

Institution: University of Reading
Unit of Assessment: 34B Art and Design: History, Practice and Theory - Typography
Title of case study: Enriching communities of literacy: typographic support for world scripts
<p>1. Summary of the impact</p> <p>Research by the University of Reading's Department of Typography & Graphic Communication into the historical development of world scripts (predominantly South and Southeast Asian and Greek) and their adaptation to new technologies has had significant impact on global companies, including Adobe and Microsoft, supporting the use of non-Latin typefaces in their products as they enter new markets. The research has had additional impact on international type designers and manufacturers, Dalton Maag and Monotype, and on leading publishers such as Cambridge University Press and Brill.</p> <p>Commercial uptake of the research brings global societal benefits, with millions of people seeing typefaces in print and on digital displays that represent their scripts with linguistic, historic and typographic integrity.</p>
<p>2. Underpinning research</p> <p>The key researchers for this project were</p> <p>Gerry Leonidas (Senior Lecturer, 1998–present) Fiona Ross (Reader, 2003–present)</p> <p>Additional contributors were Dr Jo de Baerdemaeker (PhD student, 2005–9; Leverhulme research fellow 2011-13) and Titus Nemeth (PhD student, 2010–13).</p> <p>People's access to digital communication systems depends on the correct representation of their language's script (writing system) through typefaces (computer-based renditions of the letters of their script). The Department of Typography & Graphic Communication's research has shown how the technological, corporate and cultural environments in which non-Latin typefaces have been made have influenced interpretation of the original underlying scripts. In some cases this has compromised the subtlety and readability of new typefaces.</p> <p>Ross's research (1999, republished 2009) on the development of Indian typefaces (specifically Bengali) broke new ground, showing how a full account of a typeface's development depends on analysis of:</p> <ul style="list-style-type: none"> • the framework of the development of the script itself and the impact of type-making and typesetting technologies on that development; • the tension between tradition and modernity in contemporaneous visual communication that influences the design of an individual typeface and • the growth of non-Latin typeface design as an industrial enterprise, pre-digitally and digitally. <p>Ross (2002/12) used her historical analysis as the basis for a methodology for the development of new typefaces for South and Southeast Asian scripts. These scripts have particularly large character sets and specific features, such as combining character forms in certain letter configurations, which make accommodating them on Latin-based typesetting technologies problematic. Ross developed technical solutions to resolve these problems.</p> <p>Leonidas' analysis (2000, 2002) has augmented Ross's. Working on a methodology for designing Greek typefaces, Leonidas has dealt with issues arising from the dominance of Latin alphabetic forms in contemporary visual culture and exacerbated by the apparent commonality of some Latin and Greek letterforms. These influences have often led to inappropriate transfers of design characteristics from Latin to Greek fonts, both stylistically and in order to fit Latin-based type-making technologies. These transfers can undermine the cultural and graphic integrity of the Greek script. Leonidas' analysis also dealt with the technical challenges of combining classical and modern character sets in the same typeface.</p>

The Department's research has addressed a misperception that high-quality typefaces can be designed only by native users of a script. A key result of the research has been the development of a systematic and analytic approach, exemplified in Ross's practice outputs (2009 and 2012), for developing new designs that are typographically coherent and culturally sensitive. Although the researchers' work has focused on South and Southeast Asian scripts, Arabic and Greek, their approach has been applied to other non-Latin scripts, including Tibetan and Mongolian (by PhD and postdoctoral researchers) and Armenian, Amharic, Hebrew and Korean.

The research has relied on the world-class Non-Latin Type Collection, held in the Department and curated by Ross. This resource includes manuscripts, tools and techniques of writing; material relating to type-making and typesetting technologies (from hand-set metal type to current digital typefaces); documentation for the making of existing typefaces and a wide range of printed materials in many non-Latin scripts. Since 2005, the collections have been the foundation for five AHRC- and Felix-funded PhD studentships within the Department.

