European Journal of Special Education Research
ISSN: 2501 - 2428
ISSN-L: 2501 - 2428
Available on-line at: www.oapub.org/edu

DOI: 10.46827/ejse.v11i5.6257 Volume 11 | Issue 5 | 2025

VALIDITY OF THE LOGICAL-MATHEMATICAL SUBSCALE IN IDENTIFYING GIFTEDNESS: PARENT VERSION[i]

Victor Alexandre Barreto da Cunha[1ii],
Carina Alexandra Rondini[2],
Francinne Gonzalez Andrioni[3]
Development and Learning Psychology,
São Paulo State University,
Brazil

Abstract:
The aim of the study was to describe the evidence of semantic and content validity of the items in the Logical-Mathematical Subscale of an identification scale for High Abilities/Giftedness (HA/GD) behaviors in children aged 6 to 10 years – parent version. The semantic analysis was conducted with the support of a sample of 45 parents/guardians from various regions of Brazil, through the Google Meet platform, via Focus Group meetings. The subscale was analyzed by five experts specializing in HA/GD and/or instrument development. The results showed that the subscale items are easy to understand; minor suggestions were made to enhance their clarity, demonstrating evidence of semantic validity from the perspective of parents/guardians. The content-based analysis of the subscale, assessed by the experts, indicated a Content Validity Index (CVI) of 100%, evidencing high agreement among the judges. The analyses revealed that the subscale demonstrated reliable evidence of semantic and content validity for identifying HA/GD behaviors, in conjunction with other sources of information. Future research is necessary to investigate additional validity evidence.

Keywords: high abilities/giftedness, instrument, content validation, parents/guardians

Resumen:
El objetivo del estudio fue describir las evidencias de validez semántica y de contenido de los ítems de la Subescala Lógico-Matemática de una escala de identificación de comportamientos de Altas Capacidades/Superdotación (AC/SD) en niños de 6 a 10 años, en su versión para padres. El análisis semántico se realizó con el apoyo de una muestra de 45 padres/tutores provenientes de diversas regiones de Brasil, a través de la plataforma Google Meet, mediante encuentros en Grupos Focales. La subescala fue

[i] VALIDEZ DE LA SUBESCALA LÓGICO-MATEMÁTICA EN LA IDENTIFICACIÓN DE LA SUPERDOTACIÓN: VERSIÓN PAÍS

[ii] Correspondence: email victor.barreto-cunha@unesp.br

analizada por cinco jueces especializados en AC/SD y/o en la construcción de instrumentos. Los resultados mostraron que los ítems de la subescala son de fácil comprensión; se sugirieron ajustes sutiles para hacerlos aún más comprensibles, lo que demuestra evidencias de validez semántica por parte de los padres/tutores. El análisis basado en el contenido de la subescala, a través de la evaluación de los jueces, indicó un Índice de Validez de Contenido (IVC) del 100%, evidenciando una alta concordancia entre los jueces. Los análisis revelaron que la subescala presentó evidencias de validez semántica y de contenido, además de ser confiable para la identificación de comportamientos de AC/SD, en conjunto con otras fuentes de información. Se requieren futuras investigaciones para explorar otras evidencias de validez.

Palabras clave: altas capacidades/superdotación, instrumento, validación de contenido, padres/tutores

1. Introduction

The field of High Abilities/Giftedness (HA/GD), a topic of growing scientific interest, has gained prominence in Brazil in recent decades, particularly regarding the identification of HA/GD (Cunha, Pedro & Capellini, 2024; Nakano, 2021; Silva, Luz & Negrini, 2023; Rzezak, Hakim & Halpern-Chalom, 2024). According to Brazilian legislation, students with HA/GD are those who may demonstrate high potential in one or more areas, such as "*intellectual, academic, leadership, psychomotor, and the arts, in addition to showing high creativity, engagement in learning, and task completion in areas of interest*" (Brasil, 2008, p. 15).

Giftedness is a multifaceted phenomenon and can manifest in various ways (Azevedo, Cipriano & Cavalcante, 2024; Renzulli, 2018; Sabatella, 2023), including high performance in one or several domains, advanced vocabulary, curiosity, ease of learning, a peculiar sense of humor (Brasil, 2006), excellent memory, and outstanding abilities in mathematics, language, music, biology, and the arts (Renzulli, 2018; Renzulli & Reis, 2022).

According to the Marland Report (1972), it is estimated that 3% to 5% of students exhibit characteristics associated with giftedness. However, the most recent School Census, published in 2025, reports only 43,950 students identified as gifted in Basic Education in Brazil in 2024 (Instituto Nacional de Estudos e Pesquisas Educacionais "Anísio Teixeira", 2025). The country has a total of 47,088,922 students enrolled in Basic Education (Instituto Nacional de Estudos e Pesquisas Educacionais "Anísio Teixeira", 2025). Therefore, based on Marland's estimate, Brazil should have approximately 1,412,667 to 2,354,446 gifted students.

Gifted students are part of the target group of Special Education. Consequently, Brazilian legislation establishes that these students are entitled to enrollment in regular classrooms, along with access to Specialized Educational Services (SES) (Brasil, 2011). In order to provide SES to students with HA/GD, it is necessary to consider the processes of identification and assessment (Gonçalves & Stoltz, 2022; Martins, 2021; Pérez & Freitas, 2016; Sabatella, 2023).

