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BEHAVIORAL AND COGNITIVE DIFFERENCES BETWEEN GIFTED INDIVIDUALS AND THOSE WITH EXTREMELY HIGH IQ - PEOPLE AT 2SD AND 3SD

A LOOK AT INCLUSIVE EDUCATION FROM THE PERSPECTIVE OF A TEACHER IN THE MATHEMATICS AREA

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Behavioral and Cognitive Differences between Gifted Individuals and Those with Extremely High IQ - People at 2SD and 3SD

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ABSTRACT

Gifted individuals, with IQs 2 standard deviations above the mean, exhibit behaviors more closely associated with the frontal region of the brain, which may be imbalanced with other areas responsible for different types of intelligence. This imbalance contributes to a tendency towards maladaptive perfectionism. Despite demonstrating above-average intelligence, these individuals often show low creativity in terms of innovations and unconventional thinking. Behaviorally, there is a greater similarity with the autism spectrum, manifesting through compensatory behaviors. Conversely, individuals with extremely high IQs, 3 standard deviations above the mean, exhibit more uniform cognitive characteristics, tending to explore a broader range of actions and showing less rigidity and specificity in their choices. This plurality is associated with greater creativity based on emotional foundations. They demonstrate less interest in determinism and a reduced need for competition. Additionally, they possess a more developed instinctive system and a perception of existence that is less literal and more differentiated. This contrast suggests that while gifted individuals may excel in specific areas due to their intense focus and specialized skills, those with extremely high IQs benefit from a more holistic and integrated approach, facilitating creativity and emotional adaptability.

***Keywords*:** giftedness, high IQ, behavior, creativity, perfectionism

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Diferencias conductuales y cognitivas entre personas superdotadas y aquellas con un coeficiente intelectual extremadamente alto: personas en 2SD y 3SD

RESUMEN

Individuos superdotados, con coeficientes intelectuales 2 desviaciones estándar por encima de la media, muestran comportamientos más asociados con la región frontal del cerebro, lo cual puede estar desbalanceado con otras áreas responsables de diferentes tipos de inteligencia. Este desequilibrio contribuye a una tendencia hacia el perfeccionismo maladaptativo. A pesar de demostrar inteligencia por encima del promedio, estos individuos a menudo muestran baja creatividad en términos de innovaciones y pensamiento no convencional. Conductualmente, hay una mayor similitud con el espectro autista, manifestándose a través de comportamientos compensatorios. Por el contrario, individuos con coeficientes intelectuales extremadamente altos, 3 desviaciones estándar por encima de la media, muestran características cognitivas más uniformes, tendiendo a explorar un rango más amplio de acciones y mostrando menos rigidez y especificidad en sus elecciones. Esta pluralidad se asocia con una mayor creatividad basada en fundamentos emocionales. Demuestran menos interés en el determinismo y una menor necesidad de competencia. Además, poseen un sistema instintivo más desarrollado y una percepción de la existencia menos literal y más diferenciada. Este contraste sugiere que mientras que los individuos superdotados pueden sobresalir en áreas específicas debido a su enfoque intenso y habilidades especializadas, aquellos con coeficientes intelectuales extremadamente altos se benefician de un enfoque más holístico e integrado, facilitando la creatividad y la adaptabilidad emocional.

Palabras clave: superdotación, coeficiente intelectual alto, comportamiento, creatividad, perfeccionismo

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INTRODUCTION

The study of cognitive and behavioral differences between gifted individuals and those with extremely high Intelligence Quotient (IQ) is crucial for understanding the complexities of the human mind. Gifted individuals, defined as those with an IQ 2 standard deviations (SD) above the average, and those with extremely high IQ or profound giftedness, 3 SD above the average, display distinctive characteristics that influence their social, emotional, and intellectual adaptation. Giftedness is not a homogeneous phenomenon; individuals within this category may exhibit a wide range of specific abilities and challenges, influenced by different brain areas.

