

The Grover Foundry's fifty years of business secured it a reputation that has lasted centuries, it is referred to in many typographic books as the originator of the first English display face: Union Pearl.

Grover is the name of a Sesame Street muppet.

Grover is the family maiden name of the designer of this typeface, who is not knowingly related to either of the above.

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grover

a family of three typefaces

grover

which consider the problems

grover

and needs of the dyslexic reader

The literal translation of the word itself is dys: difficulty, lexis: words. As the term 'dyslexia' itself has caused controversy, it is sometimes referred to as a Specific Learning Disorder (SLD). Dyslexia is recognised as a disability under the 1970

Chronically Sick and Disabled Persons Act. However, a significant factor is that dyslexia is not correlated with intelligence; Einstein and Leonardo da Vinci are alleged to have been dyslexic.

At least one person in twenty-five is dyslexic to some extent. Perhaps two per cent of the population can be counted as suffering from severe dyslexia.

Osmond¹ describes the experience of a dyslexic reader as similar to a television with poor reception – the set works but images and sound are blurred.

Dyslexia is defined as a disorder which creates problems in processing language, particularly in reading and writing.

The Grover typeface has been designed in three variations: Sans, Serif and an italic Casual version. All three variations are based on traditional typographic design details for legibility and take into account the needs of dyslexic readers, in particular readers of student age – 16 plus. The design was progressed from initial hand rendered sketches to FontLab 4.6.

Formative pilot testing was undertaken in June 2004 – the results are included in this booklet together with research and information given by dyslexia associations.

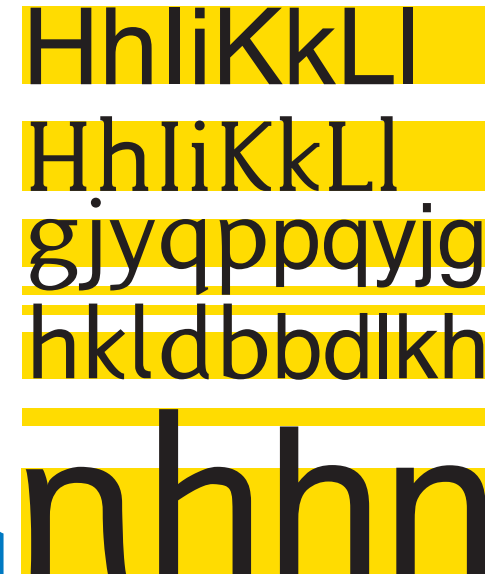
Sans
Serif
Casual



Traditionally, long ascenders and descenders are recommended for clear definition of confusable characters. Walter Tracy² claims that if descenders are short for g j p q and y, the reader's comprehension of the text will not suffer, but if the ascenders are short for b d h k and l, the letters lose their individuality and the words lose their familiar shape. It is the ratio of x height to ascender which is crucial.

Grover has been designed with longer ascenders for clear definition of confusable characters such as h and n.

abcde
fghijklm
nopqrstu
vwxyz



Top example shows the equal height ascenders and capitals of Helvetica and the shorter capitals of Grover.

Bottom example shows Grover and Helvetica to the same x height: the tint panels show the difference in ascender and descender proportions.

For a typeface to be dyslexia-friendly, there needs to be clear definition between confusable characters such as b and d, p and q ie the same letterform should not be flipped and/or rotated, serifs are used to aid differentiation.



bd
bd
pq
pq

Reading has been described as a psycho linguistic guessing game, whereas

The double storey Grover Sans and Serif lowercase g was designed to avoid further confusion with p and q.

Observations on perception were made by Orton³ 'concerning the particular problems that dyslexics had with printed symbols, especially reversible symbols such as b/d p/q no/on was/saw, stimulated interest in the notion that dyslexia was a consequence of visual and perceptual difficulties'.

A sans serif face has been recommended for dyslexic readers because the serifs are said to be 'distracting ticks and tails' but Sassoon,⁴ Noordzij,⁵ the RNIB,⁶ and Pumfrey & Reason⁷ all stress the importance of the integration of letters into word shapes and this is aided by serifs.

