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Validity and reliability testing of the transitional impact scale

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Abstract

The transitional impact scale (TIS) was developed to measure the quality and quantity of changes brought about by transitional events. The aim of the present study was to investigate the psychometric properties of the TIS. Study 1 investigated the validity and internal consistency of the TIS among 445 participants (aged 18–73 years) who completed the TIS, Beck anxiety inventory (BAI), centrality of event scale (CES), impact of event scale-revised (IES-R), and post-traumatic growth inventory. Study 2 investigated the test–retest reliability of the TIS among 140 university students (70 female; 70 male) who completed a retest of the TIS after a 2-week interval. The two-factor structure (i.e., material change and psychological change) of the TIS proposed by Svob et al. (2014) was confirmed in different age and socioeconomic status groups of a Turkish sample. The TIS was significantly correlated with the BAI, CES, and IES-R. Finally, the TIS had a high test–retest reliability.

KEYWORDS

adaptation, positive transitions, transitional impact scale, traumatic events

1 | INTRODUCTION

People's lives are usually composed of ordinary and repeated events such as daily work routines, grocery shopping, and family dinners. However, there are also distinctive events that bring about significant changes in people's lives, such as graduating from university, marriage, getting a job, and having a terminal illness. Turning points (Hareven & Masaoka, 1988), momentous events (Pillemer, 2009), and self-defining events (Singer & Salovey, 1993) are some of the terms used to identify these transitional events. Transitional events have been studied in a number of different areas of psychology, including clinical psychology (Johnson & Thompson, 2008; Rutter, 1996; Wheaton, 1990), developmental psychology (Galambos & Krahn, 2008; Hareven & Masaoka, 1988; Perrig-Chiello & Perren, 2005), and cognitive psychology (Berntsen & Rubin, 2004; Brown & Lee, 2010; Brown et al., 2009; Pillemer, 1998; Pillemer, 2001; Shum, 1998; Thomsen & Berntsen, 2008). Some of these studies of physiology and life stress have indicated that stress is positively associated with death by heart attacks (Rahe & Lind, 1971; Ueyama et al., 2003; Ueyama, Kasamatsu, Hano, Tsuruo, & Ishikura, 2008) and chronic health problems (Danielsson et al., 2012; Wyler, Masuda, & Holmes, 1971) and other psychological problems such as depression and anxiety (Hassanzadeh

et al., 2017; Johnson & Thompson, 2008; Rutter, 1996; Tennant, 2002; Terziev, 2018; Vinokur & Selzer, 1975; Ward & Kennedy, 1993; Wheaton, 1990).

As shown in the studies above, transitions are important triggers of stress, and during transitions stress can reach extreme levels (i.e., during trauma). Therefore, examining the subjective evaluations of transitions is an important means of understanding how individuals develop transition-related adaptation problems. In particular, measuring the degree to which an event has changed an individual's life is an important part of understanding the longer-term cognitive, emotional, and social consequences of transitional events.

To account for the different forms and levels of changes brought about by transitional events, Svob, Brown, Reddon, Uzer, and Lee (2014) developed the transitional impact scale (TIS). This tool comprises two factors—material change and psychological change—that together explain the overall changes caused by a transitional event. Material changes refer to alterations in how people live their lives (i.e., the “fabric of daily life”; Svob et al., 2014, p. 449), including changes in where they live, what they own, and their daily activities, friends, and occupation. Psychological changes refer to changes in people's feelings and beliefs, such as changes in life philosophy, attitudes, self-perception, emotions, and beliefs about right and wrong or religious beliefs. Both material and

psychological changes must be considered in order to determine the overall impact of an event on a person's life. These two changes are partly independent, such that an event might dramatically change people's life psychologically even as most of the material aspects of their life remain intact or vice versa (Svob et al., 2014). For instance, changes in religious beliefs after a traumatic experience would be an example of a strong psychological change but a weak material change (see also Svob et al., 2014, p. 453).

