

Grit as A Distinctive Predictor for School Maladjustment of Nontraditional College Students

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Abstract

This article discusses the distinctive role of grit on school maladjustment above and beyond personality traits. We surveyed 535 adult open university students in South Korea and analyzed their responses using structural equation modeling. The results indicated that our model fit the data well. Specifically, two grit factors negatively predicted overall school maladjustment, including academic, emotional, and career-related areas. With Regards to personality traits, only neuroticism and conscientiousness significantly predicted grit factors. Mediation analyses indicated that only perseverance played a mediating role between conscientiousness and academic/career maladjustment. These results suggest that perseverance might have a distinctive role in predicting academic and career school maladjustment above conscientiousness.

Keywords: grit, consistency, perseverance, Big Five personality traits, school maladjustment

Introduction

Grit is a psychological trait with two components, ‘consistency of interests’ and ‘persistence’ in the pursuit of “long term goals in the face of adversity”(Duckworth, Peterson, Matthews, & Kelly, 2007, p.1087). It has been reported as an significant contributor to future success of academic, career, and even in emotional well-being. As there are many similar variables, there is much controversy on whether grit can be viewed as an independent variable, differentiated from conventional variables.

Under the premise that grit is conceptually differentiated from conventional variables, research must be performed in the following direction to resolve the above mentioned controversy. First, there needs to be contemplation on the dependent variable that grit is predicted. In other words, we need to shed light on the success properties (or achievement) known to be well-predicted by grit from many angles because the achievement properties predicted by grit may differ from other variables. Moreover, it is possible for the influence of grit to apply differently to each area of achievement. For example, Abuhassan and Bates(2015) argues that it is important to classify the achievement properties into either the accomplishment property or skill acquisition and adds that grit is a concept more appropriate for explaining “accomplishments,” which involve completion over a long period and overcoming difficulties, such as operating a company or publishing a book rather than making achievements at the level of skill acquisition, such as a GPA score. Even if this argument is not completely valid, it is still important to classify achievement into areas of academics, careers, and emotions. Career, in particular, has the possibility of exhibiting characteristics that differ from other areas because it requires relatively long-term effort compared to others. Moreover, in the current situation where there rarely be appropriate theoretical explanations on how grit impacts achievement(Hodge, Wright, & Bennett, 2018), it is significant to look at the process of how grit is applied from various angles rather than solely insisting on the connection between grit and achievement results. For instance, it is necessary to observe the association between grit and maladjustments or difficulties because of hardship, not just

limited investigation of grit and success. As the concept of enduring hardship is incorporated into the definition of grit, analyzing grit’s relationship with maladjustment will provide useful information in developing grit in future educational contexts. Accordingly, this study will look at grit from the prospect of maladjustment in school and classify it into three areas, which are academics, careers, and emotions, to provide a detailed view.

Second, the research target must satisfy the definition of grit. As mentioned earlier, Abuhassan and Bates(2015) said that the GPA score is not an accomplishment and that grit is better suited for measuring accomplishment rather than GPA. Referencing this perspective, it makes sense to make the research target people whose work involves long-term commitment or “people who are in a situation where they must achieve certain accomplishments under a certain hardship” whether because of the assignment itself or the individual’s circumstance. There is doubt as to whether previous studies have selected targets that match this description. As such, this study chooses adult learners as its target. Most of them are more hindered in their studies than school aged students because they must carry out their studies, work, and family duties simultaneously(Jones, Mendenhall, & Myers, 2016). Thus, they are targets who experience “adversity” described in the definition of grit.

Third, although many other studies have conducted this, it is important to use variables known as similar constructs of grit and continuously confirm whether grit is a concept differentiated from those other variables. As such, the current study will identify the relationship between grit and big five constructs including the conscientiousness, known as the variable with the highest connection to grit.

