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RESEARCH PAPER

Is Grittiness Next to Happiness? Examining the Association of Triarchic Model of Grit Dimensions with Well-Being Outcomes

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Abstract
The present research explored the link of triarchic model of grit underpinned by three dimensions – *perseverance of effort, consistency of interest,* and *adaptability to situations* with well-being outcomes using a cross-cultural design among Filipino, Japanese, and Polish undergraduate students (Study 1), a cross-sectional design including Filipino employees (Study 2), and a longitudinal design involving Filipino high school students (Study 3). Study 1 demonstrated that *perseverance* was positively correlated with flourishing in Japanese undergraduate students. *Adaptability* was related to increased flourishing among Filipino, Japanese, and Polish students. Study 2 showed that both *adaptability* and *perseverance* positively predicted psychological flourishing in selected Filipino employees. Study 3 demonstrated that T1*perseverance* and T1*adaptability* positively predicted T2life satisfaction even after controlling for age, gender, previous GPA, and auto-regressor effects. However, all dimensions of grit did not predict T2flourishing. Implications of the results to advancing the extant grit theory are discussed.

Keywords Flourishing · Life satisfaction · Triarchic model of grit · Positive psychology

1 Introduction

Existing literature has emphasized the importance of promoting non-cognitive abilities in students' academic functioning (Duckworth and Yeager 2015). One of the non-cognitive abilities that has received considerable attention in recent investigations is grit. Duckworth et al. (2007) conceptualized grit as individuals' tendencies to show passion and perseverance for long-term goals. These authors pointed out that grit was underpinned by two dimensions – *perseverance of effort* and *consistency of interest*. *Perseverance of effort* pertains to individuals' inclinations to persist in performing challenging tasks even with the potential hurdles or risk of failures. *Consistency of interest* pertains to tendency to constantly stick to a specific set of interests to achieve long-term aspirations.

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Studies have demonstrated that grit positively predicted academic achievement (Bowman et al. 2015; Duckworth et al. 2007; Li et al. 2018a, b; Rimfield et al. 2016), school motivation (Eskreis-Winkler et al. 2014), self-regulation (Wolters and Hussain 2015), and academic engagement (Datu et al. 2016). Furthermore, investigations have shown that grit could be linked to academic success due to the mediating effects of academic self-regulation (Wolters and Hussain 2015) and study time (Duckworth et al. 2007). Indeed, grit may serve as an essential predictor of students' optimal academic functioning.

There is a growing body of literature showing how grit may be linked to well-being and mental health outcomes. Previous investigations have demonstrated that grit was associated with higher levels of life satisfaction (Datu et al. 2016; Jin and Kim 2017; Vainio and Daukantaitė 2016), meaning in life (Datu et al. 2018b, 2019; Kleiman et al. 2013), positive affect (Datu et al. 2016; Singh and Jha 2008), school satisfaction (Ivcevic and Brackett 2014), and psychological well-being (Salles et al. 2014). Moreover, existing studies have shown that grit was associated with lower levels of suicidal ideation (Kleiman et al. 2013), depression (Datu et al. 2018b, 2019), and work-related burnout (Salles et al. 2014).

In addition, past research demonstrated that each facet of grit may differentially predict various outcomes. While *perseverance of effort* has been found to be associated with higher levels of life satisfaction (Datu et al. 2016, 2018b), college satisfaction (Bowman et al. 2015), and academic adjustment (Bowman et al. 2015), *consistency of interest* was not linked to such well-being outcomes. Despite the growing body of evidence on how these grit dimensions relate to well-being and mental health outcomes, all these investigations solely focused on exploring the link of the two-factor model of grit's dimensions (Duckworth et al. 2007) to well-being.

However, the original two-factor model of grit received a number of criticisms in the existing literature. Whereas some studies demonstrated that grit had incremental effects over conscientiousness in predicting academic achievement (Duckworth et al. 2007; Li et al. 2018a, b), other research showed strong overlap between grit and proactive aspects of conscientiousness (Schmidt et al. 2018) and robust evidence on how conscientiousness had better predictive power than grit and other non-cognitive factors in predicting achievement (Dumfart and Neubauer 2016; Ivcevic and Brackett 2014; Mayer and Skimmyhorn 2017). Psychometric issues were also raised on the robustness of the two-factor model of grit (Crede et al. 2017; Datu et al. 2017b). In addition, whereas *perseverance of effort* has been linked to increased levels of positive academic functioning and well-being, *consistency of interest* did not predict such outcomes (see Datu et al. 2017b for a review). Furthermore, whereas *perseverance of effort* had stronger associations with well-being and character strengths, *consistency of interest* had weaker or no significant link to such positive psychological outcomes across participants from 6 continents across the globe (Disabato et al. 2018). The existence of a higher-order grit structure was not replicated in collectivist contexts (Disabato et al. 2018). *Consistency* may not necessarily be meaningful for individuals in collectivist contexts as doing actions that unswervingly reflect personal values and preferences in different situations can thwart harmonious interpersonal relationships (Suh 2007). This is because in interdependent societies, the desire to belong to a larger and cohesive social unit operates as a powerful motivational drive (Markus and Kitayama 1991). Crede et al. (2017) have even pointed out that the theoretical value of the original model of grit lies in the *perseverance of effort* dimension.

Clearly, existing debates on the validity of the grit construct have opened opportunities to explore the nature, generalizability, and consequences of grit in different societies. Whereas research showed that the general grit construct comprising *perseverance of effort* and *consistency of interests* may not be replicable given that these dimensions have a

distinct nomological network (Crede et al. 2017), other research cast doubts on this reasoning due to the likelihood that even lower-order factors of broad dispositional variables (e.g., Big Five personality factors) exhibit unique concurrent validity (Disabato et al. 2018). At any rate, these concerns on the measurement and theorizing of grit call for the need to examine alternative models of grit especially in non-Western contexts.

Therefore, the present research aimed to assess the association of a triarchic model of grit's (TMG) dimensions with well-being outcomes such as life satisfaction and psychological flourishing in a different set of samples. Specifically, this investigation used cross-cultural design involving undergraduate students in Japan, Philippines, and Poland (Study 1), cross-sectional study including selected Filipino employees in the Philippine context (Study 2), and short-term longitudinal design involving selected high school students in the Philippines (Study 3).

1.1 The Triarchic Model Of Grit

The TMG is an extended model of grit which underscores the significance of *perseverance of effort, consistency of interest,* and *adaptability to situations* in successfully pursuing temporally distant goals in a collectivist context such as the Philippines (Datu et al. 2017a, 2018a, b). Unlike the original two-factor model of grit that involves *perseverance of effort* and *consistency of interest*, TMG emphasizes the role of *adaptability to situations* which involves individuals' inclinations to adjust actions based on specific situational and contextual demands. Whereas *perseverance of effort* involves showing persistence even in difficult times to achieve a long-term goal (Duckworth et al. 2007), *adaptability to situations* is characterized by appreciation of changes in goal-related strategies or pathways depending on situational or contextual factors. Instead of constantly persevering in accomplishing difficult activities or plans to achieve long-term goals, individuals with high levels of *adaptability* may give up such plans for other equally appealing pathways in order to achieve distant goals in life. Moreover, while *consistency of interests* encompasses sticking to specific interests or actions over a prolonged period, *adaptability* involves adopting flexible plans or strategies to achieve a temporally remote goal. Individuals with high levels of *adaptability* constantly find ways to improve pathways in goal attainment and realistically know when to 'let go' of strategies or even goals that are bound to fail. Datu et al. (2017a) have shown that *perseverance of effort* and *adaptability to situations* had incremental validity over and beyond the effects of conscientiousness, openness, agreeableness, extraversion, and neuroticism, in predicting academic self-efficacy, career exploration self-efficacy, and talent development self-efficacy.

