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Review Article

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Enhancing Outcomes: A Systematic Review of Grit's Role in Education, Well-being and Personality

Sonuçların Geliştirilmesi: Eğitim, İyi Oluş ve Kişilikte Grit'in Rolüne İlişkin Sistematik Bir Derleme

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Abstract

This analytical study of research on grit has been conducted to identify its contribution in various social-cultural settings. This review also focuses on the limitations of the current research and suggests future research direction. A total of 57 studies have been included in the review to understand how grit has been studied in the academic and well-being context. The current research has also identified the correlation of grit with personality factors to better understand its concept. The reviewed studies were published across twenty-three countries. These studies encompassed a total of 41,826 participants. Of the 60 reviewed studies, 39 used the 8-item scale by Duckworth and Quinn (2009). All of the studies employed quantitative designs and used self-rated surveys. In general, it was found that grit is related to personality and significantly impacts academic performance, well-being, and personality, with issues related to grit diminishing these outcomes and hindering personality development. While grit has demonstrated positive implications for certain settings and populations, concerns about its generalizability have emerged. To achieve a comprehensive and conclusive understanding of grit's broader implications, future research should gather more evidence about grit, especially in terms of its relationship with a wide variety of variables.

Keywords: grit, wellbeing, academic performance, personality

Öz

Bu analitik çalışma, grit üzerine yapılmış araştırmaları inceleyerek, onun çeşitli sosyo-kültürel bağlamlardaki katkısını belirlemeyi amaçlamaktadır. Bu derleme aynı zamanda mevcut araştırmaların sınırlılıklarına odaklanmakta ve gelecekteki araştırmalar için yönelimler önermektedir. Toplam 57 çalışma, grit'in akademik ve iyi oluş bağlamında nasıl incelendiğini anlamak için derlemeye dahil edilmiştir. Mevcut araştırma ayrıca grit'in kişilik faktörleriyle olan korelasyonunu belirleyerek kavramın daha iyi anlaşılmasını sağlamayı hedeflemiştir. İncelenen çalışmalar yirmi üç ülkede yayımlanmıştır. Bu çalışmalar toplamda 41.826 katılımcıyı kapsamaktadır. İncelenen 60 çalışmadan 39'u Duckworth ve Quinn (2009) tarafından geliştirilen 8 maddelik ölçeği kullanmıştır. Çalışmaların tamamı nicel desenlerle yürütülmüş ve öz-bildirim anketleri uygulanmıştır. Genel olarak, grit'in kişilikle ilişkili olduğu ve akademik başarı, iyi oluş ve kişilik üzerinde anlamlı bir etki yarattığı bulunmuştur. Bununla birlikte, grit ile ilgili sorunların bu çıktıları zayıflattığı ve kişilik gelişimini engellediği görülmüştür. Grit belirli bağlamlar ve örneklemler için olumlu sonuçlar ortaya koymasına rağmen, genellenebilirliği konusunda kaygılar ortaya çıkmıştır. Grit'in daha geniş etkilerine ilişkin kapsamlı ve kesin bir anlayışa ulaşmak için, gelecekteki araştırmalar özellikle çeşitli değişkenlerle ilişkisi bağlamında daha fazla kanıt toplamalıdır.

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Anahtar Kelimeler: grit, iyi oluş, akademik başarı, kişilik

Introduction

Individuals exhibit diverse behavioral responses based on their success or failure in pursuing long-term goals. Some demonstrate unwavering persistence in their pursuit, spanning years or even decades, while others abandon their goals when faced with significant challenges (Arco-Tirado et al., 2018). Recent research has highlighted non-cognitive abilities as key predictors of individual performance and productivity across various life domains (Berga & Austers, 2021; Duckworth & Yeager, 2015a; García, 2014). Terms such as qualities, traits, non-cognitive competencies, soft skills, or life skills are often used interchangeably to predict psychological, social, economic, and physical well-being (Farruggia et al., 2018; Rozhkova, 2024). The variability in terminology may stem from the lack of a shared definition of "non-cognitive skills" and challenges in measurement (Duckworth & Yeager, 2015a; Farruggia et al., 2018). According to various authors, non-cognitive is commonly viewed as a pattern encompassing cognitive, emotional, and behavior (Chang et al., 2023; Cinque et al., 2021). Non-cognitive skills also encompasses a wide range of attitudes, personality traits, and behaviors, including self-perceptions (such as self-concept and self-efficacy), motivation, self-control, metacognitive strategies, social competencies (like social and leadership skills), resilience, creativity, and perseverance (such as engagement and grit) (Frank, 2020; Singh & Singh, 2022; Teng & Yang, 2022). They can be important in explaining why some people are more successful than the others.

