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Research Article

Validation Evidence for the Oviedo Grit Scale (EGO) in a Non-Western Context

Oviedo Azim Ölçeği'nin (EGO) Batılı Olmayan Bir Bağlamda Geçerlilik Kanıtı

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A B S T R A C T

Grit is a positive non-cognitive characteristic related to perseverance and passion for long-term goals. It positively impacts various aspects of life, but limited tools are available for measuring it, particularly in Turkish. Thus, this research aimed to establish the psychometric values for the Turkish version of the Oviedo Grit (EGO) scale by Postigo et al. (2021). The sample consisted of 500 Turkish university students. The analyses for single items, structural validation, measurement invariance, and the scale's relationship with personality traits (i.e., big five personality dimensions) and external variables (i.e., grade point average) supported the claim that the EGO scale, originally developed in Spanish by Postigo et al. (2021), is a reliable, unidimensional tool to measure grit Turkish language. Some limitations and potential paths for future research were also discussed.

MAKALE BİLGİSİ

Anahtar Kelimeler:
Azim, EGO Azim Ölçeği, Bilişsel Olmayan Karakteristik Özellikler, Uyarlama, Güvenirlik, Geçerlik.

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ÖZ

Azim, uzun vadeli hedeflere yönelik sebat ve tutku ile ilgili bilişsel olmayan olumlu bir kişilik özelliğidir. Yaşamın çeşitli yönleri üzerinde olumlu etkiye sahiptir, ancak özellikle Türkçede azimi ölçmek için sınırlı araç mevcuttur. Bu nedenle, bu araştırma Postigo ve diğerleri (2021) tarafından geliştirilen Oviedo Grit (EGO) ölçeğinin Türkçe versiyonunun psikometrik değerlerini belirlemeyi amaçlamıştır. Örneklem 458 Türk üniversite öğrencisinden oluşmaktadır. Madde, yapısal geçerlilik, ölçme değişmezliği ve ölçeğin kişilik özellikleri (örn. beş büyük kişilik boyutu) ve dış değişkenlerle (örn. not ortalaması) ilişkisi için yapılan analizler, Postigo ve arkadaşları (2021) tarafından İspanyolca olarak geliştirilen Oviedo Azim Ölçeği'nin Türkçe çevirisinin azim kişilik özelliğini ölçmek için güvenilir, tek boyutlu bir araç olduğu iddiasını desteklemiştir. Sınırlılıklar ve gelecekteki araştırmalar için potansiyel yollar da tartışılmıştır.

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1. INTRODUCTION

In the late 19th century, Galton argued that ability alone does not guarantee success (Duckworth, Peterson, Matthews, & Kelly, 2007). Accordingly, scholars have debated that non-cognitive characteristics could also play a role in achieving success, even with equal intelligence. These discussions have sparked curiosity in investigating different personal attributes. Although some may be situation-specific, according to Duckworth and colleagues (2007), grit is one characteristic that successful individuals commonly possess across all domains.

Duckworth et al. (2007) defined the construct of grit as "perseverance and passion for long-term goals" (p.1087). They introduced it as a trait-like, non-cognitive quality predicting achievement over and beyond talent. They advocated that grit is related to but distinct from conscientiousness (one of the dimensions of the Big Five [Costa & McCrae, 1985]) and the need for achievement (McClelland, 1961). People with high levels of grit can pursue their motivation and commitment toward goals, though they might require longer to accomplish, even when faced with difficult circumstances.
Grit has gained attention as a non-cognitive quality, particularly in achievement and performance (Credé, Tynan, & Harms, 2017). Moreover, since it has been recognized as a positive characteristic, it sparked an interest in positive psychology (Duckworth & Quinn, 2009); scholars investigated it as related to happiness, life satisfaction, and positive hardiness (e.g., Lovering et al., 2015; Mia & Daiva, 2016).

While grit is a valuable non-cognitive characteristic that positively impacts various areas of life (Postigo et al., 2021), limited tools are available for measuring it, particularly in Turkish. The only available grit tool has been the Turkish translation (Sarıçam, Celik, & Oğuz, 2016) of Duckworth and Quinn's (2009) Grit-S. This measure has been used in a limited number of studies (e.g., Bulgur & Esen, 2021; Kurt Taşpınar & Külekçi, 2018) with Turkish participants.

