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Turkish adaptation and validation of Spielberger's State Anger Subscale

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Abstract

The purpose of this study was to investigate the psychometric properties of the Turkish version of the State Anger Subscale of Spielberger using a sample of Turkish undergraduate students aged 18 to 31 years. The scale's reliability and validity were assessed by examining its internal consistency, factor analytic structure, concurrent, and construct validity. Supporting the validity of the scale, one factor structure underlying the original form was replicated. A statistically significant relation between the State Trait Anger Expression Inventory and the Novaco Anger Scale was also found. Regarding construct validity, an experimental manipulation using anger induction and imagination revealed a significant difference between experimental and control group. Overall, the findings indicate that the State Anger Subscale is a reliable and valid assessment tool for research and clinical practice to identify angry people in Turkey.

Keywords: State anger, anger expression, adaptation, STAXI, emotions.

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1. Introduction

Anger is a common uncomfortable emotion that many people experience in daily life with destructive effects, including involvement in many pathological problems. Anger has therefore come to be recognized as a crucial social problem worthy of clinical attention and systematic research, especially in the last two decades (Novaco, 1975; Bandura, 1973; Spielberger, 1988; Berkowitz, 1989). Historically, there have been many different and definition of anger. Spielberger (1988), who has a prominent place in anger studies, conceptualized accepted anger as an emotional state composed of different feelings of various intensity levels, ranging between mild irritation and intense rage.

In general, the most commonly used definitions of anger have been constituted according to the behavioural, cognitive and emotional components of the anger concept. Novaco's (1975) cognitive-behavioral conceptualization identified anger as a stress reaction with three response components: cognitive, physiological, and behavioral. Novaco (1975) defined the cognitive component as the perception of social stimuli, attributions concerning responsibility, and evaluation of oneself and the situation. Together with cognitive deficits and distortions, aggressive individuals display high levels of emotional and physiological arousal. Deffenbacher (1999) also emphasized the co-occurrence of emotional, cognitive, and physiological components, and their rapid interaction with and influence on each other as a singular phenomenon. Kassinove and Sukhodolsky (1995) provide the most comprehensive definition: "anger is a negative, internal feeling state associated with specific cognitive and perceptual distortions and deficiencies, subjective labeling, physiological changes, and action tendencies to engage in socially constructed and reinforced organized behavioral scripts" (p.179).

Researchers have also focused on the need to differentiate anger expression, as angry or hostile outward behavior, from anger experience, which is the tendency to feel anger emotions inwardly (Moscovitch, McCabe, Antony, Rocca & Swinson, 2008). In his more comprehensive definition, the State-Trait Anger Theory, Spielberger (1988) labeled the phenomenology of anger experience as state anger, defined as a psychobiological feeling that varies in intensity (from mild irritation to fury), accompanied by physical reactions indicating autonomic nervous system arousal. Thus, he considered an individual's tendency to experience intense angry feelings (state anger) as the other component of anger experience, which he called trait anger. Anger expression can involve directing this feeling outwardly toward other individuals through violent behavior or directing it inwardly by trying to suppress or hold in angry feelings like anxiety (Spielberger, 1994; Deffenbacher, 1999).

Depending on the state-trait distinction, anger is considered a psychobiological emotional state or condition characterized by a broad range of subjective feelings, such as intense or mild irritation, annoyance, intense fury and rage (Spielberger, et al., 1983). Among different anger theories, the state-trait distinction is important as it entails assigning the intensity of emotional states and individual differences in personality traits into two different categories. Although many assessment tools have been developed for the anger concept, no measures explicitly took the state–trait distinction into account until the development of Spielberger's State-Trait Anger Inventory. Traits represent stabilities of behavior and beliefs about our dispositions. However, the variation over time of a person's state of mind or transient internal conditions must be considered as important for assessment. In principle, although states may refer to any reliably measurable characteristic, state variables typically refer to conscious, verbally reportable qualities like moods. Trait-state models are important because they tell us something about how traits influence behavior. These effects are mediated by states; that is, states have a more direct effect on behavior than traits (Eysenck, 1982). Research on anger indicates that the presence or activation of a state implies some tangible, perhaps observable, here-and-now referent. Traits, however, are never here-and-now in the way states are so one can term a state a concrete entity and a trait an abstract one (Spielberger et al., 1988; Fridhandler, 1986).

Besides, in Turkey, some assessment tools have been developed for the anger concept, however; no measures took the state–trait distinction into account. Only, Ozer (1994) attempted to adapt STAXI into Turkish but he left out adaptation of state anger subscale. Thus, a need to adapt State Anger Subscale to

Turkish culture came to light. To achieve this, the present study aims to assess reliability and validity of the Turkish version of the State Anger Subscale.

