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The Adaptation and Psychometric Analysis of the Global Transformational Leadership (GTL) Scale for Turkish Educational Institutions

Cihat Turan
Fırat University, Elazığ, Türkiye

Zülfü Demirtaş
Fırat University, Elazığ, Türkiye

Müslim Alanoğlu*
Fırat University, Elazığ, Türkiye

Abstract

Effective leadership is essential in transforming schools into vibrant learning environments that foster teachers' professional growth and boost student achievement. Among various leadership styles, transformational leadership, with its emphasis on vision, support, and innovation, stands out due to its potential to maximize performance and foster school success. The objective of this research is to translate and culturally adapt the Global Transformational Leadership Scale (GTL) by Carless et al. (2000) into Turkish, with a focus on its application in educational institutions. The adaptation process followed a rigorous methodology to ensure the scale's semantic and conceptual equivalence in Turkish culture. This process involved translation, back-translation, and revisions based on expert feedback. The research was conducted with a sample of 322 teachers from a mid-sized city in eastern

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*Corresponding author
E-mail: malanoglu@firat.edu.tr

Türkiye, and data collection took place in three phases: linguistic equivalence testing with English teachers, parallel testing with the Multifactor Leadership Questionnaire and other relevant scales, and test-retest reliability analysis. CFA was performed to verify the scale's factor structure, and various validity and reliability measures were assessed, including convergent validity, nomological validity, and measurement invariance across gender, education level, and tenure. The results indicated that the adapted GTL scale is a reliable and valid instrument for measuring transformational leadership in Turkish educational institutions.

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Introduction

Effective leadership plays a crucial role in transforming educational institutions into dynamic learning environments, supporting the professional development of teachers, and comprehensively promoting student achievement. This facilitates schools in achieving their shared goals and contributes to establishing a clear direction towards their objectives (Day et al., 2016; Garcia-Martinez et al., 2020). The literature contains numerous studies that highlight the significance of effective leadership in educational organizations (Gumus et al., 2018; Hallinger & Hosseingholizadeh, 2020). Notably, learning-centered leadership (Alanoglu, 2023; Male & Palaiologou, 2012), participative leadership (Somech, 2005), distributive leadership

(Tran et al., 2022), and transformational leadership (Nedelcu, 2013) emerge as prominent leadership structures on which school principals rely. Each of these leadership structures holds the potential to enhance student learning and improve the quality of teaching. Among these leadership types, transformational leadership stands out due to its unique characteristics (Dahlgaard-Park, 2015; Marks & Printy, 2003; Piccolo & Colquitt, 2006). It constitutes a vital component of effective school leadership by maximizing teacher and student performance and fostering school achievement (Boberg & Bourgeois, 2016; Leithwood & Sun, 2012; Ratna et al., 2022).

Transformational leadership is an approach that primarily focuses on the leader's vision and leadership style to improve the performance of teachers and students (Alzoraiki et al., 2023). This leadership style involves the leader collaborating with teachers to consistently provide support and motivation (Aydın et al., 2013). To promote the professional development of teachers, leaders should have a comprehensive understanding of their needs and offer appropriate support and resources (Leithwood et al., 2008; Thomas et al., 2020). As part of this process, leaders can establish mentoring programs, provide continuing education opportunities, and cultivate collaborative work environments to facilitate teachers' professional growth. However, Sun and Leithwood (2012) argue that transformational leadership not only aims to enhance teacher development but also strives to improve student achievement. Therefore, leaders should adapt educational programs and teaching strategies to meet the diverse needs and learning styles of students (Robinson et al., 2008). Student-centered learning methods and personalized educational programs have the potential to enhance student satisfaction and academic performance (Kumar et al., 2004). Adapting teaching methods to different learning

styles can also boost students' confidence and knowledge levels (Brannan et al., 2016). Taking individual differences into account can also improve the inclusion of disadvantaged students in the educational process (Gadbow, 2001). Thus, it can be argued that transformational leadership has the capacity to enhance the overall success of a school by optimizing the performance of both teachers and students (Boberg & Bourgeois, 2016).

Developing and supporting the leadership skills of school administrators is paramount for schools to achieve their goals. To accurately evaluate the leadership behaviors of school administrators and ensure their long-term viability (Demirbilek & Çetin, 2021), it is crucial to focus on transformational leadership. This leadership style positively impacts overall school performance by fostering the professional growth and motivation of teachers (Abuhassira et al., 2024; Zhang et al., 2022). Consequently, measuring teachers' perceptions of school leaders' transformational leadership skills is essential. This process provides valuable insights into school effectiveness and empowers school administrators to enhance their leadership practices. Furthermore, it supports the professional development of teachers, enabling them to discover their leadership potential and contribute to creating a more effective educational environment within schools.

The aim of this study is to adapt the Global Transformational Leadership Scale (GTL), developed by Carless et al. (2000), to the Turkish cultural context. Various transformational leadership scales, such as the Leadership Practices Inventory (Kouzes & Posner, 1990), the Conger-Kanungo Charismatic Leadership Scale (Conger & Kanungo, 1994), the Multifactor Leadership Questionnaire (MLQ; Avolio & Bass, 1995), and the Transformational Leadership Scale (Taş

& Çetiner, 2011), allow for a broad evaluation of transformational leadership behaviors. However, there is a growing interest in the use of the GTL for measuring transformational leadership in educational institutions in the international literature (e.g., Al-Aamri et al., 2024; Berkovich & Hassan, 2023; Charoensukmongkol & Puyod, 2021; Iqbal et al., 2023; Schmitz et al., 2023; Özdemir et al., 2024). This suggests that the GTL is a valid tool for educational settings, and its inclusion in the Turkish educational administration literature would be valuable. Validity and reliability analyses of the scale adapted to Portuguese culture have shown that the scale is valid and reliable (Van Beveren et al., 2017). As a brief, seven-item tool, the GTL offers a practical solution for measuring transformational leadership. Each item of the scale evaluates a different dimension of transformational leadership, demonstrating its comprehensiveness, efficiency, and effectiveness as a tool for researchers and practitioners to measure leadership behaviors (Carless et al., 2000). Therefore, the scale contributes to a faster and more comprehensive assessment of leadership skills and facilitates the examination of the impacts of the transformational leadership model.

Transformational Leadership Behaviors

Based on a comprehensive review of transformational leadership literature, Podsakoff et al. (1990) identified six key behaviors: vision setting and communication, role modeling, support of group goals, high performance expectations, individualized support, and intellectual stimulation. Carless et al. (2000) expanded this framework by distinguishing between staff support and individual development, leading to the identification of seven core behaviors influencing transformational leadership. Podsakoff et al. (1990) used "high performance expectancy," which Bass (1985) linked to charismatic

behavior, thus referring to it as "charisma" in the original scale. Carless et al. (2000) also adapted the term "staff development" to "teacher development" for educational contexts. The transformational leadership behaviors according to Carless et al. (2000) are: (1) vision, (2) teacher development, (3) support, (4) empowerment, (5) innovative thinking, (6) leading by example, and (7) charisma.