Grit, personality, and academic maladjustment

Many studies has reported that grit and academic adjustment are positively related (e.g., Lim & Ha, 2017; Rimfeld, Kovas, Dale, & Plomin, 2016). A study conducted on US and Chinese college students demonstrated that grit predicted achievement goals (Chen, Ye, & Hangen, 2018). In addition, studies on college students in Australia (Hodge, Wright, & Bennett, 2018) and the US (Fong & Kim, 2019)

also reported that grit predicted both academic productivity and GPA. Academic success of Latino first-generation university students in the US (O'Neal et al., 2016) and academic adjustment of nontraditional female college students in Korea (Lim & Ha, 2017) were also predicted by grit.

Despite the empirical evidence for the correlation between grit and academic adjustment, whether grit has incremental benefits above and beyond 'other previously established constructs' is still controversial (Raphiphatthana, Jose, & Salmon, 2018). Duckworth et al. (2007) showed that grit has exhibit incremental benefits over and above IQ and conscientiousness for predicting academic success. Lee and Sohn (2017) also reported that grit predicted academic achievement, after controlling for the Big Five personality traits.

On the other hand, other research has reported that only perseverance of effort demonstrates incremental predictability above and beyond other previously established constructs. For example, in the meta-analysis by Credé et al. (2016), only perseverance of effort indicated incremental variance in academic achievement above conscientiousness. Perseverance of effort of Korean high school students was correlated with academic adjustment (Choi, 2016). In a sample of Korean undergraduate students, perseverance of effort predicted the amount of time undergraduates spent studying (Choi, 2018). When it comes to nontraditional female college students in Korea, academic adjustment was predicted by age, self-control, conscientiousness, and perseverance of effort (Hwang, Lim, & Ha, 2018).

However, other studies have shown that grit does not have incremental predictability above that of conscientiousness, one of the Big Five traits (e.g., Davidson, 2014; Steinmayr, Weidinger, & Wigfield, 2018). After controlling for the other Big Five personality traits, all school outcomes of US private high school students were significantly predicted by conscientiousness and emotional self-regulation ability, but not grit (Ivcevic & Brackett, 2014). Grit subscales added little explanatory power after controlling for established constructs such as intelligence, prior school grades, conscientiousness among Germany adolescent students (Steinmayr et al., 2018). Despite such contradictory findings, grit has still been shown to predict desirable outcomes, and therefore we agree with Raphiphatthana et al. (2018)'s assertion that the topic is worth further examination.

Grit, personality, and career-related maladjustment

Concerning university students' adjustment to career-related college life are significant indicators for success (Ginzberg, Ginsburg, Axelrad, & Herma, 1951). Despite scant empirical research, grit has been shown to predict career adjustment. Researchers have reported that gritty college students exhibit higher levels of career preparation behaviors (Kang, Yoon, Kim, & Ryoo, 2016; Lee & Shon, 2017), engagement in work (Singh, 2018; Suzuki, 2015), higher levels of job performance (Aparicio, Bacao, & Oliveira, 2017), career advancement (Norkeliunas, 2015), and fewer changes of one's career (Duckworth et al., 2007). For example, grit predicted the career preparation behaviors of Korean natural science college students (Kang et al., 2016). Moreover, according to Lee and Shon (2017), grit predicted Korean college students' career adjustment when controlling for an academic year and personality traits. Both components of grit significantly predicted work engagement of full-time employees working in India above and beyond other related constructs such as tenure and educational qualification (Singh & Chopra, 2018).

On the other hand, Clark (2016) found that grit did not have significant predictability of career-related variables. Grit did not have significant additive predictability of US working adults' career success.

These inconsistent findings calls for further investigation whether grit affect career maladjustment especially to nontraditional students enrolled in university programs.

Grit, personality, and emotional maladjustment

Grit is the quality that allows a person to continue to work at something even despite initial failure or when there is no immediate payoff (Slick & Lee, 2014). Based on the quality of grit, grit might be associated with emotional adjustment, in that those with high levels of grit will work arduously while enduring failure and adversity and continue to have their interest in attaining their goals (Duckworth et al., 2007). Despite the intuitive relevance of these concepts, little research has been conducted to investigate these parameters.