This is reflected in the growing interest in understanding the factors that contribute to individual excellence and success, particularly in the field of education (Duckworth et al., 2007; Suhaimie et al., 2021). Apart from cognitive ability, talent, and opportunity, high achievers exhibit a range of non-cognitive or motivational characteristics such as creativity, commitment, emotional intelligence, growth mindset, gratitude, self-confidence, and emotional stability (Christopoulou et al., 2018; Duckworth & Gross, 2014b). These qualities have been shown to positively impact academic outcomes, social relationships, as well as psychological and physical well-being (Christopoulou et al., 2018; Duckworth & Gross, 2014a; Duckworth & Yeager, 2015a).

One specific non-cognitive factor that has gained considerable attention in recent years is grit. Grit is considered a performance character strength, utilized to achieve one's potential in a specific challenge (Saleh et al., 2019; Soutter & Seider, 2013). Research on grit has been primarily conducted by Angela Duckworth. Duckworth et al (2007) define grit as "the perseverance and passion for long-term goals". Grit entails persistent and vigorous effort towards challenging goals, maintaining interest and effort over extended periods despite setbacks, obstacles, and phases of stability in progress. Gritty individuals demonstrate stamina to stay on track and achieve their goals, contrasting with individuals low in grit who may easily become disinterested or discouraged and give up or pursue alternative actions (Apró et al., 2024; Duckworth et al., 2007). Grit is considered a personal quality common among leaders and an important predictor of success and excellence across all domains regardless of giftedness or talent (Duckworth & Yeager, 2015a; Khodaverdian Dehkordi et al., 2021). A long-term goal must be not only deeply meaningful but also engaging enough to sustain effort and vigor (Pavlíčková et al., 2024; Rivera-Pérez et al., 2021). Grit is fundamental ingredient of success, as perseverance of effort (PE) contributes to mastery despite failure, and consistency of interest (CI) is crucial for engaging in deliberate practice to achieve mastery (Credé et al., 2017; Wang et al., 2021). The distinction between these two aspects of grit is captured by the Grit Scale, a 12-item self-report questionnaire (Duckworth et al., 2007) and its shorter version, the 8-item Grit Scale-S (Duckworth & Quinn, 2009).

In recent years, a majority of studies have sought to identify the predictive role of grit in academic achievement and other educational outcomes. A series of studies by Duckworth et al. (2007) suggested that grit is a significant predictor of successful educational outcomes beyond IQ. Grittier individuals tend to attain higher levels of education, experience fewer career transitions, and achieve higher Grade Point Averages (GPA) in high standard university settings compared to less gritty counterparts (Christopoulou et al., 2018; Kumari et al., 2022). Grit was also found to be a stronger predictor of West Point military academy summer retention of cadets compared to self-control (Galaleldin & Anis, 2019; Kelly et al., 2014; Shao, 2023). Duckworth and Quinn, (2009) found that both grit and life satisfaction were strong indicators of teacher effectiveness, as reflected in their students' academic achievements.

A recent meta-analysis by Credé et al. (2017) demonstrated grit, performance and retention, with a strong correlation with conscientiousness. The meta-analysis also revealed that the "effort" facet of grit accounts for variance in academic performance beyond conscientiousness, suggesting it should be considered as a separate construct (Credé et al., 2017). A Prior study found that grit played a mediating role in well-being (Okur et al., 2023). Perseverance of effort was found to have a positive indirect link with life satisfaction (An et al., 2021; Chen & Gong, 2021). A longitudinal SEM model by Casali, Lee, & Harms (2023) demonstrates that grit has an indirect positive relationship with life satisfaction. Chakraborty et al (2020) study has found that, grit and psychological wellbeing have a positive link. One key finding indicates that grit has a significant impact on academic performance (Correa-Rojas et al., 2024; Daniels et al., 2023; Guo et al., 2023; Lee, 2023; Nishikawa et al., 2022; Sultanova et al., 2024; Tang et al., 2021) and personality (Ekinci & Kizilkaya, 2021; Harpaz et al., 2023; Ionel et al., 2023; Kannangara et al., 2018; Khodaverdian Dehkordi et al., 2021; Millonado Valdez & Daep Datu, 2021).