1. Method

1.1. Participants

To assess the reliability and validity of the State Anger Subscale 211 undergraduate students (147 female, 69 % and 64 male, 30 %), whose ages ranged from 18 to 33 (M=21, SD=2.3), were recruited by convenience sampling. From this sample, 60 undergraduates (30 female and 30 male, average age 22, ranging from 20 to 30) also voluntarily participated in the experiment.

1.2. Instruments

The newly adapted Turkish version of the State Anger Subscale was used in this study, along with the Trait Anger and Anger Expression Inventory (adapted into Turkish by Ozer, 1994), the Novaco Anger Inventory (translated by Tekinsav-Sutcu and Aydin, 2008), and an additional demographic form (sex, age, education, etc.). The STAXI can be administered to individuals aged 13 and above who have a fifth grade reading level.

1.2.1. Spielberger's State-Trait Anger Expression Inventory (STAXI)

The STAXI is a 44-item inventory developed for two major purposes: first, to help measure the components of anger for assessing normal behavior; second, to investigate the role of various components of anger in the development of pathological problems. The STAXI has three parts: How I feel right now (10 items), How I generally feel (10 items), and How I generally express anger (24 items). Each item uses a 4-point Likert scale from 'not at all' to 'very much so', or from 'almost never' to 'almost always'.

The first part concerns state anger, defined as "a psychobiological state or condition consisting of subjective feelings that vary in intensity, from mild irritation or annoyance to intense fury and rage, with concomitant activation or arousal of the autonomic nervous system" (Spielberger, 1988). It is further assumed that state anger fluctuates as a function of perceived affronts, injustice, or frustration. The second part concerns trait anger, which is defined in terms of individual differences in the frequency that state anger is experienced, assuming that people high in trait anger perceive a wider range of situations as anger provoking (e.g. annoying, irritating, or frustrating) than those low in trait anger, and that they more frequently experience elevated state anger whenever the encounter such conditions.

The third part concerns anger expression (AX), to measure the intensity of state anger and the frequency of its expression or suppression. Spielberger et al. (1985) constructed a scale to measure anger expression unidimensionally, combining anger-in and anger-out constructs. Anger-in was defined in terms of how often angry feelings are experienced but not expressed (suppressed) whereas anger-out is the frequency that angry feelings are expressed verbally or through physically aggressive behavior. The 24 AX scale items included descriptions of the suppression of angry feelings (AX/In) or the aggressive expression of anger (AX/Out).

Ozer (1994) investigated STAXI's psychometric properties in the Turkish population, excluding the first part (State Anger Subscale). The Turkish adaptation of the Trait Anger and Anger Expression Scale (TAAES), using a 4-point Likert-type response scale, consists of 34 items, including a 10-item trait anger scale and a 24-item anger expression styles scale (for anger- in, anger-out, and anger control). Higher scores on trait anger indicate higher anger levels; higher scores on the anger-in subscale indicate higher levels of suppressed anger; higher scores on the anger-out subscale indicate easier anger expression,

and higher scores on the anger-control subscale indicate better anger control. The internal consistency coefficients of the scale were .79 for trait anger dimension, .84 for anger control, .78 for anger-out, and .62 for anger control (Ozer, 1994).

The State Anger Subscale (SAS) of Spielberger's STAXI consists of 10 items assessing anger at a specific time (here and now). This study developed a Turkish version of the scale using translation and back-translation in accordance with standard recommended procedures (Sousa and Rojjanasrirat, 2011) for translation and cross-cultural adaptation.

1.2.2. Novaco Anger Scale (NAS)

In order to provide criterion-related evidence of concurrent validity, this study explored correlations between the Novaco Anger Scale (NAS) and the Turkish-adapted STAXI scales. NAS, developed by Novaco (1993), is a two-part instrument. Part A consists of 48 items rated on three-point scales to measure the cognitive, arousal, and behavioral domains of the anger construct. The cognitive subscale items focus on suspiciousness, attention toward anger cues, and hostile attitudes. Items on the arousal subscale assess duration and intensity of angry feelings, and feelings of tension or irritability. The behavioral subscale items focus on impulsive behavior, verbal and physical aggression, and general anger expression strategies. The 25-item Part B scale is essentially a shortened version (with four-point scales) of the original NAS that measures the degree of responsiveness to a variety of anger-provoking situations across five subscales (Novaco, 1993). Tekinsav-Sutcu and Aydin (2008) adapted the 25-item short-form NAS into Turkish, which assesses state anger or provocation level of anger. This instrument includes 25 different anger-provoking situations. Cronbach alphas were .93.

