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LETTER RECOGNITION AND HAND-COPYING SKILLS OF CHILDREN: A COMPARATIVE STUDY OF DARI AND ENGLISH ALPHABET LETTERS

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Abstract
This study aimed to explore and compare the difficulty level of alphabet letter recognition and hand-copying skills among children between two languages, English capital letters, and Dari alphabet letters. The participants were preschool children aged (4-5) in Taloqan City of Afghanistan. An observation method followed by a pre-test, a class session, and a post-test were conducted on the participants. The tests used in this study were Rapid Automatized Naming (RAN) and a paired samples t-test. The study's findings showed no significant difference in letter recognition between English and Dari letters; however, there was a significant difference in the hand-copying test. Also, the results of the study displayed that shapes of the letters played an important role in hand-copying the alphabet letters while it did not impact the letter recognition process.

Keywords: English and Dari alphabet, hand-copying, letter recognition, preschoolers, RAN

Introduction
Alphabet books were designed to teach and attract the attention of children to the letters so they can help children to better learn the alphabet, which is important for learning to read (Lonigan et al., 2013). The literature lacks a study comparing the alphabet letter recognition and hand copying levels between the Dari and English languages. Therefore, this study aims to measure the level of difficulty of letter recognition and hand copying between Dari and English alphabet letters in preschool children.

Travers (1967) asserted that in symbolic and verbal learning some of the information from the pre-perceptual field is chosen and kept in short-term memory, and a stage in which selected data in short-term memory is transferred to long-term memory by being hooked up to earlier saved information stored in long term memory. Learning the alphabet letters requires individuals to differentiate them visually. It is not just a common discrimination training that children need for naming the letter purposes rather it is visual discrimination training that can assist the children in remembering the exclusive shapes of the alphabet letters. These are the features that create a difference between identifiable and different letters

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(Samuels, 1970). NELP's suggestion is that there are significant correlations in post reading abilities including decoding, reading comprehension and spelling and these correlations are created by name-writing skills (National Early Literacy Panel, 2008). Previous writing abilities like uppercase writing, lowercase writing, and writing unconventionally expressing meaning, writing letters and words prevent upcoming reading problems (Snow et al., 1998). Gibson et al. and Dunn-Rankin's study show that letters (such as T) that have angular intersections and gaps in their lines are common letters to be recognized easily (Dunn-Rankin, 1990; Gibson et al., 1962). In an experiment with children aged 4 to 8, Gibson et al. (1962) examined whether children could recognize the topological transformation of the letters. The results showed that the children could contrast the transformations that were irrelevant with transformations that differentiated real letters. In terms of gender, Puranik and his colleagues stated that girls were better at writing the letter correctly than boys (Puranik et al., 2013). Their study results complied with Berninger and Fuller's (1992) study in which older children in elementary grades displayed that girls were better at remembering letters from orthographic memory for writing.

It is still not clear whether children, just like experts, only process a small part of letter forms (Dunn-Rankin, 1990; Fiset et al., 2008, 2009) or whether the method by which children process letter forms predicts the ease of learning letters. A lot of practice is possibly needed before the critical dimensions of letter forms are stored in children's memory and children instantly recognize a letter form by concentrating on the critical dimensions of the form (Both-de Vries & Bus, 2014). Also, the research among adults shows that expert readers identify letters by fixating only on small parts of the letter (Dunn-Rankin, 1990; Fiset et al., 2008). Fiset et al. (2008) used the so-called bubbles, a classification image technique, to investigate which areas of letters help most to recognize lower- and upper-case Arial letters. This task was conducted by covering a part of each of the letters with bubbles it was possible to test which features are important for letter identification. The results showed that line terminations were the most important features for letter identification. That is, ''the inferior termination of the uppercase 'C' clearly allows the discrimination of this letter form from the uppercase letters 'G', 'Q' and 'O', and is, in fact, sufficient for the correct identification of 'C''' (p. 1166). The areas, described as distinct features by Dunn-Rankin (1990), are the lower quarter of most letters that attract few fixations, particularly when letters include ascending vertical lines like h and k. The study is very similar to Gibson et al. (1962). The lower quarter of most letters involved few fixations, especially with letters including ascending verticals like 'h' and 'k'. The angular intersection of the letters appeared to be a unique feature for the letters 'x', 'v', and 'w'. For 'C', fixation was placed close to the opening at the right side and included more of the letter's background than the letter itself. When letters have more than one distinctive feature, such as an angular intersection plus an ascending vertical in the letter 'k', both of the areas can attract eye fixations (Both-de Vries & Bus, 2014).