Research on the role of grit in educational, well-being and personality may still be evolving, but it has already faced some criticism (Sigmundsson & Hauge, 2023). Duckworth et al (2015a) acknowledge that while grit measurement addresses individual differences, it overlooks situational factors that may influence well-being and success. Anderson, Turner, Heath, and Payne (2016) criticize the concept, highlighting issues such as grit being presented as a panacea in research or potentially counterproductive if excessive, and its potential to exacerbate educational inequality by placing blame on students from low socioeconomic backgrounds for their academic performance, or its lack of consistent correlation with creative success. Duckworth & Yeager (2015b), highlight numerous other factors such as opportunity, talent, luck, and additional personality traits like curiosity that also impact achievement outcomes. Furthermore, as highlighted by Roberts et al. (2007) and Mustaza and Kutty (2022), the substantial impact of grit underscores its importance as a single trait in predicting objective outcomes, aligning with findings on other personality traits. Viewing grit both as an outcome and a predictor is crucial from intervention and educational perspectives (Farruggia et al., 2018).

The lack of research on predicting grit is noticeable in the literature, likely because researchers tend to focus more on how different measures predict outcomes rather than on how grit itself can be predicted. Given the substantial increase in studies on grit over the past decade and the growing recognition among authors of its dual role as both a predictor and an outcome in personal, professional, and educational development, there is a pressing need for a systematic review of grit based on rigorous international standards and protocols. Systematic reviews play a crucial role in the scientific information chain and serve as essential tools for evidence-based practices (Ioannidis, 2016). Therefore, the objective of this systematic review is to synthesize the existing research on grit as a predictor of educational, professional, and success, as well as grit as an outcome of educational, professional, and personal factors, while adhering to international high-quality review standards (e.g., The Campbell Collaboration, 2015). This study seeks to investigate

the impact of grit, on academic, as well as well-being and personality traits. The primary objective is to enhance our comprehension of grit and identify factors that contribute to its cultivation as a positive trait in academic, well-being, and personal contexts. This study aims to analyze the relationships between grit and a range of educational, well-being, and personal outcomes, and ascertain which outcomes can be consistently predicted by grit.

Method

The review team developed a systematic review protocol with following the guidelines outlined by The Campbell Collaboration (2015). The protocol is available upon request from the review team. The study protocol was registered on PROSPERO under registration number CRD42022329722. This study used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

Literature Search

Before conducting a systematic literature search, we used the Oxford Handbook of Positive Organizational Scholarship to construct an initial list of search terms (Cameron & Spreitzer, 2011). To ensure a comprehensive search for relevant studies, multiple sources were utilized in this literature review. The authors employed various methods, such as searching databases, reviewing relevant websites, snowballing through reference lists, and reaching out to experts in the field. RefWorks was utilized to manage the search process and remove any duplicate or already published abstracts. The initial search was conducted in March 2024, and a secondary search was also performed to identify any additional studies for potential inclusion in the review. We used Google Scholar to look for relevant research from 2018 to 2024. The first search terms consisted of free words: “grit$” or/and, “perseverance”, “effort”, “passion”, and “interest”. The second search term included combinations of “education”, “success$”, “perform$”, “academic”, “GPA”, “Achievement test scores”, “Repetition rate (reversed)”, “graduation”, “achieve$”, “well-being”, “wellbeing”, “psychological wellbeing”, “subject wellbeing” (i.e., positive and negative affect, happiness, optimism, life, job and school satisfaction, subjective well-being, mental well-being, and overall well-being), “university”, “college”, “school”, (by detecting words with the same stem, the sign $ was utilised to broaden the search). The third search term included combinations of “personality”. This approach produced an excessive number of results because some sources were published many times.

The process of literature search and selection involved utilizing various literature databases, including Google Scholar, Proquest, PsycINFO, Web of Science (WOS), ERIC, EBSCOhost, Embase, MEDLINE, PubMed, and Mendeley for unpublished studies. To ensure comprehensiveness, a primary search was initially conducted, followed by a supplementary search to identify additional relevant studies for inclusion in the research: A Scopus database was conducted to find undetected articles on this topic, using the same terms, but no any new articles were found. Two reviewers (SH and RB) independently examined publications in two phases. Data were cleaned to remove duplicates, book reviews and book chapters, content such as news or magazine articles, posters, and all available articles that were relevant to this systematic review objective were retrieved.

