

2012

Letter and Number Reversals – Identifying the problem

Janet Richmond

Edith Cowan University, j.richmond@ecu.edu.au

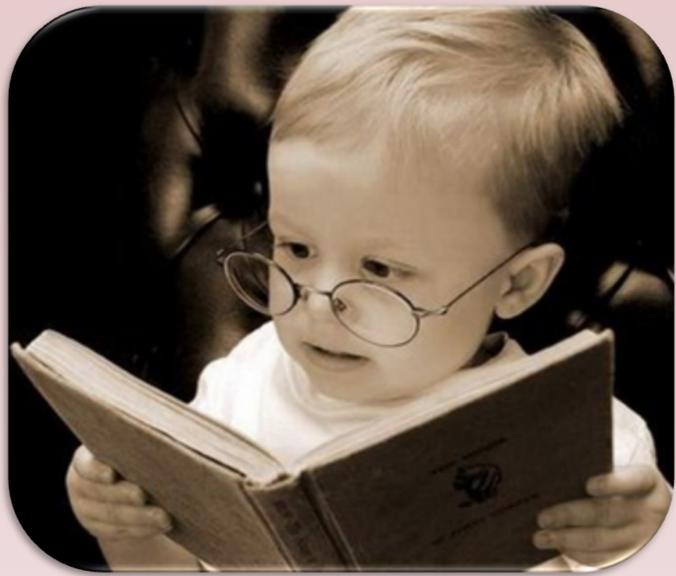
Follow this and additional works at: <http://ro.ecu.edu.au/ecuposters>

 Part of the [Cognition and Perception Commons](#), and the [Occupational Therapy Commons](#)
Richmond, J. (2012). Letter and number reversals - identifying the problem. Poster presented at the Occupational Therapy Association of Australian Northern Territory Conference. Participation in Action. June 8, 2012, Darwin, Northern Territory, Australia

Recommended Citation

Richmond, Janet, "Letter and Number Reversals – Identifying the problem" (2012). *ECU Posters*.
<http://ro.ecu.edu.au/ecuposters/4>

This Book is posted at Research Online.
<http://ro.ecu.edu.au/ecuposters/4>



Dr Janet Richmond, Edith Cowan University

Letter and Number Reversals – Identifying the problem

METHOD

- A descriptive correlation study to compare recognised and hand written letter and number reversals
- Ethical approval through Edith Cowan University
- Victorian Modern Cursive Font
- 74 boys (59%) and 52 (41%) girls, Year 1-4
- Completed letter and number recognition scale
- Children wrote the alphabet and numbers from memory
- Dictated words were given to Year 1 and older students

INTRODUCTION

Writing quality = teacher perception of ability
 Letter and number orientation affects legibility
 Traditional theorists present the development of visual perception and fine motor skills as an integrated yet linear process
 This linear development should enable children to integrate the skills equally well in tasks such as reading and writing
 Recognition and written direction of letters and numbers should develop along a similar linear process
 Reversals in academic tasks can occur in manual encoding (writing) or visual receptive functioning
 Children who make reversal errors exhibit poor visual-motor skills and poor visual perceptual tendencies, resulting in a tendency to make less progress in reading and general academic performance
 Children with reading difficulty made more errors in letter orientation



RESULTS

11-20% of children did not attempt to write letters they were confused about
 Disproportionate letter reversals in j, z, b, c, q, i, t, d, l, p, s
 Independently written letters reversed more often than those written within words

No correlation to increasing grade
 Agree with previous findings

DISCUSSION

Children have less difficulty producing letters when they use an integrated approach of letter sounds, formations and directionality matching when committing the letters to memory during the initial letter recognition and writing phase.
 Written orientation of letters and numbers combined with the ability to recognise when an error has been made in the printed orientation of letters and numbers, require more attention when teaching children to write, read and spell.
 Eight of the letters: u / t / q / n / k / g / j / z (j / z most difficult) do not correlate to grade
 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

