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Grit, positive youth development, and school engagement among Filipino adolescents

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Abstract
Educational researchers have noted the importance of identifying non-cognitive traits that may bolster student engagement. The triarchic model of grit (TMG), defined as one's disposition to exhibit perseverance of effort, consistency of interests, and adaptability to situations when pursuing long-term aspirations, is one of the non-cognitive traits linked to engagement. However, there is limited evidence on the psychological mechanisms that facilitate these links. This study examined whether the TMG's dimensions will have indirect relations on school engagement domains via the 5Cs dimensions of positive youth development (competence, confidence, connection, character, and caring), while controlling for the influence of gender, age, perceived socioeconomic status, and school type. Data were obtained from 2,283 Filipino secondary school students (M_{age} = 17.59; SD_{age} = 1.54; Females = 59.88%). Structural equation modeling revealed distinct patterns among the dimensions of grit, PYD, and school engagement. Specifically, whereas the associations between grit facets and *behavioral engagement* were explained by *efficacy-related Cs* (competence and confidence), the relations between grit dimensions as well as *emotional and cognitive engagements* were explained by *socio-emotional Cs* (connection and character). The results further highlight the beneficial impacts of perseverance and adaptability over consistency in increasing school engagement dimensions.

Keywords 5Cs · Grit · Positive youth development · School engagement

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Introduction

Effectively engaging students to perform academic tasks remains a critical challenge for many teachers and psychologists in educational contexts. As with the decline of students' engagement over time (Symonds et al., 2016; Wigfield et al., 2015), there is a need to identify psychological resources that can boost students' involvement in academic and extra-curricular activities at school. This need is particularly critical in contexts that lack economic resources like the Philippines (ASEAN, 2023; OECD, 2023). In this study, the researchers focused on examining the roles of grit and positive youth development (PYD) characteristics in promoting Filipino adolescents' school engagement.

Grit, defined as passion and perseverance for long-term aspirations (Duckworth et al., 2007), has been associated with indicators of positive psychological and academic functioning (Christopoulou et al., 2018; Datu, 2021). Past studies have shown that students who report high levels of grit not only perform academically well but are also more likely to show active participation, positive feelings, and effortful thoughts in academic activities (Datu et al., 2016, 2018). However, scarce investigations have examined underlying mechanisms that facilitate the associations between grit and school engagement, especially in non-Western and collectivistic countries where alternative models of grit may be more appropriate (Credé et al., 2017; Disabato et al., 2019). One such model is the Triarchic Model of Grit (TMG), which defines grit in terms of *perseverance of effort* (persistence to achieve long-term goals amidst challenges and difficulties), *consistency of interest* (sustained interest for long-term goals), and *adaptability to situations* (flexibility in strategies and pathways to achieve long-term goals; Datu et al., 2017, 2018). In addition, past studies tend to aggregate the specific dimensions of grit and school engagement into unidimensional constructs (Yau & Shu, 2023), thus, precluding a more precise understanding of their relations.

Specifically, school engagement pertains to students' level of active participation in academic and co-curricular activities at school (Fredricks et al., 2004; Li & Lerner, 2013). School engagement has been conceptualized as having behavioral, emotional, and cognitive aspects (Skinner et al., 2009; Wong et al., 2024). Specifically, *behavioral engagement* pertains to active participation in academic activities, presence of positive conduct, and the absence of negative behaviors. *Emotional engagement* involves positive emotional reactions toward school, including teachers, classmates, and classroom activities. Lastly, *cognitive engagement* refers to positive thoughts and investment related to education and learning (Fredricks et al., 2004). Considering the multidimensional nature of grit (Datu et al., 2017; Duckworth et al., 2007) and school engagement (Fredricks et al., 2004; Li & Lerner, 2013), it is important to differentiate how perseverance, consistency, and adaptability are specifically related to the behavioral, emotional, and cognitive engagements. Additionally, part of unpacking these associations is identifying key psycho-social resources (e.g., PYD characteristics) that may facilitate these linkages among students.

To address these gaps, this study sought to clarify the links between the dimensions of the TMG (perseverance, consistency, and adaptability) and school engagement (behavioral, emotional, and cognitive engagements) through the 5Cs of PYD (competence, confidence, connection, character, and caring; Lerner et al., 2005) in the Philippines, a non-Western, collectivist, lower-middle income country. As 90% of the world's youth reside in low- and middle-income countries (Catalano et al., 2019), it is important to examine how these associations operate in diverse developmental contexts, where challenges related to learning and education may be more pronounced (Bernardo et al., 2022; OECD, 2023; Trinidad,

2020). The results can provide a more comprehensive understanding of how the grit and the 5Cs of PYD may promote active engagement at school in these settings.

Grit as a psychological construct

Grit is defined as perseverance and passion for long-term goals (Duckworth et al., 2007). As a non-cognitive characteristic, grit was originally conceptualized as having two dimensions: *perseverance of effort* and *consistency of interest* (Duckworth et al., 2007). Specifically, whereas perseverance entails persistence despite hardships, failures, and adversities to achieve long-term goals, consistency includes sustained interest in activities that lead to goal achievement (Duckworth et al., 2007). Individuals with high levels of grit are less likely to be distracted by short-term goals or discouraged by setbacks and failures typically encountered in performance-related domains, such as those encountered by students at school (Duckworth et al., 2007).

Existing evidence supports the positive associations between grit and student's optimal psychological (Datu, 2021) and academic functioning (Christopoulou et al., 2018). For example, higher levels of grit has been associated with greater subjective well-being (Datu et al., 2016, 2020), basic psychological needs satisfaction (Jin & Kim, 2017), social-emotional learning (Datu & Restubog, 2020), pro-environmental attitudes and behaviors (Datu & Buenconsejo, 2021), psychological flourishing (Datu et al., 2020), as well as lower levels of psychological distress (Datu et al., 2018) and symptoms of depression (Jin & Kim, 2017). Likewise, grit has also been associated with greater academic achievement (Duckworth et al., 2007), school motivation and academic conscientiousness (Eskreis-Winkler et al., 2014), and self-regulated learning strategies (Wolters & Hussain, 2015). Further, studies have shown that students with high levels of grit are also more likely to be engaged in academic and co-curricular activities at school (Datu et al., 2016; Hodge et al., 2017).

Recent reviews on grit, however, have noted conflicting results on its two dimensions as well as the applicability of its two-factor model in non-Western and collectivistic societies (Christopoulou et al., 2018; Disabato et al., 2019). For example, perseverance consistently showed positive associations with optimal academic and psychological outcomes, but consistency did not always exhibit similar relationships (Credé et al., 2017; Datu et al., 2020). In fact, in some cases, consistency has shown negative correlations with students' academic achievement (Dixson et al., 2016) and psychological well-being (Disabato et al., 2019).

