GRIT: A CHARACTERISTIC TRAIT OF PEOPLE WITH HIGH ABILITIES?

GRIT: UM TRAÇO CARACTERÍSTICO DE PESSOAS COM ALTAS CAPACIDADES?

GRIT: ¿UN RASGO CARACTERÍSTICO DE LAS PERSONAS CON ALTAS CAPACIDADES?

Bárbara Amaral MARTINS[1]
e-mail: barbara.martins@ufms.br

Amanda Rodrigues de SOUZA[2]
e-mail: amanda.rodriguesdesouza@professor.universidadviu.com

África BORGES[3]
e-mail: aborges@ull.edu.es

How to reference this article:

MARTINS, B. A.; SOUZA, A. R.; BORGES, Á. Grit: A characteristic trait of people with high abilities?. **Revista Ibero-Americana de Estudos em Educação**, Araraquara, v. 18, n. 00, e023162, 2023. e-ISSN: 1982-5587. DOI: https://doi.org/10.21723/riaee.v18i00.18851

| **Submitted**: 21/08/2023
| **Revisions required**: 16/09/2023
| **Approved**: 07/10/2023
| **Published**: 27/12/2023

Editor: Prof. Dr. José Luís Bizelli
Deputy Executive Editor: Prof. Dr. José Anderson Santos Cruz

[1] Federal University of Mato Grosso do Sul (UFMS), Corumbá – MS – Brazil. PhD in Education. Professor of the Postgraduate Program in Education at the Pantanal Campus.
[2] International University of Valencia (VIU), Valencia – Spain. Post-doctorate in Psychology from the University of La Laguna (ULL). Professor in the Master's Degree in Psychopedagogy.
[3] University of La Laguna (ULL), Tenerife – Spain. Professor of Psychology at the University of La Laguna (ULL).

ABSTRACT: Grit corresponds to the association between passion and perseverance, expressed over time, often seen in successful people. The objective was to investigate whether there is a difference between university students with and without high abilities in terms of grit. The study has an analytical, observational and cross-sectional design and involved 188 university students with and without high abilities from universities in Spain and one from Germany. For data collection, the Oviedo Grit Scale (EGO) and the Matrices-TAI general intelligence test were used. The results revealed that the difference between the groups in terms of grit was not statistically significant and refuted the initial hypothesis that high abilities and grit were related. It is believed that the focus on IQ scores to identify participants with high abilities represents a limitation of the study and further investigations on the subject are suggested.

KEYWORDS: High ability. Giftedness. Grit. University education.

RESUMO: *O grit corresponde à associação entre paixão e perseverança, expressa ao longo do tempo, frequentemente percebida em pessoas bem-sucedidas. Objetivou-se investigar se existe diferença entre estudantes universitários com e sem altas capacidades em termos de grit. O estudo apresenta desenho analítico, observacional e de corte transversal e contou com a participação de 188 estudantes universitários com e sem altas capacidades provenientes de universidades da Espanha e um da Alemanha. Para a coleta de dados, utilizou-se a Escala Grit de Oviedo (EGO) e o teste de inteligência geral Matrices-TAI. Os resultados revelaram que a diferença entre os grupos em termos de grit não possui significância estatística e refutaram a hipótese inicial de que as altas capacidades e o grit estariam relacionados. Acredita-se que o enfoque nas pontuações de QI para a identificação dos participantes com altas capacidades representa uma limitação do estudo e se sugerem novas investigações sobre o tema.*

PALAVRAS-CHAVE: *Altas habilidades. Superdotação. Grit. Educação Superior.*

RESUMEN: *El grit corresponde a la asociación entre pasión y perseverancia, expresada a lo largo del tiempo, que suele percibirse en las personas de éxito. El objetivo fue investigar si existen diferencias entre estudiantes universitarios con y sin altas capacidades en cuanto al grit. El estudio tiene un diseño analítico, observacional y transversal e involucró a 188 estudiantes universitarios con y sin altas capacidades de universidades de España y una de Alemania. Para la recogida de datos se utilizó la Escala Grit de Oviedo (EGO) y el test de inteligencia general Matrices-TAI. Los resultados revelaron que la diferencia entre los grupos en términos de grit no era estadísticamente significativa y refutaron la hipótesis inicial de que la alta capacidad y el grit estarían relacionados. Se cree que el hecho de centrarse en las puntuaciones de Cociente Intelectual (CI) para identificar a los participantes con altas capacidades representa una limitación del estudio y se sugiere seguir investigando sobre el tema.*

PALABRAS CLAVE: *Altas capacidades. Superdotación. Grit. Educación Superior.*

Introduction

There are different theoretical models that conceptualize high capabilities, so there is no definition that is globally accepted to explain this phenomenon (PÉREZ *et al.,* 2020). Obviously, the different conceptions result in dissimilar identification and educational intervention processes and are also related to the concept of intelligence that underlies the understanding of high capabilities.

The main intelligence models existing in the 20th century can be classified from three perspectives: monolithic, factorial, and hierarchical. Understanding intelligence from a monolithic perspective assumes that it corresponds to a single cognitive structure, expressed in the diversity of behaviors, learning and performance levels. This conception supports the models of mental age, Intelligence Quotient (IQ) and general intelligence (G factor), which share their origins in the school context, being closely linked to academic learning and cultural content.