Nevertheless, as suggested by Postigo et al. (2021), possible psychometric issues regarding the Grit-S (i.e., dimensionality and reliability) and a better fit of a unidimensional structure make the Oviedo Grit (EGO) scale a practical tool to measure grit. The EGO scale is easy to apply and interpret because of its straightforward structure. On the other hand, previous instruments, like the Grit-S scale, have faced difficulties in terms of their dimensionality. There have been discussions on whether grit can be best measured with multiple dimensions or as a single construct. Recent studies suggest that grit may be better represented as a single factor, which agrees with the EGO scale's unidimensional nature.

Thus, the EGO scale is a more practical and reliable tool to measure grit than existing ones. It features a unidimensional structure, measurement invariance, high reliability, and strong validity evidence. Therefore, it is highly valuable for researchers and practitioners who want to assess grit in different populations and contexts.

Accordingly, the purpose of the present study was to confirm the validity of the EGO scale items using a sample of Turkish participants.

2. METHOD

2.1. Participants and Procedure

The study's sample consisted of 500 Turkish university students. Since the items were evaluated from the classical test theory (Novick, 1966) and item response theory (Hambleton & Swaminathan, 1985), the sample was enough for the former and the two-parameter logistics (2PL) model within the latter (Jiang, Wang, & Weiss, 2016). The participants were primarily women (82 %) and undergraduates (80%), with a mean age of 22.75 (SD = 3.86) and a grade point average (GPA) of 3.24 (SD = 0. 53).

The participants responded to an online questionnaire in Qualtrics. The questionnaire consisted of the EGO scale (Postigo et al., 2021), the Short Grit Scale (Duckworth & Quinn, 2009; Sarıçam et al., 2016), the Big Five Inventory (Benet-Martinez & John, 1998; Sümer, Lajunen, & Özkan 2005), and some demographic questions including their assigned sex, age, and their GPA. The research was approved by the university's Ethics Committee (No # E-47749665-050.01.04-160).

2.2. Instruments

EGO Scale

The EGO was developed by Postigo et al. (2021) as a 10-item unidimensional scale to measure grit using a 5-point Likert ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) (see Table 1 for Turkish and original Spanish items).

Table 1: EGO Scale Turkish and Spanish Items

Item	Spanish	Turkish
Item 1	Cuando me planteo un objetivo persisto en el hasta conseguirlo.	Kendime bir hedef koyduğumda onu gerçekleştirene kadar devam ederim.
Item 2	Cumplo lo que me propongo.	Bir şeyi yapmaya karar verirsem yaparım.
Item 3	Soy constante en mis intereses.	İlgi alanlarım konusunda tutarlıyımdır.
Item 4	Tengo mis objetivos claros.	Hedeflerim konusunda netimdir.
Item 5	Aunque los resultados se vean muy lejos, persisto en la tarea.	Sonuç almaya çok yakın olmasam dahi yaptığım işte ısrarla devam ederim.
Item 6	Cada día trabajo duro para acercarme mas a mis objetivos.	Hedeflerime yaklaşmak için her gün çok çalışırım.
Item 7	Cuando tengo un proyecto en mente hago todo lo posible por llevarlo a cabo.	Aklımda bir proje olduğunda, onu gerçekleştirmek için mümkün olan her şeyi yaparım.
Item 8	Dedico el máximo de mi tiempo y energía a lograr mis metas.	Hedeflerime ulaşmak için mümkün olduğunca çok zaman ve enerji harcarım.
Item 9	Si me propongo algo, trabajare en ello hasta conseguirlo.	Eğer bir işe koyulursam, başarana kadar üzerinde çalışırım.
Item 10	Termino lo que empiezo.	Başladığım şeyi bitiririm.

The original items were subjected to a double translation-retranslation process for the current study. First, the original Spanish items were translated into Turkish by a bilingual, then re-translated into Spanish by another bilingual Spanish-speaking academic. Simultaneously, two other academics translated the English version again and retranslated it. Afterward, the two Turkish versions were compared and contrasted, and the items were presented to a group of students to test their comprehensibility. The items' list was finalized at the end of the process. The psychometric evaluation of the Turkish items will be discussed further.