Fixation, in the literature, is another factor in learning the alphabet letters. It was not yet revealed whether new readers identify letters by focusing on their unique features. It is plausible consumption that children begin familiarizing themselves with the forms of the letters at an early age if they grow up in a society where people are literate and the print is exposed to children continuously. The fixation duration will be reduced if the children are more familiar with the letter

forms (Both-de Vries & Bus, 2014). According to Evans et al. (2009), about one-third, over 20%, of the children's time is spent on looking at letters.

One of the assessment methods in reading is Rapid Automatized Naming (RAN). Di Filippo et al. (2005) conducted the RAN test in two-step tasks in their study. The first one asked the participants to name the items loudly and in the second task the participants crossed out a specific stimulus e.g., 9 digits naming every time they faced it. Their conclusion suggests that only the naming procedure correlated with reading significantly. In another study, Georgiou et al. (2013), suggest that due to their serial processing need, reading and RAN were related and they said that there was considerable correlation between RAN and oral reading fluency. It is worth mentioning that co-curricular activities can also enhance the reading outcome in language acquisition (Titrek et al., 2016). During conducting RAN, naming speed can significantly affect learners' second language word recognition explanation (Geva & Wade-Woolley, 1998). Gholamain and Geva (1999) concluded that speed naming and working memory in the Persian language are more stable predictors of word recognition than in English. Their study also showed that regardless of language proficiency and age, a robust explanatory framework for first and second-language basic reading abilities can be provided by considering the speed of letter naming and working memory. The relationship between the speed of naming and reading patterns remained consistent while the relationship between such processes to comprehension became progressively marginal with reliance on higher-level cognitive processes (Bowers et al., 1988; Wolf et al., 1986).

There are some views regarding learning writing in children. It is believed that the experience of handwriting, in printing letters form, impacts greatly the early letter knowledge skills (Aram, 2006; Aram & Biron, 2004; Longcamp et al., 2005; Lonigan et al., 2011; Neumann, Hood, & Ford, 2013). In the study by Lonigan et al. (2011). They asked children participants to write the letters in their names in a similar intervention schedule and the experimental group displayed more expressive knowledge, print knowledge, and phonological awareness compared to control groups. Zemlock et al. (2018) assert that the comparison of authentic handwriting with other sensorimotor interventions plays an important role in displaying the impact of handwriting on emergent literacy.

To understand the formation behind the impact of handwriting on letter recognition, comparing handwriting to a non-active control condition is important as Li and James (2016) compared handwriting to a visual-only learning condition. The result of their study showed that the groups that studied typed letterforms learned less than the group that studied handwritten forms either through tracing, viewing, or seeing during writing. Puranik et al. (2013) believe that the most difficult letters for children to write are J, G, Q, and R thus not all letters are equally difficult or easy while letter writing. Zemlock et al. (2018) have indicated that practicing handwriting to learn symbols is more effective than exposure to them for the same amount of time. The results of their study showed that children who practiced producing letters were better at letter recognition than their peers who were exposed to the letters for the same amount of time, but they never produced the letters by hand. They further asserted that practicing numbers by hand can also improve subsequent letter recognition. According to Samuels (1970), there are similarities between learning to name the alphabet letters and learning to recognize

names such as animals, flowers, airplanes, birds, and numerous other objects in our environment. He also labeled these letters as confusing: b, d, p, q, h, u, v, n; c, e, u, s; y, h, k, t; m, n, w, r; x, z, v, w; f, l, t, h; a, r, e, s; I, j, y, l.