From this perspective, the model created by Spearman, at the beginning of the 20th century, called the G Factor (ALMEIDA, 1994) stands out. From the factor analysis of all intelligence tests existing up to that time, Spearman found a common factor among them all, which was named general intelligence and came to be recognized as the main explanation for the diversity of performances in tests and situations based on the cognitive abilities displayed by different individuals (CASTELLÓ, 1996; MARTINS; ALVES; ALMEIDA, 2015). This general capacity of intelligence, from Spearman's perspective, is defined by the subject's ability to understand the meaning of things, establish relationships between elements and apply such relationships to deduce implications, which makes this general factor very close to the ability of inductive and deductive reasoning (ALMEIDA, 1994).

The conception of factorial intelligence rejects the idea of a single variable, understanding it as a set of intellectual components, more or less independent of each other. Intelligence would then be formed by several different intellectual abilities, such as, for example, verbal aptitude, numerical aptitude and spatial aptitude, causing diverse profiles among individuals. At this point, a person's intelligence can only be described if we take their position in relation to the population average in these different skills, because, as these are autonomous, one can perform better in one and, worse, in another (ALMEIDA, 1994; CASTELLÓ, 1996). More recently, in Psychology, we stopped referring to specific skills, preferring to think about intelligence. The most relevant contribution in this area is associated with Gardner (1983) and his theory of multiple intelligences, specified below.

Finally, in order to integrate monolithic and factorial models, hierarchical models emerge, which bring G Factor at the top of the hierarchy and combine first and second order factors, to also highlight specific skills. Cattell's model dichotomizes the factors of fluid intelligence – Gf (primary) – and those of crystallized intelligence – Gc (secondary) –, the first being more structural, corresponding to genetically determined intelligence and not concretely applied, and the second, to intelligence marked by social interaction, which takes shape in determined contents and actions and is related to the motivation and interests of the individual (CASTELLÓ, 1996; MARTINS; ALVES; ALMEIDA, 2015). "Gf reflects the ability to solve problems that do not require experience or prior learning, and Gc the knowledge obtained through education, cultural information and experience." (PÉREZ; MEDRANO, 2013). Additionally, Almeida (2002) clarifies that Gf and Gc are interrelated, so that intellectual aptitudes do not only depend on the individual's sociocultural and educational experiences, as they also depend on the degree of fluid intelligence biologically attributed or strongly marked by the educational experiences of the individual in early ages.

Another important contribution to hierarchical models is from Carroll (1993) with his theory of the Three Strata. For the aforementioned author, it is important to demonstrate the cognitive capabilities of human beings, through general and specific cognitive processes and organized in a hierarchical manner, more precisely, in three strata. The first stratum, also called closed, would be more specialized in capabilities that reflect the effects of experience and learning and lead to the adoption of unique performance strategies, they would be more primary capabilities; the second, or broad, stratum is based on broad domains of behavior; In this stratum, Carroll (1993) names eight elements (fluid intelligence, crystallized intelligence, memory, visual perception, auditory perception, recovery capacity, response speed and processing speed) that emphasize the process, content and way of responding; and the third, or general, stratum stands out for being present and participating in all cognitive manifestations of the human being of a more complex nature and appears in any situation, which does not happen with the other two strata, which only appear when the situation allows. This last stratum is very present within the G Factor. From the synthesis between the fluid and crystallized intelligence model proposed by Cattell and Horn and Carroll's Hierarchy of the Three Strata, the Cattell-Horn-Carroll model, known as CHC, is derived (SCHELINI, 2006).

As an alternative to the models that affirm the existence of G Factor, Gardner's Theory of Multiple Intelligences (1993) and Sternberg's Theory of Successful Intelligence (1985) stand out. Gardner, starting from seven, came to propose ten types of intelligence, keeping

eight of them in his last formulation, each being relatively independent of the others, whose competencies involved correspond to the designation received: linguistic, logical-mathematical, musical, spatial, corporal - kinesthetic, interpersonal, intrapersonal and naturalistic. Sternberg's Successful Theory model considers the interaction between the individual, the context and practical activity, in order to focus on the components involved in problem solving and identify three intelligences: analytical, creative and practical. Analytical intelligence presents itself in solving familiar and abstract problems; creative intelligence is present in generating ideas and solving new problems; practical intelligence concerns the effective application of ideas and procedures in solving everyday tasks (MARTINS; ALVES; ALMEIDA, 2015; PÉREZ; MEDRANO, 2013).

