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Reading is done without consciously recognising letters. Nevertheless letters constitute an important aspect to determine legibility. Letters need to be decoded in order to obtain meaning. A person whose reading process is impeded, is less able to develop both intellectually and socially.

Due to the low quality level of visual input they receive in the form of printed text, beginning visually impaired readers are at a disadvantage in comparison to their peers. Their reading speed is lower, which eventually can lead to cognitive problems. In the past, typography has often been looked upon as a useful instrument to improve the legibility of the printed reading material that is being offered to children with low vision. However, the legiblity research efforts that were at the base of this conception were not always of good quality.

In cognitive science for example, many efforts were made that were methodologically correct, yet the test material (the used typefaces) had little to do with reality. Many typefaces that were supposed to improve legibility were also suggested by typographers themselves, but the reasoning behind them was hardly ever sufficiently methodologically supported.

Moreover, most legibility research focused on people with low vision in general, ignoring the fact that visually impaired children constitute a very particular group with specific issues. Both the fact that their reading process has just started, as well as the fact that their visual impairment is not caused by ageing make it difficult or even impossible to simply transfer results.

Comprehensive legibility research takes into account both scientific methods and typographic practice. A designer-researcher is able to combine these two and thus guarantee the internal and external validity of the test material. During the process of designing the test typefaces the focus was on parameter designs. Parameters are form features that can be isolated within one particular typeface. Departing from two existing typefaces (serif and sans-serif) a number of derived typefaces (five different parameters) were designed. These five parameters were used to examine the balance homogeneous-heterogeneous in both form and rhythm. Theoretical and practical insights concerning legibility in low vision children pointed in the direction of more heterogeneity.

This doctoral research project in design seeks to shed a light on legibility in the context of visually impaired beginning readers.

The typefaces were tested by means of experimental and subjective legibility research. For the experimental part a psychophysical method was applied, presenting the children with pseudowords in the test typefaces for a short time, registering the number of errors. In the subjective part of the project reading experiences of children who were confronted with the test typefaces were examined. Both children with good eyesight and low eyesight were selected in order to study the reading skills and reading experiences in visually impaired children.

The legibility research results showed a rather early conditioning with daily reading material in beginning readers. They associated sans-serifs with school and considered them to be writable; serifs they associated with literature (e.g. books and newspapers) and considered to be difficult to reproduce themselves. The non-visually impaired children generally perceived the most conventional typeface as being the most easily legible one. Amongst the visually impaired children this was not always the case.

Some of the children experienced social pressure to choose a normal letter. A remarkable finding is that children with normal vision read significantly better when a serif typeface is being used, instead of the conventional sans-serif. In visually impaired children the difference between both typefaces is less pronounced. During the reading (decoding) process non-visually impaired children appear not to be hampered by a homogeneous rhythm, but rather by a homogeneous form. The children with low vision however, seemed to be hampered more and even in particular by a homogeneous rhythm. It may be so that a certain degree of formal heterogeneity also offers support.

Starting from these findings a typeface called Matilda was designed that will be able to provide support for the target group of visually impaired children in the first stages of the reading process. Matilda is based on a serif typeface, in order to reduce the gap between the reading material for non-visually impaired children and those with low vision.

Matilda, a broad, low contrast letter of which the terminations augment its individuality and distinctiveness, will develop into a large typeface family consisting of various functional fonts.