VALIDATION PROCESS OF THE GERONTO-PSYCHOMOTRICITY ASSESSMENT BATTERY

PROCESSO DE VALIDAÇÃO DA BATERIA DE AVALIAÇÃO EM GERONTOPSICOMOTRICIDADE

PROCESO DE VALIDACIÓN DE LA BATERÍA DE EVALUACIÓN GERONTOPSICOMOTORA

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How to reference this paper:

VELASCO, C. G.; EGUTHI, C. A. Y.; MEDAGLIA, K. dos R.; NAKAZONE, S. S.; SILVA, E. C. G. e. Validation process of the Geronto-psychomotricity assessment battery. **Temas em Educ. e Saúde**, Araraquara, v. 20, n. 00, e024004, 2024. e-ISSN: 2526-3471. DOI: https://doi.org/10.26673/tes.v20i00.19010

| **Submitted**: 06/02/2024
| **Revisions required**: 24/06/2024
| **Approved**: 10/07/2024
| **Published**: 16/09/2024

Editors: Prof. Dr. Luci Regina Muzzeti
Prof. Dr. Rosangela Sanches da Silveira Gileno
Deputy Executive Editor: Prof. Dr. José Anderson Santos Cruz

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ABSTRACT: The objective is to build and validate the battery for the Gerontopsychomotor, to screen the psychomotor conditions of the older adult without functional limitation. This is a methodological study following the steps (1) the conception of the battery instrument for the Geronto-psychomotor Profile Record; (2) the initial actions for its consolidation as an instrument for assessing Geronto-psychomotricity; (3) the planning of the psychometric validation of Geronto-psychomotricity, which includes the assessment of the relevance of the items of psychomotor professionals. Descriptive analysis was performed using mean and standard deviation. To measure the degree of agreement among the experts, the content validity coefficient (CVC) was used, adopting (CVC≥ 0.80). The values of the Content Validity Coefficient were satisfactory, both for the clarity (CVCt=0.97) and the relevance (CVCt=0.96) of the questions. The Geronto-psychomotricity Assessment Battery presented acceptable psychometric qualities to be used as a tool in evaluating psychomotor aspects among older adults.

KEYWORDS: Aging. Evaluation Study. Geriatric Assessment. Longevity.

RESUMO: *O objetivo foi construir e validar uma bateria para Registro do Perfil Gerontopsicomotor, como rastreio das condições psicomotoras da pessoa idosa sem limitação funcional. Trata-se de um estudo metodológico que contou com as etapas de estabelecimento da estrutura conceitual: (1) concepção do instrumento da bateria para Registro do Perfil Gerontopsicomotor; (2) ações iniciais para sua consolidação como instrumento de avaliação da Gerontopsicomotricidade; (3) planejamento da validação psicométrica da Gerontopsicomotricidade com avaliação da clareza e pertinência por profissionais psicomotricistas. Análise descritiva realizada por média e desvio padrão após teste de Shapiro-Wilk. Para grau de concordância entre os especialistas, utilizou-se coeficiente de validade de conteúdo (CVC) adotado (CVC≥ 0.80). Os valores foram satisfatórios, tanto para a clareza (CVCt=0,97) quanto pertinência (CVCt=0,96) das questões. Assim o instrumento apresentou qualidades psicométricas aceitáveis para ser utilizada como ferramenta na avaliação dos aspectos psicomotores entre as pessoas idosas.*

PALAVRAS-CHAVE: *Envelhecimento. Gerontopsicomotricidade. Avaliação. Retrogênese. Longevidade.*

RESUMEN*: El objetivo fue construir y validar una batería de registro del Perfil Gerontopsicomotor, como screening de las condiciones psicomotoras de personas mayores sin limitaciones funcionales. Se trata de un estudio metodológico que incluyó las siguientes etapas: (1) diseño de la Batería de Registro del Perfil Gerontopsicomotor; (2) acciones iniciales para su consolidación como instrumento de evaluación de la Gerontopsicomotricidad; (3) planificación de la validación psicométrica de la Gerontopsicomotricidad con evaluación de pertinencia por psicomotricistas profesionales. Análisis descriptivo por media y desviación estándar tras la prueba de Shapiro-Wilk. Se utilizó el coeficiente de validez de contenido (CVC) adoptado (CVC≥ 0,80) para el grado de acuerdo entre los expertos. Los valores fueron satisfactorios tanto para la claridad (CVCt=0,97) como para la pertinencia (CVCt=0,96) de las preguntas. Por lo tanto, el instrumento presentaba cualidades psicométricas aceptables para ser utilizado como herramienta de evaluación de aspectos psicomotores entre las personas mayores.*

PALABRAS CLAVE*: Envejecimiento. Gerontopsicomotricidad. Evaluación. Retrogénesis. Longevidad.*

Introduction

Psychomotricity is the execution of a thought through a cohesive, harmonious, and precise motor act (Fernandes; Barros, 2015). It is the science that studies the integral development of the human being, from conception until death (Vasconcelos, 2003). Each phase presents a level of maturity, acquisitions, and a decline with aging. Gerontopsychomotricity, on the other hand, specifically studies human retrogenesis, the biopsychosocial aspects of the aging process, considering each elderly person with their abilities, difficulties, declines, and losses, i.e., involution (Fonseca, 2009).

Understanding this process and having knowledge of Gerontopsychomotricity, which aims to maintain functional capacities, as well as to improve and enhance self-awareness and the effectiveness of actions, especially in daily living activities (Balbinotti, 2005), allows the elderly to recognize the power of their wisdom, value their abilities, and highlight their strengths. This facilitates the management of certain physical limitations and losses, encouraging self-care through the development of personal health habits. Such intervention will certainly lead the elderly to reflect on their attitudes, providing greater possibilities for adapting to the changes inherent in aging (Gallahue, Ozmun, Goodway, 2013; Levy, 2000; Vasconcelos, 2003).

Population aging is one of humanity's greatest triumphs, but also one of our biggest challenges. The World Health Organization argues that countries can afford aging if governments, international organizations, and civil society implement "active aging" policies and programs that improve the health, participation, and safety of older citizens (Fonseca, 2009). The time to plan and act is now (WHO, 2005).