Even though there are challenges to classical theories of intelligence, such as, for example, with the proposals of multiple intelligences, social intelligence and emotional intelligence (GARDNER, 1983; GOLEMAN, 2000; 2006), research continues to reveal grounds for the existence of a factor of general intelligence inherent to all learning and cognitive performance, as well as to the contribution of specific factors linked to the cognitive processes involved and the content of the tasks. Thus, in an investigation involving 360 Portuguese children aged five, seven and nine, students from public and private institutions, Martins, Alves and Almeida (2015) applied the Competence Scale for Children aged four to 10 (ECCOs 4 /10), in order to evaluate the factorial structure of the results in this battery of cognitive tests. The scale consists of 11 tests that aim to evaluate various processes (perception, memory, understanding, reasoning, problem solving and divergent thinking), using tasks with different content (verbal and figurative). The results of the study indicated the prevalence of a general intelligence factor, responsible for explaining around 30% of the variance in results in the battery tests. The authors suggest that, with advancing age, academic experiences promote a gradual change in the structure of cognition that moves from generic intelligence to more specialized cognitive abilities, making the existence of a general intelligence capacity disappear. Studies also point to the existence of a general factor that emerges in the analysis of tasks designed to evaluate the Multiple Intelligences proposed by Gardner, explaining approximately 40% of the total variance, the same occurring with the Sternberg *Triarchic Abilities Test* (STAT), intended to measure successful intelligence and its different components (ALMEIDA *et al.,* 2009; PÉREZ; MEDRANO, 2013).

Research into intelligence seems to suggest, in recent decades, that hierarchical models are those that are most in line with the results of individuals in cognitive tasks at the

present time. Although they recognize the existence and importance of the G Factor, they assume that it does not explain all the variability of intelligence; Many current IQ tests are formulated within Carroll's (1993) three-stratum model, where they analyze the G factor in the third stratum and also the specific abilities present in the second stratum. Therefore, alongside general intelligence (or even fluid intelligence), the results suggest that this capacity is complemented by the intervention of more specific aptitudes or abilities (PÉREZ; MEDRANO, 2013). Such more specific skills may arise from the cognitive processes involved, for example, convergent production (plus reasoning) and divergent production (plus creativity), and from the contents of the tasks to be learned and performed (verbal, numerical, musical, spatial, physical-motors etc.).

With the contributions of neuroscience, the various cognitive abilities began to be understood in their distribution among multiple brain areas, and studies demonstrated the existence of brain plasticity, which enables development and learning throughout life. This understanding highlights the influences of environmental stimuli on intellectual functioning (SÁNCHEZ ANEAS, 2013). In this sense, it is clarified that specifically human psychological characteristics are not attributed exclusively by the biological apparatus, but built on the basis of social interactions (KASSAR, 2013; VYGOTSKY, 1981), which allows us to affirm that at the core of high capabilities there is a genetic component, however, this depends on favorable environmental conditions for what is potential to be converted into ability.

Although high abilities continue to be prominently related to high IQ both on social media and in various scientific research, their existence is recognized in the most varied domains of human abilities – although there may be terminological differentiation when their presence occurs in a specific field, such as, for example, calling it “mathematical talent”, “artistic talent”, etc. (ESTEVES FAJARDO *et al.,* 2020) – and its possible coexistence with disorders, difficulties and disabilities, known as double exceptionality (COSTA; RANGNI, 2011), is assumed, in such a way that the diversity of profiles that characterize people with high capabilities seems obvious.

Additionally, there are multidimensional perspectives that explain high capabilities based on the interaction between certain factors, as is the case of Renzulli's Three Ring Theory (2011), which is widely disseminated in Brazil and establishes the link between above-average capability, creativity and commitment to the task as essential in the creation of high capabilities. From this perspective, not only can superior ability manifest itself in any area of human knowledge or practice, it must also be accompanied by creativity – which is

characterized by divergent thinking and is revealed in behaviors, ideas and products marked by originality (SÁNCHEZ ANEAS, 2013) –, in addition to demonstrating a refined form of motivation that directs energy to a specific activity or problem (commitment to the task) belonging to a certain performance area (RENZULLI, 1996), in order to highlight a complete involvement that is maintains for long periods of time. This level of involvement is commonly referred to by words such as: "passion, perseverance, persistence, hard work, dedication and self-confidence" (MAIA-PINTO, 2012, p. 25, our translation).

It is from this perspective that we highlight *grit*, a trait understood as an association between passion and perseverance over time, often seen in successful people (DUCKWORTH, 2016). The author considers that *grit* plays a preponderant role in success and constitutes an important differentiator in an individual's career.

> Grit involves working hard toward challenges, maintaining effort and interest over the years despite failure, adversity, and plateaus in progress. The individual with a high level of grit approaches achievement like a marathon: his advantage is endurance. While disappointment or boredom signals to others that it is time to change course and reduce losses, he stays the course (DUCKWORTH *et al.,* 2007, p. 1087-1088, our translation).

Its importance has been recognized for entrepreneurship, job satisfaction and work performance (POSTIGO GUTIÉRREZ, 2021). Furthermore, research points to its influence on various aspects of life, such as health, marriage and education, having been widely investigated in its relationship with academic performance (POSTIGO GUTIÉRREZ *et al.,* 2021).

Research that analyzes *grit* in association with high capabilities indicates that people with high capabilities have greater *grit* than the common population (CODY, 2019; MILLWARD; WARDMAN; RUBIE-DAVIES, 2016), a positive association was also found between *grit* and time spent participating in extracurricular activities (PARK, 2010), as well as regarding life satisfaction (DATU *et al.,* 2022); on the other hand, it is suggested that *grit* is not a significant predictor of academic performance in students with high abilities (CLEVENGER, 2018; DIXSON *et al.,* 2016).

