



A STUDY TO DETERMINE DEVELOPMENTAL TRENDS FOR CURSIVE HANDWRITING SPEED AMONG INDIAN CHILDREN

DR.U.GANAPATHY SANKAR

Assistant Professor, Faculty of Medical & Health Sciences, SRM College of Occupational Therapy, SRM University Kattankulathur, Kancheepuram District, Tamil Nadu 603 203, India

ABSTRACT

The purpose of this study was to identify developmental trends for Cursive Handwriting speed among Indian children. **METHOD** Six hundred (n=600) children, aged 6 -10 years were recruited by means of convenience sampling procedure from normal schools. Evaluation Tools for Children Handwriting-Cursive [ETCH-C] was used to identify developmental trends. One way ANOVA was used to determine developmental trends for cursive handwriting speed in Near Point Copying and Far point copying. The results showed that there was statistically significant difference between the age groups in Near Point Copying [$F(3,579) = 35.76; p = .000$] and Far Point Copying [$F(3,579) = 37.421; p = .000$]. The results showed that there was statistically significant between the age groups. The present study was concluded that Cursive handwriting Speed has developmental trends among Indian children. It depicts that when the age increases children cursive writing speed increases.

KEYWORDS: Developmental trends, Handwriting speed, Cursive writing, ETCH-C, Indian children



DR.U.GANAPATHY SANKAR

Assistant Professor, Faculty of Medical & Health Sciences, SRM College of Occupational Therapy, SRM University Kattankulathur, Kancheepuram District, Tamil Nadu 603 203, India

1. INTRODUCTION

Communication, in its broadest sense, includes verbal expression, written expression, and physical cues such as gestures and facial expressions that have social meaning¹. Written expression remains an important part of elementary school curriculum². Written communication allows the child to express what he or she knows³. Handwriting is an important skill for school aged children. A student's ability to produce fluent and legible writing is important for expressing, communicating, and recording ideas as well as for educational development⁴. Cursive (joint script) and Manuscript (print) are the important types of handwriting. A generally accepted sequence for handwriting instruction was manuscript writing for use in grades 1 and 2, with children transitioning to cursive writing at the end of grade 2 or *beginning of grade 3*⁵.

1.1 Cursive writing

Cursive is any style of handwriting that is designed for writing down notes and letters quickly by hand. The word comes from the Latin *cursivus* meaning "flowing". Cursive writing is a beautiful art form that connects the letters with swoops and curls. It is an art form that is unique to each individual student. No two handwritten letters were the same even though each word written is identical. In British English, the phrase "joined-up writing" or "joint writing" is far more commonly used, while the term "running writing" or "handwriting" is most commonly used in Australia. Cursive is also commonly known as simply "handwriting" in Canada and New Zealand. Cursive is considered distinct from the so-called "printing" or "block letter" style of handwriting, in which the letters of a word are unconnected, and from "printing-writing", which is a cross between cursive and printing, with some unconnected letters and some connected. Cursive writing is beneficial for the following reasons: cursive movement patterns allow for faster and more automatic writing; reversal of individual letters and transpositions of words are less likely to occur than in manuscript; continuous, connected line enables the child to form words as units; cursive is faster than manuscript; it allows the poor printer a new type of written format that may be motivating the child's current maturity level⁶. Benbow, Hanft and Marsh⁷ listed four prerequisite areas: dominant hand use, midline crossing with the dominant hand, proper posture and pencil grip, and ability to copy the first nine shapes of the Developmental Test of Visual-Motor Integration⁸. Another foundation skill for pre-handwriting and handwriting is shoulder and arm stability. Handwriting can be deficient either in legibility or in terms of speed. Factors affecting handwriting are internal and external factors. External factors are instructional procedures and materials used during writing^{9,10}. Internal factors are abilities found within the student and these are visuo-motor skills, visual perception and kinesthetic awareness^{11,12}.

1.2 Need for the Study

Handwriting problems interfere with the child's ability to show what he or she knows. The child with the handwriting problems often cannot finish assignments on time; because writing is difficult, the child may try to complete written assignments in as few words as

possible. When a child has to focus on the mechanical aspect of writing, he or she cannot fully attend to content of information. Thus, there is a tradeoff between concentration on learning and writing¹³. Handwriting is more emphasized in elementary grades and students who have difficulties in that develop low self-esteem and frustration because they are unable to express their knowledge in written form¹⁴. Child's handwriting performance is of concern to the occupational therapists, educators, and parents because it is an essential skill required participating in educational activities successfully. Handwriting speed plays vital role in complete assignment, theory examination with prescribed time. Children with dysgraphia may have problems in handwriting speed. Hence the current study was carried out to identify developmental trends for handwriting speed in cursive writing.

2. METHODOLOGY

2.1 Research design

Quantitative research design, Cross-sectional study.

2.2 Sample

Six hundred children, aged 6 -10 years (mean age = 7.24 ± 1.14) were recruited by means of convenience sampling procedure from normal schools located in North, South, Central Chennai in order to maintain geographical distribution.