Inclusion and Exclusion Criteria

In order to be eligible for the review, inclusion criteria are as follows: the article should be published in a peer-reviewed journal, the time period covered in this study extends from 2018 onwards until 2024, the full-text article (published in English), the term “grit” (either as a predictor or outcome) should be used in the title and abstract of the papers, empirical and quantitative

studies, (b) the publication should have original data (no meta-analysis or systematic review); and the publication should have a Digital Object Identifier (Doi). The researcher exclude those working papers that do not provide overall grit score (i.e., separately doing statistical analyses according to Grit's domains scores), book chapters theses/dissertations, conference proceeding papers, if the correlation coefficients were not reported (e.g., statistical analysis was inadequate for coding), and magazine and newspapers articles. The full articles were examined in case of the doubt based on abstracts and included based on a set of specified criteria.

Literature screening

EndNote X20 reference manager was performed to remove the probable duplicates from the search results, and then by the first two authors (both of whom were accomplished researchers in the subject) screened the literature review independently of each other, based on the inclusion and exclusion criteria. In the first stage, reading the titles/abstracts, reviewers preliminarily screened papers and the papers that did not match the criteria for inclusion and exclusion were removed and recorded. In the second stage, the full text of the remaining papers was read and reviewed to re-screen the papers. If both authors disagree, the last two authors check the article, decide whether or not it should be included.

Coding Procedure

After the literature screening, the first two authors used for data extraction form to extract the following data and record it: study number, first author's name, year of publication, the participants, title, country, and study methods.

Results

The initial search identified a total of 41,826 publications (1,524 in the primary search and 1,166 in a complementary search). After removing duplicates and those published before 2018 (first screening level), 2,386 publications were excluded. The titles and abstracts of the remaining 304 publications were then reviewed (second screening level), leading to the exclusion of 233 publications. Finally, after full-text reviews of 71 publications (third screening level), 60 publications (containing 61 studies) qualified for analysis. Five studies were not obtained in full text despite repeated attempts. Among these 60 publications, two included two studies each, resulting in a final count of 61 studies. Figure 1 shows the flowchart of the literature search and screening process.