1.3. Procedure

After necessary approval was obtained from Bahcesehir University Ethical Committee, students were informed about the main goal of the research, anonymity, and voluntary participation. Firstly, procedures for transliteral equivalence of the SAS were completed according to the standard procedures of Sousa and Rojjanasrirat, (2011). The first step was forward translation of the original instrument (STAXI; Spielberger, 1983) into the target language. This was done independently by ten monolingual, native-Turkish-speaking translators who had written and taught in English. In the second step, a third independent translator with an advanced level of English, having written and taught in English, and familiar with psychological terminology compared the ten translated (Turkish) instruments with each other and with the original instrument. Because the translations mostly varied, a multiple-choice test of the translated items was prepared including all the state-anger items with the ten different translations.

Five psychology instructors who were knowledgeable about psychological terminology and had written and taught in English separately answered this multiple-choice test to determine the best translations of the items and the scale's instructions. Finally, two native-English-speaking translators with advanced Turkish, one of whom was knowledgeable about psychology whereas the other one was knowledgeable about the cultural and linguistic nuances of Turkish, independently completed a back-translation of the resulting translated instrument into English. A multidisciplinary committee then evaluated the similarity of these back-translated instructions, items, and response formats for wording, sentence structure, meaning, and relevance to the original scale. This showed that no item was unclear and needing revision, thereby completing preparation of the Turkish form of the SAS.

Data collection was done in two steps: administration of the instruments and the experimental study. International Test Comission (ITC) Guidelines for Test Adaptation (Hambleton, 2005) were followed for adaptation. The Turkish adapted version of SAS, TAAES, the short-form NAS, and additional demographic information questions were administered to students at the same time over 20 minutes. For the experimental study, the authors collected data and conducted experiments individually in the

counseling office with student volunteers. Before and after the experiment, the Turkish Adapted SAS and demographic forms were administered to the experimental and control groups. The average respondent took 10-12 minutes to complete the test.

A mixed experimental design was used in order to provide construct validity evidence of the Turkish State Anger Subscale. It is difficult for natural observation of anger to capture the moment that anger is experienced so this method tends to measures anger expression rather than experience. Therefore, some researchers prefer to use different anger induction techniques in a semi-structured context to assess anger experience. For example, Stemmler, Heldmann, Pauls and Thomas (2001) examined psychophysiological responses to anger inductions in both real-life and imagination. Real-life experience of an activity and its mental visualization generally evoke very similar changes in neurological processes (Driskel, Copper & Moran, 1994; Weiss, Hansen, Rost & Beyer 1994).Before the experimental study, a trial was conducted with 20 university students. This indicated that the imagination technique was preferred for inducing an angry mood to assess state anger. For the experiment, participants were instructed to close their eyes and follow the instructions to imagine an event for 10 minutes. This induction procedure was expected to effectively induce a specific state of anger while not inducing other negative mood states. Participants in the experimental group were instructed to remember an event which provoked anger (the most angering event they could remember) and imagining that event in detail. The control group participants were asked to imagine something which was not anger-provoking but neutral (imagine a possible campus environment).

For the second phase of the experiment, participants were asked to complete the SAS again, with the instructions emphasizing that they should respond in terms of how angry they had felt during the interaction. After the individuals had completed the post-test, a safe place exercise (Young, et al, 2003) was performed to minimize any negative effect of the study on subjects and reduce potentially angry feelings. Participants reported that this technique helped them to reduce their angry feelings.

2. Result

2.1. Construct Validity

2.1.1. Factor Analysis

In order to determine if the Turkish State Anger Subscale factor structure conformed to the original structure, a confirmatory factor analysis was run. Because the inter-item correlations were extremely high, measurement error was high so the analysis suggested a somewhat poor fit of the original Turkish State Anger Subscale factor structure in the Turkish sample. That is, a poor fit indicates that the hypothesized measurement model is inconsistent with the observed data, which is interpreted as evidence against the model's adequacy. Because of this poor fit, an exploratory factor analysis was conducted to determine the most general understanding of state anger in the Turkish sample. Accordingly, the 10 items of the SAS were subjected to factor analysis (FA) with maximum likelihood estimation. Prior to performing the FA, the suitability of the data for factor analysis was assessed. Inspection of the correlation matrix revealed many coefficients of .3 and above. The Kaiser-Meyer-Olkin measure of sampling adequacy was .88, indicating that the degree of common variance among the variables was "meritorious"; that is, the factors extracted in an FA would account for a fair but not substantial amount of the variance. Bartlett's test of sphericity was significant ($\chi 2$ (45) = 1474.59, $p< .05$), indicating correlations in the data set appropriate for FA.

