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**Abstract**

In the current study, the psychometric properties of a measure of psychological grit among 344 Latinx college students was investigated. Researchers used confirmatory factor analysis to validate a previously identified two-factor model of the Short Grit Scale (Grit-S). Internal consistency was acceptable as measured by coefficient alpha. A two-factor model of Grit-S had a good model fit with the data. A discussion regarding the importance of these findings is provided and implications for counselors and researchers are offered.

Researchers have attempted to understand Latinx students' academic performance given the documented achievement gap between Latinx students and their non-minority peers (American Council on Education, 2012). Several explanations have been given for differences in academic achievement, including deficit models that blame Latinx students, culture, and families. Other researchers (Navarro, Schwartz, Ojeda, & Pina-Watson, 2014; Ojeda, Edwards, Hardin, & Pina-Watson, 2014) have used an ecological model, positive psychology framework, resilience, or strength-based perspectives to examine how Latinx students persist in the face of environmental and systemic challenges. When researchers use a strength-based model to examine systemic challenges that influence Latinx students such as tracking, discrimination, and low expectations, identification of factors to help Latinx students sustain interest toward long-term goals can be realized. One factor related to academic achievement among various populations is psychological grit

(Duckworth, Peterson, Matthews, & Kelly, 2007). However, because factor structure to measure grit can vary between cultural groups (Hakatanir, Lenz, Can, & Watson, 2016), a validity study of the Grit-S with a group of Latinx students is important. Counselors and researchers need to identify assessments within a positive psychology framework that demonstrate strong psychometric support for use with Latinx populations.

**Psychological Grit**

Psychological grit refers to perseverance and passion toward goals (Duckworth et al., 2007) and includes two components: (a) consistency of interests and (b) perseverance of effort. Consistency of interest refers to sustained interest in activities over time while perseverance of effort relates to tendencies to continue working toward long-term goals (Duckworth et al., 2007). Students with high levels of grit have high self-control, dependability, orderliness, long-term passion, and perseverance to achieve

goals (Duckworth & Eskries-Winkler, 2015). Despite challenges, gritty individuals sustain commitment and perseverance toward the same long-term goals over long periods of time. Grit also demonstrates predictive ability to outcomes such as general intelligence, physical aptitude, educational attainment, and career changes (Duckworth et al., 2007). Researchers also found that grit predicts students' graduation from high school, grade point average in college, and persistence in cadet training (Duckworth et al., 2007; Duckworth & Quinn, 2009). Duckworth and Eskries-Wrinkler (2015) suggest that only two studies have been conducted to show how gritty individuals appear to have higher achievement outcomes. Individuals with high grit appear to dedicate more time to deliberate practice and counterfactual thinking. Finally, Muenks, Wigfield, Yang, and O'Neil (2017) examined the relationship among high school and college students' grit, personality characteristics, self-regulation, engagement, and achievement. Students' perseverance of effort influenced grades later in school, providing important evidence regarding the long-term benefits of grit.

Using a valid instrument to measure grit with diverse populations is important given the positive relationship with psychological well-being, academic performance, and hope. One popular measure for evaluating students' perceptions of grit is the Grit-S (Duckworth & Quinn, 2009). Duckworth et al. (2007) developed and evaluated a 12-item instrument to measure psychological grit. However, Duckworth and Quinn (2009) conducted several studies to develop and validate a shortened two-factor version of the grit scale, which is the focus of the present study.

### **Measuring Grit: Short Grit Scale**

The Grit-S is a brief (8-item) and two-subscale measure designed to evaluate perceptions of sustained and perseverance of effort toward long-term goals (Duckworth & Quinn, 2009). In the initial validation study, Duckworth and Quinn (2009) removed four items from the original 12-item scale and tested psychometric properties with a sample of West Point cadets, finalists in the National Spelling Bee, and Ivy League undergraduate students. The revised Grit-S had internal reliability coefficients ranging from .73 to .83. In the next stage of instrument development, the factor structure did not vary by gender and results correlated ( $r = .96$ ) with the original version. Following this, Duckworth and Quinn examined test-retest stability among high school students and found a positive correlation with scores one year later. However, because this instrument was normed with a mostly White population (Hakatanir et al., 2016), confirming the factorial structure with culturally-diverse populations is important. Several researchers identified different factor structures across different cultural groups (Hakatanir et al., 2016) and developmental levels (Muenks et al., 2017).

