

Examining the Factor Structure of Short Grit Scale (8 items) among University Students in a Collectivist Society - Pakistan

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Abstract

Pakistan's education ministry correctly identified management problems in its latest policy but paid no attention to helping students improve their psychological mindset. It is necessary to develop programs to help children raise their psychological outlook to bear the rigors of 21st-century education. This study examined grit that has the potential to be part of any developmental program. In particular, we focused on examining the factor structure of the short grit scale among university students using optimal strategies. Additionally, we provided cultural interpretations of the results. Our EFA result on polychoric data ($n=268$) in the R program revealed a two-factor solution: consistency of interest (4 items) and perseverance (3 items). The mean interitem correlation reliability was within the range (.29 to .34), and ordinal alpha was significant (.65) in both dimensions. Further, the CFA on polychoric data ($n=269$) displayed good fit indices for a two-factor solution with high reliabilities for both dimensions (Coefficient $H > .80$). Our first MGCFA exhibited metric-level measurement invariance across gender. Similarly, the second MGCFA between groups ($n=41$) separated by 4.5 months displayed metric-level measurement invariance. The cultural interpretations of the results surmise that a two-factor solution exists among the sample students. However, these facets might act independently, and a high score on both dimensions might imply a gritty person. Though additional dimensions to define grit in collectivist societies have emerged, they require further validation.

Keywords: Cultural, Factor structure, Short Grit Scale

Introduction

How can a person survive in today's world of bewilderment? Harari (2018) believes education can guarantee mental balance and survival capability in the 21st century of confusion and uncertainty. Fortunately, Pakistan's education ministry acknowledged the importance of education in today's fast-moving world and correctly identified a few issues concerning education in its latest policy (Pakistan Ministry of Federal Education and Professional Training, 2018). It accorded top priority to a question: *“How to bring 22.5 million out-of-school children to school and ensure that the enrolled students complete their education?”* The policy also provided a few management solutions to address the problems, such as: improving infrastructure; resolving funding issues; using technology, and deploying educational volunteers. However, the policy did not pay any attention to improving children's psychological attributes to help them withstand the modern-day educational rigors and complete their studies. Without efforts to improve children's mental faculties, management efforts by the education ministry to help out-of-school or struggling children might fail. Therefore, the education ministry must design children's developmental programs to improve different psychological attributes that can boost children's mental capacities and assist them in staying in school while combating opposing forces.

Significance of the study

Among various psychological constructs that could be part of any developmental program to help out-of-school and struggling students, *grit* is a construct that has drawn widespread attention. However, grit should be rigorously tested before including it in any developmental program because several researchers reported issues for various reasons, including its structure and impact of culture (Datu, 2021). Therefore, this investigative study intends to assist the educational ministry of Pakistan in developing programs that include grit while examining the short grit scale among university students using optimal techniques and providing a cultural interpretation of the results.

Literature Review

Duckworth, Peterson, Matthews, and Kelly (2007) defined grit as “passion and perseverance for long-term goals.” It consists of two first-order factors: consistency of interest and perseverance. Grit is more concerned with stamina for long-term goals while leaving weariness, irritants, and possible failure behind. In other words, while not diminishing the role of talent, grit focuses more on effort than talent in achieving long-term goals (Duckworth, Eichstaedt, &

Ungar, 2015). Thus, people matched on talent and capacity for hard work might differ in grit. In the extant literature, grit is often referred to as a *non-cognitive* trait. However, since every psychological construct requires cognitive ability, it will be apt to label grit as one of the positive personal faculties other than the cognitive ability that leads to success (Duckworth & Yeager, 2015).

Grit overlaps with most other important personal psychological attributes, yet it is different. For example, grit differs from conscientiousness's achievement and dependability aspects due to its focus on stamina and long-term efforts (Duckworth et al., 2007). The authors also differentiated grit from the need for achievement (McClelland, 1961) because grit is about making a conscious decision to follow a specific long-term path that does not require immediate feedback.