Short Grit Scale (Grit-S)

The Turkish-adapted version (Sarıçam et al., 2016) of the Grit-S (Duckworth & Quinn, 2009) was used to validate the convergent validity of Turkish EGO items. Grit-S is a two-dimensional (i.e., consistency of interest and perseverance of effort) 8-item scale. The item responses were provided on a Likert scale from 1 (*very untrue of me*) to 5 (*very true of me*). Sample items were "New ideas and projects sometimes distract me from previous ones." (Yeni fikirler ve projeler beni bazen öncekilerden uzaklaştırır.) for consistency of interest and "I finish whatever I begin." (Başladığım işi bitiririm.) for perseverance of effort. The reported Cronbach's Alphas for the Turkish version (Sarıçam et al., 2016) was .83 overall, .80 for the consistency of interests (CoI) dimension, and .71 for the perseverance of effort (PoE) dimension. In the current study, they were: .84, .79, and .84, respectively.

The confirmatory factor analysis (CFA) revealed a good fit ($\varkappa 2$= 52.711 (df = 19); GFI = .97; CFI = .98; RMSEA = .060) for the two-dimensional structure of the scale in the current sample.

The Big Five Inventory (BFI)

To test EGO's Turkish items' relation with other personality characteristics (especially with conscientiousness), the BFI's (Benet-Martinez & John, 1998) adapted version (Sümer et al., 2005) was used. BFI is a 44-item scale measuring extraversion (eight items), neuroticism (eight items), conscientiousness (nine items), agreeableness (nine items), and openness to experience (nine items) and using a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items were "full of energy" (enerji dolu), "gets nervous easily" (kolayca sinirlenen), "perseveres until the task is finished" (görevi tamamlanıncaya kadar sebat edebilen), "is considerate and kind to almost everyone" (hemen hemen herkese karşı saygılı ve nazik olan), and "is original, comes up with new ideas" (orijinal, yeni görüşler ortaya koyan), for each subdimension respectively.

After the first reliability analysis, one item from each subscale (i.e., conscientiousness item 2, neuroticism item 6, openness to experience item 7, agreeableness item 5, and extraversion item 2) were eliminated due to their low (i.e., <.30) corrected item-total correlation values.

Again, a CFA ($\varkappa 2$= 2687.549 (df = 649); GFI = .74; CFI = .68; RMSEA = .079) was conducted to validate the scale's construct. As a result of the

factor loadings, one item from agreeableness (item 6) was eliminated. The subscales demonstrated Cronbach's Alpha values between .64 and .77 in Sümer et al.'s (2005) study, while in the present study, the reliability coefficients were as follows after the item elimination: extraversion .82; neuroticism .76; conscientiousness .77, agreeableness .66, and openness to experience .80.

with the overall sample were carried out (Reeve & Fayers, 2005). Both of the analyses, based on the classical test theory (Novick, 1966) and item response theory (Hambleton & Swaminathan, 1985), authenticated the structure and factor loadings (see Table 4).

Following Postigo et al.'s (2021) path, the measurement invariance concerning assigned sex

Table 2: Descriptive Statistics of the Turkish Items

Item	*M*		*SD*		Skewness		Kurtosis		a	
	TR	Org	TR	Org	TR	Org	TR	Org	TR	Org
Item 1	3.91	4.1	0.95	0.76	-0.74	-0.63	.036	0.24	2.84	3.06
Item 2	4.12	3.99	0.89	0.72	-0.90	-0.45	.047	0.19	2.36	2.62
Item 3	3.86	4.06	1.06	0.78	-0.69	-0.57	-0.27	0.16	1.38	2.3
Item 4	3.83	4.12	1.06	0.79	-0.63	-0.73	-0.36	0.43	2.21	2.69
Item 5	3.48	3.96	1.19	0.79	-0.32	-0.67	-0.86	0.63	1.79	2.16
Item 6	3.31	3.97	1.17	0.82	-0.13	-0.54	-0.83	-0.05	2.57	1.99
Item 7	3.64	4.04	1.14	0.81	-0.43	-0.59	-0.72	0.08	2.56	2.73
Item 8	3.73	3.6	1.09	0.90	-0.56	-0.35	-0.49	-0.11	2.66	1.8
Item 9	3.93	4.08	1.04	0.70	-0.69	-0.44	-0.42	0.14	3.60	3.4
Item 10	3.99	3.93	1.05	0.83	-0.88	-0.7	0.04	0.61	1.70	2.14

Note. TR: Turkish items; Org: original Spanish items; M: mean, SD: standard deviation; a: discrimination index from Item Response Theory.

