

Analysis of the internal consistency of the portuguese version of the Dynamic Occupational Therapy Cognitive Assessment for Children (DOTCA-Ch) in students aged 06 to 12 years old

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Abstract: Introduction: The Dynamic Occupational Therapy Cognitive Assessment for Children (DOTCA-Ch) was constructed in 2004 in Israel at Loewenstein Hospital with the proposal to evaluate the cognitive performance of children aged 6 to 12 years old in 22 subtests distributed in five cognitive areas: Orientation, Space Perception, Praxis, Visual-motor Construction, and Thought Operations. For each subtest, there is a structured choice of up to five levels of mediation. Objective: To analyze the internal consistency of the Portuguese version of the DOTCA-Ch battery in students of the municipal teaching system of Santos, São Paulo, Brazil. Method: The study was carried out in partnership with the Secretary of Education of the municipal of Santos, in a school municipal, with 90 students of both genders, distributed between the 1st and 7th grades, evaluations were carried out in the period from August 2015 to November 2016. Data were analyzed by domains, evaluating the internal consistency of the instrument. Results: The Cronbach's alpha value points to very high reliability ($\alpha = 0.92$) of the battery in the evaluation of students in regular education. We can identify that they benefit from mediations, especially in more complex cognitive areas such as Praxis and Thinking Operations. Conclusion: The Portuguese version of the DOTCA-Ch battery presented excellent internal consistency for the use of students aged 6 to 12 years old. In this way, a dynamic instrument of reliable cognitive evaluation is available to professionals in the field of Occupational Therapy to be used in evaluations and interventions that consider an integrality of the child, his unique way of thinking and doing.

Keywords: *Occupational Therapy, Child, Cognition, Education, Primary and Secondary.*

Análise da consistência interna da versão em português da Avaliação Cognitiva Dinâmica de Terapia Ocupacional para Crianças (DOTCA-Ch) em estudantes de 06 a 12 anos

Resumo: Introdução: A Avaliação Cognitiva Dinâmica de Terapia Ocupacional para Crianças (DOTCA-Ch) foi construída em 2004 em Israel no hospital de *Loewenstein* com a proposta de avaliar o desempenho cognitivo de crianças com idade de 6 a 12 anos em 22 subtestes distribuídos em cinco áreas cognitivas: Orientação, Percepção Espacial, Práxis, Construção Visuomotora e Operações de Pensamento. Para cada subteste existe uma opção estruturada de até cinco níveis de mediação. Objetivo: Analisar a consistência interna da versão em português da bateria DOTCA-Ch em estudantes da rede municipal de ensino de Santos, São Paulo, Brasil. Método: O estudo foi realizado em parceria com a Secretaria de Educação, da Prefeitura Municipal de Santos, em uma escola da rede municipal de ensino, com 90 estudantes, de ambos os gêneros, distribuídos entre 1º e 7º anos, as avaliações foram

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realizadas no período de agosto de 2015 a novembro de 2016. Os dados foram analisados por domínios, avaliando a consistência interna do instrumento. Resultados: O valor do *alpha de Cronbach* aponta para uma confiabilidade muito alta ($\alpha=0,92$) da bateria na avaliação de estudantes do ensino regular. Podemos identificar que eles se beneficiam das mediações, especialmente em áreas cognitivas mais complexas como Práxis e Operações de Pensamento. Conclusão: A versão em português da bateria DOTCA-Ch apresentou ótima consistência interna para ser utilizado com estudantes de 6 a 12 anos. Desta forma, estando disponível aos profissionais da área de terapia ocupacional um instrumento dinâmico de avaliação cognitiva confiável para ser utilizado em avaliações e intervenções que considerem a integralidade da criança, seu modo singular de pensar e fazer.

