Developmental Eye Movement (DEM) test: validity reassessment in Italian population

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Introduction

The Developmental Eye Movement (DEM) test is an inexpensive, practical and easy method that is used to assess and quantify oculomotor skills in children. In the updated manual (Richman, 2009) and in a original article (Garzia et al., 1990) the qualities of the test (validity, reliability and normative results) are reported. The validity of the test is concerned with what the test measures and how well it does so (Urbina, 2004). As reported in the DEM manual, data used to test the validity and results are listed, but there is no clear explanation of the results. The purpose of this study is to reevaluate these and other parameters of validity in subjects from the Italian population, by using a language-specific test of reading to confirm and expand the validity of DEM after acquiring specific normative values.

Experiment

The validity of a test can be subdivided into three main categories: content, criterion and construct. Despite this division, the more recent studies place all the aspects of validity into a construct validity, thus bypassing the older separation of validity into criterion and content (Urbina, 2004). Construct validity is defined as a totality of evidence that represent a check of the construct (Anastasi, Ubbiva, 1997).

In consideration of this new concept, the DEM test was reanalyzed by means of construct validity and new statistical methodology. These new and original methods of analyses are being employed 20 years after the original American values were obtained. Since different language, educational programs and the concept of educational agreement can modify the DEM values, all these factors will be considered to reassess validity in Italian population.

Subjects

Three different samples of children have been used that were obtained in several interdisciplinary school screening programs conducted by optometrists and psychologists.

Methods

A full psychometrical evaluation of validity was applied to the DEM and other psycho-educational tests using a construct validity scheme (Urbina et al., 2004).

Results

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
<th>Test Collected</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>40 children from 6 to 10 year: 6y (4); 7y (10); 8y (10); 9y (10); 10y (10)</td>
<td>SDQ (Jimenez et al., 2003)</td>
</tr>
<tr>
<td>2</td>
<td>40 children from 7 to 11 year: 7y; 8y; 9y; 10y; 11y (9y)</td>
<td>NSUCO (Maples, 1995)</td>
</tr>
<tr>
<td>3</td>
<td>42 children from 7 to 13 year: 7y; 8y; 9y; 10y; 11y; 12y; 13y</td>
<td>Subtest 4 and 5 of DDE-2 Battery (Sarton, J., et al., 1995)</td>
</tr>
</tbody>
</table>

For each group, the analysis pertinent to test and collected data was performed taking into account, if not specified, the adjusted value of the horizontal (AHT) and the vertical (VT) time. Data from the Learning Disabled (LD) group was taken into account only for the evaluation of the pathologic group, comparing LD and the remainder of sample 3 in control. Diagnosis of dyslexia was made by a multidisciplinary team at a specific centre.

Factor 1

Prp. Tot. 0.396930

Factor 2

Expl. Var. 0.963586

Factor 3

Expl. Var. 0.963488

Conclusion

The more extensive scheme of construct validity and new methods of psychometric and statistical analyses has permitted reconfirmation and expansion of the original results of the DEM test. This study reconfirms the validity of the DEM test to assess oculomotor ability in the developmental age also in the Italian population and permits differentiation of ocular motility and naming problems.

The final confirmation of validity and the only kind of validity which has not been tested in this research is the relationship between DEM test and an objective measurement of ocular movements. To the extent that validity has been reconfirmed by this study, this has created a foundation for a future standardization of the DEM test in the Italian population.

References


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