The identification of giftedness is a complex and challenging task that requires appropriate assessment tools (Bergamin et al., 2022; Delou, 2022; Nakano & Negreiros, 2024; Piske, 2021) and demands skilled professionals trained to conduct the evaluation process (Breviário, 2024; Silva, Luz & Negrini, 2023). For the assessment of this population, it is essential to rely on a set of reliable instruments, including scales, questionnaires, inventories, and protocols, capable of measuring and cross-referencing information from multiple sources (Cunha, 2023; Delou, 2022; Pocinho, 2009).

It is important to highlight that the family plays a fundamental role in the process of identifying HA/GD (Cunha & Rondini, 2021; Cunha, Rondini & Andrioni, 2024; Ogeda & Pedro, 2021; Gonçalves & Stoltz, 2022; Sabatella, 2023), since it is well established that the first signs of giftedness are typically observed within the family context (Cunha & Rondini, 2024; Rzezak, Haki & Halpern-Chalom, 2024; Sakaguti & Bolsanello, 2012).

In the Brazilian context, there is still a significant shortage of identification instruments designed for parents (Cunha, 2023; Cunha, Rondini & Andrioni, 2024). Cunha and Rondini (2024) conducted a literature review to identify instruments, scales, checklists, inventories, and questionnaires, both national and international, with or without evidence of validity for the Brazilian context, aimed at identifying gifted behaviors in parent-report versions. The study identified 14 instruments, nine in English (developed in the United States), three in Portuguese (two developed in Brazil and one translated from English), and two in Spanish (one from Ecuador and one translated from English). Only two international instruments presented psychometric properties. The researchers therefore, emphasize the importance of developing instruments specifically designed for this population.

Given this scenario, the present study aims to describe the evidence of semantic and content validity of the logical-mathematical subscale of an instrument designed to identify HA/GD behaviors in children aged 6 to 10 years, parent-report version.

2. Method

This is a quantitative-qualitative study with a descriptive design. The research employed the theoretical model for instrument development proposed by Pasquali (2013; 2016). In constructing the items for the subscale, the items derived from the instruments identified in the literature review (Cunha & Rondini, 2024) were revised, compiled, and allocated within the academic domain, in accordance with Brazilian legislation (Brasil, 2008).

The synthesized version of the scale consists of 127 statement-based items, divided into nine subscales: Intellectual (15 items), Creativity (11 items), Emotional/Social (18 items), Linguistic (14 items), Logical-Mathematical (11 items), Arts (17 items), Psychomotor (13 items), Leadership (12 items), and Independence/Nonconformity (16 items). It is a five-point Likert-type scale (0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Regularly, and 4 = Always), in which parents or guardians mark an X to indicate the behaviors observed in the child. This article focuses specifically on the analysis of the Logical-Mathematical subscale.

The study [iii] was approved by the Research Ethics Committee (Protocol No. 3.652.270), and all participants signed the Informed Consent Form (ICF).

2.1 Participants

2.1.1 Focus Group

The semantic analysis was conducted through three focus groups (Pasquali, 2013; Pacico, 2015) using the Google Meet platform. The sample consisted of 45 parents or guardians, selected by convenience, and divided into an Experimental Group (EG) and a Control Group (CG). The Experimental Group was composed of parents or guardians whose children had been identified with HA/GD and who participated in projects that employed different identification protocols, which could result in varied experiences and consequently influence their evaluation of the scale. This group was further divided into two subgroups: G1 and G2. G1 consisted of participants involved in outreach projects and institutions working with HA/GD across various regions of Brazil. G2 consisted of participants from a specialized institution dedicated to the assessment of giftedness, located in the southern region of Brazil. The Control Group was composed of parents or guardians whose children had not been identified with HA/GD and, since they had not undergone any identification process, could offer different perspectives to the present study.

G1 consisted of 20 participants, aged between 31 and 53 years,[iv] with a mean age of 42 years and a standard deviation of 6 years. The majority were female, 19 participants (95%), and married, 13 participants (65%). Regarding educational level, 7 participants (35%) reported holding a lato sensu postgraduate degree, and 5 participants (25%) reported having diverse occupations.

G2 was composed of 16 participants, aged between 34 and 58 years[v], with a mean age of 42 years and a standard deviation of 4 years. The majority were female, 15 participants (94%), and married, 13 participants (81%). Regarding educational background, 5 participants (31%) reported having completed a bachelor's degree and a lato sensu postgraduate specialization, 5 (31%) held a master's degree, and 2 (12%) held a doctoral degree, while 1 participant (6%) reported having completed a postdoctoral fellowship.

The Control Group (CG) consisted of nine participants, aged between 31 and 50 years, with a mean age[vi] of 40 years and a standard deviation of 6 years. All participants were female. Regarding marital status, 7 participants (67%) were married. As for educational background, 3 participants (33%) reported having completed high school, and 2 participants (22%) reported having completed a bachelor's degree.

[iii] This study is part of the first author's doctoral research, conducted at São Paulo State University (UNESP), Bauru Campus, São Paulo, Brazil. The research was supported by the Brazilian Coordination for the Improvement of Higher Education Personnel (CAPES).

[iv] Variable with normal distribution: W = 0.9719; p = 0.7945. Shapiro-Wilk normality test.

[v] Variable with normal distribution: W = 0.915; p = 0.1616. Shapiro-Wilk normality test.