Studies suggest that gifted individuals often show an imbalance in the development of different brain areas, particularly hyperactivity in the frontal region associated with executive functions and impulse control. This imbalance can contribute to the manifestation of maladaptive perfectionism, where the relentless pursuit of perfection results in anxiety and frustration. Additionally, these individuals may exhibit limited creativity in terms of innovations and unconventional thinking, with behaviors often compared to the autism spectrum due to the compensatory attitudes they exhibit.

Conversely, individuals with extremely high IQ, also categorized as profoundly gifted, present more uniform and balanced cognitive profiles. They tend to explore a wider range of actions and show less rigidity and specificity in their behavioral choices. This plurality of interests and approaches is often associated with greater creativity, grounded on solid emotional foundations. These individuals also demonstrate a lesser need for competition and a reduced interest in determinism, reflecting a more developed instinctual system and a perception of existence that is less literal and more differentiated.

This study seeks to analyze and compare the behavioral and cognitive characteristics of gifted individuals (IQ 2 SD above average) and those with extremely high IQ (IQ 3 SD above average). Based on a comprehensive review of the existing literature, this article aims to identify the particularities of each group, discuss the implications of these differences for personal and academic development, and provide a foundation for future research and educational practices.

DEVELOPMENT

To better understand the difference between individuals with 3 SD (Standard Deviation) and 2 SD IQ (Intelligence Quotient), it is essential to grasp the concept of the normal distribution and how IQ is calculated. The normal distribution is a curve that represents the frequency of values in a population. The mean is the central value, and the SD measures the dispersion of values around the mean. In a normal distribution, about

68% of values fall within 1 SD of the mean, about 95% within 2 SD, and about 99.7% within 3 SD. IQ is calculated as the ratio of a person's actual intelligence to the average intelligence of the population, multiplied by 100. The average intelligence is normalized to 100, and the SD is normalized to 15. This means that the average intelligence is 100 and the SD is 15.

Studies suggest that individuals with high IQ, both gifted (2 standard deviations above the average) and extremely high IQ or profoundly gifted (3 standard deviations above the average), exhibit significant distinctions in their cognitive and behavioral profiles. This analysis aims to discuss these differences based on rigorous scientific evidence. Gifted individuals, defined as those with an IQ 2 standard deviations above the average, often display a cognitive profile characterized by increased activity in the frontal region of the brain, associated with executive functions and impulse control. This imbalance between brain areas can lead to maladaptive perfectionism, where the pursuit of perfection can become counterproductive. Additionally, these individuals tend to exhibit limited creativity in terms of innovation and outside-the-box thinking. This phenomenon has been compared to behaviors observed on the autism spectrum, particularly in terms of compensatory attitudes (Rabiee et al., 2019).

On the other hand, individuals with extremely high IQ (3 standard deviations above the average) demonstrate more uniform cognitive profiles. Studies indicate that these individuals explore a wider range of actions and exhibit less rigidity in their behavioral choices. This variability is accompanied by emotionally grounded creativity, reflecting a greater capacity for divergent thinking and innovative solutions. The reduced need for competition and a diminished interest in determinism are striking characteristics of this group, suggesting a more developed instinctual system and a less literal perception of reality (Chiang et al., 2014).

Differences in terms of cognitive processing are also evident. Individuals with high IQ tend to have profiles characterized by greater capabilities in matrix reasoning and working memory but may show deficiencies in verbal comprehension and processing speed (Thaler et al., 2010). In contrast, those with extremely high IQ exhibit a better balance between verbal and performance intelligence, and superior brain efficiency, reflected in lower metabolic rates during intense mental activities (Deary & Caryl, 1997). Neuropsychological studies also suggest that IQ profiles can moderately predict behavioral functionality in different contexts. For instance, in children with traumatic brain injuries, subgroups defined by IQ profiles showed significant variations in behavioral disorders, with the most compromised groups displaying the greatest disturbances (Thaler et al., 2010).