Palavras-chave: *Terapia Ocupacional, Criança, Cognição, Ensino Fundamental.*

1 Introduction

Children and adolescents who grew up since 1990 in Brazil are part of the first generation born after the so-called “priority revolution”. In 1989, the UN General Assembly adopted the Convention on the Rights of the Child, which was ratified in the following year in our country. The Federal Constitution (BRASIL, 1988) anticipated this international movement and guaranteed the adolescence as an absolute priority in its article 227. Consequently, in 1990, the country innovated again with the translation of these principles into more complete and detailed legislation, the Child and Adolescent Statute (ECA) (UNITED..., 2015).

There are around 59.7 million Brazilian children and adolescents. This is the equivalent of the population of Italy, according to IBGE (INSTITUTO..., 2010) data from 1991 to 2010. The Brazilians of up to 19 years old has decreased from 45% to 33%. In the last two decades, the proportion of children and adolescents in relation to the Brazilian population has been decreasing due to the aging tendency of the country. From 1990 to 2013, the percentage of children out of school, with compulsory school age fell by 64%; from 19.6% to 7%. Thus, access to 93% of their children and adolescents in elementary school was ensured (INSTITUTO..., 2013).

However, the problems related to school education, and the failure of teaching and learning difficulties are recurrent in Brazil, the subject of several discussions. Many authors have pointed to the high occurrence of learning difficulties in elementary school students in our country (DEL PRETTE; DEL PRETTE, 2003). Children with school difficulties usually show problems that affect their emotional and behavioral state and may interfere in their family life and interpersonal relationships (MEDEIROS; LOUREIRO, 2004).

According to Erickson (1976), socio-emotional development has different stages with its own tasks and challenges. The satisfactory resolution or

failure at a given stage influences the later stages of development. An important stage for the academic performance of children occurs from the 6 to 12 years old, which corresponds to the beginning of the school. At this stage, the child needs to learn from adults and to be competent and productive, seeking social recognition.

The maturation aspect is emphasized by Inhelder and Piaget (1976), and according to the authors, from the development of his biological and organic hereditary structures, the maturation gradually gives the child the possibility of responding to the environment in which he is inserted, to assimilate and structure new information.

School performance is a protective or vulnerability condition for further development (MARTURANO; LOUREIRO, 2003). On one hand, good academic performance and on the other hand, learning difficulties that reflect a complex set of cognitive and affective variables that guide the child’s perception of performance and recognition (LOUREIRO; MEDEIROS, 2004). According to Marturano and Ferreira (2004), the association between low school performance and social and emotional problems is worrying, since both represent central problems in childhood.

Loureiro and Medeiros (2004) affirm that the experience of academic failure in the first years of school can cause a sense of noncompliance with their psychosocial tasks, interfering in the construction of feelings of low self-esteem and low self-efficacy, resulting in a decrease in adaptive capacity and vulnerability to new demands. Thus, the child who experiences the school failure can face a vicious circle of failure, identified as a failure and as the only responsible for the school difficulties. This self-perception reflects negatively on the way they deal with different situations in the family and at school (JACOB; LOUREIRO, 2004).

Every student has the right to develop his/her cognitive potential to the fullest, and governments have the responsibility to guarantee them adequate

opportunities and means (FONSECA, 2015), and the school is an institution that offers mainly opportunities for acquiring cognitive skills (SOARES, 2007).

Cognitive deficits impact every aspect of life and can create difficulties in all areas of occupation. Because of the central role of cognition in human functioning, occupational therapists must have an understanding of this cognition, and how cognitive abilities contribute to occupational performance (GRIEVE; GNANASEKARAN, 2010).

Occupational Therapy (OT) highlights the performance rather than the ability, that is, a person's ability to "do" or their function in normal environments and contexts. It is one of the major professions with the knowledge and skills to deal with the consequences of brain injuries, when the occupational therapist uses cognitive interventions or allows the person to learn new strategies, using principles of cognitive rehabilitation (KATZ, 2014).