Believing in the importance of non-cognitive factors in the composition of high abilities and considering the influence of *grit* on success, the present research aims to investigate whether there is a difference between university students with and without high abilities in terms of *grit*.

Method

The research project was assessed and approved by the Research Ethics and Animal Welfare Committee of the Universidad de La Laguna, Spain (CEIBA2022-3139). Its design is analytical, observational and cross-sectional (FONTELLES *et al.,* 2009).

The research was carried out at the Universidad de La Laguna, in Tenerife – Spain and involved the participation of 188 university students, of which 116 identify as female and 70 as male, while two preferred not to inform. These students came from 16 universities (15 Spanish and one German), lived in different parts of Spain and 42 of them (22.34%) had some kind of job. Table 1 displays the distribution of participants according to age group.

Table 1 – Age range of participants

Age range	f	%
16 to 20 years old	83	44.1
21 to 25 years old	54	28.7
26 to 30 years old	11	5.9
31 to 35 years old	11	5.9
36 to 40 years old	9	4.8
41 to 45 years old	9	4.8
46 to 50 years old	4	2.1
51 to 55 years old	6	3.2
56 to 60 years old	0	0.0
over 60 years old	1	0.5
Total	188	100.0

Source: Own preparation

Among the 145 students who reported the course they were taking, 76 (52.40%) were training in the humanities area, 33 (22.80%) in the exact area and 36 (24.80%) in the biological sciences area.

The selection criteria for participants were: living in Spain and attending a higher education institution. Participants were recruited through Mensa Spain [4] and by invitations to ULL students.

Participants were informed about the objectives and procedures of the research, as well as data protection, ensuring the safeguarding of anonymity and confidentiality of

[4]Association of people with high intellectual quotient

information, used solely for scientific purposes, as determined by Organic Law 3/2018, of December 5th, *Personal Data Protection and Digital Rights Guarantee* (SPAIN, 2018).

Students who were not linked to Mensa and did not participate in the ATENEA Program[5] were subjected to an intelligence test called Matrices-TAI to check whether they were (or not) people with high abilities.

Instruments

The Oviedo Grit Scale (EGO): has five *Likert -type response options* that range from complete disagreement (1) to complete agreement (5), consisting of 10 items divided into two domains: consistency of interests and perseverance of effort, however, it is a unidimensional scale (POSTIGO GUTIÉRREZ, 2021).

Matrices-TAI: is an inductive reasoning test based on non-verbal stimuli, which estimates fluid intelligence (Gf) and general ability or G Factor. The test is administered digitally, with participants receiving an adjusted access code when profiled (age and sex) (ABAD; SÁNCHEZ-SÁNCHEZ; SANTAMARÍA, 2023).

Data collect

Data were collected through the EGO (POSTIGO GUTIÉRREZ, 2021), accompanied by a questionnaire characterizing the participants, in addition to the Matrices-TAI intelligence test (ABAD; SÁNCHEZ-SÁNCHEZ; SANTAMARÍA, 2023).

Data collection took place virtually, by responding to the instruments via Google Form. When there was a need to take the intelligence test, the participant received their access code by email.

Data analysis

The results of the Matrices-TAI IQ tests were analyzed by the computerized system itself and based on the results presented, we considered an IQ equal to or greater than 120 in the test as the cutoff point.

EGO (POSTIGO GUTIÉRREZ, 2021) was analyzed quantitatively, using descriptive statistics, analysis of variance (ANOVA) and Pearson correlation with the aid of the *IBM Statistical Package for Social Sciences* (SPSS), version 28. ANOVA allows you to compare means of two or more populations represented by random and independent samples, while

[5]Mentoring Program for university students with high abilities at the Universidad de La Laguna

Pearson's correlation coefficient measures the intensity and linear direction between two quantitative variables (MARÔCO, 2014).

Results and discussion

Initially, we evaluated the consistency of the instrument ($\alpha = 0.936$) and verified its reliability. We tested the variance of the EGO results based on gender (male and female) and, taking into account only the female and male categories, we present the results in Table 2.

Table 2 – Distribution of the *grit* score obtained by university students in the EGO in relation to gender

Gender	n	Average	DP	Min.-Max.
Woman	116	38.99	8.48	10-50
Man	70	37.87	8.84	15-50
Total	186	38.58	8.61	10-50

Source: Own preparation

Although the average female score was higher than the male one, it was found that the difference between the groups was not statistically significant ($F_{(1,184)} = 0.737$; $p = 0.392$).

The Pearson correlation test with age as the independent variable also did not reveal statistical significance $p = 0.382$).

Considering students with high abilities as those who (i) were linked to Mensa, (ii) were part of ATENEA-ULL or (iii) demonstrated an IQ ≥ 120 in Matrices-TAI, our sample was composed of 89 students with high abilities (47.30%) and 99 without this condition (52.70%), in order to constitute our control group. It is worth noting that all participants who made up the control group were previously evaluated with the Matrices-TAI in order to ensure that they were not people with high intellectual abilities. The results are described below:

Table 3 – Distribution of the *grit* score obtained by university students in the EGO in relation to high abilities

Group	n	Average	DP	Min.-Max.
With high capacities	89	37.89	7.93	20-50
No high capacities	99	39.12	9.12	10-50
Total	188	38.58	8.57	10-50

Source: Own preparation.