Researchers have found that gritty people have higher levels of life-satisfaction (Singh & Jha, 2008), happiness (Batres, 2011; Singh & Jha, 2008), and well-being (Datu et al., 2016; Salles et al., 2014), and lower levels of burnout (Halliday et al., 2017) and depression (Musumari, Tangmunkongvorakul, Srithanavibonchai, Techasrivichien, et al., 2018; O'Neal et al., 2016). For instance, among Latino first-generation college students in the US, grit predicted lower levels of depression (O'Neal et al., 2016). Furthermore, grit predicted lower levels of math anxiety among children and adolescents in Canada (Holtby, 2018). On the other hand, according to Wong, Anderson, Knorr, Joseph, and Sanchez (2018), grit levels were not associated with trait anxiety.

Despite the conflicting findings, the topic of grit is worth further investigation due to the lack of empirical evidence. Still, there is no research demonstrating the relationship between grit and emotional maladjustment considering personality-related variables.

Taken together, grit is related to school-adjustment factors such as academic, career, and emotional adjustment. Gritty people tend to exhibit higher retention rates not only in school, but also in work and marriage (Eskreis-Winkler et al., 2014). As such, this study hypothesized that grit would predict areas of academic-, emotional-, and career-related maladjustment as well. We also hypothesized that grit would be predicted by personality variables, depending on grit's two related but distinct components.

Current Study

We first tested a 10-factor measurement model among grit, Big 5 personality traits, and three areas of school maladjustment (i.e., academic-, emotional-, and career-related problems) using Confirmatory Factor Analysis (CFA). We then examine whether different personalities could significantly predict two grit factors (i.e., perseverance and consistency), which, in turn, were associated with three kinds of maladjustment among college students. Finally, we investigated how grit factors mediated personality and school maladjustment. Figure 1 illustrates the research hypotheses of the present study.

Methods

Participants

A total of 535 Korean nontraditional college students at an open university participated in the present study. The mean age was 37.21 ($SD=4.55$). Most of the participants were female students (95.1%), and 38.7% of the total participants were sophomores, 31.2% were juniors, and 27.7% were seniors.

Measures

Grit was measured based on the translated version of the short form of the Grit Scale developed by Duckworth et al. (2009). It was

translated to Korean version by Hwang et al., (2015). Grit scale consists of perseverance of effort and consistency of interest. Perseverance and consistency comprise six items each, and their reliability coefficients were .69 and .67, respectively.

In order to measure personality traits, the International Personality Item Pool (IPIP) for the Big Five personality traits (Goldberg, 1992) was

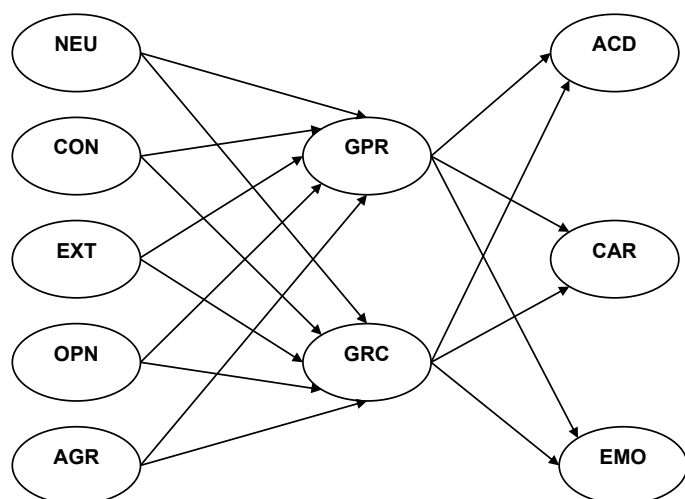


Figure 1. The research model of the present study.

Covariance and error terms of the measurement model are not presented for clarity. NEU = neuroticism; EXT = extraversion; OPN = openness; AGR = agreeableness; CON = conscientiousness; GRP = perseverance; GRC = consistency; ACD = academic maladjustment; CAR = career-related maladjustment; EMO = emotional maladjustment.