Since this process is inevitable and constitutes a life stage that must be learned, as it requires adaptation (Levy, 2000), Psychomotricity can have a preventive effect, preserving functional tonicity, flexible postural control, a positive body image, practical spatial and temporal organization, and the integration and prolongation of ideomotor praxes, perfectly adapted to the specific functional needs of the elderly. This helps them avoid immobility, passivity, isolation, loneliness, depression, dependency, institutionalization, and segregation, giving the terminal phase of life the dignity it deserves (Balbinotti, 2005; Vasconcelos, 2003).

For this intervention, a Gerontopsychomotor Assessment is of fundamental importance. Today, numerous assessment instruments are in different fields aimed at the elderly. Although several authors have adapted and validated assessment tools for older adults, there is still a gap

in Brazil when it comes to psychomotor assessment instruments, particularly for this population (Hua, Fernandes, Safons, 2019; Souza, 2017).

The ways to assess human motor skills in older adults can vary, but none are perfect or holistically encompass all aspects of development (and retrogenesis). The choice and use of an assessment tool will be conditioned by various factors, such as professional training and experience, material handling, practical application, population, interpretation of results, and corresponding report, among others, which must be integrated with other information (personal data, medical exams, etc.) (Aubert, Albaret, 2012; Rosa Neto, 2009).

In a motor assessment, it is possible to diagnose, guide, and identify changes in relation to the individual's motor performance to achieve greater movement fluency (Aubert; Albaret, 2012). There has been a significant increase in professionals in the fields of gerontology and exercise sciences, emphasizing the need to develop tests to assess physical parameters, particularly performance tests, which can be measured in elderly individuals with varying functional levels (Hua; Fernandes; Safons, 2019).

Psychomotor retrogenesis assessment needs to be considered not only to obtain results in tests, no matter how adapted they may be, but primarily to demonstrate the development and retrogenesis process of that elderly person (Gallahue; Ozmun; Goodway, 2013).

According to Vendramini, Silva, and Chenta (2004) and Amorim, Parreira, and Santos (2022), measurement is "describing a phenomenon from a quantitative point of view," while evaluation is "interpreting quantitative and qualitative data to provide a judgment or value assessment based on standards or criteria." Therefore, each professional in their field must observe what is relevant in the elderly to create excellent intervention programs, understanding that EVALUATION IS NOT MEASUREMENT.

Thus, the creation of an "assessment battery" that could identify the strengths and weaknesses of each elderly person, in terms of psychomotor retrogenesis in the aging of each individual, was necessary. It is expected that, with the research results, a useful, reliable, reproducible, and highly applicable instrument will be developed for professionals in Gerontopsychomotricity. This tool will provide essential support for qualified, responsible, and excellent performance in working with elderly people.

Therefore, the present study aimed to develop and validate a battery for the Gerontopsychomotor Profile Record (GPR) to be used by researchers and professionals in the field of Gerontopsychomotricity as a screening tool for the psychomotor conditions of the elderly, without functional limitations.

Methodology

This methodological study followed the stages of establishing a conceptual framework: (1) the design of the battery instrument for the Gerontopsychomotor Profile Record; (2) the initial actions for its consolidation as an evaluation instrument for Gerontopsychomotricity; (3) the planning of the psychometric validation of the Gerontopsychomotricity, which includes item relevance assessment and evaluation by psychomotor professionals applying the protocol.

The construction stages (1) and actions for consolidating the instrument (2) were conducted at *Associação Vem Ser*, located in São Paulo, and online via Google Forms, respectively.

For the instrument construction process (stage 1), referring to the first step, it focused on the theoretical foundation, to define the operational construct and its dimensionality. This step was based on a narrative review developed from an exploratory bibliographic review. The keywords used in the search for bibliographic material were: aging, motricity, gerontology, assessment, and longevity. Based on these terms, scientific articles were analyzed from the databases of the *Scientific Electronic Library Online* (Scielo), Medline, and PubMed, along with a complementary search for technical and informative notes and epidemiological bulletins available on the websites of the World Health Organization and the Ministry of Health.

Inclusion criteria were defined as follows: research available in Portuguese, English, and Spanish, which had used the instrument to assess content in educational health materials and had been published between 2013 and 2023. Excluded materials included editorials, letters to the editor, reflective studies, experience reports, conference proceedings, and duplicate publications in the databases.

For the theoretical support of the instrument's evaluated items, references based on the principles of instructional design were used, defined as a systematic action for planning and constructing teaching methods and/or materials. This instrument considers psychomotor focuses (Breathing, Tonicity, Balance, Lateralization, Body Awareness, Spatial Structuring, Temporal Orientation, Global and Fine Praxia).

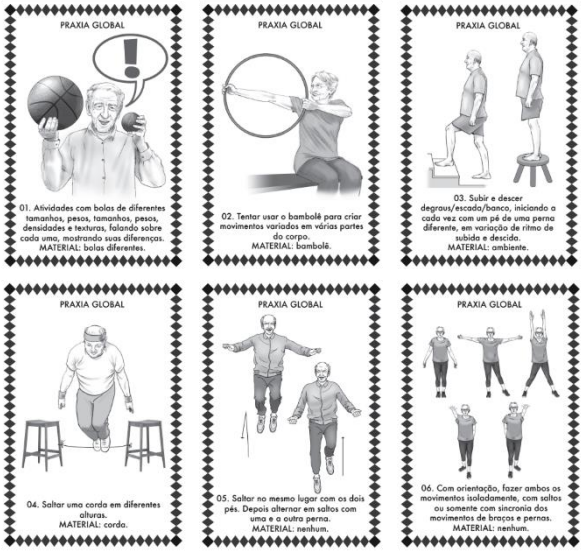
Figure 1 – Fine Praxia Tests

Source: Prepared by the authors (2024).

The construction of the instrument (stage 2) refers to the elaboration or selection of its content based on the operational definitions of the construct. The conceptual framework stage allowed the construction of 58 items: 14 tests for Fine Praxia (Figure 1); 6 tests for Global Praxia (Figure 2); 5 tests for Spatial Structuring (Figure 3); 4 tests for Temporal Orientation (Figure 4); 5 tests for Body Awareness (Figure 5); 7 tests for Lateralization (Figure 6); 8 tests for Balance (Figure 7); 4 tests for Tonicity (Figure 8); 5 tests for Breathing (Figure 9).