Svob et al.'s (2014) scale enables assessment of both qualitative change (i.e., the form of the change) and quantitative change (i.e., the extent of change). On the other hand, the TIS has some limitations as well. First, the construct validity of the TIS was not tested with other related measurements. Second, it was developed using only university students; therefore, the transitional events were restricted to those that can be experienced by undergraduate students (e.g., immigration, severe injury, buying a car, having a terminal illness, parental divorce, losing significant others, criminal acts, changing religion, starting high school, entering university). Other possible transitions, such as promotion, childbirth, and starting a full-time job, that are more likely to happen in later periods of life, were not included in the development of the TIS.

Moreover, there are many traumatic events (e.g., sexual assault, torture) that Svob et al. (2014) did not use when developing the TIS. Therefore, it remains unclear whether TIS can be used to assess the changes resulting from such traumatic events. Traumatic experiences are an important type of transitional event that can have serious psychological consequences, such as the development of post-traumatic stress disorder (PTSD) or anxiety and mood disorders. Currently, the negative impact of a traumatic event is typically measured with the impact of event scale (IES) developed by Horowitz, Wilner, and Alvarez (1979). The IES measures the impact of a traumatic event by assessing difficulties experienced after the trauma (e.g., to what extent a person has trouble staying asleep or tries to remove the event from memory). The impact of event scale-revised (IES-R) version, constructed by Weiss and Marmar (1997), contains seven additional items related to the hyperarousal symptoms (e.g., symptoms such as anger and irritability, heightened startle response, difficulty concentrating, and hyper vigilance) of PTSD that were not included in the original IES. Items correspond directly to 14 of the 17 DSM-IV symptoms of PTSD. The IES-R is widely used to assess post-traumatic stress symptoms (Elhai, Gray, Kashdan, & Franklin, 2005). There is also empirical research supporting the clinical utility of the IES-R as a screening tool for PTSD in large-scale research studies and intervention studies (Morina, Ehring, & Priebe, 2013). However, to our knowledge, there is no scale that can directly measure the life changes that can occur after a traumatic event. Finally, Svob et al. (2014) did not test the stability (i.e., test-retest reliability) of the scale. Because the TIS must be administered after a traumatic event, assessing its test-retest reliability is important.

The present project was an extension of Svob et al.'s (2014) study. In the present study, we particularly aimed to investigate the validity of TIS by including a greater variety of transitional events (including traumatic experiences) and applying it to a wider range of ages and socioeconomic status (SES) groups. We used a Turkish

sample to examine whether TIS is applicable to more collectivistic cultures. Although Svob et al.'s (2014) sample consisted of undergraduates (i.e., mostly Canadian-born undergraduate students) enrolled in an introductory psychology course at the University of Alberta ($M_{\text{age}} = 19.4$, range 17–36 years for Study 1; $M_{\text{age}} = 19.3$, range 18–59 years for Study 2), the present sample consisted of Turkish people between 18 and 75 years old and living in different parts of Turkey. Previous research reported between- and within-culture differences in how “transition” is defined. For example, adolescence is considered an important transition (e.g., physical changes in body, changing to a new school, revision of personal habits, changes in number of family get-togethers, changes in social roles) in most western cultures; however, in other cultures, such as Samoa, it is not considered as a stressful identity crisis (Banspach et al., 2016; Hopson, 1982). Simmons (2017) also argues that the discrepancy between physical capabilities and expected independence roles are perceived as stressful for adolescents in modern Western society. Furthermore, according to anthropologists, marriage is regarded as an important transition to adulthood in most traditional cultures (Schlegel & Barry III, 1991), whereas in the United States and Canada, events such as completing school or getting a job are considered more important transitions to adulthood (Arnett, 1998). As the criteria for defining what constitutes a transition are to some extent influenced by cultural values (Hareven & Masaoka, 1988), it is thus important to validate TIS in a sample different from a sample coming from an individualistic culture. The present study was also intended to assess the test-retest reliability of the TIS.