Contrary to what we assumed, the group of university students with high abilities presented a lower average score than that obtained by their peers without high abilities. The analysis of variance revealed that the difference between the groups was not statistically significant ($F_{(1,186)} = 0.833$; $p = 0.363$). Therefore, it is not possible to say that students with high abilities in our sample have a higher or lower level of *grit* than their peers.

Although several studies have focused on the effects of *grit* in relation to other variables in the typically developing population, research that analyzes this construct in the population with high abilities is scarce.

When carrying out a literature review in the EBSCOhost and CAPES Periodicals databases using the descriptors *grit, gifted* and *giftedness*, we identified only six research reports that proposed investigating *grit* in people with high abilities, four of which were North Americans, one from New Zealand and one Chinese (CODY, 2019; MILLWARD; WARDMAN; RUBIE-DAVIES, 2016; DIXSON *et al.,* 2016; PARK, 2010; DATU *et al.,* 2022; CLEVENGER, 2018). Among them, only one study compared *grit* between typical and high-ability people.

Morgan Cody (2019) developed research entitled "*A closer look at mindset and grit among third grade students in gifted education: A comparative study*" as part of the requirements necessary to obtain the Educational Specialist certification in Ohio, in the United States.

Considering an inverse association between a high level of *grit* and scores on the *Scholastic Aptitude Test* – SAT [6](DUCKWORTH *et al.,* 2007), Cody (2019) proposed examining the relationship between *grit*, ability and performance in gifted school-age students. The study involved the participation of 35 children between 7 and 9 years of age. The instrument used to assess *grit* was the *Short Grit Scale* (DUCKWORTH; QUINN, 2009), in addition to a questionnaire on growth *mindset* and access to standardized academic performance tests in mathematics and reading that select gifted students for an enrichment program[7].

The results indicated that students with high abilities obtained, on average, a higher score on the *grit scale* (M=3.68, SD=0.42) when compared to typical students (M=3.18,

[6]North American school exam whose score can enable admission to universities.
[7]All students are submitted to these tests at the end of the second year of schooling in the Iowa district where the research was developed and those selected participate in an enrichment program that consists of 55 minutes of intervention in mathematics and/or reading for five days per week.

SD=0.38), F=13.287, p = 0.001. As the data were collected after the students had been identified as people with high abilities, it is not known whether this difference in terms of *grit* already existed or whether it was a reflection of identification.

However, the highest level of *grit* was a predictor of worse performance in the mathematics performance test. Cody (2019) supposes that this result may suggest a negative aspect of *grit* in the sense that it makes students with high abilities more likely to persist in their tasks or strategies, when they could stop and ask for help or try alternative strategies.

It is important to highlight that the reliability of the *Short Grit Scale* was examined and the result indicated low internal consistency ($\alpha = 0.219$), which may have been partially influenced by the small sample size (n=35) and requires that the results be interpreted with caution.

It is also worth highlighting that grit was positively correlated with the growth mindset among students without high abilities, but no correlation was observed between these variables in the sample of students with high abilities *(CODY, 2019).*

Among the studies developed exclusively with people with high abilities, four had school-age children and adolescents as participants (DIXSON *et al.,* 2016; PARK, 2010; DATU *et al.,* 2022; CLEVENGER, 2018). The exception was the research carried out by Millward, Wardman and Rubie-Davies (2016), in New Zealand, which involved the participation of 128 university graduates, who were identified based on a score that derives from the grades obtained in their respective courses and is registered in the institution's database. Of these, 22 were interviewed and *grit* appeared as a personal factor of great contribution to overcoming challenges and academic success.

From this perspective, Duckworth (2016) warns that although intelligence (or talent) is socially valued to the detriment of effort, by directing all attention to it, we risk leaving equally relevant factors unnoticed, such as grit, which according to the author, counts double: it is necessary for the development of capabilities and after that, it remains necessary so that the constant exercise of these capabilities, with a view to long-term objectives, makes it possible to achieve success.

In view of the above, how can we explain the absence of statistical difference in the *grit* levels of university students with and without high abilities who participated in the present study? Perhaps the justification lies in the identification process, which was based exclusively on a figurative test of fluid intelligence, without considering other variables,

restricting itself to the recognition of "academic giftedness", or it may be related to the motivational aspects of the participants.

The identification process, in turn, depends on the theoretical conception that defines the phenomenon investigated. The government of the Canary Islands (Autonomous Region of Spain) conceives of high abilities as the simultaneous and effective management of different cognitive resources, involving the types, namely: logical, numerical, spatial, memory, verbal and creative (it is called “giftedness”). ” in the absence of creativity and “giftedness” in its presence); or, exceptional prominence in one or some of these resources (called talent) (CANÁRIAS, 2023). It is noted that creativity and motivational aspects are not determining criteria for characterizing high capabilities in the Canary Islands, as in other regions of Spain.