Researchers (Duckworth et al., 2007; Vela, Lu, Lenz, Savage, & Guardiola, 2018) have used the Grit-S to examine high school and college students' academic and counseling experiences. A review of published studies revealed a trend for applications of grit scores in prediction models on clinical and academic outcomes as well as outcome variables in regression models. Undergraduate students at an elite university with higher levels of

psychological grit had higher grade point averages, while students in the National Spelling Bee with higher levels of grit outperformed other competitors with lower levels of grit (Duckworth et al., 2007). Additionally, Vela, Lu, Lenz, and Hinojosa (2015) conducted a study with 128 Latinx college students and multiple regression analysis showed higher levels of hope led to higher levels of psychological grit but that higher levels of search for meaning in life was negatively associated with psychological grit. Students who had higher levels of search for meaning in life had lower levels of grit. Also, Salles, Cohen, and Mueller (2014) examined the relationship between grit and well-being among medical residents. Unlike Vela et al. (2015) who used grit as an outcome variable, Salles et al. used grit as a predictor variable to examine the extent to which grit predicted residents' psychological well-being and burnout. Psychological grit predicted resident psychological well-being and low burnout six months later. Finally, Reed (2014) found a relationship between grit and exercise behavior as measured by effort and persistence. Participants completed the Grit-S, Big Five Inventory conscientiousness scale and an industriousness adjective checklist. Results showed that although conscientiousness, industriousness, and exercise were positively related with exercise, only grit was a significant predictor of exercise score.

### **Purpose of the Study**

Although the Grit-S was used in the research reported, this instrument has not been psychometrically evaluated with Latinx populations. Because this instrument was normed with a mostly White population (Hakatanir et al., 2016),

the normative group seems to be different from those groups with whom this tool has been applied for research and practical purposes. Examining factorial stability with diverse populations is important to provide valid information about indicators of psychological well-being and academic performance (Ikonomopoulos, Lenz, & Guardiola, in press). Latinx students are a diverse group who might have different experiences and perceptions of mental health issues (Center for Disease Control and Prevention, 2015), spirituality, academic achievement, and sustained interest toward long-term goals. Obtaining information and insight on grit among Latinx students will provide valuable information to counselors and researchers who want to identify predictive factors of academic achievement and mental health. Also, researchers and practitioners are evaluating academic and counseling outcomes using the Grit-S with Latinx students, thereby making understanding the psychometric properties of this scale with Latinx students important. We agree with Niles and Harris-Bowlsby (2017) who said that "counselors must ensure that the instrument is valid, reliable, and appropriate for the client's cultural and linguistic context" (p. 119). As such, the purpose of the current study was to confirm a previously-identified two factor structure of the Short Grit Scale (Grit-S) with Latinx students to provide evidence of validity. We examined the following research question: Is the identified two-factor Grit-S valid and reliable for the Latinx population?

### **Method**

A post-hoc analysis of data from three published studies (Vela et al., 2015; Vela, Lu, Lenz, Savage, & Guardiola,

2016; Vela, Smith, Whittenberg, Guardiola, & Savage, 2018) was completed. Focus of previously published studies was relationships among positive psychology, cultural, and family factors on Latinx students' mental health and positive emotions. Focus of present study was to confirm a previously identified two-factor model of the Short Grit Scale (Grit-S) with a Latinx group of participants in the central southern region of the United States. Confirmatory Factor Analysis (CFA), which is the appropriate analysis when researchers confirm a previously identified factor structure, was used (Dimitrov, 2009).

### Participant Characteristics

Participants were Latinx college students who participated in research studies (Vela et al., 2015, 2016, 2018) at a Hispanic Serving Institution (HSI) in the southern region of the United States. The HSI had an enrollment of approximately 28,000 undergraduate and graduate students (approximately 93% of students at this institution are Latinx). Participants were mostly young and middle-aged adults ( $n = 344$ ) whose age ranged from 18 to 55 ( $M = 20.81$ ,  $SD = 4.46$ ). Sample consisted of men ( $n = 156$ ; 46%) and women ( $n = 182$ ; 54%). Among participants, 183 self-identified as Latinx or Hispanic (54%), 111 described themselves as Latinx (33%), with 44 indicating a Mexican ethnic identity (13%). Related to generation status, participants identified the following from a checklist: first-generation ( $n = 58$ ; 17%), second generation ( $n = 175$ ; 52%), third generation ( $n = 28$ ; 8%), fourth generation ( $n = 47$ ; 14%), and fifth generation ( $n = 12$ ; 7%).