2 | STUDY 1

2.1 | Method

The main objective of Study 1 was to test whether the TIS is a valid and reliable scale. With respect to the validity of TIS, first, confirmatory factor analysis (CFA) was conducted. Next, the centrality of event scale (CES) was used to test the convergent validity of the TIS. Finally, the beck anxiety inventory (BAI), IES-R, and post-traumatic growth inventory (PTGI) were used to test the concurrent validity of TIS. For reliability, internal consistency coefficients, and the Guttman split-half reliability coefficients were computed. To calculate Guttman split-half reliability, items were randomly divided into two groups using a random number generator. Items 9, 12, 7, 11, 4, and 3 made up the first part and Items 6, 8, 10, 5, 2, and 1 formed the second. These items were entered in this order into SPSS and the Guttman split-half reliability coefficient provided in the output was reported.

2.2 | Participants

The sample consisted of 283 females and 162 males. The mean age of the participants was 33 (min = 18 years; max = 73) years old. Of the participants, 49% were single while the others belonged to the

married/engaged/living with a partner category. By education, 48% of the participants were university graduates, 43% had a master's degree or PhD, and 9% had high school/secondary school/primary school degree. In terms of SES, 43% were from the middle SES, 51% were from above average/high SES, and 6% were from low SES. Participants were recruited through social media advertising (e.g., mostly from the author's social media accounts) and announcements via academic e-mail lists, course lectures, and different university billboards. Participation was voluntary and participants were not paid for their participation. Those with a history of neurological (e.g., Alzheimer's disease) problems, cognitive impairment, and diagnosis of psychiatric disorders (e.g., PTSD, OCD, depression) were excluded in the study. In addition, there were no missing data, because the computer administration of the questionnaire did not permit omissions.

2.3 | Materials

2.3.1 | Transitional impact scale

The scale was developed by Svob et al. (2014) to measure the form and quantity of changes brought about by transitional events. The form consists of 12 items rated on 5-point Likert type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), where higher scores indicate greater changes produced by the event. TIS had two factors (e.g., "This event has changed the things I own") and psychological change (e.g., "This event has changed my sense of self"). In the original form, the internal consistency of the scale was .84 (Cronbach's $\alpha_{\text{material change}} = .80$; $\alpha_{\text{psychological change}} = .85$).

2.3.2 | Convergent validity measures

CES short form

CES was developed by Berntsen and Rubin (2006). The short form of the CES consists of seven items measuring the extent to which an event is central to one's identity and life story (e.g., "This event has become a reference point for the way I understand myself and the world"). Each statement is rated on 5-point Likert type scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). The internal consistency of the scale was .94. The scale was positively correlated with Beck depression inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; .23, $p < .05$) and the post-traumatic stress disorder checklist (PCL; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; .38, $p < .05$). The scale was adapted to Turkish by Uzer, Beşiroğlu, and Karakılıç (2020). The internal consistency of the Turkish version was .92 and it was positively correlated with Beck depression inventory (Beck et al., 1961). In the present study, Cronbach's alpha of CES was .89; and the correlation between CES and TIS was used to test the TIS's convergent validity. The CES was used as a convergent validity measure because Berntsen and Rubin (2006) argued that an event becomes central to one's identity because it is perceived as a reference point, a turning point, or a life-changing event. Pillemer (1998) also proposed that many momentous

events (e.g., traumatic events, personally significant events such as marriage), which are characterized by "importance, definiteness, and brevity" (p. 27), act like turning points that alter the ongoing flow of life. Furthermore, Uzer et al. (2020) demonstrated that the transitional impact of an event mediated the relationship between event centrality and PTSD severity. All these researchers emphasize that the life-changing aspect of an event is an important characteristic in considering the event as central or significant.

2.3.3 | Concurrent validity measures

Beck anxiety inventory

The BAI was developed by Beck, Epstein, Brown, and Steer (1988) to measure clinical anxiety and to differentiate between anxious and nonanxious groups. It consists of 21 items. For each item, respondents are required to rate the degree to which they experienced the worrisome situations within the last week. The scores of each item ranges from 0 (*none*) to 3 (*extreme levels-hard time to tolerate*). The scale was adapted to Turkish by Ulusoy, Şahin, and Erkmen (1998). Ulusoy et al. (1998) reported that the internal consistency of the scale was .93 and that interitem correlations ranged from .45 to .72. In their study, the correlation between BAI and BDI was .43. Cronbach's alpha of the BAI in this study was .93, and the BAI was used for testing TIS's convergent validity. The BAI was selected as a concurrent validity measure because, as indicated in the Introduction, transitions are important triggers of stress, which may predict anxiety. In the present study, BAI instructions were modified so as to measure the extent to which the participant has been bothered by the symptoms of anxiety during the past 2 weeks with respect to the event that they reported.