Further, studies conducted in Asian and Latin American contexts, have questioned the validity of the factor structure of grit as well as the low reliability estimates of the consistency domain in these contexts (Credé et al., 2017; Datu et al., 2016). It has been argued that a multidimensional factor structure of grit may be more appropriate in collectivistic societies (Datu et al., 2016; Disabato et al., 2019). Likewise, socio-cultural factors, such as relationships with parents, teachers, and peers, may influence one's passion and perseverance for long-term aspirations in such societies (Datu et al., 2017). Taken together, these findings highlight the importance of considering socio-contextual factors when examining and promoting grit among adolescents.

The triarchic model of grit

Building on the limitations of the two-factor model of grit, Datu and colleagues (2017, 2018) proposed the triarchic model of grit (TMG), which included *adaptability to*

situations aside from perseverance of effort and consistency of interest. Distinct from the first two dimensions of grit, adaptability pertains to anticipating challenges, accepting changes, exhibiting flexibility, and manifesting the drive to overcome challenges and obstacles as they arise (Datu et al., 2017). Whereas perseverance entails persisting despite hardships, failures, and adversities to achieve long-term goals, individuals high in adaptability may adjust their efforts and find alternative pathways to achieve remote goals in life. Similarly, whereas consistency of interest involves maintaining a set interests for a prolonged period of time, highly adaptive individuals tend to adopt flexible plans and strategies, including changing one's interest, to achieve temporally remote aspirations (Datu et al., 2017).

A series of empirical investigations provide evidence on the utility of the TMG in predicting optimal psychological and academic outcomes, particularly among students from collectivistic societies (Datu et al., 2017, 2020). For example, the TMG was found to be correlated with increased life satisfaction, positive affect, and interdependent happiness in sample of Filipino high school students, even after controlling for the influence of gender, age, and neuroticism (Datu et al., 2018). Extending the TMG to other cultural contexts, perseverance was found to be related with flourishing among students in Japan, while adaptability was linked to flourishing among Filipino, Japanese, and Polish students (Datu et al., 2020). Notably, whereas perseverance and adaptability showed positive relations with Filipino high school students' social-emotional learning, consistency exhibited negative relations with it (Datu et al., 2020).

Similarly, past investigations have also linked the specific dimensions of the TMG with academic-related outcomes including students' autonomous motivation, achievement goal orientations, and school engagement (Datu et al., 2023b, 2024). These studies, however, have also generated distinct findings of grit. For example, although all dimensions of the TMG were found to be positively correlated with behavioral engagement, only perseverance and adaptability were found to be positively associated with Filipino high school students' emotional and cognitive engagements (Datu et al., 2018). Similar patterns of results were also observed in a series of cross-cultural investigations that examined the links between the TMG and domain-specific forms of school engagement among students from the Philippines, mainland China, Hong Kong, and Macau (Datu et al., 2023a, 2024). Specifically, whereas perseverance and adaptability exhibited positive associations with students' math and science engagements, consistency yielded weak or negative correlations with these domain-specific forms of school engagement (Datu et al., 2023a, 2024).

Against this backdrop of prior studies about the educational benefits of grit, it is plausible to expect perseverance of effort and adaptability to situations to have stronger associations with behavioral, emotional, and cognitive engagements. On the other hand, the consistency of interest domain may be expected to yield weaker or even negative associations with school engagement dimensions. Finally, it is important to differentiate how grit dimensions are specifically related to its behavioral, emotional, and cognitive manifestations given the multidimensionality of school engagement (Fredricks et al., 2004; Wong et al., 2024).

The 5Cs of positive youth development as mediators

The positive youth development (PYD) framework provides an optimistic lens on adolescent development by highlighting young people's strengths and potential contributions to society (Lerner et al., 2005). It also aims to identify and promote psychosocial resources

that may boost youth thriving (Geldhof et al., 2014). As such, PYD considers young people as resources to be developed instead of problems to be solved or patients to be cured (Lewin-Bizan et al., 2010). As an alternative perspective to deficit model of adolescent development, PYD has garnered considerable attention from researchers and practitioners from various fields including developmental psychology, education, public health, social work, and sociology (Buenconsejo & Datu, 2021). Indeed, this traction has generated numerous frameworks that aim to conceptualize and measure adolescent thriving including the 40 internal and external developmental assets framework, the 15 PYD constructs, as well as the 5Cs model of PYD (see Buenconsejo & Datu, 2022; Qi et al., 2020). Among these frameworks, the *5Cs model* (Lerner et al., 2005) is argued to be the most empirically supported framework of youth thriving because of its research support, practical utility, and relative parsimony (Arnold & Silliman, 2017).

According to the 5Cs model, adolescent thriving is characterized by five interrelated but distinct constructs, namely, competence, confidence, connection, character, and caring (Lerner et al., 2005). More specifically, *competence* pertains to a positive view of one's actions in domain specific areas such as academic, cognitive, and social tasks. *Confidence* is a general sense of self-worth and self-efficacy as opposed to the domain specific areas captured by competence. *Connection* encompasses positive relationships with people and institutions that include mutually beneficial interactions. *Character* includes integrity, respect for societal and cultural norms, a moral sense of right and wrong, and having a set of standards for ethical behaviors. Lastly, *caring* includes having sympathy and empathy for others (Lerner et al., 2005). It is postulated that adolescents exhibiting these characteristics are hypothesized to experience higher adaptive developmental outcomes, lower maladaptive ones, and are more likely to contribute meaningfully to their own growth and to their respective families, schools, and communities (Geldhof et al., 2014).

Indeed, past investigations have supported the associations between the 5Cs and adaptive developmental outcomes, including life satisfaction and psychological empowerment (Holsen et al., 2017), spirituality (Buenconsejo & Datu, 2023), flourishing (Buenconsejo et al., 2022), academic achievement (Kozina et al., 2019), school satisfaction (Årdal et al., 2018), involvement in extracurricular activities (Urban et al., 2009), as well as higher levels of contribution (Yang & McGinley, 2021) and prosociality (Buenconsejo et al., 2024). On the other hand, the 5Cs have shown inverse associations with maladaptive developmental outcomes such as symptoms of anxiety and depression (Buenconsejo & Datu, 2024), suicidal ideation (Wong et al., 2021), emotion dysregulation (Dvorsky et al., 2019), as well as risk-taking behaviors (Urban et al., 2009).