### Measurement of Construct

**Grit.** The Grit-S (Duckworth & Quinn, 2009) measures perseverance and passion for long-term goals with two factors: (a) consistency of interest and (b) perseverance of effort. Participants respond to 8-statements evaluated on a five point Likert-scale ranging from *very much like me* (5) to *not at all like me* (1). Sample response items include, "Setbacks don't discourage me" and "New ideas and projects sometimes distract me from previous ones" (see Table 1). The average score is computed with higher scores representative of higher perceptions of grit. Duckworth et al. (2007) found that grit had predictive validity for several lifetime career changes among undergraduates at an elite university as well as GPA among students. Also, test-retest stability of grit scores one year later was .68 among middle and high school students. Internal reliability coefficients range from .73 to .83 (Duckworth & Quinn, 2009). Finally, only a few researchers have examined psychometric properties of the Grit-S with diverse samples, including Turkish and Filipino students. Datu, Valdez, and King (2016) found that the Grit-S factor structure was different for Filipino students compared with White college students. Hakatanir et al. (2016) found that several items needed to be removed in the final factor structure with Turkish students.

### Procedures

A post-hoc analysis of data from three published studies (Vela et al., 2015, 2016, 2018) was completed. First, permission from the Institutional Review Board at a university in the southern region of the United States to conduct research with Latinx students was

obtained. Once IRB approval was obtained, several professors at the university were contacted. Participants were recruited from undergraduate students in Introduction to Psychology and Educational Psychology courses. Participants were informed that their participation was voluntary, participation would not affect their grade or affiliation with the university, and they had to be 18 years of age or older to participate. Finally, a packet with a demographic form, surveys, and information regarding IRB approval was distributed. Questionnaires took approximately 15-20 minutes to complete and were done during class time. Data was inputted into SPSS (IBM Corporation, 2013). For the current study, data from the Grit-S was used.

### **Data Analysis**

**Statistical power analysis.** A power analysis was conducted to detect the adequacy of our sample size for detecting model fit using Stevens' (2009) criteria,  $n/p \geq 10$ . Given our sample size of 344, we consider our sample sufficient for making inferences about model fit.

**Preliminary analysis.** After transferring data into a Statistical Package for the Social Sciences (SPSS; IBM Corporation, 2013) file, missing values within the data were replaced by using the series mean function in SPSS in order to complete the analysis (Ikonopoulou et al., in press). The assumption of normality was examined using Shapiro-Wilk test and was met ( $p > .01$ )

**Primary analysis.** SPSS Analysis of Moment Structures Software (AMOS), Version 22 was used to analyze model fit for the Grit-S. A confirmatory factor analysis (CFA) utilizing maximum

likelihood method for the two-factor model was used. Indices, including chi-square ( $\chi^2$ ), root-mean-square error of approximation (RMSEA), standardized root-mean square residual (SRMR), comparative fit index (CFI), and Goodness of fit index (GFI), were used to examine model fit between the sample covariance matrix and population covariance matrix (Dimitrov, 2012). A CFI lower than .85 is considered an unacceptable fit and greater than .95 is considered an evidence of good model fit. The cutoff values for GFI are same as CFI scores. An SRMR value greater than .08 is considered an unacceptable model fit and values of less than .05 are desired. An RMSEA value between .08 and .05 is considered acceptable model fit and values less than .05 indicates a good model fit (Dimitrov, 2012; Hu & Bentler, 1999).