Vision: The capacity to articulate a cogent and compelling vision is fundamental to transformative leadership. Leaders adeptly convey their prospective objectives in order to steer and motivate the entire educational community towards common goals. This vision plays a pivotal role in nurturing a sense of purpose and guidance (Bass, 1985).

Teacher Development: Transformational leaders place a high priority on the ongoing development of teachers through the implementation of comprehensive professional development programs. This unwavering dedication not only strengthens teachers' skills but also cultivates a culture of perpetual improvement and adaptability, which is essential in the ever-changing educational landscape (Leithwood & Jantzi, 2000).

Support: Providing robust support systems is of utmost importance in an academic context. Leaders play a crucial role in improving both job satisfaction and performance by guaranteeing that teachers and staff members have access to the necessary resources and emotional support, enabling them to effectively carry out their respective roles (Demirtaş, 2010; Demirtaş & Alanoglu, 2015; Tschannen-Moran & Gareis, 2015).

Empowerment: Empowerment is a key element in which leaders inspire their staff to proactively take on more responsibilities and demonstrate initiative. Such empowerment fosters a more engaged and proactive

institutional milieu, thereby facilitating innovation and personal commitment to the institution's overall prosperity (Avolio & Bass, 1995).

Innovative or Lateral Thinking: Leaders foster an environment where creative solutions and new ideas are welcomed. This culture of innovation is crucial for adapting to changing educational demands and keeping the school at the forefront of educational practices (Moolenaar et al., 2010).

Lead by Example: Transformational leaders, who serve as exemplars, demonstrate elevated ethical principles and professional conduct. Their unwavering integrity and unwavering commitment profoundly impact the school culture and establish an exceptional benchmark for all community members to emulate (Brown & Treviño, 2006).

Charisma: Charisma enhances a leader's ability to motivate and inspire their team. Charismatic leaders exhibit personal charm and an alluring appeal, which prove to be highly efficacious in instigating transformative change and fostering unwavering dedication among their followers (Conger & Kanungo, 1998).

Method

The adaptation of the GTL Scale to Turkish was conducted in three stages, focusing on reliability and validity. Each stage's findings are presented in detail, ensuring a thorough examination of the adaptation process. The initial stage entailed an examination of paired sample t-tests and correlations based on the responses of 48 English teachers to the translated and back-translated scale. Next, the fundamental structure of the scale was verified through CFA using teachers' responses. The resulting outcomes were presented as validity statistics, encompassing analyses of convergent validity, nomological

validity, and measurement invariance. Finally, in the third stage, reliability evidence was provided by assessing Cronbach's Alpha, McDonald's Omega, CR, and test-retest values.

Participants

The study's population includes teachers from a medium-sized city (population 500,000-1,000,000) in eastern Türkiye during the 2023-2024 academic year. The study involved the participation of 322 teachers from this population. Data were collected at three different time points. In the first period (T1), the translated and original English versions of the GTL were administered to English teachers to assess linguistic equivalence. During the second data collection period (T2), the GTL was administered along with the "Multifactor Leadership Questionnaire" for parallel testing, focusing on the Transformational Leadership dimension, the "Short Transformational Leadership Scale," and the "Job Satisfaction Scale." Three weeks after these data were collected, the GTL was re-administered to the same group of 111 participants for test-retest reliability (T3). Table 1 provides participant information for both time points.

Table 1.

Participants' Demographic Information

Category	Variable	N	%
T1 (N = 48)			
Gender	Female	31	64.6
	Male	17	35.4
Education Level	Undergraduate	30	62.5
	Graduate	18	37.5
Tenure	14 years and below	25	52.1
	15 years and above	23	47.9

T2 (N = 322)			
Gender	Female	147	45.7
	Male	175	54.3
Education Level	Undergraduate	193	59.9
	Graduate	123	40.1
Tenure	15 years below	167	51.9
	15 years above	155	48.1
T3 (N = 111)			
Gender	Female	45	40.5
	Male	65	59.5
Education Level	Undergraduate	78	70.3
	Graduate	33	29.7
Tenure	14 years and below	63	56.8
	15 years and above	48	43.2

In the first group, 64.6% are female (n = 31) and 35.4% are male (n = 17), with 62.5% (n = 30) holding an undergraduate degree and 37.5% (n = 18) holding a graduate degree. Additionally, 52.1% (n = 25) have 14 years or less of experience, while 47.9% (n = 23) have 15 years or more. In the second group, 45.7% are female (n = 147) and 54.3% are male (n = 175). Among them, 59.9% (n = 193) hold an undergraduate degree and 40.1% (n = 123) hold a graduate degree. Moreover, 51.9% (n = 167) have 14 years or less of experience, while 48.1% (n = 155) have 15 years or more. In the third group, 40.5% are female (n = 45) and 59.5% are male (n = 65). Among these teachers, 29.7% (n = 33) hold a graduate degree. Furthermore, 56.8% (n = 63) have 14 years or less of tenure, while 43.2% (n = 48) have 15 years or more.

Ethical consideration

Ethical approval for the study was obtained from the Ethics Committee for Social and Human Sciences Research at Fırat University. All procedures were conducted in accordance with the ethical standards

set by the committee and the 1964 Helsinki Declaration and its subsequent amendments.

Scale and Procedure

The aim of this research is to adapt the Global Transformational Leadership Scale (GTL), developed by Carless et al. (2000), to the Turkish educational context. The GTL is a brief yet effective tool that measures seven key behaviors associated with transformational leadership using a five-point Likert scale. The scale was initially developed in Australia by evaluating 695 branch managers through assessments by their regional managers and subordinates. However, the transformational leadership behaviors emphasized by the scale—such as providing vision, enhancing motivation, and supporting individual development—are universal in nature and can be similarly evaluated across different types of organizations (Bass, 1997). The broad applicability of transformational leadership principles supports the usability of the GTL in the educational field. Indeed, studies by Eyal and Roth (2011) and Leithwood and Jantzi (2006) have demonstrated that leadership scales developed in non-educational settings can be successfully applied within the educational context. The increasing international use of the GTL in educational institutions (e.g., Al-Aamri et al., 2024; Berkovich & Hassan, 2023) provides further evidence supporting its adaptation to the Turkish cultural and educational organizational context. In this study, the GTL has been culturally and contextually adapted for Turkish educational institutions, following internationally recognized guidelines for scale adaptation (Hambleton & Patsula, 1999; International Test Commission, 2017; Seçer, 2015). First, permission was obtained from the original developers to adapt the scale. The researchers translated the scale items into Turkish, and the translation was reviewed by four

faculty members: two experts in Educational Administration and two in Educational Measurement and Evaluation. The items were revised based on their feedback and then reviewed by two Turkish language experts. Using the back-translation method (Brislin, 1970), the items were translated back into English and checked by two English language experts for any loss of meaning. Revisions were made according to their recommendations. To test the semantic, conceptual, linguistic, and experiential equivalence of the scale, both the Turkish and English forms were administered to English teachers with a two-week interval. Following these tests, the Turkish version of the scale was finalized. For nomological validity, the Multifactor Leadership Questionnaire (Avolio & Bass, 1995), the Short Transformational Leadership Scale (Berger et al., 2012; adapted to Turkish by Okan & Okan, 2021), and the Job Satisfaction Scale (Ho & Au, 2006; adapted to Turkish by Demirtaş, 2010) were used.

