Handwriting: Current Trends in UK Occupational Therapy Practice

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Handwriting and related fine motor difficulties are a primary reason for referral to occupational therapy services.

In particularly Canada, up to 90% of referrals to the school-based occupational therapist are for this particular problem.

(Ref: Feder et al 2000; Marr and Dimeo 2006; Missiuna et al, 2008).
Purpose:

To describe the assessment and treatment approaches commonly used by occupational therapists working, within the UK, with children who exhibit handwriting and related fine motor difficulties.
Previous studies.


- Feder (2000) surveyed 50 Canadian paediatric occupational therapists.
Objectives:

- To identify how occupational therapists working with children assess the handwriting competence of those referred to their service.

- To identify the types of intervention occupational therapists provide to improve handwriting competence in children who are struggling with this important childhood occupation.

- To determine how occupational therapists evaluate handwriting competence following therapeutic intervention.
Methodology

A non-experimental fixed design was selected for this quantitative study. The selected data collection method used was a survey design, using a postal self-completion questionnaire.

Feder et al’s (2000) previous study obtained data via telephone interviews but due to the numbers involved a questionnaire was utilised although the researcher was aware that this would be a difficult method in which to gain the quality of responses necessary.
Questionnaire design

The questionnaire incorporated three sections
20 multiple-choice questions plus opportunities for comment.

1. Demographic details
2. Assessment
3. Approach
4. Mode of therapeutic delivery
5. Type of intervention
6. Outcome measurement
Purposive Sample

711 questionnaires were distributed to members of the COT SS CYPF.

NB: 47% previously identified that handwriting was an occupation which they were interested in, therefore it was hoped that a response rate of 334 could be achieved.

In reality 402 completed questionnaires were returned.

This gave an overall response rate of 56%.
Demographic details

- Of the 402 respondents 67% were occupational therapists who had been qualified for 11 years or more.

- The majority having worked with children for over 11 years and only 9% having less than 3 years experience.
All regional areas were represented in the study, with the main representation being from the South East, South West, Midlands, London and the North West.
14% (56 respondents) did not address issues directly, rather they…

- Provided advise only
- Recommended specific programmes
- Provided a recommendation pack created by occupational therapy department
- Recommended a private practitioner
Assessment

Handwriting is assessed as part of a more global assessment, incorporating manipulation, fine motor coordination, posture, perception, motivation, comprehension and visual-motor integration.
Assessments used (346 respondents):

Comparison of pre and post handwriting samples (20%)

Teacher report (17%)

Locally designed measure or published checklists i.e. handwriting file, checklist in Addy (2004) 10%
Standardised assessments used:

Developmental Test of Visual Motor Integration (VMI) (Beery 1997) (16%)

Test of Visual Perceptual Skills (non-motor) (Gardner (1982) (14%).

Detailed Assessment of Speed of Handwriting (Barnett et al 2007)(8%),

Perceived Efficacy and Goal setting (Missiuna et al 2004) (5%)

Handwriting Checklist (Alston and Taylor 1984) (5%),

Bruininks-Oseretsky Test of Motor Proficiency (1978) (2%)

Evaluation Tool of Children’s Handwriting (ETCH) (Amundson 1995) (1%).

Peabody Developmental Scales (Folio and Fewell,1983) (1%)

Sensory Integration Praxis Test (Ayres 1989) (1%)
Use of VMI (Beery)

Use with younger children

- Students were developmentally ready to learn how to print based on their ability to copy the first eight geometric figures on the Beery VMI (5th ed.) (Zwicker 2009)

Use with older children

- Research advised caution against the routine use of the VMI to assess older school-aged children with handwriting dysfunction.

- The VMI correctly identified only a small number of the children with handwriting dysfunction (sensitivity, 34%). (Goyen and Duff 2005)
‘The evaluation of children’s handwriting remains a challenge for school-based therapists. This is partly due to the subjective nature of evaluating handwriting quality and the many performance components inherent in this complex, sensorimotor task.’
To obtain a representative writing sample (346 respondents):

- 28% asked children to copy a sentence previously written by the therapist.
- 21% took a typical sample from his/her school work.
- 19% encouraged the copying of the alphabet,
- 16% asked for a sample of free writing (untimed).
- 3% traced letter forms.
- 3% asked children to write a well known nursery rhyme.
McMasters Handwriting Protocol

1) *Writing from Memory* – Ask the student to write the appropriate stimuli. If the student is not able to write a particular letter or number, ask him/her to proceed to the next appropriate number.