### **Results**

The correlation between subscale means and standard deviations for the Grit-S are presented in Table 2. To demonstrate evidence of internal structure (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014) and to confirm factor structure of Grit-S, a CFA was conducted. The results of model fit indices showed that the  $\chi^2$  was significant for the hypothesized model,  $\chi^2(19) = 39.26, p < .01, CMIN/DF = 2.06$ . The fit indices indicated a good fit for the data,  $GFI = .97, CFI = .95, SRMR = .04,$  and  $RMSEA = .05$ . The model included two latent variables with eight items. The results showed that eight factor loadings between the latent and observed variables were significant (see Table 1;  $p < .01$ ). The highest factor loading was between

Consistency of Interest and Item 6 (.72). The latent factor of consistency explained 52% of the variance in Item 6. On the other hand, the lowest factor loading was between Perseverance of Effort and Item 2 (.20). This means Perseverance of Effort explained .04% of the variance in Item 2. Tabachnick and Fidell (2013) recommended to remove items which have loadings less than .30 since they explain less than 10% of the variance. In addition, reliability analysis showed that Item 2 affected the coefficient score. Perseverance of Effort subscale had a reliability score of .52 with Item 2. However, if Item 2 removed from the scale, the reliability score would be .60. After reviewing Haktanir et al.'s (2016) findings and considering factor loadings and reliability analysis, we decided to remove Item 2 from the analysis.

A second analysis was run with two-factor and seven item model. The results of model fit indices showed that the  $\chi^2$  was significant for the hypothesized model,  $\chi^2(13) = 29.26, p < .01$ , CMIN/DF= 2.25. The fit indices indicated a good fit for the data except RMSEA value, GFI= .98, CFI= .96, SRMR= .04, and RMSEA= .06. Final model factor loadings between the latent and observed variables were presented in Figure 1. Additional changes were not made since it would not significantly contribute to the model.

## Discussion

The purpose of this study was to validate a previously identified two-factor model for the Grit-S with Latinx college students. With the increasing interest in positive psychology constructs related to positive development, there is a growing need to provide validity evidence for

instruments with diverse populations. Based on findings from the current study, the Grit-S can serve as a measure of sustained effort toward long-term goals among Latinx college students. The final two-factor model with seven items demonstrated good psychometric properties when administered to a Latinx population. After analyzing data and removing item 7, a modest two-dimensional factor structure with Latinx students was confirmed. Therefore, consistency of interests and perseverance of effort subscales have evidence of validity with Latinx students. As a result, this initial exploration of this scale may provide researchers and counselors with a measure to examine grit using a seven-item version of this instrument. Our suggestion is similar to Haktanir et al.'s (2016) recommendation to use a modified version of the grit scale following a CFA with Turkish college students. Similar to previous studies which adapted measures developed by U.S. participant samples (Haktanir et al., 2016; Karaman, Balkin, & Juhnke, in press; Lenz, Balkin, Gómez Soler, & Martínez, 2015), this study indicated similar results. The explanation of removing Item 2 from the analysis might be explained with cultural differences and interpretations of individual items regarding perseverance and sustained effort toward long-term goals. Similar to other culturally-diverse groups such as Turkish students, Latinx students might have different conceptualizations of items measuring persistence and passion toward long-term goals. Theoretical concepts within this item also might not transfer to Latinx populations.

## **Implications for Research and Practice**

Based on this study's findings, there are implications for researchers and practitioners. First, researchers should continue to validate the Grit-S with Latinx populations to determine if Grit-S items may be useful and whether revision of items are necessary. Additionally, investigations identifying relationships between grit scores with other constructs would demonstrate evidence with other variables and internal structure. If researchers provide convergent, discriminant, and predictive evidences among grit and other variables, an important body of literature with Latinx populations might develop. Other important factors to investigate include gratitude, subjective well-being, mindfulness, meaning in life, and depression. It also is important to validate the Grit-S and other positive psychology instruments in Spanish with Latinx populations. Similar to other culturally-diverse populations such as Turkish students (Hakatanir et al., 2016), validating instruments in participants' native language might change factor structure. Researchers also can use single case research designs (Lenz, 2015) to examine the impact of counseling methods to increase Latinx students' grit. Potential counseling methods to increase grit include narrative therapy (White & Epston, 1990), solution-focused brief therapy (Kim, 2008), positive psychology (Seligman, 2002), and creative journal arts therapy (Ikonopoulou et al., 2017; Vela, Ikonopoulou, Dell'Aquila, & Vela, 2016). Finally, replication studies to provide additional structure with other Latinx populations and in other settings is important. The Grit-S factor structure might differ across developmental levels

so examining factor structure with Latinx middle school and high school students is worthwhile.