Resilience, which has an element of optimism and bouncing back, is another concept similar to grit. However, grit differentiates itself from resilience because it requires setting goals and maintaining consistent interest in them over the long term (Perkins-Gough, 2013). Grit and academic tenacity (Dweck, Walton, & Cohen, 2014) are the two constructs that resemble the most. They ask individuals to set goals and work hard for them. However, grit is more than academic tenacity; it asks for being passionate about goals. Another concept that looks similar to grit is hardiness is another concept that resembles grit. Hardiness allows a person to determine the best course of action in a situation and change accordingly, whereas grit focuses on maintaining a long-term interest in goals (Black, 2014). Duckworth and Yeager (2015) also differentiate grit from self-control; whereas self-control is more about exercising restraint for immediate gratification, grit is more about perseverance for long-term goals.

Grit has a positive influence over various educational outcomes and behaviors. Duckworth et al. (2007) reported that grit was associated with educational attainment, GPA, lesser TV watching hours, retention in West Point Academy, and final round attainment in spelling bee competitors. In the latest integrative review, Datu (2021) reported that grit influences outcomes in primary and higher levels of general and specific academic achievement; course-specific achievements; self-efficacy; intellectual self-concept; emotional engagement; and school-related motivation. In Pakistan, the researchers also found grit essential to developing second language proficiency among students (Lodhi, Hanif, & Fatima, 2019); enhancing happiness and life satisfaction (Ain, Munir, & Suneel, 2021; Khan, 2017) and reducing depression (Majeed et al., 2019).

Although grit sparked much positive attention among scholars, Datu (2021) summarized various issues with the existing grit structure, and among them, the most critical issue is the applicability of grit in different cultures (Henrich, Heine, & Norenzayan, 2010). While explaining culture, the most common dimension is the individualistic–collectivist continuum along which grit can be examined (Hofstede, 1983; Lykes & Kemmelmeier, 2014). In individualistic societies, people view themselves as independent with unique abilities, and their likings remain constant across contexts; in collectivist societies, people view themselves as tied to their extended families, and their behaviors do not remain constant across contexts (Markus & Kitayama, 1991, 1998). Though the behavioral patterns do not remain constant (Gardner, Gabriel, & Lee, 1999), western cultures mostly exhibit an independent view, and many non-western cultures exhibit an interdependent view of self. Since Pakistan is a collectivist country (Country Comparison, 2022; Islam, 2004), grit might exhibit a different structure. As deemed necessary in this study, the correct estimation regarding grit structure in Pakistani society will provide a solid foundation to use grit judiciously in any developmental program.

The higher-order grit structure underpinned by two factors, consistency of interest and perseverance, is also criticized (Credé, 2018; Credé, Tynan, & Harms, 2017; Datu, Valdez, & King, 2016a, 2016b). Duckworth, Quinn, and Tsukayama (2021), the authors of the grit scale, admitted the mathematical constraints in the model but asserted that statistical techniques, such as factor analysis, could not substitute the theoretical reason for a construct and its underlying factors. The authors persisted in their argument that the consistency of interest and perseverance are distinct but related constructs and complement each other, showing the disposition of an individual to reach long-term goals, such that the total grit score will define the individual's collective response towards reaching a goal. However, Morell et al. (2021) found various structures of grit across age and culture and questioned the use of the two terms: long-term and passion.

Though the education ministry of Pakistan has set forth a gigantic task of bringing 22.5 million out-of-school children to the sphere of education and helping the enrolled students to complete their education, it is not possible to achieve the target if the government does not design programs to improve the psychological mindset per se of the children. It must be noted that these out-of-schools children are not from the privileged class and do not have the resources to grow on their own; therefore, the government must bear the cost of developing and implementing

programs to help children improve their psychological mindset. Grit has the potential to become part of such programs because it has shown the ability to repel educational pressures, remove mental barriers while pursuing long-term goals, and offset any socio-economic hurdles. Since the grit structure is not stable across cultures and age, knowing how grit behaves in a collectivist Pakistan is necessary. With the backdrop to assist the education ministry in developing programs for out-of-school and struggling children, this investigation focuses on examining the short grit scale among university students using optimal techniques and providing a cultural interpretation of the results. The following is the work methodology:

1. Using polychoric correlation, employ exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to determine the factor structure of grit.
2. Using the best fit model, conduct multigroup confirmatory factor analysis (MGCFA) across gender and between two longitudinally separated groups.
3. Provide collectivist cultural interpretations of the structure.

