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Conclusion

This study sets out to determine the effect of the complexity of word formation on legibility. It is also designed to assess the role the short vowels play in the reading of Arabic texts. This is carried out via a holistic approach to legibility research that combines the visual culture with reading and legibility studies.

To do this it starts by giving a short account of the development of Arabic letterforms used in the setting of long texts and their transition from manuscript to typographic norms. It is a story of an increasing level of maturity and complexity in manuscript forms that initially proved too difficult to morph from handwritten forms to metal-set ones. This introduces the theme of complexity and the role that technology has played in morphing manuscript styles into typographic ones. The first four centuries of printing Arabic comprised an increasing level of complexity in terms of design; that would soon come to halt with the 20th century and the quest for speed, rather than beauty of form. It also establishes how the current state of affairs is one that allows Arabic typography to grow in either or both directions. As such, it sets the stage for the key question regarding the role of complexity of word shaping in the reading of Arabic texts.

The dissertation analyzes the anatomy of the Arabic script, in both manuscript and typographic forms and offers a glimpse of the typographic visual culture of the Arab world today. It also presents the design process of the specially designed Afandem typeface family that is representative of the three different typographic interpretations of Naskh. This family is meant to provide the stylistic variable that tests the effect of the complexity of the word formation on legibility, as set out in the research question.

To that, this dissertation also investigates the characteristics of eye movement in reading and the results of legibility studies. It presents a new definition of legibility that is rooted in the models of eye movement research, and argues that legibility is relative and depends on the characteristics of the visual stimulus, the viewer, the distance between them, and the task, and. It has also demonstrates that legibility effects are manifest very early on in word processing. As to the reading of Arabic, it has argued that there are specifics to it that are different from the reading of Latin. To that effect, one needs to address the process of reading from an international perspective, one that takes in the special characteristics of different languages and scripts.

The Findings and Implications

The foremost significant finding to emerge from this study is the affirmation that the increased complexity of word formation has a negative effect on the legibility of Arabic typefaces. This is in line with the view of leading psycholinguists that the complexity of the visual has an extra cost in word processing.

The study has also confirmed the argument that the short vowels are second class citizens within the Arabic alphabet and that their inclusion in text adds a cost to word processing even though they bring with them extra clarity that results in a reduced number of regressions.

Returning to the hypothesis presented at the beginning of this dissertation, it is now possible to state that the act of reading is one that revolves around cost and benefits. The relevance of complexity as a candidate for investigation is clearly supported by the results showing that the increased complexity in the word shaping, and the extra visual complexity that the short vowels bring both come at an extra cost to word processing. The complexity of word shaping sometimes increases letter-form differentiation and thus renders them easier to distinguish. The vowels bring in clarity in pronunciation and transform the orthography into a shallow one. However, both these benefits are outweighed by the cost of visual complexity.

Taken together, these results suggest that the way texts are being presented today is not so far from the ideal. The evidence suggests that in the case of educational textbooks as well as the instances where speed of reading is paramount, the simpler the style of the typeface, the better it is. The results also indicate that the gradual process of weaning students off vocalized text is also beneficial.

The problem of diglossia and the low levels of literacy and reading as a culture are ones that are not so simple to resolve. However, the literature review has shown that early exposure to Modern Standard Arabic facilitates the process for children first learning how to read Arabic. The solution, it seems, echoes the premise of this paper: that we need a holistic approach to the study of reading, and again to the problems facing educators today. It is not enough to address the design of Arabic typefaces as a cure to the troubles in learning how to read Arabic, and it is also not possible to ignore the influence that the complexity of the visual brings. The solution lies in the convergence of the disciplines of reading research, education, and design.

The Significance and Limitations

The examination of the role of visual complexity assists in the understanding of reading and word identification in Arabic. It adds significant results to the very few bits of information of what we do know about reading Arabic, and is perhaps the first in offering solid evidence regarding Arabic typeface legibility. It is hoped that this research will serve as a base for further studies in both reading and legibility, and that it might also inspire a more international approach to reading research.