[vi] The age distribution of the participants in the Control Group (CG) was not included in the Shapiro-Wilk normality test due to the small sample size.

2.1.2 Expert Judges

The panel consisted of five participants with expertise in the field of G/HA and/or in instrument development, identified as Judge 1 (J1), Judge 2 (J2), Judge 3 (J3), Judge 4 (J4), and Judge 5 (J5). The judges were selected by convenience through the researchers' professional network.

2.1.3 Instruments

2.1.3.1 Parents/Guardians

The pre-test version of the Logical-Mathematical subscale of the *Behavioral Signaling Scale for Giftedness/High Abilities in Children – Parent Version* (ESCAH/C-Parents) was used to identify HA/GD behaviors in children aged 6 to 10 years. This scale was developed by Cunha (2023).

A Sociodemographic Questionnaire developed by the researchers was also applied, consisting of 12 items. However, for the purposes of this study, priority was given to items addressing: (1) personal identification data, (2) educational background, (3) degree of kinship with the child, (4) gender, (5) age, and (6) marital status.

2.1.3.2 Expert Judges

Data collection with the judges began in April 2022 and was completed in May of the same year. The judges were contacted via WhatsApp and/or email through an invitation letter. Upon accepting the invitation, the judges received the synthesized version of the subscale, along with a form to evaluate the items. This evaluation included content validity, analysis of the wording of the items, suggestions for additions or removals, and an assessment of the clarity and representativeness of the items, aiming to make them more understandable and accessible.

The judges analyzed the items based on predefined criteria: 1 (item is not representative), 2 (item requires substantial revision to be representative), 3 (item requires minor revision to be representative), and 4 (item is representative) (Alexandre & Coluci, 2011; Souza, Alexandre & Guirardello, 2017). Additionally, the form provided space for the judges to justify why an item was considered not representative. In cases where the item required substantial or minor revision, a dedicated field was available for them to suggest a revised version (Cunha, 2023; Cunha, Rondini & Andrioni, 2024).

2.2 Data Collection Procedures – Parents/Guardians

Data collection with parents or guardians was carried out between February and April 2022. Parents were invited through messages shared within the researchers' contact networks, including research groups, outreach projects, parent groups, and WhatsApp groups. The invitation contained the objectives of the study and the researcher's contact information, so that those interested in participating could express their interest via WhatsApp. Once interest was confirmed, the "Groups" were created. The Informed Consent Form (ICF) and the Sociodemographic Questionnaire were sent to the participants via WhatsApp groups.

The meetings were conducted collectively using a brainstorming approach (Pacico, 2015; Pasquali, 2013). Three meetings were held for each group. Participants were asked to read the subscale items and reflect on whether "*the wording was clear*", whether they "*would change anything to make the wording clearer*", "*what would make the item easier to understand*", and "*whether, upon reading the item, they were able to understand and respond to it*" (Rondini, Pedro & Nakano, 2022, p. 14).

To facilitate the focus group discussions, participants were informed that content placed in parentheses indicated synonyms. They were asked to help determine which word would be more appropriate, for example, "*diverse (different) contexts*." Content placed in brackets indicated additional information that participants should evaluate to decide whether it was necessary for understanding the item, for example, "*Enjoys strategy games [chess, checkers...].*" Finally, content in braces indicated a possible substitution of the word used, for example, "*Loses track of time {Spends a lot of time}*," and participants were asked to choose which alternative was better suited (Cunha, 2023).

2.3 Data Analysis Procedures

For the semantic analysis, a qualitative analysis was conducted based on the participants' suggestions for each item in the subscale. The data provided by the expert judges were analyzed using descriptive statistics (absolute and relative frequency) and percentage agreement for each item, according to the judges' assessments, as well as the Content Validity Index (CVI). The analysis aimed to verify whether there was agreement among the expert judges regarding the items (Pacico, 2015; Pasquali, 2013).

3. Results and Discussion

The following section presents the results of the validity evidence based on the semantic analysis, obtained through the evaluation by a sample of the target audience (parents/guardians), as well as the results of the content validity evidence for the subscale, assessed by the panel of expert judges.

In the Logical-Mathematical Subscale, specifically for item 1, "*Learns mathematics quickly*," groups G1, G2, and CG unanimously suggested keeping the original wording. For item 2, "*Learns mathematics without the need for repetition*," G1 suggested that replacing the phrase "*without the need for repetition*" with "*without effort*" would be more appropriate, resulting in the revised item "*Learns mathematics without effort*." Meanwhile, groups G2 and CG agreed to maintain the original wording of the item.

Item 3, "*Learns (content) advanced (difficult) mathematical concepts for their age*," was modified based on the input from groups G1, G2, and CG, who preferred the term "*content*" instead of "*concepts*." Additionally, G1 and CG preferred using the term "*advanced*" rather than "*difficult*," leading to the revised wording "*Learns advanced mathematical content for their age*." On the other hand, G2 preferred the term "*difficult*," resulting in "*Learns difficult mathematical content for their age*."

For item 4, "*Shows interest in (problems/activities) {that involve} mathematical content {mathematics},"* G1 and CG chose the wording "*Shows interest in mathematical content*," while G2 preferred "*Shows interest in activities that involve mathematics*."

Regarding item 5, "*Loses track of time {Spends a lot of time} in activities that involve mathematics {with mathematics},"* both G1 and CG reformulated it as "*Loses track of time in activities that involve mathematics*." G2, however, opted for "*Spends a lot of time in activities that involve* mathematics." The final synthesized version became "*Loses track of time in activities that involve mathematics*".