Data Analysis

First, the data were checked for missing values, and then skewness and kurtosis values were assessed. Values within ±1.5 were considered evidence of univariate normality (Tabachnick & Fidell, 2013). The values ranged from -1.130 to 1.243, demonstrating that univariate normality was achieved. Following this, the mean and standard deviation of the scale's dimensions were calculated to further assess the data's distribution. The adaptation of the scale was carried out in three stages: (1) language equivalence, (2) validity evidence related to the scale structure, and (3) reliability.

In the initial phase, to ensure the linguistic equivalence of the GTL, a paired samples t-test was administered. This test compared the responses from 48 English teachers at two-week intervals. The lack of

a significant difference in the t-test results confirmed linguistic equivalence.

In the next phase, various validity analyses of the GTL were conducted. Confirmatory Factor Analysis (CFA) was performed to assess the scale's unidimensional structure. Model fit was evaluated using the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), following the guidelines of Xu and Tracey (2017). A good model fit is indicated by CFI and TLI values above .90, and RMSEA and SRMR values below .08, as per Hu and Bentler (1999). Convergent validity was assessed through Composite Reliability (CR) and Average Variance Extracted (AVE), where CR values higher than AVE values and an AVE above .50 suggest convergent validity (Fornell & Larcker, 1981). For nomological validity, parallel test correlations were examined. Measurement invariance was evaluated using the CFA model, with changes in $\chi 2$ used to assess measurement invariance (Byrne et al., 1989). Muthén and Muthén (2012) recommend testing for non-significant changes, indicating that a more constrained model fits the data as well as a less constrained model but with greater parsimony. Due to $\chi 2$'s sensitivity to sample size (Chen, 2007), multiple fit indices were used to evaluate nested models. Cheung and Rensvold (2002) suggest that a change of -.01 in ΔCFI is acceptable for measurement invariance. Alternative indices such as ΔRMSEA and ΔSRMR were also considered (Meade et al., 2008). Chen (2007) recommends a variation of .01 for ΔCFI and ΔTLI, and .015 for ΔRMSEA and ΔSRMR.

In the third stage, reliability analyses of the GTL were performed. The internal consistency of the scale was evaluated by calculating the Cronbach's Alpha and McDonald's Omega reliability coefficients, with

values of .70 or higher deemed acceptable (Hayes & Coutts, 2020; McDonald, 2013). Additional reliability evidence was provided by calculating composite reliability (CR) from the CFA factor loadings. To measure the scale's stability, a test-retest correlation was conducted, with significant correlation values at $p<.01$ indicating stability (Gravesande et al., 2019). For parallel tests, a correlation coefficient of .50 was accepted as the threshold value (Cohen, 1988).

Findings

This section sequentially presents the findings from the stages of linguistic equivalence, validity, and reliability of the GTL Scale.

t-test Results for the Linguistic Equivalence of the Scale

The paired samples t-test results related to the linguistic validity of the GTL Scale are presented in Table 2.

Table 2.

Correlation and Paired Samples t-test Results for the Linguistic Validity of the GTL Scale

		Paired Samples Test					
		N	X	r	ss	t	p
Item1	Turkish1	48	3.17	.743	.919	.628	.533
	English1		3.08				
Item2	Turkish2	48	3.27	.854	.714	1.415	.164
	English2		3.13				
Item3	Turkish3	48	3.27	.846	.772	1.310	.197
	English3		3.13				

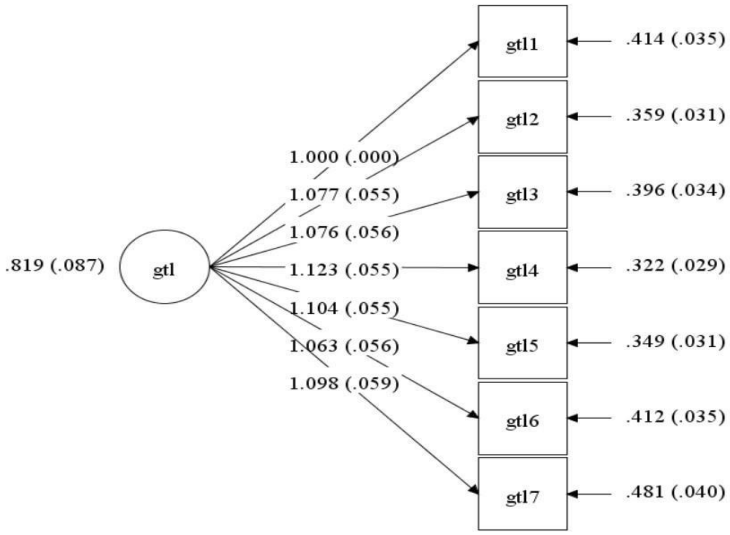
Item4	Turkish4	48	3.38	.815	.875	1.155	.254
	English4		3.23				
Item5	Turkish5	48	3.27	.810	.850	1.188	.241
	English5		3.13				
Item6	Turkish6	48	3.25	.798	.866	1.000	.322
	English6		3.13				
Item7	Turkish7	48	3.10	.858	.798	-.362	.719
	English7		3.15				
General	Turkish	48	3.24	.927	.493	1.504	.139
	English		3.14				

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

The paired samples t-test results compare the scores of each item's Turkish and English versions. The correlation coefficients range from .743 to .927, indicating a moderate to strong relationship between the scores in both languages. For individual items, the mean scores are similar across the two languages. The t-values range from -.362 to 1.504, showing variability in statistical significance levels. However, since none of the p-values are below .05, it is evident that none of these differences are statistically significant at the conventional significance threshold.

CFA Results for the Basic Factor Structure of the Scale

The diagram for the CFA related to the unidimensional structure of the GTL Scale is presented in Figure 1.



Note(s): gtl refers to Global Transformational Leadership

Figure 1. CFA Model for the GTL Scale (Unstandardized)

The CFA results indicate that the measurement model of the scale fits well and confirms the unidimensional structure of the GTL Scale in Turkish culture ($\chi 2 = 45.492$ ($df = 13$; $p < 0.01$), RMSEA = 0.078 (90% CIs = 0.053-0.104), CFI = .985, TLI = .978, and SRMR = 0.017). The CFA results are presented in Table 3.

Table 3.

Validity Values of the GTL Scale (Standardized)

	Item Name	Factor Loading	S.E.	z	p	χ2/df	RMSEA	CFI	TLI	SRMR
GTL	Vision	.815	0.019	42.281	.000					
	Teacher Development	.852	0.016	52.829	.000					
	Support	.840	0.017	48.897	.000	3.249	.078	.985	.978	0.017
	Empowerment	.873	0.014	60.796	.000					
	Innovative Thinking	.861	0.015	55.894	.000					
	Lead by Example	.832	0.018	46.649	.000					
	Charisma	.820	0.019	43.570	.000					

GTL; Global Transformational Leadership

As seen in Table 3, the standardized factor loadings of the CFA model range from .815 to .873, and all path coefficients of the factor loadings are significant ($z > 2.56$; $p < .01$). The mean and standard deviation values for the GTL Scale and the scales used for parallel testing, as well as the parallel test and test-retest correlation values, are presented in Table 4.