Therefore, the OT also works with children with cognitive deficits to facilitate their participation in all areas of occupational performance, such as self-care, education, leisure, social participation, and play. These professionals trained in different areas with a broad view at educational, social and health issues, aim at the integral development of the child, promoting quality of life and preventing future aggravations.

Until now in Brazil, standardized instruments in the area of Occupational Therapy aimed at children indicated for the evaluation of the cognitive components have not been developed nor validated.

The evaluation process should be robust. This depends on the application of good clinical reasoning in a clear evaluation procedure. Many factors should be considered when deciding on evaluation tools. They are related to the patient, the service environment, the availability and usefulness of the valuation tools and their properties. Reliability, the validity of findings and intended uses of results should be included (GRIEVE; GNANASEKARAN, 2010).

According to Hayes (1995, p. 54),

[...] the validity is the degree the scale used in the questionnaire, (and consequently) it actually measures the object to measure, and reliability is defined as the degree with which the measurements are free of random errors.

Reliability is the reproducibility of a measure, and the criterion proposed for this evaluation was the internal consistency analysis (Cronbach's alpha). According to Trochim (2003), the internal consistency is the degree to which the items of the questionnaire

are correlated with each other and with the overall result of the research, representing a measure of its reliability. This is one of the statistical procedures most used to measure internal consistency - the Cronbach alpha coefficient.

The purpose of this paper is to analyze the internal consistency of the Portuguese version of the DOTCA-Ch battery applied to the population of students from 06 to 12 years old in the municipal education system of Santos, São Paulo, Brazil.

2 Method

The research and the Informed Consent Form (ICF) and the Informed Assent Form (IAF) were approved by the Research Ethics Committee of UNIFESP, under opinion 1,253,132/2015.

The study was conducted in partnership with the Department of Education (SEDUC), Santos City Hall, São Paulo, in a school of the municipal school network, in which DOTCA-Ch battery applications were carried out from August 2015 to November 2016.

This is a DOTCA-Ch battery reliability study, with a convenience sample of 90 students between 06 and 12 years old, of both genders, distributed between the 1st and 7th school grades. All participating students were instructed on the purpose of the study and agreed to participate with the consent of those responsible.

The convenience sample was used since at the beginning of an investigation, the psychometric property from the internal consistency of the instrument was checked, and the results for planning the continuity of the study were shown. In the original Noomi Katz study, 381 healthy children were evaluated in several schools in Israel (KATZ et al., 2004).

2.1 Participants

The sample had volunteer students from a school in the municipal network, located in Ponta da Praia neighborhood, with a pre-selection of the students by the school's educational counselor. The invitation to participate in the study was during the school period, with the initial sample involving 100 students, but at the time of the consent 10 of them refused to participate, totaling a final sample of 90 students.

Being active research, there is no control over all possible interferences, since the collaboration and the interest of the child to participate in the research is needed to sign the IAF and start the evaluation. The child is informed that his participation is not

mandatory and he may stop when he does not want to participate. Ten of the 100 children selected by the school coordination based on the inclusion and exclusion criteria did not agree to participate in the study, with three children refusing to receive information about the research, five children did not agree to participate after the explanation of the research, and two children gave up participating after starting the evaluation, both justified that they did not know how to perform the tasks requested during the evaluation.

Participants' eligibility criteria were: to be between 6 and 12 years old, to be enrolled and attending school, parents or guardians to sign the ICF and students to sign the IAF. The exclusion criteria of the participants were: age-grade distortion, their age being incompatible with the school grade in which they were (delayed in the school year).

2.2 Instrument

2.2.1 The Dynamic Occupational Therapy Cognitive Assessment for children (DOTCA-Ch)

The Cognitive Assessment of Occupational Therapy for Children (DOTCA-Ch) was created in 2004 by the clinical staff of the Loewenstein Rehabilitation Hospital in Israel with the purpose of evaluating the cognitive performance of children aged 6 to 12 years old, allowing the identification of potentials and limitations in the primary cognitive areas; related to function, as well as its short-term memory performance (KATZ et al., 2004).

