Validity and Reliability of Nine Types Temperament Scale

Dokuz Tip Mizaç Ölçeği'nin Geçerlik ve Güvenirliği

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Abstract

The aim of this study is to develop a scale compatible with the Nine Types Temperament Model (NTTM), which did not have any prior measurement tools to scientifically prove its reliability and validity. NTTM is created by re-evaluating the Enneagram System –a system that defines nine personality types- used for analyzing and comprehending ego mechanisms. Nine Types Temperament Scale (NTTS) which is a self-rated instrument composed of 91 items with three-point Likert type was developed from this model and applied to 990 participants. Confirmatory factor analyses were carried out in order to evaluate whether the scale fits to the model related to the temperament model. In exploratory factor analyses of the scale eigen values of nine factors vary between 8.089 and 1.661, and represent 39.04% of the total variance. In confirmatory analyses of the scale CFI value is 0.88, GFI value is 0.84, IFI value is 0.88 and RMSEA value is 0.05. Test-retest reliability of the scale was evaluated with 46 participants. Cronbach alpha value of the whole scale is 0.75, while Cronbach alpha values for every temperament type were calculated as 0.77, 0.79, 0.68, 0.71, 0.80, 0.74, 0.71, 0.83 and 0.77 respectively. Concurrent validity was performed with Cloninger's TCI (Temperament and Character Inventory) and Akiskal's TEMPS-A (Temperament Evaluation of Memphis, Pisa, Paris and San Diego Autoquestionnaire Version). The types of NTTM showed significant correlations with TCI and TEMPS-A. Results of the study support that NTTS is a reliable and valid scale.

Key Words: Temperament, Nine Types Temperament Model, Nine Types Temperament Scale, Reliability, Validity

Öz

Bu çalışmada, benlik mekanizmalarını dokuz kişilik tipi ile açıklayan Enneagram Sistemi'nin yeniden yorumlanması ile oluşturulan ve günümüzde geçerlik ve güvenirliği bilimsel açıdan kanıtlanmış bir ölçüm aracı bulunmayan Dokuz Tip Mizaç Modeli (DTMM) ile uyumlu bir ölçek geliştirilmesi amaçlanmıştır. 91 maddeden oluşan ve üçlü Likert tipi bir öz bildirim ölçeği olan Dokuz Tip Mizaç Ölçeği (DTMÖ) 990 üniversite öğrencisine uygulanmıştır. Ölçeğe uygulanan açıklayıcı faktör analizlerinde dokuz faktörün öz değerleri 8.08 ve 1.66 arasında değişmekte ve toplam varyansın %39.04'ünü temsil etmektedir. Ölçeğin modele uygunluğunu saptamak için doğrulayıcı faktör analizi uygulanmıştır. Ölçeğin doğrulayıcı faktör analizi sonuçlarına göre CFI değeri 0.88, GFI değeri 0.84, IFI değeri 0.88 ve RMSEA değeri 0.05'tür. Ölçeğin test-tekrar test güvenirliği 46 katılımcıyla sınanmıştır. Ölçeğin tümü için Cronbach alfa değeri 0.75, tipler için sırasıyla 0.77, 0.79, 0.68, 0.71, 0.80, 0.74, 0.71, 0.83, 0.77'dir. Ölçeğin eş zamanlı geçerliği Cloninger'in MKE (Mizaç ve Karakter Envanteri) ve Akiskal'in TEMPS-A(Temparement Evaluation of Memphis, Pisa, Paris and San Diego- Autoquestionnaire) ölçekleriyle sınanmıştır. DTMM'deki tipler TCI ve TEMPS-A ile anlamlı bağıntılar göstermiştir. Araştırmanın sonuçları DTMÖ'nün geçerli ve güvenilir bir ölçek olduğunu desteklemektedir.

Anahtar Kelimeler: Mizaç, Dokuz Tip Mizaç Modeli, Dokuz Tip Mizaç Ölçeği, Güvenirlik, Geçerlik

Introduction

Temperament theories, which are developed to better understand patients, have an important place in psychiatry. Buss and Plomin (1984), who adopted a childhood-oriented approach to temperament, define temperament as inherited personality traits that exist since early childhood. According to Thomas and Chess, temperament is the individual differences among behaviour styles that children display in their relationship with their surroundings (Goldsmith et al., 1987). Among the adult-oriented approaches, Allport (1937) defines temperament as a concept directed at the inherited parts of an individual's emotional structure. On the other hand, Strelau (2002) propounds that temperament consists of inherited personality traits that are determined with biological mechanisms from birth and show consistency through time.

Adult oriented theories and models used in current psychology are Eysenck's PEN Theory and Costa and McCrae's Big Five Model. Eysenck defines temperament as the non-cognitive side of the personality (Eysenck & Eysenck, 1985). In PEN theory, three personality dimensions, extrovertedness (E), neurotism (N) and psychotism (P) are defined (Eysenck H.J., 1978). Costa & McCrae developed a five factor model using Eysenck's three factored personality theory. In this model, openness to experience, harmony and self-discipline are added to neurotism and extrovertedness (McCrae & Costa, 1987).

Solid proof in current psychiatric studies on temperament is acquired through the models developed by Akiskal and Cloninger (Akiskal at al., 2005; Cloninger, Pryzbeck, Svrakic & Wetzel, 1994). Akiskal propounded that temperament composes the core of emotional, motivational and compliance-oriented automatisations (Akiskal, 1989; Akiskal & Akiskal, 1992), defining temperament in five different categories as depressive, cyclothymic, hiperthymic, anxious and irritable (Akiskal & Mallya, 1987). Cloninger defines temperament as the tendency of the body in forming the behavioural reaction that is conditioned to physical stimuli. He evaluated temperament in four dimensions: novelty seeking (NS), harm avoidance (HA), reward dependence (RD) and persistence (P). Cloninger determined three more character dimensions in addition to four temperament dimensions (self-directedness (SD), cooperativeness (C), self-transcendence (ST), thus propounding that combination of temperament and character constitutes personality (Cloninger et al., 1994).

Nine Types Temperament Model (NTTM), a new approach to temperament concept, is developed by Yılmaz et al., by re-evaluating the Enneagram System (Yılmaz, 2010; Yılmaz, Gençer & Aydemir, 2011). Enneagram, -a system that defines nine personality types and their relations with each other- is used for analyzing and comprehending the ego mechanisms (Palmer, 1991). It's transformed into a personality type model with the contributions of Ichazo and psychiatrist Naranjo. Enneagram, on which various assumptions are asserted about its emergence and origin, was

transferred from Eastern wisdom to the West with the contributions of Gurdjieff (Riso, 2003). According to NTTM, traits that are defined under personality types in Enneagram are actually temperament traits, which are structural and unchanging for a lifetime (Yılmaz, 2010).

Enneagram interpreters do not mention the definition, content, limit, context and relation of basic concepts like temperament, character and personality. In addition they cannot clearly put the differences between "static" temperament features that do not change and "dynamic" personality manifestations that can change positively or negatively throughout lifetime. Contrary to Enneagram, NTTM especially avoids defining temperament types with adjectives specific to each type. NTTM argues that temperament types cannot be defined according to a single feature and every type can only be defined by considering all features and adjectives that compose it (Yılmaz, 2010).

Enneagram evaluates personality types in three levels: healthy, average and unhealthy (Riso & Hudson, 2000). On the other hand, NTTM defines temperament types with general features and risky features that are apt to negativity and evaluates them on the same level. The reason for this is, the aim of being at a healthy level is actually personality manifestations that are revealed with awareness beyond the daily consciousness, which depends on virtue and maturity despite lifelong temperament features.