Table 1. Descriptive Statistics

	Max	Min	M	SD	Skewness	Kurtosis	
Consistency	1.33	4.50	3.09	.52	-.24	.12	
Perseverance	1.50	4.67	3.23	.56	-.02	-.03	
Neuroticism	1.30	5.00	2.79	.61	.38	.46	
Extraversion	1.30	5.00	3.15	.57	.12	.50	
Openness	1.90	4.80	3.11	.45	.24	.25	
Agreeableness	2.20	4.80	3.47	.43	-.02	.13	
Conscientiousness	1.90	4.80	3.40	.46	.08	.38	
Academic	1.00	4.10	2.39	.58	.11	-.29	
Emotional	1.00	4.20	2.17	.57	.37	-.08	
Career	1.00	4.50	2.77	.61	-.16	-.12	

Note. Consistency = consistency of interest; perseverance = perseverance of effort; academic = academic maladjustment; career = career-related maladjustment; emotional = emotional maladjustment.

Table 2. Bivariate Correlation Coefficients

	1	2	3	4	5	6	7	8	9
Consistency	-								
Perseverance	.36***	-							
Neuroticism	-.30***	-.30***	-						
Extraversion	.03	.21***	-.33***	-					
Openness	.10*	.26***	-.20***	.38***	-				
Agreeableness	.04	.25***	-.17***	.39***	.33***	-			
Conscientious	.26***	.49***	-.25***	.21***	.24***	.39***	-		
Academic	-.23***	-.29***	.25***	-.20***	-.13***	-.16***	-.29***	-	
Emotional	-.25***	-.34***	.60***	-.38***	-.23***	-.23***	-.28***	.53***	-
Career	-.33***	-.45***	.35***	-.34***	-.33***	-.32***	-.33***	.52***	.58***

Note. Consistency = consistency of interest; perseverance = perseverance of effort; academic = academic maladjustment; career = career-related maladjustment; emotional = emotional maladjustment.

* $p < .05$, *** $p < .001$.

used. It comprises neuroticism, extraversion, openness (or intellect/imagination), agreeableness, and conscientiousness. The reliability coefficients ranged between .75 and .88.

The School Maladjustment Scale of 30 items, developed and validated by Lee, Hwang, and Kwon (2008) was used to measure nontraditional college students' school maladjustment. It measures academic, emotional, and career-related school maladjustment ($\alpha = .87 \sim .86$).

The three measures have response options ranging from 1(*not very much like me*) to 5(*very much like me*).

Analysis

After conducting descriptive statistics, we conducted correlation analyses among the variables of interest. Then we employed CFA to test a 10-factor measurement model. Next, we tested our hypothesized model using structural equation modeling. In order to prevent the measurement error from being overestimated and model fit from being poor because of too many items to measure for one factor, item-parceling were used. Thus, the items of measurement model were to be divided into parcels. To parcel the items, we consider the sequence of the item and each parcel was used as one measured variable to reflect the latent variable.

Results

Descriptive statistics and correlations among variables

The descriptive statistics and correlation coefficients among study variables are shown in Tables 1 and 2. Grit's two components, consistency and perseverance, were negatively related to school

maladjustment ($r_s = -.23 \sim -.45$). Grit showed a negative correlation with neuroticism and a positive correlation with conscientiousness, but the pattern was slightly different for consistency and perseverance. Perseverance (not consistency) demonstrated stronger positive associations with extraversion, openness, agreeableness, and conscientiousness ($r_s = .21 \sim .50$).

Confirmatory factor analysis

We first conducted CFA to investigate the factor structure with maximum likelihood estimation procedures. For evaluating model fit, we used the Tucker–Lewis Index (TLI), comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and chi-square statistics. In order to ensure adequate specification of the measurement model before testing structural relationships among the latent variables, we included all observed and latent variables in this step of the analyses. The fit indices of the 10-factor measurement model were marginally acceptable, $\chi^2 = 1,037.57(df=305, p < .001)$, TLI = .872, CFI = .897, RMSEA = .067, and all the loadings were higher than .30. Table 3 and Table 4 show the factor loadings and latent variable correlation coefficients. Specifically, areas of maladjustment were positively correlated with the others ($\phi_s = .47$ to $.57, p < .001$). The two grit factors were positively correlated with each other ($\phi = .41, p < .001$). Neuroticism was negatively correlated with the four other personality traits ($\phi_s = -.21 \sim -.39, p < .001$), while other personality factors (i.e.,

conscientiousness, extraversion, openness, and agreeableness) were positively correlated with the others ($\phi_s = .26 \sim .49, p < .001$).