It is a dynamic assessment instrument (KATZ et al., 2004), specific for occupational therapists with 22 subtests in five cognitive areas: Orientation, Spatial

Perception, Praxis, Visual-motor Construction and Thought Operations. For each subtest, there is a structured choice of four or five levels of mediation, as shown in Table 1.

Higher values show the need for greater assistance in the execution of the task. Each level indicates the type of mediation required for the child, being stimuli for learning, allowing better cognitive performance and guiding the onset of intervention.

Dynamic evaluation allows the identification of the learning potential of the children and their thinking strategies through the analysis of the process of mediation of the tasks (KATZ et al., 2004). Also, immediate and delayed memories are measured at 05 Visual-motor Construction subtests and the reaction time is measured in the Visual-motor Construction and Thought Operations subtests.

Table 2 shows the cognitive areas evaluated by the battery, the subtests and the number of items by subtests, and a brief description of the verified components.

The DOTCA-Ch battery is a cognitive screening and initial status evaluation aimed at establishing basic cognitive skills fundamental to occupational performance. At the end of this process, the occupational therapist must have a detailed knowledge of the patients' strong and weak cognitive components in the occupational performance (KATZ, 2014).

It is administered in three phases: the first phase is when the children are evaluated for their cognitive status, comprising the initial evaluation that is the static phase of the battery. In the second phase, the examiner provides children with hierarchically structured clues, when necessary, developed to promote their maximum learning potential; this is the dynamic phase of the battery (mediations).

Table 1. Mediation Levels of DOTCA-Ch Battery.

General Intervention	General Feedback	Specific Feedback	Structured Category	Reduced Quantity
1	2	3	4	5
The evaluator draws the attention of the child "Think", "Pay attention" to the information of the task to be developed.	The evaluator informs the child that something is not completely correct and asks questions about the task so the child can see the error.	The evaluator clarifies where the child's mistake is and asks the child to redo the task.	The evaluator shows to the child what should be done so the task is best developed. In some subtests, the evaluator begins the task and the child continues to develop it.	The task is simplified, so it maintains the initial goal, but with fewer details/actions to be developed. The evaluator develops the task, and the child observes and then performs the task again.

To verify the learning potential of the children and their responsiveness to instructions, the third phase of the DOTCA-Ch battery requires the examiner to administer only those items of the test that the children

needed to mediate immediately after performing the test, and to assess whether performance of the children improved from the initial phase, from the retest phase (post-mediation), as shown in Table 3.

Table 2. DOTCA-Ch Battery Test Item Groupings.

DOTCA-Ch Battery Test Item Groupings			
Cognitive Areas	Subtests	Items	Description
Orientation	1. Space Orientation	4	It is about the awareness of the child on the spatial and temporal orientation. In this domain, four questions related to each of these guidelines are asked.
	2. Temporary Orientation	4	
Perception Space	3. Guidelines Regarding their own Body	4	It is the ability to visually locate objects in the space, composed in part by the awareness of their position in the space, such as the determination of the spatial relationship of figures and objects with themselves and/or with other forms and objects, the ability to understand the concept of laterality and directionality and/or the understanding of the external position of an object in space in relation to him/her. Commands are performed, requesting actions and/or identifying objects.
	4. Space Relations between Child and Objects in an Upcoming Space	4	
	5. Space Relationships in a Figure	4	
Praxis	6. Motorcycle Imitation	12	It is the development and learning of the movements and their control. It is a primary means by which the child reaches the self-domain and develops skills with objects and tools in the environment. These tasks involve either the movement through the use of the object by imitation, seeing or using the actual object, or verbal command without seeing or using the object. Also, the test items include intentional movements and unintentional movements.
	7. Use of Objects	5	
	8. Symbolic Actions	5	
Visual-motor Construction	9. Copy of Geometric Figures*	1	It is the ability to integrate visual stimulus and construct or design a reproduction, involving the ability to perceive spatial relationships between component parts, to perform all relevant thinking operations, and to answer with manual movements necessary to assemble or synthesize these parts into an object. Another strategy used to achieve the sensitivity of the evaluation results is by measuring the response time of the task. In this cognitive area, the immediate and delayed memory is also evaluated against the activities performed.
	10. Reproduction of a Two-Dimensional Model*	1	
	11. Construction in the Pit Box*	1	
	12. Colored Blocks Model*	1	
	13. Simple Block Model*	1	
	14. Playing a Puzzle	1	
15. Clock Drawing	1		
Thought Operations	16. Categorization	1	It is the child's performance in thinking operations that require a basic capacity for conceptualization and includes the ability to identify discrete features of objects, organize them between hierarchies, and classify them into basic categories.
	17. Non-Structured Classification	1	
	18. Structured Classification	1	
	19. Sequence of Figures A	1	
	20. Sequence of Figures B	1	
	21. Sequence of Geometric Figures A	1	
22. Sequence of Geometric Figures B	1		

