Assessing visual perception using letters and numbers

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Letter and number literacy are important in education.

Difficulty with visual perception of letters and numbers is a significant issue in primary and secondary schools. Children with reading difficulty make more errors in letter and number reversals. This is particularly true for the letters b/d/p/q and t/c, which are easily confused due to similarity in shape and sound. Moreover, children with reading difficulty also exhibit poor visual perceptual skills, resulting in a tendency to make less progress in reading, writing, mathematics, and general academic performance.

The integration of visual perception, fine motor skills, and academic performance is crucial for effective learning. Children with reading difficulty may require additional assistance in learning their letters and numbers. The integration of visual perception, fine motor skills, and academic performance enables children to integrate the skills equally well in tasks such as reading, writing, and mathematical calculations.

Integrated visual perception and fine motor skills development is essential for primary and secondary students. Interventions targeted to occupation, improved visual perception, and improved academic achievement can be addressed first. Identification and targeted intervention will enable full inclusion and engagement in classroom activities. The occupation of reading and writing, which are participated in during school hours, will be accessible to all students.

Rasch Analysis produced eight highly reliable, linear, unidimensional scales. Items ordered from easy to hard and student measures from low to high on the same scale. The fit residual statistics for each scale and the targeting were reasonable.

The Rasch measurement model analysis of recognized and hand written letter and number reversals was used to create a linear scale to measure the ability of primary school children to visually discriminate upper and lower case letters in readiness for learning to read and perform mathematical calculations. Ethical approval through Edith Cowan University, Perth, Western Australia. Victorian Modern Cursive Font.

Pilot study with 20 children determined appropriate, user friendly design. Completed letter and number recognition scale encompassing visual discrimination, form constancy, figure ground, spatial orientation and sequencing of letters and numbers (Richmond Reversal Rating).

Written alphabet, numbers, and twenty dictated words from memory. Data on all items were Rasch analyzed to create eight linear scales.

Implications for occupational therapy: These scales are useful in identifying, accurately, and objectively, students who require additional assistance in learning their letters and numbers. Targeted intervention can begin prior to habits forming. Integrated approach of letter sounds, forms and directionality matching used in memorising letters and numbers in the learning phase. Written orientation of letters and numbers combined with the ability to recognize when an error has been made in the printed orientation of letters and numbers, requires more targeted attention in teaching children to write, read, and spell.

Most commonly reversed letters in the English language, b/d/p/q and t/c are easily confused due to similarity in shape and sound. Number sequences are easier than letter sequences in learning and should be addressed first. Identification and targeted intervention will enable full inclusion and engagement in classroom activities.

The occupation of reading and writing which are participated in during school hours will be accessible to all students.

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Acknowledgements:
- AOTA Press.
- Melbourne, Victoria.
- No profit-making organization.
- Chiefly for people and their families.
- Informed consent.
- Rasch Analysis.
- To create a new visual perception test using letters and numbers in isolation and in context.

Method:
A Rasch measurement model analysis of recognised and hand written letter and number reversals. Ethical approval through Edith Cowan University, Perth, Western Australia. Victorian Modern Cursive Font.

324 pre-primary and primary up to Year 4 students: 177 girls and 146 boys. Aged 4-9 years old. Specialist focus group determined content validity.

Pilot study with 20 children determined appropriate, user friendly design. Completed letter and number recognition scale encompassing visual discrimination, form constancy, figure ground, spatial orientation and sequencing of letters and numbers (Richmond Reversal Rating).

Written alphabet, numbers, and twenty dictated words from memory. Data on all items were Rasch analyzed to create eight linear scales.

Discussion:
One, two buckle my shoe; Three, your foot at the door.

Results:
- Recognised/read reversals
  - P: c a 4
  - D: s g 7
  - K: t q 9
  - E: d z 3

- Written reversals
  - j: z b c
  - i: q t d
  - l: p s

References:


Jordan Left -Right Reversal Test

St. Louis, MI: Academic Therapy Publications.

SCHNECK, C. M. (ed.) 2005. Visual perception, motor dysfunction and its effects on eye

-Soac/saoc, laugh/laugh.

Further development of miss -group validity study.

Rasch Analysis produced eight highly reliable, linear, uni-

Dimensions scales; validity study.

Richmond Reversal Rating.

Further development of miss -dimensional scales; validity study.

Intervention targeted to occupation.

Improved visual perception.

Improved academic achievement.

Inclusion and engagement in class.

Research:
Further development of misfit items.

Expanded to qualitative input from students and teachers.

Discriminant and known-group validity study.

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