Because research alludes to the psychological risks of constantly pursuing interests or goals that may result in failure (Lucas et al. 2015; Baumeister et al. 2003), incorporating *adaptability* offers a more nuanced perspective on how to realistically achieve distant goals in life. Importantly, evidence on the theoretical value of *adaptability* indirectly supports previous contentions on the state-like features of grit (DiMenichi and Richmond 2015) as this dimension of grit enables an individual to calibrate his or her behaviors based on situational demands. This dimension of grit holds appealing impacts especially in collectivist societies because displaying context-sensitive behaviors functions as an essential cultural task in such settings (Vignoles et al. 2016; Suh 2007). Furthermore, Disabato et al. (2018) have pointed out that in collectivist contexts, grit may involve pursuing relational or growth-oriented goals which indicates flexible pursuit of long-term ambitions depending on situational factors. Hence, TMG argues that successful pursuit of temporally distant

goals does not only require persistence in challenging tasks and constant attention to specific interests but also flexibility in pathways or strategies that realistically enhance the likelihood of goal attainment.

TMG dimensions have been found to be associated with positive student outcomes. Studies have demonstrated that both *perseverance and adaptability* were associated with higher levels of agentic, behavioral, cognitive, and emotional engagement among Filipino high school students (Datu, Yuen et al. 2018b) as well as various domains of self-efficacy (i.e., academic, career exploration, and talent development) and autonomous motivation among selected Filipino university students (Datu et al. 2017a). Also, TMG positively predicted positive affect, life satisfaction, and interdependent happiness among Filipino secondary school students (Datu et al. 2018b). However, as Datu et al. (2018b) used a cross-sectional design in exploring the link of TMG to well-being outcomes in high school student samples, limited insights could be drawn into how TMG may optimize mental health in other student populations (i.e., undergraduate student sample). Also, previous studies mainly focused on exploring how TMG dimensions may relate to well-being in student samples.

1.2 Theoretical Perspective

It is anticipated that different dimensions of TMG dimensions may exhibit differential associations with well-being outcomes. First, it is likely that *perseverance of effort* may be associated with increased well-being because the "*invest-and-accrue*" model of conscientiousness has pointed out that individuals with higher levels of this Big Five personality factor proactively engage in actions that optimize success (Hill and Jackson 2016). If conscientiousness is strongly linked to grit (Duckworth et al. 2007; Dumfart and Neubauer 2016; Ivcevic and Brackett 2014), it is reasonable to argue that grit may motivate individuals to perform behaviors that promote success and happiness. For instance, research suggests that grittier individuals are more likely to exercise mindfulness, an activity that has been linked to higher levels of life satisfaction (Li et al. 2018a, b). For these reasons we predict that persistence will predict well-being outcomes. Second, existing literature alludes to the benefits of flexibly adjusting goals and interests to cope with continuously changing environmental conditions (Dreisbach and Fröber 2019) which can explain why *adaptability to situations* may relate to elevated levels of well-being. In fact, research has pointed out that whereas grit involves consistent pursuit of a personal goal in individualist contexts, this construct may be considered relationally oriented or improvement-driven pursuit in collectivist societies (Disabato et al. 2018). Supporting this argument, studies have recognized the importance of replacing originally identified long-term goals with more realistic ambitions in life to achieve optimal functioning (Datu and McInerney 2017; Wolters and Hussain 2015). For these reasons we predict that adaptability will predict well-being outcomes. Third, as *consistency of interests* was not correlated with positive outcomes like satisfaction with job (Meriac et al. 2015) and maladjustment at school (Hwang et al. 2018), we hypothesized that this TMG dimension will not predict well-being outcomes.

1.3 The present research

The central aim of this research was to examine how each TMG dimension may differentially predict well-being outcomes using cross-cultural (Study 1), cross-sectional (Study 2),

and longitudinal (Study 3) research designs. In particular, we concentrated on assessing the link of grit's dimensions to life satisfaction (Study 1 and Study 3) and psychological flourishing (Study 1, Study 2, and Study3). Life satisfaction pertains to subjective evaluation of individuals' sense of content with life (Diener et al. 1985). It is regarded as the cognitive dimension of subjective well-being (a.k.a. hedonic well-being). On the other hand, psychological flourishing refers to effective psychological functioning characterized by optimism, purpose, positive relationships, and self-esteem (Diener et al. 2010). Flourishing is considered a measure of psychological well-being (a.k.a. eudaimonic well-being).

Except for Disabato et al.'s (2018) research, previous studies mostly focused on examining how grit relates to well-being outcomes in Western societies (i.e., United States and United Kingdom), which hold limited applicability to individuals in non-Western and collectivist contexts. To address this limitation, Study 1 explored the associations of TMG dimensions with well-being outcomes among selected undergraduate students in individualist (i.e., Poland), borderline individualist (i.e., Japan), and collectivist (i.e., Philippines) societies. In addition, whereas Western societies consider Japan as a collectivist context, Asian countries regard Japan as relatively individualist in nature (Hofstede Insights 2018).

Although findings of Study 1 can offer valuable insights on the differential associations of grit's dimensions with well-being in three distinct countries, it concentrated on identifying correlates of grit in undergraduate student samples which may not be generalizable to non-student samples. Study 2 addressed this gap through assessing the association of grit with psychological flourishing in selected Filipino employees using a cross-sectional design.

In addition, the cross-sectional nature of Study 1 and Study 2 may potentially increase susceptibility to common method bias which can negatively affect the validity of these investigations' results (Podsakoff et al. 2003, 2012). We addressed these methodological shortcomings through exploring the link of TMG dimensions to well-being outcomes among selected Filipino high school students via a two-wave longitudinal design in Study 3.

In general, through adopting diverse methodological research designs to examine how TMG dimensions (i.e., *perseverance of effort, consistency of interests,* and *adaptability to situations*), our research can provide comprehensive insights on the complex association of grit with various well-being outcomes. Across different investigations, we tested the following hypotheses:

Hypothesis 1 *Perseverance of effort* will positively predict life satisfaction and flourishing.

Hypothesis 2 *Adaptability to situations* will positively predict life satisfaction and flourishing.

Hypothesis 3 *Consistency of interest* will not predict life satisfaction and flourishing.

2 Study 1: Cross-Cultural Study in the Philippines, Japan, and Poland

The objective of Study 1 was to explore whether dimensions of TMG would predict life satisfaction and flourishing using a cross-cultural design. In particular, undergraduate student samples from Poland, Philippines, and Japan were recruited for this investigation. We included Polish students because they are embedded in a society that places much premium

on individualism (i.e., individualism score = 60; Hofstede Insights 2018). We also selected students from Japan which is approaching the borderline score of an individualistic society (individualism score = 46), and Philippines which is considered a collectivist society (individualism score = 32; Hofstede Insights 2018). Although Japan was usually categorized as a purely collectivist setting due to its emphasis on preserving relationship harmony and rejection avoidance (Hashimoto and Yamagishi 2013), research studies have shown that Japanese culture is moving towards increased individualism (Ogihara 2017, 2018). The use of a cross-cultural approach involving students from different cultural contexts reflecting various levels of individualism and collectivism should provide meaningful insights into the role that grit may play in shaping well-being outcomes in different societies and provides a theoretical base for proposing our hypotheses.

Although we do not know of any evidence demonstrating the possible generalizability of *TMG* dimensions in various contexts, we anticipated that *perseverance of effort* might be linked to well-being outcomes in Polish, Japanese, and Filipino samples because previous literature has pointed out that this dimension underscores the importance of the grit construct (Crede et al. 2017; Disabato et al. 2018). Studies have also shown that *perseverance* was linked to higher levels of optimal student outcomes not just in individualist (Bowman et al. 2015) but also in collectivist settings (Datu et al. 2016, 2017a, 2018b). In other words, it is possible that *perseverance* may operate similarly in individualist and collectivist settings.

Furthermore, it is likely that *adaptability to situations* can play an adaptive role in promoting well-being because adjusting one's actions to contexts may lead to well-being especially in interdependent settings (Suh 2007). While we proposed that this dimension of TMG may be salient in collectivist societies, we are also expecting that *adaptability* may be equally relevant in individualist contexts because in such societies, the capability to engage in behavioral, cognitive, and emotional self-regulation in order to effectively deal with new or changing situations in life has been associated with positive academic functioning (Martin et al. 2012, 2013).