3. RESULTS

The analysis started with the descriptive statistics for the Turkish items. The results revealed acceptable values for each item in skewness and kurtosis. Furthermore, following Thurstone's (1925) and Samejima's (2004) polytomous models, the 2PL model (i.e., estimating item difficulty and discrimination) with polytomous data (Reeve & Fayers, 2005) revealed that the discriminatory power for each of the items was strong (parameter a [1.38 3.60]) (Baker, 2001) (see Table 2 as compared with the values from the original EGO scale).

A CFA was conducted to validate the EGO scale's unidimensional structure offered by Postigo et al. (2021) in Spanish. The analysis revealed high factor loadings (.580, .841) (see Figure 1), and the model fitted well enough ($\chi 2$ = 123.833 (df = 34); GFI = .95; CFI = .97; RMSEA = .073) (see Table 3 as compared with the indicators of the original EGO scale). To verify the unifactorial structure and the factor loadings, one additional CFA with the random half of the sample, an explanatory factor analysis (EFA) with the other half of the sample, and a 2PL model based on the item response theory

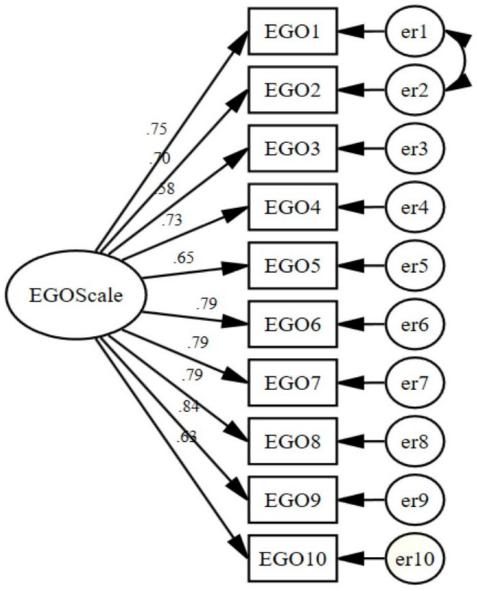

Figure 1: Unidimensional Model of EGO Scale

was examined. The Chi-square test results, the ΔCFI, and ΔMc NCI suggested that scalar, configural, and metric invariance assumption is tenable, including intercepts and residuals (Cheung & Renswold, 2002; Hu & Bentler, 1998) (see Table 5, 6, and 7). Moreover, the compared means did not

reveal significant results for women (M = 3.76) and men (M = 3.84), t(499) = -0.85, p = 39 as in the original EGO scale (Mwomen = 4.02, Mmen = 3.92, p = .059, Postigo et al., 2021).

The scale's internal consistency was tested as Cronbach's Alpha and the composite reliability. The Cronbach's Alpha was .92 for the Turkish items, which was .94 for the original EGO scale (Postigo et al., 2021). For the latter, two values were calculated based on factor loadings revealed by CFA (n = 500), EFA (n = 500), and 2PL model (n = 500) analyses, which were .92, .93, and .95, respectively (see Table 8).

To constitute the convergent validity of the items, the average variance extracted (AVE), which should exceed .50 to be adequate for convergent validity (Hair, Hult, Ringle, & Sarstedt, 2014), was calculated again based on the loadings revealed by different analyses. The AVE values were .53, .58., and .63, respectively. Thus, the scale demonstrated convergent validity (see Table 8).

The discriminant validity was determined by the heterotrait-monotrait (HTMT) ratio of correlation (Henseler, Ringle, & Sarstedt, 2015) rather than Fornell-Larcker (1981). Although the latter was the dominant approach, recent scholars have argued that the HTMT criterion is reliable for detecting discriminant validity problems, and additional research is needed to validate its effectiveness fully (Henseler et al., 2015).