A seminal study compared adolescents with IQs above 130 with their peers with IQs below 130, using a series of psychological and neuropsychological scales. The results indicated that the adolescents with IQs higher than 130 did not develop more phobias but exhibited greater shyness and fewer friends both in the real and virtual worlds. Additionally, these adolescents showed greater familial cohesion and did not exhibit a significant relationship between the socioeconomic status of the parents and the IQ values of the children (Lacour & Zdanowicz, 2019).

Another study examined the neuropsychological performance of adults in different IQ ranges, finding that adults with above-average IQs (130-140) significantly outperformed those with average IQs on various cognitive measures. However, the differences between the IQ 130 and above 140 groups showed that the precision of IQ scores is not empirically supported, as the 95% confidence intervals could not be reliably replicated across different intelligence tests (Diaz-Asper, Schretlen, & Pearlson, 2004).

Jaušovec (1998) investigated differences in brain activity between gifted individuals and those with average IQ during the resolution of tasks. Using electroencephalography (EEG), the study revealed that gifted individuals exhibited less mental activity (higher alpha power) and less brain complexity (lower Kolmogorov entropy) in tasks requiring working memory, arithmetic operations, and deductive reasoning, suggesting more efficient use of brain resources compared to individuals with average IQ. "The conclusion drawn from this finding is that processing speed is not the main reason for the differences displayed in mental activity. It appears that the efficiency hypothesis describes much better the outcomes obtained in this study" (JAUŠOVEC, 1998, p. 264).

Guénolé et al. (2013) investigated the behavioral profiles of gifted children referred to clinics, seeking to understand if internalizing problems (anxiety, social withdrawal) predominated and if children with higher IQs (≥145, 3 SD above the average) or with developmental asynchrony (verbal-execution discrepancy) exhibited more behavioral problems. Contrary to expectations, the study revealed that gifted children referred to clinics exhibited both internalizing and externalizing problems (aggressiveness, disobedience), with developmental asynchrony being a risk factor for externalizing and mixed problems. However, no significant differences were found between children with high IQ (130-144, 2 SD) and very high IQ (≥145, 3 SD) concerning behavioral problems. "These results suggest that developmental asynchrony is important when examining emotional and behavioral problems in gifted children" (GUÉNOLÉ et al., 2013, p. 3). The study highlights the importance of

considering the heterogeneity of development in gifted children, especially asynchrony, when assessing their emotional and behavioral difficulties.

Brody (2005) discusses a longitudinal study called the Study of Exceptional Talent (SET), which follows students with exceptional abilities in mathematical and/or verbal reasoning, identified by scoring between 700 and 800 on the math or verbal section of the SAT I before the age of 13. Although the study does not directly compare individuals with 2 and 3 standard deviations (SD) above the average, it provides relevant information about the development and characteristics of profoundly talented students. The study discovered that, although most participants in the SET benefit from rigorous academic programs to complement their school education, those who achieve the highest scores on general aptitude tests generally require a more individualized approach. The author emphasizes that these students, with exceptional abilities, may face challenges in finding learning opportunities that challenge them and match their potential. "Students with such exceptional abilities may also be at risk of social isolation if their interests and abilities differ greatly from their peers of the same age" (BRODY, 2005, p. 88).

Runco (1999) presents a longitudinal study with exceptionally talented young people, divided into two groups: one with an IQ above 150 and another with exceptional talents in mathematics and science. The study does not focus on a direct comparison between individuals with 2 and 3 standard deviations (SD) above the average. The study investigated various aspects, including expectations of independence, personality (measured by the California Psychological Inventory - CPI), and divergent thinking (DT). The results showed that the mothers of the young people in the high IQ group tended to allow more autonomy compared to the mothers of the young people talented in mathematics and science. Additionally, flexibility, measured by the CPI, was a prominent characteristic in both groups, suggesting its importance for creative potential. Regarding divergent thinking (DT), which is an indicator of creativity, correlations were found with the mothers' expectations of independence and with some scales of the CPI, such as Communion and Capacity for Status. Interestingly, the DT scores of the young people did not correlate with their IQs, indicating that creativity and intelligence, although related, are distinct constructs. The study also explored family dynamics, revealing that the DT of the young people in the high IQ group correlated with the DT of both parents, while in the math and science group, the correlation existed only with the mothers.