Method

Data Collection

This study was conducted at the University of Karachi, and the psychology department provided the necessary approvals. A team of ten volunteer undergrad psychology students was trained in data collection to collect student data from randomly selected 25 different departments of the university. They collected data during morning class timings from Aug to Oct 2021. The data collectors distributed the personal data form and grit questionnaire to volunteer students in a class. The grit questionnaire also contained a data dictionary to help participating students understand various terms. In the personal data form, we implored the respondents to participate in the next round of data collection for the longitudinal study. We gave each member of the data-collecting team stipends and participation certificates.

Participants

Initially, five hundred and eighty-six students (Males = 150; Females = 436) from 24 different departments of the University of Karachi voluntarily participated. A majority of these students were undergrad (81%) and self-identified themselves as Urdu speaking (53%), followed by Sindi and Punjabi (10% each), and the rest were of different ethnic origins (27%). A small percentage of the students (20%) reported high-level proficiency, whereas 80% showed intermediate-level

mastery of the English language. The students used paper and pen to complete the demographics and the Grit – S forms. We did not collect socio-economic status data.

A small portion of the students ($n = 41$; Males = 13, Females = 28), who earlier participated in the cross-sectional study, provided us with their responses using Google forms after 4.5 months in the longitudinal study.

Measure

The original grit scale was developed by Duckworth et al. (2007), which is a second-order construct undergirded by two first-order factors: consistency of interest (COI: 6 items) and perseverance of efforts (PERS: 6 items). Because of psychometric issues, Duckworth and Quinn (2009) developed an improved short form (Grit – S, COI: 4 items, PERS: 4 items) that retained its original structure but had fewer items. COI is about a burning desire to achieve a long-term goal (Sample item: “New ideas and projects sometimes distract me from previous ones”); PERS is about continuous efforts to achieve a long-term goal (Sample item: “I am diligent”). After reverse scoring the COI items, the total score is computed by adding the scores of the first-order factors. The higher the score, the grittier the person is. The authors provided additional validity evidence, including consensual validity and reported invariance across genders. The Cronbach Alpha ranges from .73 to .83. The authors chose a 5-point Likert scale (1 = not like me at all; 5 = very much like me). The confirmatory factor analysis revealed good fit indices [$\chi^2 (19, N = 1554) = 188.52, p < 0.001$; CFI = 0.96; RMSEA = 0.76 (90%, CI = .66, .086)], and the test-retest reliability after one year was 0.68 ($p < 0.001$).

Data Analyses

We searched several resources for data cleansing procedures using SPSS (V.23) (Osborne, 2013; Tabachnick & Fidell, 2013), and this resulted in the removal of 19 cases due to unengaged responses and 21 cases due to missing data. For the rest of the missing data, we adopted the expectation-maximization procedure. As the data was slightly non-normal, we also employed transformation techniques, including two-step transformation (Templeton, 2011). Since we did not obtain better-transformed data, we accepted the original data. Finally, we removed 9 more cases being multivariate outliers, which reduced the initial data from 586 to 537 cases for final analysis (Females: 407, 76%; Males: 130, 24 %).

Due to poor fit indices in the initial CFA, we resorted to EFA (Knekta, Runyon, & Eddy, 2019). While maintaining gender equality, we divided the sample ($n = 537$) using random

sampling into two halves (Bandalos & Finney, 2010; Knekta et al., 2019). Employing the psych package in R (Revelle, 2017), we used polychoric data to conduct EFA from the first half ($n = 268$: Males = 65; Female = 203). Three methods were used to determine the possible factors in the data: parallel test, latent root criterion, and scree test (Hair, Black, Babin, Anderson, & Tatham, 2018). Since the data was slightly non-normal, we followed Leandre, Fabrigar, and Wegener (2012) and used principal axis factoring and promax rotation. Furthermore, we removed items with low factor loadings ($<.3$). We followed Gadermann, Guhn, and Zumbo (2012) to estimate ordinal alpha and Pallant (2016) to measure mean inter-item correlation (range: .2 - .4) for reliability estimates.