Post-traumatic growth inventory

The PTGI was developed by Tedeschi and Calhoun (1996). It consists of 21 items measuring positive developments after a traumatic event. Each item is rated on a 6-point scale ranging from 0 (*I did not experience this change as a result of this event*) to 5 (*I experienced this change to a great extent as a result of this event*). Items are loaded on five dimensions: perceived new opportunities, interpersonal relations, individual strength, spiritual change, and understanding the value of life dimensions. In the original form, α for the five factors had the values .84, .85, .72, .85, and .67, respectively. The scale was adapted to Turkish by Dirik and Karanci (2008). There were three factors (changes in interpersonal relations, changes in life philosophy, and personal strength perception) in the Turkish version whose corresponding alpha values were .86, .87, and .88, respectively. Total internal consistency coefficient was .94 in Dirik and Karanci's (2008) adaptation study. Total internal consistency coefficient was .95 (and .88, .88, and .91 for changes in interpersonal relations, changes in life philosophy, and personal strength perception, respectively) in the present study. Because PTGI measures the extent to which the struggle with highly challenging life events predicts positive changes (Tedeschi & Calhoun, 1995), this scale was used to test TIS's concurrent validity.

Impact of event scale-revised

The scale was developed by Horowitz et al. (1979) and was revised by Weiss and Marmar (1997). It has 22 items measuring intrusions, avoidance, and hyperarousal. Each item was assessed on a 5-point Likert scale (1 = *not at all* to 5 = *a lot*). A score of 33 and above indicates a probable diagnosis of PTSD. Turkish adaptation was conducted by Corapcioglu, Yargic, Geyran, and Kocabasglu (2006). The Turkish form has high internal reliability ($\alpha = .94$) and was significantly correlated with the BAI ($r = .93$), BDI ($r = .91$), and PTSD ($r = .79$). The IES-R is more directly associated with diagnostic criteria of PTSD from the DSM-IV rather than the DSM-V, but there is also empirical research supporting the clinical utility of the IES-R as a screening tool for PTSD in large-scale research studies and intervention studies (Morina et al., 2013). In Morina et al.'s (2013) study, IES-R was compared with the MINI International Neuropsychiatric Interview in terms of sensitivity and efficiency values. Janoff-Bulman (1989) claimed that a traumatic or a highly stressful event results in dramatic changes in people's basic assumptions about the safety of the world. Previous research also demonstrated that the extent to which participants believed that the trauma had caused a permanent negative change in their lives (i.e., "I feel like I don't know myself anymore," "I will never recover") predicted PTSD severity (Dunmore, Clark, & Ehlers, 1999; Ehlers, Maercker, & Boos, 2000). Therefore, IES-R was also used to test concurrent validity of TIS in this study. Cronbach's alpha for the IES-R was .94 in this study. In the present sample, IES-R was positively correlated with BAI ($r = .85, p < .05$).

2.4 | Procedure

First, consent was obtained from Svob et al. (2014) to adapt the TIS to Turkish. The TIS was translated into Turkish by three faculty members fluent in both Turkish and English. Next, two different faculty members assessed these translations and selected the best equivalent items for the Turkish sample, and the selected items were back-translated to English by four independent translators. Later, the back-translated items were compared with the original TIS items. After some minor modifications, the Turkish TIS was ready for a pilot test involving 50 undergraduate students taking the author's class, who assessed the items for clarity. Based on the students' feedbacks, some more minor modifications were made, and the final version of the Turkish TIS was constructed. The study was approved by the Review Board of the University. In accordance with research ethics regulations, all participants were asked to read and sign the informed consent form. In addition, they were debriefed about the study after they completed it.