Every temperament type in NTTM is briefly summarized below:

Type 1: In general they are serious, mature, idealist, principled and tense individuals. They are obedient to rules and unpermissive about the others' obedience to rules (Yılmaz et al., 2011). They are perfectionistic and detail-oriented people who try to be flawless in their actions. They are attentive to cleanness, tidiness and regularity (Yılmaz, 2010). They recognize errors and deficiencies rapidly; then they criticize and judge them. They are self-disciplined, diligent, planned, prudent, consistent and responsible individuals who care to do their work with a particular method. They are controlled and logical rather than being sentimental (Riso & Hudson, 2000). They get easily tense and angry if the works take a turn for the worse. They place importance on justice and morality. Their mental processes are prone to define, classify, compare and systematize. They classify the facts and concepts/terms as true or false (Riso, 2003).

Type 2: They are very emotional, sincere, extroverted, talkative and amiable individuals. They act according to their emotions rather than their logic. They give great attention to their relations and focus their lives on them (Yılmaz, 2010). They make contacts easily and warm-heartedly. They enjoy giving and getting attention. They like to insist. They care about being noticed and appreciated in one-to-one and social relations. They are very emotional and reveal/express their emotions by all means. They prioritize the need of loving and being loved (Riso & Hudson, 2000). They are very sensitive to others' troubles and get easily affected by them. They are full of love, altruistic and helpful. Although they are usually in the "giving" position in their relations, they can reproach for this. They are very touchy; they easily get hurt and offended (Wagner, 1996). They can be insisting and manipulative about their wishes. They are proud; when they do not get attention or they are not loved, they can be aggressive and furious (Yılmaz, 2010).

Type 3: They are success-oriented, lively, energetic, popular, ambitious, competitive and self-confident individuals (Yılmaz et al., 2011). They highly prioritize their image, status and having a good career. They exist with their successes and identify themselves with their image. They are easily motivated to reach their goals (Riso, 2003). They are productive, hardworking and disciplined people. In order to reach success, they try to overcome all obstacles with practical ways. They have difficulty in creating emotional identification and empathy with others. They are far from sentimentalism. They do not let their feelings become an obstacle in order to reach their goals (Yılmaz, 2010). They motivate their surroundings well to find success. In a society, they know how to impress people and act in a diplomatic way according to the occasion (Palmer, 1991). To be accepted and approved, they believe

that they must be the most successful and at the top. Not to experience failure, they can ignore ethical rules and act without principles (Riso & Hudson, 1999).

Type 4: They are emotional, romantic, sensitive, unique, individualist, incongruous, extraordinary, natural, naive and introverted people (Yılmaz et al. 2011). They give importance to return from the world of relations to their own world where they discover the meaning of feelings in their minds (Riso & Hudson, 1999). They like to be understood by expressing their feelings in aesthetic perspectives and artistic ways. They are friendly, sincere, merciful and empathetic (Palmer, 1991). They want to live as they like, according to their feelings. They want themselves and their actions to be deep, meaningful, extraordinary and unique (Yılmaz, 2010). They do not hesitate to act incongruously because of their differences and uniqueness. Although they are very emotional and can get easily hurt, they do not reveal their feelings and wait for others to notice their fragility/sensitiveness (Riso & Hudson, 1999). They passionately desire things they want or tend towards. They feel the lack of things that exist in others but not in themselves and they envy these people (Yılmaz, 2010). They have a very wide and melancholic dream world. They think they are different, unique and incomprehensible (Riso & Hudson, 2000). As they experience their emotions more deeply and perceive events in a more exaggerated and melodramatic way than others, they think they do not belong to their environment, they feel alienated (Palmer, 1991).

Type 5: They are introverted, quiet, timid, analytical observer, rational and abstracting individuals who like loneliness (Yılmaz et al., 2011). They are cold and distant in their relations and avoid physical contact. They do not like to catch attention and put themselves forward; they prefer to be alone most of the time (Riso, 2003). They observe things happening around them objectively; however they do not like to get involved (Wagner, 1996). They have difficulty in sharing. They are stingy and cheeseparing/calculating. They are totally logical and absolutely rational people. They believe that feelings disrupt objectivity; therefore they do not prioritize emotions in their life. They experience fear intensely, but they do not let others know (Palmer, 1991). They have an abstracting mind. They analyze and conceptualize all data they gather. They have a deep curiosity and hunger for knowledge. They are investigators and try to specialize in the fields they are interested in. They are sceptical; their minds tend to form paranoid setups (Yılmaz, 2010).

Type 6: They are safety and security oriented, meticulous, neat, fussy and thrifty individuals (Yılmaz et al. 2011). They like to be calm, compatible, controlling and distant; they care about not getting attention and not being distinguished in a crowd (Yılmaz, 2010). They like to obey the rules. They move in a calculating way because of their cautiousness. They are secretive and discreet. They try to finish their work correctly and neatly. They are bothered from deficiencies and mistakes (Riso, 2003). They give great importance to loyalty and trust; they frequently question other's intentions and secretly test them. Usually they experience intense feelings of fear, worry and anxiety in situations of danger and ambiguity related with security and safety. Their minds are prone to obsessive thinking; they are ambivalent, questioning and suspicious (Riso & Hudson, 2000). They try to think all possibilities at the same time and get prepared for the worst. They are indecisive or have difficulty in being confident after making a decision. They require a wise and trustworthy authority. At the same time, they oppose to authority figures, sometimes openly, mostly secretly (Yılmaz, 2010). They are sensitive, fragile and touchy (paranoid touchiness) to people who are a trustworthy figure for them (Riso, 2003). They are curious, give attention to knowledge and store all kinds of information with the intention that they might need them in the future (Palmer, 1991).

Type 7: They are highly active, extroverted, cheerful, teasing and talkative individuals (Yılmaz et al., 2011). They quickly establish relations with their daring and sociable style. Although they have contact with many people, their relations are usually superficial and situational. They avoid being connected and limited (Yılmaz, 2010). They like novelty and change. They enjoy adventure; they prioritize fun, pleasure and excitement (Riso, 2003). They are impulsive; they feel an unbearable

curiosity to discover things they enjoy. They have difficulty in controlling their wishes; they are impatient, hasty, pushy and insistent. They forget their responsibilities and act aimlessly. They are scattered, disordered and lavish. They like to do many things at the same time. They are whimsical (Riso & Hudson, 2000). They get easily bored of everything. They try to avoid troubles and pain. They do not give much attention to negative feelings. They are very intolerant and impatient to being restrained. They are optimistic; they believe that they will definitely find a practical solution to problems. Although they often experience fear, they feel excited about overcoming it by denial (Palmer, 1991). Their mental world is very active. They have very quick connotations; they have many ideas and projects fluttering in their mind. Their attention is distracted; they cannot focus on a single idea for a long time. They are visionary, innovative; have a fantastic and dreaming mind (Yılmaz, 2010).

Type 8: They are brave, leader, self-confident, highly durable to hardships, grandiose and furious individuals who give importance to be strong and powerful. They are combative and dominating (Yılmaz et al., 2011). They are protective, possessive and generous to those around them. They are authoritative, tough, oppressive and intervening. They cannot tolerate indecisiveness, weakness and impotence (Palmer, 1991). They act swiftly and decide quickly. They are decisive and insistent about their claims. They are outspoken. They act according to what they think is right (Riso, 2003). They are intolerant, quick-tempered, furious, prone to violence and quarrelsome (Palmer, 1991). They do not care about what others think or feel. They are prone to being harsh, oppressive and despotic in their relations. They are intolerant to being forced or suppressed; they immediately oppose and challenge. It's "all or nothing" for them, they do not like anything in between (Yılmaz, 2010).