2) *Near Point Copying* - The stimulus should be placed approximately 3 inches away from the student’s paper. Ask the student to copy the appropriate word/passage on their typical writing paper.

3) *Far Point Copying* – The stimulus should be located 6 to 8 feet from the child and 4 feet from the floor. Prior to beginning this task, ensure that the student is able to read the passage. Ask the student to copy the appropriate word/passage on their typical writing paper.
4) *Dictation* – Ask the student to write the dictated sentence.
   *NOTE*: The time to complete the task should be recorded on the assessment protocol for calculation of writing speed.

5) *Composition* – Suggested topics are included in the table below, but the student may wish to choose their own topic. Age appropriate expectations for composition:

   - Grade 1: compose simple but complete sentence on topic of choice
   - Grade 2: compose short paragraph on topic of choice (2-3 sentences)
   - Grade 3: compose paragraph on topic of choice
   - Grade 4: compose a paragraph on topic of choice
   - Grade 5: compose a paragraph on topic of choice
   - Grade 6: compose three paragraphs on topic of choice
Assessment of handwriting speed

- 77% (266) assessed handwriting speed
- 23% (80) did not assess handwriting speed.
Time used…

- 32% measured legibility over a 5 minute period,
- 1% used 4 minutes.
- 43% stated they measured writing legibility over a three minute period,
- 16% used 2 minutes,
- 8% used one minute

Why is it necessary to time writing?
Importance of assessing speed.

‘Children with dysgraphia show deterioration in tripod pinch strength which interferes with the handwriting process, expressed in writing velocity, spatial measures, temporal measures and pressure.’

Ref: Engel-Yeger and Rosenbaum (2010)
Speed versus legibility

Subjects generally choose a compromise between speed and accuracy, meaning that movements are slower to guarantee task success in the presence of fatigue.

Ref: Missenard (2009)
Approaches used

- 5% of respondents stated that they adopt a top-down approach
- 12% adopt a bottom-up approach
- 83% a mixture of both, these being determined by the child’s needs.
Specific approaches that were adopted

- Perceptual motor (17%),
- Compensatory (15%),
- Motor learning (12%),
- Sensory integrative (12%),
- Kinaesthetic (10%),
- Biomechanical (8%),
- Neurodevelopmental (8%),
- Cognitive-behavioural (5%),
- Mixed (13%).

Does this reflect years in practice? age of children? confidence in using top-down strategies?
Programme delivery

Based on total number of respondents (402)

- 14% no input, referred on.
- 22% direct input by occupational therapist
- 12% programme delivered by OT Assistant
- 3.5% equipment only
- 46.5% indirect programme delivery

Compared to Feder’s (2000) Canadian study where 50% of participants provided direct intervention.
Indirect Intervention: the programmes established by the occupational therapist were delivered by:

- Parents (26%)
- Class Teacher (12%)
- Teaching Assistant (30%)
- Child’s Teaching Assistant (25%)
- Parent-Helper (2%)
- Other (5%)
How Direct Input is typically Delivered

- Demonstration to teacher, parent or LSA: 20%
- 1:1 in school: 11%
- Initial 1:1 session, then follow-up: 14%
- 1:1 session in clinic or centre: 8%
- Small group within the school: 6%
- After-school group: 5%
- School holiday therapy group: 20%
- 1:1 at child’s home: 16%

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Intervention

The number of sessions given was difficult to quantify as each child’s needs differed. However the following are the average number of sessions allocated:

- 21% 1-4 sessions,
- 37% 5 – 8 sessions,
- 10% 9-12 sessions.
- 32% stated that it was impossible to give an answer, as each child’s needs varied so much.
● Feder et al (2000) showed that handwriting treatment was most frequently provided by occupational therapists on a weekly basis, for a duration of 3 – 4 months.

● Peterson and Nelson (2003) indicate that handwriting can be improved with only 10 hours of occupational therapy.

