



# Mothers helping their preschool children to spell words: A comparison between interactions using the computer vs. pencil and paper



Dorit Aram\*, Orit Chorowicz Bar-Am

School of Education, Tel Aviv University, Israel

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## ABSTRACT

Computers can serve as useful tools in developing children's literacy. The study compared the nature of mother–child interactions spelling words using a computer vs. pencil and paper and explored whether mothers have a consistent mediation style beyond the writing tool. We videotaped 49 preschoolers and their mothers in their homes, spelling an eight-item shopping list, half of the words using a pencil and half using a computer. We coded the interactions, and compared between them while controlling for the child's spelling level. The results show that mothers supported their children somewhat differently based on the writing tool. When using the computer, mothers supported their children through a more complete cognitive spelling process and gave them more independence. When using the pencil, mothers were more willing to ignore errors and entered into their child's space more frequently. Beyond these differences, we found support for some consistency in the mothers' mediation across the two writing tools. When given a choice of tools to spell a word, children preferred the computer. We call for raising parents' and teachers' awareness of the opportunities that the computer offers for joint writing and early literacy activities with children as a complement to traditional early literacy support.

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## 1. Introduction

Children develop within the context of the opportunities afforded to them in their culture [1]. Today, computers are an inseparable part of that culture and young children exhibit curiosity to engage in the experience of operating computers in their home environments. In 2013, 83.8% of U.S. households reported owning computers [2]. Similarly, 83% of the UK households [3], 93% of the Netherlands' [4], and 89.0% of Israeli households [3] reported owning computers.

In literate societies, children show an interest in written marks and attempt to produce their own writings long before they are formally taught to write or read (e.g., [5]). Young children actively use technology [6] and within the literacy realm, they find digital forms of print interesting [7,8]. In preschools, children use paper, pencils, and crayons for writing and drawing, along with computers. Computers are an integral part of the curriculum, supporting and enhancing literacy programs [9]. At home, parents join their young

children's interest in the written world; they encourage them to write and they frequently help them spell words (e.g., [10]). Although parents help their young children spell words on both paper and on digital screens, to date, the nature of parent–child spelling interactions has only been studied using pencil and paper (for a review see [11]). The present study addresses this issue by comparing the nature of mother–child spelling interactions using a computer to their spelling interactions with pencil and paper. Moreover, beyond the writing tool, we aimed to identify a possible maternal spelling support style.

## 2. Literature review

### 2.1. Children's early writing and parental spelling mediation

Spelling is an important skill that plays a fundamental role in children's paths to literacy [12]. It integrates the central skills of phonological awareness and letter knowledge and provides a way to learn about sound to letter connections [13]. Young children who do not know yet how to spell words conventionally, frequently use random letters to write notes, lists, greetings, and the like (e.g., [10]). Children begin to understand the written code

\* Correspondence to: School of Education, Tel Aviv University, 69907, Israel. Tel.: +972 52 2847346; fax: +972 3 6844834.

E-mail address: [dorita@post.tau.ac.il](mailto:dorita@post.tau.ac.il) (D. Aram).

when they start to spell words by representing the sounds within words using phonetically relevant letters [14,15].

In alphabetic orthographies, young children's spelling levels provide evidence of their understanding of the alphabetic system [16] and predict early literacy, literacy growth, and literacy achievements in school (e.g., [17–20,16]). Children learn about the writing system through two main modalities: direct exposure to stimuli and mediated learning experiences [21].

Explicit instruction is required for children to master reading and writing; yet, children learn a great deal about the written language through informal interactions with their parents at home [22]. Parents familiarize their children with the alphabet and help their children write their names and names of other family members, birthday cards, notes, etc. (e.g., [23,10,24,25]). Writing activities with young children are valuable as they allow the practice of spelling and integration of literacy skills [26].

Research supports the important role of active parental mediation in enhancing children's cognitive development (e.g., [27–29]). Effective mediation includes scaffolding at a challenging but not frustrating level, sensitivity to the child's competence and perspective, encouragement of active participation on the part of the child, and assistance in alerting the child to metacognitive processes [30,31]. The parents' mediation processes are gradually internalized by the child and facilitate the development of various cognitive functions.

Parental spelling mediation refers to the ways in which parents help their young children cope with the spelling task. It mainly reflects the degree to which parents guide their child through the process of segmenting each word into its sounds and retrieving the required letter for each sound; the autonomy that parents allow their child in printing each letter; their elaborations; demand for precision; and the atmosphere that they create during the joint activity (e.g., [32,11]).