More recently, researchers have made a distinction between *efficacy-related Cs* (competence and confidence) and *socio-emotional Cs* (connection, character, and caring) within the 5Cs model (Buenconsejo et al., 2025; Wong et al., 2021). Whereas efficacy-related Cs are characterized by self-focused qualities like self-development, personal achievement, and individual success, socio-emotional Cs typically involve other-focused characteristics like concern for others people's welfare, empathizing with others' suffering, interpersonal connections, and maintaining these relationships. Notably, in a study examining the moderating effect of spirituality on the relations between religiosity and the 5Cs, Buenconsejo and Datu (2023) found significant positive interactions for socio-emotional Cs, but not for efficacy-related Cs. On the other hand, the efficacy-related Cs of competence and confidence plus connection were found to mediate the indirect associations between perceived school empowerment and school satisfaction, but not the socio-emotional Cs of character and caring (Årdal et al., 2018). Based on these studies, it is also reasonable to argue that efficacy-related Cs may play a stronger role on

academic well-being outcomes while socio-emotional Cs may be related more strongly with psychological well-being outcomes (Årdal et al., 2018; Buenconsejo & Datu, 2023). Hence, considering the academic nature of school engagement, it is plausible to anticipate stronger indirect associations between the dimensions of grit and school engagement via the efficacy-related Cs of competence and confidence compared to the socio-emotional Cs of connection, character, and caring.

Studies further suggest that efficacy-related Cs may be more emphasized in individualistic societies like the U.S., while socio-emotional Cs are valued in collectivistic contexts like Taiwan (Yang & McGinley, 2021), mainland China (Chen et al., 2018), or the Philippines (Buenconsejo et al., 2022). Although we anticipate stronger associations between efficacy-related Cs and school engagement dimensions, it is worthwhile to examine the mediating roles of the socio-emotional Cs between grit and school engagement dimensions given the collectivistic nature of the Philippines.

The Philippine context

The Philippines is a lower-middle-income country with a population of around 109 million, 18% (19.8 million) of which is comprised of youth aged 15 to 24 (PSA, 2021). Approximately 3 million adolescents were enrolled as senior high school students (i.e., grades 11 and 12) in public (1.7 million) and private (1.3 million) schools (PSA, 2021). Based on the recent Southeast Asian youth development index, the Philippines has shown improvements in the domains of safety and security (lower poverty, interpersonal violence, and disaster risk) as well as equity and inclusion (greater access to electricity and sanitation) (ASEAN, 2023). However, compared to its neighbouring countries in the region, the Philippines has consistently ranked last in terms of youth employment and opportunity, which has been attributed to the declining economic performance of its financial institutions (ASEAN, 2023).

Although a slight increase was observed in the education and skills domain, as evidenced by the gross graduation rates (ASEAN, 2023), it is disconcerting that Filipino students' proficiency in mathematics, science, and reading continues to lag behind some 70 other countries in the recent Program for International Student Assessment (PISA) (OECD, 2023). Notably, socio-economically advantaged students (top 25% in terms of socio-economic status) outperformed disadvantaged students (bottom 25%) in mathematics, while girls outperformed boys in mathematics and reading (OECD, 2023). There is also a gap between students who go to public and private schools (Bernardo et al., 2015, 2022; Trinidad, 2020). Families who can afford to pay tuition fees tend to send their children to private educational institutions while those who cannot typically rely on government-funded public schools, which tend to have fewer material resources than private ones (Trinidad, 2020). In terms of academic achievement, Filipino private school students tend to outperform those from public schools (Bernardo et al., 2022). Public school students in the Philippines also report lower levels of academic support, academic self-concept, and achievement goals than private school students (Bernardo et al., 2015). Considering the unique socio-contextual and academic challenges faced by Filipino students, it is important to identify psychosocial resources that may enhance their psychological and academic well-being in school contexts. In this study, we conjectured that specific grit dimensions might relate to greater school engagement through their links with the 5Cs of PYD.

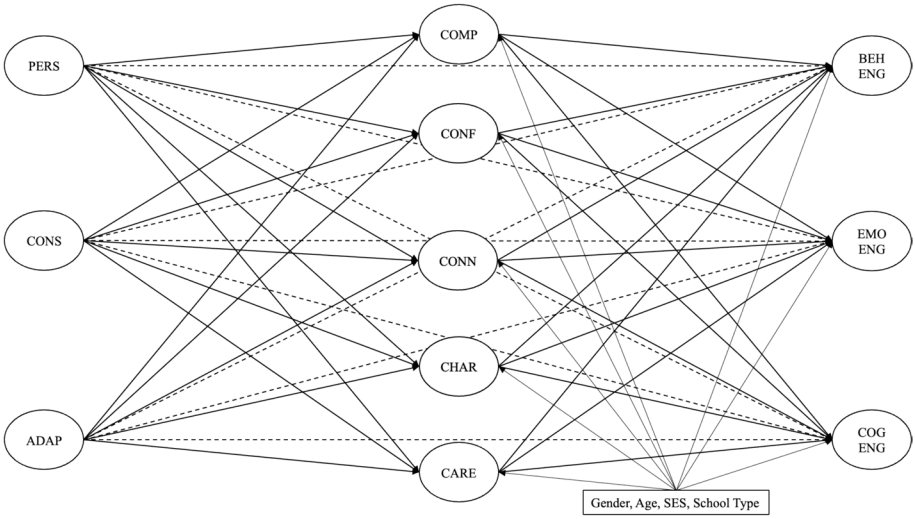

Fig. 1 Conceptual model showing the direct (dashed lines) and indirect (solid lines) relations between the triarchic model of grit and the dimensions of school engagement via the Five Cs of positive youth development while controlling for the socio-demographic covariates

The present study

Although past investigations have established the associations between the triarchic model of grit and school engagement (Datu et al., 2018, 2024), few studies have explored more precise mechanisms that may facilitate these links, especially in non-Western and collectivistic settings such as the Philippines. Hence, the present investigation aimed to examine the indirect associations between the dimensions of grit (perseverance of effort, consistency of interest, and adaptability to situations) and school engagement (behavioral, emotional, and cognitive engagements) via the 5Cs of PYD (competence, confidence connection, character, and caring) among Filipino secondary school students.

To address omitted variable bias in this study, the influence of gender, age, socio-economic status, and school type (i.e., public or private school) were also controlled. Previous studies have suggested that older individuals with higher socio-economic status tend to exhibit higher levels of grit (Datu, 2021). On the other hand, PYD investigations have noted that younger female students with high socio-economic status are more likely to report higher levels of PYD (Årdal et al., 2018; Urban et al., 2009). Lastly, considering the difference between public and private school students in the Philippines (Bernardo et al., 2015, 2022; Trinidad, 2020), we controlled for the influence of school type in the model. Figure 1 presents a conceptual diagram of the present investigation.

Methods

To examine the direct and indirect relations between grit and school engagement dimensions through the 5Cs of PYD framework, this study utilized a cross-sectional research design among Filipino secondary school students. The following section details the participants, procedures, measures, and analyses used in the present investigation.