However, *consistency of interest* may not significantly predict well-being outcomes (i.e., life satisfaction and psychological flourishing) in the abovementioned contexts as the existing literature has demonstrated that this grit dimension did not predict optimal academic, work-related, and well-being outcomes in various contexts (Crede et al. 2017; Datu et al. 2017b; Disabato et al. 2018).

Hence, we tested the following hypotheses in Study 1:

Hypothesis 1a *Perseverance of effort* will positively predict both life satisfaction and flourishing in Poland, Japan, and Philippines.

Hypothesis 1b *Adaptability to situations* will positively predict both life satisfaction and flourishing in Poland, Japan, and Philippines.

Hypothesis 1c *Consistency of interests* will not predict life satisfaction and flourishing in Poland, Japan, and Philippines.

2.1 Methods

2.1.1 Participants and Procedures

There were 279 Filipino, 743 Japanese, and 392 Polish samples who participated in this investigation. In the Philippines, course instructors of different classes helped in recruiting

undergraduate students belonging to education, social sciences, and business departments from a private college in a rural setting. The average age of Filipino participants was 19.27 and the sample was 59.9% female. Participants received course credit for their participation in this research. In Japan, course instructors assisted in recruiting undergraduate students belonging to humanities, social sciences, psychology, commercial science, and sports science faculties of a private university. The average age of Japanese participants was 19.24 and the sample was 59.20% male. In return for their participation, Japanese students received a course credit from their instructors. In Poland, course instructors helped in distributing an online link to an internet-based survey among undergraduate students belonging to humanities and social sciences faculties (i.e., English and Romaniani philology, political sciences, psychology, criminology, and pedagogy) from a public and a private university. The average was 20.53 and the sample was 81.20% female. Participants received extra course credit as a reward for joining this study.

Before administering the survey packet to target participants, the authors sought ethical approval in the Institutional Ethics Committee of their respective universities. After getting the approval to conduct this research, the authors prepared the Filipino, Japanese, and Polish versions of the scales through conducting forward and backward translation procedures. Then, the translated versions (i.e., Japanese, Filipino, and Polish versions) of the survey were administered to undergraduate student samples in Japan, Philippines, and Poland. All the participants voluntarily participated in the research and filled in active consent forms before answering the survey packet. In Japan and Philippines, paper-and-pencil form of the survey was used while in Poland, an internet-based questionnaire was utilized in collecting data.

2.1.2 Measures

Grit. The Triarchic Model of Grit Scale (Datu et al. 2017a, b) is a 10-item survey that was used to assess perseverance, consistency and adaptability for long-term goals. Here are sample items in the scale: "I am diligent" (perseverance of effort), "New ideas and projects sometimes distract me from previous ones", "I have been obsessed with a certain idea or project for a short time but later lost interest", as well as "I often set a goal but later choose to pursue a different one" (consistency of interest), and "Changing plans or strategies is important to achieve my long-term goals in life" (adaptability to situations). Items were marked on a 5-point likert scale (1 = Not like me at all; 5 = Very much like me). The Cronbach's alpha coefficients of the TMGS' subscales for the Filipino sample were $\alpha_{perseverance} = 0.77$, $\alpha_{consistency} = 0.67$, and $\alpha_{adaptability} = 0.85$. The Cronbach's alpha reliability coefficients of TMGS' domains for the Polish sample were $\alpha_{perseverance} = 0.84$, $\alpha_{consistency} = 0.60$, and $\alpha_{adaptability} = 0.75$. The Cronbach's alpha reliability coefficients of the subscales for the Japanese sample were $\alpha_{perseverance} = 0.75$, $\alpha_{consistency} = 0.50$, and $\alpha_{adaptability} = 0.67$.

Life satisfaction. The 5-item Satisfaction with Life Scale (Diener et al. 1985) was used to assess cognitive well-being among the participants. Sample items in the scale include: "In most ways my life is close to ideal" and "I am satisfied with my life". Items were marked on a 7-point likert scale (1 = Strongly disagree; 7 = Strongly agree). The Cronbach's alpha reliability coefficients of the scale in Philippines, Japan, and Poland were .79, .83, and .83 respectively.

Flourishing. The 8-item Flourishing Scale (Diener et al. 2010) was used to assess the extent to which the participants experienced social-psychological prosperity or flourishing. Items were rated on a 7-point likert scale (1 = Strongly disagree; 7 = Strongly agree).

The Cronbach's alpha reliability coefficients of this scale in Philippines, Japan, and Poland were .95, .82, and .92 respectively.

2.2 Results

Before conducting confirmatory factor analysis (CFA) and structural equation modeling (SEM) using the 25th edition of Analysis of Moment Structures (AMOS) to examine the hypothesized measurement and structural model in this study, we calculated the descriptive statistics (e.g., mean and standard deviation), reliability coefficients, and bivariate correlational coefficients (i.e., Pearson-r correlational coefficients) using the 25th edition of the Statistical Package for the Social Sciences (SPSS).

To examine the relationships between TMG dimensions (i.e., *perseverance of effort, consistency of interests,* and *adaptability to situations*) and different aspects of well-being (i.e., life satisfaction and psychological flourishing), we conducted SEM in each country separately. In the first step we assessed a measurement model comprising grit, life satisfaction and flourishing in each country separately. Then we ran multi-group CFA to determine if we achieved measurement invariance of methods across countries. Model 1 assumed configural invariance, namely, the same structure of scales (number of factors and pattern of loadings) across countries. Model 2 assumed metric invariance, namely, equivalence of factor loadings across countries. Metric invariance allows comparison between structural models in our three national samples (see Steinmetz et al. 2009).

After establishing metric invariance, we ran SEM analyses via maximum likelihood estimation approach using AMOS in each country separately, examining the interrelations between TMG's dimensions (i.e., *perseverance of effort, consistency of interests,* and *adaptability to situations*), life satisfaction, and psychological flourishing. Further, we used the default standard error calculation method specified in AMOS. Finally, we compared different solutions, assuming cross-cultural differences on all interrelations (unconstrained model) and constrained model, assuming lack of cross-cultural differences.

2.2.1 Measurement Model

To test for measurement models, we used confirmatory factor analysis via maximum likelihood estimation approach and combining single-item full measurement model with parcels (two aggregated items) as observed variables via AMOS. Parcelling was used to reduce estimation errors (Coffman and MacCallum 2005), improve model fit, and stabilize parameter estimates (see Matsunaga 2008). We tested three models: in the first one we used full measurement model, with three correlated factors representing three dimensions of grit, each of them were loaded by single items corresponding to each scale (namely, *perseverance of effort, consistency of interests,* and *adaptability to situations*), in the second one latent factor of flourishing was loaded by four parcels,[1] created in random fashion from single items of flourishing scale, and in the third one latent factor of life satisfaction was loaded by five single items. All latent factors were measured by at least three parcels or

[1] We examined full measurement model for flourishing scale, based on single items. However, in Poland we were forced to allow for three correlations between errors to achieve good model fit. Therefore, as we were interested in examining interrelations in structural model and comparisons the results across three countries, we decided to use parcels to minimize measurement error and stabilize models fit.

Table 1 Model fit indices for measurement models in three nations—single CFA

	χ^2	df	CFI	RMSEA	SRMR
Grit (three correlated latent factors, each of them loaded by single items)					
Japan	144.63	32	.915	.069 (.058 .081)	.058
Philippines	89.64	32	.948	.080 (.061 .100)	.073
Poland	64.92	32	.962	.059 (.038 .080)	.061
Flourishing (four parcels, 2 items per each)					
Japan	4.76	2	.998	.043 (.000 .095)	.012
Philippines	1.54	2	1.00	.000 (.000 .110)	.004
Poland[a]	4.35	1	.997	.107 (.021 .218)	.026
Life satisfaction (one latent factor, with five single items as observed variables)					
Japan	19.62	5	.990	.063 (.035 .094)	.023
Philippines[b]	8.86	3	.987	.084 (.022 .150)	.034
Poland[c]	13.57	4	.987	.091 (.041 .146)	.023

[a]We allowed for correlates between errors for parcel 1 and 3

[b]We allowed for correlations between errors of items 1 and 4 and 3 and 5

[c]Errors for items 1 and 2 correlated

items and all items and parcels loaded on a proper factor significantly ($p < 0.001$, all factor loadings higher than 0.40). To assess the goodness of fit of the model we used the following cut-off criteria: the root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR), both smaller than 0.08, and comparative fit index (CFI) larger than 0.90 (Lance et al. 2006).