Structural equation modeling

Next, we tested the hypothesized model for grit, personality, and school maladjustment. After examining the Modification Indexes (MI) carefully, just one covariance of error term, which was adjacent to EM1 and EM2, was freed. The fit indices of the final hypothesized model showed an acceptable fit ($\chi^2 = 1,165.36, df=319, p < .001$; TLI = .881; CFI = .859; RMSEA = .070).

The results indicated that two grit factors had different effects on each subscale of school maladjustment. Specifically, both grit factors negatively predicted school maladjustment in terms of career-related and emotional factors ($\beta_s = -.20$ to $-.58$). For the academic area, only perseverance of effort negatively predicted maladjustment ($\beta = -.40$). This result implies that students with higher grit levels tend to have fewer problems in school regarding academic, emotional, and career-related concerns, while the effects of perseverance of effort were higher than those of consistency of interest.

Only neuroticism ($\gamma = -.23$ for perseverance, $\gamma = -.41$ for consistency) and conscientiousness ($\gamma = .66$ for perseverance, $\gamma = .28$ for consistency) significantly predicted grit factors; neurotic students were less likely to have grit, while students with higher levels of

Table 3. Standardized and Unstandardized Coefficients in the Measurement Model

Latent Variables	Items	<i>B</i>	<i>beta</i>	<i>p</i>
Consistency	← GC1	1.000	.865	.000
	← GC2	.688	.613	.000
Perseverance	← GP1	1.000	.681	.000
	← GP2	1.154	.751	.000
Neuroticism	← NEU1	1.000	.590	.000
	← NEU2	1.265	.676	.000
	← NEU3	1.447	.790	.000
Extraversion	← EXT1	1.000	.558	.000
	← EXT2	1.302	.730	.000
	← EXT3	1.130	.623	.000
Openness	← OPN1	1.000	.583	.000
	← OPN2	1.172	.723	.000
	← OPN3	.801	.769	.000
Agreeableness	← AGR1	1.000	.434	.000
	← AGR2	1.582	.783	.000
	← AGR3	1.233	.600	.000
Conscientiousness	← CON1	1.000	.450	.000
	← CON2	1.238	.540	.000
	← CON3	.511	.380	.000
Academic	← AC1	1.000	.732	.000
	← AC2	1.031	.703	.000
	← AC3	1.300	.874	.000
Emotional	← EM1	1.000	.693	.000
	← EM2	1.031	.702	.000
	← EM3	1.300	.893	.000
Career	← CA1	1.000	.801	.000
	← CA2	.969	.795	.000
	← CA3	.792	.742	.000

Note. Consistency = consistency of interest; perseverance = perseverance of effort; academic = academic maladjustment; career = career-related maladjustment; emotional = emotional maladjustment; GC = consistency of interest; GP = perseverance of effort; NEU = neuroticism; EXT = extraversion; OPN = openness; AGR = agreeableness; CON = conscientiousness; PER = perseverance; CST = consistency; ACD = academic maladjustment; CAR = career-related maladjustment; EMO = emotional maladjustment.

conscientiousness were more likely to have grit. In terms of the relative predictability of personality traits, conscientiousness appeared to have a higher association with grit than neuroticism did. Table 5 presents the standardized coefficients obtained in the research model.