Type 9: They are calm, compatible, peaceful, mediator, shy, stubborn and phlegmatic individuals who suppress their anger (Yılmaz et al., 2011). They care about having good relations with people, not to make any trouble and not to oppose. They are tender, soft, comfortable/relaxed, flexible and patient. They try to embrace people as they are, without judging them (Palmer, 1991). They are disturbed by being forced and forcing others. They try to find people whom they can become integrated with. In order to get integrated, they act very compatibly and have difficulty saying "no" to others (Riso & Hudson, 2000). Behind this compatible, tranquil and non-intervening nature lies the prioritization of the need to be physically satisfied (eating, drinking, sexuality, etc), to be comfortable and protected. They are bothered by conflicts and quarrels. They are fond of their comfort. They like routines; they have difficulty in adapting to changes. They are slow to get into action and show their reactions. They suppress their rage (Yılmaz, 2010). When they are forced to do something, they hold out and act in a stubborn, passive aggressive way (Riso, 2003). They tend to think positively, they sometimes ignore negative situations and possibilities. They believe that problems will disappear by themselves after a while, without any intervention; therefore they let them be. They have difficulty in making a decision when there are multiple choices (Yılmaz, 2010).

Enneagram is a model that stands out with its integrability to modern psychological models and hypotheses regarding the possible relation between personality structures and psychopathological symptoms. In addition, there is no existing measuring device of this model. Wagner's scale study with participants who were trained for two months on Enneagram types could be considered as the primary psychometric study in this field (Wagner & Walker, 1983). However, the use of this scale in the general sample group and clinical practice is not widespread.

Other than Enneagram model, there are psychometric studies about temperament and personality. The scales of NEO-PI-R, which is prepared by Costa & McCrae (1992); TCI, which is prepared by Cloninger et al. (1994), and TEMPS-A, which is prepared by Akiskal et al. (2005), are being widely used today.

There is no scale developed in conformity and approved validity and reliability with NTTM. The aim of this study is to develop a new, statistically valid and reliable scale which is consistent with the model and which will be widespread in academic and clinical practice fields.

Method

The design of the study was an epidemiological, cross-sectional, paper-pencil method. The sample group was intended to be healthy subjects without any physical, mental or cognitive dysfunction. Thus the study was carried with university students without any diagnosed disease or health problems.

Development of Nine Types Temperament Scale

This part of the study has two phases. In both phases the participants are obtained from the healthy volunteer relatives of outpatients and inpatients of Erenköy Psychiatric Education and Research Hospital (EPERH). The health criteria of the participants were determined according to results of Structured Clinical Interview for DSM-IV (SCID-I) (Özkürkçügil, Aydemir, Yıldız, Esen, & Köroğlu 1999) and Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II) (Coşkunol, Bağdiken, Sorias, & Saygılı, 1994), which were applied by psychiatry specialists E.D.Y. and A.G.G. as well as their declaration of having no chronic physical / psychiatric illness .

In the first phase, written sources on Enneagram were studied. According to these sources, features (adjectives) describing the nine types that were claimed to exist in Enneagram were determined and grouped according to their types. For every type, an average of 20-35 features were shown to a group of 24 people (13 women, 11 men) with no prior knowledge on Enneagram. This group was designed to represent various age, education and socio-cultural levels in order to create a heterogeneous group that will represent society. These participants were asked to choose the group and the features in this group that describe themselves the best. Then semi-structured interviews with the participants were conducted by authors E.D.Y. and A.G.G., who have comprehensive knowledge of NTTM, in order to determine their temperament type according to Enneagram model. This way, each temperament type and its corresponding list of features/adjectives were formulated. As a result, the features that overlap were eliminated and the features that represent a group the most were determined. In the second phase, authors E.D.Y. and A.G.G. conducted focus group interviews to comprehend expressions of temperament types better. These interviews with a total of 20 participants were carried out by applying to relatives of outpatients and inpatients in EPERH. In the interviews, it was obtained how the participants express and experience their temperament features. Finally, lists were formulated for every temperament type with the expressions of the participants. Consequently, the best descriptive features/adjectives and expressions of participants were taken into consideration to prepare items for every temperament type. For each type, 19 items were formulated and thus a 171-item(s) scale was prepared. The structure of the scale was designed as a self-rated scale and three-point Likert type rating was used for the response range. The scale was filled out by the participants alone, and then it was evaluated by the authors with the participants for comprehensibility. Afterwards, the scale was shown to five psychiatrists. Later, experts in this field, E.D. Yılmaz and A.G. Gençer, have determined the items that describe and differentiate each type in the best way for the final version of the scale. Thus, the scale was reduced down to 91 items. The final version was prepared after the correction of incomprehensive items.

Therefore, the resulting scale had 91 items in total. The validity and reliability studies were carried out with this 91-item scale.

Participants

The study was approved by the Clinical Studies Ethical Board of Celal Bayar University, Faculty of Medicine.

1200 university students from different faculties of Fırat, Atatürk, Adnan Menderes and Başkent Universities were enrolled in this study. The criteria for enrolment were signing the voluntary consent form and being a student in a university program; while the criteria for exclusion were participants' declaration of being under treatment for any psychiatric disease, alcohol and/or substance abuse (except for nicotine) and having a chronic physical illness. 1020 students accepted to participate in this study. The subject group of the study then compromised of the 990 participants who have filled in the scale forms completely. The scale was filled in by the participant, who has signed the voluntary consent form, after being informed by the previously trained interviewer about the aim and instructions of the scale. The interviewers replied to items during the application and collected the scales after being filled.

Materials and Measures

TCI: TCI, which was developed by Cloninger et al. (1994) and for which Turkish validity-reliability study was performed by Köse et al. (2009), is a self –report scale with 240 items that are answered using the Thurstone method. Cronbach alpha values of temperament dimensions are between 0.60-0.85, while between 0.82-0.83 in character dimensions.

TEMPS-A: TEMPS-A, which was developed by Akiskal et al. (2005) and Turkish validity-reliability study done by Vahip, Kesebir and Alkan (2005). It is a self-report scale consisting of 110 items with Yes - No answers. The test-retest reliability calculated for each temperament type is between 0.73-0.93 and Cronbach alpha value is between 0.77-0.85.

Statistical Analyses

Statistical analyses were carried out with SPSS 16.0 and AMOS program.