Table 1 shows that the measurement model fits to data well in each country separately. Some problem could be noted regarding flourishing in Poland and life satisfaction in Philippines and Poland, limited to RMSEA values. However, remaining model fit indices were satisfactory, suggesting that measurement models are acceptable.

In the next step we established measurement invariance of the measured constructs across three countries. As we were interested in examining the relationships between the variables, we tested for the metric level of measurement invariance. Table 2 shows that metric invariance was established for each measurement model, and in consequence all variables measured in the study, because in all cases ΔCFI was lower than 0.01, meeting the recommended cut-off of 0.01 (Chen 2007). In case of life satisfaction, only partial metric inavriance was achieved, with unconstrained loading for item 1.

2.2.2 Descriptive Statistics, Reliability Analyses, and Correlational analyses

We calculated the descriptive statistical, reliability, and correlational analyses in different cultural contexts (see Table 3). In particular, we performed Pearson-r correlational analyses using SPSS to provide evidence on how TMG dimensions relate to each other and well-being outcomes in each country. *Perseverance of effort* was positively correlated with *adaptability to situations* in all countries. Whereas *perseverance* was positively correlated with *consistency of interests* in Filipino participants, these TMG dimensions were negatively correlated in Japanese and Polish participants. Across Filipino, Japanese, and Polish

Table 2 Results for multi-group confirmatory factor analysis

	χ^2	df	CFI	RMSEA	SRMR
Grit (three correlated latent factors, each of them loaded by single items)					
Configural	299.52	96	.938	.040 (.035 .045)	.073
Metric	333.30	110	.932	.039 (.035 .044)	.073
Flourishing scale (four parcels, 2 items per each, errors for parcel 1 and 3 correlated)					
Configural	9.90	3	.998	.042 (.015 .072)	.004
Metric	27.72	9	.994	.040 (.023 .057)	.026
Life satisfaction (one latent factor, loaded by five single items, errors for item 1 and 2 correlated)					
Configural	53.23	12	.985	.051 (.038 .066)	.012
Metric	114.26	20	.966	.060 (.050 .071)	.032
Partial metric[a]	76.61	18	.979	.050 (.039 .062)	.030

[a]Partial metric with loading for item 1 unconstrained

Table 3 Descriptive statistics and correlational coefficients among TMG dimensions, life satisfaction, and flourishing in Philippines, Japan, and Poland

	Mean						Correlations									
	Philippines		Japan		Poland		Philippines (upper) Japan (lower)					Poland				
	(n = 279)		(n = 737)		(n = 293)											
	M	*SD*	*M*	*SD*	*M*	*SD*	1	2	3	4	5	1	2	3	4	5
1. Perseverance of effort	3.69	.79	2.90	.89	3.45	.90	–	.34***	.69***	.32***	.49***	–				
2. Consistency of interests	3.48	.79	3.60	.76	3.15	.76	−.19***	–	.45***	.22***	.31***	−.36***	–			
3. Adaptability to situations	3.89	.76	3.65	.67	3.64	.67	.32***	.09*	–	.27***	.58***	.51***	−.06	–		
4. Life satisfaction	4.33	1.03	3.62	1.23	4.21	1.19	.22***	−.05	.32***	–	.32***	.36***	−.05	.34***	–	
5. Flourishing	5.42	1.16	4.31	.94	4.99	1.01	.39***	.004	.54***	.59***	–	.47***	−.14*	.60***	.65***	–

*$p < .05$; ***$p < .001$

Table 4 Goodness of fit indices for structural model in three nations

	χ^2	df	CFI	RMSEA	SRMR
Japan	492.68	140	.927	.059 (.053 .064)	.057
Philippines	283.27	140	.951	.061 (.050 .071)	.062
Poland	270.38	140	.956	.056 (.046 .067)	.053

Table 5 Model fit indices for measurement models in three nations

	χ^2	df	CFI	RMSEA	SRMR
Model 1: Unconstrained	1046.55	420	.942	.034 (.031 .036)	.057
Model 2: Constrained	1205.03	460	.903	.035 (.033 .038)	.065

samples, both *perseverance* and *adaptability* were positively associated with life satisfaction and psychological flourishing. Whereas *consistency of interests* was positively correlated with both life satisfaction and flourishing in the Philippines, this TMG dimension was not significantly correlated with both facets of well-being in Japan. Moreover, *consistency of interests* was negatively correlated with flourishing and not correlated with life satisfaction among Polish participants.

2.2.3 Structural Model

The structural model assessed the associations of TMG dimensions with well-being outcomes. Specifically, we simultaneously explored the link of TMG dimensions with life satisfaction and psychological flourishing among selected undergraduate students in Japan, Philipines, and Poland using SEM via maximum likelihood estimation using AMOS. The use of SEM enabled us not only to assess the relationship of grit dimensions to each well-being outcome after controlling for other well-being measure but also to provide evidence on the invariance of the hypothesized pattern of association across different countries. Table 4 shows the fit indices for structural model in each country separately. In each sample structural model fits to data well.

In the further step we assessed two competitive models: one unconstrained, assuming all direct paths as diverse across countries (Model 1), fully constrained, assuming regression weights equal across countries (Model 2). Table 5 shows indices for models fit. Model comparisons indicated that Model 1 (unconstrained) differ significantly from Model 2 (ΔCFI = 0.039). Model 2 differs significantly from Model 1(ΔCFI = 0.039).

2.2.4 Relations Between Three Aspects of Grit Across Three Countries

Although we focused mostly on relations between three aspects of grit and outcome variables, we need to note that interrelations within three factors of TMG varied cross-culturally. *Perseverance of effort* and *adaptability to situations* were moderately to strongly positively correlated across three countries. In Filipino students, we found that their latent correlation was $\rho < 0.85$ indicating evidence of multicollinearity, under the recommended cut-off values for distinguishing variables (i.e., $\rho < 0.80$; Combs 2010; Gray 2017), however in Japan and Poland it was lower. In Japan and Poland, we found a negative correlation

between *perseverance of effort* and *consistency of interests*, while the correlation between *consistency of interests* and *adaptability to situations* was insignificant. In the Philippines, correlations among all factors of grit were positive, suggesting some consistent underling higher-order factor, while in Japan and Poland relations between three factors of grit were less consistent. Despite these cross-cultural differences, we have found metric level invariance for grit and replicability of grit model across three countries.

2.2.5 Relations Between Three Aspects of Grit and Outcome Variables in Three Countries

Life satisfaction and flourishing were positively related in all three countries. In Japan and Poland these relationships were strong, and in Philippines the relationship was moderate. *Perseverance of effort* was weakly related to flourishing in Japanese sample, while it was unrelated to flourishing in the Philippines and Poland. *Perseverance of effort* was related positively and strongly to life satisfaction in Philippines, and moderately in Poland, and unrelated in Japan. No significant difference existed on how *perseverance of effort* relates to life satisfaction in Philippines and Poland ($z = 1.51$, *n.s.*). We found a lack of association of *consistency of interests* with flourishing and life satisfaction in all three countries. *Adaptability to situations* was related strongly and positively to flourishing, with relatively same strength across three compared countries based on the results of critical ratio of differences. The strength of regression weights did not reach cut-off 0.80 recommended for distinguishing between the two phenomena. Therefore, *adaptability to situations* could be deemed as a strong, culturally universal, predictor of flourishing. The relationship between *adaptability to situations* and life satisfaction was culturally diverse: (a) positive relationship in Japan and Poland; and (b) not significant in Philippines. Results of a z-test showed that the regression coefficient on this path did not differ across students in Japan and Poland ($z = 0.37$, *n.s.*) (Fig. 1).