A total of 445 participants responded to the questionnaires on the computer. First, each participant read and signed the consent form and then completed the demographic information form. Next, participants were shown a list of transitional events (getting a car/house, childbirth, starting high school/university, marriage/engagement, starting a job/promotion, having an extraordinary achievement, experiencing a fatal (very serious) accident/injury, sudden death of a

family member/very close friend, having a serious health problem/a family member having a serious health problem, being exposed to a natural disaster, being victim of a sexual assault, being tortured, and being exposed to explosion/terrorist attack) and asked to indicate whether they have ever experienced each event by clicking a YES or NO button. For example, a YES response to being victim of a sexual assault indicates that the participant has experienced that event at least once in his/her life. Likewise, a NO response to marriage indicates that the participant has never been married before. Next, one of the transitional events experienced by the participant was randomly selected by the computer. The random selection procedure was used to ensure that different types of transitional events were included in the study. The randomly selected transitional event was presented on the screen, and the participant was instructed to complete the TIS, PTGI, CES, and IES-R regarding only the randomly selected transitional event (e.g., having an extraordinary achievement) that appeared on the screen. Participants also rated the emotional valence of the selected event ($-3 = \text{very negative}$; $0 = \text{neutral}$; $+3 = \text{very positive}$), and answered the BAI items. The presentation order of each scale was randomized across participants. In addition, each item in each scale was presented one at a time to the participant, and the order of items in each scale was randomized across participants.

2.5 | Data analysis

First, correlations between demographic variables and the study measures were calculated (see Table 1). In the present study, positive transitional events (i.e., getting a car, childbirth, getting a house, starting university/high school, marriage, engagement, having a promotion, starting a job, having an extraordinary achievement) and traumatic events (i.e., experiencing a fatal (very serious) accident/injury, sudden death of a family member, sudden death of a very close friend, having a serious health problem, a family member having a serious health problem, being exposed a natural disaster, being victim of a sexual assault, being tortured, being exposed to explosion, being exposed to a terrorist attack) were included. Emotional valence ratings also

TABLE 1 Correlations among demographic variables and TIS, CES, BAI, PTGI, and IES-R

Variables	TIS	CES	BAI	PTGI	IES-R
Gender ^a	−0.10 [*]	−0.11 [*]	−0.24 [*]	0.04	−0.01
Marital status ^b	−0.02	−0.06	−0.04	−0.08	0.10 [*]
Income level	0.08	0.05	0.19 [*]	0.13 [*]	−0.26 [*]
Education	0.00	0.05	−0.13 [*]	−0.11 [*]	−0.39 [*]
Age	−0.07	−0.08	−0.03	−0.05	0.06

Abbreviations: BAI, beck anxiety inventory; CES, centrality of event scale; IES-R, impact of event scale-revised; PTGI, post-traumatic growth inventory; TIS, transitional impact scale.

^aFemales = 0; males = 1.

^bSingle = 0; married = 1.

* $p < .05$.

indicated that positive events ($M = 1.90$; %95 CI [1.80; 2.00]) received significantly higher scores than traumatic events ($M = -2.09$; %95 CI [-2.28; -1.91]; $F(1, 340) = 1,589.5$; $p < .001$). In addition, none of the positive events received a score lower than 1, and none of the traumatic events received a score higher than -1. In terms of demographic characteristics, education was non-normally distributed, with a skewness of $-.555$ ($SE = .116$) and kurtosis of $.931$ ($SE = .223$).

To test the factorial structure of the TIS, CFA was conducted using the analysis of moment structures 24 statistical package software. Partial correlations between the TIS and CES were computed to examine the convergent validity of TIS, and partial correlations among the TIS, BAI, PTGI, and IES-R were calculated to examine the concurrent validity of the TIS (Table 5). In these correlations, we controlled for demographic variables (i.e., gender, marital status, income level, education level, and age of participants). Cronbach's alpha coefficients were calculated to assess the internal consistency of overall TIS and its subscales. Each participant responded to the scales only for a single event so as to focus only on responses for one event. Therefore, the number of stressful events each participant had experienced was not controlled as a participation criterion. Table 2 presents the frequency of participants by number of positive transitions and traumatic events that were experienced.