Indirect effect of personality

In order to examine the indirect effects of personality on school maladjustment, we employed bias-corrected bootstrapping procedures (Hayes, 2013). In this study, we used bootstrap samples to generate 95% confidence intervals around the parameter estimate and determined an effect to be statistically significant if the confidence interval did not include zero. Table 6 shows the statistically significant totals and specific indirect effects of each of the personality variables. For academic maladjustment, the total effects of neuroticism and conscientiousness (Boot TE's=.14 and -.30, respectively) were statistically significant, suggesting that the personality traits affected the grit factors and, in turn, influenced academic maladjustment. Neuroticism was found to positively predict academic maladjustment, while conscientiousness was found to negatively predict the outcome. For career maladjustment, the total effects of neuroticism and conscientiousness (Boot TE's=.19

and -.42, respectively) were statistically significant. Like the results for academic outcome, neuroticism was found to positively predict career-related maladjustment, while conscientiousness was found to negatively predict the outcome. For emotional maladjustment, the total effects of neuroticism and conscientiousness (Boot TE's=.17 and -.30, respectively) were statistically significant. Like the results of academic and career outcomes, neuroticism was found to positively predict emotional maladjustment, while conscientiousness was found to negatively predict the outcome. It should be noted that the effect of conscientiousness was greater than that of neuroticism. Thus, the positive influence of conscientiousness on school adjustment was confirmed.

Additionally, we decomposed the indirect effects of perseverance and consistency. Among the specific indirect effects, paths including conscientiousness and perseverance were statistically significant. For example, the path from conscientiousness to perseverance and academic maladjustment was significant (Boot IE= -.27), while the path to consistency was not (Boot IE= -.03). Similarly, the path from conscientiousness to perseverance and career-related maladjustment was significant (Boot IE= -.38), while the path to consistency was not

Table 4. Correlations Among Latent Variables in the Measurement Model

Latent Variables		<i>beta</i>	SE	<i>p</i>
Consistency	↔ Perseverance	.414	.088	.000
Career	↔ Academic	.474	.049	.000
Emotional	↔ Academic	.565	.050	.000
	↔ Career	.570	.052	.000
Conscientiousness	↔ Neuroticism	-.238	.053	.000
Extraversion	↔ Neuroticism	-.390	.043	.000
	↔ Conscientiousness	.259	.052	.000
Openness	↔ Neuroticism	-.266	.049	.000
	↔ Conscientiousness	.352	.051	.000
	↔ Extraversion	.487	.042	.000
Agreeableness	↔ Neuroticism	-.210	.051	.000
	↔ Conscientiousness	.541	.046	.000
	↔ Extraversion	.483	.043	.000
	↔ Openness	.445	.045	.000

Note. Consistency = consistency of interest; perseverance = perseverance of effort; career = career-related maladjustment; academic = academic maladjustment; emotional = emotional maladjustment.

Table 5. Standardized Coefficients in the Hypothesized Model

		<i>beta</i>	SE	<i>p</i>
Academic Maladjustment	← Perseverance	-.403	.057	.000
	← Consistency	-.107	.057	.109
Career-Related Maladjustment	← Perseverance	-.575	.050	.000
	← Consistency	-.146	.052	.000
Emotional Maladjustment	← Perseverance	-.377	.068	.000
	← Consistency	-.194	.062	.001
Perseverance of Effort	← Neuroticism	-.231	.060	.000
	← Conscientiousness	.662	.066	.000
	← Extraversion	.051	.064	.291
	← Openness	.108	.060	.074
	← Agreeableness	-.046	.076	.532
Consistency of Interest	← Neuroticism	-.413	.057	.000
	← Conscientiousness	.278	.070	.000
	← Extraversion	-.068	.068	.448
	← Openness	.005	.065	.991
	← Agreeableness	-.135	.077	.081

Table 6. Total and Indirect Effects of Specific Paths

	Boot	Boot SE	LLCI	ULCI
<i>Effects from NEU to ACD</i>				
Total Indirect Effect	.14	.05	.04	.22
NEU→GRP→ACD	.09	.06	-.03	.20
NEU→GRC→ACD	.04	.06	-.09	.16
<i>Effects from CON to ACD</i>				
Total Indirect Effect	-.30	.06	-.41	-.19
CON→GRP→ACD	-.27	.08	-.42	-.11
CON→GRC→ACD	-.03	.05	-.13	.07
<i>Effects from NEU to CAR</i>				
Total Indirect Effect	.19	.07	.07	.32
NEU→GRP→CAR	.13	.08	-.03	.30
NEU→GRC→CAR	.06	.07	-.08	.20
<i>Effects from CON to CAR</i>				
Total Indirect Effect	-.42	.06	-.54	-.30
CON→GRP→CAR	-.38	.09	-.56	-.20
CON→GRC→CAR	-.04	.07	-.17	.09
<i>Effects from NEU to EMO</i>				
Total Indirect Effect	.17	.09	.00	.34
NEU→GRP→ACD	.09	.11	-.13	.30
NEU→GRC→ACD	.08	.13	-.17	.33
<i>Effects from CON to EMO</i>				
Total Indirect Effect	-.30	.07	-.44	-.17
CON→GRP→EMO	-.25	.17	-.58	.08
CON→GRC→EMO	-.05	.12	-.30	.19