2.3 Brief Discussion for Study 1

The primary aim of Study 1 was to assess how TMG dimensions (i.e., *perseverance of effort, consistency of interest,* and *adaptability to situations*) would predict life satisfaction and flourishing in the Philippines, Japan, and Poland. The results partly confirmed our hypotheses on the differential associations of grit dimensions with well-being outcomes.

Hypothesis 1a was partially supported as results of bivariate correlational analyses showed that whereas *perseverance of effort* was linked to increased flourishing in all countries, this TMG dimension was positively linked to flourishing in Japan but not in the Philippines and Poland after controlling for remaining the TMG dimensions and other well-being facets. This TMG dimension was positively correlated with life satisfaction in the Philippines and Poland but not in Japan. These results indicate that sustained effort to accomplish long-term goals even in difficult times, may exhibit different patterns of associations with well-being outcomes in such cultural contexts.

The pattern of association between *adaptability to situations* and well-being outcomes largely confirmed our theoretical predictions and Hypothesis 1b. Whereas *adaptability* was related to increased flourishing in the Philippines, Japan, and Poland, this TMG dimension was only linked to elevated life satisfaction in Japan and Poland. These findings imply that inclinations to engage in context-sensitive behaviors may be associated with higher levels of psychological flourishing in Japan, Philippines and Poland.

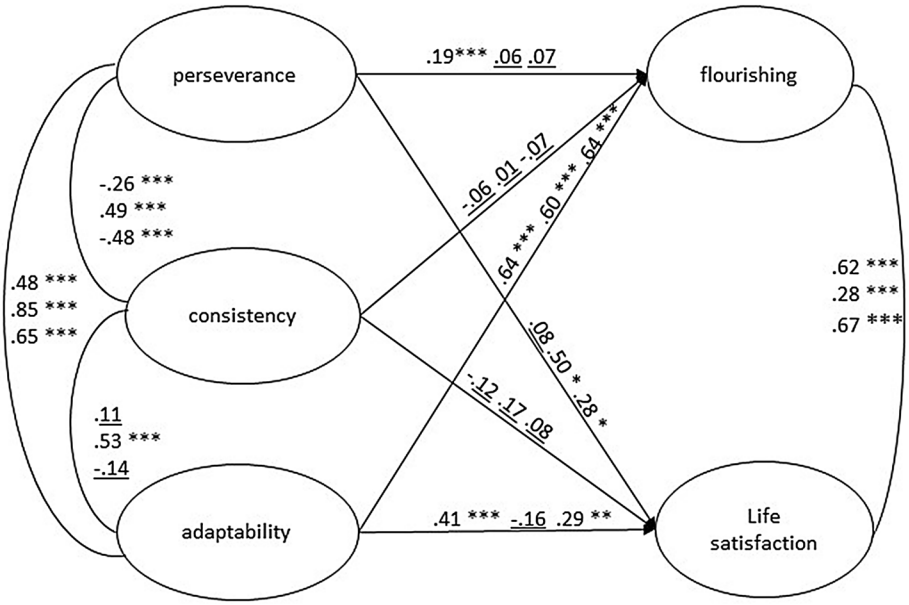

Fig. 1 Structural unconstrained model presenting the relationships among TMG dimensions, flourishing and life satisfaction. *Note* $*p < .05$; $**p < .01$; $***p < .001$. Unsignificant standardized regression weights are underlined. Regression coefficients are presented in the following order: Japan, Phillipinnes, Poland. Only latent factors are presented in this figure, without observed variables

Supporting Hypothesis 1c, *consistency of interest* did not predict life satisfaction and flourishing in all cultural settings. These results suggest that showing greater tendencies to focus on a specific goal for a prolonged period may not be linked to perceived satisfaction with life and social-psychological prosperity. Although the findings reported in Study 1 provided evidence on how TMG dimensions could predict well-being in different societies, note that this investigation examined correlates of grit in undergraduate student populations which hold limited implications for non-student samples.

3 Study 2: Cross-Sectional Study Involving Selected Filipino Employees

As Study 1 and previous studies (Datu et al. 2017a, 2018b) focused on assessing the relationship of TMG dimensions to positive psychological and well-being outcomes in undergraduate student samples, these results may not be generalizable to non-student populations. Against this methodological shortcoming, this investigation explored how TMG dimensions may be linked to psychological flourishing in selected Filipino employees using a cross-sectional design. As previous research (Duckworth et al. 2007) has shown that grit increased with age, we controlled for the influence of age in this investigation.

In particular, we tested the following hypotheses in Study 2:

Hypothesis 2a *Perseverance of effort* will positively predict flourishing after controlling for age, gender, and average monthly income.

Hypothesis 2b *Adaptability to situations* will positively predict flourishing after controlling for age, gender, and average monthly income.

Hypothesis 2c *Consistency of interests* will not predict flourishing after controlling for age, gender, and average monthly income.

3.1 Methods

3.1.1 Participants and Procedures

In Study 2, 88 Filipino full-time employees from various fields (e.g., education, human resources management, and tourism) participated in the investigation. The participants' average age was 27.83 with a standard deviation of 8.04. The sample was composed of 57 female and 31 male adults which was recruited via a convenience sampling approach. Participants were recruited through creating Facebook ads and sending a link of consent and survey forms to target participants. Employees indicated their willingness to voluntarily participate in this study through the online consent form and answered an internet-based questionnaire.

3.1.2 Measures

Triarchic model of grit. The TMGS (Datu et al. 2017a) was used to assess the participants' tendencies to exhibit *consistency of interests, perseverance of effort,* and *adaptability to situations*. The Cronbach's alpha reliability coefficients of the subscales in this investigation were $\alpha_{perseverance} = 0.73$, $\alpha_{consistency} = 0.72$, and $\alpha_{adaptability} = 0.77$.

Flourishing. In Study 2, we used the 8-item Flourishing Scale (Diener et al. 2010) to measure the participants' perceptions of social-psychological prosperity or psychological flourishing. The Cronbach's alpha reliability coefficient of the scale in this study was .90.

3.2 Results

The results of descriptive, reliability, and correlational analyses are reported in Table 6. Results demonstrated that all dimensions of TMG were positively correlated. Findings showed that whereas *perseverance of effort, consistency of interests,* and *adaptability to situations* were positively correlated to monthly income and psychological flourishing.

Findings of hierarchical regression analyses were reported in Table 7. Results demonstrated that *perseverance of effort* significantly and positively predicted flourishing after controlling for the participants' age, gender, and average monthly income which supported Hypothesis 2a. Further, *adaptability to situations* positively and marginally predicted flourishing after controlling for the above-mentioned demographic covariates which gave support for Hypothesis 2b. Consistency of interest contributed no explanatory power to the regression equation. Hypothesis 2c was, therefore, confirmed as *consistency of interests* did not predict flourishing.

Table 6 Descriptive statistics, reliability, and correlational coefficients among the variables in Study 2

Variables	α	*M*	*SD*	*r*						
				1	2	3	4	5	6	7
1. Perseverance of effort	.73	4.15	.58	–	.42***	.54***	.61***	.13	−.12	.25*
2. Consistency of interests	.72	2.92	.82		–	.29**	.33**	.14	−.14	.26*
3. Adaptability to situations	.77	4.28	.51			–	.49***	.20*	.07	.31**
4. Flourishing	.90	3.67	1.32				–	.27*	.05	.19
5. Age								–	.05	.18
6. Gender									–	−.04
7. Monthly income (in Philippine pesos)	–	32,328	2,954.20							–

*$p < .05$; **$p < .01$; ***$p < .001$

Table 7 Hierarchical regression analyses of demographic variables and TMG dimensions as predictors of flourishing among selected Filipino employees

Predictors	β	t	95% CI	R^2	ΔR^2
Step 1				.119	.119*
Age	.03**	2.66	.01, .05		
Gender	.00	− .002	− .36, .36		
Monthly income	.11	1.28	− .06, .28		
Step 2				.433	.315***
Age	.02*	1.99	.00, .04		
Gender	.09	.62	− .21, .39		
Monthly income	− .02	− .32	− .17, .12		
Perseverance of effort	.56***	3.78	.28, .91		
Consistency of interests	.07	.73	− .12, .25		
Adaptability to situations	.32†	1.91	− .01, .65		

†$p < .10$; *$p < .05$; ***$p < .001$

3.3 Brief Discussion for Study 2

The primary aim of Study 2 was to assess how TMG dimensions (i.e., *perseverance of effort, consistency of interests,* and *adaptability to situations*) may be linked to psychological flourishing among selected Filipino employees from various industries.