2.6 | Results

2.6.1 | Factor structure of the TIS

CFA was conducted to investigate the factor structure of the Turkish TIS in a sample of participants of different ages. The proposed two-factor structure of the TIS was tested using CFA with the maximum likelihood method of estimation and covariances matrices. Model fit was assessed based on whether the comparative fit index (CFI) and Tucker-Lewis index (TLI) were greater than or equal to .90; chi-square/degrees of freedom (χ^2/df) was lower than 3; and RMSEA was .05 or less (Kline, 2005).

The CFA results demonstrated that the model fit the data well ($\chi^2(df = 53, N = 445) = 135.57$, $\chi^2/df = 2.56$, CFI = .97, TLI = .97,

TABLE 2 Frequency of participants by number of events they experienced across event type

Event type	Number of events experienced	% of participants
Positive transitions		
	0-1	0
	2-6	22
	7-11	54
	12-17	24
Traumatic events		
	0-1	34
	2-6	62
	7-11	4
	12-17	0

RMSEA = .059). Each item's loading on its own factor was significant ($p < .05$). The factor loadings are shown in Table 3. The intercorrelations and covariances among the subscales of the TIS are shown in Table 4.

2.6.2 | Convergent validity of the TIS

Pearson correlations were computed for the TIS and CES to test the convergent validity of the TIS (Table 5). The TIS showed significant and positive correlations with CES ($r = .87$, $p < .001$; Table 5). Thus, the more an event changes a person's life, the more that person attributes meaning to it regardless of the event's valence. Thus, it seems that even if the life transition is expected and positive such as marriage, it brings about some form of change in a person's life.

2.6.3 | Concurrent validity of the TIS

Pearson correlations were computed among the TIS, BAI, PTGI, and IES-R to test the concurrent validity of the TIS (Table 5). The correlation between TIS and BAI was significant ($r = .16$, $p < .001$; Table 5). The higher the change that happens after an event, the more anxiety it creates. The positive correlation between BAI scores and TIS scores makes sense because during a life transition, whether it is positive or negative, adjustment to change can be difficult. People may feel sad for what they are leaving behind, and in addition fear of uncertainty about the new situation may cause stress.

There was a positive significant correlation between the TIS and PTGI ($r = .65$, $p < .001$; Table 5), meaning that the greater the change in a person's life after a transitional event, the more positive change, that is, post-traumatic growth, that occurs. The positive correlation between the TIS and IES-R ($r = .55$, $p < .001$; Table 5) indicates that the greater the change that the event brings about in a person's life, the more it produces stress-related responses.

2.6.4 | Reliability of the TIS

Cronbach's alpha coefficients were calculated for the overall score and each subscale of the TIS to assess internal consistency and reliability. The internal consistency coefficients were .91 for overall TIS, .89 for material change, and .89 for psychological change. Split-half reliability was also calculated for overall TIS. The Guttman split-half coefficient was .89, while Cronbach's alpha coefficients were .84 and .83 for the two randomly divided parts of the scale. Item-total correlations for the TIS ranged between .45 and .72.

3 | STUDY 2

This study was conducted to assess the test-retest reliability of the TIS.

TABLE 3 Factor loadings and Cronbach's alphas of TIS subscales

Factor	Items	Factor loading*			Cronbach's alpha*		Item-total correlations
Material change					.89		
	This event has changed the places where I spend time.	.81	.83	.81	.79	.84	.66
	This event has changed the things that I own.	.70	.71	.75			.61
	This event has changed my material circumstances.	.79	.71	.71			.66
	This event has changed the activities I engage in.	.82	.67	.70			.71
	This event has changed the people I spend time with.	.82	.63	.65			.72
	This event has changed where I live.	.61	.61	.60			.51
Psychological change					.89		
	This event has changed my attitudes.	.80	.84	.84	.86	.80	.72
	This event has changed the way I think about things.	.86	.83	.83			.71
	This event has impacted my emotional responses.	.75	.80	.79			.59
	This event has changed my sense of self.	.79	.74	.75			.70
	This event has impacted me psychologically.	.62	.66	.66			.45
	This event has influenced my understanding my right and wrong.	.73	.61	.59			.62

Abbreviation: TIS, transitional impact scale.