Note. The bootstrap sample size was 5,000. The indirect effect is considered significant when the confidence intervals do not contain zero. LLCI= lower limit of the 95% bias-corrected bootstrap confidence interval; ULCU= upper limit of the 95% bias-corrected bootstrap confidence interval; SE= standardized error; GRP= grit-perseverance of effort; GRC= grit-consistency of interest; NEU= neuroticism; CON= conscientiousness; ACD= academic maladjustment; CAR= career-related maladjustment; EMO= emotional maladjustment. *Only statistically significant effects are presented in the table. Other coefficients calculated from the analysis can be provided upon request.

(IE= -.04). This means that among the grit factors, only perseverance demonstrated a mediating role between personality and school adjustment.

Discussion

The model testing revealed that grit predicted lesser school maladjustment of nontraditional college students. First, students who reported higher levels of perseverance and consistency showed lesser maladjustment in college. Moreover, mediation analyses indicated that only perseverance played a mediating role between conscientiousness and academic/career maladjustment. These results support previous studies' reports that perseverance showed distinctiveness to other construct (i.e. conscientiousness). More details are discussed as follows.

The relation between grit and personality

The results of our study concerning the relationships between grit and other personality traits are consistent with those of previous research (Duckworth et al., 2007; Hill et al., 2016; Lee & Sohn, 2013). Lee and Sohn (2013) reported significant correlations among personality traits and grit; neuroticism and grit was negatively related ($r = -.46$), while conscientiousness and grit was moderately positively related ($r = .52$) among Korean college students. In addition, Hill et al. (2016) also confirmed that neuroticism and grit were negatively related ($r = -.37$), and conscientiousness and grit were moderately positively correlated ($r = .60$) among Canadian college students.

Suzuki et al.(2015) used multiple regression analysis and found a positive correlation between conscientiousness and grit among working adults in Japan($\beta=.202$, $p<.001$); however, no significant correlation

was found between neuroticism and grit. However, according to their secondary analysis for the subscales of grit, both conscientiousness and neuroticism showed correlations with the each aspect of grit (i.e., perseverance and consistency). Both conscientiousness and neuroticism were positively related to perseverance. Consistency, however, was positively associated with conscientiousness but inversely associated with neuroticism. In the present study on adult learners in Korea, our results concerning the directionality of the relationships between consistency and conscientiousness/neuroticism, perseverance, and conscientiousness were consistent with those of Suzuki et al.(2015). However, in our study, neuroticism was inversely associated with perseverance of effort, which is inconsistent with the research results of Suzuki et al.(2015). To identify the reason for reporting different results in the directionality of the relationships between perseverance of effort and neuroticism, future research must consider factors related to the participants' home culture (i.e., cultural differences between Korea and Japan) or occupational status (i.e., full-time workers, full-time students etc.).

When it comes to the magnitude of the correlation between conscientiousness and perseverance/consistency, our results are in line with those of Suzuki et al. (2015). The positive correlation coefficient between conscientiousness and perseverance ($\beta=.662$; Suzuki et al.(2015)'s $\beta=.025$, both $p<.001$) was much higher than that between conscientiousness and consistency ($\beta=.278$, $p<.001$; Suzuki et al.(2015)'s $\beta=.012$, $p<.01$). Based on these results, we concluded that there was a differential effect of personality on similar but distinct aspects of the grit factors.