For item 6, "*Quickly solves math problems mentally {Does math calculations mentally},*" all three groups modified it to "*Quickly solves math problems mentally*." According to the focus group participants, this alternative was the most appropriate, as the wording was clear and easily understandable for the target audience.

Item 7, "E*njoys strategy games [chess, checkers, ...] and challenges involving logical reasoning*," was modified by G1 to "*Enjoys strategy games and challenges involving logical reasoning.*" According to groups G2 and CG, keeping the examples "*chess, checkers...*" made the item clearer. Therefore, the item was revised to "*Enjoys strategy games, such as chess, checkers, and challenges involving logical reasoning*."

Regarding item 8, "*Persists in solving difficult and complex math activities*," G1 and CG chose to keep the original wording. In contrast, G2 suggested replacing "*in solving*" with "*to solve*" to simplify the statement. Thus, the item was modified to "*Persists to solve difficult math activities*."

Finally, the final results obtained from the validity evidence based on the semantic analysis, through the evaluation of a sample of the target audience (parents/guardians), were as follows: (1) Learns mathematics quickly; (2) Learns mathematics effortlessly; (3) Learns difficult mathematical content for their age; (4) Shows interest in activities that involve mathematics; (5) Loses track of time in activities that involve mathematics; (6) Quickly solves math problems mentally; (7) Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning; (8) Persists in solving difficult and complex math activities; (9) Demonstrates a high capacity for logical reasoning; (10) Finds it easy to solve problems involving time, money, or measurements; and (11) Applies mathematical learning to new situations in different contexts.

It is important to emphasize that the final wording of these items in the synthesized version was developed in accordance with the current literature (Alexandre & Coluci, 2011; Damásio & Borsa, 2017), considering the interaction with the parents/guardians in the focus groups and the inferences made by the researchers, specifically regarding item comprehension, vocabulary adequacy, consistency, and standardization.

Following this, the results of the content validity evidence for the subscale, based on the evaluation by the panel of expert judges, are presented. Box 1 illustrates the synthesized version of the subscale. The suggestions and modifications proposed by the judges are highlighted in *italics*.

Box 1: Synthesized Version of the Logical-Mathematical Subscale

Synthesized Version	**Judge 1**	**Judge 2**	**Judge 3**	**Judge 4**	**Judge 5**	**Final Version**
1. Learns mathematics quickly.	1. Learns *mathematical operations* mathematics quickly.	1. Learns mathematics quickly.	1. Learns mathematics quickly.	1. Learns mathematics quickly.	1. Learns mathematics quickly.	1. Learns mathematics quickly.
2. Learns mathematics effortlessly.	2. Learns *mathematical operations* effortlessly.	2. Learns mathematics effortlessly.	2. Learns mathematics effortlessly.	2. Learns mathematics effortlessly.	2. Learns mathematics effortlessly.	2. Learns mathematics effortlessly.
3. Learns difficult mathematical content for their age.	3. Learns difficult *mathematical operations* content for their age.	3. Learns difficult mathematical content for their age.	3. Learns difficult mathematical content for their age.	3. Learns difficult mathematical content for their age.	3. Learns difficult mathematical content for their age.	3. Learns difficult mathematical content for their age.
4. Shows interest in activities that involve mathematics.	4. Shows interest in activities that involve mathematics	4. Shows interest in activities that involve mathematics	4. Shows interest in activities that involve mathematics	4. Shows interest in activities that involve mathematics	4. Shows interest in activities that involve mathematics	4. Shows interest in activities that involve mathematics
5. Loses track of time in activities that involve mathematics.	5. Loses track of time in activities that involve *logical reasoning, such as chess, puzzles, strategy games, and similar activities*	5. Loses track of time in activities that involve mathematics.	5. Loses track of time in activities that involve mathematics.	5. Loses track of time in activities that involve mathematics.	5. Loses track of time in activities that involve mathematics.	5. Loses track of time in activities that involve mathematics.
6. Quickly solves math problems mentally.	6. Quickly solves math problems mentally.	6. Quickly solves math problems mentally.	6. Quickly solves math problems mentally.	6. Quickly solves math problems mentally.	6. Quickly solves math problems mentally.	6. Quickly solves math problems mentally.
7. Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning.	7. Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning.	7. Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning.	7. Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning.	7. Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning.	7. Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning.	7. Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning.

8. Persists in solving difficult and complex math activities.	8. Persists in solving difficult and complex math activities.	8. Persists in solving difficult and complex math activities.	8. Persists in solving difficult and complex math activities.	8. Persists in solving difficult and complex math activities.	8. Persists in solving difficult and complex math activities.	8. Persists in solving difficult and complex math activities.
9. Demonstrates a high capacity for logical reasoning	9. Demonstrates a high capacity for logical reasoning	9. Demonstrates a high capacity for logical reasoning	9. Demonstrates a high capacity for logical reasoning	9. Demonstrates a high capacity for logical reasoning	9. Demonstrates a high capacity for logical reasoning	9. Demonstrates a high capacity for logical reasoning
10. Finds it easy to solve problems involving time, money, or measurements.	10. Finds it easy to solve problems involving time, money, or measurements.	10. Finds it easy to solve problems involving time, money, or measurements.	10. Finds it easy to solve problems involving time, money, or measurements.	10. Finds it easy to solve problems involving time, money, or measurements.	10. Finds it easy to solve problems involving time, money, or measurements.	10. Finds it easy to solve problems involving time, money, or measurements.
11. Applies mathematical learning to new situations in different contexts.	11. Applies mathematical learning to new situations in different contexts.	11. Applies mathematical learning to new situations in different contexts.	11. Applies mathematical learning to new situations in different contexts.	11. Applies mathematical learning to new situations in different contexts.	11. Applies mathematical learning to new situations in different contexts.	11. Applies mathematical learning to new situations in different contexts.