The RNIB experiments demonstrated that serifs have the effect of linking letters within words to make more visible blocks.

a
dyslexic
reads
word
for
word
and
loses
the
meaning

For design continuity, the counters of b, d, p and q are identical, rotated shapes. The outer stroke details, entry and exit strokes differ for each letterform to give differentiation between confusable letters:

Illicit

The Sans version lowercase i and l were designed to avoid the confusion often encountered with sans serifs qed 30 point Arial:

Illicit

equipage
equipage

The double storey Grover Sans and Serif lowercase a complements the g and was designed to avoid confusion with the letter d.



Conflicting information given by dyslexia associations

Information about dyslexia and advice on typefaces is given in easy to read non-technical language (eg serif fonts with their 'ticks' and 'tails'). The advice summarises authoritative cognitive research but also contains conflicting typographic advice, for example, a preference for typefaces with long ascenders and descenders is followed by a recommendation for Comic Sans (www.dyslexic.com). The British Dyslexia Association (www.bdadyslexia.org.uk) states that 'some dyslexic people focus on spaces rather than on the words' but then that 'fonts should... allow space between letters' and a font that 'spaces letters rather than running them closely together' is preferred. Fonts that 'reflect ordinary cursive writing' are said to be preferred but sans serif fonts are recommended. 'Bear in mind that fonts that have unusual shaped letters can create difficulties' is followed by (another) recommendation for

Comic Sans. Other recommended typefaces are Arial, Trebuchet, Sassoon Primary, Geneva, Helvetica, Tahoma and Verdana none of which appear to fulfil the prescribed criteria. Serifs are recommended for easy reading: the fluency of handwriting combined with a sense of rhythm [is] required to provide an on going left to right momentum for the reader. This is easier to achieve with a serif face.⁶

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The results of the RNIB Tiresias experiments summarised that darker weight faces and semi serifs (resembling a bracketed serif) were preferred. 'It appears that a slight degree of serif which accentuates the character ends without distracting from the simple form actually increased legibility.'⁶ The Grover design investigates the use of such serifs to aid readability for dyslexic readers.



The Grover serifs are short and with curved brackets - a style recommended by the Tiresias research.

abcdefghijklmnopqrstuvwxyz



government
government
government

Easily confused letter combinations such as rn with m were considered in the Grover design. The n has a symmetrical counter compared with the m, the main stroke of the r is angled at the top and the curve is flatter in comparison to the n. The right-hand stroke of the Sans n and m differ: the n curves slightly. The centre stroke of the Serif m does not have a serif to aid differentiation between n and m.

Example shows 40 point Grover Sans, Serif and Arial



Non lining numerals were designed as standard - this was intended to aid the legibility of and the integration of numerals within text matter.

Lining, tabular numerals are also available for tables and mathematical use.

Another view on dyslexia

Gerrit Noordzij ⁵ claims that the neurological basis on the physiological and psychological analysis of dyslexia is out of date. He states that as many as 30% of western children are dyslexic and that it is the fault of western education. His argument is that words are taught as sequences ie bag = 217 but that the sequence itself is not logical, it could be 712, and that if a child reads the word in this order, as gab, the child is said to be dyslexic

which is considered a brain dysfunction and therefore not the school's responsibility. A controversial view but his theory that words should be seen as blocks: The word is the foundation of reading and a word is not a sequence of black elements but a structure of black and white shapes' could be proved by the fact that, allegedly, there is no dyslexia in Japan where complete words are represented as symbols.



The effects of typefaces on dyslexics

The visual discomfort experienced by some dyslexic readers when reading print has been described as: 'certain styles of text resemble a pattern of stripes under some light conditions and this can have adverse effects, this contributes to developmental dyslexia' the solution is to either, cover lines not being read, or to wear tinted glasses (especially those that absorb green) was suggested by Wilkins.⁸

Comic Sans has been recommended for dyslexic readers. This typeface was designed for a special use when a cartoon style was needed – Microsoft Bob and 3D Movie Maker, it is based on comic book lettering. There has been a web based campaign to 'Ban Comic Sans', the designer of the typeface, Vincent Connare has commented that he can understand some of the sentiment behind the campaign because often the font is used in an inappropriate way. 'I have seen Comic Sans used well – Disney has used it in some advertising – and I have seen it used poorly – An English coach line uses Comic Sans as its logo font painted on the side in half meter lettering. I am too personally amused when I go to restaurants and have to read it off the menu.'⁹

The cursive version of Grover follows the principles and proportions of the sans and serif variants but the 6° slant and curved exit strokes give a more casual appearance. Perhaps it might provide an alternative to Comic Sans?

abcdefghijkl

A cursive script was recommended

mnopqrstuv

for dyslexic readers because it would

wxyz 6° slant

'be simpler in terms of starting and finishing... the lack of straight lines and confusable forms and connectedness helps in the assimilation of word patterns as gestalts.'

