The Effects of HHIW Intervention on Handwriting for Children with Autism

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Abstract. The purpose of this study was to investigate the effects of “Here’s How I Write” (HHIW) interventions on handwriting for children with autism in special education classroom. Multiple baseline design across behaviors was established among children with autism. After the intervention of HHIW, behaviors such as properly spacing words, staying on the lines, and correctly copying words increased in the children. All 3 behaviors showed positive changes during maintenance probes.

Keywords: Handwriting, Children with autism, Here’s How I Write

1 Introduction

While writing comprises a range of activities from handwriting to essay writing, it can be said that the former presents the foundation for the ability to write cohesively. Handwriting can be a means for academic achievement in school-age children with disabilities. However, many school-age children with autism encounter difficulties with handwriting, compared to children without autism [1]. This may be due to a variety of causes, including impairments in social, linguistic, and cognition skills, behaviors or preferences to abnormal degrees, or underdeveloped motor muscles [2].

Self-monitoring and self-assessments are useful in improving the writing skills of children with disabilities, and may also help enhance their sense of self-efficacy [3]. “Here’s How I Write” (HHIW) [4] is a standardized English version of the Hebrew original “Kach Ani Kotev,” [5] which was developed as a self-assessment tool. In particular, the tool was developed in such a way as to be suited for application of RTI (response-to-intervention) models. It also helps children to set their own goals by consulting with instructors, and has been designed to be amenable to support by intervention. While the efficacy of such intervention programs have been examined in foreign studies [4], to the best of our knowledge there have been no studies regarding the improvement of handwriting through self-directed learning methods such as self-assessment and goal-setting in Korea. Therefore, in this study we administer intervention through self-assessment and goal-setting focusing on autistic children, and analyze the effects of these approaches on handwriting.
2 Method

2.1 Participants

One autistic child A, who was receiving education from itinerant special education teachers, participated in this study. Written parental permission was obtained, and the child’s own willingness to participate was confirmed. Child A, a male child aged 7 years and 3 months, was diagnosed with severe autism according to the Korean Autism Diagnostic Scale [6]. While his writing skills were sufficient for rudimentary communication using simple words, he was passive in interacting with others and also exhibited signs of echolalia.

2.2 Setting

Experiments were conducted within a peripatetic class held in the general school where the child A was enrolled, with interventions supported by a special education teacher. This teacher was female, with 2 years of experience, whose college major was special needs education.

2.3 Experimental Design and Interventions

A multiple baseline design across behaviors was applied to study the effects of interventions. The baselines and interventions were administered 3 times a week in 40-minute sessions. Maintenance probes were administered once a week, also in 40-minute sessions.

Baseline. Prior to the baseline period, we held 3 training sessions on writing intervention with the special education teacher, reaching a trainee-rater agreement rate of 100%. During the baseline period, the teacher administered no writing interventions on the child, only collected baseline data.

Intervention. The HHIW program was administered as the intervention. Consisting of 24 writing intervention cards, the program is designed to let the child perform a self-assessment based on the cards and to receive assistance from the teacher in setting his own goals and proceeding with further learning. First, an assessment was made by having the child choose among cards with either a positive or negative statement on face and back (according to instructions translated into Korean) for 24 different questions. The self-assessment score for the autistic child A was 56 (out of 100), while the teacher’s assessment score was 43. Based on these scores, the child set 3 writing goals for himself, and the teacher also set 3 goals for the child. After this, the child and the teacher consulted to arrive at 3 final tasks to work on. These tasks included practicing proper spacing between words, staying on the lines, and correctly copying words.

Maintenance. During the 2-4 weeks after administration of interventions was completed, maintenance probes were conducted on A through a course of 3 sessions.
2.4 Data coding

Percentages were recorded for the actualized tasks formulated based on the across-behavior multiple baseline design: practicing proper spacing between words, staying on the lines, and correctly copying words. For the first task, the number of proper (defined here as the space occupied by a single character) spaces between words was measured by dividing the number of positive responses by the total number of spaces. The resulting fraction was multiplied by 100. For the second task, the number of phonemes falling within the given line (i.e., correct responses) was divided by the total number of phonemes on the line. The resulting fraction was multiplied by 100. For the third task, the number of correctly copied phonemes was divided by the total number of phonemes, then multiplied by 100.

2.2 Reliability and Validity

**Inter-observer Reliability.** Inter-observer reliability was calculated between 2 observers, Observer 1 and Observer 2. Observer 1 was the author of this study, while Observer 2 was the special education teacher. Training was carried out repeatedly until the agreement rate between the observers reached 100%. Inter-observer reliability was calculated based on a random sample of 25% of the data. In total, the value of the reliability measure was 94.7%.

**Social Validity.** The author interviewed 33 special education teachers, including the teacher who participated in this experiment, and 7 academic experts for social validity. The questionnaire contained questions on the content of the intervention cards, as well as questions on the overall means of intervention. Results suggested that 3 of the intervention cards (numbers 7, 12, and 13) may be inapplicable in Korea, while the interviewed experts found that the means of intervention would, overall, have positive onsite relevance.

3 Results

Child A’s resulting actions in terms of correct copying, staying on lines, and proper spacing after self-assessment and goal-setting interventions are illustrated in Figure 1. Child A’s baseline for word spacing was found to be lowest among the 3 tasks, followed by correct copying and staying on the lines. Intervention effects were found to be substantial in all 3 tasks, with the largest improvements observed in word spacing. In the case of correct copying, the mean percentage of positive responses during baseline sessions was low, at 34.3%. This improved to 97.8% during intervention sessions, and was maintained with an average of 98.9% during maintenance probes. In the case of staying on lines, the mean percentage of positive responses during baseline sessions was moderately low, at 52.7%. This improved to 98.1% during intervention sessions. The average during maintenance probes dropped only slightly to 94%. In the case of word spacing, the mean percentage of positive responses during baseline sessions was very low, at 2%. This improved to 99.8%
during intervention sessions. The average during maintenance probes dropped only slightly to 94.0%.

Fig. 1. Percentage of correct responses across three behaviors of handwritings during self-assessment and goal-setting sessions by child A.
4 Discussion

In this study, we utilized HHIW as a self-assessment tool for analysis by RTI models, and applied it as an intervention program. Results from experiments conducted on an autistic child find that there were improvements in 3 handwriting-related tasks, and that these improvements endured during subsequent maintenance probes. Our findings suggest that providing intensive and individualized writing support for disabled children experiencing difficulties in writing may contribute to improvements in their handwriting skills.

References