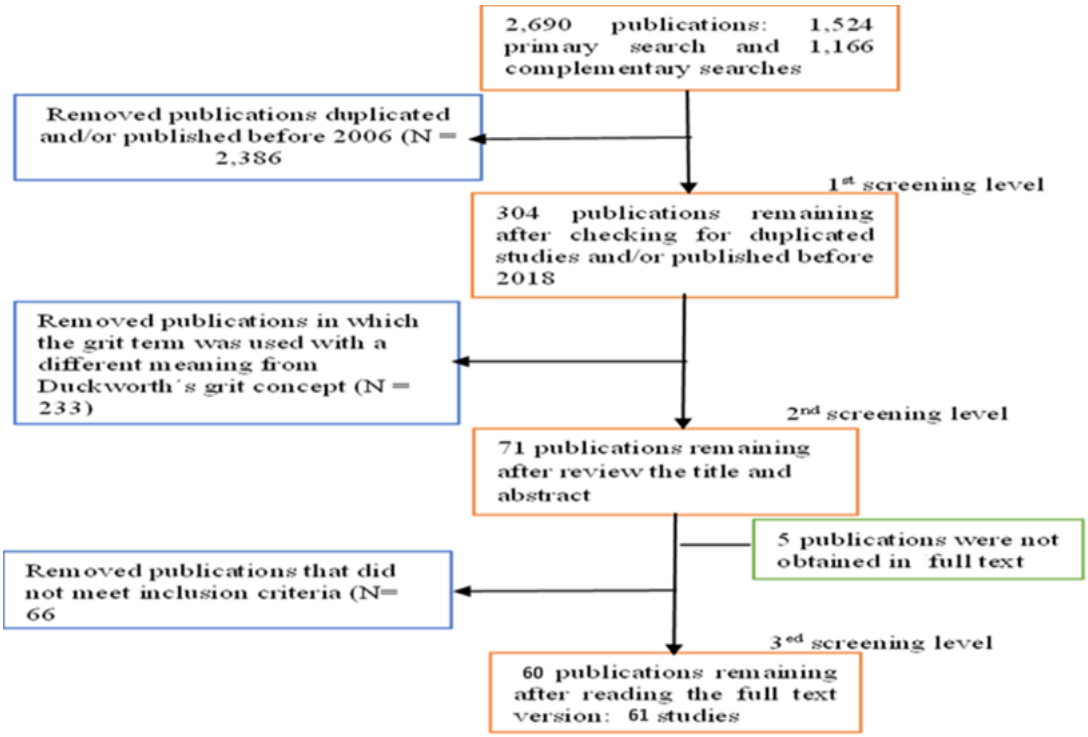

Figure 1. Flow Chart for the Literature Search and Screening

The reviewed studies encompassed a total of 40,067 participants, whose ages ranged from 9 to 85 years. These studies were published across twenty-three countries. Of the reviewed studies, 39 used the 8-item scale by Duckworth and Quinn (2009), while 12 utilized the 12-item scale by Duckworth et al. (2007). The majority of these studies were cross-sectional (n = 49), with 8 being longitudinal. Structural Equation Modelling (SEM) was the primary statistical analysis method used in 34 studies. Specifically, 26 studies explored the relationship between grit and well-being, 28 focused on grit and academic performance, and 6 examined grit and personality. Among these, 49 studies reported significant relationships. One study found a weak significance between grit and well-being, while 5 studies found no or negligible significance between grit and academic performance. Additionally, one study noted that passion was not significantly related to academic performance. Eleven studies found that perseverance of effort had weak or no significant relationship, whereas one study identified it as the strongest predictor of grit and academic performance. Another study indicated that lower levels of grit and personality were associated with perseverance of effort combined with low consistency of interest. The studies varied in sample sizes, ranging from 232 to 7,617 participants. Gender distribution was generally mixed, with 56 studies including both males and females, and one study consisting solely of female participants. Most samples comprised school or university students, with specific studies focusing on Japanese amateur triathletes, UK freelancers, Romanian climbers and boulderers, Chinese employees, Chinese insurance agencies and Chinese adolescents. The majority of the studies were conducted in the US and China.

Table 1. Studies Employing Grit as a Predictor of Education performance, Well-being, and Personality

Author	Study design	Participants	Statistically results or not	Scale	Age	Statistical analysis
Grit and Well-being						
Çarkıt (2024)	Cross-sectional	338 university students	Significant	Duckworth and Quinn (2009,8 item)	18-28	Correlation Regression
Casali et al	longitudinal	445 Italian	Significant	Duckworth and	11-18	SEM

(2023)		high school students		Quinn's (2009,8item)		ANOVA
Harpaz et al (2023)	Cross-sectional	351 Israeli and Anglophone university students	Significant	Clark & Malecki (2019, 30 item)	18-58	SEM
Okur et al (2023)	Cross-sectional	731 Turkish	Significant	Duckworth and Quinn's (2009,8item)	NM	SEM
Zhou (2023)	Cross-sectional	748 Chinese university students	Significant	Teimouri et al (2022,9 item)	19-21	SEM
Ain et al (2021)	Cross-sectional	350 Pakistan university students	Weakly Significant	Duckworth et al (2007,12 item)	18-26	Correlation T-test ANOVA
An et al (2021)	Cross-sectional	347Japanese amateur triathletes	Significant	Duckworth and Quinn's (2009,8item)	21-78	SEM
Aujla et al (2021)	Cross-sectional	282 UK freelancers	Significant	Duckworth and Quinn's (2009,8item)	NM	Correlation
Chen & Gong (2021)	Prospective	234 Chinese university students	Significant	Duckworth and Quinn's (2009,8item)	17-24	SEM
Mason (2021)	Cross-sectional	405 South Africa university students	Significant	Duckworth et al (2007,12 item)	NM	Regression T-tes
Kwon (2021)	Cross-sectional	1008, US and South Korea	Significant	Duckworth and Quinn's (2009,8item)	18-85	SEM
Chakraborty et al (2020)	Cross - sectional	450 India university students	Significant	Duckworth et al (2007,17items)	22-26	Correlation
Choi (2020)	Cross-sectional	273 South Korea university students	Significant	Duckworth and Quinn's (2009,8item)	19-28	T-tests SEM
Ma et al (2020)	Cross-sectional	380 Chinese college students	Significant	Duckworth and Quinn's (2009,8item)	18-25	Correlation
Oriol et al (2020)	Cross-sectional	275 Peruvian high students	Significant	Duckworth and Quinn's (2009,8item	NM	SEM
Jiang et al (2019)	Cross-sectional	2,963 Chinese adolescents	Significant	Duckworth et al (2007,12 item)	24-39	SEM
Lan & Moscardino (2019)	Cross-sectional	440 Chinese early adolescents	Significant	Duckworth and Quinn's (2009,8item)	10-13	Correlation
Lan & Zhang (2019)	Cross-sectional	1113 Chinese adolescents	Significant	Duckworth and Quinn's (2009,8item)	13-18	SEM
Weisskirch (2019)	Cross-sectional	232 US university students	Significant	(Duckworth et al (2007, 12 item)	18-25	Correlation
Arya & Lal (2018)	Cross-sectional	250 Indian university students	Significant	Duckworth & Quinn (2009, 8 item)	17-25	Correlation