For the validity analyses, structural and concurrent validity analyses were performed. In order to evaluate the structural validity of the scale, both explanatory and confirmatory factor analyses were applied. Explanatory factor analysis was carried out with varimax rotation according to principal components analysis, and the factors with eigenvalue equal to or greater than 1 were taken for evaluation. Varimax rotation was preferred since it was hypothesized that there are inter-correlations between temperament types. Items with factor load equal to or greater than 0.3 were evaluated. Explanatory factor structure was compared with the original nine-dimensional structure of the scale. In confirmatory factor structure, the fit to the model and the stability model of the data were evaluated. Confirmatory factor analysis was performed by Amos. When evaluating the fit of the CFA and stability models to the data, we used several types of goodness-of-fit indexes. We used the standard chi-square index of statistical fit that is routinely provided under the maximum likelihood estimation of parameters. However, a well-known disadvantage of the chi-square statistics is its high sensitivity to sample size and in practice, irrelevant deviations of the empirical data from what is theoretically expected, are detected due to the overwhelming statistical power. It was therefore used also other indexes of practical fit, including the root mean square error of approximation (RMSEA), and the goodness of fit index (GFI). Besides GFI, confirmatory fit index (CFI), normed fit index (NFI), and adjusted goodness of fit index (AGFI) were evaluated. The RMSEA is an absolute index of fit. RMSEA values under 0.05 indicate close fit with the data, values between 0.05 and 0.08 represent reasonable fit, values between 0.08 and 0.10 reflect poor fit, and values greater than 0.10 are unacceptable. The GFI values may range between 0 and 1 and should be greater than 0.90. In addition, a good indicator of the model calculated as cmin/degree of freedom is obtained. This indicator of the model fit should be ideally less than 2, but less than 4 is also accepted. Also, in confirmatory factor analysis, conceptual path diagram was drawn.

In concurrent analyses total score of every temperament type was correlated with the each temperament type obtained from TCI and TEMPS-A.

In reliability analyses, Cronbach alpha internal consistency analyses of the sum and sub-dimensions of the scale were conducted. Besides, the reliability of the scale was proven with item total score, intra-class correlation coefficients and sub-scale total point correlation coefficients. During the application, 91 item form of NTTS was re-applied to 46 volunteers from the subject group two weeks after the first application, and the correlation coefficient was calculated between two applications to determine test-retest reliability.

Results

Statistical Findings

For validity analyses and confirmation of structural validity, explanatory and confirmatory factor analyses were applied to 411 male (41.5 %) and 579 female (58.5 %) healthy university students at a mean age of 20,06±2,34.

Considering the correlation with age, no correlation was determined between the subscales of temperament types and age.

When the effect of gender on temperament types is examined, there is no difference between genders for types 1, 4 and 9. In type 2 subscale, type 3 subscale, type 6 subscale, type 7 subscale and type 8 subscale, females have statistically significant higher scores than males. In type 5 subscale, males have statistically significant higher scores than females (Table 1).

Table 1.

The effect of gender on temperament types

Gender	Type 2	Type 3	Type 5	Type 6	Type 7	Type 8
Female	6.05	-3.06	-	4.55	-3.19	-5.81
Male	-	-	-3.65	-	-	-

p<0.001

Structural Validity Analyses

Explanatory factor analyses

Item-total score correlations of the Types are shown in Table 2.

Table 2.
Item-total score correlation coefficients of NTTS

Subscales	Item-total score correlation coefficients	Subscales	Item-total score correlation coefficients
Type 1	0.29-0.57	Type 6	0.26-0.49
Type 2	0.32-0.62	Type 7	0.27-0.48
Type 3	0.21-0.46	Type 8	0.39-0.61
Type 4	0.29-0.45	Type 9	0.29-0.58
Type 5	0.25-0.61		

p<0,01

Kaiser-Mayer-Olkin analysis was applied to prove whether or not sample distribution is appropriate for factor analysis. The coefficient of this analysis was found to be 0.87 and chi-square value was calculated as 26130.320 (p<0.001) in the Bartlett test.

Explanatory factor analysis was carried out with varimax rotation according to principal components analysis, and the factors with eigenvalue equal to or greater than 1 were taken for evaluation. Varimax rotation was preferred since it was hypothesized that there are inter-correlations between temperament types.

When the explanatory factor analysis was applied to the 91-item scale, a total of 21 factors were obtained, representing 54.32% of the variance. All factors are positive and negative loaded, and items with a factor load over 0.3 were taken into consideration. According to this, items 103 and 117 are not represented in explanatory factor analysis. Items of type 8 was found in the first factor, type 5 was found in factor two, while types 2, 6 and 1 were found in factors three, four and five respectively. Types 9, 7 and 3 were found in factors six and twelve, eight and ten, and nine and eleven respectively. Type 4 is represented randomly in the rest of the factors. Types 8, 5, 2, 6 and 1 were almost completely represented in a single factor structure, while the other types are represented in more than one factor with some of their items.

One more explanatory factor analysis was applied to the 91-item scale and an analysis was made for the nine factor structure. The eigen values of these factors vary between 8.089 and 1.661, and represent 39.04% of the total variance. In nine factor analyses, items 10, 21, 22, 24, 26, 42, 85, 102, 103, 117, 133, 150 and 156 were not represented. In nine factor structure, temperament sub-types are represented appropriately. Items of type 5 were found in the first factor, while type 6 and type 8 items were found in the second and third factors respectively. Items pertaining to types 1, 2, 9, 7, 4 and 3 were found in the fourth, fifth, sixth, seventh, eighth and ninth factors respectively. Items of type 4 are found in different factors, while the other types are found in only one factor (Table 3).

Table 3.

9 Factor Structure of NTTS Obtained In Explanatory Factor Analysis

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9
126	,72								
106	,68								
89	,67								
142	,65								
63	,64								
78	,61								
114	,53								
17	,46								
91		,62							
49		,61							
121		,58							
51		,56							
128		,54							
151		,50							

6	,50		
65	,50		
104	,48		
15	,45		
120		,68	
149		,68	
81		,64	
139		,57	
44		,56	
71		,54	
28		,53	
94		,49	
84		,46	
1			,71
160			,60
48			,57
37			,54
129			,53
86			,52
147			,49
11			,44
109			,43

116				,70
93				,68
155				,64
100				,64
32				,54
62				,48
130				,47
80				,43

29					,62

45	,60		
135	,60		
52	,59		
159	,56		
19	,56		
56	,54		
171	,45		
144	,43		
41		,58	
88		,57	
98		,57	
61		,51	
79		,48	
9		,47	
105		,46	
118		,44	
132		,41	
5			,66
36			,63
27			,58
148			,55
95			,46
131			,40
31			,66
162			,61
76			,49
64			,48
122			,47
113			,44
170			,44
46			,41

When the variances and factor correlations of the subscales are considered according to NTTM's temperament types, the values obtained are shown in Table 4.

Table 4.
Variances and factor correlations of the subscales

		Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Type 9
Type 1	Pearson Correlation	1								
Type 2	Pearson Correlation	-,08*	1							
Type 3	Pearson Correlation	,16**	-,09**	1						
Type 4	Pearson Correlation	,02	,10**	,02	1					
Type 5	Pearson Correlation	,17**	-,27**	-,04	,38**	1				
Type 6	Pearson Correlation	,09**	,28**	-,06	,30**	,17**	1			
Type 7	Pearson Correlation	-,20**	,03	,24**	,06	-,18**	-,14**	1		
Type 8	Pearson Correlation	,20**	-,21**	,39**	,03	-,001	-,25**	,31**	1	
Type 9	Pearson Correlation	-,03	,15**	-,13**	-,005	,11**	,13**	-,22**	-,47**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

For every temperament sub-type, the group was divided into lower 27 % and upper 27 % groups and item discrimination was determined. According to the results, all the items have a good level of discrimination (Table 5).