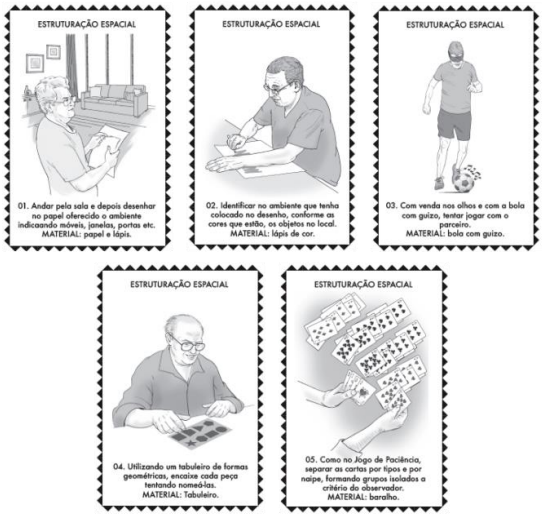
Considering psychomotor retrogenesis as the object of this instrument, the applied tests are listed below in the order in which they occur during the aging process (from Fine Praxia to Breathing). These tests were organized into specific CARDS for each of the nine psychomotor focuses, created to facilitate their applicability for the professionals who will use them.

Figure 2 – Global Praxia Tests



Source: Prepared by the authors (2024).

Figure 3 – Spatial Structuring Tests

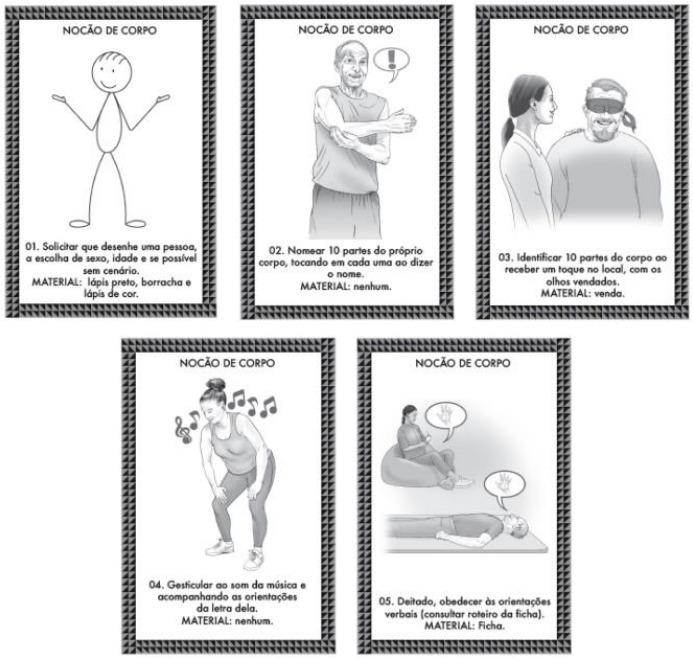


Source: Prepared by the authors (2024).

Figure 4 – Temporal Orientation Tests

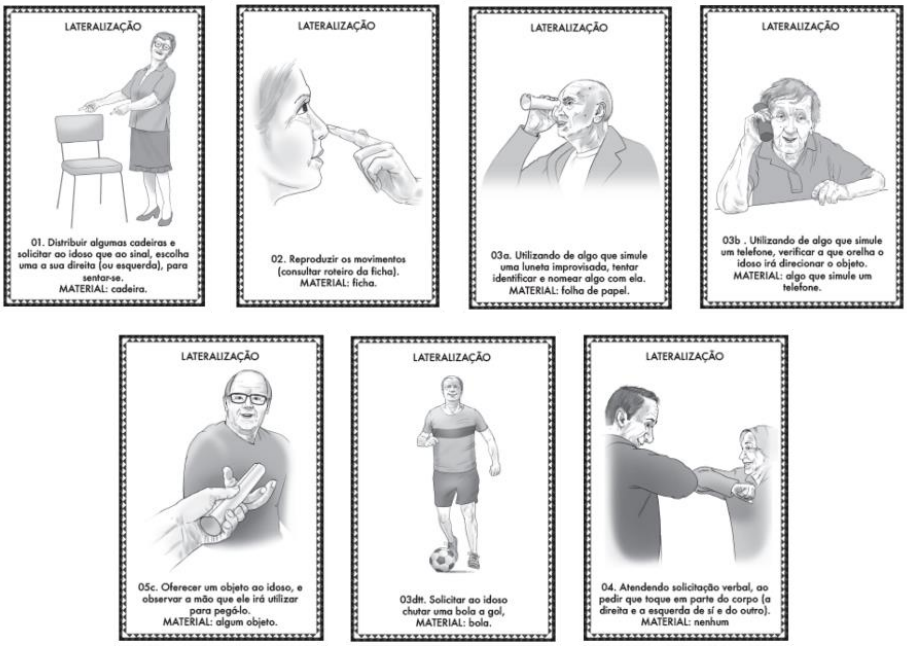
Source: Prepared by the authors (2024).

Figure 5 – Body Awareness Tests



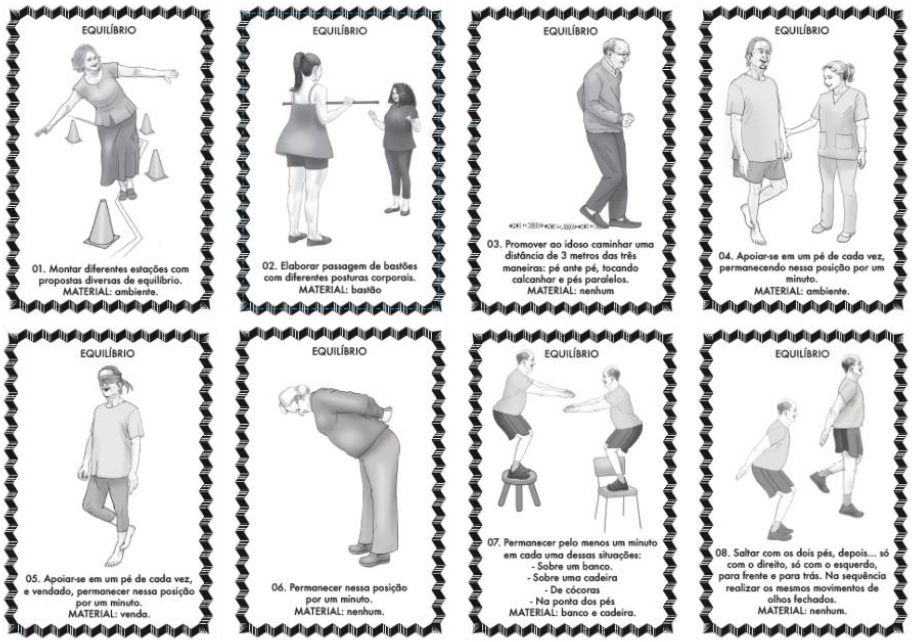
Source: Prepared by the authors (2024).