The italic version of Grover has single storey a and g, because its basis is for a more casual appearance influenced by single storey hand written g and a letterforms.

casual

June 2004 formative testing:

The three variations of Grover, sans, serif and ital were tested with typefaces recommended by dyslexia associations : Arial, Comic Sans and Times.

TEST ONE

Three paragraphs of equal length and similar ease of reading (Flesch- Kincaid rated) were set in each of the three Grover variations. The order of typefaces changed on different sheets. Readers were randomly given one of three sheets. After being given time to read the paragraphs, the reader was asked which paragraph was easiest to read.

TEST TWO

Three sheets, given to the reader one at a time. Each sheet contains the same paragraph set four times one sheet with the three Grover variations together with one paragraph in Comic Sans, one sheet with the three Grover variations together with one paragraph in Times, one sheet with the three Grover variations together with one paragraph in Arial. The reader is told that it is not necessary to read the page but just to say which paragraph looks most welcoming/easiest to read.

The readers were also asked if they had a preferred typeface... one that looks like Times, Comic Sans or Times, or another?

Test One texts are shown opposite, three versions of the test were produced with the three Grover variations being used for each of the three paragraphs. Test Two texts are shown on the following page.

TYPE SPECIFICATIONS

Test One:

First paragraph: 12/15 point Grover ital (6° slant)
 Second paragraph: 12/15 point Grover sans
 Third paragraph: 12/15 point Grover serif
 (typefaces then rotate through the paragraphs on subsequent pages)

All paragraphs: ranged left, no hyphenation
 Average 11.6 words per line
 Half line space between paragraphs

Test Two:

Grover variations sizes and leading as above
 Comparative typefaces set to match x height of Grover variations
 Arial: 10.75/12 point
 Times: 12/15 point
 Comic sans: 11/15 point
 All paragraphs: ranged left, no hyphenation

TEXT: Learning support tutors gave advice on text length and content: maximum length of 350 words with a topical content and readability stats should be checked – see table below.

A new film out this month in America takes the nation's obsession with fast food to its logical extreme. Super Size Me tells the true-life story of Morgan, a fit 32-year-old filmmaker as he undertakes to eat only at McDonald's for a month. He sets himself simple rules: to eat three meals a day, and to try everything on the menu at least once. The results were truly disgusting. The doctors he saw beforehand expected him to put on a little weight, but instead, he put on nearly two stone. He became depressed, blotchy and headachy, his liver was badly affected and doctors begged him to give up before the 30 days were over.

The BlackBerry, which is made in Canada, is a small hand-held device that will change your life. Everyone who is anyone now has a Blackberry. On a BlackBerry you can receive and send e-mails, keep your diary and addresses and make phone calls. Thanks to BlackBerry, the idea of working from an office could be a thing of the past. Send an e-mail, take a call – how is your boss to know whether you are on the beach, beside the sea or at an important meeting. With no need for electrical connections, the BlackBerry will be your new best friend. Thanks to BlackBerry, working from an office is finally obsolete.

Word of mouth about Damon Gough, also known as Badly Drawn Boy's talents spread even before the long-awaited release of his debut album: the Hour of Bewilderbeast. The bearded, beanie-wearing songwriter was the opposite of the modern-day pop star: this was not a man well groomed or even young. But over the years Damon had been saving up his songs, so when his first album was finally released, it played like a gem, full of supreme pop moments and beautiful moods. A Mercury Prize and huge sales followed, and next Gough was asked to write the sound track to the new Hugh Grant film: About A Boy. Shortly after the release of the film his second album appeared.