Consistent with Hypothesis 2a and Hypothesis 2b, our results demonstrated that *perseverance of effort* and *adaptability to situations* were linked to increased flourishing even after controlling for age, gender, and average monthly income among selected Filipino employees. These findings indicate that greater disposition to persevere in difficult times and adjust constantly to varying situations in life may be associated with higher levels of social-psychological prosperity characterized by having positive relationships, optimism, self-respect, meaning in life, as well as competence. *Consistency of interests* did not predict flourishing which corroborated Hypothesis 2c. This result suggests that espousing similar and focused interest in attaining a specific long-term goal may not be linked to flourishing. This finding also suggests, as did Study 1, the limited heuristic value of the consistency construct (at least in the form in which it is measured).

4 Study 3: Short-Term Longitudinal Study Involving Selected Filipino High School Students

Whereas Study 1 and Study 2 showed that TMG dimensions (i.e., *perseverance of effort* and *adaptability to situations*) positively predicted well-being outcomes using cross-cultural and cross-sectional research designs, results of these studies are prone to common method bias. In order to address such methodological limitations, Study 3 examined the association of TMG dimensions with both life satisfaction and flourishing via a short-term longitudinal design. Consistent with methodologically recommended approaches in controlling for common method bias (Podsakoff et al. 2003, 2012), we measured predictor and outcome variables at a two-month interval. This design would enable us to show how TMG

dimensions may relate to longitudinal changes in life satisfaction and flourishing after accounting for participants' age, gender, previous objective academic performance, and auto-regressor effects (i.e., Time 1 life satisfaction and Time 1 flourishing).

Specifically, we tested the following hypotheses in Study 3:

Hypothesis 3a Time 1 *Perseverance of effort* will positively predict Time 2 life satisfaction and Time 2 flourishing after controlling for age, gender, previous GPA, and auto-regressor effects.

Hypothesis 3b *Adaptability to situations* will positively predict Time 2 life satisfaction and Time 2 flourishing after controlling for age, gender, previous GPA, and auto-regressor effects.

Hypothesis 3c *Consistency of interests* will not predict Time 2 life satisfaction and Time 2 flourishing after controlling for age, gender, previous GPA, and auto-regressor effects.

4.1 Methods

4.1.1 Participants and Procedures

In Study 3, the sample was composed of 381 Filipino senior secondary school students from 10 classes of a government-funded high school in Quezon City, Philippines. Normally, students enrolled in such schools belong to low-income families. Selected teachers of this school assisted in recruiting target participants. There were 200 girls and 181 boys. The average age of the participants was 14.32 with a standard deviation of 1.67. Active consent forms were distributed to participants before requesting them to fill in the surveys for this investigation. Then, a paper-and-pencil survey packet was administered to participating students in their respective classrooms. Participants received course credit after joining this study. There was a 2-month lag between the first and second phase of data collection.

4.1.2 Measures

4.1.2.1 Triarchic Model of Grit TMGS (Datu et al. 2017a) was used to measure the participants' inclination to show *perseverance of effort, consistency of interest,* and adaptability *to situations*. The Cronbach's alpha reliability coefficients of Time 1 *perseverance, consistency,* and *adaptability* were 0.67, 0.60, and 0.70.

4.1.2.2 Life Satisfaction The 6-item Riverside Life Satisfaction Scale (Mangolis, Schwitzgebel, Ozer, and Lyubomirsky 2018) was used to assess the extent to which the participants experience life satisfaction. The Cronbach's alpha coefficients of the scale were .70 and .70 at Time 1 and Time 2 respectively.

4.1.2.3 Flourishing The 8-item Flourishing Scale (Diener et al. 2010) was used to measure the participants' perceived levels of psychological flourishing. The Cronbach's alpha coefficients of the scale at Time 1 and Time 2 were .87 and .94 respectively.

After getting consent from the participants, classroom advisers provided a copy of the students' most recent objective overall academic achievement scores during measurement of Time 1 TMG dimensions and wellbeing outcomes. The GPA score ranged from 0 to 100 with higher scores indicating better academic performance.

4.2 Results

Before conducting descriptive statistics and reliability analyses, we examined whether our data had missing responses. The percentage of missing data did not exceed 2.40%. Little's missing completely at random (MCAR) test demonstrated that such data were missing completely at random: $\chi^2 = 651.16$, df = 605, $p = .09$. In cases like this, previous studies (Little 1998; Schlomer, Bauman, and Card 2010) have pointed out that expectation-maximization (EM) imputation approach is an appropriate strategy to deal with missing data.

The results of descriptive statistical and reliability analyses are reported in Table 8. A review of the Cronbach's alpha reliability coefficients indicates that the scores from the TMG dimensions and all well-being scales exhibited adequate reliability coefficients except for *consistency of interests* ($\alpha = .60$) and *perseverance of effort* ($\alpha = .67$). Results of correlational analyses showed that both *perseverance of effort* and *adaptability to situations* were positively correlated with previous GPA, life satisfaction and flourishing across two time points. Time 1 life satisfaction and Time 1 flourishing were positively correlated to Time 2 life satisfaction and Time 2 flourishing. Furthermore, previous GPA was positively correlated with life satisfaction and flourishing at both time points. However, *consistency of interests* was negatively correlated with these outcome variables.

To examine whether TMG dimensions may predict subsequent well-being outcomes after controlling for age, gender, previous GPA, and auto-regressor effects, we conducted hierarchical regression analyses using the 23rd edition of SPSS. Findings of the regression analyses are reported in Table 9. Hypothesis 1 was partly confirmed because *T1 perseverance of effort* positively predicted T2 life satisfaction but not T2 flourishing after controlling for demographic covariates, previous GPA, and auto-regressor effects (i.e., T1 life satisfaction and T1 flourishing). Hypothesis 2 was partially supported as *adaptability to situations* positively predicted T2 life satisfaction (but not T2 flourishing) after controlling for demographic covariates, past GPA, and auto-regressor effects. Consistent with Hypothesis 3, *T1 consistency of interest* did not predict any well-being outcome.

4.3 Brief Discussion for Study 3

The central objective of Study 3 was to examine whether dimensions of TMG namely—*perseverance of effort, consistency of interest,* and *adaptability to situations*, may be associated with subsequent levels of subjective well-being and psychological flourishing. In general, findings showed that *perseverance* and *adaptability* served as consistent predictors of life satisfaction after controlling for relevant covariates and baseline wellbeing scores. *Consistency of interest*, in line with our hypothesis, was not a predictor in any analysis.

Partially supporting Hypothesis 3a, our results demonstrated that *T1 perseverance of effort* positively predicted increases in life satisfaction after controlling for relevant covariates and auto-regressor effects. These findings suggest that students' inclinations to persevere in times of difficulty may be linked to higher levels of both cognitive well-being.

