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Dissemination of a New Assessment Tool on Handwriting Readiness throughout Europe

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Abstract

Introduction: Writing Readiness Inventory Tool In Context (WRITIC) is an activity-based assessment tool to evaluate which kindergarten children are at risk of developing handwriting difficulties. WRITIC-assessment is valid, reliable, feasible, predictive, and norm-referenced. Broad international interest in translating WRITIC-assessment exists.

Objectives: Making WRITIC available to professionals internationally to enable participation in handwriting at school.

Methods: Composing translation teams with universities in different countries, back-and forth translation, cross-cultural assessment adaptation, carrying out feasibility and validation studies, starting courses for training the professionals.

Results: Translation teams have been started in different countries resulting in an English, Portuguese and Slovenian translation, validation studies in Flanders, UK, Portugal and Slovenia and translation projects in Greece, Bulgaria, Germany, Austria, and Switzerland. A Figshare environment was developed to safely store, exchange the data and to support international research. An international digital platform has been constructed to sell e-manuals, share e-learning and support people worldwide.

Conclusion: The translation and cross-cultural adaptation in different languages and the international digital platform made WRITIC-assessment accessible to children's therapists around the world with the same results: enabling school participation of all children in contributing to inclusive education.

Introduction

Despite the increasing use of computers, tablets, and smartphones, handwriting remains an important skill that children learn to participate in school (Kiefer & Velay, 2016). Handwriting is essential for learning reading and spelling. The brain has close functional relationships between the reading and writing processes (Longcamp et al., 2008). James and Engelhart (2012) stated that handwriting is important for the early conscription in letter processing of brain regions known to underlie successful reading and may facilitate reading achievement in young children (James & Engelhardt, 2012).

Although the time children spent on fine motor activities and handwriting in school has decreased over the last 20 years as technology has become more important in childhood education, primary school children still spend 18%-47% of classroom activities on fine motor activities mainly handwriting (McMaster & Roberts, 2016). Therefore, prewriting and handwriting remain an important goal of education in primary school.

In the Netherlands children learn prewriting skills in kindergarten at an age of 5 to 6,5 years. In this phase, children learn an appropriate sitting posture, to handle the pencil properly and produce different writing patterns before they start handwriting with cursive or block letters in first grade. In the Netherlands, children enter first grade normally in the school year in which they turn six before 1st of January. However, teachers can decide together with parents to let children duplicated the last kindergarten year due to developmental or social delays.

Learning to write is not easy for everyone, some children develop handwriting difficulties. The prevalence of handwriting difficulties in 6-12 old children ranges between 6% and 33% (Overvelde & Hulstijn, 2011). It has been reported that children with handwriting difficulties develop negative

experiences in this area, including frustration, self-reliance, and low motivation (Dinehart, 2015). Persistent handwriting difficulties may also have negative effects on a child’s academic performance and self-esteem (Ratzon et al., 2007). Identification of kindergarten children at risk of developing handwriting difficulties may allow early intervention to prevent handwriting difficulties and negative secondary effects in later grades.

Writing Readiness Inventory Tool In Context: WRITIC-assessment

WRITIC-assessment is an activity-based assessment developed to evaluate handwriting readiness in 5-6.5 years old children (van Hartingsveldt, de Vries, et al., 2014). WRITIC-assessment is administered in the classroom, where the influence of the context is taken into account.

WRITIC-assessment contains items of three domains: ‘Child’, ‘Environment’, and ‘Paper-and-pencil tasks’. Every domain consists of two subdomains: the ‘Child’ domain includes ‘Interest’ and ‘Sustained attention’, the ‘Environment’ domain includes ‘Physical environment’ and ‘Social environment’, and the Paper-and-pencil tasks domain includes ‘Task performance’ and ‘Intensity of performance’ (see figure 1).

Domains WRITIC	Subdomains WRITIC	
Child	Interest Questionnaire 6 items 3-point scale Range 0–12	Sustained attention <i>Scored by tester</i> 1 item 3-point scale Range 0–2
	Physical <i>Scored by tester</i> 2 items 3-point scale Range 0–4	Social <i>Scored by tester</i> 1 item 3-point scale Range 0–2
Environment	Task Performance[†] <i>Scored by tester</i> 7 items 3-point scale 6 items 7-point scale Range 0–50	Intensity of performance <i>Scored by tester</i> 4 items 7-point scale Range 0–24
Paper-and-pencil tasks		

Figure 1: Overview of (sub)domains of the Writing Readiness Inventory Tool in Context with number of items, sort of scale and range. [†]Norm-referenced part of the WRITIC.

First, the child’s interest in paper-and-pencil tasks is evaluated by means of a short questionnaire. Then, the child is encouraged to complete a drawing booklet with seven paper-and-pencil tasks while a trained assessor observes and scores performance and quality of the paper-and-pencil tasks. In previous group studies, it was found that WRITIC-assessment is a valid, reliable, feasible and predictive measure (van Hartingsveldt, Cup, et al., 2014; van Hartingsveldt et al., 2015; van Hartingsveldt, de Vries, et al., 2014).