Table 3: CFA Fit Indices for One-Factor Model

	n	χ^2/df	GFI	CFI	RMSEA	SRMR
Turkish EGO scale	500	3.64	.95	.97	0.073	0.03
Original EGO scale	531	2.43	-	.98	0.050	-

Note. χ^2: Satorra-Bentler chi-square; df: degrees of freedom; GFI: goodness-of-fit index; CFI: comparative fit index; RMSEA: root mean-square error of approximation; SRMR: standardized root mean square residual.

Table 4: Factor Loadings

Item	CFA	CFA[a]	EFA[b]	2PL	Original EGO items
	n = 500	*n* = 250	*n* = 250	*n* = 500	*n* = 531
Item 1	.76	.76	.74	.86	.79
Item 2	.70	.75	.73	.81	.54
Item 3	.58	.52	.52	.63	.73
Item 4	.73	.72	.72	.79	.77
Item 5	.65	.69	.69	.73	.69
Item 6	.79	.79	.80	.83	.69
Item 7	.79	.80	.80	.83	.77
Item 8	.79	.77	.78	.84	.66
Item 9	.84	.85	.85	.90	.80
Item 10	.63	.70	.70	.71	.69

Note. CFA: confirmatory factor analysis in SPSS AMOS, EFA: exploratory factor analysis in SPSS; 2PL: two-parameter logistics from Item Response Theory in R.
[a] ⍺2 = 94.009 (df = 34); GFI = .92; CFI = .96; RMSEA = .084
[b] KMO = .92, Bartletts's Test of Sphericity <. 001, Total variance explained = %57.5

Table 5: The Measurement Invariance Models for Assigned Sex

Model	χ^2	df	CFI	gamma hat	Mc NCI	$\Delta\chi^2$	Δdf	*p*	ΔCFI	ΔMc NCI	Δgamma hat
Configural	175.59	68	.96	.96	.90	-	-	-	-	-	-
Metric	190.52	77	.96	.95	.89	14.93	9	.09	.00	.01	.01
Scalar	196.53	86	.96	.95	.90	6.01	9	.74	.00	.00	.00
Invariance residual	212.96	96	.96	.95	.89	16.43	10	.09	.00	.01	.01

Note. Mc NCI: McDonald's noncentrality index; $\Delta\chi^2$: chi-square change; Δdf: degrees of freedom change; ΔCFI: comparative fit index change; ΔMc NCI: McDonald's noncentrality index change

Table 6: The Measurement Invariance of Intercepts for Assigned Sex

Label of parameter	χ^2	df	$\Delta\chi^2$	Δdf	*p*
Item 1	196.5	85	0.01	1	.94
Item 2	196.3	85	0.20	1	.65
Item 3	195.1	85	1.43	1	.23
Item 4	193.7	85	2.83	1	.09
Item 5	196.4	85	0.13	1	.72
Item 6	196.5	85	0.03	1	.86
Item 7	195.4	85	1.13	1	.29
Item 8	195.7	85	0.83	1	.36
Item 9	196.5	85	0.03	1	.86
Item 10	196.5	85	0.03	1	.86

Note. The χ^2 was 194.057, and df was 86 for the baseline (i.e., scalar) model.

Table 7: The Measurement Invariance of Residuals for Assigned Sex

Label of parameter	χ^2	df	$\Delta\chi^2$	Δdf	*p*
Item 1	212.2	95	0.76	1	.38
Item 2	212.4	95	0.56	1	.45
Item 3	212.9	95	0.06	1	.80
Item 4	208.2	95	4.76	1	.03
Item 5	212.3	95	0.66	1	.42
Item 6	212.0	95	0.97	1	.32
Item 7	208.8	95	4.13	1	.04
Item 8	211.7	95	1.26	1	.26
Item 9	209.4	95	3.56	1	.06
Item 10	212.4	95	0.56	1	.45

Note. The χ^2 was 210.9, and df was 96 for the baseline (i.e., invariance residual) model.

Table 8: Cronbach's Alpha, Composite Reliability, and the Average Variance Extracted (AVE)

Cronbach's Alpha		.92	
	CFA	**EFA**	**2PL**
Composite reliability	.92	.93	.95
AVE	.53	.58	.63

Note. The composite reliability and the AVE values were calculated based on the factor loadings resulting in CFA, EFA, and 2PL separately.