Table 4.

Correlation Results for Parallel Test

Parallel test (N = 322)	1	2	3	4	Skewness	Kurtosis
GTL (1)	1				-1.130	1.243
MLQ (2)	.866	1			-1.091	1.327
STL (3)	.895	.822	1		-1.146	1.519
JS (4)	.481	.560	.443	1	-.974	1.192

**p < .01; GTL. Global Transformational Leadership; 2. MLQ; Multiple Leadership Questionnaire; 3. STL; Short Transformational Leadership Scale; 4. JS; Job Satisfaction;

The correlation analysis results indicate the relationship between the GTL Scale and the Multifactor Leadership Questionnaire is (r = .866; p < .01), the relationship with the Short Transformational Leadership Scale is (r = .895; p < .01), and the relationship with the Job Satisfaction Scale is (r = .481; p < .01). The correlation values, which can be considered evidence of convergent validity for the GTL Scale, are above the threshold value (r = .50; p < .01). This indicates that the scale's nomological validity is established. Additionally, as shown in Table 6, the CR/AVE values with CR above .70 and AVE above .50, and the CR (.944) value being higher than the AVE (.709) value, demonstrate that convergent validity is also established.

Measurement Invariance Results

The categories determined by gender, education level, and seniority were evaluated in terms of the four levels of measurement invariance (configural, metric, scalar, and strict). The results are presented in Table 5.

Table 5.

Measurement Invariance Results for the GTL Scale

Model	$\chi 2$ (df)	CFI	TLI	RMSEA	SRMR	$\Delta\chi 2$(df)	p($\chi 2$)	ΔCFI	ΔTLI	ΔRMSEA	ΔSRMR
Gender (N=322)											
Model 1: Full Configural	71.925 (28)	.973	.960	.099	.026	-	-	-	-	-	-
Model 2: Full Metric	72.999 (34)	.976	.971	.084	.032	1.074 (6)	.983	.003	.011	-.015	.006
Model 3: Full Scalar	77.321 (40)	.977	.976	.076	.034	4.322 (6)	.633	.001	.005	-.008	.002
Model 4: Full Strict	82.150 (47)	.979	.981	.068	.044	4.829 (7)	.567	.002	.005	-.008	.010

Education (N=322)											
Model 1: Full Configural	108.462 (47)	.963	.967	.090	.085	-	-	-	-	-	-
Model 2: Full Metric	113.917 (53)	.964	.970	.084	.077	5.455 (6)	.607	.001	.003	-.006	-.008
Model 3: Full Scalar	118.561 (59)	.964	.972	.079	.081	4.644 (6)	.593	.000	.002	-.005	.004
Model 4: Full Strict	123.206 (65)	.964	.973	.075	.084	4.645 (6)	.590	.000	.001	-.004	.003
Tenure (N= 322)											
Model 1: Full Configural	67.063 (28)	.976	.964	.093	.024	-	-	-	-	-	-
Model 2: Full Metric	68.059 (34)	.979	.974	.079	.030	.996 (6)	.986	.003	.010	-.014	.006
Model 3: Full Scalar	70.157 (40)	.982	.981	.068	.032	2.097 (6)	.911	.003	.007	-.011	.002
Model 4: Full Strict	73.507 (47)	.984	.986	.059	.032	3.350 (7)	.914	.002	.005	-.009	.000

The measurement invariance tests by gender produced the following fit indices for the configural model: χ^2 (df) = 71.925 (28), CFI = .973, TLI = .960, RMSEA = .099, and SRMR = .026. For the metric model, the fit indices were χ^2 (df) = 72.999 (34), CFI = .976, TLI = .971, RMSEA = .084, and SRMR = .032, meeting the conditions for metric invariance. The scalar model's fit indices were χ^2 (df) = 77.321 (40), CFI = .977, TLI = .976, RMSEA = .076, and SRMR = .034, indicating scalar invariance. The strict model's fit indices were χ^2 (df) = 82.150 (47), CFI = .979, TLI = .981, RMSEA = .068, and SRMR = .044, confirming strict invariance. Thus, the dataset demonstrates full measurement invariance for gender

across all models, supported by both non-significant chi-square difference tests and changes in CFI, TLI, RMSEA, and SRMR.

For measurement invariance by education level, the fit indices for the configural model were χ^2 (df) = 108.462 (47), CFI = .963, TLI = .967, RMSEA = .090, and SRMR = .085. The metric model showed fit indices of χ^2 (df) = 113.917 (53), CFI = .964, TLI = .970, RMSEA = .084, and SRMR = .077, satisfying metric invariance conditions. The scalar model fit indices were χ^2 (df) = 118.561 (59), CFI = .964, TLI = .972, RMSEA = .079, and SRMR = .081, indicating scalar invariance. The strict model had fit indices of χ^2 (df) = 123.206 (65), CFI = .964, TLI = .973, RMSEA = .075, and SRMR = .084, meeting strict invariance conditions. Therefore, the dataset fulfills measurement invariance requirements for education level across all models, as demonstrated by non-significant chi-square difference tests and changes in CFI, TLI, RMSEA, and SRMR.

Regarding tenure, the configural model's fit indices were χ^2 (df) = 67.063 (28), CFI = .976, TLI = .964, RMSEA = .093, and SRMR = .024. The metric model fit indices were χ^2 (df) = 68.059 (34), CFI = .979, TLI = .974, RMSEA = .079, and SRMR = .030, confirming metric invariance. The scalar model fit indices were χ^2 (df) = 70.157 (40), CFI = .982, TLI = .981, RMSEA = .068, and SRMR = .032, supporting scalar invariance. The strict model's fit indices were χ^2 (df) = 73.507 (47), CFI = .984, TLI = .986, RMSEA = .059, and SRMR = .032, verifying strict invariance. Thus, the dataset shows full measurement invariance for tenure across all models, as evidenced by non-significant chi-square difference tests and changes in CFI, TLI, RMSEA, and SRMR.

Reliability Analyses

The results of the reliability analyses for the GTL Scale are presented in Table 6.

Table 6.