Figure 6 – Lateralization Tests



Source: Prepared by the authors (2024).

Figure 7 – Balance Tests



Source: Prepared by the authors (2024).

Figure 8 – Tonicity Tests

Source: Prepared by the authors (2024).

Figure 9 – Breathing Tests

Source: Prepared by the authors (2024).

For stage 3, 21 specialists were recruited, selected by judgment, who met the following inclusion criteria: possessing a degree in psychomotricity or having more than one year of professional experience (clinical, teaching, or research) in psychomotricity, having access to the online questionnaire, and agreeing to participate in the study by selecting "yes" in the digital

Free and Informed Consent Form (TCLE). The exclusion criteria included specialists who did not respond to the study invitation and those without knowledge of the Portuguese language.

At this stage of the protocol, the experts provided their evaluative feedback by rating each code of the instrument based on clarity and relevance, using a scale from 1 to 5. The instructions for item evaluation provided to the experts included a 5-point Likert scale. At the end of the evaluation for each test, they were asked to leave a comment or suggestion for each item, if necessary. In addition to the written portion of the evaluation battery, the experts were provided with a video demonstrating the execution of each test.

The sample characteristics were analyzed through descriptive statistics, using measures of central tendency and variability for quantitative variables and relative percentages for categorical variables, according to the normality of the data, assessed by the Shapiro-Wilk test. To measure the level of agreement among the experts regarding each item, the Content Validity Coefficient (CVC) was used, which evaluates reliability and consistency (Balbinotti, 2005; Hernandéz-Nieto, 2002). The analyses were performed using JASP software (version 0.15), adopting a significance level of 5% ($p<0.05$) and an agreement threshold of 80% as a decision criterion for the relevance of the instrument's item, or its modification, with a ($CVC \geq 0.80$).

The Content Validity Coefficient (CVC_i), proposed by Hernandez-Nieto (2002), was calculated for each item of the instrument (CVC_c) and for the instrument as a whole (CVC_t), both generally and according to the theme, as demonstrated in the calculations below:

Content Validity Coefficient (CVC_i)[6]

$$CVC_i = \frac{Média\ das\ pontuações}{Valor\ máximo\ que\ o\ item\ pode\ alcançar}$$

Source: Prepared by the authors (2024).

Content validity coefficient for each item of the instrument (CVC_c); Content Validity Coefficient; Correction Factor – considering the number of judges in the evaluation (Pe_i)

$$CVC_C = CVC_i - Pei$$

Source: Prepared by the authors (2024).

Correction Factor – considering the number of judges in the evaluation (Pe_i); Number of evaluators (J)

[6] Top translation: Average of the scores; Bottom translation: Maximum value the item can achieve.

$$Pe_i = \left(1/J\right)^J$$

Source: Prepared by the authors (2024).

Validity Coefficient for the Entire Instrument (CVC_t); Content Validity Coefficient (CVC_i); Correction Factor – Considering the Number of Judges in the Evaluation (Pe_i)

$$CVC_t = \text{Média}(CVC_i) - Média(Pe_i)$$

Source: Prepared by the authors (2024).

Validity Coefficient for the Entire Instrument (CVC_t); Content Validity Coefficient (CVC_i); Correction Factor – Considering the Number of Judges in the Evaluation (Pe_i)

Results

The gerontopsychomotor assessment battery was developed based on nine psychomotor dimensions: Breathing (5 items), Tonicity (4 items), Balance (8 items), Lateralization (7 items), Body Awareness (5 items), Spatial Structuring (5 items), Temporal Orientation (4 items), Global Praxis (6 items), and Fine Praxis (14 items).

Invitations were extended to 23 experts to form the committee, and 21 responded by completing the questionnaire. Of these, 4 had expertise in the field of instrument validation. The majority were female, representing 90.5% (n=19), with 80% (n=17) having a background in psychomotricity, 67% (n=14) having over 15 years of experience, 29% (n=6) holding a Master's degree, and 9.5% (n=2) holding a Doctorate. Among them, 71.4% (n=15) had published articles in indexed journals in their field of expertise (Table 1).

After evaluation by the expert committee, all domains of the instrument achieved a Content Validity Index (CVI) of ≥ 0.968. This was achieved following the incorporation of the experts' suggestions, including grammatical adjustments, replacement of terms deemed difficult to understand, and changes to the sequence of items.

Table 1 - Participant Characteristics

Characteristics	
Average age (SD) years	53,15 (6,88)
Gender	
- *- Female (n%)*	19 (94,5)
- *- Male (n%)*	2 (5,5)
Location	
- *- São Paulo*	13(61,9)
- *- Rio de Janeiro*	7 (34,0)
- *- Porto Alegre*	1 (4,1)
Title	
- *- Specialist*	13 (61,9)
- *- Master's degree*	6 (28,6)
- *- Doctorate*	2 (9,5)
Time in the profession	
- *- Between 05 - 10 years*	8 (38,0)
- *- Between 10 and 15 years*	5 (24,0)
- *- More than 20 years*	8 (38,0)

Legend: Participants (n), Percentage (%).
Source: Prepared by the authors (2024).

Regarding the experts' judgments on clarity, the average Content Validity Index (CVI) for the items was 0.96 (Table 2). All items across the nine psychomotor dimensions evaluated had values above 0.91.

Regarding the assessment of relevance performed by the experts, the average CVI for the items was 0.97 (Table 3). All items across the nine psychomotor dimensions evaluated had values above 0.92.