3. References to the research

1 Written outputs

- 1999 Ross, F. *The Printed Bengali Character and its Evolution*. Richmond: Curzon Press. Revised and extended (2009), Kolkata: Sishu Sahitya Samsad
- 2000 Leonidas, G. *An Introduction to Greek Typeface Design*. Palo Alto, CA: Agfa/Monotype
- 2002 Leonidas, G. 'A primer for Greek type design' In Berry, John D. (Ed), *Language Culture Type: International type design in the age of Unicode*. New York: Association Typographique Internationale and Graphis, 76–90
- 2002 Ross, F. 'An approach to non-Latin type design'. In Berry, J. (Ed), *Language Culture Type: International type design in the age of Unicode*. New York: Association Typographique Internationale and Graphis, 65–75. Available upon request

2 Practice-based research outputs

- 2009 Ross, F. Adobe Devanagari: original Hindi typeface design in two weights produced as OpenType typefaces by Fiona Ross and Timothy Holloway with John Hudson. (Peer reviewed as being of at least 2* quality and included as REF2 output)
- 2012 Ross, F. Nirmala UI: default user-interface typefaces for Indian scripts for various versions of Microsoft Windows 8 OS, patented and published 2012. Ross was script researcher and art director for Nirmala typefaces and co-designer for Devanagari: other scripts supported by the typefaces (and, hence, founded on Ross's research) are Bengali, Gujarati, Gurmukhi, Kannada, Malayalam, Oriya [Odiya], Sinhala, Tamil and Telugu.

3 Funding that has supported Departmental research on non-Latin scripts

2006–2007 EuropeAid-funded project Neralec (PI Ross): Devanagari type design and typeface production training for Nepalese trainees contracted to the Open University (£11,000)

2008 University of Reading Research Endowment Trust Fund (PI Ross): World typeface design: understanding designers and their processes through the Linotype Non-Latin Collection (£2,000)

2009 University of Reading Arts Fund (PI Leonidas): Documenting Indian newspapers (£750)

2009 Printing Historical Society (PI Ross): Digitization and design analysis of original 1936 Linotype hot-metal Tamil letter-drawings (£1,000)

2011-13 Leverhulme Research Fellowship to De Baerdemaeker (£30,000)

4. Details of the impact

Development of typefaces for global software applications

The research carried out by the University of Reading enables major software developers and publishers to support non-Latin scripts in their products, in a linguistically, historically and typographically correct manner. The typefaces to which the research team has contributed its expertise appear in standard operating systems and key applications and are embedded resources in software used worldwide. The research has brought quality to the default forms of letters that readers see everyday and has enabled local communities to preserve and extend use of their written language in a globalised environment.

Examples include the following:

- **Microsoft Windows main interface typefaces (2007–present):** Leonidas contributed to the development of the Greek Segoe and Office ClearType typefaces, while Ross contributed to the development of the Nirmala typefaces for Indian languages. Lead Program Manager for Fonts and Typography at Microsoft, has described their work as having ‘significant positive impact on the quality of fonts we provide for international customers’.
- **Adobe application typefaces (2011):** Ross’s family of Devanagari OpenType typefaces (developed in collaboration with Timothy Holloway and John Hudson) is included within Adobe’s primary layout applications, and other key applications are in the process of adding it. The Senior Manager, Type Development, at Adobe, says: ‘We consider Ross and Leonidas to be the leading experts in their respective fields and they are two of the most crucial advisors for Adobe’s type development work. Their guidance has helped Adobe develop fonts that are among the world’s most useful for the Indian language and for Greek. Without their ongoing assistance, I would be worried about our ability to properly address the unique challenges of these languages’.
- **Mobile phone operators (2008):** Ross’s consultancy has fed into the design of Indian scripts and Thai in the Nokia Pure typeface and the global extensions of Vodafone’s corporate typeface (both projects with type designers Dalton Maag).
- **Other non-Latin typefaces in global use:** During the REF period, several MA research projects, developed with the research team’s input, were the foundation for successful commercial typefaces; for example, Skolar Pan-European in Typekit (Brezina, 2011), and Nassim Arabic (Nemeth, 2011), the latter used for the BBC’s Arabic, Farsi and Pushtu websites.