Dari has 32 alphabet letters many of which are shared by Arabic and Dari. It has a one-to-many sound-to-symbol correspondence. Sounds can own a lot of graphical representations. Thus, irrelevant semantic words created from these letters appear to be the same (Gholamin & Goa, 1999). The direction of Persian alphabet letters is from right to left (Khanlari, 1979). Therefore, there is no visual similarity between the Persian and Roman alphabet writing systems (Baluch, 1996). There are three long vowels in Dari /i/, /u/, and /a/. Each of these vowels is represented by six spoken vowels, a letter, and three short vowels, /e/, /o/, and /ae/. Lack of diacritics for short vowels usually does not create a problem for advanced readers because by using alternative sources of knowledge, they can read and interpret the words (Abu-Rabia, 1997; Baluch & Besner, 1991). There is a consistent rule of graphemes-to-phonemes rule in the Dari language because there is a single pronunciation for every grapheme. However, the script in the Dari language is poly-graphic because more than one grapheme characterizes several phonemes. For instance, three various graphemes represent the /s/ phoneme and the /z/ phoneme is represented by four graphemes. There is a possibility that the relative contribution of phonological skill, and orthographic skill may display different patterns in performing tasks since Dari does not preserve the same level of orthographic complexity for reading (less complex) and spelling (more complex). Dari's writing is expected to facilitate the use of grapheme-to-phoneme rules of adaption for young readers as do other consistent and regular texts. Meanwhile, learning visual vocabulary should be eased by effective phonological skills (Frith, 1985; Gough et al., 1992). The results of this study present important findings on how difficult or easy the Dari and English alphabet letter recognition and hand copying are for Afghan children.

Method

Context of the study

There are over 35 languages that are spoken in Afghanistan where Dari, Pashto, and Uzbek have the most speakers. Dari and Pashto are the official languages of Afghanistan and other languages, e.g., Uzbek is considered an official language in places with the majority of speakers (Afghanistan, 2004; Orfan, 2023). Dari, as one of the varieties of Persian, dominates business, politics, and education in the country; therefore, it is considered the lingua franca of Afghanistan (Central Intelligence Agency, 2019). In Tajikistan, Persian is the official language which is called Tajiki in the country; however, it was renamed Dari in Afghanistan in 1964, but still, it is commonly called Farsi, meaning Persian, is the official language (Spooner, 2012). Dari is also the language of instruction at universities and schools in many parts of the country (Central Intelligence Agency, 2019; Coyle, 2014; David, 2014, Orfan & Seraj, 2022).

Dari alphabet has 32 letters whose traditional alphabetical order is shown below.

ا ب پ ت ث ج چ ح خ د ذ ر ز ژ س ش ص ض ط ظ ع غ ف ق ک گ ل م ن و ه ی

There is always one sound for a letter in Dari. Unlike the English alphabet, two letters never combine to produce a single sound. For instance, the single sound /ʃ

/should be spelled by letters such as /sh/, /tio/, /sio/… while it is / ش / in Dari. On the other hand, four sounds are produced by more than one letter of the alphabet. For example, the letters producing the /S/ sound are /ث / / س /and / ص / in which the letter / س /is used more often than the two other ones. Likewise, /ت /and / ط / produce the /t/ sound. Words with a /t/ sound are frequently spelled with / ت /and are rarely spelled with/ ط /. The /z/ sound can be spelled as / ز /, / ذ /, / ض / or / ظ /, and / ز / is used more than others. / هـ / and / ح / are used to produce the /h/ sound and both of these letters are almost used equally (Sultany, 1977).

English is learned and taught as a foreign language in Afghanistan, and it is one of the major courses at schools and universities in Afghanistan (Orfan, 2021) English has four main areas of usage: to connect with people abroad, to study in other countries, in the media and translation and interpretation (Coleman, 2019; Orfan, 2020). English language usage improved gradually after the Soviet Union withdrew from Afghanistan in 1989. Learning English became popular after the arrival of American troops and international organizations in the country in 2001 (Azami, 2009; Orfan et al., 2021). In addition, English plays an important role in employment and academic careers in institutions of higher education.

Research design

A mixed approach was used to carry out this research. Descriptive and paired samples *T*-tests were conducted for data analysis. Rapid Automatized Naming (RAN) test plus naming speed were observed as a measurement instrument. The participants were given a pre-test followed by training sessions and a post-test to observe their responses to 10 Dari alphabet letters and 10 English alphabet letters.

Participants

The participants of the study were 12 children aged 4-5 selected in Taloqan City, Afghanistan. Half of the respondents (6) were female. The respondents were speakers of the Dari language. The participants were preschool children who had not been exposed to any direct or indirect English or Dari alphabet letters before. To ensure whether the participants were exposed to indirect alphabet learning e.g., watching alphabet-learning cartoon shows, a pre-test was applied in which two of the participants were disqualified for the observation. A consent letter regarding the children's participation was developed and signed by the participant's parents.