In interviews with individuals from the Gifted group, with IQs between 130 and 160, we observed that those with profound giftedness reported receiving more freedom from their parents. The parents justified this

autonomy based on the maturity and trust demonstrated by their children. As a result, these individuals were less dedicated to school. In contrast, the gifted group (IQ 130-145) reported greater encouragement and pressure from parents to achieve good school grades.

The study by Persson (2010) investigates the experiences of intellectually gifted students in an egalitarian and inclusive educational system in Sweden, where giftedness is not officially recognized. The research involved 287 members of the Swedish Mensa, all with IQs equal to or above the 98th percentile. Using an online questionnaire, quantitative data were analyzed as dispersions within the group, while qualitative data were subjected to content analysis. Comparing the experiences of gifted individuals with different IQ levels, the results suggest that gifted individuals with 2 SD (standard deviations) above the average face significant challenges in being recognized and supported in the Swedish educational system. Those with 3 SD above the average face even greater difficulties, often resulting in greater alienation and underutilization of their intellectual capacities.

Schultz (2018) discusses the characteristics and behaviors of profoundly gifted (PG) students, with IQs 3 or more standard deviations above the average, in mixed-ability classrooms. The author argues that these students are rare and often misunderstood in traditional educational settings, due to a lack of knowledge and preparation by teachers to address their unique needs. The article presents a table with common trends and behaviors in PG students, such as isolation, complex sense of humor, quest for justice, fast and conceptual learning, frustration and anxiety in non-challenging environments, high reading ability, existential questioning, and divergent thinking. These characteristics, although varied and not exhaustive, can help educators and parents better identify and understand these students. Schultz (2018) emphasizes the importance of differentiating levels of giftedness so that the specific needs of PG students are recognized and met. The lack of recognition and adequate support can lead to anxiety, frustration, and even challenging behaviors in these students. The author suggests that parents and educators seek professional help to develop flexible and individualized learning plans for these students, and that awareness of the existence and needs of PG students is crucial to ensure that they reach their full potential.

Shih (2011) investigated the relationship between perfectionism, implicit theories of intelligence, and academic engagement in Taiwanese eighth-grade students. The study sought to understand how perfectionist tendencies and beliefs about the nature of intelligence influence academic emotions and students' self-regulation. The results revealed that adaptive perfectionism, characterized by high personal standards and

organization, was associated with positive emotions and behavioral self-regulation, related to emotional intelligence, a term used by some researchers. On the other hand, maladaptive perfectionism, marked by concern with errors and doubts about one's own actions, was linked to negative emotions and self-sabotage strategies. Moreover, the research demonstrated that the incremental theory of intelligence, the belief that intelligence can be developed, predicted positive affect and constructive coping, while the entity theory, which sees intelligence as fixed, was associated with negative emotions and self-sabotage. The study also identified distinct profiles of students with different perfectionist tendencies. Adaptive perfectionists exhibited the healthiest emotions and self-regulation styles, while maladaptive perfectionists demonstrated more dysfunctional patterns.

Autistic individuals, including those previously diagnosed with Asperger's Syndrome, often face challenges in social interactions and in understanding and expressing emotions. These challenges can manifest as difficulty in interpreting social cues, initiating or maintaining conversations, understanding sarcasm, expressing their own feelings in conventional ways, among others. The intensity and specific characteristics of these challenges vary greatly from person to person, and some may develop strategies to cope with them. Evidence suggests that autistic individuals with higher Intelligence Quotients (IQs) may have an easier time developing these strategies and compensating for some social and emotional difficulties. MacDonald et al. (1989) investigated the recognition and expression of emotional cues in high-functioning autistic adults compared to normal adults. Autistic participants exhibited impairment in recognizing emotions in speech and facial expressions, especially in negative emotions, and their emotional expression was considered atypical. Although no individual test completely differentiated the groups, a composite score proved effective in identifying socioemotional deficits in autistic individuals. The authors suggest that this battery of tests may be valuable in family genetic studies on autism, aiding in the identification of subtle deficits that may be linked to the etiology of autism.