WRITIC-assessment gives valuable criterion-referenced information on handwriting readiness by evaluating factors regarding the child, the environment and the paper-and-pencil tasks (van Hartingsveldt, de Vries, et al., 2014). The subdomain ‘Task performance’ of WRITIC-assessment, which was found to be predictive for development of handwriting difficulties is the norm-referenced subdomain which clarifies if children are ready to learn the skill of handwriting (van Hartingsveldt, de Vries, et al., 2014). Reference data are collected in 374 Dutch kindergarten children (age 5 – 6.5 years) (Haberfehlner et al., 2023).

Dutch speaking children’s therapists and specialized teachers benefit from these products. In the Netherlands and Flanders, the benefit of WRITIC-assessment is quite clear: more than 800

Dutch and Flemish children's therapists and specialized teachers are trained in administering WRITIC assessment.

From all over the world we have gained interest in translations of WRITIC-assessment. Our international activities started with the English translation of the manual that was published in September 2019. Our aim is that WRITIC-assessment can be used in different languages and cultures as handwriting is an academic activity, children need at schools all over the world.

Methods

We followed guidelines for translation and validation instruments in cross-cultural healthcare research. This promotes cross-cultural representativeness, comparability of scores and reliability and precision, also minimizing confounds such as construct irrelevance (Iliescu, 2017). This broad activity is described across two distinct phases: (a) preliminary activities such as contacting the authors of WRITIC and forming a translation team, and (b) a formal set of procedures and guidelines occurring across six stages consisting of: 1) forward translation; 2) translation review, decentering, and reconciliation of content; 3) back translation; 4) team review and further cultural adaptation; 5) pretesting and revision, and 6) team review and consensus forming (Lenz et al., 2017).

Results

Based on methodology for translation and cross-cultural assessment adaptation, translation teams have been started in different countries to translate, back-translate WRITIC-assessment.

With the Metropolitan College in Athens and the University of Ruse, we are in the first phase of forming translation teams which started the Greece and Bulgarian back and forth translation.

We started with an English back and forth translation of the WRITIC-assessment with Brunel University to enable translation from English to other languages. In collaboration with University of Evora the translation process was carried out for the European Portuguese WRITIC, with Zurich University of Applied Science Winterthur, the University of Applied Science Zuyd Hogeschool, and the University of Applied Science FH Campus Wien for the German WRITIC and with University Rehabilitation Institute Republic of Slovenia for the Slovenian WRITIC. Only minor differences were found in the original and back translations in which we could easily find consensus.

With Brunel University London we began the validation with the translated WRITIC-EN in 100 British children. In Flanders (Dutch speaking) a validation study on WRITIC-assessment was done with 149 children.

With the University of Evora we established internal consistency on the subdomain 'Task Performance' ($n=70$, Cronbachs alpha of 0.72), obtained high to excellent test-retest ($N=65$) and inter-rater reliability ($N=69$) (ICCs of 0.88-0.93) and determined convergent validity ($N=87$) that underpin the construct proposed by the translated WRITIC-PT. Correlations of WRITIC-assessment with Beery-Buktenica Developmental Test of Visual-Motor Integration (Beery™VMI-6) and Nine Hole Peg-Test (9HPT) were moderate (r from 0.39 to 0.65) (Delgado et al., 2023).

With the University Rehabilitation Institute Republic of Slovenia, a validation study started on 50 children with the translated WRITIC-SI.

Pilot-feasibility and validity studies on the translated WRITIC-DE are started in Germany and Austria.

To support the global use of WRITIC-assessment we developed a Figshare environment to safely store and exchange the data from different countries. Beside this we will start with an international digital platform so that therapists and teachers in every country have access, can chat, exchange experiences, and learn the administration of the assessment and can benefit from WRITIC-assessment tool.

University Programs in Occupational Therapy and Psychomotor Therapy play a key role in the dissemination in different countries.

Discussion

In the last ten years, the focus of assessment and intervention in occupational therapy has changed and moved away from the traditional approach on performance components (Kennedy et al., 2013) to an occupation-based assessment in real-life situations, making the performance assessment contextual and meaningful (Hocking, 2001)

Handwriting readiness is receiving increasingly attention in order to be able to provide additional exercise and if needed intervention to prevent handwriting difficulties and enable the child to positively and successfully start handwriting education.

The interest from all over the world as a result of the international publications on the development of the WRITIC-assessment and its psychometric properties shows the need for evaluation of handwriting readiness.

In inclusive education there is an increased focus on early identification of children at risk of developing (learning) difficulties and on a growing body of expertise in teachers in how to deal with these children. An assessment like the WRITIC fits well in this development, especially since children's occupational, physical, and psychomotor therapists, but also specialist teachers, can administer the WRITIC in children about whom the teachers have concerns in terms of their handwriting readiness.

Assessments in occupational therapy that are occupation-based are administered in the environment in which occupational performance takes place and focus on meaningful activities. The WRITIC is an occupation-based assessment and is used in the classroom environment. For some countries this is challenging since law and school regulations are somehow still restrictive for children's therapists to provide their care in the classroom.

Conclusion

Cross-national collaboration of Universities for OT and Psychomotor Therapy broadens the use of WRITIC-assessment in the prevention of handwriting difficulties. The translation and cross-cultural adaptation in different languages, the validation studies in different countries and the international digital platform made WRITIC-assessment accessible to children's therapists and specialized teachers around the world with the same results: enabling school participation of all children in contributing to inclusive education.

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