university, and there was a common opinion that there was no difference between these two versions.

In order to see in practice whether the Turkish and English forms had the same meanings obtained from the expert opinion, the Turkish and English forms were given at 3-week intervals to 24 PhD students who had good knowledge of English, and the Pearson moment-product correlation coefficient was calculated between the scores from both applications. The Pearson moment-product correlation coefficient was 0.94 (p=0.00) for the two applications of the scale. Based on the obtained correlation coef-

ficient and expert opinion, it was assumed that parallelism was provided and that the language was valid.

Factor Structure Analysis

Confirmatory factor analysis; CFA was used to test the one-factor structure of the NFC-SF revealed by exploratory factor analysis. The correlation matrix obtained from 15 items in the CFA application was used as the data. CFA is intended to assess the extent to which a factorial model of observable factors conforms to actual utility (36-39).

As a result of the analysis, the compliance indices showed that the observed data fit well with the suggested one-dimensional model. The ratio calculated by CFA ($\chi^2/Df=366, 71/90$) was 4.07 (p=0.000), indicating that the proposed factor model is consistent with the given data (22). The GFI value was 0.90, the IFI value was 0.89, the CFI value was 0.90, the AGFI value was 0.88, the NNFI value was 0.90, and the RMSEA value was 0.011, which shows that as a result of CFA, the one-factor structure gives acceptable and valid results. The coefficients of the item-factor relationships calculated by CFA are shown in Figure 1.

As can be seen in Figure 1, the path coefficients vary between 0.10 and 0.68. These values seem to be acceptable (36,37,38).

Criterion-Based Validity

The Epistemological Beliefs Scale, Multi-Measure Agentic Personality Scale, Identity Styles Scale, the Knowledge Oriented and the Norm-Oriented subscales, and the Uncertainty Intolerance Scale were used to test the criterion for the Need for Closure Scale-Short Form. These scales were applied to 236 participants, all residing in Ankara province. All of the participants were university students between the ages of 17 and 24 years. The mean age was 20.04 years (SD=1.48 years), and 170 of the participants were women (72%) and 66 of them were men (28%). In addition, 113 of the participants were in first class (47.9%), 70 in second class (29.7%), 33 in third class (14%), and 20 in fourth class (8.5%). The Pearson moment-product correlation coefficient results with the dataset obtained from 236 participants are presented in Table 1.

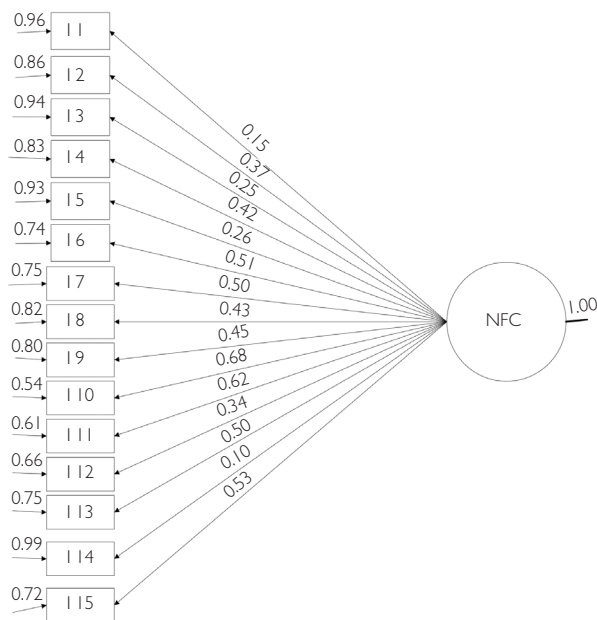


Figure 1. Item load values of Need for Closure-Short Form

Table 1. Relationships between need for closure, epistemological beliefs, identity styles, agency, and intolerance to uncertainty

	Need For closure	Epistemological beliefs	Information oriented	Norm-oriented	Agency	Intolerance to uncertainty
Need for closure	1	0.28**	-0.04	0.38**	0.20**	0.30**
Epistemological beliefs		1	0.19**	0.17**	0.07	0.15*
Information-oriented			1	0.19**	0.09	0.07
Norm-oriented				1	0.11	0.17**
Agency					1	0.22**
Intolerance to uncertainty						1