After the content validation by the judges for all items and components evaluated, the instruments were subjected to semantic validation by the expert committee. This committee suggested changes, all of which were incorporated if deemed relevant to each test, while suggestions that did not significantly contribute to the improvement of the instruments or were not relevant to the issue under review were discarded.

Table 2 - Content Validity Indices Obtained from the Experts' Evaluation of the Clarity of the Gerontopsychomotor Assessment Battery

Clarity						
ITEM		**AVERAGE**	**CVCi**	**Pei**	**CVCc**	**CVC total**
FINE PRAXIS	1. Match Alphabet	4,857	0,971	0,00	0,971	0,961
	2. Shuttlecock	4,762	0,952	0,00	0,952	
	3. Bow	4,952	0,990	0,00	0,990	
	4. Paper Balls	4,714	0,943	0,00	0,943	
	5. Tic Tac Toe	4,714	0,943	0,00	0,943	
	6. Chopsticks	4,857	0,971	0,00	0,971	
	7. Finger Picking	5,000	1,000	0,00	1,000	
	8. Heart	4,857	0,971	0,00	0,971	
	9. Giant Needle	4,905	0,981	0,00	0,981	
	10. Necklace	4,8 (57	0,971	0,00	0,971	
	11. Entering the House	4,810	0,962	0,00	0,962	
	12. Eating	4,762	0,952	0,00	0,952	
	13. What Could It Be?	4,571	0,914	0,00	0,914	
	14. “Funny” Smells	4,619	0,924	0,00	0,924	
GLOBAL PRAXIS	1. Passing the ball	4,667	0,933	0,00	0,933	0,949
	2. Hula hopping	4,714	0,943	0,00	0,943	
	3. Steps	4,762	0,952	0,00	0,952	
	4. Jump rope	4,714	0,943	0,00	0,943	
	5. Jumps	4,905	0,981	0,00	0,981	
	6. Jumping jacks and jumping jacks	4,714	0,943	0,00	0,943	
SPATIAL STRUCTURE	1. Room topography	4,714	0,943	0,00	0,943	0,945
	2. Coloring	4,905	0,981	0,00	0,981	
	3. Blind football	4,714	0,943	0,00	0,943	
	4. Fitting	4,571	0,914	0,00	0,914	
	5. Playing cards	4,714	0,943	0,00	0,943	
TEMPORARY ORIENTATION	1. Player	4,762	0,952	0,00	0,952	0,960
	2. Personal story	4,952	0,990	0,00	0,990	
	3. Repeat the following sentences	4,905	0,981	0,00	0,981	
	4. Stamback Mira Test	4,571	0,914	0,00	0,914	
BODY CONCEPT	1. Drawing the Human Figure	4,905	0,981	0,00	0,981	0,983
	2. Naming	5,000	1,000	0,00	1,000	
	3. Feeling	4,952	0,990	0,00	0,990	
	4. Singing Tin Doll	4,810	0,962	0,00	0,962	
	5. Proprioceptive Relaxation	4,905	0,981	0,00	0,981	
LATERIZATION	1. Musical Chairs	4,905	0,981	0,00	0,981	0,988
	2. Movement Reproduction	4,952	0,990	0,00	0,990	

	3a. Visual Identification	4,810	0,962	0,00	0,962	
	3b. Auditory Identification	5,000	1,000	0,00	1,000	
	3c. Manual Identification	5,000	1,000	0,00	1,000	
	3d. Pedal Identification	4,905	0,981	0,00	0,981	
	4. Right and Left Recognition	5,000	1,000	0,00	1,000	
BALANCE	1. Balance Circuit	4,810	0,962	0,00	0,962	0,960
	2. Stick Dance	4,857	0,971	0,00	0,971	
	3. Walker	4,952	0,990	0,00	0,990	
	4. Soft Foot	4,905	0,981	0,00	0,981	
	5. Soft Foot with Eyes Closed	4,762	0,952	0,00	0,952	
	6. Flexed Trunk	4,619	0,924	0,00	0,924	
	7. Balance for One Minute	4,571	0,914	0,00	0,914	
	8. Hops	4,905	0,981	0,00	0,981	
TONE	1. Tug of War	4,810	0,962	0,00	0,962	0,962
	2. Extensibility	4,714	0,943	0,00	0,943	
	3. Diadochokinesis	4,857	0,971	0,00	0,971	
	4. Strength	4,857	0,971	0,00	0,971	
BREATHING	1. Diaphragmatic Breathing	4,810	0,962	0,00	0,962	0,962
	2. Inspiration	4,857	0,971	0,00	0,971	
	3. Expiration	4,905	0,981	0,00	0,981	
	4. Apnea	4,714	0,943	0,00	0,943	
	5. Practice	4,762	0,952	0,00	0,952	
TOTAL						0,963

Legend: Initial Content Validity Coefficient (CVC_i); Final Content Validity Coefficient (CVC_c); Correction Factor - Considering Number of Judges in the Evaluation (Pe_i)
Source: Prepared by the authors (2024).

Table 3 – Content Validity Indices Obtained from the Experts' Evaluation of the Relevance of the Gerontopsychomotor Assessment Battery

Relevance						
ITEM		**AVERAGE**	**CVCi**	**Pei**	**CVCc**	**CVC total**
FINE PRAXIS	1. Match Alphabet*	5,000	1,000	0,00	1,000	0,969
	2. Shuttlecock	4,762	0,952	0,00	0,952	
	3. Bow	5,000	1,000	0,00	1,000	
	4. Paper Balls	4,952	0,990	0,00	0,990	
	5. Tic Tac Toe	4,619	0,924	0,00	0,924	
	6. Chopsticks	4,952	0,990	0,00	0,990	
	7. Finger Picking	5,000	1,000	0,00	1,000	
	8. Heart	4,857	0,971	0,00	0,971	
	9. Giant Needle	4,857	0,971	0,00	0,971	
	10. Necklace	4,952	0,990	0,00	0,990	