Data collection instrument

A literature review was conducted to arrange the research design. One of the factors to be considered, regarding the teaching sessions, was the attention span whether to adjust the session for 10 minutes, 15 minutes, or less. There were controversial opinions about this topic. Davis (1993) states that "...student attention during lectures tends to wane after approximately 10–15 minutes." Likewise, Wankat (2002) claims that "Although student attention rises at the beginning of a session, it reaches a lower point after 10–15 minutes. However, according to Bradbury (2016), the greatest variability in student attention arises not from the teaching format itself but from differences between teachers. It is the teacher's responsibility to enhance their teaching skills to provide not only a satisfying lecture experience for the students but also rich content. Therefore, the teaching sessions for observation were set for 30 minutes and run by effective teaching methodology.

Both English and Dari alphabet teaching sessions for letter recognition took place in the morning half an hour after the participants had their breakfast. To prevent the participants' boredom and keep them refreshed for the sessions, there was only one session per day so the next session was launched the next day. To assess the participants' letter recognition a Rapid Automatized Naming (RAN) test was applied. RAN is the ability to name visually presented familiar symbols such as objects, colors, digits, and letters as quickly as possible (Denckla, 1972). According to Georgiou et al. (2013), RAN is linked with reading because it involves oral production of the names of the stimuli and serial processing. To avoid confusion among the participants and achieve the best results, only one representation was selected out of the whole group of similar letters such as multi grapheme letters like /ظ/، /ذ/، /ض/، /ز/ or /ث/، /ص/، /س/، . The same procedure was applied to English letters as well so only one was selected for the observation e.g. from C or G and Q or O (Dunn-Rankin, 1990). In addition, the most complicated letters for children like J, G, Q, and R (Puranik et al., 2013) were deselected in the list of letters for letter recognition and hand-copying tests. After the letter recognition test was over, a set of 10 English uppercase letters (Figure 1) and 10 Dari letters (Figure 2) were projected and the participants were asked to hand-copy the letters. These are the letters chosen for the test.



Figure 1. Dari letters selected for letter recognition and hand-copying tests

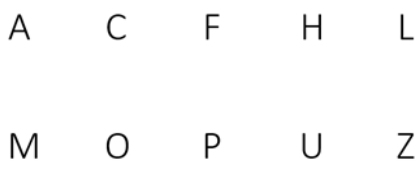


Figure 2. English uppercase letters selected for letter recognition and hand-copying tests

Data analysis

The participants' responses to the RAN for letter recognition test and hand-copying test were recorded by the researcher. Descriptive statistics was used to define the mean, frequency, and standard deviation of the data. Also, to evaluate the significant difference between English and Dari letter recognition ability and hand-copying ability of the participants, a paired samples t-test was used. The mentioned tests were performed in SPSS version 26.

Findings and Discussion

Findings

The participants (N=12) were given a pre-test on both Dari and English letter recognition and Dari and English writing before taking learning sessions. The pre-test results indicated that the participants had zero knowledge of Dari and English letters (Table 2).

Table 2. Results of the participants' pre-test

Participant No	D.L.Re.R.T	E.L.Re.R.T	D.L.Wr.T	E.L.Wr.T
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0

*D.L.Re.R.T = Dari Letter Reading Recognition Test
*E.L.Re.R.T = English Letter Reading Recognition Test
*D.L.Wr.T = Dari Letter Writing Test
*E.L.Wr.T = English Letter Writing Test

The authors conducted teaching sessions for the participants, and they were given posttest. As Table 2 shows, the teaching sessions had a significant impact on children's learning of English and Dari alphabet letters. Furthermore, the total score of students for the Dari RAN Test is 48 while it is 46 for the English RAN test, which is not very significant. On the other hand, the total score of the participants for the English hand copying test is 80, which is almost twofold of students' total score for the Dari hand copying test.