The maximum likelihood analysis revealed the presence of two components with eigenvalues exceeding 1, explaining 59.8 % and 11.2 % of the variance respectively. An inspection of the scree plot revealed a clear break after the first component. Because of the insufficient number of primary loadings and difficulty of interpreting the second and subsequent factors, a one-factor solution was preferred with an eigenvalue of 5.9. The rotation solution, as shown in the Table 1, yielded one interpretable

factor, "state anger", which explained 59.8 % of the item variance. To aid in interpreting this component, an oblique rotation was performed. The rotated solution revealed a simple structure.

Table 1. Principal Axis Factor Analysis of State Anger Subscale Summary: One Factor Rotated Matrix Loadings

Factor 1	
Eigenvalues	5.9
Percent of Variance	59.7
Items	
1. Furious	.71
2. Irritated	.67
3. Angry	.76
4. Feel like yelling	.77
5. Feel like breaking	.77
6. Mad	.84
7. Feel like banging	.79
8. Feel like hitting	.69
9. Burned up	.75
10. Feel like swearing	.68

2.1.2. Experimental Study

To provide construct validity evidence of the Turkish State Anger Subscale, a 2 x 2 Mixed Design ANOVA was conducted with group (control, experimental) as the between-subjects factor and time (pre- and post-test) as the within-subjects factor. The experimental group was exposed to an anger induction via an imagination technique whereas the control group imagined a neutral event. The State Anger Subscale was administered both before and after the experiment.

Table 2. Means and Standard Deviations for State Anger Scores (Pre- and Post-Test Scores

Groups	Pre-Test (*M*)	Post-Test (*M*)	Pre-Test (SD)	Post-Test (SD)
Control Group (*n* = 30)	12.3	10.8	14.9	7.32
Experimental Group (*n* = 30)	12.2	23.3	13.98	6.22

The results showed a significant main effect for support, $F(1,58)=43.99$, $p<.01$, partial $\eta^2 = .56$. The control group (M = 10.50, SD = 2.68) reported significantly less state anger than the experimental group (M = 23.27, SD = 8.68). In this phase of the analysis, there was also a significant interaction between state anger level and time, Greenhouse-Geisser adjusted $F(1, 58) =76.7$, $p<.01$ partial $\eta^2 = .56$. The experimental and control groups showed no significant difference before anger induction $t(58) = -.16$, $p<.05$. After the anger induction, however, the control group reported significantly less state anger than the experimental group $t(58) = 7.51$, $p< .05$. Means and standard deviations for the control and experimental groups before and after the experiment are given in Table 2.

2.2. Reliability

In order to analyze reliability, item analyses were conducted on the 10-item State Anger Subscale. Initially, each item was correlated with the total score for state anger, which showed that Alpha reliability of the Turkish form of the State-Anger Subscale was high. Corrected item-total correlations of the Turkish form ranged between .63 and .78, with all items having item-total correlations above .50, with an average value of .71 (see Table 3)

Table 3. Corrected Item-Total Correlations of the Turkish State-Anger Subscale.

Group	Corrected item total correlation
1. Furious	.70*
2. Irritated	.67*
3. Angry	.76*
4. Feel like yelling	.75*
5. Feel like breaking	.74*
6. Mad	.78*
7. Feel like banging	.72*
8. Feel like hitting	.63*
9. Burned up	.70*
10. Feel like swearing	.65*
Scale Alpha	.92*

*p <.05

2.3. Reliability Convergent and Concurrent Validity

To provide evidence of convergent/concurrent validity, a Pearson correlation analysis was conducted between participants' Turkish adapted State-Trait Anger Expression Scale (STAX-I) scores and NAS scores. NAS was used to assess the concurrent validity of STAXI because both scales assess anger within a multidimensional model. The hypothesis was that the higher the STAX-I score, the higher the NAS. The Pearson Correlation indicated a coefficient of .87 between the two scales, indicating a significant, positive correlation (r=.45; p<.01).

To determine whether there was a significant relationship among the major study variables, namely state anger, trait anger, anger expression, and anger disposition, Pearson correlation coefficients for these variables were computed. In support of the convergent validity of the Turkish State Anger Subscale, significant positive correlations among variables were found, specifically between state anger, trait anger, anger expression, and anger disposition (NAS). These positive correlations are evidence for the criterion-related validity of the Turkish State Anger Subscale (see Table 4).