Reliability Analysis Results for the GTL Scale

		Paired Samples Test									
		N	X	r	ss	t	p	α	ω	Ave	Cr
Item1	Test1	111	3.95	.743	.286	-.332	.741				
	Retest1		3.95								
Item2	Test2	111	4.11	.854	.392	.726	.469				
	Retest2		4.08								
Item3	Test3	111	4.04	.846	.569	1.000	.320				
	Retest3		3.98								
Item4	Test4	111	4.05	.815	.269	-.706	.482				
	Retest4		4.06								
Item5	Test5	111	4.05	.810	.416	.228	.820				
	Retest5		4.04								
Item6	Test6	111	4.00	.798	.344	.276	.783				
	Retest6		3.99								
Item7	Test7	111	3.97	.858	.493	.962	.338				
	Retest7		3.93								
General	Test	111	4.02	.927	.139	1.272	.206	.933	.932	.709	.944
	Retest		4.00								

Upon examining the results from the paired samples t-test analysis for the test-retest reliability of the items on the GTL Scale, the following was observed: item one ($p = .741$; $r = .743$; $p < .01$), item two ($p = .469$; $r = .854$; $p < .01$), item three ($p = .320$; $r = .846$; $p < .01$), item four ($p = .482$; $r = .815$; $p < .01$), item five ($p = .820$; $r = .810$; $p < .01$), item six ($p = .783$; $r = .798$; $p < .01$), item seven ($p = .338$; $r = .858$; $p < .01$), and the overall scale ($p = .206$; $r = .927$; $p < .01$). The t-test results indicate that the values ($p > .05$; $r > .50$; $p < .01$) sufficiently demonstrate the test-retest reliability of the GTL Scale. Additional reliability assessments included Cronbach's Alpha ($\alpha = .933$) and McDonald's Omega ($\omega = .932$) for internal consistency, with AVE (.709) and CR (.944) values also

reported. A Cronbach's Alpha and McDonald's Omega above .70, AVE over .50, and CR over .70 confirm the scale's reliability.

Discussion

This study aims to adapt the Global Transformational Leadership Scale (GTL), developed by Carless et al. (2002), to the Turkish cultural context and evaluate its validity and reliability. The original scale was developed in English and validated using data collected from managers and their subordinates in a factory setting. However, in recent years, the GTL has been widely used in educational institutions across the international literature, with studies consistently demonstrating its reliability and validity. In this context, the present study investigates the applicability of the scale in educational institutions by collecting data from teachers and evaluates how effectively a scale developed for one profession can measure school administrators' transformational leadership behaviors as perceived by teachers. The linguistic equivalence, validity, and reliability analyses of the GTL were carried out in three stages. In the first stage, data collected from English teachers were analyzed for correlations and paired samples t-tests to ensure the validity of the English and Turkish forms. In the second stage, CFA was performed to evaluate the construct validity of the original scale's structure within the context of Turkish culture. Convergent validity was established by evaluating nomological validity, CR, and AVE values. Additionally, measurement invariance was examined based on gender, education level, and seniority. In the third stage, the reliability of the scale was evaluated through multiple methods: test-retest stability, internal consistency using Cronbach's alpha and McDonald's omega coefficients, and CR values. This comprehensive approach ensured

that the adapted GTL serves as an effective tool for measuring transformational leadership within the Turkish educational context.

First Stage

In examining the data collected from English teachers at two different time intervals for the linguistic equivalence of the scale, the correlation analysis and paired samples t-test results indicated sufficient evidence for linguistic equivalence. The high correlation coefficients obtained in the correlation analysis (generally 0.70 and above) confirmed that the scale measures similarly in both languages. These high correlation coefficients demonstrate that the English and Turkish versions measure the same construct, thus ensuring linguistic equivalence. Similarly, the paired samples t-test results showed no statistically significant differences between the two languages, supporting the linguistic consistency of the scale. These analyses indicate that the scales in both languages provide consistent and compatible results, confirming that the Turkish version of the scale is equivalent to the original English format. Geisinger (1994) emphasizes the critical role of pilot testing in ensuring linguistic and cultural validity. Van de Vijver and Leung (1997) also highlight the importance of ensuring linguistic equivalence for the validity of scales used in different cultural contexts. These results demonstrate that the original format of the scale has been successfully adapted to Turkish and that the Turkish version can be used valid measurement tool.

Second Stage

The CFA fit indices for the GTL (χ^2/df, RMSEA, CFI, TLI, and SRMR) demonstrated that the single-factor measurement model was well-fitted. Additionally, the z-values for the factor loadings confirmed that all path coefficients were statistically significant. These findings

validated the construct validity of the scale in the Turkish language and cultural setting. The CR and AVE values calculated from the CFA factor loadings supported the scale's convergent validity. For nomological validity, scales representing similar constructs to the GTL, such as MLQ and the Short Transformational Leadership Scale (STL), were applied and confirmed the theoretical expectations by showing empirical relationships with the GTL. The correlation with the "Job Satisfaction Scale" also supported the positive link between transformational leadership and job satisfaction, reinforcing findings in the literature. (Choi et al., 2014; Hanaysha et al., 2012; Tesfaw, 2014; Yıldız & Şimşek, 2016).

High correlation coefficients between the GTL and other leadership scales such as the MLQ and STL indicated strong relationships among theoretically similar constructs, ensuring the nomological validity of the GTL. The positive correlation with the Job Satisfaction Scale demonstrated that transformational leadership significantly impacts teachers' job satisfaction, aligning with existing literature (Munir et al., 2012).

The GTL was evaluated for measurement invariance across gender, education level, and tenure. Achieving measurement invariance is crucial for ensuring that the scale measures the same construct across different groups (Millsap, 2011). The study achieved strict invariance for these demographic variables, which is essential for comparing group factor means and understanding differences in latent factor means (Chen, 2007; Schmitt & Kuljanin, 2008). These results indicate that the GTL is comparable across different demographic groups, providing a reliable basis for analyzing leadership behaviors based on gender, education level, and seniority. This validation ensures that statistical analyses across these groups are valid, supporting

meaningful comparisons and insights into transformational leadership in educational settings.

Third Stage

To evaluate the scale's reliability, internal consistency coefficients were initially examined, focusing on Cronbach's α and McDonald's ω. The coefficients exceeding the threshold value and the close values between the dimensions indicate that the scale is reliable (Kline, 2016). High internal consistency coefficients suggest that the scale items are consistent and coherent, thus providing reliable data. Additionally, the CR values for composite reliability being above the established threshold provide evidence of the scale's composite reliability. This suggests that the scale has a generally reliable structure, with the items consistently reflecting the concepts they are designed to measure. The stability of the scale was assessed using the test-retest method. Significant correlation values and non-significant paired samples t-test results between the scale scores administered to the same participants at three-week intervals indicate that the scale provides consistent results over time and is thus stable. The test-retest method is an important approach for confirming the reliability of the scale. As a result of these analyses, the high internal consistency coefficients and the consistency of the composite reliability and test-retest results demonstrate that the GTL Scale is a reliable and stable measurement tool. This indicates that the scale can accurately and consistently measure leadership behaviors in educational institutions and that the obtained data are reliable.

Limitations

This study has some limitations and could provide guidance for future research. First of all, the study did not test the longitudinal invariance

of the GTL Scale. The longitudinal validity of the scale, which assesses whether teachers' responses to the scale remain consistent over time, was not investigated. This limitation leaves an important gap in the reliability and validity of the scale for long-term use. Future studies are recommended to conduct longitudinal research to evaluate the scale's validity and invariance over time (Millsap & Cham, 2013). Such research will determine whether the scale provides consistent results over time and will test its suitability for broader use. Additionally, the data for this study were collected from a limited geographical area. Conducting the study with a broader sample from different cities and regions could enhance the generalizability of the findings and allow for a more comprehensive examination of transformational leadership practices across educational institutions in Türkiye. Addressing these limitations in future studies will allow for more comprehensive and detailed analyses of the scale's validity and reliability.