The CFA was conducted on polychoric data using second-half data ($n = 269$; Males = 65; Females = 204), Lavaan package in R (Rosseel, 2012), and WLSMV estimator. We sequentially fitted three models, including (a) a correlated first-order factor model, (b) a hierarchical model, and (d) a one-factor model. Consistent with the recommendations in the extant literature, the following multiple indices were used: a small near to zero χ^2 ; less than 2 [χ^2/df] ratio; CFI $> .95$ as good and $> .90$ as acceptable; TLI $> .95$ as good and $> .90$ as acceptable; RMSEA $< .06$ as good and $< .08$ as acceptable; SRMR $< .08$ as good and $< .10$ as acceptable (Browne & Cudeck, 1992; Hu & Bentler, 1999; Hair et al., 2018). Heywood cases were adjusted by applying a low value (0.05; Brown, 2015). In addition, we examined standardized loadings ($> .3$) and directionality to investigate the factor structure (Brown, 2015; Byrne, 2016). Based on an optimally weighted scale (Kalkbrenner, 2021; McNeish, 2018), we computed coefficient H ($\geq .60$) for reliability estimates to estimate maximum reliability.

Like Duckworth et al. (2007), we estimated measurement invariance across genders while conducting MGCFA on the model with best-fit indices. In the second MGCFA, we analyzed invariance between groups separated by 4.5 months.

Finally, we provided the cultural interpretation of the results.

Results

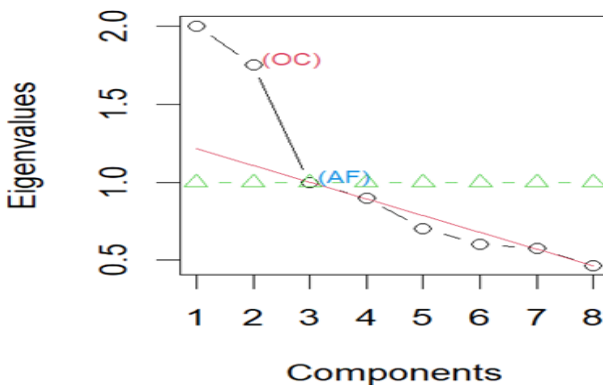
EFA

Though the parallel test indicated one factor only, the latent root criterion (eigenvalue > 1) and scree test resulted in a two-factor solution (Figure 1). Only one item showed low factor loadings ($< .3$) from the perseverance factor (PER_2: "Setbacks don't discourage me") and was removed. After applying the Promax rotation, two factors (7 items) that described 53% and 47% of the

variance (Table 1) and had an acceptable mean inter-item correlation (.28 to.33) and the ordinal alpha (.65) for both dimensions emerged. Both factors were weakly correlated with each other ($r = .2$).

Figure 1

Determination of Factors – Scree Test



Note: OC: Optimal Coordinated; AF: Acceleration Factor

Table 1

Exploratory Factor Analysis – Factor loadings for the 7 items of Grit (n = 268; Females =203, Males = 65)

<u>Items</u>	<u>COI</u>	<u>PERS</u>
1R. New ideas and projects sometimes distract me from previous ones.	.44	
3R. I have been obsessed with a certain idea or project for a short time but later lost interest.	.62	
5R. I often set a goal but later choose to pursue a different one.	.57	
6R. I have difficulty maintaining my focus on projects that take more than a few months to complete.	.62	
4. I am a hard worker		.59
7. I finish whatever I begin.		.58
8. I am diligent.		.68
Proportion Explained	.53	.47
Mean Inter-Item Correlation	.286	.338
Ordinal α	.65	.65

Note: COI: Consistency of Interest; PERS: Perseverance; R denotes the reverse coded items; polychoric correlations were used

CFA

Three different models were analyzed. Though χ^2 value was higher than expected, the two-factor correlated model cumulatively provided excellent fit statistics (“ χ^2 (df) = 8.31 (13), CFI = 1.00, TLI = 1.02, RMSEA = .000 [.000 - .037], SRMR = .034”; Table 2). Moreover, the directionality is as expected (Figure 2), and the standardized factor loadings were greater than .3 (range: .372 – .704). The two factors were weakly correlated ($r = .2$) but exhibited strong reliability (Coefficient H: COI: .83, PERS: .85).