Table 5.
Lower - Upper Group Statistics / Discriminant Validity

Temperament Type	Lower Group	Upper Group	t test
Type 1	19.33±4.07	19.84±4.38	144.63
Type 2	17.82±4.29	18.39±4.61	126.89
Type 3	17.02±3.44	17.47±3.74	149.84
Type 4	20.59±3.94	21.07±4.28	157.92
Type 5	26.33±5.10	27.01±5.74	154.72
Type 6	17.23±3.82	17.77±4.12	137.84
Type 7	19.20±3.87	19.73±4.18	151.37
Type 8	20.99±4.57	21.61±4.92	139.86
Type 9	18.30±4.24	18.86±4.57	131.87

p<0.001

Confirmatory Factor Analyses

In confirmatory factor structure, the fit to the model and the stability model of the data were evaluated. As shown in Table 6, confirmatory factor analyses coefficients are in acceptable level.

Analysis was applied to all items of 91-item scale according to NTTM in confirmatory factor analysis. According to this, NTTM's CFI value is 0.88, GFI value is 0.84, IFI value is 0.88 and RMSEA value is 0.05. Chi-square/degree of freedom is calculated as 2.92. All coefficients of temperament dimensions and items are larger than 0.2 and statistically significant (p<0,05). When temperament sub-scales are analysed with confirmatory factor analysis, CFI value is found to be between 0.82 and 0.96, GFI value between 0.84 and 0.96 and RMSEA value is found to be between 0.05 and 0.11.

Table 6.

Confirmatory Factor Analysis Coefficients of NTTS

Subscales	CFI	GFI	AGFI	NFI	RMSEA	X^2
Whole scale	0.88	0.84	0.73	0.82	0.05	15193.33
Type 1	0.91	0.94	0.89	0.90	0.09	334.53
Type 2	0.94	0.94	0.93	0.90	0.09	298.07
Type 3	0.88	0.95	0.91	0.86	0.09	227.94
Type 4	0.82	0.91	0.86	0.81	0.11	478.02
Type 5	0.96	0.94	0.91	0.94	0.07	349.44
Type 6	0.94	0.96	0.93	0.93	0.07	204.61
Type 7	0.85	0.93	0.88	0.83	0.10	383.75
Type 8	0.94	0.92	0.87	0.93	0.11	416.58
Type 9	0.94	0.95	0.92	0.93	0.08	242.07

CFI: comparative fit index   GFI: goodness- of-fit index   AGFI: adjusted goodness of fit index

NFI: normed fit index   RMSEA: root mean square of error approximation

Path diagram is shown below (Figure 1).
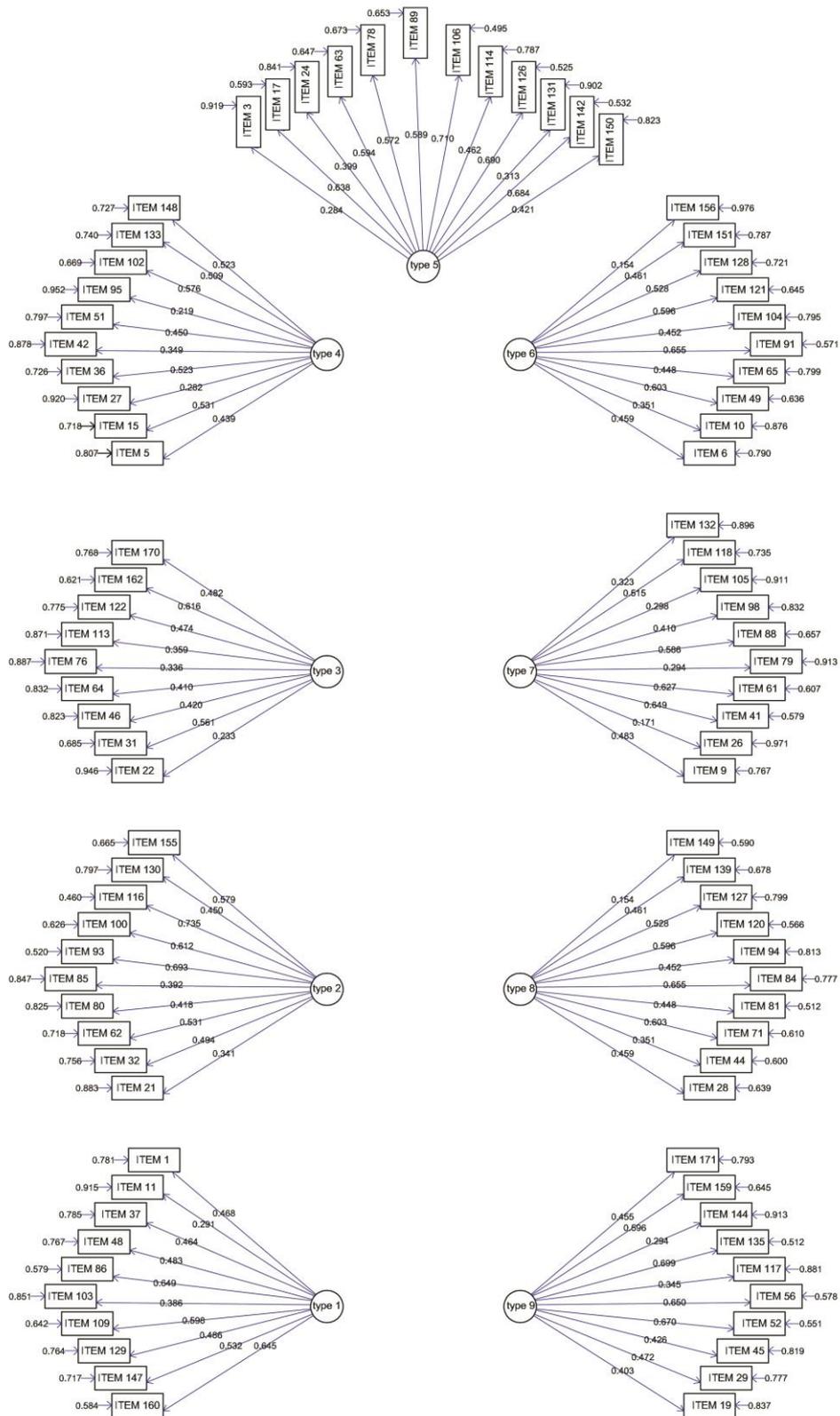
Chi-Square= 15193.33, df=3968,
P-value=0.00000 RMSEA=0.054,
CFI= 0.880

Figure *1.* Path Diagram

Concurrent Validity Analyses

Concurrent validity of 91 item NTTS form was evaluated using Cloninger's TCI (Temperament and Character Inventory) and Akiskal's TEMPS-A (Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto-questionnaire Version) scales. The statistical relation between the temperament dimensions obtained from NTTS and those from TCI and TEMPS-A scales were analyzed with Pearson correlation test.

Scale validity analyses were conducted with 100 healthy volunteers without any Axis-I disorder according to SCID-I chosen randomly from relatives of patients who applied to EPERH Outpatient Department of Psychiatry. The criterion for enrolment was signing the voluntary consent form; while the criteria for exclusion was being under treatment for any psychiatric disease, alcohol and/or substance abuse (except for nicotine). 91-item NTTS was applied to participants together with TCI and TEMPS-A scales in a single session, and the socio-demographical features of participants were recorded. The mean age of participants is 31.5±9.7, while mean education duration is 12.4±3.8 years. Of 56 female and 44 male subjects, 45% are married and 65% are working.

Correlation analyses between NTTS, TCI and TEMPS-A were shown on Table 7 and Table 8.