● Ratzon et al (2007) indicate 12 sessions, once a week for 45 minutes.
# PROGRAMMES USED

<table>
<thead>
<tr>
<th>Writing Programme</th>
<th>%</th>
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<tbody>
<tr>
<td>Write from the Start</td>
<td>25%</td>
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<tr>
<td>Speed up!</td>
<td>19%</td>
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<tr>
<td>Handwriting without Tears</td>
<td>17%</td>
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<tr>
<td>Departments own programme (combination)</td>
<td>9%</td>
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<tr>
<td>Write Dance</td>
<td>5%</td>
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<td>Hands up for handwriting</td>
<td>3%</td>
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<td>Nelson Handwriting Development Skills</td>
<td>2%</td>
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<td>Callirobics</td>
<td>1%</td>
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<tr>
<td>Penpals for Handwriting</td>
<td>1%</td>
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<tr>
<td>Handwriting Skills Copybook</td>
<td>1%</td>
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<tr>
<td>Write Now</td>
<td>1%</td>
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<tr>
<td>Hand for Spelling</td>
<td>1%</td>
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15% suggested other programmes which included:

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<tr>
<th>Handwriting Second Chance</th>
<th>Berol Scheme</th>
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<tr>
<td>Fizzy and Clever Hands</td>
<td>Magician-Harlequin Pre-Writing</td>
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<tr>
<td>Programmes</td>
<td>Programme</td>
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<tr>
<td>Hoops, Loops and Other</td>
<td>Hands at Work and Play</td>
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<td>groups</td>
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<td>Big Strokes for Little</td>
<td>Roll n Write</td>
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<td>Folks</td>
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<td>Handwriting Rescue Kit</td>
<td>TRICS for Written</td>
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<td></td>
<td>Communication - Amundson</td>
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<tr>
<td>Peggy Lego Programme</td>
<td>Start Write, Stay Right</td>
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<td>Write Away, Philip and</td>
<td>From Pegs to Paper</td>
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<tr>
<td>Tracey</td>
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<tr>
<td>I Can Write Cursive</td>
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Over 30 programmes were suggested!

This highlights the need for clear evaluative studies to determine the validity and effectiveness of these programmes so that practice can remain grounded in good evidence

(ref: Woodward and Swinth 2002).
Evaluation

Do you use a Specific Handwriting Outcome Measure?

- Yes: 31%
- No: 35%
- Sometimes: 34%
Outcome measures used..

- Pre/post handwriting sample
- Repeat of previous assessments i.e. VMI
- Additional measures, such as:
  - School AMPS
  - Minnesota Test of Handwriting Skills
  - McMasters Handwriting Protocol
  - Durrell Handwriting Speed Test
Handwriting comparison

- Copying a sentence: 28%
- Typical writing sample from a school book: 11%
- Writing or copying the alphabet: 16%
- Free writing sample (un-timed): 19%
- Timed writing based on a given theme: 3%
- Tracing letter forms: 2%
- Writing out a well known verse or nursery rhyme from memory: 2%
Limitations

- Sample group- members of CYPF COT SS: Membership to this special interest group is voluntary and requires a subscription fee; therefore, not all children’s occupational therapists within the UK are members of the group.

- Difficulty defining practice which varies so much from child to child.
Conclusion

“It would be useful to have clinical standards for handwriting and a better understanding of what really works”

Do we need a national uniform handwriting style such as they do in France….

‘A uniform style of handwriting is taught throughout primary education; using traditional calligraphy to produce a distinctive, ornate hand.’ (Teachers TV 2010)
Questions raised

- What are we assessing and why? If the referral is to address handwriting, do we need to look at all aspects of occupational performance?

- Should we be more specific in our use of assessments?

- What influences our therapeutic approach?

- What is the evidence for the use of selected programmes?

- Is indirect programme delivery as effective as direct delivery.
Do we need more creative modes of therapeutic delivery?

- Summer schools
- Asset-based approach
- Intensive intervention
- Teacher training
To conclude:

- Handwriting is a *complex* occupational task has many underlying component skills that may interfere with handwriting performance. (Feder et al 2007)

- Handwriting difficulties do not disappear without intervention. (Preminger et al 2004)
Acknowledgements

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