According to Renzulli (2011), there are differences between academic giftedness – evidenced by tests and easily recognized in academic spaces – and productive-creative giftedness – which combines superior ability with creativity and involvement and manifests itself in any area of knowledge –, being the one that provides more socially significant achievements. It is assumed that there may be a correlation between *grit* and productive-creative giftedness.

Another hypothesis – also related to the type of giftedness they present – refers to the intrinsic motivation of the participants themselves, which may have influenced more or less the results of *grit*, since, as highlighted by Renzulli (1996), people with high abilities present a high persistence in the task that derives from high motivation. This motivation they exhibit is predominantly intrinsic, originating from internal stimuli from the subject himself (SÁNCHEZ, 2010; CLINKENBEARD, 2012). For Sánchez (2010), students with high abilities have high logical intelligence, high creative intelligence, maturity and emotional balance and internal or work motivation. Clinkenbeard (2012) states that students with high abilities are very likely to have high intrinsic motivation for learning and internal control, attributing success to their own efforts. Also, the aforementioned author (2012) identifies that the variables of intrinsic motivation may be related to their strong intellectual or creative interests outside the school environment, which leads to great success in their personal goals and allows for more autonomous advancement in studies. Thus, it can be hypothesized that university students participating in the research may not have high intrinsic motivation or, furthermore, may not feel motivated to answer the EGO instrument itself.

Final remarks

The objective of investigating the existence of differences in the *grit levels* of university students with and without high abilities led us to carry out quantitative research using the Oviedo Grit Scale as its main data collection instrument.

The results demonstrated no difference in terms of *grit* among the students in our sample. We did not find similar studies in the literature regarding the objective, the audience and the research methodology that could facilitate the comparison of the results obtained.

Returning to the question that titles this article, can we affirm or refute the hypothesis that *grit* is a characteristic trait of people with high abilities? The answer is: we cannot say that it is, however, we cannot refute it, as there are different conceptions of high capabilities, which in turn guide identifying processes. The fact is that among the university students identified as such in Spain who participated in this research, the relationship between *grit* and high abilities was not confirmed. It is believed that the focus on IQ scores to identify participants with high abilities represents a limitation of the study.

It is suggested that *grit* be investigated in other samples of people with high abilities, especially adults and with traits of creativity and commitment to the task (productive-creative giftedness).

REFERENCES

ABAD, F. J.; SÁNCHEZ-SÁNCHEZ, F.; SANTAMARÍA, P. **Matrices-TAI**. Test Adaptativo de Inteligencia General. [*S. l.*]: TEA Ediciones, 2023. https://web.teaediciones.com/Matrices-TAI-Test-Adaptativo-de-Inteligencia-General.aspx. Access: 12 Jan. 2023.

ALMEIDA, L. S. **Inteligência**: definição e medida. Aveiro: CIDInE, 1994.

ALMEIDA, L. S. As aptidões na definição e avaliação da inteligência: o concurso da análise fatorial. **Paidéia**, Ribeirão Preto, v. 12, n. 23, p. 5-17, 2002. DOI: 10.1590/S0103-863X2002000200002. Available at: https://doi.org/10.1590/S0103-863X2002000200002. Access: 15 Mar. 2023.

ALMEIDA, L. S.; FERRANDO, M.; FERREIRA, A. I.; PRIETO, M. D.; FERNÁNDEZ, M. C.; SAINZ, M. Inteligências múltiplas de Gardner: é possível pensar a inteligência sem um factor g? **Psychologica**, Coimbra, n. 50, p. 41-55, 2009. DOI: 10.14195/1647-8606_50_3. Available at: https://impactum-journals.uc.pt/psychologica/article/view/1647-8606_50_3. Access: 09 June 2023.

CANÁRIAS. Consejería de Educación, Universidades, Cultura y Deportes. **Alumnado con altas capacidades intelectuales**. [S. l.: s. n], 2023.

Available at: https://www.gobiernodecanarias.org/educacion/web/servicios/necesidades_apoyo_educativo/otras_neae/altas_capacidades_intelectuales/. Access:23 May 2023.

CARROLL, J. **Human Cognitive Abilities**. A Survey of Factor-Analytic Studies. Cambridge: Cambridge University Press, 1993.

CASTELLÓ, A. Concepto de superdotación y modelos de inteligencia. *In*: BENITO MATE, Y. (coord.). **Desarrollo y educación de los niños superdotados**. 2. ed. Salamanca: Amarú Ediciones, 1996.

CLEVENGER, A. J. **Non-cognitive attributes**: correlations to high ability students'academic achievement. Orientador: Marilynn Quick, 2018. 166 f. Tese (Doutorado em Educação) – Ball State University, Muncie, Indiana, Estados Unidos, 2018.

CLINKENBEARD, P. R. Motivation and gifted students: Implications of theory and research. **Psychology in the Schools**, [*S. l.*], v. 49, n. 7, p. 622-630, 2012. Available at: DOI: 10.1002/pits.21628. Available at: https://doi.org/10.1002/pits.21628. Access: 05 July 2023.