Hypothesis 3b was also partly confirmed as our findings showed that T1 *adaptability to situations* positively predicted increases in life satisfaction over time. This result indicates that

Table 8 Descriptive statistics and reliability coefficients among the variables in Study 3

Variables	α	M	SD	1	2	3	4	5	6	7	8
1. T1 Perseverance of effort	0.67	3.52	.71	–							
2. T1 Consistency of interests	0.60	2.70	.79	−.27***	–						
3. T1 Adaptability to situations	0.70	3.79	.68	.52***	−.29***	–					
4. T1 Life satisfaction	0.70	5.02	1.01	.34***	−.18***	.42***	–				
5. T1 Flourishing	0.88	5.22	.86	.52***	−.14**	.52***	.44***	–			
6. T2 Life satisfaction	0.77	5.02	.96	.33***	−.14**	.38***	.38***	.40***	–		
7. T2 Flourishing	0.86	5.16	.97	.35***	−.10	.35***	.30***	.49***	.59***	–	
8. Previous GPA	–	80.45	3.90	.22***	−.08	.28***	.25***	.29***	.14**	.24***	–

*$p < .05$; **$p < .01$; ***$p < .001$

Table 9 Regression analyses of demographic variables, Time 1 GPA, Time 1 well-being dimension, Time 1 TMG dimensions as predictors of subsequent life satisfaction (Model 1) and flourishing (Model 2)

Model	Variable	β	t	95% CI	R^2	ΔR^2
1	Step 1				.152	.152**
	Age	.02	.74	− .04, .08		
	Gender	− .04	− .43	− .23, .15		
	Previous GPA	.01	1.00	− .01, .04		
	T1 Life satisfaction	.35***	7.51	.26, .44		
	Step 2				.223	.072***
	Age	.01	.37	− .04, .06		
	Gender	− .03	− .36	− .22, .15		
	Previous GPA	− .01	− .08	− .03, .02		
	T1 Life satisfaction	.24***	4.86	.14, .34		
	T1Perseverance of effort	.19**	2.63	.05, .34		
	T1 Consistency of interests	− .01	− .08	− .12, .11		
	T1 Adaptability to situations	.29***	3.52	.13, 45		
2	Step 1				.247	.247***
	Age	− .003	− .12	− .06, .05		
	Gender	− .09	− 1.00	− .27, .09		
	Previous GPA	.03*	2.36	.01, .05		
	T1 Flourishing	.49***	9.64	.41, .62		
	Step 2				.250	.016*
	Age	− .002	− .08	− .06, .05		
	Gender	− .08	− .84	− .26, .10		
	Previous GPA	.02	1.92	− .001, .05		
	T1 Flourishing	.42***	6.51	.29, .54		
	T1 Perseverance of effort	.14	1.76	− .02, .29		
	T1 Consistency of interests	.02	.33	− .10, .13		
	T1 Adaptability to situations	.13	1.55	.03, .29		

Model 1 = T2 Life satisfaction served as the outcome variable, Model 2 = T2 Flourishing served as the outcome variable

***$p < .001$; **$p < .01$; *$p < .05$

students' capability to effectively adjust to changing circumstances in life is linked to increased cognitive well-being.

However, Hypothesis 3c was confirmed as *T1 consistency of interests* did not predict any well-being outcome after controlling for demographic covariates and auto-regressor effects. This result suggests that exhibiting higher inclinations to pursue similar interests over time is not related to subsequent contentment with life and social-psychological prosperity.

5 General Discussion

Recent studies have provided evidence on the advantageous role of *triarchic model of grit* underpinned by three dimensions—*perseverance of effort, consistency of interests,* and *adaptability to situations* (Datu et al. 2017a, 2019, 2018b) especially in a collectivist

context. Yet, existing studies mainly relied on cross-sectional research designs to explore the well-being benefits of TMG dimensions. In general, combination of cross-cultural (Study 1), cross-sectional (Study 2), and longitudinal (Study 3) approaches points to the importance of *perseverance* and *adaptability* in promoting psychological wellness.

Across three studies, *perseverance of effort* positively predicted different well-being outcomes like life satisfaction and psychological flourishing. Study 1 demonstrated a relatively distinct pattern of association between *perseverance* and well-being outcomes (i.e., life satisfaction and flourishing) in three countries. On one hand, whereas *perseverance* positively relates to flourishing in Japan, these constructs were not related in Philippines and Poland. A potential reason that may account for the positive association of *perseverance* and social-psychological prosperity or flourishing involves the salience of long-term orientation in Japan compared to Philippines and Poland (Hofstede Insights 2018). Because attainment of flourishing encompasses satisfactorily fulfilling many areas of optimal functioning (i.e., purpose in life, positive relationships, engagement, optimism, and self-respect; Diener et al. 2010), adopting a long-term orientation may complement the benefits associated with working hard and persevering even in times of difficulties. On the other hand, while *perseverance* was linked to elevated life satisfaction in Philippines and Poland, this TMG dimension did not predict this outcome in Japan. As Philippines and Poland garnered low scores on long-term orientation indicating relative emphasis on attainment of quick gratifications (Hofstede Insights 2018), it is likely that *perseverance of effort* may be beneficial for achieving hedonic well-being. These results indicate cross-cultural nuances on how *perseverance* relates to various well-being dimensions in different societies.

These findings corroborated results in previous studies showing how grit relates to well-being outcomes (Bowman et al. 2015; Datu et al. 2016, 2018b). Showing higher tendencies to persist even in extremely challenging times may be associated with greater levels of well-being. *Perseverance of effort* may be linked to increased subjective and psychological well-being because traits belonging to *conscientiousness* personality factor optimize effort and actions that facilitate objective and subjective success in various domains of life (Hill and Jackson 2016). In other words, if *perseverance* boosts one's capacity to invest in behaviors that catalyze a sense of personal accomplishment, this can explain why persevering individuals may achieve both hedonic and eudaimonic well-being.

A potential psychological mechanism underpinning the positive association of *perseverance* with wellbeing outcomes involves the emotion regulation theory (Gross 1998, 2015; Gross and John 2003). This framework has pointed out that *cognitive reappraisal* which involves changing the interpretation of a situation to experience desirable emotions, is the most adaptive emotion regulation strategy (Gross 2015). In particular, it is possible that when persistent individuals face very difficult and exhausting tasks, they are more likely to demonstrate *cognitive reappraisal* through interpreting such goal-related obstacles as opportunities for improving their problem-solving skills. In turn, positive interpretation accrued through *perseverance* may optimize increased well-being outcomes.

Furthermore, our research dovetails with findings from previous literature (Disabato et al. 2018) on the benefits of *perseverance* in both individualist and collectivist societies. It is not surprising that *perseverance* positively predicted specific domains of psychological wellness (e.g., subjective well-being and psychological flourishing) in cultural settings as different as Japan, Philippines and Poland, because extant literature has reiterated that the theoretical validity of the grit construct lies in this dimension (Crede et al. 2017).

In addition, we found a relatively consistent line of evidence demonstrating the predictive value of *adaptability to situations* on a wide range of well-being outcomes. Specifically, our research demonstrated that *adaptability* was linked to: (a) increased psychological

flourishing via cross-cultural (Study 1) and cross-sectional research designs (Study 2); and (b) increased life satisfaction via a cross-cultural design (for Japanese and Polish students in Study 1); and (c) increases in subsequent life satisfaction using a short-term longitudinal design (Study 3). The positive associations of *adaptability* with life satisfaction and psychological flourishing confirm our theoretical predictions regarding the valuable role of calibrating or changing interests and behaviors in pursuit of long-term aspirations. Adopting flexible interests or actions holds promising benefits for individuals not only because of its ability to boost ability to cope with the ever-changing environmental conditions in life (Dreisbach and Fröber 2019) but also to protect them against the hazards of pursuing interests or goals that are bound to fail (Lucas et al. 2015).

As expected, *consistency of interest* did not predict well-being outcomes in the abovementioned investigations which corroborated results from previous studies on the lack or non-significant association of *consistency of interests* with optimal psychological outcomes (Bowman et al. 2015; Datu et al. 2016, 2018b; Disabato et al. 2018). Moreover, *consistency* was negatively correlated with well-being outcomes in Study 3. Espousing a consistent set of interests may be associated with reduced well-being because in situations where obstacles in achieving long-term goals are no longer manageable, adopting this approach can lead to frustration and even failure in achieving specific goals. In cases where pursuing consistent interests does not seem to pay off, it is equally beneficial to consider alternative interests or goals. Furthermore, previous studies have acknowledged the benefits of giving up on goals that could not be realistically attained (Datu et al. 2019; Datu and McInerney 2017). Our findings reinforce existing evidence about lack of heuristic value of *consistency* in the grit construct (Crede et al. 2017). This may be a problem with the construct itself (an issue of construct validity) and require re-theorizing, and perhaps a reduction again to a two-factor model including persistence and adaptability. Alternatively, the lack of construct reliability may impact on significant findings and suggest that alternative ways of measuring the construct (such as a revised and extended set of questions) may lead to more solid justification of the construct validity and heuristic value of the consistency construct.