Tucker and Haferstein (1997) explored the sensitivity and emotional intensity in gifted children aged 4 to 6 years, using Dabrowski's theory of overexcitabilities as a theoretical basis. The qualitative research involved classroom observations, interviews with teachers, and analysis of documents such as individual educational plans, psychological assessments, and questionnaires completed by parents. The results revealed that all five children studied exhibited behaviors consistent with Dabrowski's theory, manifesting different forms of overexcitabilities. All children demonstrated intellectual, imaginative, and emotional overexcitability, while two of them also exhibited characteristics of psychomotor and sensory overexcitability. Intellectual

overexcitability manifested through curiosity, formulation of thought-provoking questions, concentration, problem-solving, and theoretical thinking. Imaginative overexcitability was evident in participation in fantasy play, animistic and imaginative thinking, daydreaming, and dramatic perception. Emotional overexcitability was expressed through concern for others, shyness, fear, anxiety, difficulty adjusting to new environments, and intensity of feelings.

Shaywitz et al. (2001) investigated the heterogeneity within the gifted population, comparing boys with high IQ (140-154), low IQ (124-139), with learning disabilities, and a normal control group. The results indicated that boys with high IQ exhibited levels of behavioral problems similar to boys with learning disabilities, while boys with low IQ demonstrated significantly lower levels of behavioral problems compared to the group with learning disabilities.

The authors used various measures to assess the participants, including intelligence tests (WISC-R), performance tests (Woodcock-Johnson Psychoeducational Battery), teacher assessment scales (Abbreviated Conners Teacher Rating Scale), and questionnaires filled out by parents (Yale Children's Inventory - YCI). The YCI assesses dimensions of learning disabilities, with an emphasis on attention deficits, and provides scales that reflect behavioral, attentional, and cognitive characteristics.

Data analysis revealed that the groups differed significantly in terms of socioeconomic status, but not in age or ethnicity. The average scores on the YCI for the group with learning disabilities were systematically higher (indicating poorer performance) than the averages for the other three groups, especially on the Habituation, Language, Attention, and Academic scales. The averages for the normal group were generally in the mid-range on all measures.

The averages for the low IQ group were the lowest of all the groups (indicating better performance), except for the Negative Affect and Academic scales. The averages for the high IQ group were generally higher than the corresponding averages for the normal and low IQ groups, with the Treatability scale showing a particularly high average. The authors conclude that the gifted population is heterogeneous, with boys with high IQ exhibiting more behavioral problems than boys with low IQ. This heterogeneity may explain the inconsistent results of previous studies on gifted children. The authors also suggest that the behavioral characteristics of boys with high IQ may resemble those found in children with learning disabilities, and that high intelligence may be a vulnerability factor for social and emotional difficulties.

"We know very little about highly gifted individuals, partly because their numbers are so small. In the general population, about 1 in 1000 people are highly gifted. Within the gifted population, this ratio is about 1 in 16. There is little research on highly gifted adults, although there are some studies on highly gifted children. This leaflet aims to provide information about high giftedness and to increase awareness and understanding of these individuals. Our writings and recommendations are based on practical experience, concrete examples, and literature sources" (IHBV, 2021, p. 1).

"Giftedness is defined as having an IQ within the top 2%, which corresponds to an average score of 100 plus 2 standard deviations. Individuals scoring 3 standard deviations above the mean (IQ of 145 or top 0.1%) are considered 'highly gifted.' Unfortunately, there is no global consensus on these terms. We use the term 'exceptionally gifted' for IQs of 160 or higher (4 standard deviations above the mean). English also distinguishes 'profoundly gifted' for IQs above 175. Tests reliably indicating scores above 145-150 are currently unavailable and cannot precisely determine the 'degree' of giftedness within an IQ number" (IHBV, 2021, p. 2).