**p<0.01; *p<0.05

Table 2. Descriptive statistical results of the upper-lower 27% Groups of the Need for Closure-Short Form

Items	Group	N	\bar{X}	Sd	Mean Sd
1	Lower %27	59	5.32	1.31	0.17
	Upper %27	59	5.98	0.13	0.01
2	Lower %27	59	2.89	1.45	0.18
	Upper %27	59	5.08	1.10	0.14
3	Lower %27	59	4.06	1.63	0.21
	Upper %27	59	5.44	1.03	0.13
4	Lower %27	59	4.86	1.47	0.19
	Upper %27	59	5.86	0.57	0.07
5	Lower %27	59	2.47	1.50	0.19
	Upper %27	59	4.55	1.56	0.20
6	Lower %27	59	3.67	1.40	0.18
	Upper %27	59	5.55	0.77	0.10
7	Lower %27	59	4.96	1.23	0.16
	Upper %27	59	5.86	0.39	0.05
8	Lower %27	59	4.11	1.71	0.22
	Upper %27	59	5.61	0.66	0.08
9	Lower %27	59	3.86	1.69	0.22
	Upper %27	59	5.37	0.84	0.11
10	Lower %27	59	3.45	1.70	0.22
	Upper %27	59	5.61	0.69	0.09
11	Lower %27	59	3.77	1.21	0.15
	Upper %27	59	5.54	0.67	0.08
12	Lower %27	59	3.98	1.80	0.23
	Upper %27	59	5.35	1.01	0.13
13	Lower %27	59	3.61	1.59	0.20
	Upper %27	59	5.47	1.07	0.13
14	Lower %27	59	3.64	1.64	0.21
	Upper %27	59	4.74	1.30	0.17
15	Lower %27	59	3.61	1.37	0.17
	Upper %27	59	5.52	0.70	0.09

SD: standard deviation

Table 3. Item analysis and reliability analysis of the Need for Closure-Short Form

Item number	Scale \bar{X} if item deleted	Scale variance if item deleted	Corrected item-scale correlation	Cronbach's alpha if item deleted
1	65.15	91.19	0.14	0.739
2	66.64	80.00	0.40	0.716
3	65.96	83.88	0.30	0.727
4	65.32	87.69	0.32	0.726
5	67.40	82.56	0.26	0.736
6	66.11	81.85	0.45	0.712
7	65.21	87.68	0.42	0.721
8	65.92	84.20	0.35	0.722
9	66.21	82.93	0.38	0.719
10	66.01	79.54	0.51	0.705
11	66.06	83.27	0.45	0.713
12	66.00	85.57	0.25	0.732
13	65.97	82.05	0.40	0.716
14	66.76	87.86	0.15	0.745
15	66.07	83.60	0.38	0.719

As seen in Table 1, there was a weakly positive correlation ($r=0.28$, $p<0.01$) between need for closure and epistemological beliefs. In addition, there was a moderate relationship ($r=0.38$, $p<0.01$) in the positive direction between the need for closure and the norm-oriented identity style. There was a weakly positive relationship with autonomous action ($r=0.20$, $p<0.01$), while there was a moderate relationship in the positive direction with the intolerance of uncertainty ($r=0.30$, $p<0.01$). These findings can be interpreted as meaning that the NFC-SF is significantly related to the scales used for criterion validity and that these results are sufficient in terms of the criterion validity of the NFC-SF.

Confirmatory factor analysis results and criterion-related validity results to determine construct validity are valid measures to measure the need for cognitive closure of the NFC-SF, which consists of 15 items and one dimension.

Item Analysis

The mean, standard deviation, and item total score correlations for the upper and lower zones were calculated for item distinctiveness. Item analysis results are presented in Table 2 and Table 3 below.

When the results of the item analysis are examined, it is seen that the item with the lowest distinctiveness is the first item, and the item with the highest distinctiveness is the second item.

As a result of the item analysis, it is seen that the corrected score of total item score varies between 0.14 and 0.51. When the alpha values are examined when the item was excluded, it is seen that these values range between 0.71 and 0.75.