	11. Entering the House	4,905	0,981	0,00	0,981	
	12. Eating	4,762	0,952	0,00	0,952	
	13. What Could It Be?	4,619	0,924	0,00	0,924	
	14. “Funny” Smells	4,619	0,924	0,00	0,924	
GLOBAL PRAXIS	1. Passing the ball	4,905	0,981	0,00	0,981	0,965
	2. Hula hopping	4,952	0,990	0,00	0,990	
	3. Steps	4,762	0,952	0,00	0,952	
	4. Jump rope	4,619	0,924	0,00	0,924	
	5. Jumps	4,857	0,971	0,00	0,971	
	6. Jumping jacks and jumping jacks	4,857	0,971	0,00	0,971	
SPATIAL STRUCTURE	1. Room Topography	5,000	1,000	0,00	1,000	0,977
	2. Coloring	5,000	1,000	0,00	1,000	
	3. Blind Football	4,476	0,895	0,00	0,895	
	4. Fitting	5,000	1,000	0,00	1,000	
	5. Playing Cards	4,952	0,990	0,00	0,990	
TEMPORARY ORIENTATION	1. Player	4,905	0,981	0,00	0,981	0,971
	2. Personal story	5,000	1,000	0,00	1,000	
	3. Repeat the following sentences	4,905	0,981	0,00	0,981	
	4. Stamback Mira Test	4,619	0,924	0,00	0,924	
BODY CONCEPT	1. Drawing of the human figure	4,952	0,990	0,00	0,990	0,985
	2. Naming	5,000	1,000	0,00	1,000	
	3. Feeling	5,000	1,000	0,00	1,000	
	4. Singing Tin Doll	4,810	0,962	0,00	0,962	
	5. Proprioceptive Relaxation	4,857	0,971	0,00	0,971	
LATERIZATION	1. Musical Chairs	5,000	1,000	0,00	1,000	0,982
	2. Reproduction of movements	5,000	1,000	0,00	1,000	
	3a. Visual Identification	4,810	0,962	0,00	0,962	
	3b. Auditory Identification	5,000	1,000	0,00	1,000	
	3c. Manual Identification	4,762	0,952	0,00	0,952	
	3d. Pedal Identification	4,810	0,962	0,00	0,962	
	4. Recognition of Right and Left	5,000	1,000	0,00	1,000	
BALANCE	1. Balance Circuit	4,952	0,990	0,00	0,990	0,970
	2. Stick Dance	4,905	0,981	0,00	0,981	
	3. Walker	5,000	1,000	0,00	1,000	
	4. Soft Foot	5,000	1,000	0,00	1,000	
	5. Soft Foot with Eyes Closed	4,857	0,971	0,00	0,971	
	6. Flexed Trunk	4,714	0,943	0,00	0,943	
	7. Balance for One Minute	4,429	0,886	0,00	0,886	
	8. Hops	4,952	0,990	0,00	0,990	
TONE	1. Tug of War	4,762	0,952	0,00	0,952	0,974
	2. Extensibility	4,857	0,971	0,00	0,971	

	3. Diadochokinesis	5,000	1,000	0,00	1,000	
	4. Strength	4,857	0,971	0,00	0,971	
BREATHING	1. Diaphragmatic Breathing	4,857	0,971	0,00	0,971	0,966
	2. Inspiration	4,952	0,990	0,00	0,990	
	3. Expiration	4,905	0,981	0,00	0,981	
	4. Apnea	4,762	0,952	0,00	0,952	
	5. Practice	4,667	0,933	0,00	0,933	
TOTAL						0,973

Legend: Initial Content Validity Coefficient (CVC_i); Final Content Validity Coefficient (CVC_c); Correction Factor - Considering Number of Judges in the Evaluation (Pe_i)
Source: Prepared by the authors (2024).

Below, we describe the improvements and additional instructions that were possible for the application of each test, corresponding to each focus area (Chart 1).

Chart 1 - Description of the Development of Tests According to the Gerontopsychomotor Focus Areas

FINE PRAXIS	
Match Alphabet	Match Alphabet Use popsicle sticks, because they are larger, for those with a high level of difficulty in this approach and with low vision.
Shuttlecock	Shuttlecock Demonstrate what a shuttlecock is to those who are unfamiliar with it.
Paper Balls	Paper Balls Suggestion of papers being of different colors, for color-blind people. Document the lateral dominance of the hand in this application.
Chopsticks	Chopsticks Consider the ability to use chopsticks with one or two hands, considering the level of difficulty each person has, also for cultural reasons.
Giant Needle	Giant Needle String with a stiffer tip to facilitate initial handling.
Necklace or Bracelet	Necklace or Bracelet Be careful with the size of the clips, eliminating difficulties that may arise with very small and thin ones.
Entering the Playhouse	Entering the Playhouse Offer different sizes of buttons and houses. It can be done on a piece of clothing to be worn or not. The buttons should be placed on the house with both hands and, if possible, quantify the execution time, which will give us a parameter of the difficulty each person has.
Eating	Eating Respect cultural differences in the way of eating
	GLOBAL PRAXIS
Hula Hooping	Make adaptations for those who have never had contact with the hula hoop.
Steps	Be careful with the bench used, making sure it has good support to prevent falls.
Jump Rope	Consider the height and intensity of the “rope-jumping”, creating all possible adaptations that take into account each profile.
Jumps	Be careful with the elderly person's history to perform the exercise safely, according to each person's clinical conditions.
Jumping Jacks and Polyshoes	The same concern as the previous test, analyze the clinical conditions to make adaptations for performing these movements.
	SPATIAL STRUCTURE
Blind Football	Be careful with the blindfold and the ball with a bell, suggest moving with help if necessary.
	TEMPORAL ORIENTATION
Player	Possibility of using musical instruments.

Personal History	Adjust the timing of the story.
Repeating Phrases	Adjust the length of the sentences and some variations in more fragile cases.
	BODY NOTION
Feeling	Be careful with elderly people with neuropathies who may not respond positively to the test.
Proprioceptive Relaxation	Avoid using incense or music / have options for sitting.
	LATERALIZATION
Musical Chairs	Make it very clear which chair will be used to sit, with clear rules of execution.
Visual Identification	Be careful with elderly people with visual impairments.
Auditory Identification	Be careful with elderly people with hearing impairments.
Manual Identification	Be careful to offer material without directing it to a specific hand.
Pedal Identification	If necessary, provide assistance.
	BALANCE
Balance Circuit	Make adaptations for elderly people with labyrinth problems.
Stick Dance	Option of using other materials, such as fabrics.
Walker	Isolate the proposal at different times and orientations in relation to the position of the feet.
Limp Foot with Eyes Closed	Be careful with the blindfold.
	TONICITY
Tug of War	Balance the length of the rope, signaling its middle. Ensure that the test applicator positions himself appropriately during the test next to the elderly person.
Strength	Explain which muscle group the “strength” is being tested for.
Exhalation	A more complex situation can be created for this.
Apnea	The objective will be to check synkinesis.
Practice	Be careful with the balloons used, so as not to generate overload.
Extensibility	Indicate the desired degrees for the test score.