There are implications for counselors to use the Grit-S which has preliminary evidence of validity with Latinx populations. The Grit-S can be integrated into counseling centers to assess students' psychological grit. Obtaining evidence and insight about students' perseverance and sustained interest toward long-term goals is important for college counselors who lead interventions and use techniques to improve students' academic outcomes and mental health. Informed by the results of this study, college counselors can use the Grit-S with Latinx students to measure and provide feedback to help increase levels of grit. If college students have low grit, counselors can use a therapeutic intervention to increase grit. Grit-S results can provide Latinx students with insight to foster reflection and commitment toward long-term goals. Additionally, counselors can use individual items to further explore Latinx students' passion and commitment toward long-term goals. As one example, if a Latinx student reports feeling a "2" on an individual item with 5 representing "high grit," counselors can use the following solution-focused questions to explore meaning: "What does this 2 look like? What would it take for you to feel like a 4?" Finally, the Grit-S can be used as an instrument in psycho-educational presentations on changes in sustained interest in activities over time and perseverance of effort to work toward long-term goals.

## **Limitations**

Despite practical implications for counselors and researchers to use the Grit-

$\bar{S}$  with Latinx students, several limitations warrant attention. First, all data collected in the current investigation came from a non-clinical sample of college students from a Hispanic Serving Institution with over 93% Latinx students. Researchers evaluating the reliability and factor structure of grit scores with Latinx students at other institutions may provide greater accountability for their unique cultural experiences. Also, data was not collected from a clinical sample of Latinx students in psychological distress or non-successful students as defined by non-enrollment in postsecondary education.

### Conclusion

In this study, the psychometric evaluation of the two-factor structure of the Grit-S with Latinx college students was described. A modified two-factor model of the Grit-S had good fit with Latinx college students. Although further research is needed to evaluate the factorial validity of the Grit-S, findings provide counselors and researchers with an instrument to measure perseverance and commitment toward long-term goals among Latinx students.

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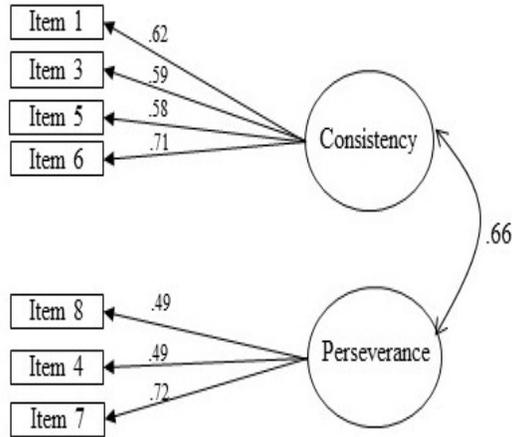


Figure 1. The final confirmatory factor analysis model of Short Grit Scale (Grit-S). The standardized parameter estimates for the Grit-S are listed. Rectangles indicate the 7 items on the Grit-S, and ovals represent the 2 latent factors of subscales.

Table 1

Standardized and Unstandardized Estimates of Factor Loadings for Two Models of the Grit-S

Item	Model 1			Model 2		
	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>
P2 Setbacks don't discourage me.	.20	.51	.17			
P4 I am a hard worker	.50	.95	.16	.49	.95	.17
P7 I finish whatever I begin	.70	1.48	.23	.72	1.56	.25
P8 I am diligent	.50	1.00		.49	1.00	
C1 New ideas and projects sometimes distract me from previous ones	.62	.75	.08	.62	.76	.08
C3 I have been obsessed with a certain idea or project for a short time but later lost interest.	.58	.76	.09	.59	.77	.09
C5 I often set a goal but later choose to pursue a different one	.58	.69	.08	.58	.70	.08
C6 I have difficulty maintaining my focus on projects that take more than a few months to complete	.72	1.00		.71	1.00	

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Table 2

*Correlations between the Subscales, Means (M), and Standard Deviations (SD)  
of the Grit-S*

Scale	<i>M</i>	<i>α</i>	<i>SD</i>	1	2
1. Consistency of Interest	3.12	.72	1.12	—	
2. Perseverance of Effort	4.02	.60	.87	.41*	—

*Note.* Grit-S= Short Grit Scale

\* $p < .01$