CODY, M. A. **A closer look at mindset and grit among third grade students in gifted education**: A comparative study. Orientadora: Sarah Watt, 2019. 32 f. Dissertação (Especialista Educacional) – Miami University, Oxford, Ohio, Estados Unidos, 2019.

COSTA, M. de P. R. da; RANGNI, R. de A. Altas habilidades/superdotação e deficiência: dupla necessidade educacional. **Revista Ibero-Americana de Estudos em Educação**, Araraquara, v. 5, n. 2, p. 208–217, 2011. DOI: 10.21723/riaee.v5i2.3484. Available at: https://periodicos.fclar.unesp.br/iberoamericana/article/view/3484. Access: 7 Apr. 2023.

DATU, J. A. D.; YUEN, M.; FUNG, E.; ZHANG, J.; CHAN, S.; WU, F. The Satisfied Lives of Gifted and Gritty Adolescents: Linking Grit to Career Self-Efficacy and Life Satisfaction**.** **Journal of Early Adolescence**, [*S. l.*], v. 42, n. 8, p. 1–21, 2022. DOI: 10.1177/02724316221096082. Available at: https://doi.org/10.1177/02724316221096082. Access: 08 June 2023.

DIXSON, D. D.; WORRELL, F. C.; OLSZEWSKI-KUBILIUS, P.; SUBOTNIK, R. F. Beyond perceived ability: the contribution of psychosocial factors to academic performance. **Annals of the New York Academy of Sciences**, [*S. l.*], v. 1377, p. 67-77, 2016. DOI: 10.1111/nyas.13210. Available at: https://pubmed.ncbi.nlm.nih.gov/27626785/. Access: 08 June 2023.

DUCKWORTH, A.; PETERSON, P.; MATTHEWS, M. D.; KELLY, D. R. Grit: Perseverance and passion for long term goals. **Journal of Personality and Social Psychology**, [*S. l.*], v. 92, n. 6, p. 1087–1101, 2007.

DUCKWORTH, A. L.; QUINN, P. D. Development and validation of the Short Grit Scale (GritS). **Journal of Personality Assessment**, [*S. l.*], v. 91, p. 166-174, 2009.

DUCKWORTH, A. L. **Grit***:* The power of passion and perseverance. New York: Scribner, 2016.

ESPANHA. Ley Orgánica 3/2018, de 5 de diciembre, de Protección de Datos Personales y garantía de los derechos digitales. **Boletín Oficial del Estado**, 294 de 6 de diciembre. Available at: https://www.boe.es/eli/es/lo/2018/12/05/3. Access: 27 Dec. 2022.

ESTEVES FAJARDO, Z.; CHENET ZUTA, M. E.; PIBAQUE PONCE, M. S.; CHÁVEZ ROCHA, M. L. Estilos de aprendizaje para la superdotación en el talento humano de estudiantes universitários. **Revista de Ciencias Sociales**, [*S. l.*], v. 26, n. 2, p. 225-235, abr./jun. 2020. Available at: https://dialnet.unirioja.es/servlet/articulo?codigo=7500754. Access: 27 May. 2023.

FONTELLES, M. J; SIMÕES, M. G.; FARIAS, S. H.; FONTELLES, R. G. S. Metodologia da pesquisa científica: diretrizes para a elaboração de um protocolo de pesquisa/ Scientific research methodology: guidelines for elaboration of a research protocol**. Rev. Para. Med.**, [*S. l.*], v. 23, n. 3, jul./set. 2009. Available at: files.bvs.br/upload/S/0101-5907/2009/v23n3/a1967.pdf. Access: 10 June 2023.

GARDNER, H. **Frames of mind**: The theory of multiple intelligences. New York: Basic Books, 1983.

GOLEMAN, D. **Inteligência emocional**. Tradução de Mário Dias Correia. 9. ed. Lisboa: Temas e Debates, 2000.

GOLEMAN, D. **Inteligência social:** o poder oculto das relações humanas. São Paulo: Ed. Campus, 2006.

KASSAR, M. C. M. Neurologia e implicações pedagógicas. *In*: MELETTI, S. M. F.; KASSAR, M. C. M. (org.). **Escolarização de alunos com deficiências:** desafios e possibilidades. Campinas, SP: Mercado das Letras, 2013. p. 77-107.

MAIA-PINTO, R. R. **Aceleração de ensino na educação infantil**: percepção de alunos superdotados, mães e professores. Brasília: UNB. 2012. 153 f. Tese (Doutorado em Processos de Desenvolvimento Humano e Saúde) – Universidade de Brasília, Brasília, 2012.

MARÔCO, J. **Análise Estatística com o SPSS Statistics**. 6. ed. Reportnumber: Perô Pinheiro, 2014.

MARTINS, A. A.; ALVES, A. F.; ALMEIDA, S. L. A estrutura da inteligência na infância: desenvolvimento e diferenciação cognitiva. **Internacional Journal of Developmental and Educational Psycology**, [*S. l.*], v. 01, n. 01, p. 57-66, 2015. Available at: http://repositorium.sdum.uminho.pt/handle/1822/35754. Access: 13 Dec. 2022.

