Payam -e- Noor University

Faculty of Literature and Humanities

Department of Linguistics and Foreign Languages

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(TEFL)

Effect of font type, font size, and line spacing on legibility of the text, reading

comprehension and recalling of Iranian EFL intermediate students

By:

ElhamMohammady

Supervisor: **Dr. HasanSoleimani**

Reader: Dr. ManoochehrJafarigohar

Tehran- Iran

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Dedicated to

My husband, for his endless and unconditional love

My parents, for their encouragement and support

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ABSTRACT

This experimental study investigated the relationship between the independent variables: font type, font size, and line spacing and the dependent variables: legibility, as measured by speed of reading, comprehension, and recalling. Instruments for testing legibility and reading comprehension were presented in eight typographical styles in print. The study tested 90 students for legibility and 76 students for comprehension. The subjects were chosen from Urmia Language Center institute and they were both males and females. Two weeks after reading comprehension test, the subjects took part in a recalling test. In all tests, the subjects were randomly assigned to one of the eight different typographical styles with Arial or Bookman Old Style (font selection) and 10pt or 12pt (font size). But the subjects had both set solid and double spaced leading in their instruments. Results indicated that the 12pt was read faster than 10pt. But font selection and line spacing did not have any significant effect on reading speed. Also, there were no significant results with regard to comprehension and recalling.

Keywords: Typography; legibility; speed of reading; comprehension; recalling; font selection; font size; line spacing; serif; sans serif; Arial; Bookman Old Style; set solid

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Chapter One

Introduction

1.1.Background

In order to be informed, people undoubtedly depend on reading material (Aberson&Bouwhuis, 1977). Instruction mostly takes place through reading. And yet, very little is known about how type is perceived by the readers. Studies, like this one, are vital to find out the importance of type design and typographical issues in learning and reading through repeatable experimentation. It is more than a century that editors and printers have been concerned with legibility of print. There have been lots of recommendations and ideas regarding legibility, but they were not based on scientific studies and were based on casual observations. Few studies have been done before 1900 but after 1925, the researchers expanded their studies in this area (Tinker, 1963).

In the early years of research, the only important factor considered was aesthetic appearance of print (Tinker, 1963). Although words should be aesthetically acceptable, like other manmade objects, and although they should be written in a typeface which can affect readers' perception of the text (Subbaramu, 2010), they cannot be the only factors leading to a legible text. Economy of printing and traditional practices are two other factors influencing the choice of typographical factors. These factors were on the stage for many years. These factors are still operating; however, they have less influence. The reason why truly scientific typography is happening really slowly is these practices and ideas (Tinker, 1963).

The advances in research and technology have not led to innovation, and its result is that the typesetting today is not so different from that of the printing times in the past. One reason is the

cost. Because of considering and managing the cost, publishers has to set the lines and letters so close together which is not beneficial for the readers (Beidler, 2006).

Rand Reading Study Group (2002) defined reading comprehension "as the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (p.11). RRSG suggested that reading comprehension consists of three factors: the reader, activity, and text. According to Tracey and Morrow (2002), surface features of the text, like the content of the text, the readability of it, and even the font size and font type of the text can influence the interaction of the reader with the text (as cited in Pardo, 2004).

Larson and Picard (2005) have stated that typography has some effects on reading. They tried to measure the effect of aesthetics on readers' reading. They used Relative Subjective Duration (RSD) to measure the participants' perception of the amount of time they were working on the task. It has been claimed that the participants underestimate the duration of time when the task is easy to do. The result showed that high quality typography makes the task easier and can bring about the positive mood and so it has little effect on reading speed and comprehension. Aberson and Bouwhuis (1997) have claimed that if the visual representation of words does not take place effectively, word recognition takes more time which consequently delays the performance of saccades therefore it results in less accurate eye-movement.

Fluency is an important issue to be considered in reading comprehension. Pang, Muaka, Bernhardt, and Kamil (2003) have maintained that the fluency is directly related to comprehension, so it is really important. In addition, Pikulski and Chard (2003) state:

> reading fluency refers to rapid, efficient, and accurate word recognition skills that permit
> a reader to construct the meaning of the text. Fluency is also manifested in accurate,

rapid,   expressive oral reading and is applied during, and makes possible, silent reading

comprehension. (p. 3).

 Fluency which is rapid word recognition saves more space for comprehending the message

of the text in readers' working memory (N. A., 2004). Working memory has limited capacity;

therefore, automaticity of word recognition leaves more space for processing of higher order

thinking, like comprehension. Capacity of attentional resource is also limited, so if word

recognition takes place effortlessly, more attentional resources remain for comprehension

(LaBerg& Samuels, 1974, as cited in Hudson, Lane, & Pullen, 2005).