The analysis revealed that the Turkish EGO scale discriminated from CoI of Grit-S (.57), extraversion (.37), agreeableness (.31), openness to experience (.33), and neuroticism (-.32). On the other hand, the HTMT ratio for PoE of Grit-S (.87) was above the acceptable HTMT criterion (i.e., .85), which is parallel to the findings of Postigo et al. (2021) that EGO demonstrated evidence of convergent validity, especially with the PoE dimension of Grit-S (r(529) = .75, p < .01). Furthermore, the ratio was quite close to the critical threshold for conscientiousness (.78) (see Table 9).

In addition to HTMT ratios, the correlations between the EGO scale and PoE of Grit-S (r(498) = .77, p < .01) and conscientiousness (r(498) = .65, p < .01) were also quite strong again, like in Postigo
In addition to HTMT ratios, the correlations between the EGO scale and PoE of Grit-S (r(498) = .77, p < .01) and conscientiousness (r(498) = .65, p < .01) were also quite strong again, like in Postigo et al.'s (2021) study (.75 for PoE of Grits-S and .66 for conscientiousness), which further provides evidence of convergent validity for Turkish EGO scale. As another evidence of discriminant validity, the EGO exhibited significant but weaker associations with the other dimensions of BFI (Sümer et al., 2005). It has a positive correlation with extraversion (r(498) = .25, p < .01; it was .18 for the original EGO scale), agreeableness ((r(498) = .26, p < .01; it was .16 for the original EGO scale), and openness to experience (r(498) = .28, p < .01; it was .10 for the original EGO scale) and negative relationship with neuroticism as might be expected (r(498) = -.26, p < .01; it was tested as emotional stability and the correlation was .29 for the original scale) (see Table 10). Nevertheless, as

Table 9: The Heterotrait-Monotrait (HTMT) Ratio of Correlation

Variable	1	2	3	4	5	6	7	8
1. EGO								
2. Consistency of interest (Grit-S)	.57							
3. Perseverance of effort (Grit-S)	.87	.60						
4. Extraversion	.37	.20	.43					
5. Agreeableness	.31	.38	.38	.14				
6. Openness to experience	.33	.06	.37	.45	.26			
7. Neuroticism	-.32	-.39	-.40	-.40	-.45	-.19		
8. Conscientiousness	.78	.65	.90	.37	.47	.44	-.38	

mentioned above, it discriminated from these scales although it was significantly related.

Finally, testing the criterion validity of the EGO scale, the relationship between the EGO scale and the participants' general point averages (GPA) was tested. The analysis revealed a relatively weak but significant positive correlation between them ($r(498) = .11$, $p = .019$).

this study aims to validate a promising tool, the EGO scale developed by Postigo et al. (2021), to measure grit. Specifically, this research seeks to confirm the unifactorial structure, validity, and reliability of the EGO scale in the Turkish language.

The analyses of the data collected from Turkish university students reveal that the Turkish EGO scale demonstrates a unidimensional structure that matches the original one. The measurement

Table 10: Correlations for Study Variables

Variable	1	2	3	4	5	6	7	8	9
1. EGO	-								
2. Consistency of interest (Grit-S)	.46**	-							
3. Perseverance of effort (Grit-S)	.77**	.47**	-						
4. Extraversion	.25**	.15**	.30**	-					
5. Agreeableness	.26**	.25**	.29**	.14**	-				
6. Openness to experience	.28**	.04	.31**	.25**	.23**	-			
7. Neuroticism	-.26**	-.30**	-.32**	-.30**	-.39**	-.12**	-		
8. Conscientiousness	.65**	.57**	.71**	.24**	.37**	.26**	-.39**	-	
9. Grade point average (GPA)	.11*	.12**	.19**	-.06	.06	.02	.01	.17**	-

* $p < .05$. ** $p < .01$.

4. DISCUSSION

Research on grit measurement has been extensively conducted in the United States, but it is still nascent in Europe (Schmidt, Fleckenstein, Retelsdorf, Eskreis-Winkler, & Möller, 2019). Consequently, measuring grit in a non-western context such as Turkey remains a challenge. To address this gap,

invariance for assigned sex shows that the Turkish scale maintains its unidimensional structure for both men and women. Despite the unequal sizes of the groups, the insignificance of the group-mean differences confirms that the Turkish EGO scale can be used among both sexes without any bias concerns. This result is consistent with the findings of Credé et al.'s (2017) meta-analysis, showing no difference regarding sex in grit's measurement.