Participants

With an anticipated effect size of.30 and a desired statistical power of.80, an a priori power analysis suggested a minimum sample size of 195 for a structural equation model involving 11 latent variables, 42 manifest variables, and 4 covariates (Soper, 2024). Cross-sectional data were obtained from 2,283 Filipino Grades 11 and 12 students aged 15 to 20 years old ($M_{age} = 17.59$; $SD_{age} = 1.54$) from 23 different schools in the National Capital Region and nearby provinces in the Philippines from October to November of 2021. Majority of the participants were girls (59.88%) enrolled as Grade 12 students (52.56%) in private schools (52.21%). More than half of the respondents (56.55%) reported having an average family monthly income of less than Php 20,000, 33.42% reported Php 20,001 to 60,000, while 10.03% reported Php 60,001 and above. These income thresholds were guided by national benchmarks to reflect socio-economic distinctions in the Philippines. The lower bound (Php 20,000) approximates households near or below the poverty line (Php 13,797; PSA, 2023) and aligns with classifications of low-income but not poor households (below Php 21,914; Albert et al., 2020). The upper bound (Php 60,000) roughly captures relatively higher-income households and aligns with national estimates of middle-income brackets (Php 43,828 to Php 76,669 Albert et al., 2020).

Procedures

After obtaining the necessary permission from the Human Research Ethics Committee of the first author's university, approval was sought from the principals and research coordinators of the schools for data gathering. Consent letters were then distributed to parents and legal guardians of the students asking their permission to allow their child to participate in the study. Active consent forms were sent to students before the actual online survey administration. Teachers distributed the Qualtrics survey link, and students completed the survey at their convenience in approximately 20 to 25 min using their own devices. Students' participation was completely voluntary. To ensure data completeness, the participants were asked to answer all questions in the survey. Otherwise, they had the option of withdrawing from the data collection without any negative consequence if they chose not to proceed. This approach avoided incomplete responses, which was particularly challenging when answering the online survey using a mobile phone because of interface changes. There were no missing responses in the dataset since only complete responses were encoded in the system. Three validity questions (e.g., "Please select 'strongly disagree' if you are carefully reading this statement") were randomly placed throughout the online survey to detect students who may have answered randomly. All instruments were administered in English, one of the two official languages of instruction in the Philippines. As token for their participation, each student respondent had the chance of joining a raffle draw of 28 gift certificates worth PHP 1,000 each.

Measures

Grit. The 10-item Triarchic Model of Grit Scale (TMGS; Datu et al., 2017) was used in measuring participants' perseverance of effort (3 items; e.g., "New ideas and projects

sometimes distract me from previous ones"), consistency of interest (3 items; e.g., "I often set a goal but later choose to pursue a different one"), and adaptability to situations (4 items; e.g., "I appreciate new opportunities that come into my life"). Respondents rated each item using a 5-point scale (1 = *not like me at all* to 5 = *very much like me*). Reliability coefficients are reported in Table 1, ranging from.70 (consistency) to.83 (adaptability). The TMGS has been validated among Filipino adolescents (Datu et al., 2018).

Positive youth development. PYD was assessed using the 17-item Very Short Measure of PYD for older adolescents (Geldhof et al., 2014), which has been validated in the Philippine context (Buenconsejo et al., 2022). Competence includes 3 items on academic, social, and skill competence (e.g., "I do a good job at school"). Confidence includes 3 items on self-worth, positive identity, and physical appearance (e.g., "I am happy with who I am most of the time"). Connection includes 4 items pertaining to relationships in their families, neighborhoods, schools, and peers (e.g., "I feel useful in my family"). Character 4 includes items on social conscience, diversity valuation, conduct behavior, and personal values (e.g., "It is important for me to help the world become a better place to live"). Caring includes 3 items on experiencing sympathy and empathy for others (e.g., "I feel bad for people who are hurt or are upset"). Items were rated using a 5-point scale (1 = *very untrue of me; strongly disagree; not important; never true* to 5 = *very true of me; strongly agree; extremely important; always true*). As shown in Table 1, internal consistency ranged from.66 (character) to.90 (confidence). The relatively lower alpha for character may reflect the fewer number of items and conceptual variability in adolescents' interpretations of moral constructs.

School engagement. School engagement was measured using the 15-item behavioral, emotional, and cognitive school engagement scale (Li & Lerner, 2013). Sample items included "I complete homework on time" (5 items; behavioral engagement), "I am happy to be at my school" (5 items; emotional engagement) and "School is very important for later success" (5 items; cognitive engagement). Respondents rated each item using a 4-point scale (1 = *never; strongly disagree* to 5 = *always; strongly agree*). The reliability coefficients of the overall school engagement and its dimensions are presented in Table 1. Table 1 shows Cronbach's alphas ranging from.68 (behavioral engagement) to.86 (overall engagement). This instrument has also been previously validated among Filipino adolescents (Buenconsejo & Datu, 2024).

Socio-demographic covariates. In addition to the measures on grit, PYD, and school engagement, respondents were also asked of their gender, age, socio-economic status (i.e., family monthly income) and school type (i.e., public or private school). These covariates were controlled for the mediators (i.e., 5Cs of PYD) and outcome variables (i.e., behavioral, emotional, and cognitive school engagement) in the structural equation model.

Data analysis

Originally, 2,649 complete responses were obtained from the participants, but only 2,283 (86%) were deemed trustworthy based on the validity questions. Using this dataset, descriptive statistics (i.e., mean, standard deviation, skewness, and kurtosis), reliability coefficients (i.e., Cronbach's alpha and McDonald's Omega), and Pearson's r correlations were calculated using the 29th version of the Statistical Package for the Social Sciences. Additionally, the tolerance indices and variance inflation factors (VIFs) of the constructs were also examined to identify possible multicollinearity issues. Before specifying the

Table 1 Descriptive statistics and reliability coefficients of grit, positive youth development, school engagement, and their dimensions ($n = 2{,}283$)

	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's α	McDonald's ω
Grit	1.00	5.00	3.8847	.62	-.61	1.06	.79	.79
Perseverance of Effort	1.00	5.00	3.90	.87	-.62	.08	.80	.80
Consistency of Interest	1.00	5.00	3.58	.94	-.38	-.20	.69	.70
Adaptability to Situations	1.00	5.00	4.10	.78	-.79	.52	.82	.83
Positive Youth Development	1.24	5.00	3.94	.45	-.63	1.43	.90	.89
Competence	1.00	5.00	3.47	.69	-.35	.17	.72	.72
Confidence	1.00	5.00	3.92	.90	-.99	.93	.89	.90
Connection	1.00	5.00	3.78	.65	-.60	.79	.81	.81
Character	1.00	5.00	4.16	.50	-.87	1.72	.66	.66
Caring	1.00	5.00	4.36	.62	−1.44	2.41	.80	.80
School Engagement	1.53	4.00	3.28	.41	-.51	.17	.87	.86
Behavioral Engagement	1.00	4.00	3.23	.51	-.51	-.38	.67	.68
Emotional Engagement	1.00	4.00	3.15	.51	-.47	1.14	.81	.81
Cognitive Engagement	1.00	4.00	3.46	.49	-.89	1.18	.84	.84

structural equation model, individual confirmatory factor analyses (CFAs) were first conducted on the triarchic model of grit, five-factor model of PYD, and three-factor model of school engagement.