Source: Cunha (2023, p. 195-196).

In the Logical-Mathematical Subscale, for item 1, "*Learns mathematics quickly*," Judge 1 (J1) suggested adding the words "*mathematical operations*." Accordingly, the item was revised to "*Learns mathematical operations quickly*." For item 2, "*Learns mathematics effortlessly*," J1 likewise recommended adding the words "*mathematical operations*." Regarding item 3, "*Learns difficult mathematical content for their age*," J1 also considered it necessary to include "*mathematical operations*."

As for item 4, the judges unanimously agreed to maintain the original wording: "*Shows interest in activities that involve mathematics*." For item 5, "*Loses track of time in activities that involve mathematics*," J1 suggested replacing the phrase "*that involve mathematics*" with "*that involve logical reasoning*," and adding examples such as "*such as chess, puzzles, strategy games, etc*." to make the item clearer and more accessible to the target audience. Consequently, the item was revised to *"Loses track of time in activities that involve logical reasoning, such as chess, puzzles, strategy games, etc*." Regarding items 6 to 11, the judges unanimously agreed to maintain the original wording.

In summary, the synthesized versions of the items were re-evaluated by the researchers in accordance with the suggestions and modifications proposed by the judges. The researchers adopted the final versions presented in Table 1, based on guidance from the relevant literature on scale development methodology (Damásio & Borsa, 2017), which emphasizes the need for methodological rigor. This process recognizes that, in addition to psychometric measures, the review of items by the researcher involves subjective judgment, which requires considering various factors, such as evaluating the judge's suggestions in light of their research expertise and publication background, and determining whether the suggestions adequately reflect the intended purpose of the scale.

Finally, Table 1 presents the Content Validity Index (CVI) and the Percentage of Agreement from the panel of expert judges for the subscale.

Table 1: Content Validity Index (CVI) and Percentage of Agreement from the Panel of Expert Judges for the Subscale

Logical-Mathematical	**J1**	**J2**	**J3**	**J4**	**J5**	**CVI**	**%**
1. Learns mathematics quickly.	3	4	4	4	4	1.00	100
2. Learns mathematics effortlessly.	3	4	4	4	4	1.00	100
3. Learns difficult mathematical content for their age.	3	4	4	4	4	1.00	100
4. Shows interest in activities that involve mathematics	4	4	4	4	4	1.00	100
5. Loses track of time in activities that involve mathematics.	3	4	4	4	4	1.00	100
6. Quickly solves math problems mentally.	4	4	4	4	4	1.00	100
7. Enjoys strategy games such as chess, checkers, and challenges involving logical reasoning.	4	4	4	4	4	1.00	100
8. Persists in solving difficult and complex math activities.	4	4	4	4	4	1.00	100
9. Demonstrates a high capacity for logical reasoning	4	4	4	4	4	1.00	100
10. Finds it easy to solve problems involving time, money, or measurements.	4	4	4	4	4	1.00	100
11. Applies mathematical learning to new situations in different contexts.	4	4	4	4	4	1.00	100

Source: Cunha (2023, p. 213).

Regarding the analysis of the subscale, the quantitative data indicate 100% agreement across all 11 items. The items were rated as either "*3 – item requires minor revision to be representative*" or "*4 – representative*."

Specifically for item 5, "*Loses track of time in activities that involve mathematics*," the same judge rated it as requiring minor revision to be representative, suggesting replacing the phrase "that involve mathematics" with "*that involve logical reasoning*" and adding examples such as "*such as chess, puzzles, strategy games, etc*." Accordingly, the item was revised to "*Loses track of time in activities that involve logical reasoning, such as chess, puzzles, strategy games, etc*." as proposed by this judge.

Items 6 to 11 were rated as representative by all five judges, demonstrating strong content validity and high agreement among the evaluators.

All five judges unanimously classified seven items (64%) as representative, while only one judge (J1) indicated the need for minor revisions in four items (36%), confirming that the subscale achieved content validity according to the expert judge.

4. Conclusion

It is noteworthy that the semantic analysis conducted with the target population resulted in modifications to 8 out of the 11 items in the subscale (72%), with subtle changes in item wording aimed at making them clearer, more objective, and easier to understand for the scale's target audience.

Overall, the participants were able to understand the content of the items in the pre-test version of the subscale. Some of their suggestions were incorporated, and the wording of the items was revised to improve clarity and comprehension, ensuring understanding and providing semantic validity for the target population. This stage is crucial in the development of an instrument, as it offers an opportunity for parents and guardians to share their opinions, express the difficulties they encountered in understanding the items, and propose suggestions, modifications, or reformulations.

The results demonstrated the adequacy of the subscale items, showing excellent agreement rates among the judges (100%). The evidence of content validity for the subscale was supported by the rigorous application of the Content Validity Index (CVI), which confirmed excellent levels of agreement and representativeness among the judges, item adequacy, and strong content validity, reflecting robustness and methodological rigor.