Source: Prepared by the authors (2024).

Discussion

The development of this assessment instrument was based on the Fundamentals of Gerontopsychomotricity, as developed by Professor Vitor da Fonseca over many years of clinical experience. He created a psychomotor assessment model subdivided into 7 psychomotor focus areas (or factors), distributed according to Luria's neuropsychological model, confirming the model of functional organization and giving meaning to the principle of the brain's structural hierarchy (Fonseca, 2009).

The focus on Respiration is not listed as a factor in Professor Vitor da Fonseca's works; however, he acknowledges it as fundamental in his lectures and personal guidance with the author, being the basis of Luria's three functional units. Considering the endorsement of this

esteemed professional, an international reference in our field, we included it in our list, as the first psychomotor focus area (Fonseca, 1995). Among the 8 focus areas presented (Respiration, Tonicity, Equilibration, Lateralization, Body Awareness, Spatial-Temporal Structuring, Global Praxia, and Fine Praxia), we separated SPATIAL-TEMPORAL STRUCTURING into Spatial Structuring and Temporal Orientation (Martins *et al*., 2017).

Elderly individuals often experience changes in their sense of space and time, which are not solely attributed to the aging process but are related to diseases associated with aging. Some individuals become spatially disorganized but maintain a good rhythm, while others may not be as spatially disorganized but lose track of time entirely. By keeping these two notions together, we might not receive an accurate representation of the elderly individual's condition, as these aspects often interact. Therefore, we separated the analysis, observation, and attention into 5 tests for Spatial Structuring and 4 tests for Temporal Orientation.

Numerous assessment instruments are applied to this population, evaluating intellectual functioning, personality, psychopathology, emotional functioning, information, memory and concentration, autonomy and functional capacity, quality of life, executive functions, language, and more. Some of these instruments predominantly focus on motor or cognitive aspects, thereby not providing a comprehensive view of the assessed individuals (Camara *et al*., 2008; Martins *et al*., 2017).

In light of the above, the development of the Gerontopsychomotor Assessment Battery was deemed necessary. Its application aims to assess the psychomotor status of elderly individuals, considering their aging in terms of retrogenesis. The goal is to identify the most affected areas and those that remain active and strong. To achieve this record, it is essential to work from the foundation of psychomotor principles, following the sequence of human retrogenesis. The deterioration of psychomotor organization begins with fine praxia and extends over time to tonicity (Fonseca, 2009). Our study added respiration as the final psychomotor focus for analysis, as it represents our finitude.

FINE PRAXIA is the last competency acquired during development, involving the maturation of the cerebral cortex. The uniqueness of our species lies in this ability, which other species do not possess: the use of our hands, extremities, and body segments—skills that we develop with primacy, representing psychomotor refinement. As we age, this refinement is often the first to decline, either being lost or maintained with significant difficulty.

Following this is Global Praxia, which encompasses the overall performance of our body in space, interacting with objects and people within an ecosystem. Disorganization in this

area manifests as we age (Aubert; Albaret, 2012), particularly affecting the coordination of rapid movements (Guimarães; Santos; Lebre, 2020).

The main causes of changes in this area include decreased reaction time, lack of coordination, loss of muscle mass and strength, reduced flexibility and elasticity, and diminished joint range (Aubert, Albaret, 2012; Guimarães, Santos, Lebre, 2020; Juhel, 2010;). SPATIAL STRUCTURING is significantly impacted once Global Praxia weakens. The body's spatial awareness, location, and precision are lost and disorganized in the elderly's lived contexts, often necessitating physical adaptations to their living environment to ensure accessibility and support during movement.

TEMPORAL ORIENTATION is closely related to memory, rhythm, and the synchrony of the elderly person's life. Anxiety and depression in some individuals lead to temporal imbalance and a complete distortion of temporal perception. Some experience an excess of the past (depression), others an excess of the future (anxiety), and some show an excess of the present (stress).

BODY AWARENESS is visibly apparent in aging. Physical transformations psychomotorically affect the elderly, leading to dissatisfaction, denial, mourning, and difficulty in acceptance, which impacts body image and significantly manifests retrogenesis.

LATERALIZATION is one of the focus areas least affected by aging. This is because it relates to a neurological maturity acquired over a lifetime of use and disuse, resulting in minimal loss. Therefore, our manual, pedal, auditory, and visual lateral dominance remains, although performance may show some changes. This focus prioritizes the body's relationship to all its sides (inside, outside, front, back, above, below, right, and left).

BALANCE is sensitive to changes, vulnerabilities, and concerns related to advanced age. Considering muscle loss and the effects of gravity on the body, elderly individuals frequently require additional supports and aids to address balance challenges.

As commonly known, TONICITY is the most widely recognized psychomotor focus in terms of impairment, but it is only one part of this psychomotor loss scale. It is crucial to emphasize that it heavily depends on the elderly person's lifestyle. If they remain active, engage in regular movement, and maintain healthy habits and diet, this loss may occur more slowly and be more manageable.

Finally, the RESPIRATION focus is part of this Gerontopsychomotor Record, as functional ventilatory capacity in aging is compromised by both lung and heart functions. This

highlights the importance of documenting the elderly person's inhalation, exhalation, and apnea process.

The nine psychomotor focuses described above are present in some assessment batteries for the elderly, wholly or partially, sometimes under different terminologies (Fonseca, 2009; Hua *et al*., 2021; Rosa Neto, 2011;). They are also found in assessments for children (Amorim, Parreiral, Santos, 2022; Fonseca, 1995; Michel, Soppelsa, Albaret. 2011; Silva *et al*., 2022), underscoring the importance of their inclusion in the present Gerontopsychomotor Battery.