Disabato et al. (2019)	Cross-sectional	7,617 international sample	Significant	Duckworth et al (2007,12 item)	NM	SEM
Hwang et al (2018)	NM	509 Korean female students	Significant	Duckworth et al (2007,12 item)	NM	SEM
Kannangara et al (2018)	Cross-sectional	340 UK university students	Significant	Duckworth et al (2007,12 item)	18-31	Correlation
Li et al (2018)	cross-sectional	243 Chinese employees	Significant	Duckworth and Quinn's (2009,8item)	19-29	SEM
Mullen & Crowe (2018)	NM	330 US university students	Significant	Duckworth and Quinn's (2009,8item	NM	SEM
Li et al (2018)	Cross - sectional	2,363 Chinese insurance agencies	Significant	Duckworth and Quinn's (2009,8item)	19-70	SEM
Grit and Education						
Correa-Rojas et al (2024)	Cross-sectional	305 Peruvian university students	Significant	Duckworth and Quinn's (2009,8item)	17-30	SEM
Minnigh et al (2024)	Cross-sectional	401, US university students	Not Significant	Duckworth and Quinn's (2009,8item)	NM	SEM
Uribe-Moreno et al (2024)	Cross-sectional	343 Colombian university students	Not Significant	Duckworth and Quinn's (2009,8item)	17-60	SEM
Guo et al (2023)	Cross-sectional	493 Chinese university students	Significant	Duckworth and Quinn's (2009,8item)	10-12	SEM MANOVAs
Harpaz et al (2023)	Cross-sectional	351 Israeli and Anglophoni university students	Significant	Clark & Malecki (2019, 30 item)	18-58	SEM
Lee (2023)	Cross-sectional	304 US student-athletes	Significant	Duckworth et al (2007,12 item)	NM	Correlation
Daniels et al (2023)	Cross-sectional	875 US university students	Significant	Duckworth and Quinn's (2009,8item)	NM	Correlation
Park et al (2023)	Cross-sectional	2,240 school students	Significant	Duckworth and Quinn's (2009,8item)	9-11	SEM
Nishikawa et al (2022)	longitudinal	1403 Japanese high school students	Significant	Duckworth and Quinn's (2009,8item)	NM	SEM
Neroni et al (2022)	longitudinal	2027 Netherlands university students	Not Significant	Duckworth and Quinn's (2009,8item)	18–80	Correlation
Lee et al (2021)	Prospective	320 Korean university student	Significant	Duckworth and Quinn's (2009,10item)	NM	T-test SEM
Postigo, et al (2021)	Longitudinal	5,371 Spanish school	Significant	Academic grit 5 items	NM	SEM

		students				
Xin et al (2021)	Cross-sectional longitudinal	549 Finnish high school students	Significant	Duckworth and Quinn's (2009,8 item)	14–16	Correlation
Mohd Matore (2020)	Cross-sectional	468 Malaysian Polytechnic students	Significant	Duckworth and Quinn's (2009,8 item)	NM	Correlation
Huéscar Hernández et al (2020)	Cross-sectional	474 Portuguese sports science students	Passion was not significant	Duckworth and Quinn's (2009,8 item)	18-28	SEM
Alhadabi et al (2020)	Cross-sectional	258 US university student	Significant	Duckworth and Quinn's (2009,8 item)	NM	Correlation
Chen & Ganzach (2020)	Cross-sectional	6,748 US population	Negligible effect	Duckworth and Quinn's (2009,8item)	29-34	Regression
Schmidt et al (2019)	Cross-sectional	698 Germany university students	Significant	Germany version	NM	SEM
Lumontod et al (2019)	Cross-sectional	313 Philippines freshmen students	Not Significant	Duckworth and Quinn's (2009,8 item)	18-24	Correlation
Usher et al (2019)	Cross-sectional	2,430 US elementary and middle school students	perseverance of effort weakly or unrelated Significant	Duckworth and Quinn's (2009,8 item)	NM	Correlation
Clark &Malecki (2019)	Cross-sectional	776 US middle school students	Significant	Duckworth and Quinn's (2009,8 item)	NM	ANOVA SEM
Tang et al (2019)	longitudinal	2018 Finnish adolescents	Significant	Duckworth and Quinn's (2009,8 item)	12-13	SEM
Steinmayr et al (2018)	longitudinal	227 US high school students	Significant	Duckworth et al (2007,12 item)	NM	Regression
Li et al (2018)	Cross-sectional	607 Chinese high school students	Significant	Duckworth and Quinn's (2009,8 item)	NM	SEM
Cosgrove et al (2018)	NM	1,246 US high school students	Perseverance of effort is the strongest predictor	Duckworth and Quinn's (2009,8 item)	NM	SEM
Park et al (2018)	Cross-sectional, prospective, longitudinal	1,277 US high school students	Significant	Duckworth and Quinn's (2009,8 item)	NM	SEM
Chen et al (2018)	Cross-sectional	272 US and Chinese university students	Significant	Duckworth and Quinn's (2009,8 item)	NM	Correlation
Farruggia et al (2018)	Cross-sectional	1603 US university students	Significant	Duckworth et al (2007,12 item)	16-33	Correlation SEM
Grit and Personality						
Harpaz et al	Cross-	351 Israeli	Significant	Clark &	18-58	Correlations