 Reading speed may be an indicator and measure of automaticity component of fluency

(Rasinkki, Homan, & Biggs, 2008), so increasing the speed of reading will increase the fluency

and consequently the word recognition becomes easier and faster and will result in better reading

comprehension (Taguchi, Gorsuch, &Sasamoto, 2006).

 Research on the readability of texts in print has continued for decades, but unfortunately, as

Bloodsworth (1993) has noted, these are the publishers who determine the factors affecting

legibility, which as Tinker (1963) suggests can be measured by speed of reading, based on their

own opinions and beliefs and not based on the findings of the researchers.

 Although different typefaces or fonts have different connotations and can have influence on

the readability, interpretation, and the impact of the words they represent (Thangaraj, 2004), for

decades there has been a disagreement among the scientists and typographers concerning the best

typographical factors using in print. Up to now, no one has been able to provide a conclusive

answer to this issue. Some important issues to be considered dealing with the best typography

choices in print are font type, font size, and leading or the vertical space between the lines

(Tinker, 1963). But there is no agreement among researchers on the best typographical factors. For example, there is no agreement about the proper size of type among authorities. Most publishers believe that ten or eleven point size is the smallest one can be used in books, but others reject this claim (Bloodsworth, 1993). For example, Fuchs (2006) believes that font size 10 and still better 11pts should be recommended for the main texts.

In one study done by Russell and Chaparro (2001), it was found that increasing size of text up to a critical point increased the reading speed but surprisingly it did not have any effect on reading comprehension. Russell and Chaparro's finding violated the ideas mentioned about the beneficial role of reading speed on reading comprehension. In contrast to Russell and Chaparro (2001), Beildler (2006) claimed that the first thing needed to be done for improving the readability of print is increasing its font size. Aberson and Bouwhuis (1997) have rejected the idea of increasing characters' size for increasing reading speed or comprehension, and stated that characters' size do not have any effect on reading rate of the readers with normal acuity provided that the characters are not too small (1mm) and not too large (9mm). They claimed that increasing the size of characters makes the reading easier and also can enhance reading rate up to a point only for readers with low vision.

Typeface is another typographical factor that suffers controversies. The available research on typefaces does not give any clear picture of the best typeface. Some researchers and designers suggest using serif fonts for the body and sans serif fonts for the headings. Others believe that in smaller sizes its better to use serif fonts to have more legible texts. The others maintain that sans serif faces are suitable for the texts which are not meant to be read continuously (Hartley, 2004).

Some, like Erdogan (2008), believe that serif fonts are more legible but others, like Woods, Davis, Scharff (2005) believe that sans serif fonts lead to more legibility. However, there is no agreement among them; there is uniformity in books' typefaces and sizes. Gelderman (1998) prefers serif fonts over sans serif fonts because: 1. In sans serif typefaces, letters look like mirror image of each other, so they are easily confused, but serif fonts are more distinct and so they can be seen more easily, 2. The beginning and the end of serif fonts are more emphasized, and 3. Serifs make it easy for readers to recognize the shape of the words, because experienced readers do not read the letter but only the words and especially the upper half of the lines.

Leading is the other issue that suffers from some contradictory ideas. As Bloodsworth (1993) has mentioned, there is not any uniform opinion on the best form of leading, like other areas of printing. For example, Fukaya et al. (2010) concluded from their study that 0.7 is suitable for leading; however, Hooper and Hannafin (2010) suggested double space leading for density of having more than 40 characters per line.

Reviewing the literature shows that researchers have done lots of studies on the role of typographical factors on legibility and reading comprehension. Nevertheless, there is no clear picture of the issue and there is no agreement among them. Moreover, there is not enough work on the role of typographical factors on recalling. So there is an evident necessity for working on these issues.

1.2.Significance of the Study

1.2.1. Theoretical contribution

According to Romney (2006):

Most teachers give students handouts. Whether syllabi, activities or homework, handout content is only half of the document. The other half is its layout or visual appeal. While lots of thought and energy go into the creation of content, often visual elements are ignored. (p.1).

Reading is a kind of common but complicated activity. Readers extract characters from an image and recognize the words while reading. Readers can read under different conditions: For example, they can read both handwriting and printed letters. But some conditions are easier than the others (Rossum, 1998). Print has influence on reading because reading becomes so difficult if the text is not legible.

Knowing the importance of print, one should be really careful to note the methodologies used in previous studies (Chandler, 2001). In fact few of the studies related to type design of print were done in real-life situation (Hartley, 2004). As Chandler (2001) believes, the current ideas about type design are based on historical preference and are out of date and old information. The lack of experimentally supported findings highlights the significance of this study.