Conclusion

The GTL Scale is a reliable and valid tool for measuring school principals' transformational leadership according to teachers' perceptions and has the potential to be used in Türkiye. Its brevity offers practicality and time savings in implementation and evaluation processes (Carless et al., 2000). Additionally, this study significantly contributes to understanding the impact of transformational leadership in educational institutions within the context of educational leadership. Considering that school administrators can potentially enhance teachers' and students' performance by adopting a transformational leadership approach, the use of this scale can help leaders develop effective strategies.

The scale also has high potential for use in further research or practical applications in schools in Türkiye. It can be utilized to explore the impacts of transformational leadership within educational institutions in greater depth. Additionally, this scale can serve as a tool for leaders to evaluate and develop their leadership behaviors. In this context, it can contribute to improving educational environments by enhancing the quality of leadership studies conducted in schools in Türkiye. Moreover, in recent years, this scale has been frequently used in studies within the context of educational institutions (Berkovich & Hassan, 2023; Fernet et al., 2015; Fleming et al., 2023; Schmitz et al., 2023), establishing itself as a proven measurement tool. This supports the scale's international validity and reliability, indicating that it can also be effectively used in educational institutions.

References

Abuhassira, H. Y., Razak, A. Z. A., & Hoque, K. E. (2024). The impact of transformational leadership on classroom interaction in UAE secondary schools. *Education and Information Technologies*. https://doi.org/10.1007/s10639-024-12701-3

Al-Aamri, M. S. H., Soliman, M., & Ponniah, L. S. (2024). Influencers of academic staff performance in higher education: The role of motivation, transformational leadership, and involvement in strategic planning. *Journal of Applied Research in Higher Education*. Advance online publication. https://doi.org/10.1108/JARHE-08-2023-0339

Alanoglu, M. (2023). Creating learning schools through learning-centered leadership: Understanding the moderating role of teacher performance. *Educational Management Administration & Leadership, 0*(0), 1-20. https://doi.org/10.1177/17411432231188641

Alzoraiki, M., Ahmad, A., Ateeq, A., Naji, G., AlMaamari, Q., & Beshr, B. (2023). Impact of Teachers' Commitment to the Relationship between Transformational Leadership and Sustainable Teaching Performance. *Sustainability, 15*(5), 4620. https://doi.org/10.3390/su15054620

Avolio, B. J., & Bass, B. M. (1995). Individual consideration viewed at multiple levels of analysis: A multi-level framework for examining the diffusion of transformational leadership. *The Leadership Quarterly, 6*(2), 199-218.

Aydın, A., Sarıer, Y., & Uysal, Ş. (2013). The effect of school principals' leadership styles on teachers' organizational commitment and job satisfaction. *Kuram ve Uygulamada Eğitim Bilimleri, 13*(2), 806–811.

Bass, B. M. (1985). *Leadership and performance beyond expectations.* Free Press.

Bass, B. M. (1997). Does the transactional–transformational leadership paradigm transcend organizational and national boundaries? *American Psychologist, 52*(2), 130-139.

Berger, R., Romeo, M., Guardia, J., Yepes, M. & Soria, M. A. (2012). Psychometric Properties of the Spanish Human System Audit Short-Scale of Transformational Leadership, *The Spanish Journal of Psychology, 15*(1), 367-376.

Berkovich, I., & Hassan, T. (2023). Principals' digital transformational leadership, teachers' commitment, and school effectiveness. *Education Inquiry, 1*-18. https://doi.org/10.1080/20004508.2023.2173705

Boberg, J., & Bourgeois, S. (2016). The effects of integrated transformational leadership on achievement. *Journal of Educational Administration, 54*, 357-374. https://doi.org/10.1108/JEA-07-2014-0086

Brannan, J. D., White, A., & Long, J. (2016). Learning styles: Impact on knowledge and confidence in nursing students in simulation and classroom. *International Journal of Nursing Education Scholarship, 13*, 63-73.

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology, 1*(3), 185-216.

Brown, M. E., & Treviño, L. K. (2006). Ethical leadership: A review and future directions. *The Leadership Quarterly, 17*(6), 595-616.

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*(3), 456–466. https://doi.org/10.1037/0033-2909.105.3.456

Carless, S. A., Wearing, A. J., & Mann, L. (2000). A short measure of transformational leadership. *Journal of Business and Psychology, 14*, 389-405.

Charoensukmongkol, P., & Puyod, J. V. (2021). Influence of transformational leadership on role ambiguity and work–life balance of Filipino University employees during COVID-19: Does employee involvement matter?. *International Journal of Leadership in Education, 27*(2), 429–448. https://doi.org/10.1080/13603124.2021.1882701

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Choi, S., Yusof, W. M. W., Tan, O., & Low, H. H. (2014). The impact of transformational leadership style on job satisfaction. *World Applied Sciences Journal*, 29(1), 117-124.

Conger, J. A., & Kanungo, R. N. (1988). *Charismatic leadership in organizations*. Sage Publications.

Conger, J. A., & Kanungo, R. N. (1994). Charismatic leadership in organizations: Perceived behavioral attributes and their measurement. *Journal of Organizational Behavior, 15*, 439-452.

Dahlgaard-Park, S. (2015). Transformational leadership. In *The SAGE encyclopedia of quality and the service economy* (Vol. 2, pp. 820-823). SAGE Publications. https://doi.org/10.4135/9781483346366

Day, C., Gu, Q., & Sammons, P. (2016). The impact of leadership on student outcomes. *Educational Administration Quarterly, 52*, 221-258. https://doi.org/10.1177/0013161X15616863

Demirbilek, M., & Çetin, M. (2021). School principals' sustainable management behaviors. *International Journal of Management and Administration, 5*(10), 1-36.

Demirtaş, Z. (2010). Teachers' job satisfaction levels. *Procedia Social and Behavioral Sciences, 9*, 1069-1073.

Demirtaş, Z., & Alanoglu, M. (2015). The relationship between teachers' participation in decision-making and job satisfaction. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 16*(2), 83-100.

Eyal, O., & Roth, G. (2011). Principals' leadership and teachers' motivation: Self-determination theory analysis. *Journal of Educational Administration, 49*(3), 256-275.

Fernet, C., Trépanier, S. G., Austin, S., Gagné, M., & Forest, J. (2015). Transformational leadership and optimal functioning at work: On the mediating role of employees' perceived job

characteristics and motivation. *Work & Stress, 29*(1), 11–31. https://doi.org/10.1080/02678373.2014.1003998

Fleming, C. M., Calvert, H. G., & Turner, L. (2023). Burnout among school staff: A longitudinal analysis of leadership, connectedness, and psychological safety. *School Mental Health, 15*(3), 900-912.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. https://doi.org/10.2307/3151312

Gadbow, N. F. (2001). Teaching strategies that help learners with different needs. *Adult Learning, 12*(2), 19-21.