"It is likely that the characteristics of highly gifted adults are similar to those of gifted adults in general but potentially more intense and extreme. Many highly gifted children cannot attend regular schools or skip several grades. Some even fall completely outside the school system. Finding like-minded individuals is often a challenge. Even within the group of gifted people, they may still feel 'different'" (IHBV, 2021, p. 3).

"Findings by Hollingworth and Gross show that social connection from childhood is important for highly gifted people. Finding peers who are intellectually equal is much harder for this group than for the average child. Brackmann (2020) wrote a book in German about highly gifted adults, emphasizing the importance of social connection. More attention and study of this subgroup of gifted people are urgently needed for their well-being and possibly for professional help" (IHBV, 2021, p. 4).

The study "Höchstbegabte Erwachsene: Ihr persönliches Erleben der Begabung und ihre Erfahrung mit Psychotherapie," conducted by Christina Heil, explores the subjective experiences of highly gifted adults and their encounters with psychotherapy. The research included 72 participants with an IQ of 145 or higher, utilizing a qualitative approach with detailed interviews and analysis of personal accounts.

Participants demonstrated highly rapid and complex thinking abilities, with strong logical-analytical skills and a constant search for patterns. The study also revealed a high moral sensitivity and intense emotional capacities, frequently showing a deep sense of justice and empathy.

Many participants reported a persistent feeling of being different from others, resulting in social integration difficulties and isolation. Additionally, highly gifted individuals often faced underutilization of their abilities in professional environments, leading to frustration and dissatisfaction.

The participants emphasized the importance of working with therapists who understand the specific needs of the highly gifted. Collaboration and deep understanding by therapists were seen as crucial for the success of treatment. Psychotherapy was considered beneficial for many, helping them cope with feelings of isolation, develop strategies for social integration, and find emotional balance.

The study concludes that there is an urgent need for greater attention and research on highly gifted adults. Proper understanding of their specific needs and the provision of specialized support are essential for their well-being. The author stresses the importance of more studies and the creation of more accurate measurement tools to better serve this population (Heil, 2021).

Analysis of results

Comparative Analysis of Giftedness: Insights from the Genetic Intelligence Project

The Genetic Intelligence Project (GIP), spearheaded by the CPAH - Heráclito Research and Analysis Center, conducted a comprehensive study examining the differences between individuals with giftedness at two standard deviations (2SD) and those with profound giftedness at three standard deviations (3SD) above the mean IQ. The study engaged participants from elite high-IQ societies such as Mensa, Intertel, ISPE, Triple Nine Society, ePiq, IIS, and ISI, specifically targeting members of the Gifted debate group on Meta, a forum for individuals with IQs above the 98th percentile.

The findings reveal significant distinctions between the two groups in several areas:

Emotional Well-Being:

Participants with 2SD are perceived to have a lower likelihood of suffering from depression compared to those with 3SD. Those with 3SD often experience more intense emotional fluctuations, likely due to the heightened intensity of their characteristic traits.

Creativity

Individuals with 2SD tend to apply their creativity to the knowledge they have acquired, innovating within familiar domains. In contrast, those with 3SD frequently exhibit creativity in new and unexplored areas, pushing the boundaries of conventional understanding.