Table 7.
Correlations Between NTTS and TCI Subscales (Pearson correlation test)

	TCI Subscales						
Subscales	NS	RD	P	HA	ST	C	SD
Type 1	-0.38 ***	0.06	0.31 ***	0.01	0.06	0.08	0.11
Type 2	0.17	0.58***	-0.14	0.13	0.19	0.25*	-0.28
Type 3	0.11	-0.35***	0.23*	-0.31***	0.08	-0.45***	-0.12
Type 4	0.45***	0.04	-0.16	0.19	0.44***	-0.26**	-0.56***
Type 5	-0.18	-0.37***	-0.11	0.30**	0.003	-0.36***	-0.25*
Type 6	-0.04	0.21*	-0.22*	0.53***	0.07	-0.11	-0.57***
Type 7	0.47***	0.24*	-0.09	-0.22	0.26	-0.13	-0.34***
Type 8	0.24*	-0.12	0.04	-0.18	-0.04	-0.43***	-0.34***
Type 9	-0.16	0.32***	-0.04	-0.02	0.20*	0.44***	0.07

***p<0.001, **p<0.01, *p<0.05

Table 8.
Correlations of NTTS and TEMPS-A Subscales (Pearson correlation test)

TEMPS-A Subscales					TEMPS-A Subscales					
Subscales	DT	ST	HT	AT	IT	Subscales	DT	ST	HT	AT	IT
Type 1	0.21*	-0.05	0.16	0.19	0.07	Type 6	0.56***	0.55***	-0.20*	0.64***	0.49***
Type 2	0.28	0.47***	0.12	0.42***	0.38	Type 7	0.03	0.44***	0.45***	0.25	0.41***
Type 3	-0.02	0.03	0.52***	-0.03	0.15	Type 8	0.09	0.24	0.50***	0.21	0.53***
Type 4	0.24	0.67***	0.06	0.40***	0.45***	Type 9	0.22**	0.02	0.008	0.15	-0.21
Type 5	0.34***	0.18	-0.28**	0.24	0.28						

***p<0.001, **p<0.01, *p<0.05

There is a significant relation (p<.001) between Type 2 and RD sub-dimension, Type 6 and HA sub-dimension, Type 7 and NS sub-dimension, Type 9 and C sub-dimension in the correlation analysis between NTTS and TCI.

According to the correlation analysis between NTTS and TEMPS-A, there is a significant relation (p<.001) between Type 4 and ST, Type 6 and AT, Type 7 and HT.

Reliability Analyses

In reliability analyses, Cronbach alpha internal consistency analyses of the sum and sub-dimensions of the scale were calculated When internal consistency analyses were applied to all 91 items of the scale, Cronbach alpha value was calculated as 0.75. However, as this scale represents individual temperament structures and not a whole, internal consistency was also calculated for every temperament type (Table 9). Cronbach alpha internal consistency coefficients of temperament types vary between 0.68 and 0.83. Intraclass correlation coefficients of all temperament dimensions were found between 0.68 and 0.83 and were statistically significant (p<0,001).

Table 9.
Reliability Analysis Coefficients of NTTS

Subscales	Cronbach alpha coefficient	Subscales	Cronbach alpha coefficient
Whole scale	0.75		
Type 1	0.77	Type 6	0.74
Type 2	0.79	Type 7	0.71
Type 3	0.68	Type 8	0.83
Type 4	0.71	Type 9	0.77
Type 5	0.80		

p<0,01

NTTS was re-applied to 50 participants after two weeks, and test-re-test analyses were applied on 46 participants who have filled the scale appropriately. According to this, correlation coefficients for every temperament type were calculated (Table 10).

Table 10.
Test-re test correlation coefficients of NTTS

Subscales	Measurement 1	Measurement 2	Test- re test correlation coefficients	Subscales	Measurement 1	Measurement 2	Test- re test correlation coefficients
Type 1	19,57±4,23	20,55±4,25	0.78***	Type 6	17,51±3,96	15,46±4,02	0.69***
Type 2	18,08±4,45	19,10±4,53	0.83***	Type 7	19,47±4,02	18,44±4,01	0.81***
Type 3	17,23±3,59	19,16±3,74	0.73***	Type 8	21,29±4,75	21,22±4,82	0.93***
Type 4	20,84±4,12	21,80±4,03	0.79***	Type 9	16,87±3,98	18,07±3,90	0.65***
Type 5	26,67±5,38	24,58±5,59	0.72***				

*** p<0.001

Discussion

The discussion on validity and reliability of NTTS will be carried out from the results of 91-item form which is reduced from 171-item form after explanatory factor analysis.

The correlation of gender with some temperament types can be related to the limited age span of subjects. Applying the scale on a larger sample group could alter the findings. Nevertheless, according to the nature of some temperament types, it might be possible for some of them to occur more frequently along men or women, which is independent from the size of the sample group (for eg. female type 2 and 6; male type 5, etc.) In addition, future studies which will determine the relation between temperament types and genetic transfer, might help to consider the relation between temperament types and gender.

Structural Validity Analyses

In the explanatory factor structures of NTTS, all temperament types are represented in factor structures as a block with all their items, except for type 4. Types, 8, 5, 2, 6 and 1 have the most unique structure. Types 7, 3 and 9 are represented partially in factors. The reasons why these temperament types are represented in more than one factor structure are as follows. For type 7, relation based attitudes and features that give pleasure, such as being witty and humorist, having fun by annoying and mocking people and features of mental processes, such as lack of concentration, being unable to focus on one subject and fast thinking might be represented by different factors. For type 3, features of success-oriented, pragmatic thinking strategies, such as having no boundaries to advance in a career, to ignore ethical rules and principles, and phenomenological features of narcissistic acceptance such as being appreciated, to impress and be admired might be represented by different factors. For type 9, features upon which the relationships are based, such as avoiding anger, being compliant, not interfering with problems around and energy-saving attitudes such as not being in a hurry and slowing down duties could be represented by different factors. There are two items not represented in explanatory factor structure: item 103 (I criticize and judge people around me for not carrying out their duties better) and item 117 (As I tend to ignore things that might disrupt my peace, there are times when I am late to intervene to events around me). The reason why item 103 is excluded is that the general attitude type 1 tempered individuals display might be perceived as a positive moral duty-obligation by other types. The reason why item 117 did not appear in factor structure might be that, due to lack of emphasis in the item, "being in peace" is understood in its most general state desired by types other than 9, whereas it is a general attitude displayed by type 9 tempered individuals.

When factor correlations of the subscales are considered according to NTTM's temperament types, the obtained values prove that the types are not interrelated and are independent from each other.

Confirmatory factor analysis proves that the structure of the whole scale and all temperament types are significant, and model coherence coefficients and error of approximation coefficients have acceptable values. However, model coherence coefficient and error of approximation coefficient of type 4 are at the lowest acceptable level. The fragmented structure of type 4 in explanatory factor analysis shows that the items that try to determine the temperament structure do not thoroughly cover a unique temperament model. One reason for this might be related with the lack of subject number, since this type is less prevalent in the society when compared to other types. Another reason is that, due to their individualist and unique nature, type 4 tempered people build their identities upon being different from everyone else and do not care about theories and evaluations that categorize people. In addition, abstracting feelings of sorrow, grief and sadness introverted like type 5 tempered people and the difficulty of understanding oneself due to emotional unclarity and confusion caused by ambivalent mind structure similar to that of type 6 could cause this result (Yılmaz, 2010). In any case, type 4 was defined as a validly usable temperament dimension. In the confirmatory factor analysis, except for Type 4, Types 3 and 7 have the lowest acceptable CFI score. Their narcissistic structure and efforts to look well might cause Type 3 individuals to answer negative items without

being objective; thus explaining the low CFI score. Type 3 individuals might give positive answers to Type 8 items, because they do not let their feelings get in the way when reaching for their aims, they can easily use and let go off their relations for their own benefit, they are ambitious and they like to be in the spotlight. When answering the NTTS items, Type 7 individuals can get bored easily, lose their concentration because they are easily distracted and might not spare enough attention due to their impulsiveness. These qualities can explain their low CFI score. As a result, structural validity for NTTS is provided.