Moreover, findings of correlational analyses in Study 1 showed that there were distinctions on how *perseverance of effort* relate to *consistency of interests* among undergraduate students in three countries (i.e., Japan, Philippines, and Poland). In particular, whereas *perseverance* was linked to increased levels of *consistency* in Filipino sample which corroborated findings from previous research involving Filipino high school students (Datu et al. 2018b), both dimensions of grit were negatively correlated in Japanese and Polish samples. These results appear to contradict what was found in previous investigations which demonstrated non-significant relationship between *perseverance* and *consistency* (Datu et al. 2016, 2017a). The diverging patterns of correlations on grit dimensions further contribute to inconsistent evidence not only in terms of the relationship of *perseverance* to *consistency* but also to psychometric discrepancies associated with the grit scales across the globe (Crede et al. 2017; Disabato et al. 2018). At any rate, more studies are needed to offer stronger evidence on the differential associations of *perseverance* and *consistency* in individualist and collectivist cultural contexts.

Results of Study 3 demonstrated that whereas *perseverance of effort* and *adaptability to situations* were associated with increases in life satisfaction over time after controlling for age, gender, previous academic performance, and auto-regressor effects, these TMG dimensions were not linked to temporal changes in psychological flourishing. It is probable that both dimensions of grit may be more relevant for subsequent life satisfaction as existing literature has pointed out that while personality traits are usually connected to stable differences in subjective or hedonic well-being, psychological well-being or eudaimonic

well-being is more strongly related to different types of values (Bojanowska and Piotrowski 2018). This inference requires further investigations as we did not explore TMG dimensions and specific values (e.g., openness to change and self-transcendence) as differential predictors of hedonic and eudaimonic well-being.

Our study has limitations. As our three-fold study used cross-sectional and short-term longitudinal designs to examine how grit may predict specific well-being outcomes, it may be premature to infer that grit can promote optimal psychological functioning. Given that Study 3 used a short-term longitudinal research design in assessing the link of grit facets to well-being, limited insights can be drawn on how grit relates to long-term happiness and psychological wellness. Future studies can address this gap through designing longitudinal research with larger time lags and larger and more diverse samples to offer stronger evidence on the long-term well-being impacts of espousing grit. In Study 2, the high mean scores on *perseverance of effort* and *adaptability to situations* in selected Filipino employee and high school student samples indicate possibility of acquiescence bias which may distort the findings of the study. Although our results corroborate previous investigations showing higher inclinations for Filipinos to have extreme response bias (Bennett 1977; Church 1987) and salience of acquiescence bias in collectivist contexts (Harzing 2006), future studies are recommended to refine TMGS by adding negatively-worded items which has been found to be an effective approach in reducing acquiescence bias (Yorke 2009). Moreover, this research did not control for the potential effects of conscientiousness, self-control, and neuroticism on how grit relates to well-being. As previous research has demonstrated that grit did not have incremental validity over self-control (Vazsonyi et al. 2019) and conscientiousness (Muenks et al. 2017; Schmidt et al. 2018) in predicting meaningful outcomes, future scholars are recommended to add such constructs as covariates in their investigations to determine if TMG dimensions uniquely predict optimal well-being outcomes. It is also important to explore the precise social, cognitive, affective, and motivational processes underpinning the complex interplay between grit domains (i.e., *perseverance of effort* and *adaptability to situations*) and well-being.

Furthermore, while our study provided preliminary evidence on how grit could predict well-being outcomes in an individualist (i.e., Poland), and collectivist societies (i.e., Philippines and Japan), it remains unknown whether specific sociocultural variables can either strengthen or weaken the anticipated impacts of *perseverance* and *adaptability* on a wide range of psychological outcomes. It is therefore essential to identify cultural variables (e.g., self-construals and individualism-collectivism) that can moderate the relationship of grit to well-being. Also, in assessing the participants' grittiness, we relied on self-reported evidence of grit, psychological flourishing, and subjective well-being which may increase the likelihood of monomethod biases. A potential way to address this methodological limitation may involve using alternative approaches (e.g., peer-report format assessing grit and examining the participants' objective well-being) to measure grit and such well-being domains. It is an interesting research direction to explore how the TMG dimensions can predict psychological and physical health outcomes and pathological states in challenging contexts in life (e.g., soldiers who are assigned in war-laden societies and children who are exposed to extreme poverty conditions). The low Cronbach's alpha reliability coefficients of the *consistency of interest* subscale of TMGS Study 1 and Study 3 was another limitation of this study. To some extent, this result corroborates what has been found in previous research on the low reliability coefficients of *consistency of interests* in collectivist societies (Disabato et al. 2018). Moreover, the low reliability coefficients may have been brought about by translational issues especially for Japanese undergraduate student participants. Further, the

reliability coefficient of *perseverance of effort* was relatively low in Study 3. Although the low reliability estimates of specific TMG dimensions in Study 1 and Study 3 may affect the validity of the findings, these results corroborate existing psychometric issues raised on the validity of the grit construct (Crede et al. 2017; Datu et al. 2016, 2018b; Disabato et al. 2018; Dumfart and Neubauer 2016). At any rate, more investigations are needed to provide evidence on the psychometric properties of TMGS especially in other cultural settings.

Our research has concrete theoretical implications. As Study 1 generated preliminary evidence about the cross-cultural invariance of the three-factor model of grit across Filipino, Japanese, and Polish undergraduate student samples, it is reasonable to argue that conceptualizing grit as *perseverance of effort, adaptability to situations,* and *consistency of interests* may be equally generalizable both in individualist and collectivist cultural contexts. Because all investigations (Study 1, Study 2, and Study 3) in this research demonstrated that *consistency of interests* did not predict any well-being outcome, results converge with existing literature that cast doubts on the heuristic value of *consistency of interests* in understanding the theoretical validity of grit (Crede et al. 2017; Disabato et al. 2018). Indeed, these results accentuate the theoretical values of: (a) reconceptualizing "*consistency*" or *passion* through borrowing tenets from relevant psychological theories (i.e., defining *passion* as "a strong feeling toward a personally important value/preference that motivates intentions and behaviors to express that value/preference (Jachimowicz et al. 2018, p. 9980"); and (b) replacing *consistency of interests* with the *adaptability to situations* dimension of TMG. In any case, future research needs to explore the theoretical validity, nomological network, and well-being correlates of alternative grit models.

Our multi-method research uniquely contributes to psychological literature in a number of ways. First, whereas most studies concentrated on examining how the two-factor model of grit (Duckworth et al. 2007) could predict well-being dimensions, our study focused on exploring the link of TMG facets to specific well-being domains (i.e., life satisfaction and flourishing). Second, while Datu et al. (2018b) have demonstrated that composite TMG positively predicted life satisfaction, positive affect, and interdependent happiness via a cross-sectional design, our three-fold study combined cross-cultural, cross-sectional, and short-term longitudinal designs to provide preliminary evidence on how each dimension of TMG may predict subjective well-being and psychological flourishing. Third, although existing studies investigated the link of grit to subjective well-being and psychological well-being (Datu et al. 2016, 2019, 2018a, b; Disabato et al. 2018; Jin and Kim 2017; Salles et al. 2014; Singh and Jha 2008; Vainio and Daukantaitė 2016), this is the first investigation of its kind to show how different dimensions of grit contribute to psychological flourishing. In general, our research stimulates on going debates on the scientific validity and mental health benefits of grit in various cultural contexts.

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