MILLWARD, P.; WARDMAN, J.; RUBIE-DAVIES, C. Becoming and being a talented undergraduate student. **Higher Education Research & Development**, [*S. l.*], v. 36, n. 6, p. 1242-1255, 2016. DOI: 10.1080/07294360.2016.1144569. Available at: https://doi.org/10.1080/07294360.2016.1144569. Access: 13 June 2023.

PARK, G. H. **The role of extracurricular activity in positive youth development**. Orientador: Michael Sachs. 2010. 238 f. Tese (Doutorado em Filosofia) – Temple University, Filadélfia, Pensilvânia, Estados Unidos, 2010.

PÉREZ, E.; MEDRANO, L. A. Teorías contemporáneas de la inteligencia. Uma revisión crítica de la literatura. **Psiencia: Revista Latinoamericana de Ciencia Psicológica**, Buenos Aires, v. 05, n. 02, p. 105-118, nov. 2013. DOI: 10.5872/psiencia/5.2.32. Available at: http://www.psiencia.org/ojs/index.php/psiencia/article/view/113. Access: 22 Dec. 2022.

PÉREZ, J., APERRIBAI, L., CORTABARRÍA, L., BORGES, A. Examining the Most and Least Changeable Elements of the Social Representation of Giftedness. **Sustainability,** [*S. l.*], v. 12, n. 13, p. 5361, 2020. DOI: 10.3390/su12135361. Available at: https://www.mdpi.com/2071-1050/12/13/5361. Acesso: 16 Oct. 2022.

POSTIGO GUTIÉRREZ, Á. **Medición de los rasgos psicológicos de la persona empreendedora**. Orientadores: Eduardo García Cueto; Marcelino Cuesta Izquierdo. 2021. 234 f. Tese (Doutorado em Ciências da Saúde) – Universidade de Oviedo, Espanha, 2021.

POSTIGO GUTIÉRREZ, Á., CUESTA, M., GARCÍA-CUETO, E., MENÉNDEZ-ALLER, Á., GONZÁLEZ-NUEVO, C., Y MUÑIZ, J. Grit assessment: Is one dimension enough? **Journal of Personality Assessment**, [*S. l.*], v. 103, n. 6, p. 786-796, 2021. DOI: 10.1080/00223891.2020.1848853. Available at: https://www.tandfonline.com/doi/full/10.1080/00223891.2020.1848853. Access: 10 June 2023.

RENZULLI, J. S. En qué consiste lo sobresaliente: un reexamen de la definición de sobresaliente y talentoso. **Dossier**, México, n. 5, p. 12-29, 1996.

RENZULLI. J. S. What Makes Giftedness? Reexamining a Definition. **Kappan**, [*S. l.*], v. 92, n. 08, p. 81-88, mai. 2011. DOI: 10.1177/003172171109200821. Available at: https://doi.org/10.1177/003172171109200821 Access: 10 June 2023.

SÁNCHEZ, E. El modelo tetrártico de superdotación emergente. [The emerging model of giftedness quad]. **Revista de Psicología y Educación,** [*S. l.*], v. 1, n. 5, p. 51-68, 2010. Available at: https://dialnet.unirioja.es/servlet/articulo?codigo=3630355 Access: 05 July 2023.

SÁNCHEZ ANEAS, A. **Altas capacidades intelectuales**: sobredotación y talentos: Detección, evalución, diagnóstico e intervención educativa y familiar. Formación Alcalá: Alcalá la Real, 2013.

SCHELINI, P. W. Teoria das Inteligências fluida e cristalizada: início e evolução. **Estudos de Psicologia**, [*S. l.*], v. 11, n. 03, p. 323-332, 2006. DOI: 10.1590/S1413-294X2006000300010. Available at: https://www.scielo.br/j/epsic/a/BCX9HwQJpSFXjJSfVmrYDKH/?format=pdf&lang=pt Access: 17 July 2023.

STERNBERG, R. J. **Beyond IQ**: A triarchic theory of human intelligence. Cambridge: Cambridge University Press, 1985.

VYGOTSKY, L. S. The genesis of higher mental functions. *In:* J. V. WERTSCH (ed.). **The concept of activity in soviet psycology**. New York: Sharpe, 1981. p. 144-189.

CRediT Author Statement

Acknowledgments: We thank the Universidad de La Laguna and the Federal University of Mato Grosso do Sul for making the conditions for carrying out the research possible.

Funding: Funding provided by the Ministry of Science and Innovation of the University of La Laguna (ULL), Spain. This work was carried out with support from the Federal University of Mato Grosso do Sul – UFMS/MEC – Brazil and the Coordination for the Improvement of Higher Education Personnel – Brazil (Capes) – Financing Code 001.

Conflicts of interest: None.

Ethical approval: The research project was assessed and approved by the Research Ethics and Animal Welfare Committee of the Universidad de La Laguna, Spain (CEIBA2022-3139).

Availability of data and material: Not applicable.

Author contributions: The first author analyzed data, discussed results, wrote and submitted the article. The second author collected and analyzed the data and contributed to writing the article. The third author guided all stages of the investigation.

Processing and publishing: Editora Ibero-Americana de Educação.
Review, formatting, standardization, and translation.