Importance of perseverance in maladjustment

Our results showed a relative predictability for the grit factors; that is, perseverance is more important than consistency for school maladjustment. Specifically, while perseverance of effort contributed to all domains of school maladjustment (i.e., academic, career, and emotional factors), consistency was not shown to significantly contribute to academic maladjustment. Moreover, perseverance of effort uniquely mediated personality and maladjustment; for example, neuroticism and conscientiousness indirectly predicted academic- and career-related maladjustment via perseverance, not consistency. The finding that only perseverance is responsible for academic performance is in accord with the results of previous research (Cred  t al., 2016; Choi, 2018; Hwang et al., 2018).

The role of consistency of interest in career and emotion of university students

While this study confirmed the importance of perseverance, there are two significant findings with respect to consistency of interest. Consistency significantly predicted career and emotional maladjustment. Previous research on grit and performance has tended to focus on achievement in academic and work-related areas, revealing that only perseverance contributes to the outcomes (i.e., Cred  t al., 2016). This is partly because the items of perseverance overlapped with positive personality traits (e.g., conscientiousness, task-persistence) associated with achievement outcomes. We additionally demonstrated the significance of interest in grit, in similar line with the result of Lee and Shon (2017), who found that gritty students demonstrate better career preparation behaviors. Christen and Knezek (2014) contended that grit has different psychometric components. For university students, it is important to choose a career path and continue to try to pursue it even in the face of frustrations. In this sense, consistency of interest describes well this aspect of grit, in that it reflects the phenomenon that those with higher levels of consistency lead to persist in their career paths, even in the face of obstacles during the career preparation period.

Moreover, consistency of interest was also found to be related to emotional maladjustment. This result shows that students with lower levels of consistency of interest are likely to change their career paths or goals, which could lead to emotional discomfort. Therefore, although there is still no consensus on grit's unique prediction of success (e.g., Steinmayr et al., 2018), further research to identify how each dimension of grit has a impact on various kinds of achievement is needed. This suggestion is in consideration of Wolters and Hussain's (2015) contention that grit may have two distinctive traits, which is supported by the results of other studies (e.g., Lee & Sohn, 2017), including the present study.

Implications and limitations

Our findings suggest that students with lower level of grit not only adjust less in the academic domain, but also in career and emotional domains. Thus, educators should focus on improving students' grittiness. Because grit may be amenable to intervention (Weisskirch, 2018), developing programs or strategies for increasing students' grit might be helpful. In fact, DiMenichi and Richmond (2015) conducted a series of experimental studies in which the participants were asked to write about a difficult time in which they persevered and subsequently failed (i.e., the "failure" condition). The researchers found that these students obtained higher grit scores than those who were asked to write about a difficult time in which they persevered and subsequently succeeded (i.e., the "success" condition). This failure-grit relationship contributed to modifying one's performance; that is,

individuals who were asked to reflect on past failures showed better performance on a cognitive task which requires perseverance quality of grit. In a similar vein, Raphiphatthana et al. (2018) recommended that mindfulness interventions focusing on 'non-judgment' and 'acting with awareness'—which have been reported to be the most relevant to grit—, might be effective for cultivating grit. Moreover, the impact of personality (such as conscientiousness and neuroticism) on grit should be noted. This includes not only helping students to exert systematic efforts to achieve their goals, but helping them to manage their emotions as well.

One limitation of this study lies in its use of self-report measures. Thus, in future research to use other types of measures, such as observations or daily diaries in addition to self-report measures might be useful. Second, the current study was conducted within the Korean context with adult learners recruited from Korea, which makes it difficult to generalize the research results to other populations. Thus, future research should investigate different task difficulties, age groups, nationalities, and cultures. Last, other predictors, such as students' age, gender, and self-control, which have also been reported as influential factors in success, were not considered in this study, even though we considered the effect of personality traits on grit. Thus, it is difficult to ensure the comparability of the results of the current study with those of previous research on grit. Therefore, future research should consider those predictors. Nevertheless, the findings of the present study are noteworthy, in that two distinct components of grit were examined, and career and emotional maladjustment were also considered.

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