*Subtests 9 through 13 include immediate and late task building memory testing.

Table 3. Illustration of the Proposed Battery Assessment Process DOTCA-Ch.

Phase I	Phase II	Phase III
Test	Mediation	Post-Mediation
<i>(Static Phase)</i>	<i>(Dynamic Phase)</i>	<i>(Retest)</i>

Source: Novelli et al. (2015).

2.2.2 Learning potential

The complete battery application lasts approximately one to two hours, depending on the need for the mediation (UCHÔA-FIGUEIREDO et al., 2016). According to the instructions of the original researcher of the instrument, the battery can be administered in up to two sessions, and there is a proposition that the test is interrupted in the first session at the end of the Praxis domain, and resumed in the Visual-motor Construction domain.

Thus, from a dynamic evaluation of the DOTCA-Ch battery, the evaluation of the child’s limitations are proposed, without losing the focus on their abilities (KATZ et al., 2004). It is possible to promote interventions and actions that consider the integrality of the children, their unique way of thinking and doing, their potentialities and their own time for carrying out the proposed activities/tasks.

The assessment provides the insight into this information and can identify capabilities and limitations, facilitators, and barriers that the occupational therapist can use to structure a patient-centered intervention plan (UCHÔA-FIGUEIREDO et al., 2016). The occupational therapist creates a learning environment to facilitate ideal learning. In this approach, the cognition acts as a mediator between a person’s ability and performance (KATZ, 2014).

In this perspective, the DOTCA-Ch battery is a promising and specific instrument for the Occupational Therapy area, assessing both the limitations and the abilities of the children in the scope of cognitive performance.

The DOTCA-Ch battery was cross-culturally translated and adapted into Brazilian Portuguese by the research group of the occupational therapy course at UNIFESP *Baixada Santista* campus and since then, the Portuguese version has been available to use it by Occupational Therapy professionals (UCHOA-FIGUEIREDO et al., 2017).

DOTCA-Ch battery researches continue to be carried out and the students entering the research group participate in a theoretical and practical technical training of 36 hours to use the instrument. Thus, the students of the course of occupational therapy are apt to collaborate with the data collection of the

research, always supervised by the fellow student of reference.

In Brazil, the use of the DOTCA-Ch battery needs training with the instrument so training courses are conducted with the OT professionals interested in using this instrument in their professional practice.

2.3 Data collection

The application was performed individually in a room without external interference located in the school. The evaluation of the complete battery lasted approximately one to two hours according to the need of the mediation. The results were recorded on the standardized score paper sheets. Later, this score was passed to the spreadsheet of the Excel program database, and at the end, the collection was analyzed by the statistical program Statistic Package for Social Sciences (SPSS) version 17.0.

2.4 Statistical analysis

In the internal consistency analysis, a total sample of 90 students was used. The participants were characterized by measures of central tendency (mean), dispersion (standard deviation) and percentage.