(2023)	sectional	and Anglophoni university students		Malecki (2019, 30 item)		
Ionel et al (2022)	Cross-sectional	427 Romanis climbers and boulderers	Significant	Duckworth et al (2007,12 item)	16-69	Correlations
Khodaverdian Dehkordi et al (2021)	Cross-sectional	384 Iranian university students	Perseverance of effort and low consistency of interest were related lower level of relationship	Duckworth and Quinn's (2009,8item)	19-24	SEM ANOVA
Ekinci et al (2021)	Cross-sectional	379 Turkey university students	Significant	Duckworth and Quinn's (2009,8item)	18-25	T-test Correlations
Millonado et al (2021)	NM	236 Filipino high school students	Significant	Datu et al (2017, 10 item)	10-19	Correlations
Kannangara et al. (2018)	Cross-sectional	340 UK University students	Significant	Duckworth et al (2007,12 item)	18-31	Correlations

Discussion

The robust relationship between grit and achievement across various domains is well-supported by extensive research (Harpaz et al., 2023). Consistent with previous research (Duckworth et al., 2007), grit has been positively linked to various educational achievements, well-being, and personality traits. The purpose of this systematic review was to investigate the role that grit plays in well-being, education achievement, and personality, based on empirical research on the subject. In addition, explore its outcomes indicating the increasing interest in these fields of research. In this study, ten electronic databases, were used to identify studies that were published in English. Only publications in English met all the inclusion criteria for this review. In addition, only studies with validated scales were included. Forty six out of the fifty-seven reviewed articles were published up to Jun 2018, the review provided a range of emerging findings from quantitative studies on the role that grit plays in education, achievement, well-being and personality. Studies have consistently shown that grit significantly contributes to success in academic, and personal arenas (Christopoulou et al., 2018; Duckworth & Gross, 2014a; West et al., 2015)

Students who demonstrated higher perseverance reported greater life satisfaction by the end of the school year. Grit has shown significant associations with academic performance indicators such as GPA, GCSE, and ACT scores, as well as science and language achievements. Additionally, grit correlates with positive behavioral outcomes, including school motivation, attendance, and adherence to rules. Previous cross-sectional studies highlighted that grit is positively associated with academic success (Calo et al., 2022; Clark & Malecki, 2019; Daniels et al., 2023; Lee, 2023; Nishikawa et al., 2022; Zisman & Ganzach, 2020) and Huéscar Hernández (2020) found that passion did not significantly impact academic outcomes. Similarly, studies by Neroni et al.(2022), Minnigh et al. (2024), Lumontod et al.(2019), and Uribe-Moreno et al.(2024) reported non-significant effects of grit on academic performance. Usher et al. (2019) noted that the perseverance of effort was weakly or unrelated to significant academic success, aligning with the overall findings that grit is not a major determinant of academic achievement. Students with higher levels of grit tend to be more resilient and capable of overcoming obstacles, leading to better educational outcomes and a sense of accomplishment (Huo, 2022).

Highlights the importance of fostering grit in educational settings as a means to support students' psychological resilience and overall well-being, especially during challenging times. This study contributes to understanding how personal attributes like grit can enhance adaptive coping and life satisfaction in the face of adversity. Moreover, the positive relationship between psychological well-being and grit has been confirmed, with factors such as resilience, motivation, and engagement acting as mediators (Huo, 2022; Macintyre & Khajavy, 2021). An individual's level of grit is influenced by their perception of the world as meaningful and their passionate pursuit of goals, which correlates with high well-being Liao, & Chen (2022). Those with grit exhibit existential courage, enabling them to adaptively face life's challenges (Maddi et al., 2013). Achieving long-term goals, such as completing medical training, necessitates perseverance and determination (Datu et al., 2017). Students in professional and technical programs who persist in their goals demonstrate self-awareness, happiness, and consistency, helping them balance life demands and reduce dropout rates (Agrawal et al., 2022; Salles et al., 2014). In the realm of well-being, recent longitudinal studies by Casali et al.(2023), Lee (2023), and Okur et al. (2023) have demonstrated significant relationships between grit and improved psychological well-being. These findings highlight the multifaceted benefits of grit, reinforcing its importance in educational and personal development contexts. Casali, Feraco & Meneghetti (2023) found that perseverance, a key component of grit, was positively associated with both posttraumatic growth and increased life satisfaction over time. While grit has demonstrated positive implications for certain settings and populations, concerns about its generalizability have emerged.