The two-step approach of Anderson and Gerbing (1988) was used in specifying the structural equation model. Specifically, a measurement model containing all the latent and manifest variables was first tested using CFA. Structural equation modeling (SEM) was then performed with the hypothesized paths from the triarchic model of grit (perseverance of effort, consistency of interest, and adaptability to situations) to each dimension of school engagement (behavioral, emotional, and cognitive school engagements) via the 5Cs of PYD (competence, confidence, connection, character, and caring). The socio-demographic covariates of gender, age, socio-economic status, and school type were also controlled among the mediators and outcome variables.

In evaluating the fit indices of the CFAs and SEM, the researchers relied on the cut-off values recommended by Hair et al. (2014): a) Comparative Fit Index (*CFI*) and Tucker-Lewis Index (*TLI*) greater than.90 and b) Standardized Mean Square Residual (*SRMR*) and Root Mean Square Error of Approximation (*RMSEA*) less than.08. Although a non-significant chi-square (χ^2) statistic is indicative of good fit, this index is difficult to obtain in studies involving large sample sizes (Barrett, 2007). All parameter estimates were obtained using robust maximum likelihood estimation with robust standard errors and a Satorra-Bentler scaled chi-square test statistic ($SB\ \chi^2$). The CFAs and SEM were performed in R (R Core Team, 2019) using the lavaan package (Rosseel, 2012). The indirect effects between the dimensions of grit and school engagement via the 5Cs of PYD were analyzed with a 95% bias-corrected confidence interval (BCCI) using 5,000 bootstrap samples. The absence of 0 in the 95% BCCI is indicative of a significant indirect effect (Preacher & Hayes, 2008). To examine whether the strength of one mediated pathway (e.g., perseverance → competence → behavioral engagement) significantly differed from another (e.g., perseverance → confidence → behavioral engagement), we conducted Wald pairwise comparison of indirect effects. Specifically, these comparisons tested.

Results

This study aimed to examine the direct and indirect relations between the dimensions of grit and school engagement through the 5Cs of PYD, while accounting for gender, age, socio-economic status, and school type. The following section presents the results of descriptive analyses, confirmatory factor analyses (CFA), structural equation modeling (SEM), and analysis of indirect relations.

Descriptive statistics and bivariate correlations

The descriptive statistics and reliability coefficients of grit, PYD, school engagement, as well as their specific dimensions are presented in Table 1. There were no indications of severe violations of normality assumptions as indicated by the acceptable kurtosis |10| and skewness values |3| (Brown, 2015). Similarly, all constructs exhibited adequate reliability values (>.60) (Hair et al., 2014). Results of the multicollinearity diagnostics show that the tolerance indices (.39 to.77) and VIFs (1.30 to 2.59) are within acceptable ranges (>.25 for tolerance indices and < 4.00 for VIFs), indicating that there are no multicollinearity issues among the constructs (Hair et al., 2014; Marcoulides & Raykov, 2019).

Table 2 Bivariate correlations of grit, positive youth development, school engagement, and their dimensions ($n = 2,283$)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Grit	–													
2. Perseverance of Effort	.75**	–												
3. Consistency of Interest	.60**	.10**	–											
4. Adaptability to Situations	.83**	.57**	.22**	–										
5. Positive Youth Development	.43**	.48**	.02	.44**	–									
6. Competence	.25**	.31**	-.01	.25**	.69**	–								
7. Confidence	.23**	.30**	-.07**	.28**	.74**	.49**	–							
8. Connection	.31**	.36**	.00	.33**	.76**	.44**	.46**	–						
9. Character	.36**	.36**	.09**	.33**	.65**	.26**	.26**	.32**	–					
10. Caring	.33**	.31**	.10**	.31**	.52**	.13**	.11**	.23**	.49**	–				
11. School Engagement	.46**	.55**	-.01	.47**	.58**	.33**	.34**	.46**	.45**	.40**	–			
12. Behavioral Engagement	.36**	.50**	-.07**	.37**	.40**	.24**	.22**	.32**	.32**	.29**	.78**	–		
13. Emotional Engagement	.38**	.43**	-.01	.41**	.55**	.33**	.38**	.47**	.37**	.31**	.84**	.46**	–	
14. Cognitive Engagement	.39**	.42**	.05*	.38**	.47**	.24**	.25**	.35**	.42**	.38**	.83**	.45**	.61**	–

** Correlation significant at $p < .01$

* Correlation significant at $p < .05$

Table 3 Results of the SEM on the relations between the triarchic model of grit and the dimensions of school engagement via the Five Cs of positive youth development while controlling for the influence of socio-demographic covariates ($n = 2,283$)

Model	*SB* χ^2 *(df)*	*p*	*CFI*	*TLI*	*RMSEA*	90% CI	*SRMR*	*AIC*	*BIC*
Step 1: Confirmatory Factor Analysis	2810.694 (763)	<.001	.923	.913	.034	.033,.036	.042	210,853.784	211,897.235
Step 2: Structural Equation Modeling	3657.715 (906)	<.001	.914	.902	.036	.035,.038	.050	210,819.113	212,005.895

SB χ^2 Satorra–Bentler scaled chi-square test statistic, *df* degrees of freedom, *CFI* Comparative Fit Index, *TLI* Tucker–Lewis Index, *RMSEA* Root Mean Square Error of Approximation, 90% CI 90% Confidence Intervals, *SRMR* Standardized Root Mean Square Residual, *AIC* Akaike Information Criterion, *BIC* Bayesian Information Criterion

Table 2 presents the results of the bivariate correlations among the variables. Overall grit, perseverance of effort, and adaptability to situations showed significant positive associations with all dimensions of PYD and school engagement. Consistency of interest, on the other hand, yielded positive and negatives relations with other variables. Specifically, although consistency showed significant positive correlations with adaptability, character, caring, and cognitive engagement, it also showed small negative correlations with confidence and behavioral engagement. No significant correlations where found between consistency and other variables. The 5Cs of PYD exhibited significant positive correlations with all dimensions of school engagement.

Confirmatory factor analyses

Results of the preliminary CFAs show that all measurement models of the constructs exhibited adequate fit with the data, hence, no modification indices were adopted for these measurement models. Specifically, factor loadings ranged between.54 to.80 for the triarchic model of grit,.40 to.87 for the five-factor model of PYD, and.30 to.81 for the three-factor model of school engagement. Given the limited space for this report, the fit indices and factor loadings of these measurement models were placed in Tables A.1 to A.4 of the supplementary material.

Structural equation modelling

As presented in Table 3, the SEM examining the relations between the triarchic model of grit and the dimensions of school engagement via the 5Cs of PYD yielded adequate fit statistics, even after controlling for the influence of the participants' gender, age, socio-economic status, and school type.