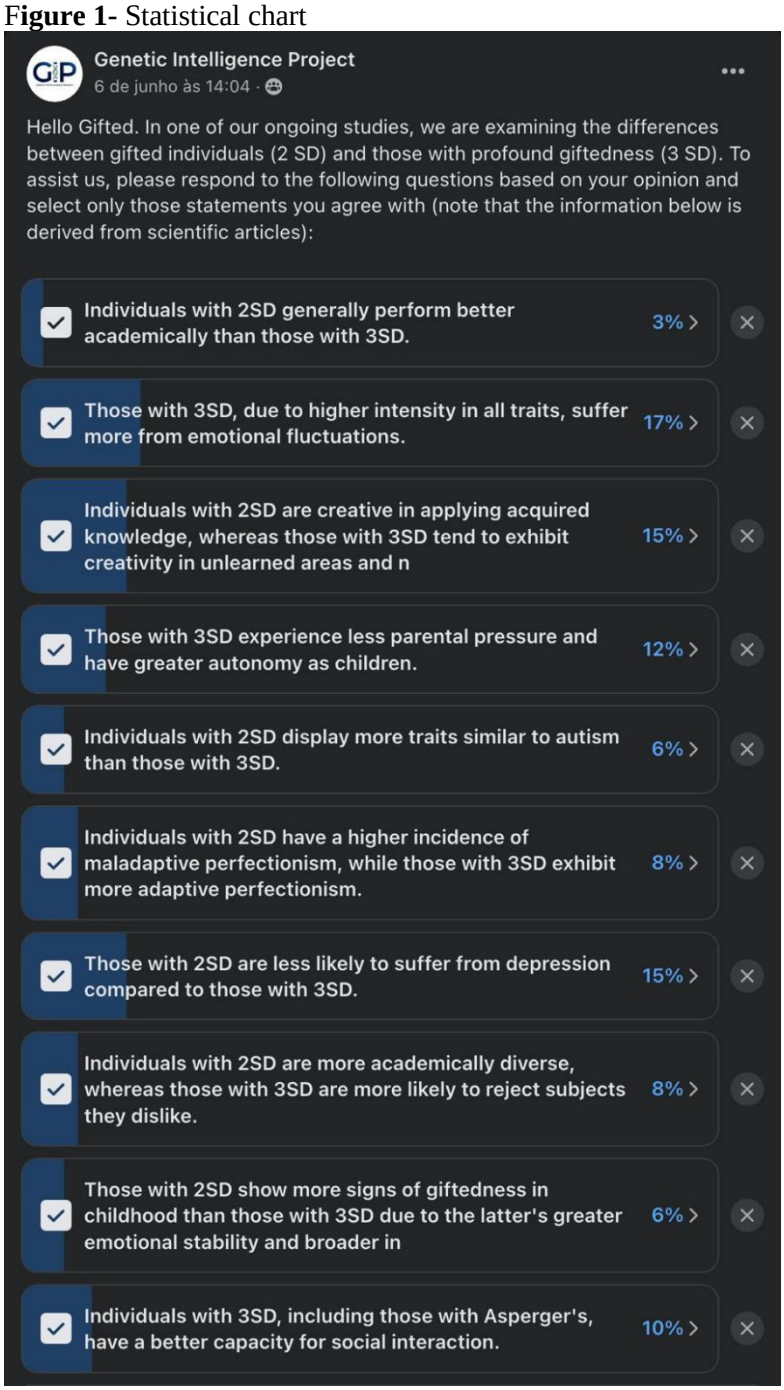
Social Interactions

The study indicates varied social experiences between the groups, with differences in how they engage and connect with others both within and outside their intellectual peer group.

These insights contribute to a nuanced understanding of the gifted community, highlighting the need for tailored support to optimize the well-being and potential of individuals with different levels of giftedness.

The statistical chart reflecting these views is shown below:

F**igure 1-** Statistical chart



DISCUSSION

The scientific literature on giftedness, while extensive, still lacks in-depth studies on individuals with exceptionally high IQs, positioned at 3 or more standard deviations above the average. This gap in knowledge is partly due to the rarity of this population and the methodological challenges inherent in its research. However, existing studies reveal an intriguing and complex scenario, highlighting the heterogeneity of the giftedness experience.