There is evidence that the nature of parents' spelling mediation in a pencil and paper-based interaction predicts children's literacy achievements, across varied orthographies (e.g., [33] in Arabic; [34,35] in Chinese; [36] in English; [32] in Hebrew; [37] in Spanish). Furthermore, parents' early writing mediation predicts children's reading and writing in school ([38] in Hebrew; [39] in Arabic).

From these studies, it seems clear that mothers' spelling mediation can help children learn about the spelling process, which continues to influence children's literacy development through early grade school. In all the above-mentioned studies, parents helped their children to graphically spell words on a paper. The present study is the first to assess whether the nature of mother-child spelling interactions varies based on the writing tool, i.e., the computer vs. pencil and paper.

## 2.2. Adult-child literacy interactions with computers

Preschoolers have access to computers in their homes and they enjoy using them, alone or with their parents, for a range of educational and recreational activities [40,41]. Studies have been conducted on the use of computers in various areas of early literacy such as phonological awareness games (e.g., [42]), vocabulary promotion (e.g., [43,44]), alphabet knowledge [45], and the like. Nonetheless, our broad search failed to find studies on parent-child spelling interactions using computers.

Adult guidance is important for effective use of the computer by young children [46]. Human mediation for computer use provides qualitative learning that suits the young child's cognitive and emotional development, whereas computer support alone lacks this aspect [47–49]. Regarding literacy development, McKenney and Voogt [50] note that frequent use of technology can have a positive learning effect on children's literacy development, at least in cases where adult facilitation is present. While children

tend to use computers daily in the home setting, most of the research exploring children's interactions with computers has focused around classroom and educational settings, leaving the roles of parents and siblings understudied [51]. We therefore conducted this study in the children's natural setting – their homes [52].

Given that the computer keyboard spreads the letters in front of both the child and the mother, we thought it would have the potential to enrich adults' spelling mediation. Parents tend to match their support to the task and its complexity [53]. Aram [54] found that mothers provided more direction in guiding the writing of words than of names and were warmer and more cooperative when writing names. Still, mothers showed a consistent spelling support style across writing tasks such as dictated words, writing family names, or an invitation. For example, mothers who gave their children more independence or reinforcements in one task did so in the other task as well (e.g., [54,55]). Studying mothers' spelling mediation when using two tools (computer vs. a pencil and paper) can teach about their spelling mediation style beyond the writing tool, a question that has not yet been answered.

There is evidence that mothers adjust their spelling mediation to their children's existing literacy skills and mediate on a higher level to children with stronger early literacy skills (e.g., [33]). Therefore, we controlled for children's spelling in our comparison. Moreover, we aimed to learn about children's preferred spelling tool. That is, do they prefer spelling a word using the computer or a pencil?

We hypothesized that, beyond the children's spelling level:

- (1) Mothers would encourage their children to spell longer words, support the children to go through a more complete cognitive process of spelling, and elaborate more often when spelling words using the computer than when using a pencil and paper.
- (2) Given the visibility of the keyboard, mothers would allow their children more independence in producing the letters, and demand more corrections from the children when spelling words using the computer than when using a pencil. Mothers would enter into their children's space more often to help them become familiar with the keyboard and the children would demand more independence when spelling words using the computer than when using a pencil.
- (3) Being sensitive to their children's physical difficulty printing the letters, mothers would ignore more errors when spelling words using the pencil and paper. They would enter into their children's space more often to print the letters for them than when using a computer.
- (4) Due to mothers' stability across tasks, mothers would show consistency in their spelling mediation beyond the writing tool (computer or pencil).
- (5) Being attracted to digital tools, children would prefer using the computer for spelling than using a pencil.

## 3. Method

### 3.1. Participants

The sample included 49 Israeli preschoolers (23 boys and 26 girls) and their mothers. The children's ages ranged from 58 to 76 months ( $M = 63.80$  months,  $SD = 3.94$ ), with an average age of approximately 5 years and 3 months. The number of children in the families ranged from 1 to 4 ( $M = 2.41$  children,  $SD = 0.81$ ); twenty-nine children in our sample were first-born, 13 were the second, four were the third, and three were the fourth-born children in their families. The mothers' mean age was 39 years ( $SD = 4.37$ ) and their education ranged from high school ( $n = 11$ ), through BA ( $n = 18$ ) and MA ( $n = 18$ ), to Ph.D. ( $n = 2$ ). Most of the families were intact (86%) and all of them had at least one computer at home.

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