Several studies have demonstrated a correlation between grit and various personality traits. Ionel et al. (2023) found a significant relationship among Romanian climbers and boulderers, study conducted by Ekinci et al. (2021) supported these findings. Additionally, Millonado Valdez & Daep Datu (2021) identified a significant correlation between grit and personality traits in Filipino high school students aged 10-19. Kannangara et al. (2018) further reinforced these observations, highlighting the consistent link between grit and personality across diverse populations. while Khodaverdian Dehkordi et al (2021) observed that perseverance of effort and low consistency of interest were associated with lower levels of relationship among Iranian university students.

This systematic review is a groundbreaking effort to explore the antecedents of grit within the realms of education, well-being, and personality. Although the field is still in its infancy, we analyzed 57 journal articles that offered significant insights into the topic. The findings partially support the proposed hypotheses concerning the practical and theoretical implications of grit. This review is crucial as it identifies several predictive factors of grit, setting the stage for deeper investigation into the processes and characteristics that sustain grit and motivate individuals to persist in their goals. Given that grit is a relatively novel concept in the literature, further research is essential to obtain more concrete findings and evidence, ultimately leading to a comprehensive and conclusive understanding of its broader implications.

This review acknowledges several limitations that need to be addressed. Firstly, the selection of studies involved certain drawbacks. The growing interest in the role of grit in education has led to numerous unpublished research papers, such as doctoral dissertations and working papers, which were not included in this review due to stringent inclusion and exclusion criteria. Additionally, most of the selected studies relied on self-report scales and questionnaires, notably the Grit Scale, which may have introduced bias and limited the generalizability of the findings. The Grit Scale, a self-report measure, has faced criticism from researchers and its developers alike. Moreover, this review was restricted to English-language studies, excluding records with insufficient study detail, such as conference abstracts and presentation slides. The data screening and extraction were primarily conducted by a single reviewer, despite quality assurance processes being in place to minimize errors. The meta-analysis conducted was also

limited in scope. Furthermore, the review did not examine how associations between interventions and well-being varied by participant characteristics (e.g., age, gender, ethnicity, mental health status) or across different follow-up durations. Important findings in other languages and significant results from in-progress or unpublished studies were also excluded from this review. In addition, the review highlighted deficiencies in the study designs of included research. Prospective studies, which can better elucidate causal relationships between variables, were fewer compared to cross-sectional studies. Future research should focus on prospective studies to better understand the relationship between grit, academic performance, well-being, and personality.

Conclusions and Recommendations

Grit aims to foster environments that support the development of individuals' skills, performance, personality, and well-being (Duckworth et al., 2007). This study makes several key contributions: identifying predictors of grit in academic and work settings, highlighting contextual and individual conditions that empirically promote well-being and personality, and examining the effects of grit on academic outcomes, well-being, and personality. These insights offer perspectives for future research on grit and provide valuable guidelines for practitioners to design healthy, supportive environments. Current empirical studies on grit are primarily situated in individual settings, underscoring the need for future research to expand in terms of scope, research sites, and participant diversity.

Previous studies have predominantly employed data-driven approaches; future research should consider qualitative and mixed-method studies to explore the antecedents and outcomes of grit, thereby providing more effective interventions. Additionally, the concept of grit needs further refinement to ensure clarity and measurability, and grit measurements should be validated across different contexts. Investigating grit in relation to diverse emotions from a holistic perspective would also be valuable. Despite numerous studies suggesting that perseverance of effort (PE) has greater utility than consistency of interest (CI), the recognition of CI's importance is gradually increasing. Thus, it is premature to disregard any sub-components of grit. This study is among the few systematic reviews of grit, aiming to facilitate readers' and researchers' understanding of this popular topic, identify potential issues, and suggest solutions to advance the field. Specifically, it provides researchers with a solid foundation for conceptualizing and assessing grit in relation to academic performance, well-being, and personality, while identifying further concerns and future trends in grit-related studies.

Declarations

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