Table 2. Results of the participants' posttest

Participant No	D.L.RAN.T	E.L.RAN.T	D.L.HC.T	E.L.HC.T
1	5	4	0	3
2	4	2	2	5
3	3	4	9	10
4	4	5	3	5
5	8	7	4	6
6	3	3	5	5
7	3	2	4	7
8	5	6	5	10
9	4	3	3	7
10	3	4	6	10
11	4	3	4	8
12	2	3	2	4
Total	48	46	47	80

*D.L.RAN.T = Dari Letter Rapid Automatized Naming Test
*E.L.RAN.T = English Letter Rapid Automatized Naming Test
*D.L.HC.T = Dari Letter Hand Copying Test
*E.L.HC.T = English Letter Hand Copying Test

In addition, a paired samples t-test was conducted to compare the score of the Dari letter rapid automatized post-test and English letter rapid automatized post-test by the participants after the participants took letter learning sessions. The result of the test showed that there was not a significant difference between the Dari letter rapid automatized naming test (M=4.00, SD=1.53) and English letter rapid automatized naming test (M=3.83, SD=1.52); *t* (22)= .518, p>0.05 (Table 4).

Table 4. Paired samples t-test results of Dari and English letters RAN test

	Paired Differences						
Pair 1	RAN	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
	DL.RAN.T - EL.RAN. T	0.167	1.115	0.322	0.518	11	0.615

* DL.RAN.T = Dari Letter Rapid Automatized Naming Test
* EL.RAN.T = English Letter Rapid Automatized Naming Test

Furthermore, the author conducted paired samples *T-tests* to determine the differences between the participants in terms of Dari and English hand copying. The results showed that there was a significant difference between the Dari letter hand copying test (M=3.92, SD=2.27) and the English letter hand copying test (M=6.67, SD=2.42) conditions; t (11) = -6.69, p<0.05 (Table 5).

Table 5. Paired samples T-test results of Dari and English letters hand copying test

	Paired Differences						
Pair 2	Hand Copying	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
	D.L.HC.T - E.L.HC.T	2.75	1.422	0.411	-6.698	11	.000

Discussion

This study investigated preschool children's ability to recognize alphabet letters and hand-copying skills in two different languages, English and Dari – only uppercase letters were selected for the English alphabet. In other words, it compared the level of difficulty of English and Dari alphabet letter learning among Afghan preschoolers. This study was limited to 12 Afghan preschoolers in Taloqan City Afghanistan.

The results of the study showed that there was not a significant difference between English and Dari alphabet letter recognition by the preschoolers. Despite the Dari alphabet letter shapes look more complicated than English alphabet letters since there are several diacritics for a single letter e.g., /ش/ which has three dots on its top, some are curved like /چ/or some have extra parts such as /گ/, the participants could recognize both languages alphabet letters almost equally. Therefore, this study suggests that preschoolers learn letter recognition of any

alphabet letters equally regardless of their shapes provided that equal teaching time is delivered for them.

Contrary to letter recognition results, the finding of this research suggested that there was a significant difference in the hand-copying test. The participants were able to copy the English alphabet letters more quickly and more easily than the Dari alphabet letters. The reason for this can be the difficult shapes of the Dari alphabet letters. It was observed and found that the participants needed more time to copy the Dari alphabet letters than the English alphabet letters. Therefore, Dari letters require more concentration for children while being hand-copied. The results of the study suggest that the more complex the alphabet letters are the more difficult and time-consuming they will get for children. From this perspective, this study conforms with Dunn-Rankin's (1990) study in which some letters are introduced as the letters that require a longer time of fixation. The study also showed that there was not a significant difference between female and male preschoolers. This finding is inconsistent with the finding of the study by Berninger and Fuller (1992) and Puranik et al (2013) whose study showed that girls achieved higher letter-writing scores than boys.

Conclusion

This study compared the level of difficulty of alphabet letter recognition and hand-copying skills among children between two languages, English and Dari alphabet letters. The findings of the study suggested that there was a significant difference in hand copying tests. In other words, the participants were able to hand copy more English alphabet letters than Dari alphabet letters. In terms of letter recognition, the results of this study displayed that the participants recognized the alphabet letters both in Dari and English almost equally. It can be concluded that the shapes and forms of the letters played a significant role in hand copying the alphabet letters, the more complicated the shapes and forms, the more difficult the hand copying. However, the shapes and forms of letters did not impact the letter recognition. Since the present study compared English uppercase letters to Dari alphabet letters, the comparison of English lowercase letters to Dari alphabet letters, whether they act similarly or differently, remains an area that requires further research.

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