For the second model, we applied equality constraints to identify the higher-order model underpinned by two factors. The factor loadings of consistency of interest (.484) and perseverance (.404) were similar, and there was no difference in fit indices from the two-factor correlated model. Finally, the one-factor model was tested, which provided poor indices (“ χ^2 (df) = 101.76 (14), CFI = .687, TLI = .530, RMSEA = .153 [.126 - .182], SRMR = .112”; Table 2).

Multigroup Confirmatory Factor Analyses (MGCFA)

While using the two-factor model, the first MGCFA across gender displayed measurement invariances at the metric level ($\Delta\text{CFI} < .01$: Table 3). Similarly, while using the two-factor model, the second MGCFA between groups separated by 4.5 months showed measurement invariance at the metric level ($\Delta\text{CFI} < .01$: Table 4). Both analyses exhibited good model fit indices.

Table 2

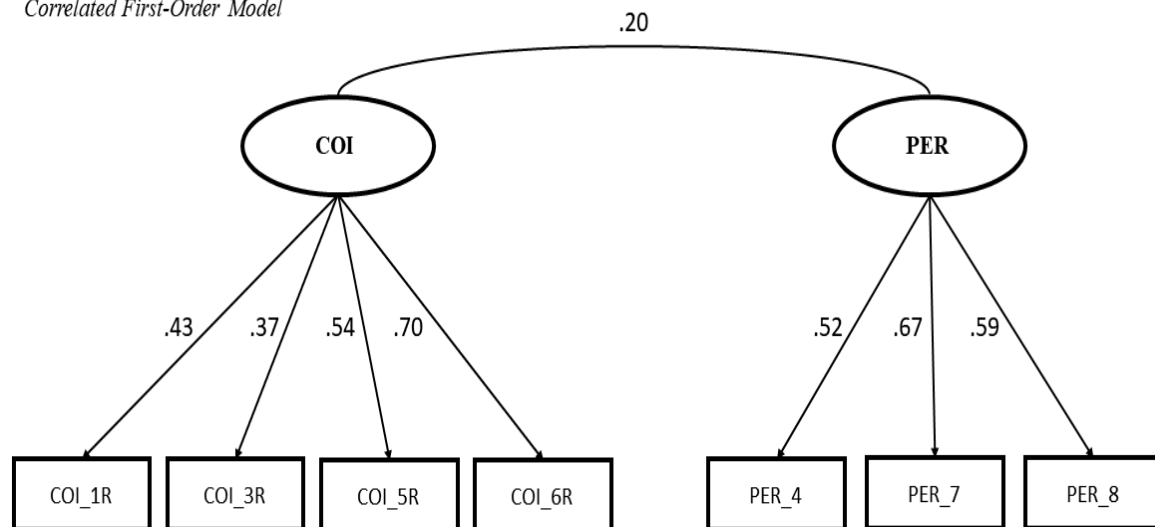
Fit Indices of the Three Models of Grit (n = 269, Males = 65, Females = 204)

	χ^2	Df	χ^2 / df	CFI	TLI	RMSEA [CI: 90%]	SRMR
Correlated ^a	8.31	13	.63	1.00	1.02	.000[.000-.037]	.034
Hierarchical ^b	8.31	13	.63	1.00	1.02	.000[.000-.037]	.034
One Factor	101.76	14	7.2	.687	.530	.153[.126-.182]	.112

Note: χ^2 : Chi-Square; CFI: Comparative Fit Indices; TLI: Tucker Lewis Index; RMSEA: Root Mean Square Error of Approximation; CI: Confidence Interval; SRMR: Standardized Root Mean Square Residual; Indices with italics fall within acceptable range; ^a One Item of Perseverance removed (PER_2); ^b Equality constraints applied

Figure 2

Correlated First-Order Model



Note: COI: Consistency of Interest; PER: Perseverance; Numerals indicate items numbers; R denotes reverse coded items; Standardized Factor Loadings