*Factor loadings for items of the TIS and internal consistency coefficients of each subscale in Svob et al.'s (2014) sample 1 ($n = 557$) and sample 2 ($n = 553$) were provided with bold numbers.

Bold numbers indicate factor loadings for items of the TIS and internal consistency coefficients of each subscale in Svob et al.'s (2014) sample 1 ($n = 557$) and sample 2 ($n = 553$) were provided with bold numbers.

TABLE 4 Intercorrelations and factor covariances between TIS

	TIS total	Material change	Psychological change
TIS total	1		
Material change	.89*	1	.63* [#]
Psychological change	.88*	.54*	1

Abbreviation: TIS, transitional impact scale.

* $p < .05$.

[#]Represents factor covariance.

TABLE 5 Partial correlations between TIS subscales and CES, BAI, IES-R, and PTGI

	TIS total	Material change	Psychological change
CES	.87*	.72*	.81*
BAI	.16*	.07	.21*
IES-R	.55*	.40*	.46*
PTGI	.65*	.51*	.65*

Abbreviations: BAI, beck anxiety inventory; CES, centrality of event scale; IES-R, impact of event scale-revised; PTGI, post-traumatic growth inventory; TIS, transitional impact scale.

* $p < .05$.

3.1 | Method

3.1.1 | Participants

A sample of 140 university students (70 female; 70 male), which is separate from Study 1, participated in the test–retest reliability study. Participants were students taking introductory psychology courses at the author's institution. The mean age of the participants was 19 (min = 18 years; max = 22 years). Participants received course credit for their participation. Similar to Study 1, those with history of neurological (e.g., Alzheimer's disease) problems, cognitive impairment, and diagnosis of psychiatric disorders (e.g., PTSD, OCD, depression) were excluded in the study.

3.1.2 | Procedure

First, each participant read and signed the consent form and completed demographic information form. Next, the participants were

provided with a list of transitional events and asked to report whether they had experienced each event. Each event had previously been assigned a number, and one of the events that the participant had experienced was randomly selected using a random number generator. The participant was instructed to answer each item regarding only this event. Two weeks later, the same participants completed the TIS again for the same event.

3.2 | Results

Test–retest reliability analysis indicated a significant positive correlation between the two applications of the test for both material change ($r = .80$; $p < .001$) and psychological change ($r = .82$; $p < .001$), indicating that the scale had a high level of test–retest reliability for both subscales. Therefore, the TIS can be used to assess changes brought

about by an event even when there is a gap between the occurrence of the event and its assessment.

4 | GENERAL DISCUSSION

Transitions usually trigger stress because they require individuals to adapt to new situations. Stress is closely related to both physical and psychological well-being (Dohrenwend & Dohrenwend, 1974; Hobson, Delunas & Kestic, 2001; Johnson & Thompson, 2008; Rutter, 1996; Tennant, 2002; Vinokur & Selzer, 1975; Wheaton, 1990; Wyler et al., 1971). Therefore, to understand problems with adaptation, it is important to identify the quality and quantity of changes that individuals experience as a result of transitional events. In addition, measuring the changes brought about by a transitional event is necessary to understand the cognitive, emotional, and social outcomes of transitions.

The present study expanded on Svob et al.'s (2014) TIS in four ways. First, we assessed the validity of the TIS with related constructs such as event centrality, anxiety, and event impact by including different age and SES groups. Second, we assessed the reliability of the TIS. Third, some of the transitional events that we used were different from those used by Svob et al. (2014). In particular, we added a number of positive transitions and traumatic events to Svob et al. (2014)'s list. Finally, we used a Turkish sample to see whether the TIS can be generalized to a more collectivistic culture.