A number of unavoidable limitations need to be considered. First, the testing is concerned primarily with the Naskh style, which is the main style used in long texts, and not with the Kufi styles. As mentioned in the previous chapters, Kufi offers many interesting venues for typographic design, and it would be interesting to compare the relative legibility of Naskh and Kufi. Ruqaa is another good candidate for analysis as it is the common handwriting style. It was outside the scope of this study to bring all of this variation into the testing, and it would have scaled it to an unmanageable level. However, these are avenues for further research, and would provide a more complete picture regarding Arabic typeface legibility.

Another limitation is the scarcity of Dynamic Naskh in daily life. Though the study tried as much as possible to neutralize this by testing with schools where religious education and Quran reading is common, it is still a somewhat unequal situation.

Lastly, this study only examined the reading measures that are time specific but has not analyzed the fixation positions in Arabic, or if the visual complexity has an effect on that. Though the data was collected as part of the same study, the analysis of fixation positions is a laborious process that would have seriously impacted the ability to conclude the study. The analysis of the reading measures already required a complete year to do, and fixation positions would have added another year, thereby significantly delaying the completion of this manuscript. It is planned that this topic would be picked up for further analysis in the near future.

Further Research

As mentioned above, this study leaves many doors open for further exploration. The issue of hemispheric specialization and its role in letter identification is an intriguing one. Is it really true that the right hemisphere cannot distinguish between Arabic letters that are only differentiated by their dots? How does this affect typeface legibility? Is there anything that can be done to compensate for the disadvantage of reading words on the left visual field? And in that vein, how does that disadvantage affect the preview benefit in Arabic? The preview benefit is mainly affected by low level information and letter codes, but if the right hemisphere is unable to process the letters, is there a preview benefit at all?

The most glaring gap, it appears, is in the understanding of the process of reading in Arabic. It is a field of study that is grossly under-researched and in the large scheme of things, more pressing to investigate than typeface legibility per se. Still, the avenues for Arabic legibility research are very wide open. Of particular relevance are the legibility of road signs and the effects of styles on that. Another topic of interest is the typefaces suited for information design, with a broader look at how Naskh and Kufi function within that domain. This is especially the case of low resolutions and user interface design.

From the Beginning to the End

This research started with the question of what to design, and how to encourage Arabs to read more. It originally started with a subjective preference for the simplicity of the Kufi styles, and a gut feeling that the complexity of manuscript Naskh makes it harder to read. These subjective feelings were soon to be challenged with the design of Afandem. The Dynamic version proved to be a joy to design and to behold, and contained within its curves a beauty and elegance of form that made the Simplified version look very awkward in comparison. The question then turned into one of genuine objectivity. All of the styles available today can blossom into great designs that enrich the typographic repertoire. It was no longer an issue of subjective preference, but of a need to know where and when to use each.

The conviction that complexity is detrimental to reading turned out to be true, but with it came the understanding that there are instances of design where you do want to slow the reader down, where you want the elegance of the letterforms to shine through. This is the paradox, and ultimately the joy, of Arabic typography. The manuscript forms were developed with the specific intention of giving value to

that which is being written, and not for the speed for reading. It is no wonder then that the typographic designs emulating those forms end up bringing that value and sense of worthiness to the text being set.

On the other hand, the simplicity of form that developed to accommodate the speed of type setting also ended up speeding the reading process. When seen in that perspective, the history of Arabic type design no longer seems as one of missed opportunities but rather of a wealth of possibilities. This brings us back to the question of what to design, and a designer's approach to legibility research. The concept of variables in design, one such example being complexity, is a variable in the full sense of the word. It is an element of design that a designer can control for maximum effect depending on the task at hand.

Still, the question of complexity is a question of reading and context. It is the story of a child faced with learning to read a language that somehow sounds familiar but is nevertheless new. It is the story of a nation-in-waiting. It is the story of a region with a young demographic and a questionable future. Type design is not a silver bullet, but the increased complexity of typefaces is one extra hurdle for that child to jump. This is, then, not a question of preference of style, but a question of reading as a culture and the benefits that typographic design can bring into the Arab nations.