Figure 2 shows the significant path coefficients in the SEM. The non-significant path coefficients and factor loadings of the manifest variables (i.e., items) can be found in Tables B.1 and B.2 of the supplementary material. Taking into account the influence of the socio-demographic covariates, perseverance of effort exhibited significant positive

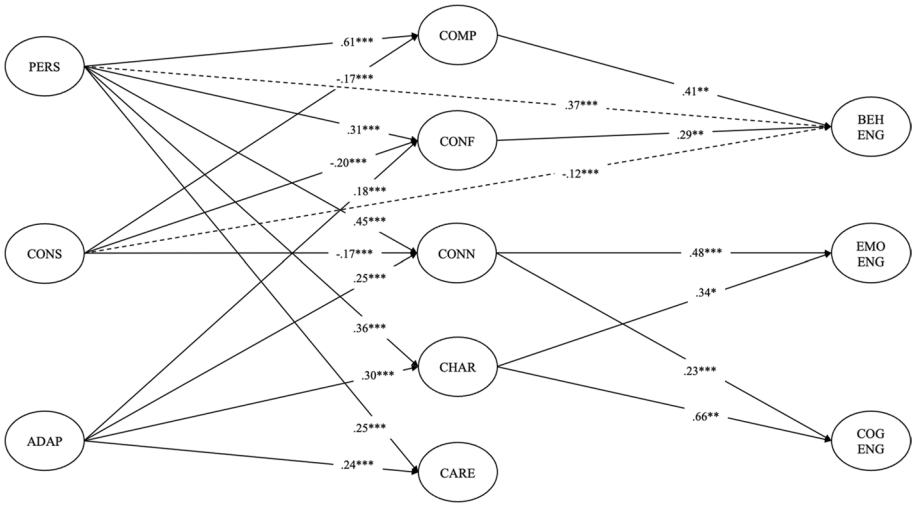

Fig. 2 Standardized path coefficients in the structural equation modeling on the relations between the triarchic model of grit and the dimensions of school engagement via the Five Cs of positive youth development after controlling for the socio-demographic covariates. *Note*. Non-significant paths, manifest variables, and covariates were excluded from the model for the purpose of parsimony; *** significant at $p < .001$; ** significant at $p < .01$; * Correlation significant at $p < .05$

relations with all 5Cs of PYD. Adaptability to situations showed positive relations with confidence, connection, character, and caring. Notably, consistency of interest consistently yielded negative relations with competence, confidence, and connection. As for the 5Cs of PYD, only competence and confidence, both classified as efficacy-related Cs, showed positive relations with behavioral school engagement. On the other hand, only connection and character, both classified as socio-emotional Cs, exhibited positive relations with emotional school engagement and cognitive school engagement. Caring did not yield any significant relations with the dimensions of school engagement. The associations of the socio-demographic covariates with PYD and school engagement dimensions are presented in Table C of the supplementary material.

Analyses of indirect relations

Table 4 presents the indirect relations between the triarchic model of grit and the dimensions of school engagement via the 5Cs of PYD. Results of the mediation analyses show only the efficacy-related Cs of competence and confidence mediated the relations between the perseverance of effort and behavioral school engagement, as well as consistency of interest and behavioral school engagement. Note, however, that the indirect relations between consistency of interest and behavioral school engagement was negative. Confidence also mediated the relations be adaptability to situations and behavioral school engagement. Results of the Wald pairwise comparisons of indirect effects show that competence, compared to confidence, was a statistically stronger mediator between perseverance and behavioral engagement ($\Delta\beta = .18$; $p < .01$; 95% CI [.21,.94]) and consistency and behavioral engagement ($\Delta\beta = -.01$; $p < .01$; 95% CI [-.36, -.07]).

Table 4 Results of the analyses of indirect relations between the triarchic model of grit and the dimensions of school engagement via the Five Cs of positive youth development while controlling for the influence of socio-demographic covariates ($n = 2{,}283$)

Indirect Paths to Behavioral Engagement	Standardized Path Coefficients	Unstandardized Path Coefficients	Standard Error	*p* value	Lower Confidence Interval	Upper Confidence Interval
Indirect paths from *Perseverance of Effort* to *Behavioral Engagement* via…						
Competence	**.27**[a]	.43	.14	.002	.15	.70
Confidence	**.09**[a]	.15	.05	.005	.05	.25
Connection	.04	.06	.03	.062	.00	.13
Character	.08	.13	.09	.173	-.06	.31
Caring	-.01	-.01	.05	.845	-.12	.10
Indirect paths from *Consistency of Interest* to *Behavioral Engagement* via…						
Competence	**-.07**[b]	-.12	.05	.010	-.21	-.03
Confidence	**-.06**[b]	-.09	.03	.004	-.16	-.03
Connection	-.01	-.02	.01	.085	-.05	.00
Character	.00	-.01	.01	.568	-.03	.02
Caring	.00	.00	.01	.849	-.01	.01
Indirect paths from *Adaptability to Situations* to *Behavioral Engagement* via…						
Competence	.03	.06	.05	.228	-.04	.15
Confidence	**.05**	.08	.03	.010	.02	.15
Connection	.02	.03	.02	.088	-.01	.07
Character	.07	.11	.08	.184	-.05	.27
Caring	-.01	-.01	.05	.844	-.11	.09
Indirect Paths to Emotional Engagement	Standardized Path Coefficients	Unstandardized Path Coefficients	Standard Error	*p* value	Lower Confidence Interval	Upper Confidence Interval
Indirect paths from *Perseverance of Effort* to *Emotional Engagement* via…						
Competence	.09	.14	.09	.135	-.04	.31
Confidence	.02	.03	.03	.373	-.03	.08
Connection	**.22**[c]	.32	.06	.000	.21	.44
Character	**.12**[c]	.18	.08	.025	.02	.34

Table 4 (continued)

Indirect Paths to Behavioral Engagement	Standardized Path Coefficients	Unstandardized Path Coefficients	Standard Error	*p* value	Lower Confidence Interval	Upper Confidence Interval
Caring	-.02	-.03	.04	.518	-.11	.06
Indirect paths from *Consistency of Interest* to *Emotional Engagement* via…						
Competence	-.03	-.04	.03	.149	-.09	.01
Confidence	-.01	-.02	.02	.375	-.05	.02
Connection	**-.08**	-.12	.03	.000	-.18	-.06
Character	-.01	-.01	.02	.553	-.05	.02
Caring	.00	.00	.01	.584	-.02	.01
Indirect paths from *Adaptability to Situations* to *Emotional Engagement* via…						
Competence	.01	.02	.02	.329	-.02	.05
Confidence	.01	.02	.02	.388	-.02	.05
Connection	**.12**[d]	.18	.05	.000	.09	.26
Character	**.10**[d]	.15	.07	.036	.01	.30
Caring	-.02	-.03	.04	.515	-.11	.05
Indirect Paths to Cognitive Engagement	Standardized Path Coefficients	Unstandardized Path Coefficients	Standard Error	*p* value	Lower Confidence Interval	Upper Confidence Interval
Indirect paths from *Perseverance of Effort* to *Cognitive Engagement* via…						
Competence	.08	.11	.08	.173	-.05	.27
Confidence	-.01	-.02	.03	.495	-.07	.04
Connection	**.10**[e]	.15	.04	.000	.07	.22
Character	**.24**[e]	.34	.12	.006	.10	.58
Caring	-.04	-.06	.06	.318	-.18	.06
Indirect paths from *Consistency of Interest* to *Cognitive Engagement* via…						
Competence	-.02	-.03	.02	.192	-.08	.02
Confidence	.01	.01	.02	.493	-.02	.05
Connection	**-.04**	-.05	.02	.002	-.09	-.02
Character	-.01	-.02	.03	.544	-.08	.04