RECOGNISED/ READ REVERSALS

P	g
D	q
K	z
E	4
c	7
s	9
t	3
d	
a	

WRITTEN REVERSALS

j (9.5%),
 z (11.9%),
 b (0.8%)
 c (0.8%)
 i (0.8%)
 q (0.8%)
 t (0.8%)
 d (1.6%)
 l (1.6%)
 p (1.6%)
 s (2.4%)

REFERENCES

- Beilin, H., & Gillman, I. S. (1967). Number language and number reversal learning. *Journal of Experimental Child Psychology*, 5, 263-277.
- Brendler, K., & Lachmann, T. (2001). Letter reversals in the context of the functional coordination deficit model. In E. Sommerfeld, R. Kompass & T. Lachmann (Eds.), *Proceedings of the International Society of Psychophysics* (Vol. 17, pp. 308-313). Jengerich, Berlin: Pabst.
- Burns, C. W., & Snow, J. H. (2006). Jordan Left-Right Reversal Test 1990 Edition. *Buros Institute of Mental Measurements*. Retrieved 1 June, 2006
- Frostig, M., & Horne, D. (1964). *The Frostig programme for the development of visual perception: Teacher's guide*. Chicago, IL: Follett Educational Corporation.
- Frostig, M., Lefever, W., & Whittlesey, J. R. B. (1966). *Developmental Test of Visual Perception: Administration and scoring manual*. Calif: Consulting psychologists press.
- Gesell, A., Ilg, G., Ilg, F. L., Bullis, G. E., & Getman, G. N. (1949). *Vision and its development in the infant and child*. New York, NY: Hoeber.
- Graham, S., Struck, M., Santoro, J., & Berninger, V. W. (2006). Dimensions of good and poor handwriting legibility in first and second graders: Motor programs, visual-spatial arrangement, and letter formation parameter setting. *Developmental Neuropsychology*, 29(1), 43-60.
- Graham, S., Weintraub, N., & Berninger, V. (2001). Which manuscript letters do primary grade children write legibly? *Journal of Educational Psychology*, 93(3), 488-497. doi: 10.1037/0022-0663.93.3.488
- Grove, M. C., & Hauptfleisch, H. M. (1978). *Perceptual development - A guide*. Pretoria: N.H.W.Press.
- Lachmann, T., & Gevert, T. (2003). Letter reversals in dyslexia: Is the case really closed? A critical review and conclusions. *Psychology Science*, 45, 50-72.
- Lane, K. A. (1985). *Reversal errors: Theories and therapy procedures*. Santa Ana, CA: Vision Extension.
- Massengill, D., & Smdberg, M. L. (2006). A unique, neurologically integrated approach designed to simultaneously teach letter sounds and formations. *Reading Improvement*, 43(3), 111-128.
- Richmond, J. E. (2010). *School aged children - visual perception and reversal recognition of letters and numbers separately and in context*. Doctor of Philosophy, Edith Cowan University, Perth. (b1923199)
- Richmond, J. E., & Holland, K. (2010). The relationship between a teacher check list and standardised tests of visual perception skills: A South African perspective. *South African Journal of Occupational Therapy*, 40(3), 9-16.
- Spencer, K. (Producer). (2006, 3 August 2011). Phonics self-teaching materials for foundation literacy. *Literacy*. Retrieved from http://online.library.wiley.com.library.ecu.edu.au/doi/10.1111/j.1467-9345.2006.00422.x/pdf
- Terepocki, M., Krug, R. S., & Willows, D. M. (2002). The incidence and nature of letter orientation errors in reading disability. *Journal of Learning Disabilities*, 35(3), 214-233.
- Tseng, M. H., & Cermak, S. A. (1994). The evaluation of handwriting in children. *South African Institute for Sensory Integration News*, 3(1), 9-13.
- Tseng, M. H., & Chow, S. M. (2000). Perceptual motor function of school-aged children with slow handwriting speed. *American Journal of Occupational Therapy*, 54(1), 83-88.
- Ziviani, J., & Watson-Will, A. (1998). Writing speed and legibility of 7 to 14 year old school students using modern cursive script. *Australian Occupational Therapy Journal*, 45(2), 59-64.