Concerning the first issue, the correlated two-factor structure of the scale proposed by Svob et al. (2014) was confirmed when applied to different age and SES groups. Furthermore, factor loadings between the original study samples and the Turkish sample showed great consistency with each other (see Table 3). The factor loadings were mostly higher in the Turkish sample than the original samples, which might be due to the different transitional events included in the present study. Nonetheless, the factor structure of the TIS remained stable across different demographic characteristics. The CES was used to assess the construct validity and the IES-R, BAI, and PTGI the concurrent validity of the TIS. There was a strong positive relationship between TIS and CES. In other words, regardless of an event's emotional valence, the greater the change an event produces in a person's life, the more meaning a person will attribute to that event. The PTGI assesses the degree to which highly stressful life experiences (i.e., traumatic events) predict positive changes. The TIS, which is supposed to measure the extent to which an event brings about a change in one's life, was significantly correlated with the PTGI in the present study. Life-changing events, especially those perceived as traumatic, lead to changes in people's beliefs about the world (Janoff-Bulman, 1989). Furthermore, the more people believe that the negative effects of trauma will stay with them for a long time, the more severe their stress reactions will be (Dunmore et al., 1999; Ehlers et al., 2000). Consistent with these arguments, there was a positive relationship between the TIS and IES-R. The TIS was also positively correlated with individuals' anxiety level (BAI). This relationship, while not very strong, was nevertheless statistically significant. The TIS does not specify whether the change is in a positive or a negative direction;

hence, the BAI may only account for the impact of events to a limited degree. These results suggest that the TIS was confirmed as having the same two aspects (psychological and material change) when applied to the Turkish sample. Furthermore, the TIS demonstrated strong psychometric properties when it was used for many other transitional events in a Turkish sample as well.

Tests of reliability and internal consistency for the TIS demonstrate that the TIS is a psychometrically sound and reliable instrument to use with Turkish samples. Cronbach's alpha values were uniformly high for the overall TIS and its subscales; split-half correlations were also high for the two randomly divided parts of the scale. Furthermore, the second study demonstrated that the scale had a good level of test-retest reliability for both types of transitions. Therefore, the TIS can be used to assess changes brought about by an event even when there is a gap between the occurrence of the event and its assessment.

We used a Turkish sample coming from different age and SES groups to examine whether the TIS is applicable to more collectivistic cultures. Whereas in Svob et al.'s (2014) participants were mostly Canadian-born undergraduate students, despite the cultural differences reported in the Introduction, the present study demonstrated that the Turkish version of the TIS provided a psychometric structure very similar to that of the original version. This finding is more in line with research reporting cultural similarities in the perceptions of what are considered important transitions (Nurmi, Poole, & Seginer, 1995; Turjeman, Mesch, & Fishman, 2008). For example, the death of a spouse is perceived as more stressful than marriage across many different countries, including Japan, the USA, Peru, Spain, France, Belgium, and Switzerland (Holmes & Rahe, 1967). Therefore, we can argue that the TIS can be used with Turkish populations to measure the transitional impact of various events that bring about varying amount of change.

In sum, the findings of the present study support the validity and reliability of the TIS for assessing both psychological and material changes brought about by positive transitions and traumatic experiences across groups of different demographic (i.e., age, gender, SES, marital status, education) and cultural characteristics. In extending Svob et al.'s (2014) results, the present study also implies that the TIS would be useful in identifying the quantity and quality of changes brought about by a traumatic experience and their relations to mood disorders such as anxiety, depression, and PTSD.

4.1 | Limitations and future suggestions

There are some limitations to the study that require mentioning. The participants were highly educated, which limits the generalizability of the findings to people from lower educational status. In addition, a nonclinical sample was used.

Another limitation was that each participant responded to the questions for a single event. Other transitional events experienced by a participant might have influenced his/her responses. Future studies might thus control the number of stressful events of each participant.

In the present study, the IES-R was used to test concurrent validity; however, the IES-R maps onto the DSM-IV rather than DSM-V criteria for PTSD. Future studies should use different constructs to examine whether the TIS retains criterion validity. The study used CES as a convergent validation. Future studies may also wish to investigate the construct validity of the TIS using divergent validity.

The TIS did not assess the duration and valence of the changes brought about by events. It is also important to assess whether negative changes are more likely to be associated with anxiety, event centrality, and PTSD severity than positive changes. Future studies should also investigate whether long-term changes are more related with anxiety, event centrality, and PTSD severity than short-term changes. Future studies should also focus on whether the TIS can be applied to children and clinical populations.

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