García-Martínez, I., Arrifano Tadeu, P. J., Pérez-Ferra, M., & Ubago-Jiménez, J. L. (2020). Building a common project by promoting pedagogical coordination and educational leadership for school improvement: A structural equation model. *Social Sciences, 9*(4), 52. https://doi.org/10.3390/socsci9040052

Geisinger, K. F. (1994). Cross-cultural normative assessment: Translation and adaptation issues influencing the normative interpretation of assessment instruments. *Psychological Assessment, 6*(4), 304-312.

Gravesande, J., Richardson, J., Griffith, L., & Scott, F. (2019). Test-retest reliability, internal consistency, construct validity and factor structure of a falls risk perception questionnaire in older adults with type 2 diabetes mellitus: A prospective cohort study. *Archives of Physiotherapy, 9*, 1-11.

Gumus, S., Bellibas, M. S., Esen, M., & Gumus, E. (2018). A systematic review of studies on leadership models in educational research from 1980 to 2014. *Educational Management Administration & Leadership, 46*(1), 25-48. https://doi.org/10.1177/1741143216659296

Hallinger, P., & Hosseingholizadeh, R. (2020). Exploring instructional leadership in Iran: A mixed methods study of high- and low-performing principals. *Educational Management Administration & Leadership, 48*(4), 595-616. https://doi.org/10.1177/1741143219836684.

Hambleton, R. K. & Patsula, L. (1999). Increasing the validity of adapted tests: Myths to be avoided and guidelines for improving test adaptation practices. *Journal of Applied Testing Technology. 1*(1), 1-30.

Hanaysha, J., Khalid, K., Mat, N., Sarassina, F., Yahya Bin Ab Rahman, M., & Zakaria, A. (2012). Transformational Leadership and Job Satisfaction. *American Journal of Economics*, 2(6), 145-148.

Hayes, A. F., & Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating reliability. But…. *Communication Methods and Measures, 14*(1), 1-24.

Ho, C.L. ve Au, W.T. (2006). Teaching satisfaction scale: Measuring job satisfaction of teachers. *Educational and Psychological Measurement, 66*, 172-185.

Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118.

International Test Commission. (2017). *The ITC Guidelines for Translating and Adapting Tests* (Second edition). [www.InTestCom.org].

Iqbal, S., Taib, C. A. B., & Razalli, M. R. (2023). The nexus between leadership styles and organizational performance: the mediating role of quality culture. Quality Assurance in Education, 31(4), 600-615.

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.

Korkmaz, M. (2005). Duyguların ve liderlik stillerinin öğretmenlerin performansı üzerinde etkisi. *Kuram ve Uygulamada Eğitim Yönetimi, 43*(43), 401-422.

Kouzes, J., & Posner, B. (1990). *Leadership Practices Inventory (LPI): A self-assessment and analysis.* San Diego Pfeiffer & Co.

Kouzes, J. M., & Posner, B. Z. (2002). *The leadership challenge* (3rd ed.). Jossey-Bass.

Kumar, P., Kumar, A., & Smart, K. (2004). Assessing the impact of instructional methods and information technology on student learning styles. *Issues in Informing Science and Information Technology, 1*, 533-544.

Leithwood, K., Harris, A., & Hopkins, D. (2008). Seven strong claims about successful school leadership. *School Leadership & Management, 28*(1), 27–42. https://doi.org/10.1080/13632430701800060

Leithwood, K., & Jantzi, D. (2000). The effects of transformational leadership on organizational conditions and student engagement with school. *Journal of Educational Administration, 38*(2), 112-129.

Leithwood, K., & Jantzi, D. (2006). Transformational school leadership for large-scale reform: Effects on students, teachers, and their classroom practices. *School Effectiveness and School Improvement, 17*(2), 201-227.

Leithwood, K., & Sun, J. (2012). The nature and effects of transformational school leadership. *Educational Administration Quarterly, 48*, 387-423. https://doi.org/10.1177/0013161X11436268

Male, T., & Palaiologou, I. (2012). Learning-centred leadership or pedagogical leadership? An alternative approach to leadership in education contexts. *International Journal of Leadership in Education, 15*, 107-118. https://doi.org/10.1080/13603124.2011.617839

Marks, H. M., & Printy, S. M. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational Administration Quarterly, 39*(3), 370-397.

McDonald, R. P. (2013). *Test theory: A unified treatment*. Psychology Press.

Meade, A. W., Johnson, E. C., & Braddy, P. W. (2008). Power and sensitivity of alternative fit indices in tests of measurement invariance. *Journal of Applied Psychology, 93*(3), 568.

Millsap, R. E. (2011). *Statistical approaches to measurement invariance*. Routledge.

Millsap, R. E., & Cham, H. (2013). Investigating factorial invariance in longitudinal data. In B. Laursen, T. D. Little, & N. A. Card (Eds.), *Handbook of developmental research methods* (pp. 109-148). Guilford Press.

Moolenaar, N. M., Daly, A. J., & Sleegers, P. J. C. (2010). Occupying the principal position: Examining relationships between transformational leadership, social network position, and schools' innovative climate. *Educational Administration Quarterly, 46*(5), 623-670.

Munir, R. I. S., Rahman, R., Malik, A., & Ma'amor, H. (2012). Relationship between Transformational Leadership and Employees' Job Satisfaction among the Academic Staff. *Procedia- Social and Behavioral Sciences*, 65, 885-890.

Muthén, L. K., & Muthén, B. O. (2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Nedelcu, A. (2013). Transformational approach to school leadership: Contribution to continued improvement of education. *Manager Journal, 17*, 237-244.

Nuckles, C. R. (2000). Student-centered teaching: Making it work. *Adult Learning, 11*(4), 5-6.

Okan, N., & Okan, Y. T. (2021). Adaptation and psychometric evaluation of the short transformational leadership scale in Turkish. *Turkish Studies - Social, 16*(2), 687-700. https://dx.doi.org/10.47356/TurkishStudies.48329

Özdemir, S., Sezgin, F., Kılınç, A. Ç., Erdoğan, O., & Turan Bora, H. (2024). Unveiling the associations between principal self-efficacy, openness to change and transformational leadership: the mediating role of well-being. Journal of Educational Administration. https://doi.org/10.1108/JEA-11-2023-0284

Piccolo, R., & Colquitt, J. (2006). Transformational leadership and job behaviors: The mediating role of core job characteristics. *Academy of Management Journal, 49*(2), 327-340. https://doi.org/10.5465/AMJ.2006.20786079

Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *The Leadership Quarterly, 1*, 107-142. https://doi.org/10.1016/1048-9843(90)90009-7

Ratna, R., Ligori, A. A. L., Rasaily, B. B., Lhamo, U., Zangmo, S., Tshering, T., & Gyeltshen, S. (2022). Impact of teacher's leadership style on student's academic performance: A case of business school. *Bhutan Journal of Research and Development, 11*(1), 71-91. https://doi.org/10.17102/bjrd.rub.11.1.027

Robinson, V. M. J., Lloyd, C. A., & Rowe, K. J. (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. *Educational Administration Quarterly, 44*(5), 635-674.