Comparative Scale Validity of NTTS with TCI and TEMPS-A

When results are evaluated, it can be asserted that NTTS temperament types show highly consistent and significant correlations with scale dimensions and categories that are widely used in psychiatry practice. These results will be discussed below, separately for each temperament type.

Type 1 individuals are perfectionistic, meticulous, neat, controlled, disciplined and diligent (Yılmaz, 2010; Yılmaz et al., 2011). Cloninger's P temperament dimension manifests as diligence, determination, ambition and perfectionism (Cloninger, Svrakic, Pryzbeck, 1993). Therefore, it is an expected result that Type 1 temperament has a positive correlation with the P temperament dimension. Type 1 individuals are strict, prescriptive, conservative, cautious, systematically and well organized (Yılmaz, 2010). According to Cloninger (1986; 1987), the NS dimension manifests as openness to new discoveries, curiosity, impulsiveness and lavishness. These features explain negative correlation between Type 1 and NS dimension. Type 1s' pursuit for flawlessness is transformed into an effort to make not only themselves, but also their conditions and relation objects perfect. At the same time, this situation results in being tense and open to risk of disappointment. When Type 1s believe that they cannot change their conditions and surroundings -no matter how perseverant and compelling they are- a melancholic depression may occur (Yılmaz, 2010). In Akiskal's definition of DT category, features of hopelessness, being pessimistic, self-judgment and excessive contemplation on inadequacies (Akiskal, 1989) explain the positive correlation between Type 1 temperament and DT.

Type 2s are emotional, warm-blooded, extroverted, social individuals that highly appreciate their relationships (Yılmaz et al., 2011). Emotional response they expect from their relationships and social acceptance may develop emotional dependency (Yılmaz, 2010). According to Cloninger, RD is observed as excessive emotionality, social sensitivity, being involved and dependency on others' acceptance (Cloninger et al., 1993). These features explain positive correlations between Type 2 with RD. Type 2s are very sensitive, compassionate and helpful in their relations. According to Cloninger, C manifests with the features of being simple-hearted, helpful, compassionate and conscientious (Cloninger et al., 1993). These features explain the positive correlation with type 2 and C. Cloninger defines SD dimension as self-acceptance, self-sufficiency, not considering others accountable for choices of oneself, defining individual aims and targets (Cloninger et al., 1993). Type 2s develop emotional dependency in their relationships and sacrifice their personal autonomies for satisfaction of warm and fulfilling feelings (Yılmaz, 2010); therefore it is expected that they have a negative correlation with SD. Instability of behaviour depending on liability caused by emotional judgments in relation process accompanies a prevalent anxiety with the increase of controlling impulses. AT is related with subliminal continuity of expectancy and situational anxiety, being tense and having pessimistic perspective (Akiskal, 1989); while ST is characterized with contrasts in subjective and behavioural appearance, (Akiskal, 1979). According to these, it is an expected result to find a positive correlation between Type 2 with ST and AT.

Type 3s prove their existence with their successes and try to overcome all obstacles with an untiring energy to reach their target. They are ambitious and hardworking (Yılmaz, 2010). Individuals with high P features are ambitious, hardworking, tend to show an excessive effort to responses of reward and are more successful than expected. Type 3 displays a positive correlation with P. Cloninger associates HA dimension with features like anxiety, timidity, pessimism, tiredness and cowardliness (Arkar, 2008). Type 3's structure does not let feelings become obstacles, it is energetic

and ready to take any risks to achieve its targets (Yılmaz, 2010); therefore these features can explain the negative correlation with the HA. Type 3 features like narcissism, weakness of emotional bonds in relations, ability to abuse relations for their own interests and then leave them behind when necessary (Yılmaz, 2010), can explain negative correlations with C and RD. They easily focus on their targets, reduce their needs for sleeping and resting in order to reach their goal(s), aim to have popularity and an attractive image for others around, are extroverted individuals and have an excessive self-confidence (Yılmaz, 2010). Poor sleeping habits, excessive self-confidence, being pretentious, extrovertedness and assiduousness features (Akiskal & Mallya, 1987) of HT is compatible with Type 3. Therefore a positive correlation between Type 3 and HT is an expected result.

Type 4s are generally introverted, unique, individualist, extraordinary and marginal. They always seek the new and original (Yılmaz, 2010). It is an expected result to find a positive correlation between features like curiosity to discover, openness to novelty and effort to be extraordinary in Cloninger's NS dimension and Type 4. ST dimension is related with features like caring about spiritual values, being intuitional, idealist and distant from selfishness, as well as having a creativity far from traditionalism (Cloninger et al., 1993). Type 4's pursuit for uniqueness provokes their creativity. Their effort to reach a mystical awareness with the help of love brings an existence at an intuitional and spiritual level (Yılmaz, 2010). In relationships they display empathetic, sensitive, compassionate, unselfish and altruistic attitudes (Palmer, 1991). Therefore a positive correlation between Type 4 and ST is expected. Type 4s stand out with individualism and insouciance to social acceptance (Yılmaz, 2010). This explains the negative correlation between Type 4 and C. While trying to form their identity in the supra-object/intellectual realm, they may have troubles with object relations in the real level. Feelings at extremes can cause irritability, dysphoria and anger crisis. It can cause opposite and impulsive actions in the behavioural field. The ambivalence they experience between caring-not caring for social acceptance, passion-hatred, being attached-not being attached can reveal their anxieties on being accepted – abandoned (Yılmaz, 2010). ST is completely compatible with Type 4's affective component. In addition, it is an expected result to find positive correlation with IT (irritability, quick temper, impulsiveness, dysphoria, pessimism and excessive complaining) and AT (Akiskal, 1989).

Type 5s are introverted, timid, asocial individuals with negative thoughts and prone to paranoid speculations (Yılmaz et al., 2011). HA is observed as social inhibition, avoiding strangers, having pessimistic thoughts with the expectation that some troubles will occur in situations that others do not worry about and having a fear of uncertainty (Cloninger, 1986 ; 1987). A positive correlation with Type 5 and HA is expected. Cloninger defines RD as sincerity in relations, excessive emotionality, sensitivity, warm-bloodedness and tendency to be attached (Cloninger et al., 1993). Type 5s are introverted individuals who like loneliness; they are emotionally cold and indifferent to relationships (Riso & Hudson, 2000). C is associated with social acceptability, empathy, helpfulness and mercy (Cloninger et al., 1993). Type 5s do not care about social acceptance and emotions; they are distant to empathy and do not like to share (Yılmaz, 2010). A negative correlation is expected with Type 5 and dimensions of RD and C. They like to stay alone. Rather than establishing direct relations with objects, they like to observe events from outside. They can speculate the data in a pessimistic and sceptical way (Yılmaz, 2010). Their silent, timid, introverted structure is compatible with DT, which is defined with features like quietness, passiveness, low psychomotor energy, pessimism, scepticism and being introverted (Akiskal, 1989); therefore type 5 and DT is positively correlated. The opposite features of type 5 and HT (extroverted, social, over talkative, warm-blooded, optimistic) explain the negative correlation between them (Akiskal, 1979).