Table 3

Multigroup CFA Between Males and Females - Correlated Model ($n = 269$, Males = 65, Females = 204)

	χ^2	df	χ^2 / df	CFI	ΔCFI	TLI	RMSEA [CI: 90%]	SRMR
Configural	21.96	26	.84	.998	-	.997	.000[.000-.055]	.053
Metric	23.93	31	.77	1.00	.002	1.03	.000[.000-.042]	.055

Note: χ^2 : Chi-Square; CFI: Comparative Fit Indices; TLI: Tucker Lewis Index; RMSEA: Root Mean Square Error of Approximation; CI: Confidence Interval; SRMR: Standardized Root Mean Square Residual; ΔCFI cut off is $<.01$

Table 4

Longitudinal Multigroup CFA Between Samples 4.5 Months Apart, Correlated Model ($n = 41$: Females = 28; Males: $n = 13$)

	χ^2	df	χ^2 / df	CFI	ΔCFI	TLI	RMSEA [CI: 90%]	SRMR
Configural	24.23	26	.93	1.00	-	1.01	.000[.000-.115]	.076
Metric	30.76	31	.99	1.00	0	1.01	.000[.000-.117]	.108

Note: χ^2 : Chi-Square; CFI: Comparative Fit Indices; TLI: Tucker Lewis Index; RMSEA: Root Mean Square Error of Approximation; CI: Confidence Interval; SRMR: Standardized Root Mean Square Residual; ΔCFI cut off is $<.01$

Discussion

Pakistan's education ministry has set a very challenging task in its latest policy to bring 22.5 million out-of-school children to schools and help enrolled students complete their education. Though the policy proposed a few management solutions, it failed to address the issue of improving students' mindsets psychologically to face the educational rigors of the 21st century. Hence, new developmental programs that aim to improve the psychological mindset of the students should be formulated. Since grit has shown its potential to impact children's mindsets, it is one of the contenders for inclusion in these programs. However, it is necessary to examine how grit behaves in the Pakistani environment to ensure accurate psychological measurement of the children. This investigative study intends to assist the education ministry of Pakistan in developing programs that include grit while examining the short grit scale among university students using optimal techniques and providing a cultural interpretation of the results. The EFA on the polychoric data deleted one item from the perseverance dimension and finally hinted at a possible two-factor solution: consistency of interest and perseverance. We obtained acceptable ordinal alpha (.65) for both the extracted dimensions, and the mean inter-item correlation was within range ($COI = .29$, $PERS = .34$). Similar to earlier studies in collectivist societies (Datu et al., 2016a, 2016b; Tyumeneva, Kardanova, & Kuzmina, 2019), the CFA using polychoric data revealed the two-factor structure of grit with good fit indices and strong reliabilities for both

dimensions (Coefficient H > .65). Lastly, the two MGCFAs supported the two-factor structure at a metric level.

In the current investigation, EFA highlighted two critical issues. The first issue was the existence of two possible grit structures: unidimensional and two-factor. Previous literature found both grit structures but in different cultures: Gonzalez, Canning, Smyth, and MacKinnon (2019) reported a unidimensional grit structure in an individualistic society; Tyumeneva et al. (2019) and Datu et al. (2016a) found a two-factor structure in collectivist societies. We surmise that the two different structures were due to the cultural difference of the participants. We will discuss the cultural aspect later.

The second issue in the EFA was removing one item from the perseverance dimension due to poor factor loadings. Mullen and Crowe (2018) also reported the removal of this particular item, which uses double negatives ("*Setbacks don't discourage me*"). Though the participants in the current sample had adequate English proficiency, the item has the potential to be misinterpreted and hints at its refinement in future studies.