Schmitt, N., & Kuljanin, G. (2008). Measurement invariance: Review of practice and implications. *Human Resource Management Review, 18*(4), 210–222. https://doi.org/10.1016/j.hrmr.2008.03.003

Schmitz, M. L., Antonietti, C., Consoli, T., Cattaneo, A., Gonon, P., & Petko, D. (2023). Transformational leadership for technology integration in schools: Empowering teachers to use technology in a more demanding way. *Computers & Education, 204*, 104880.

Seçer, G. (2015). *The process of developing and adapting psychological tests*. Ankara: Anı Publishing.

Somech, A. (2005). Directive versus participative leadership: Two complementary approaches to managing school effectiveness. *Educational Administration Quarterly, 41*, 777-800. https://doi.org/10.1177/0013161X05279448

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

Taş, A., & Çetiner, A. (2011). Teachers' opinions on the extent to which secondary school principals exhibit transformational leadership behaviors. *Turkish Journal of Educational Sciences*, *9*(2), 369–392.

Tesfaw, T. (2014). The relationship between transformational leadership and job satisfaction. *Educational Management Administration & Leadership*, 42(6), 903-918.

Thomas, L., Tuytens, M., Devos, G., Kelchtermans, G., & Vanderlinde, R. (2020). Transformational school leadership as a key factor for teachers' job attitudes during their first year in

the profession. *Educational Management Administration & Leadership, 48*(1), 106-132. https://doi.org/10.1177/1741143218781064

Tran, H., Dou, J., Ylimaki, R., & Brunderman, L. (2022). How do distributed and transformational leadership teams improve working conditions and student learning in underperforming high-needs schools?. *European Journal of Educational Management, 5*(1), 1-14. https://doi.org/10.12973/eujem.5.1.1

Tschannen-Moran, M., & Gareis, C. R. (2015). Principals, trust, and cultivating vibrant schools. *Societies, 5*(2), 256-276.

Xu, H., & Tracey, T. J. (2017). Use of multi-group confirmatory factor analysis in examining measurement invariance in counseling psychology research. *The European Journal of Counselling Psychology, 6*(1), 75-82.

Van Beveren, P., Dimas, I. D., Lourenço, P. R., & Rebelo, T. (2017). Psychometric properties of the Portuguese version of the Global Transformational Leadership (GTL) scale. Revista de Psicología del Trabajo y de las Organizaciones, 33(2), 109-114.

Van de Vijver, F. J. R., & Leung, K. (1997). *Methods and data analysis for cross-cultural research.* Sage Publications, Inc.

Yıldız, I., & Şimşek, Ö. F. (2016). Different Pathways from Transformational Leadership to Job Satisfaction: The Competing Mediator Roles of Trust and Self-Efficacy. *Nonprofit Management and Leadership*, 27(1), 59-77.

Zhang, J., Huang, Q., & Xu, J. (2022). The relationships among transformational leadership, professional learning communities and teachers' job satisfaction in China: What do the principals think? *Sustainability, 14*(4), 2362. https://doi.org/10.3390/su14042362

Appendix

GLOBAL TRANSFORMATIONAL LEADERSHIP SCALE ORIGINAL ENGLISH ITEMS

Represented Leadership Behaviors	Item No	GLOBAL TRANSFORMATIONAL LEADERSHIP SCALE **My Principal;**	Never	Rarely	Sometimes	Often	Always
Vision	**1.**	Communicates a clear and positive vision of the future	1	2	3	4	5
Staff Development	**2.**	Treats staff as individuals, supports, and encourages their development	1	2	3	4	5
Supportive Leadership	**3.**	Gives encouragement and recognition to staff	1	2	3	4	5
Empowerment	**4.**	Fosters trust, involvement, and cooperation among team members	1	2	3	4	5
Innovative Thinking	**5.**	Encourages thinking about problems in new ways and questions assumptions	1	2	3	4	5
Lead by Example	**6.**	Is clear about his/her values and practices what he/she preaches	1	2	3	4	5
Charisma	**7.**	Instills pride and respect in others and inspires me by being highly competent	1	2	3	4	5

Note(s): The scale can be used in academic studies by following proper citation rules. It is not necessary to obtain the author's permission for its use

KÜRESEL DÖNÜŞÜMSEL LİDERLİK ÖLÇEĞİ TÜRKÇE FORMU

Temsil Edilen Liderlik Davranışları	Madde No	KÜRESEL DÖNÜŞÜMSEL LİDERLİK ÖLÇEĞİ Okul Müdürüm;	Hiçbir zaman	Nadiren	Bazen	Çoğunlukla	Her zaman
Vizyon	**1.**	Geleceğe dair açık ve olumlu bir vizyon ortaya koyar	1	2	3	4	5
Personel Gelişimi	**2.**	Öğretmenlere değer verir ve kendilerini geliştirmelerini teşvik eder.	1	2	3	4	5
Destekleyici Liderlik	**3.**	Öğretmenleri cesaretlendirir ve takdir eder.	1	2	3	4	5
Güçlendirme	**4.**	Öğretmenler arasında güven, katılım ve işbirliğini teşvik eder.	1	2	3	4	5
Yenilikçi Düşünme	**5.**	Sorunlar hakkında yeni yollarla düşünmeyi teşvik eder ve varsayımları sorgular.	1	2	3	4	5
Davranışlarıyla Örnek Olma	**6.**	Değerleri konusunda nettir ve başkalarına söylediklerini kendisi uygular	1	2	3	4	5
Karizma	**7.**	Başkalarında gurur ve saygı uyandırır ve yetkinliğiyle bana ilham verir.	1	2	3	4	5

Not: Ölçek, akademik çalışmalarda uygun atıf kurallarına uyularak kullanılabilir. Kullanımı için yazarın izninin alınması gerekli değildir.

About the authors:

Cihat Turan is a teacher at the Ministry of National Education (MEB). He is a PhD student in Educational Management at Fırat University.

E-mail: cihatturan.elt@gmail.com

Authorship credit details: Conceptualization- formulation or evolution of overarching research goals and aims. Methodology- development of methodology. Formal analysis- application of statistical techniques to analyze study data. Investigation- conducting a research and investigation process. Resources- provision of study materials. Writing- original draft preparation. Writing- investigation, conducting a research and investigation process. Writing - review and editing.

Zülfü Demirtaş is a professor in the Department of Educational Sciences, specializing in Educational Management at Fırat University, Faculty of Education.

E-mail: zdemirtas@firat.edu.tr

Authorship credit details: Conceptualization- formulation or evolution of overarching research goals and aims. Supervision- oversight and leadership responsibility for the research activity planning and execution. Writing- review and editing.

Müslim Alanoğlu works in the Department of Educational Sciences at Fırat University, Faculty of Education.

E-mail: malanoglu@firat.edu.tr

Authorship credit details: Conceptualization- formulation or evolution of overarching research goals and aims. Supervision- oversight and leadership responsibility for the research activity planning and execution. Writing- review and editing.