Behavioral and Educational Aspects

Contrary to the expectation that a higher IQ would translate into greater academic success, evidence suggests that individuals with an IQ 3 SD above the average (3SD) may face more pronounced educational difficulties than those with an IQ 2 SD (2SD). This discrepancy can be attributed to the greater intensity of behavioral and emotional traits observed in 3SD individuals, which may lead to mood swings and difficulties adapting to the traditional school environment. Family dynamics also seem to play a crucial role. Studies indicate that mothers of 3SD individuals tend to offer greater autonomy and less pressure for academic performance, which may contribute to lower school engagement. In contrast, 2SD individuals often report greater parental pressure for academic results, which can boost their performance but also generate anxiety and stress.

Creativity and Expression

Creativity, a trait often associated with giftedness, manifests distinctly in the two groups. 2SD individuals tend to demonstrate applied creativity, using acquired knowledge to generate innovative solutions in specific areas. Meanwhile, 3SD individuals exhibit more divergent creativity, exploring original and unconventional ideas, often related to areas not formally learned.

Emotional and Social Intelligence

Although not measured by traditional IQ tests, emotional and social intelligence appears to be more developed in 3SD individuals. This enhanced ability to understand and manage emotions, coupled with a more refined perception of social nuances, can facilitate social interaction and adaptation to different contexts.

Clinical Aspects

While giftedness is not a pathology, the emotional intensity and hypersensitivity characteristic of individuals with high IQ can increase vulnerability to mental disorders, such as depression and anxiety. However, the greater emotional intelligence observed in 3SD individuals may act as a protective factor, aiding in emotional regulation and the development of adaptive coping strategies.

Giftedness, in its various manifestations, represents both a challenge and an opportunity for society. Understanding the nuances and heterogeneity of the giftedness experience is crucial for developing effective educational and clinical interventions that promote the comprehensive development and well-being of these individuals. Future research should delve deeper into the neurobiological bases of giftedness, investigate the interaction between genetic and environmental factors in the development of intelligence and creativity, and examine the impact of different educational and therapeutic approaches on the well-being and success of individuals with high IQ.

CONCLUSION

The research comparing behavioral and cognitive differences between gifted individuals (2SD above the mean) and those with extremely high IQ (3SD above the mean) highlights the distinct characteristics and needs of these groups. The study reveals that while gifted individuals exhibit heightened activity in the frontal brain regions, contributing to maladaptive perfectionism and limited creativity, individuals with extremely high IQ display more uniform cognitive profiles and greater emotional and creative adaptability.

Gifted individuals often experience challenges related to their intense focus on perfectionism, which can lead to anxiety and frustration. Their creativity tends to be less about innovation and more about applying existing knowledge, often exhibiting behaviors associated with the autism spectrum due to compensatory mechanisms. These individuals benefit from structured environments that can harness their specific skills and mitigate their perfectionist tendencies.

Conversely, those with extremely high IQs demonstrate a broader range of cognitive and emotional capabilities. Their balanced brain activity supports a diverse array of interests and a more profound capacity for creative and divergent thinking. These individuals are less driven by competition and more by intrinsic motivation, displaying a nuanced understanding of social dynamics and emotional intelligence. Their holistic approach to problem-solving and learning allows for greater adaptability and innovation.

The findings underscore the importance of tailored educational and therapeutic interventions for both groups. For gifted individuals, strategies should focus on managing perfectionism and fostering creativity through structured challenges. For those with extremely high IQs, the emphasis should be on supporting their broad intellectual and emotional development, ensuring they are not held back by traditional educational paradigms. The study calls for more extensive research into the neurobiological and psychological foundations of giftedness and extremely high IQ. Understanding the unique profiles and needs of these individuals will help

in developing more effective educational practices and therapeutic approaches. By addressing the specific challenges and strengths of each group, society can better support their personal and academic growth, maximizing their potential contributions.

Statement of contributions: Rodrigues, F. A. A. was the idealizer, owner and creator of the concept, wrote and revised the manuscript. Guided the team in data collection and revised the manuscript.

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