2.3 Screening criteria

A. Inclusion criteria:

- Good knowledge in cursive writing
- Age 6-8 years
- Both gender
- Normal or corrected vision
- Normal or corrected hearing

B. Exclusion criteria:

- Poor visual foundation skills
- Poor comprehension skills
- Frequent failures in the academic performance
- Motor disabilities (upper limb)

2.4 Instrument

The Evaluation Tool of Children's Handwriting - Cursive (ETCH-C)

The Evaluation Tool of Children's Handwriting-Cursive (ETCH-C) is a criterion-referenced tool designed to evaluate cursive handwriting skills of children in grades 1 to 6. Its focus is to assess a student's legibility and speed of handwriting tasks similar to those required of students in the classroom. The administration time is 20-30 minutes. The speed is calculated as the time taken to complete the task in near point copying and far point copying.

Psychometric properties of ETCH

Reliability

Dikema, Deitz, and Amundson¹⁵, (1998) examined the test-retest reliability of the legibility portion of the ETCH-M for students with handwriting deficits. The results were moderate, ICC = .77, .71 & .63 for total letter legibility, total word legibility and total numerical legibility respectively. Schuette¹⁶, (2001) examined the test -

retest reliability of the ETCH-M in typically developing children. The results were good and ICC= .88, .95 and .84 for total letter legibility, total word legibility and total numerical legibility respectively.

Validity

ETCH - C legibility scores were correlated with handwriting grades from teachers to establish the concurrent validity, the results indicated that there is significantly moderate correlation existed between cursive legibility percentage scores & teacher assigned handwriting grade and moderate correlation between legibility percentage scores of ETCH-C and classroom worksheets.

2.5 Materials used

ETCH manual, response booklet, pencil, eraser, and stopwatch.

2.6 Data collection procedure

The study was conducted in regular schools in North Chennai, South Chennai and Central Chennai. Before the study was conducted, the purpose of the study was explained to the head of the institutions and the consent

One – way ANOVA:

$$F = \frac{\text{MS between groups}}{\text{MS within groups}}$$

Where,
 F = ANOVA Value
 MS = Mean square

3. RESULTS

Table 1
Developmental trends for Cursive Handwriting speed in Near Point copying for ETCH-C among Indian children

Age interval	M	SD	'F' value	LOS
6.0-6.11	19.18	8.03	35.76	0.000
7.0-7.11	22.89	10.12		
8.0-8.11	26.89	10.67		
9.0-9.11	32.23	12.98		

*M-Mean; SD- Standard Deviation;
 F= ANOVA Value;
 LOS-Level of Significance; p ≤ 0.05*

One way ANOVA was used to determine developmental trends for cursive handwriting speed in Near Point Copying. The results showed that there was statistically significant difference (F (3,579) = 35.76; p = .000) between the age groups.

forms were obtained from respective parents. The general information about the subject’s academic performance has been collected from the respective class teacher. Subjects were seated on a chair and table, appropriate for their height. ETCH-C was administered in a separate class room with good ventilation, lighting and without distractions. Then the response booklet was given to the subject and instructed as given in the manual.

1. Near point copying

Subject has to copy the 7 word sentence from the nearby sheet which is 3 inches away from the response booklet.

2. Far point copying

Subject has to copy a 7 word sentence from the chart that is pasted on the wall (6 to 8 feet from the child’s desk and 4 feet from the ground).

2.7 Data analysis procedure

The data’s were analyzed using SPSS (22.0 version).

Table 2
Developmental trends for Cursive Handwriting speed in Far Point copying for ETCH-C among Indian children

Age interval	M	SD	'F' value	LOS
6.0-6.11	19.53	7.24	37.421	0.000
7.0-7.11	22.12	10.01		
8.0-8.11	25.99	11.32		
9.0-9.11	33.31	14.65		

M-Mean; *SD*- Standard Deviation;
F= ANOVA Value
LOS-Level of Significance; $p \leq 0.05$

One way ANOVA was used to determine developmental trends for cursive handwriting speed in Far Point Copying. The results showed that there was statistically significant difference ($F(3,579) = 37.421$; $p = .000$) between the age groups.

4. DISCUSSION

Handwriting is a complex human activity that entails an intricate blend of cognitive, kinesthetic and perceptual-motor components. Children are expected to acquire a level of handwriting proficiency that enables them to make skillful use of handwriting as a tool to carry out their work at school¹⁷. Handwriting is an important functional task used frequently in every grade beginning in kindergarten. Children are expected to gain skills gradually in handwriting speed. The purpose of this study was to determine developmental trends for cursive handwriting speed among Indian Children.

4.1 Developmental Trends for Cursive Handwriting speed

The results showed that there is statistically significant difference between the age groups. The result depicts that when age increases children handwriting speed also increases and this result is supported by previous research^{18,19,20}. In their studies, they found that there is significant differences existed in speed between the age

groups due to the fact that there is a developmental trends in visual perception, visuomotor integration, and in hand manipulation skills²¹.