The validation process for this instrument began with the establishment of an Evaluation Committee. The selection of members was based on two main criteria: working with elderly individuals for over 5 years and being a Psychometrician or having significant experience in the field. It is noteworthy that most psychometricians in Brazil are women, resulting in a reduced male sample of only two professionals. Many of these professionals are located in the country's southeastern region, particularly in Rio de Janeiro and São Paulo.

Given this mapping, we recognize the significant need to disseminate this instrument to other regions of the country, considering the increasing elderly population and the lack of public policies addressing this demand. We found few validated gerontopsychomotor assessment scales for the elderly (Fonseca, 2009; Hua *et al*., 2021; Rosa Neto, 2011), and none specifically validated for the elderly in Brazil.

To address this situation, professionals often use unidimensional scales such as tests for cognitive and executive functions, visual perception, perceptual and spatial tests, balance scales, and general functionality identification.

National and international literature includes studies with tests applied not exclusively to Gerontopsychomotricity. These studies address aspects that are relevant not only to gerontopsychomotor work but also to other therapeutic areas, such as emotional, pedagogical, and physiotherapeutic (Fonseca, 2009; Hua *et al*., 2021; Rosa Neto, 2011). Among the most relevant national studies, Rosa Neto's (2009) stands out for being the closest to Gerontopsychomotricity, although it is a valid instrument for evaluating motor parameters in elderly individuals.

In other countries, such as France, the Examen Géronto-Psychomoteur (EGP) is available, developed by Michel, Soppelsa, and Albaret (2011). This examination aims to provide information on the capacities and compensatory mechanisms of the cognitive-motor structure of elderly individuals, offering a better understanding of their overall functioning. This instrument has been validated for use in countries such as Portugal, Uruguay, and Lebanon

(Aubert; Albaret, 2012). It consists of 17 items that assess some psychomotor focuses and includes items that are not part of Psychomotricity, making it not exclusively a gerontopsychomotor instrument. Despite this, it is a fully reliable, valid, and easily applicable method, though some articles mention the need to adapt it for the Brazilian population with some adjustments.

For instance, its application to a large number of individuals becomes complex (Hernandéz-Nieto, 2002). Another issue is that this instrument provides results that support a three-factor model: cognition, motor function, and physical aspects, which are not entirely or exclusively gerontopsychomotor. In Brazil, this assessment tool has undergone translation and adaptation for Brazilian Portuguese (Hua; Fernandes; Safons, 2019), ollowed by a process of validity and reliability assessment for use in the Brazilian context (Hua *et al*., 2021). However, it is an exam that is not yet available for application in the national territory.

We also observed that the general articles consulted often target frail elderly individuals, either due to dementia (Morais; Santos; Lebre, 2017) or various therapeutic processes (Guimarães; Santos; Lebre, 2020). Thus, they do not provide justifiable comparisons, as our Gerontopsychomotor Profile Record Instrument is intended for active and healthy elderly individuals, which seems to be lacking in our scientific research.

This Gerontopsychomotor Assessment and Record Instrument represents an innovation in the field of Psychomotricity in Brazil, especially considering the scarcity of validated professionals and tools focused on working with the elderly population. Psychomotricity is widely recognized and applied in childhood, during school years, and in therapeutic processes aimed at human development. However, the field of Psychomotricity applied to the elderly, specifically Gerontopsychomotricity, is poorly documented and studied, addressing aspects of human retrogenesis.

Based on the accumulated experience over the past 40 years, it is observed that the science of Psychomotricity has limited scientific documentation, especially in its specialization, Gerontopsychomotricity. The development of this instrument is grounded in the application of theoretical knowledge and practical activities developed over the years, focusing on the aging process. This instrument is authentic in its psychomotor approach and aims to address the phenomenon of retrogenesis in the aging population in general, differentiating it from traditional Profile Record instruments.

The next and final step involves applying this assessment battery to the elderly population to confirm that the instrument is acceptable, reliable, easy to apply, and sufficiently grounded to meet any necessary requirements for its validation.

Final considerations

The Gerontopsychomotor Assessment Battery has demonstrated acceptable psychometric qualities for evaluating psychomotor aspects among elderly individuals. The overall Content Validity Index, concerning the clarity and relevance of the items and questions, was deemed satisfactory.

The items in the instrument were found to be appropriate for the intended purpose. Regarding clarity, the Content Validity Index showed a mean score of 0.96. For relevance, as assessed by experts, the Index achieved a mean score of 0.97. These results reflect the objective definition and alignment between evaluative concepts and item descriptions.

Among the study's limitations, the difficulty in including qualified evaluators due to the profession's specificity and the concentration of these professionals in a single region of the country stands out. However, it is crucial to highlight the essential participation of these specialists in the validation process. Their contributions extended beyond effective evaluation, refining the Gerontopsychomotor Battery and allowing for a clearer and more objective description of each item.

Although some observational and evaluative tools focus on aging, no instrument has yet comprehensively addressed the psychomotor aspects of human retrogenesis as the proposed instrument does. Most available tools either exclusively address aspects of Psychomotricity or focus on other specific areas.

Another significant aspect of this study is the instrument's applicability, which will aid in creating a Profile Record for each elderly individual attended by Gerontopsychomotor practitioners. This will facilitate the development of personalized and effective intervention programs for this population, considering the specific characteristics of the Brazilian context. It is important to note that due to the constant evolution of scientific research, future studies should explore different aspects of the construct validity of this measure.

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CRediT Author Statement

Acknowledgements: Not Applicable.

Funding: Not Applicable.

Conflicts of interest: No conflicts of interest.

Ethical approval: Approved by the Ethics Committee of the University of Guarulhos (UNG), Guarulhos, Brazil (CAAE: 67624723.3.0000.5506 / Number: 6.090.953).

Availability of data and material: Due to general data protection laws, data will not be made available.

Author contributions: Author – Conceptualization of the article, data collection, writing of the article, and final revision. Co-author 1 – Data collection, writing of the final article. Co-author 2 – Data collection, writing of the final article. Co-author 3 – Assistance in developing the Gerontopsychomotor Battery, writing of the final article. Co-author 4 – Methodological guidance in the creation of the Gerontopsychomotor Battery, data analysis, and writing of the final article.

Processing and editing: Editora Ibero-Americana de Educação.
Proofreading, formatting, normalization and translation.