Type 6s are security and safety oriented, therefore they try to calculate all possibilities against uncertainties. They are cautious, anxious, pessimistic and doubtful (Yılmaz et al., 2011). Type 6 is totally compatible with HA and to find a positive correlation is expected. For an intellectual satisfaction free from worries, Type 6s need an authority figure that will be a centre of reliance and

support, while feeling anxious about getting harm. This way they become dependent and ask for approval in their relations. RD's association with attachment and dependency on approval of others (Cloninger et al., 1993) can explain the positive correlation between RD and Type 6. Type 6's dependency patterns, difficulty in making decisions and openness to external factors for orientation, as well as the desire to exist within a group –not as the leader and not as the last follower- rather than existing individually (Yılmaz, 2010) explains the negative correlation with SD. Attributes like cowardliness, ambivalence, indecisiveness, inability to get into action without an authority figure explain the negative correlation of Type 6 with P. They are doubtful, over cautious, controlling individuals with self-confidence problems. Their concerns about future and security can cause pessimism; while their effort to control all processes can cause tension, nervousness, reactional attitudes, indecisiveness and ambivalence (Yılmaz, 2010). Type 6s have the most apparent anxiety potential among NTTM types (Yılmaz et al., 2011). They can often experience depression triggered with anxieties, intense contemplation, as well as opposite feelings and actions. Therefore it is an expected result to find positive correlation between type 6 and AT, DT, ST and IT. It is suitable to find negative correlation with generally non-interfering, calm, unpretentious, distant to new experiences (conservative), pessimistic, cautious and non-impulsive structure of Type 6 and over optimistic, easily contacting with people, incautious, interfering and pretentious HT.

Type 7s are highly active individuals who are most open to novelties and have the most curiosity to discover. They are easily bored with monotonous situations and relations (Yılmaz et al., 2011). The cycle of seeking novelty and pleasure can lead Type 7s to act impulsively, lavishly and inconsistently (Yılmaz, 2010). NS dimension is associated with openness to novelties and discoveries, curiosity, enthusiasm, getting bored easily, impulsiveness and lavishness (Cloninger, 1986 ; 1987). Therefore, positive correlation is an expected result. Type 7s avoid problems and responsibilities; may have troubles with focusing, having goals and self-discipline. They can be inconsistent and impulsive individuals (Yılmaz, 2010). SD dimension is related with taking responsibility of oneself, not avoiding problems, being purposeful and disciplined (Cloninger et al., 1993). Therefore it is expected to find negative correlation with Type 7 and SD. They like to act individually and avoid being attached (Riso & Hudson, 1999), therefore these features explain the negative correlation with RD. Type 7s are extroverted, active, enthusiastic, cheerful, talkative, optimistic and impulsive individuals (Yılmaz, 2010); therefore it is possible to state that Type 7 completely matches with HT (cheerful, over optimistic, warm-blooded, extroverted, talkative) category (Akiskal, 1979). Being quick tempered when restrained, hyperactive and impulsive nature of Type 7s may explain the positive correlation with the IT (irritability, quick temperedness, impulsiveness, dysphoria) (Akiskal, 1989). Type 7's impulsive inconsistencies can be observed as ambivalent behaviour and attitude (Yılmaz, 2010), therefore it explains the positive correlation with ST.

Type 8s are energetic, enterprising, quick to get into action, like to take risk and are quick tempered individuals (Yılmaz et al., 2011). Finding positive correlation with Type 8 and NS, which is associated with proneness to novelty, impulsiveness and irritability (Cloninger, 1986 ; 1987) is an expected result. Type 8s are grandiose, self-centered, tough individuals that prioritize their own benefits and insensitive to others' feelings (Yılmaz, 2010). C dimension's association with features like empathy, helpfulness and social acceptance can explain its negative correlation with Type 8 (Cloninger et al., 1993). Although Type 8s care a lot about their personal autonomy and fulfilling their responsibilities, as well as have a skillful nature to solve problems (Yılmaz, 2010), the negative correlation with SD can be explained with some of Type 8 items in our scale to be related with mostly impulsive features, such as being authoritative, tough, quick tempered and intervening. It can be stated that Type 8's dominating, intervening, irritable, impulsive and impetuous features (Yılmaz, 2010) completely match with IT (Akiskal, 1989). Type 8's grandiose, extroverted, enduring, challenging nature that dislikes restraints can explain the positive correlation with HT (Akiskal, 1979).

Type 9s are peaceful, compatible, soft, and pliant in their relations and care about social acceptance (Yılmaz et al., 2011); therefore it is expected that these features show positive correlation with C (Cloninger et al., 1993). They establish affectionate relationships; they desire to integrate with their relation objects, which eventually forms an attachment pattern, and cannot say "no" (Yılmaz, 2010). These features explain the positive correlation with RD. Type 9's features like softness, prioritizing other's needs, regarding spiritual connections (Yılmaz, 2010) explain the positive correlation with ST. Type 9s have an introverted, shy, calm, passive nature; they are sometimes distrustful of themselves (Yılmaz, 2010). These features are compatible with DT, therefore it explains their positive correlation.

Reliability Analyses

Considering internal consistency of the scale in reliability analyses, internal consistency coefficient of the whole scale as well as every temperament type is at the acceptable level. Only for type 3, internal consistency coefficient is at the lowest acceptable level; however this temperament type displayed a unique structure in factor analyses. Having an internal consistency value lower than expected could be related to type 3 participants' being uncomfortable with items that highlight success-oriented, pragmatic thinking strategies and narcissistic features, such as having no boundaries to advance in a career, to ignore ethical rules and principles, to impress people and be admired (Yılmaz et al., 2011).

These results show that Nine Types Temperament Scale is reliable.

Conclusion

NTTS is a scale that allows defining a profile related to the temperament type(s) of a person according to NTTM. According to NTTM, types are categorical and consist of traits. However, when answering the scale items, individuals not only answer the items of their own temperament type, but also others. Therefore, our scale determines in which ratios an individual is related with nine temperament types that are categorically proposed. Since there are no diagnostic criteria formulated for temperament types, the final determination of the temperament type of an individual is possible with personal interview conducted by a clinician who has prior knowledge on NTTM.

This study was conducted to determine the reliability and validity of NTTS for our society. As there are no existing measuring devices or diagnosis criteria in this field, all validity studies were carried out indirectly. To overcome this problem, comparative criteria validity was proven with present temperament scales.

The advantageous parts of this study can be listed as the application of the study on a big subject group, obtaining quite a homogenous group and enabling the scale to prove its own performance with minimum external effects. This way, structural validity and reliability data were obtained under experimental conditions. On the other hand, to test the representability of the society, the scale validity was studied for outpatients in a psychiatry hospital, which will be able represent the society better. Relevant reliability and validity methods were studied for this scale. Future studies on application of NTTS on different sample groups will increase generalization and pervading of the scale in the society.

Validity and reliability study of NTTS is an initial study carried out in the frame of NTTM. In the future studies that will be conducted in this field, research on how nine factors are grouped with top level factor analyses and further studies on determining the relation between temperament dimensions will provide a wider perspective for researchers.

Case formulation in psychiatry will be enriched with the use of NTTM. To improve this perspective, we tested the validity and reliability of NTTS with this study. In clinical practice, using NTTM and therefore NTTS will help a lot to understand and formulate patients.

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