Considering the other factors examined in the research, the Turkish scale presents a positive but weak relationship with the participants' GPA, which aligns with previous studies indicating that grit is not a strong predictor of academic performance (r = .17, Credé et al., 2017). Additionally, the analysis yields that grit is highly correlated with conscientiousness and weakly correlated with the other four Big Five dimensions, consistent with past research (e.g., Eskreis-Winkler, Shulman, Beal, & Duckworth, 2014). Furthermore, the statistical tests of HTMT ratio correlations and AVE values (Hair et al., 2014; Henseler et al., 2015) support the suggestion that the Turkish EGO scale is a unidimensional scale with convergent and divergent validity.

Finally, the Turkish EGO items possess high inter-item ($\boldsymbol{\alpha}$ = .92) and composite reliability (.92, .93, and .95, for CFA, EFA, and 2PL model loadings, respectively).
Still, the study has its possible limitations. First, the sample consists of university students only. Thus, the tool's strength should also be tested with data from samples with different characteristics (e.g., employees, non-student adults, teenagers). Moreover, some domain-specific vs. -general (e.g., Schmidt et al., 2019) grit models can be investigated to extend the understanding of the context-dependent usefulness of the scale.

Although the nature of the sample (i.e., the university students) limits the study's organizational aspect, it still has the potential to contribute to organizational behavior research (Southwick, Tsay, & Duckworth, 2019) where grit's role remains unclear (Jordan, Ferris, Hochwarter, & Wright, 2018). Therefore, exploring the concept of grit in the workplace can provide valuable insights into how individual differences impact organizational environments. Researchers investigating grit in the workplace can examine how this non-cognitive characteristic correlates with employee performance, attitudes, well-being, career development, leadership, organizational culture, and other aspects of an organization.

For example, researchers study the connection between grit and work engagement and discover a statistically significant positive relationship between the two (Eskreis-Winkler, Shulman, & Duckworth, 2014; Singh & Chopra, 2018; Suzuki, Tamesue, Asahi, & Ishikawa, 2015). In another study, grit predicts retention in sales, a high turnover rate field (Eskreis-Winkler, Shulman, et al., 2014). Additionally, Caza and Posner (2019) demonstrate that high-grit leaders exhibit more frequent role modeling and innovating behaviors. Grit also causes leaders to empower followers in non-work contexts.

Thus, using the EGO scale, Turkish scholars can study whether individuals with higher grit levels are more likely to demonstrate initiative and maintain enthusiasm for their work; whether they are more likely to set and achieve ambitious career goals and navigate setbacks effectively, whether leaders with higher levels of grit are better able to inspire and motivate their teams, persevere through complex leadership challenges, and achieve long-term organizational goals. They can also examine how organizational culture influences employees' development and expression of grit. Finally, they may explore the relationship between grit and employee well-being, including factors such as job satisfaction, stress levels, and burnout.

Second, the current study does not test any inferential predictions aligning with its purpose. Therefore, there is a necessity for empirical studies that consider various variables beyond the GPA to assess the predictive validity of the scale. Instead of relying solely on a correlational methodology, experimental or longitudinal designs could be utilized to test the predictability of the scale from a cause-and-effect perspective.

To sum it up, the psychometric evaluations mentioned above suggest that the Turkish version of the EGO scale, originally developed in Spanish by Postigo et al. in 2021, is a dependable instrument for assessing grit in the Turkish language.

ETHICS DECLARATIONS

Support Information: This study has not received support from any organization such as government, commercial or non-profit organizations.

Conflict of Interest: The corresponding author declares no conflict of interest.

Ethical Approval: All procedures performed in studies involving human participants conform to the ethical standards of the institutional and/or national research committee and the 1964 Helsinki declaration and its subsequent amendments or comparable ethical standards.

For this research, MEF University Ethics Committee Approval was obtained from the Scientific Research Ethics Committee with decision number: E-47749665-050.01.04-160 and date 11.01.2023.

Informed Consent Form: Informed consent form was obtained from all individual participants who participated in the study.

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