Table 4 (continued)

Indirect Paths to Behavioral Engagement	Standardized Path Coefficients	Unstandardized Path Coefficients	Standard Error	*p* value	Lower Confidence Interval	Upper Confidence Interval
Caring	-.01	-.01	.01	.481	-.03	.01
Indirect paths from Adaptability to Situations to Cognitive Engagement via…						
Competence	.01	.01	.02	.347	-.02	.05
Confidence	-.01	-.01	.02	.494	-.04	.02
Connection	**.06**[f]	.08	.03	.002	.03	.13
Character	**.20**[f]	.28	.11	.012	.06	.50
Caring	-.04	-.06	.06	.317	-.17	.06

Significant indirect effects are in **bold**; [a, b, c, d, e, f] are statistically significant from each other

On the other hand, only the socio-emotional Cs of connection and character mediated the relations of perseverance of effort with emotional and cognitive school engagements, as well as that of adaptability to situations with emotional and cognitive school engagements. Connection also mediated the indirect relations between consistency of interest as well as emotional school engagement and cognitive school engagement but these indirect relations were negative. Comparing the indirect effects, *connection*, compared to character, was found to be a statistically stronger mediator between perseverance and emotional engagement ($\Delta\beta$=.10; p<.001; 95% CI [.21,.50]) and adaptability and emotional engagement ($\Delta\beta$=.02; p<.01; 95% CI [.08,.33]). On the other hand, *character*, compared to connection, was found to be a statistically stronger mediator between perseverance and cognitive engagement ($\Delta\beta$=.14; p<.01; 95% CI [.06,.36]) and adaptability and cognitive engagement ($\Delta\beta$=.14; p<.05; 95% CI [.01,.27]). Finally, the overall model explains 61% of behavioral school engagement, 55% of emotional school engagement, and 51% of cognitive school engagement.

Discussion

The current study sought to examine the indirect effects of the TMG's dimensions (i.e., perseverance, consistency, and adaptability) on school engagement domains (i.e., behavioral, emotional, and cognitive engagements) via their links to the 5Cs of PYD (i.e., competence, confidence, connection, character, and caring) among Filipino secondary school students, while controlling for the influence of gender, age, socio-economic status, and school type. Results showed that perseverance and adaptability were directly and indirectly associated with more behavioral, emotional, and cognitive engagements, via their links to higher specific PYD variables. In contrast, consistency exhibited negative associations with PYD and school engagement variables. Specifically, competence and confidence mediated links to behavioral engagement, while connection and character mediated links to emotional and cognitive engagements. These findings provide empirical support for the distinct roles of grit dimensions, as well as the differentiated mediating functions of efficacy-related Cs and socio-emotional Cs in promoting students' engagement.

Consistent with prior work (Gomez-Baya et al., 2025; Yau & Shu, 2023), perseverance and adaptability emerged as robust predictors of PYD and school engagement dimensions. The findings underscore the importance of sustained effort and flexibility in promoting student thriving and school involvement, especially in settings where long-term goal pursuit may be challenged by socio-economic adversity (Bernardo et al., 2015; Datu et al., 2020). In contrast, consistency showed weaker and negative associations with PYD and school engagement variables. Specifically, it was found to be negatively linked to competence, confidence, and connection, and yielded negative indirect effects for behavioral, emotional, and cognitive school engagements.

These results lend support to the propositions of the TMG (Datu et al., 2017, 2018) and previous studies noting the advantages of perseverance and adaptability over consistency, which typically exhibits weak or negative associations with academic and psychological outcomes in non-Western and collectivistic contexts (Datu et al., 2016; Dixson et al., 2016). Although consistency is often viewed as an adaptive characteristic to long-term goal pursuit in Western societies, it may have limited heuristics in the pursuit of temporally remote goals in collectivistic settings such as the Philippines (Datu et al., 2016, 2018). In environments where students' academic choices are heavily influenced by family obligations,

shifting and unpredictable economic conditions, or limited institutional support (Trinidad, 2020), flexibility rather than stability of interest may be more adaptive. Rigid adherence to a singular interest could probably hinder students' adjustment or engagement when external circumstances demand flexibility.

This challenges the assumptions of grit as a universally beneficial characteristic and points to the need for culturally nuanced interpretations of its components. Indeed, past investigations have argued that high levels of consistency may be indicative of rigidity and lack of novelty-seeking or openness to experience (Disabato et al., 2019; Dixson et al., 2016). In collectivistic societies like the Philippines, students tend to pursue more interdependent academic goals that are heavily influenced by external factors such as parental and societal expectations (Bernardo, 2019). For Filipino students, maintaining stable interests over time may be less important than persevering through challenges and adjusting to changing opportunities and circumstances in their environments. Thus, efforts to promote grit in schools may focus more on cultivating perseverance and flexibility amidst academic hardships rather than consistency.

Beyond investigating the relations of grit with school engagement, this study extended previous work by establishing the 5Cs of PYD as psychological mechanisms linking the specific dimensions of both constructs. This is because prior studies focused on the mediating roles of learning-related constructs such as school motivation (Datu et al., 2018), perceived problem-solving self-efficacy (Sulla et al., 2022), and achievement goal orientations (Datu et al., 2024). Unpacking these associations provided a more comprehensive understanding of how perseverance and adaptability for long-term goals may influence behavioral, emotional, and cognitive participation at school through specific psychosocial resources.

The analysis of indirect effects illuminate how grit facets relate to school engagement dimensions through the 5Cs of PYD. As hypothesized, efficacy-related Cs (competence and confidence) mediated the effects of perseverance and adaptability on behavioral engagement. This is consistent with past research linking positive self-perceptions of ability to active involvement in academic (Årdal et al., 2018; Kozina et al., 2019) and non-academic tasks (Urban et al., 2009). Among the two, competence emerged as the stronger mediator, suggesting that one's perceptions of actual capabilities in domain specific areas may be more influential for active school participation than general self-confidence.

In contrast, socio-emotional Cs (connection and character) mediated the links between grit dimensions and both emotional and cognitive engagement. Connection, or the sense of belonging and social support, was especially linked to emotional engagement, while character, reflecting values and moral commitment, was more closely associated with cognitive engagement. These findings highlight the importance of social bonds and value alignment in fostering deeper emotional and reflective ties to learning, particularly in interdependent societies like the Philippines (Bernardo, 2019; Datu et al., 2020). Caring, however, did not mediate any of the grit–engagement pathways. This result echoes some prior findings (Årdal et al., 2018) and may indicate that while empathy is a valuable PYD asset, it may be less central to academic-focused engagement.