4.2. Recommendations

Ergonomic factor should be considered. Further studies can be performed to find out relationship between pencil grasp and legibility and pencil grasp and speed.

5. CONCLUSION

The present study was concluded that Cursive handwriting Speed has developmental trends among Indian children. It depicts that when the age increases children cursive writing speed increases.

ACKNOWLEDGEMENT

The authors would like to thank Management of SRM University, Director, Health Sciences, SRM University, Dean, SRM College of Occupational Therapy. Authors would like to extend thank to all the children who have participated in the study and their parents for their timely response. Authors also would like to express their gratitude to Mr. Christopher Amalraj, Biostatistician, Department of Community Medicine, and SRM University for their support in statistical analysis.

REFERENCES

- Case-Smith, J, Allen. A.S & Pratt. PN. Prewriting & handwriting. In J. Case –Smith, Allen. A.S, Pratt (Eds) Occupational Therapy for children 3rd ed, MO. Mosby, pp 524 - 545, (1996).
- Amundson, S.J. Prewriting & handwriting. In J. Case smith (Eds) Occupational Therapy for children ,4th ed., St. Louis, MO.Mosby, pp 545 – 575,(2001).
- Rubin. N., & Henderson, S.E. Two sides of the same coin: Variations in teaching methods and failure to learn to write. Special Education Trend, 9(4), 17 – 24,(1982).
- Phelps, J., Stempel, L., & Speck, G. The children's handwriting scale: a new diagnostic tool. Journal of Education Research, 79, 46 – 50,(1985).
- Bergman, K.E. & Laughlin, T.F. Remediating handwriting difficulties with learning disabled students: a review. Journal of special education, 12, 101 – 120,(1988).
- Armitage, D. & Ratzlaff, H. The non – correlation of printing and writing skills. Journal of Educational Research, 78, 174 – 177, (1985).
- Benbow, Mary; Hanft, Barbara; & Marsh, Dottie. Handwriting in the classroom: Improving written communication. In Charlotte Royeen (Ed),AOTA Self – study series: Classroom applications for school-based practice, Rockville, MD: American Occupational Therapy Association,pp. 6– 60,(1992).
- Ganapathy Sankar U.& Ramkumar, M.G. Normative data of developmental test of Visual Motor Integration(VMI) for Chennai children, Indian Journal of Physiotherapy & Occupational Therapy,4(4); 30-33,(2010).
- Mahalakshmi, R & Ganapathy Sankar U. Normative data of Evaluation tool of children Handwriting – Cursive (ETCH-C) in Chennai children, Indian Journal of Physiotherapy & Occupational Therapy ,4(4); 48-51,(2010).

10. Carlson, Kathy; & Cunningham , Jo Lynn. Effect of pencil diameter on the Graphomotor skill of preschoolers. *Early childhood Research Quarterly*, 5(2), 279 – 293,(1990).
11. Weil MJ & Amundson SJ, Relationship between visuomotor skills and writing skills of children in kindergarten. *American Journal of Occupational Therapy*, 48(11), 982 – 988,(1994).
12. Ziviani, J; Hayes, Alan; & Chant, David. Handwriting: A Perceptual – motor disturbance in children with myelomeningocele. *Occupational Therapy Journal of Research*, 10(1), 12 – 26,(1990).
13. Mc Hale, K., & Cermark, Fine motor activities on elementary school: Preliminary findings and provisional implications for children with finemotor problems. *American Journal of Occupational Therapy*, 46, 898 – 903,(1992).
14. Ganapathy Sankar U, R. Riya, Normative data of Evaluation tool of children Handwriting – Manuscript (ETCH-M). *Indian Journal of Physiotherapy & Occupational Therapy*, Vol. 5, No.3; pp 175-178,(2011).
15. Diekema, S.M., Deitz, J., & Amundson, S.J. Test – retest reliability of the Evaluation Tool of Children's Handwriting – Manuscript. *American Journal of Occupational Therapy*, 52, 248 – 255,(1998).
16. Schuette, J. Test – retest reliability of the Evaluation Tool of Children's Handwriting in assessing typically developing 6 – 8 year olds, Unpublished master's thesis, New York University, New York,(2011).
17. Reisman, J.E. Development and Reliability of the research version of the Minnesota Handwriting Test. *Physical & Occupational Therapy in pediatrics*, 13(2), 41 – 55,(1993).
18. Hamstra – Bietz L & Blöte AW. Development of handwriting in school: a longitudinal study. *Perceptual motor skills*, 70,759 –770,(1990).
19. Tseng, M. H., & Hsueh I – Ping. Performance of school – aged children on a Chinese handwriting speed test *Occupational Therapy International*, 4(4), 294 – 303,(2006).
20. Ziviani, J, & Elkins, J. Effect of pencil grip on handwriting speed and legibility. *Educational Review*, 38, 247 – 257,(1986).
21. Pehoski Charlane,Henderson Anne & Degnen - Linda Tickle. In– hand manipulation in young children: Rotation of an object in the finger. *American Journal of Occupational Therapy*, 51(7), 544– 552,(1997).