Table 4. Bivariate Correlations among STAXI subscales and NAS scores: State Anger, Trait Anger, Anger Expression, Anger Disposition (NAS scores)

Variables (Scales)	State Anger	Trait Anger	Anger Expression	Anger Disposition
State Anger	--	.39*	.21*	.21*
Trait Anger		--	-.38*	.57*
Anger Expression			--	.24*
Anger Disposition				--

3. Discussion

The results of the present study reveal that the internal reliability of the Turkish State Anger Subscale is high and consistent with the original scale (Spielberger, et al. 1983), and with adaptation studies conducted in China (Bishop & Quah, 1998), Italy (Comunian, 1992), Russia (Kassiove, Sukhodolsky, Eckhardt, & Tsytsare, 1997), and India (Ghosh & Sharma, 2006). The results suggest that the items in the total subscale were perceived as a homogenous unit by the Turkish sample. Alpha coefficients for the 10-item State Anger Subscale were .92 for Turkish undergraduate university students, indicating a high

degree of internal consistency for the State Anger Subscale, which is close to the findings for the original state anger subscale of STAXI (.90 or higher alpha coefficients) (Spielberger, 1988).

Results of the CFA suggest a somewhat poor fit of the Turkish State Anger Subscale for two-factor model. FA indicated one-factor solution for the State Anger Subscale. This one-factor structure for state anger items is consistent with Spielberger (1988), and similar to findings reported by Schwenkmezger, Hodapp, and Spielberger (1992) for the German adaptation of the STAXI. Thus, this study found that the 10-item State Anger Subscale assesses a wide range of angry feelings and provides a well-defined measure of state anger with a high degree of internal consistency. In conclusion, this study supports the use of the SAS as a separate scale in Turkish, as suggested by the scale's author (Spielberger, 1988).

To evaluate the construct validity of the Turkish State Anger Subscale, a 2 x 2 Mixed Design ANOVA on state anger was conducted with group (control and experimental groups) as the between-subjects factor and time (pre- and post-test) as the within-subjects factor. As in Spielberger (1983) and Haseth (1992), participants in this study were expected to imagine an anger-provoking experience from the past. After anger induction, individuals were expected to report higher levels of state anger. In other words, the experiment tested whether there was a significant difference between the experimental and control group after anger-provocation. As hypothesized, the two groups had no significant difference before the anger induction. However, the experimental group reported significantly greater state anger than the control group after imagining an anger-provoking. This result indicates that the test adaptation is psychometrically applicable and has strong construct validity. That is, the Turkish state anger items represent and assess intensity of anger.

Convergent validity was assessed by the correlations among the STAXI subscales. Trait anger had a significant positive correlation with state anger and anger expression, which is consistent with the original STAXI subscale correlations (Spielberger, 1988). In the literature on anger, no studies have investigated correlations between anger expression and state anger concepts except for Deffenbacher, Demm, and Brandon (1986). Similar to our study, Deffenbacher and his colleagues (1986) found that individuals high in trait anger tended to experience more lengthy states of anger and stronger general tendencies to express anger.

Because of the lack of an assessment tool for state anger, the concurrent validity of state anger subscale was assessed using the state-trait anger expression and general anger disposition scale (NAS). It was hypothesized in this study that the higher the level of state-trait anger expression, the higher the level of general anger disposition. STAXI was positively correlated with general anger disposition (.45). In the original structure of STAXI (Spielberger et al., 1983), the total score of The Buss-Durkee assessment tool of hostility was highly correlated with the Trait Anger scale while state anger scores varied reliably in the expected direction in response to acute behavioral challenges (Kamarck, Manuck, & Jennings, 1990). Like Cornell, Peterson, and Richards (1999), who investigated the validity of two standard self-report anger scales (NAS and STAXI), and examined how the anger measures correlated with each other and how they compared in their predictive accuracy, the present study found positively correlations between these two scales.

In conclusion, this study provides preliminary support for the psychometric properties of the State Anger Scale (SAS). This suggests that the scale can be used for measuring anger at a specific time in young Turkish young adults aged 18-33. Research into anger, especially experimental studies, mostly use physiological measures to assess intensity of anger (i.e. blood pressure, skin conductance levels). However, a self-report assessment tool for measuring state anger is also needed because of ease of administration. The results of this study suggest that researchers and psychologists can assess intensity of anger of Turkish examinees or clients, and use the State Anger Subscale for pre-and post-testing in experiments and treatment. Because of the limited sample size, however, the factor structure of the 44-item STAXI in the Turkish sample could not be investigated. For future studies should explore the factor structure of the complete Turkish STAXI to determine if the STAXI, including all subscales, can be used in Turkey.

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