It is therefore concluded that the Logical-Mathematical Subscale presented evidence of semantic and content validity, making it appropriate for use as an initial tool to identify behaviors associated with HA/GD, specifically regarding mathematical abilities.

The results obtained so far are promising. However, future studies will be conducted to gather additional validity evidence for the subscale, including robust psychometric analyses, to support its applicability to the target population. This study offers important contributions to the field of HA/GD, particularly in the process of instrument development, given the scarcity of research focused on this population and

the pursuit of validity evidence for identifying HA/GD in children aged 6 to 10 years, parent-report version.

Conflict of Interest Statement
The authors declare no conflicts of interest

About the Authors
Dr. Victor Alexandre Barreto da Cunha graduated in Psychology from Anhanguera College in Bauru (SP, Brazil). Master's and Doctor's degrees from the Postgraduate Program in Developmental Psychology and Learning at São Paulo State University - UNESP (Bauru/SP, Brazil). Member of the Research Groups "The inclusion of people with disabilities, TGD or giftedness and the contexts of learning and development" and "International Group of Studies and Research on High Abilities/Giftedness – GIEPAHS" (CNPq). Psychologist of the Extension Project on High Abilities/Giftedness at UNESP (Bauru/SP, Brazil).
ORCID: https://orcid.org/0000-0002-9588-5360
E-mail: victor.barreto-cunha@unesp.com
Dr. Carina Alexandra Rondini graduated in Mathematics from São Paulo State University - UNESP (Brazil). Master's in Applied Mathematics from UNESP (Brazil). Doctor in Electrical Engineering from USP (Brazil). Post-Doctorate in High Abilities/Giftedness from Purdue University (USA). Professor of the Postgraduate Programs in Teaching and Formative Processes, UNESP in São José do Rio Preto/SP (Brazil), and Psychology of Development and Learning, UNESP in Bauru/SP (Brazil). Leader of the "International Group of Studies and Research in High Abilities/Giftedness (GIEPAHS)" – CNPq. CEO of the University Extension Project RAIS - Network of Comprehensive Support to Gifted Individuals (Brazil).
ORCID: https://orcid.org/0000-0002-5244-5402
E-mail: carina.rondini@unesp.br
M.e. Francinne Gonzalez Andrioni holds a Master's degree and is currently a doctoral student in the Postgraduate Program in Developmental Psychology and Learning at São Paulo State University - UNESP (Bauru/SP, Brazil), where she is a CAPES scholarship holder for her doctorate. Graduated in Psychology from the Centro Universitário Sudoeste Paulista – UniFSP (Avaré/SP, Brazil). Specialized in Behavioral and Cognitive Psychology and Legal Psychology. Member of the International Group for Studies and Research on High Abilities/Giftedness (GIEPAHS). Coordinator of the Clinic and Psychologist in the University Extension Project RAIS - Network of Comprehensive Support to Gifted Individuals (Brazil). Psychologist at the Specialized Reference Center for Social Assistance (Avaré/SP, Brazil).
ORCID: https://orcid.org/0000-0002-1285-106X
E-mail: francinne.andrioni@unesp.br

References

Alexandre, N. M. C., & Coluci, M. Z. O. (2011). Validade de conteúdo nos processos de construção e adaptação de instrumentos de medida. *Ciência & Saúde Coletiva*, 16(7), 3061-3068. Retrieved from https://www.scielo.br/j/csc/a/5vBh8PmW5g4Nqxz3r999vrn/?format=pdf&lang=pt

Azevedo, A. K. C., Cipriano, J. A., & Cavalcante, K. R. B. (2024). Processo de identificação. In Seixas, M. M. F. P., Alencar, I. C. W., & Vinagre, R. (Ed.). *Compreendendo as altas habilidades/superdotação*: um caminho pedagógico, reflexivo e prático (pp. 53-68). João Pessoa: Oiticica

Bergamin, A. C., Cunha, V. A. B., Peixoto, M. B. C. L. M., Santos, C. E. M., & Rondini, C. A. (2022). Avaliação de Estudantes com Altas Habilidades/Superdotação Pré e Pós-Oferta de Enriquecimento Curricular. *Estudos e Pesquisas em Psicologia*, 22(1), 250-270. Retrieved from https://pepsic.bvsalud.org/pdf/epp/v22n1/1808-4281-epp-22-01-250.pdf

Brasil. (2006). Secretaria de Educação Especial. *Saberes e práticas da inclusão:* desenvolvendo competências para o atendimento às necessidades educacionais especiais de alunos com altas habilidades/superdotação. Brasília: Ministério da Educação/SEESP. Retrieved from https://www.gov.br/mec/pt-br/media/publicacoes/semesp/altashabilidades.pdf. Accessed 12 January 2025

Brasil. (2008). *Política Nacional de Educação Especial na Perspectiva da Educação Inclusiva*. Brasília: Ministério da Educação, 2008. Retrieved from http://portal.mec.gov.br/arquivos/pdf/politicaeducespecial.pdf. Accessed 8 January 2025

Brasil (2011). Decreto nº 7.611, de 17 de novembro de 2011. Dispõe sobre a educação especial, o atendimento educacional especializado e dá outras providências. *Diário Oficial da União*, Brasília. Retrieved from https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2011/decreto/d7611.htm. Accessed 11 March 2025