Reliability

In order to examine the reliability of the scale, internal consistency and test-retest stability assessed by Cronbach's alpha were analyzed. The Cronbach's alpha reliability coefficient of the scale was $r=0.74$, and this finding could be interpreted as meaning that the internal consistency of the scale was within acceptable limits. For the test-retest reliability, the scale was applied to 42 participants at intervals of 3 weeks. The participants who left at least one item blank were excluded from the evaluation, and the data from 38 participants were analyzed. The test-retest reliability coefficient calculated from the 38 participants was $r=0.92$. The reliability analysis showed that the tool had internal consistency with stable measurements.

DISCUSSION

In this study, the validity and reliability of the NFC-SF developed by Roets and Van Hiel (5) were examined, and the conformity in measuring the need for closure in Turkish university students was examined. Verbal validation, CFA, criterion validity, and item analysis showed that the Turkish version of this scale is a valid instrument for measuring the need for cognitive closure in university students and graduates. In addition, internal consistency coefficients and test-retest reliability values indicate that the scale is a reliable measurement tool. These findings are discussed in the context of the related literature.

Roets and Van Hiel (5) examined descriptive factor analysis, criterion-based validity, and CFA for validity in the NFC-SF development study, and they measured internal consistency and test-retest reliability for reliability. In this study, no exploratory factor analysis was done; only language validation, CFA, and criterion-based validity studies were performed. The reason for this is that the CFA is sufficient when the factor structure of a scale that already has a factor structure is examined. For example, Soto et al. (39) suggest that only the criterion-based validity and test-retest reliability should be considered in adaptation studies. On the other hand, in this study language validation, CFA, and item analysis were performed. The results indicate a factor structure similar to the original version of the scale. For example, the correlation coefficient calculated for the language validity of the scale indicates that the Turkish version of the scale is well understood by the participants.

Roets and Van Hiele (5) found that the one-factor structure of the scale was confirmed in the Dutch version. It is seen that the goodness of fit values obtained in the CFA are similar to those obtained in this study. For example, in both studies the χ^2/Df values, RMSEA values, GFI values, and NFI values are close to each other. However, the CFI value was higher than the CFI value in this study. The main reason for this is that the number of participants in the study of Roets and Van Hiel (5) was greater than the number of participants in this study. The low number of participants is one of the most important limitations of this study. Further studies with Turkish participants should be performed with larger samples. In this study, the single factor structure of the need for closure was verified. This shows that the one-factor structure is confirmed in the Turkish version as it is in the Dutch version of the scale. This finding can be interpreted as

a universal one-factor structure of the need for closure. To support this claim of universality, it can be examined in cross-cultural studies whether the factor structure of the scale is valid in different cultures.

Relationships between need for closure and epistemological beliefs, agentic personality, information-oriented and norm-oriented identity styles, and intolerance to uncertainty were calculated to determine the criterion validity for the NFC-SF. We found a weak relationship between need for closure and epistemological beliefs, a moderate relationship with the norm-oriented identity style, a weak relationship with autonomous action, and a moderate relationship with intolerance to uncertainty. These findings can be interpreted as meaning that the NFC-SF is significantly related to the scales used for criterion validity and that these results are sufficient in terms of the criterion validity of the NFC-SF. One of the most basic features of the need for closure is that the individual is closed to new ideas. Individuals with a norm-oriented identity take into account the expectations and wishes of their family or the individuals considered important in society. Individuals with high need for closure seek immediate answers instead of uncertainty when they encounter a new topic (1). It is essential to adhere to existing norms in the norm-oriented identity style. Those with high need for closure tend to develop a norm-oriented identity style. Individuals in this direction tend to be closed to knowledge, seeing new information as a threat to their own values and beliefs (31). In this context, it seems quite plausible that there is a positive relationship between the need for closure and the norm-oriented identity style. This result refers to the criterion-based validity of the scale. We found no relationship between the need for closure and the information-oriented identity style. It is essential to search for new knowledge in a knowledge-oriented identity style and to choose the knowledge that is appropriate for them. In this context, it is expected that the need of closure of the individuals in this direction will be low. However, there was no negative relationship as expected in this study. The reason for this is that the individuals in this style are individuals who are open and questioning new knowledge. It can therefore be said that individuals with high need for closure are not in search of knowledge.