READABILITY STATS

Flesch reading ease score rates the text on a 100-point scale the higher the score, the easier it is to understand the document. A standard is 60 – 70

TEXT SAMPLE:	A nation's obsession	Blackberry	Badly Drawn Boy	Post Its	Rolling Stones	Fast food habits
Word count:	115	110	115	83	103	95
Averages:						
Words per sentence:	19.2	15.7	23.6	20.8	20.6	19
Characters per word:	4.3	4.4	4.5	4.7	4.8	4.7
Readability:						
Passive sentences:	16%	14%	16%	0%	40%	20%
Flesch reading ease	63.7	71.6	67.8	53.2	61	57.5
Flesch-Kincaid grade	9.1	7.1	8.6	10.9	9.8	9.9

These indispensable little notes were the brainchild of Art Fry, an American scientist who wanted a marker for his hymn book. Fry recalled a glue invented by a workmate at his firm, 3M, that would stick paper to paper without leaving a trace. He experimented with it, and in 1980 his company launched a brand-new communications tool: the self-sticking repositionable note, or the Post-it, as we know it. The most popular places to stick a Post-it are on the fridge and the computer.

Women, drug busts, prison, and death the Rolling Stones have been bringing rock-n-roll decadence to the masses since 1962. With their scruffy clothes and risky lyrics, the Stones were the opposite of the clean-cut Beatles. There have been plenty of scandals not least in 1969 when, a month after being kicked out of the band, Brian Jones mysteriously drowned in his swimming pool. This year two of the Stones: Mick Jagger and Keith Richards both turn 61, but after 40 years the Stones are still filling stadiums, and are still the world's biggest-grossing pop act. Each concert earns the band about £600,000.

Americans now spend more money on fast food than on films, books, magazines, newspapers, videos and cds combined. The typical American eats three hamburgers and four orders of French fries every week. About a quarter of the population buys fast food every day. So Morgan's experiment, although it was over the top, was no more than a fast-forward version of the diet of many of his countrymen. Since the film was released, McDonald's has added healthy options to its menus but its crispy chicken salad turns out to have more calories than a big Mac

TEXT SOURCE

- A Nation's Obsession: adapted from Ann Sieghart A Nation's Dangerous Obsession article in The Times 20 May 2004
- Blackberry: adapted from coolhunter@thetimes.co.uk 24 April 2004
- Badly Drawn Boy: adapted from www.badlydrawnboy
- Post Its: adapted from Factsoflife Sunday Times Magazine 16 May 2004
- Rolling Stones: adapted from Factsoflife Sunday Times Magazine 16 May 2004
- Fast food habits: adapted from Ann Sieghart op cit

RESULTS SUMMARY AND CONCLUSIONS

Total 12 readers

4 aged 16-18, 8 over 18; 6 male, 6 female.

Dyslexia affects reading a little: 7 Dyslexia affects reading a lot: 5

Readers existing preferred typeface eg the typeface chosen for work on computer

Arial	4
Comic Sans	4
Times	4

TEST ONE

Of the three Grover typefaces, readers' preferred Grover typeface as easiest to read

Sans	5
Serif	4
Itals	3

TEST TWO

Comparison of Grover typefaces with other typefaces

	Grover Sans	Grover Serif	Grover Itals	Arial	Comic Sans	Times
Arial vs Grovers	2	4	3	3		
Comic Sans vs Grovers	2	3	1		6	
Times vs Grovers	3	4	2			4

The small sample of readers tested showed an existing equal preference for Arial, Comic Sans and Times. Test One was inconclusive in that the figures were too close to have a statistical relevance. Test Two showed a preference for Grover Serif when compared with Arial, an equal preference when tested with Times. Of the three Grover variations, Grover Serif was consistently chosen more than the Sans and Itals, Comic Sans was the overall preferred typeface.

This pilot testing is purely indicative and the results too small to be of significance, further testing would produce more data for analysis and a more definitive conclusion – especially for Test One. The tests have been useful for defining a methodology; the structure and content of the tests, recording of results and analysis of data. Useful incidental feedback was also obtained from the readers while doing the tests and further testing would also take into account paper colour, size of type, leading and line length as well as alternative letter and word spacing.