Breviário, Á. G. (2024). Altas habilidades/superdotação: procedimentos de identificação. *Ágora*, 7(10), 1-15. Retrieved from https://periodicos.unimesvirtual.com.br/index.php/formacao/article/view/1546

Cunha, V. A. B. (2023). *Construção e Estudos Psicométricos da Escala Sinalizadora de Comportamentos de Altas Habilidades/Superdotação em Crianças – Versão para Pais (ESCAH/C-Pais)* [Doctorate Tesis]. Universidade Estadual Paulista, Bauru. Retrieved from https://repositorio.unesp.br/entities/publication/b904a317-f31f-4e7b-a44c-5e068596642a

Cunha, V. A. B., Pedro, K. M., & Capellini, V. L. M. F. (2024). Avaliação de uma criança com indicadores de precocidade no contexto pandêmico: estudo de caso. *In* Rondini, C. A., & Pedro, K. M. (Ed.). *Altas Habilidades/Superdotação no Contexto Clínico* (pp. 175-193). Curitiba: CRV. Retrieved from https://loja.editoracrv.com.br/produtos/altas-habilidades-superdotacao-no-contexto-clinico/

Cunha, V. A. B., & Rondini, C. A. (2021). Filhos superdotados: quando e o que as mães conseguem identificar? In: Silveira, É. L., & Santana, W. K. F. (Ed.). *Educação, Linguagem e Ensino*: Saberes Interconstitutivos (v. 4, pp. 488-503). São Carlos: Pedro & João. Retrieved from https://pedroejoaoeditores.com.br/produto/educacao-linguagens-e-ensino-saberes-interconstitutivos-vol-1/

Cunha, V. A. B., Rondini, C. A., & Andrioni, F. G. (2024). Escala sinalizadora de comportamentos de altas habilidades/superdotação em crianças – versão para pais (ESCAH/C-PAIS: construção e evidências de validade. *Cocar*, 21(39), 1-19. Retrieved from https://periodicos.uepa.br/index.php/cocar/article/view/9270

Cunha, V. A. B., & Rondini, C. A. (2024). Análise de instrumentos para identificação das características de altas habilidades/superdotação aplicados aos pais. *Gerais:* Revista Interinstitucional de Psicologia, 17(3), 1-20. Retrieved from https://periodicos.ufmg.br/index.php/gerais/article/view/56702/46626

Damásio, B. F., & Borsa, J. C. (Orgs.). (2017). *Manual de desenvolvimento de instrumentos psicológicos.* São Paulo: Vetor. Retrieved from https://www.researchgate.net/publication/322642144_Manual_de_Desenvolvimento_de_Instrumentos_Psicologicos

Delou, C. M. C. (2022). *Informativo Altas Habilidades ou Superdotação*. Brasília: Ministério da Educação/SEMESP/DEE. Retrieved from https://gedh-uerj.pro.br/wp-content/uploads/tainacan-items/14699/31030/2022_MEC_SEMESP_DELOU_Informativo_Altas_habilidades_superdotacao.pdf.pdf

Gonçalves, P., & Stoltz, T. (2022). *Altas Habilidades ou Superdotação*: teorias, identificação, avaliação e atendimento na escola e na família. Curitiba: Juruá. Retrieved from https://www.jurua.com.br/shop_item.asp?id=29872&srsltid=AfmBOorWJa6j_IfryRAcevPxZVvDVFntvEFBAAS_ex-m_300PMdUClFU

Instituto Nacional de Estudos e Pesquisas Educacionais "Anísio Teixeira" [INEP]. (2025). *Censo da Educação Básica*: Sinopse Estatística da Educação Básica 2024. Brasília: INEP. Retrieved from https://www.gov.br/inep/pt-br/acesso-a-informacao/dados-abertos/sinopses-estatisticas/educacao-basica. Accessed 17 June 2025

Marland, S. P. (1972). *Education of the gifted and talented.* Report to the Congress of the United States by the U.S. Commissioner of Education. Washington, DC: U. S. Government Printing Office. Retrieved from https://eric.ed.gov/?id=ED056243

Martins, B. A. (2021). Sinalizando o aluno com traços de altas habilidades/superdotação: o papel do professor de sala aula comum. *In*: Rondini, C. A., & Reis, V. L. (Ed.). *Altas Habilidades/Superdotação*: Instrumentais para identificação e atendimento do estudante dentro e fora da sala de aula comum (pp. 175-196). Curitiba: CRV. Retrieved from https://books.google.ro/books/about/Altas_habilidades_Superdota%C3%A7%C3%A3o.html?id=EPtiEAAAQBAJ&redir_esc=y

Nakano, T. C. (2021). *Triagem de Indicadores de Altas Habilidades/Superdotação (TIAH/S)*. São Paulo: Vetor. https://doi.org/10.15689/ap.2019.1804.18478.13

Nakano, T. C., & Negreiros, J. R. (2024). Escalas de identificação das altas habilidades/superdotação no Brasil: análise crítica. *Olhares* - Revista do Departamento de Educação da UNIFESP, 12(1), 1-27. Retrieved from https://periodicos.unifesp.br/index.php/olhares/article/view/15134/11515

Ogeda, C. M. M., & Pedro, K. M. (2021). A família, como vai? Percepção de pais e mães do Programa de Atenção ao Estudante Precoce com Comportamento Superdotado. *Revista Educação Especial*, 34, 1-25. https://doi.org/10.5902/1984686X61982