This analysis was performed by the calculation of Cronbach’s alpha, a reliability index associated with the strength of the intercorrelations between the items of a given test. According to Freitas and Rodrigues (2005), the interpretation is performed from the calculation of the Cronbach’s alpha coefficient, and interpreted according to the following values: very low ($\alpha \leq 0.30$), low ($0.30 < \alpha \leq 0.60$), moderate ($0.60 < \alpha \leq 0.75$), high ($0.75 < \alpha \leq 0.90$) and very high ($\alpha > 0.90$), considering the questionnaires as satisfactory when presenting values of $\alpha > 0.60$.

3 Results and Discussion

Descriptive information on the demographic profile of the 90 students participating in this study is found in Table 4, showing that the male was predominant in 56% (n = 50). The mean age was 9.15 (± 2.01) and the distribution of the students evaluated was the most equally possible, among the ages presented below.

Table 4. Demographic profile of the participating students.

	Variables	N	%
Gender	Female	40	44
	Male	50	56
Age group	06 years old	11	12
	07 years old	11	12
	08 years old	15	17
	09 years old	13	15
	10 years old	12	13
	11 years old	12	13
	12 years old	16	18
	Mean 9.15 SD* (± 2.01)		
School grade	1 st	13	14
	2 nd	15	17
	3 rd	15	17
	4 th	08	9
	5 th	12	13
	6 th	15	17
	7 th	12	13
	Mean 3.93 SD* (± 2.04)		
Living in	Santos	86	96
	Guarujá	03	3
	Cubatão	01	1
Neighborhood	Ponta da Praia	54	60
	Aparecida	15	17
	Estuário	11	12
	Others	6	7
	Santa Cruz dos Navegantes (Guarujá)	3	3
	Vila dos pescadores (Cubatão)	1	1

*SD = Standard deviation.

All the evaluated students were between the 1st to the 7th grades of the municipal school area. The average school level was 3.93 (± 2.04) and the lowest number of students were in the 4th grade since there were many students with eight (08) years old in the second grade. This distribution was done according to the normalization of school admission Law n° 11.274/2006 (BRASIL, 2006), which makes primary education compulsory, with a duration of nine (09) years, starting at six (06) years old. Resolution 7/2010 (BRASIL, 2010) among its sections makes compulsory the enrollment in elementary education of children with six (06) complete years old or to be completed by March 31 of the year in which enrollment occurs, children who are six (06) years old after that date should be enrolled in pre-school education.

Most of the students of this study lived in Santos, totaling 96% (n = 86) students, and only four (04)

lived in neighboring cities. This school is located in a region very close to the port area, which divides the two cities *Santos – Guarujá*. Thus, it receives students who live in *Santa Cruz dos Navegantes* neighborhood due to its proximity, since the best access is through the boats. Therefore, there is a partnership established between the city halls for these students to study in Santos, and for the resident student of *Cubatão*, the facility for those who work in Santos.

More than half of the students were residents of the neighborhood where the school is located (Ponta da Praia). However, others live in two neighboring districts: Aparecida and Estuário.

The measurement property of the Portuguese version of the DOTCA-Ch battery analyzed was the internal consistency, presented in Table 5.

Based on this interpretation of Freitas and Rodrigues (2005), the DOTCA-Ch battery presented very high reliability ($\alpha = 0.92$). In the analysis of alpha values by domains, the areas Praxis and Visual-motor Construction presented high values ($0.75 < \alpha \leq 0.90$). In the areas of Orientation, Spatial Perception, Immediate Memory, Delayed Memory and Thought Operations, coefficients were considered moderate ($0.60 < \alpha \leq 0.75$).

Table 6 shows the comparison between the internal consistency values of the original study (KATZ et al., 2004) and the results of this study.

The results show that in the Spatial Perception and Thought Operation domains this study showed smaller coefficients than in the original study. In the Thought Operation, the value was $\alpha = 0.62$ and Spatial Perception with $\alpha = 0.67$ as a moderate coefficient.