Desire of the individuals for predictability when individuals with high need for closure encounter a situation or knowledge shows parallelism with opting for order and structure in knowledge, being disturbed by ambiguity, and demanding for certainty up to a point (5, 7-10). For this reason, there might be a positive relationship between the need for closure and epistemological beliefs in this study. The tendency of mental closure in humans is a basic mental function, but not a constant cognitive process. Without mental closure, people doubted everything, believed nothing, and could not crystallize a single thought (5, 8). This also applies to scientific knowledge up to a point. Tsai (40), for example, found that individuals who strongly believe in the traditional understanding of science perceive science as a collection of knowledge consisting of accurate knowledge, and they describe scientific knowledge as accurate and valid knowledge. These results seem to refer to the criterion-based validity of the scale. Performing autonomous action is, in its most basic sense, an individual behaving on their own behalf, taking responsibility for their behavior, directing their own life, and making their own decisions (28). In this context, individuals with a high level of autonomous action, similarly to individuals with high need for closure, will immediately feel uncomfortable when confronted with an uncertain situation and will act immediately to achieve certainty (1). The correlation between autonomous action and the need for closure in this study seems to support this conclusion. Similarly, the correlation between the need for closure and intolerance to uncertainty in this study also seems to support this conclusion. There are studies in the literature that show that as the need for closure increases, the intolerance

to uncertainty also increases (5,6,11,18-19). The result obtained in this study is also consistent with the literature, and this conformity seems to refer to the criterion-based validity of the scale.

For the reliability study of the scale, two types of reliability were calculated—the internal consistency coefficient and the test-retest reliability. The internal consistency coefficient of the scale was 0.74, and this finding could be interpreted to mean that the internal consistency of the scale is within acceptable limits. Roets and Van Hiele (5) reported an internal consistency of 0.78 for the Dutch version of the scale. Compared with the two findings, the Dutch version of the scale is more reliable, but it can also be said that the Turkish version is also reliable. The reason for this might be that the Turkish sample was smaller than the Dutch sample. In future studies, the internal consistency of the scale can be calculated with datasets from larger samples. The test-retest reliability coefficient of the scale was 0.92. Roets and Van Hiel (5) found a test-retest reliability coefficient of 0.79 in the Dutch version of the scale. When this information is taken into account, it can be stated that the test-retest reliability of the Turkish version of the scale is higher. As a result of the reliability analysis, it can be concluded that the tool has internal consistency with consistent measurements.

Taking advantage of the findings of this study, it is possible to present several proposals for daily life as well as for future research. First, repeating the validity and reliability studies of the scale in different groups might provide new evidence that the scale is compatible with different Turkish samples. The conformity of the psychometric properties of the scale can also be examined in individuals in other life stages (e.g., adolescents, adults, and the elderly). As a suggestion, this scale can be used in future empirical studies involving personality-related demographic and psychosocial variables by experts such as mental health professionals, psychiatrists, psychological counselors, economists, and social workers who work with university students and college graduates. For instance, in addition to the relationship of the need for cognitive closure of university students with variables such as obsessive-compulsive disorder, happiness, life satisfaction, parental attachment and autonomy, this scale can be used to determine whether the need for closure differs according to demographic variables such as life span, marital status, age, gender, SED, and educational status. In addition to the findings of validity and reliability, the most important limitation of this study was that the subject group consisted only of university students and university graduates, and non-student participants were not included. The second limitation is that only individuals in transition to adulthood between the ages of 19 and 26 years were included in the study, and no data were collected from other age groups. Future studies should include these age groups. Another important limitation of this study is that CFA, item analysis, and the internal consistency coefficient were performed with the same database. In this context, CFA, item analysis, and internal consistency coefficients can be calculated from different databases in future studies.

In conclusion, the NFC-SF is a valid and reliable tool for measuring the need for closure in Turkish university students and can be used both in interdisciplinary and intercultural research.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects". (amended in October 2013).

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