Pacico, J. C. (2015). Como é feito um teste? Produção de itens. *In*: Hutz, C. S., Bandeira, D. R., & Trentini, C. M. (Ed.). *Psicometria* (pp. 55-70). Porto Alegre: Artmed. Retrieved from https://www.passeidireto.com/arquivo/53626592/pacico-j-c-2015-como-e-feito-um-teste-producao-de-itens

Pasquali, L. (2013). *Psicometria:* teoria dos testes na Psicologia e na Educação. Petrópolis-RJ: Vozes. Retrieved from https://books.google.ro/books/about/Psicometria.html?id=D_Y4DwAAQBAJ&redir_esc=y

Pasquali, L. (2016). Princípios de elaboração de escalas. *In*: Gorenstein, C., Yuan-Pang, W., & Hungerbuhler, I. (Ed.). *Instrumentos de avaliação em saúde mental* (pp. 40-56). Porto Alegre: Artmed. Retrieved from https://www.scielo.br/j/jbpsiq/a/4DQ5983wq7F48NW4jvhMWYc/

Pérez, S. G. P. B., & Freitas, S. N. (2016). *Manual de identificação de Altas Habilidades/Superdotação*. Guarapuava: Apprehendere. Retrieved from https://www.scribd.com/document/855061307/FREITAS-2016-Manual-de-Identificac-a-o-01

Piske, F. H. R. (2021). *Altas habilidades/superdotação (AH/SD)*: identificação, mitos e atendimento. Curitiba: Juruá. Retrieved from https://www.jurua.com.br/shop_item.asp?id=28946&srsltid=AfmBOorqlsSU9V5E_XIGIlHc45w_CefCNAll7uokie7ADZSz7pZQ3cCQ

Pocinho, M. (2009). Superdotação: conceitos e modelos de diagnóstico e intervenção psicoeducativa. *Revista Brasileira de Educação Especial*, Marília, 15(1), 3-14. https://doi.org/10.1590/S1413-65382009000100002

Renzulli, J. S. (2018). Reexaminando o Papel da Educação para Superdotados e o Desenvolvimento de Talentos para o Século XXI: uma abordagem teórica em quatro partes. *In*: Virgolim, A. (Ed.). *Altas Habilidades/Superdotação*: processos criativos, afetivos e desenvolvimento de potenciais (pp. 19-42). Curitiba: Juruá. Retrieved from https://www.jurua.com.br/shop_item.asp?id=27083&srsltid=AfmBOopdQLewmVgoQ9S8sOLDmwYGAOT8bpIwJbu-QN4Qd_GJtn_LOVxO

Renzulli, J. S., & Reis, Sally. (2022). A concepção dos três anéis de superdotação e o modelo de enriquecimento escolar: uma abordagem de desenvolvimento de talentos para todos os estudantes. *In*: Piske, F. H. R., Nakano, T. C., Rocha, A., & Perales, R. G. (Ed.). *Altas Habilidades/Superdotação: AH/SD*: talentos, criatividade e

potencialidades (pp. 17-50). São Paulo: Vetor. Retrieved from https://www.bvirtual.com.br/NossoAcervo/Publicacao/206093

Rondini, C. A., Pedro, K. M., & Nakano, T. C. (2022). Adaptação Brasileira da Hope: Escala de Rastreio de Superdotação. *Estudos em Avaliação Educacional*, 33, 1-23. https://doi.org/10.18222/eae.v33.8055

Rzezak, P., Hakim, C., & Halpern-Chalom, M. (2024). *Como lidar com as altas habilidades/superdotação*: Guia prático para interessados, profissionais da educação e saúde, e familiares. São Paulo: Hogrefe. Retrieved from https://hom.hogrefe.com.br/como-lidar-com-as-altas-habilidades-superdotac-o-guia-pratico-para-interessados-profissionais-da-educac-o-e-saude-e-familiares.html

Sabatella, M. L. P. (2023). *Talento e Superdotação*: problema ou solução? Curitiba: InterSaberes. Retrieved from https://www.bvirtual.com.br/NossoAcervo/Publicacao/9988

Sakaguti, P. M. Y., & Bolsanello, M. A. (2012). A família e o aluno com altas habilidades/superdotação. In Moreira, L. C., & Stoltz, T. (Ed.). *Altas Habilidades/Superdotação, Talento, Dotação e Educação* (pp. 221-235). Curitiba: Juruá. Retrieved from https://www.researchgate.net/publication/325909327_ALTAS_HABILIDADESSUPERDOTACAO_TALENTO_DOTACAO_E_EDUCACAO

Silva, A. R., Luz, R. V., & Negrini, T. (2023). A identificação de Altas Habilidades/Superdotação (AH/SD) no âmbito escolar. *Revista Diálogos e Perspectivas em Educação Especial*, 10(1), 27-40. Retrieved from https://revistas.marilia.unesp.br/index.php/dialogoseperspectivas/article/view/13906

Souza, A. C., Alexandre, N. M. C, & Guirardello, E. de B. (2017). Propriedades psicométricas na avaliação de instrumentos: avaliação da confiabilidade e da validade. *Epidemiol. Serv. Saude*, 26(3), 649-659. Retrieved from http://scielo.iec.gov.br/pdf/ess/v26n3/2237-9622-ess-26-03-00649.pdf