The other domains Orientation, Praxis, Visual-motor Construction, and Immediate Memory showed higher coefficients in this study. In the comparison between the two studies, the cognitive area of Visual-motor Construction presented a higher coefficient than in the original study. The same is repeated in the domain Praxis and Guidance. The delayed memory domain was not analyzed in the original study and in this study, the score was $\alpha = 0.69$ considered moderate.

The results showed high internal reliability of the instrument, and it can be used with this population, according to Freitas and Rodrigues, since the value presented by the total score showed very high reliability of the battery $\alpha = 0.92$. Thus, the reality of Brazilian children, their contexts of life, their cultural, environmental and religious differences need to be considered, being possible studies to be carried out with children in different regions,

Table 5. Cronbach alpha values for the battery domains.

Domains	Cronbach alpha values
Orientation (8 items)	0.74
Space Perception (12 items)	0.67
Praxis (23 items)	0.79
Visual-motor Construction (7 items)	0.80
Immediate Memory (5 items)	0.74
Delayed Memory (5 items)	0.69
Thought Operations (8 items)	0.62
Alpha Coefficient	0.92

Table 6. Comparison between Cronbach’s alpha values between the original study and the results of this study.

Domains	Cronbach Alpha values	
	Original Study	This Study
Orientation (8 items)	0.61	0.74
Space Perception (12 items)	0.74	0.67
Praxis (23 items)	0.70	0.79
Visual-motor Construction (7 items)	0.61	0.80
Immediate Memory (5 items)	0.64	0.74
Delayed Memory (5 items)	--	0.69
Thought Operations (8 items)	0.77	0.62
Alpha Coefficient	---	0.92

addressing different realities and circumstances. Subsequent studies could be carried out with children who had a disorder in the overall development, so they would have the study with healthy children (control group) as reference parameters since we do not yet have scores for our population.

The limitations are pertinent to any research. Difficulties regarding the physical space of the institution that did not have external interference were found, compatible with the weekly evaluation of the school. As a long study due to the number of participants, the duration of the battery application per child ranging from 1h30 to 2 hours, and the difficulty of the school calendar with facultative points, holidays and semester holidays, often not compatible with the calendar of the research were also a limitation.

Another important limitation is the impossibility of the validation of the criterion, being another property that could be studied. However, in Brazil, there are not instruments considered as “gold standard”, which consists of a widely accepted measure with the same characteristics of the instrument presented here.

4 Conclusion

The Portuguese version of the DOTCA-Ch battery presented excellent internal consistency to be used with students from 6 to 12 years old, in a school

stage with normal development. Thus, a dynamic instrument of reliable cognitive evaluation to be used in evaluations and interventions is available to professionals in the area of Occupational Therapy that consider the children’s integrality, their unique way of thinking and doing.

The DOTCA-Ch battery helps occupational therapists to have better working conditions using a reliable resource for evaluation and can be used for a therapeutic plan according to the children’s performance and level of mediation that show their learning potential, understanding the strategies used by the children, and allowing the professional to develop appropriate interventions.

However, there is no perfect evaluation instrument or evaluation protocol, but it is up to the occupational therapist to have a sensitively elaborate a more adequate clinical reasoning, aiming at the potentialities and limitations of the child according to what the instrument reveals.

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Author's Contributions

Gabriela Souza dos Santos Demarchi created and structured the design of the study, participated in the data collection and analysis, drafted and review of the text. Mariana Dias Andrade participated in the data collection and review of the text. Marcia Maria Pires Camargo Novelli participated in the data analysis and internal consistency analysis process and review of the text. Noomi Katz creator of the instrument and research consultant of the battery. Lúcia da Rocha Uchôa-Figueiredo created and structured the study design, participated in the data analysis and internal consistency analysis process and review the text. All authors approved the final version of the text.