The specific roles of efficacy-related Cs (self-focused) on behavioral engagement and those of socio-emotional Cs (other-focused) on emotional and cognitive engagements may also be explained by the qualities of these school engagement dimensions. Behavioral engagement typically involves goal-directed actions, persistence in academic tasks, and active classroom participation, which tend to be reinforced by a strong sense of ability and self-efficacy (Fredricks et al., 2004; Li & Lerner, 2013). In contrast, emotional and cognitive engagements reflect students' affective investment in school and their deeper

processing of learning materials, which are closely tied to interpersonal relationships, moral values, and sense of belonging (Bernardo et al., 2015). These patterns also align with past studies on how efficacy-related PYD factors play a more crucial role for academic outcomes (Årdal et al., 2018; Kozina et al., 2019), while socio-emotional PYD factors tend to be stronger predictors of student's psychological well-being (Buenconsejo & Datu, 2023; Wong et al., 2021). Taken together, the present study suggests that the unique patterns of associations between the dimensions of the TMG and PYD might account for their nuanced links to school engagement domains.

Theoretical and practical implications

The findings of the present study reinforce the importance of conceptualizing grit, PYD, and school engagement as multidimensional constructs. Collapsing these domains into single scores would have obscured the differential patterns observed such as the stronger role of perseverance over consistency, or the varying mediating roles of efficacy-related Cs and socio-emotional Cs across engagement types. These distinctions are not only theoretically meaningful but also practically useful for educators and youth development practitioners aiming to design targeted interventions. Moreover, this study aims to contribute to the cultural refinement of PYD and grit frameworks. The results suggest that certain Cs (e.g., competence, connection, and character) may be more central to engagement outcomes in the Philippine context, while the role of consistency of interest may need to be reconsidered in non-Western and collectivistic settings.

The present investigation also offer practical implications for educators, school psychologists, and youth program developers. First, schools may consider implementing grit-based educational interventions (Alan et al., 2019) to cultivate positive youth development and school engagement in adolescents. Interventions designed to enhance students' perseverance and adaptability, rather than a rigid focus on consistency, may be particularly effective in promoting engagement. For example, programs that teach students to flexibly respond to setbacks or shifting demands (e.g., through metacognitive training or resilience-building programs) could boost both academic persistence and well-being. Second, the differential mediation roles of the 5Cs suggest that tailored and domain-specific strategies may be most effective. To foster behavioral engagement, schools can focus on strengthening competence (e.g., via academic skills training, project-based learning) and confidence (e.g., through positive feedback and mastery experiences). On the other hand, enhancing emotional and cognitive engagements may require a stronger emphasis on connection and character development, such as cultivating strong teacher-student relationships, implementing values education, and fostering a sense of meaning and belonging in school.

Additionally, cultivating adaptability may be particularly impactful in the Philippine context, where students often face socio-economic and academic instability (Bernardo, 2019; Trinidad, 2020). Integrating adaptability-focused modules within guidance programs, especially in public schools, could help students better navigate changing personal, academic, and familial expectations. Programs grounded in relationship-building and character-oriented values may also resonate more with Filipino youth, especially those in community-centered settings. Lastly, school–family–community partnerships can strengthen students' sense of connection and reinforce PYD and school engagement outcomes. Involving families in goal-setting, hosting community-based learning projects, and integrating local values into the curriculum could promote culturally relevant approaches to promoting school engagement.

Limitations and future directions

Despite its theoretical and practical contributions, some limitations must be noted when interpreting the results of this study. First, its cross-sectional design precludes causal interpretations between grit, PYD, and school engagement domains. Future investigations could employ longitudinal designs to establish temporal precedence among the variables. Experimental studies focusing on the promotion of efficacy-related Cs and socio-emotional Cs may also be conducted among students to assess the effectiveness of PYD-based interventions in boosting optimal academic functioning. Future studies could explore how these constructs evolve across developmental stages using repeated measures or training-based interventions.

Second, the study's reliance on self-reported measures has inherent limitations, including common method bias and social desirability effects. Although validity checks were employed, the inclusion of teacher, parent, and/or peer reports in future studies can address this limitation. Multi-informant and multi-method research designs can provide a more comprehensive understanding of youth thriving and school engagement. Additionally, although requiring participants to answer all survey items ensured data completeness, it may have limited response flexibility. Future studies could balance data quality with participant autonomy by allowing selective non-response while retaining validity checks.

Third, although our sample size was large with students coming from both public and private schools, the findings remain context-specific to Filipino secondary school students, limiting generalizability. Cultural, educational, and economic factors in the Philippines (e.g., familial expectations, school infrastructure, and value systems) may shape how grit and the 5Cs function in relation to school engagement. Replicating the study in other Southeast and East Asian contexts, or conducting cross-cultural comparative work, would clarify how these dynamics may vary or generalize across collectivistic cultures.

Fourth, the measurement of key constructs such as PYD and grit was based on existing scales. Although validated in the Philippines (Buenconsejo et al., 2022; Datu et al., 2016), the instruments may not fully capture culturally embedded expressions of these traits. Further psychometric work to refine and contextualize these tools could enhance their sensitivity to more specific forms of youth strengths and motivation (e.g., grit in reading tasks, academic positive youth development).

Finally, although we examined mediation through the 5Cs, other potential mechanisms—such as school climate, parenting practices, or cultural values—were not assessed but could help contextualize the interplay between individual traits and school engagement. Exploring such ecological variables could deepen both theoretical understanding and practical application.

Conclusion

Despite evidence linking grit with school engagement, scarce investigations have examined how perseverance, consistency, and adaptability for long-term goals relate to distinct facets of school engagement, particularly in non-Western, collectivistic settings. Addressing this gap, the present study investigated the direct and indirect relations of the dimensions of grit with behavioral, emotional, and cognitive school engagements via the 5Cs of positive youth development (PYD) among Filipino secondary school students. The findings highlight the distinct mediating roles of efficacy-related Cs and socio-emotional Cs across engagement

domains. The results caution against a one-size-fits-all approach to grit and PYD, emphasizing the importance of context-sensitive, strengths-based approaches that foster flexibility, competence, connection, and character, particularly in interdependent contexts. Although the study offers empirical and practical contributions, future research employing longitudinal, multi-informant, and cross-cultural designs is needed to further unpack the developmental and contextual dynamics shaping school engagement and thriving.

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Declarations

Conflict of Interest The authors declare that there were no conflict of interest in writing this manuscript

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Jesus Alfonso D. Datu: grit, positive psychology, positive education, inclusive education, giftedness, STEM education

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Phil Duo Liu: cognitive development, language and literacy development and difficulties

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