In contrast to the original grit higher-order construct supported by two first-order factors (Duckworth et al., 2007), our CFA exhibited a two-factor correlated structure. Various authors (Credé, 2018; Credé et al., 2017) criticized the higher-order grit structure for two reasons. Firstly, equality constraints are needed for model identification if a single second-order factor is supported by two first-order factors (Byrne, 2016; Hair et al., 2018; Rindskopf & Rose, 1988), which will result in zero difference in fit indices between the correlated and the second-order models and will make the second-order model redundant. Secondly, as a necessary condition, there must be a strong correlation between first-order factors to indicate the presence of a higher-order structure. In contrast to Duckworth et al. (2021), the CFA in the current investigation showed that the two first-order dimensions are weakly correlated ($r = .2$), which again makes the higher-order structure redundant. Besides the structural argument against the higher-order model, the results of the two MGCFAs sufficiently support the two-factor model in Pakistan. The high factor loadings of items corresponding to each dimension and the weak correlation between the dimensions suggest keeping these dimensions to define grit, such that they act independently in Pakistan's collectivist society. Thus, in line with Tyumeneva et al. (2019), calculating total grit scores is not a good practice, and a person who obtains high scores on both dimensions may be identified as a gritty person in Pakistan.

Based on Henrich et al. (2010) contention that the constructs defined and validated in western countries may not apply equally in non-western countries, Hasan, Munawar, and Khaiyom (2020) asserted that the difference between individualistic and collectivist cultures may shape the grit structure. In an individualistic society, people make independent decisions and do not have significant pressure on their lives from those around them (Markus & Kitayama, 1991, 1998). Since a simple act of independently choosing something shows a genuine desire or need for it (Iyengar, 2010), it results in consistency of interest and motivates a person to persevere till his desire is met. Independently choosing one's profession or a habit without any pressure from family or society is probably why Duckworth et al. (2007) found a strong relationship between consistency of interest and perseverance in their study conducted in an individualistic society: the USA, and which might have resulted in a higher-order factor.

On the other hand, in collectivist societies, people eulogize tightly-knit families and have significant pressure on their lives from the people around them (Markus & Kitayama, 1991, 1998). Since social pressure from others prevents individuals from making independent decisions (Iyengar, 2010), especially when choosing a profession, the individuals might succumb to the pressures and leave their long-term interests. Suh (2007) termed it behavioral inconsistency, which led Datu et al. (2016a) to assert that consistency of interest is a weak predictor of grit in collectivist societies, hinting that consistency of interest might not be a part of grit in collectivist societies. However, various other studies in collectivist societies (Arif, Khan, & Abbas, 2021; Datu, Yuen, & Chen, 2017, 2018; Singh & Chukkali, 2021) found the consistency of interest and perseverance dimensions necessary to define grit structure besides adding some new dimensions, such as adaptability to the situation and religion. Though adding new and more dimensions to grit will resolve the model identification issue, the validity of new dimensions in collectivist societies warrants further research.

Since Pakistan is a collectivist country (Islam, 2004) where children hold their *parents* in an esteem position and accept their decisions unquestionably (Zahra & Saleem, 2021; Bibi, Saleem, Khalid, & Shafique, 2020; Stewart et al., 1999; Yasinzai, Aziz, & Yasinzai, 2021; Zaman, 2014), the children assent to their parent's wish and strive in the chosen domain. In most cases, children likely develop sustained interest and persevere in the new field chosen by their parents. For now, in line with Tyumeneva et al. (2019) and based on our two-factor structure, we reiterate

that consistency of interest and perseverance are part of the grit structure in collectivist Pakistani society, and they act independently such that a gritty person scores high on both dimensions.

Conclusion, Limitations, and Future Directions

This study aims to assist the education ministry of Pakistan in developing programs to improve the psychological mindset of out-of-school and struggling children while examining the factor structure of the important constructs, grit, among university students using optimal techniques. The study demonstrated that grit could best be conceptualized through its two latent factors: consistency of interest and perseverance, which might act independently such that a high score on both dimensions reflects grittiness. Due to the two-factor structure, the study supports factor scores instead of total grit score. The cultural discussion of the study also supports the two-factor structure and signifies the importance of other dimensions, which will resolve model identification issues and might exhibit the collectivist notion in the grit structure. This study must be studied with a few limitations. In its original form, grit is a higher-order structure, whereas our data shows that a two-factor structure can best explain grit. Multiple samples are required to achieve generalizability. Moreover, cross-validation studies of two-factor grit with other related structures are required. Since new grit dimensions in a collectivist society have emerged, it will be interesting to know the research findings based on new dimensions.

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