Development of typefaces for previously unsupported script usage in publishing

Influential publishers have drawn directly on the Department’s expertise, to support innovation in their language support and improve the quality of their typography. The application of the research team’s methods and expertise to new non-Latin typeface design equips the typographic design community with a choice of high-quality fonts – something which was previously lacking.

Examples include the following:

- The **Adobe Text/ Brevier** In 2010 Leonidas was consultant on development of full polytonic (ancient/church/literary) Greek characters and monotonic (modern) characters, with innovations such as accented small caps. The work developed a research theme, started in 1998, with Greek variants of Adobe’s Minion Pro (2000), Garamond Premier Pro (2005) and Arno Pro (2007). The repertoire of these typefaces greatly extends that of their predecessors (Times and Porson), which were suited to purely academic texts, but limited in general use.
- **Cambridge University Press’s** Greek–English Lexicon uses Arno Lexicon, a specialised modification of Arno Pro, for which Leonidas designed the diacritics (which are especially important for learners of Greek) and modified and redrew other characters to ensure readability in complex typography at small sizes.
- **Dutch academic publisher, Brill** In 2012 Leonidas was consultant on the design of Greek typefaces for Brill’s on-line and print book and journal catalogue, including design for specialist archaic and obsolete characters used by researchers in transcription of archival material.
- **Anandabazar Patrika**, the largest newspaper group and publishing house in West Bengal,

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commissioned Ross (2012), who led a team of specialist designers, to design Sakar, the first fully operational Bengali OpenType typeface to overcome the problems of presenting a connecting script in narrow columns.

Type design that contributes to preservation of endangered scripts

The Department's research methods have had impact on communities where a script may be endangered, threatening the survival of languages that use it. During the REF period De Baerdemaeker's investigation into Tibetan typefaces in his MA and PhD research at Reading (supervised by Ross) resulted in development of Lungta, a Tibetan-Latin typeface design, which is now used by *University of Chicago Press* and *Oxford University Press* (USA).

Dissemination of research-based methods to practitioners

The Department's research is recognised as having changed the discourse about non-Latin typeface design among professionals as well as researchers. Dissemination has taken place in the following ways:

- **Collaboration with other professionals on specific projects**, extending the research team's expertise to others. This process was formalised in the REF period by the Knowledge Transfer Project (KTP) for Monotype Typography (2008-10) on the use of documentation to recover understanding of historic scripts. The KTP associate is now a senior employee at Monotype.
- **Invitations to run workshops and exhibit at leading conferences for type designers and manufacturers**. The Department's invited exhibitions for Association Typographique Internationale (ATypI, typically 400 attendees) in Iceland (2010) and Hong Kong (2012) were followed by further invitations to exhibit at the Indian Institute of Technology, Guwahati, and at the Granshan conference, Bangkok (March and July 2013). The reach of these exhibitions has been extended through publication of a collection of essays (for the Hong Kong exhibition), which has sold over 350 copies. Workshop attendees have taken the researchers' methods into the design studios or software departments of their employers (Apple, Adobe, Microsoft, Monotype and Dalton Maag).
- **British Council workshop** The second edition of Ross's book, *The Printed Bengali Character*, was launched at a type design workshop given by Ross and De Baerdemaeker (2009), reported in the largest circulating (1.28 million) Bengali daily newspaper, *Anandabazar Patrika*, and followed by an AHRC/British Library-funded workshop at the University Library, Kolkata (Ross, 2011).

5. Sources to corroborate the impact

Impact through very large-scale applications

Typefaces for the Microsoft Office suite and the interface for Microsoft operating systems:

- Typography and Font PM, Microsoft Typography†

Typefaces for Adobe Acrobat:

- Senior Manager, Type Development, Adobe Inc†

Impact through enabling minority communities and supporting key publications

Typefaces for specialist publishers:

- Founder, Tiro Typeworks*

Impact through domain development and change

Professional type designers who have worked on projects with Departmental staff:

- Type Director, Monotype UK*

Growing presence of the research in publications, conferences and exhibitions:

President of ATypI: conferences and exhibitions*

(†) Available upon request

(*) Contact details provided separately as per guidance