Also, there is a necessity to collect evidence for supporting or rejecting the previous studies of reading in print. This study considers three most important typographical factors influencing legibility simultaneously. Moreover, this study is a step to understanding the role of these factors on reading comprehension and recall.

1.2.2. Pedagogical and practical contribution

On way for having enjoyable texts is by using typographical choices that make reading easier and also help the reading comprehension because when readers struggle to comprehend the text,

they will lose their interest for reading. In addition, more legible fonts can be printed smaller, so they can assist economy (Rossum, 1998)

In conclusion, by conducting more accurate studies, typographical experts can give useful suggestions to the material developers. Therefore, material developers can develop more enjoyable material with higher quality which can help and improve instruction. Also teachers and syllabus designers can benefit using these materials for conducting more practical classes and they can instruct more informed students. Also students will pay more attention to the materials and they can comprehend better because as Romney (2006) states, half of reading is dependent on the visual appeal of the text.

1.3. Statement of the Problem

As mentioned above, reading is probably the most important factor for surviving in this new world. This issue becomes more vital for EFL learners because the most widely used way of learning English is reading; therefore, finding a way to make the reading easier and more interesting and also more comprehensive may be very helpful for EFL learners. The teachers and syllable designers also can use the helpful findings of this study. Syllable designers can assign the texts and books which have the most appropriate typography and the teachers by using those reading materials and also preparing their own reading materials based on the useful recommendations from these kinds of studies can manage a more interesting, practical and comprehensive reading classes.

Being so, choosing good typographical factors can be really helpful but, in spite of the studies done, there is no clear-cut answer. Researchers cannot come to agreement about the appropriate typographical factors and there is controversy among the researchers in this area. A

reason for this disagreement could be what Hartley (2004) has stated: much of earlier research was not helpful to instructional or informational text designers, because the variables were not studied in real-life situation and for instructional materials.

Also, there is scarcity of research done in the world about the effect of typographical factors on reading comprehension. The studies even are scarcer on their effects on recalling. There has been no study in Iran in this area so working on these issues is absolutely necessary for improving the quality of reading materials of Iranian students who learn English mostly through reading.

It is heard a lot from Iranian students that they do not enjoy some of their reading texts because of some physical factors of the texts, for example type of font. I myself as an EFL student have experienced this problem. Sometimes the type of font and its size make me stop continuing the text that I am reading. Also as a teacher I have seen that the students have some problems in reading and they are not fluent enough. The reason for these problems might be the surface features of the texts.

The present study examines three important facets related to print (size, type, and leading) in a real life situation, reading in class, to understand whether they have any influence on reading comprehension, recalling, and legibility. Also, the research considers the effect of these factors on reading speed which is one factor to measure the legibility of print.

1.4. Research Questions

Regarding the problems stated in the preceding section, the present study intends to examine the following questions:

Question 1

Does the use of serif type vs. sans-serif result in differences in reading speed among Iranian

EFL intermediate learners?

Question 2

Does the choice of type size (10 point, 12 point) result in differences in reading speed of Iranian

EFL intermediate learners?

Question 3

Does the choice of spacing (double spaced or set solid) result in differences in reading speed of

Iranian EFL intermediate learners?

Question 4

Does the use of serif type vs. sans-serif type result in variability in reading comprehension of

Iranian EFL intermediate learners?

Question 5

Does the choice of type size (10 point, 12 point) result in differences in reading comprehension

of Iranian EFL intermediate learners?

Question 6

Does the choice of spacing (double spaced or set solid) result in differences in reading

comprehension of Iranian EFL intermediate learners?

Question 7

Does the use of serif type vs. sans-serif result in differences in the recall of Iranian EFL intermediate learners of reading a passage?

Question 8

Does the choice of type size (10pt, 12pt) result in differences in the recall of Iranian EFL intermediate learners of reading a passage?

Question 9

Does the choice of spacing (double spaced or set solid) result in differences in the recall of Iranian EFL intermediate learners of reading a passage?

1.5. Research Hypotheses

To find answers to the questions, the following research hypotheses were formulated:

H01) The use of serif type vs. sans-serif does not make any difference in reading speed of Iranian EFL intermediate learners.

H02) The choice of type size (10 point, 12 point) does not make any difference in

reading speed of Iranian EFL intermediate learners.

H03) The choice of spacing (double spaced or set solid) does not make any difference in reading speed of Iranian EFL intermediate learners.

H0 4) The use of serif type vs. sans-serif type does not make any difference in reading comprehension of Iranian EFL intermediate learners.