Modern Catalan Typographical Conventions

Gabriel Valiente Feruglio
University of the Balearic Islands
Mathematics and Computer Science Department
E-07071 Palma de Mallorca (Spain)
Email: valiente@ps.uib.es

Abstract

Many languages, such as German, English and French, have a traditional typography. However, despite the existence of a well-established tradition in scientific writing in Catalan, dating back to 1273 in the writings of Ramon Llull, and despite the early introduction of the Gutenberg printing press in Catalonia, where the first printed book in Catalan appeared in 1474, there are not yet any standard encompassing typographical conventions for scientific writing.

Typographical rules are proposed in this paper which reflect the spirit found in ancient Catalan scientific writings while conforming to modern typographical conventions. Some of these typographical rules are realized as a set of TEX definitions, and they are meant to be incorporated in Catalan extensions of TEX and LATEX. In addition, the proposal is also expected to contribute to the development of standard rules for scientific writing in Catalan.

Introduction

Nothing in the design of TEX
limits it to the American alphabet.
Fine printing is obtained
by fine tuning to the language
or languages being used.
— D. E. Knuth, *The TEXbook* (1990)

The widespread use of TEX and LATEX in Catalan universities is causing the adoption of alien typographical conventions within documents written in Catalan. Even the `catalan` option of the `babel` package in LATEX advocates some typographical conventions which are foreign to Catalan. On the other hand, language-specific options in `babel` for languages such as German and French, which have well-established typographical conventions, accurately reflect such conventions.

There are not yet any standard encompassing typographical conventions for scientific writing in Catalan. While existing manuals of style deal with orthographic and typographical conventions for journalism (Coromina, 1993) and for literature (Joseph, 1991; Solà, 1990), books dealing with scientific writing focus primarily on linguistic aspects (Riera, 1993) and perhaps the most commonly accepted reference to scientific writing style is the way it is realized in an encyclopedia (DIGEC, 1989). A style book for authors who are themselves editors, however, has just appeared (Pujol, 1995) and another style book is about to appear (Mestres, 1995) which may soon become another accepted reference source for scientific writing style as well.

A critical review of the degree of support of the Catalan alphabet in TEX, as well as in international encoding standards, is presented in the following section. Different aspects of Catalan scientific writing style are discussed in the following sections, in the light of their (lack of) support in TEX and LATEX, and they are grouped under the headings of spacing, quoting, hyphenation, and punctuation conventions. The paper concludes with a discussion of foreign typographical conventions currently encoded in the `catalan` option of the `babel` package in LATEX.

The Catalan alphabet

All Catalan characters belong to the ISO 8859-1 coding scheme, known as ISO Latin-1, with the only exception (Valiente, 1993) of the digraph LATIN LETTER L MIDDLE DOT LATIN LETTER L in its uppercase (ĿL) and lowercase (l·l) forms.

The digraph is not a letter of the Catalan alphabet, and it is not a ligature, although it could in principle be obtained in TEX using ligatures as an input encoding mechanism; that is, ligatures `L.L` and `l.l` could be defined which would pick up the ĿL digraph and the l·l digraph. It must be noted,

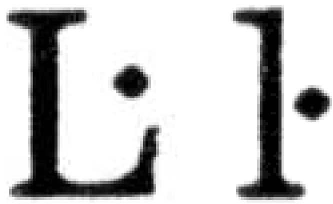

Figure 1: ISO/IEC 10646 prototypical glyphs

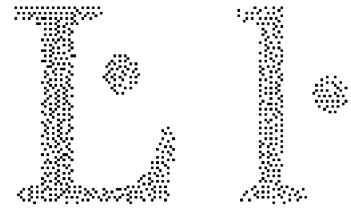

Figure 2: Unicode prototypical glyphs

however, that the corresponding hyphenation point would then be missed.

Hyphenation of the *ŀl* digraph is `l-l`, that is, it is replaced by two letters, and a similar phenomenon happens in other languages. For instance, in German `Drucker` becomes `Druk-ker`, in Swedish `tillaga` becomes `till-lage`, in Dutch `latje` becomes `lat-je` but `laatje` becomes `la-tje`, etc. All these cases fit in TEX's discretionary hyphenation mechanism.

Actually the characters are defined as special digraphs, with a raised dot as diacritic mark.

Encoding. The Cork encoding (Haralambous, 1992), an early attempt at extending the 7-bit Computer Modern encoding described in the five volumes of *Computers and Typesetting* to an 8-bit font encoding, covers the accented characters used in European languages, among them Catalan. It does not, however, include a character position for the *ŀl* digraph (Valiente, 1993).

An approximation to the *ŀl* digraph, the character combinations LATIN CAPITAL LETTER L WITH MIDDLE DOT and LATIN SMALL LETTER L WITH MIDDLE DOT, appears for the first time in the 32-bit encoding ISO/IEC 10646, in positions 0000013F and 00000140 (ISO, 1993, p. 20–21). Figure 1 shows the prototypical glyphs found therein.

The corresponding entity names `Lmidot` and `lmidot` already appear in ISO 8879 (ISO, 1986, p. 116) as Latin alphabetic characters used in Western European languages.

Furthermore, in Unicode, a 16-bit encoding which is a proper subset of the ISO/IEC 10646 32-bit encoding, the character combinations LATIN CAPITAL LETTER L WITH MIDDLE DOT and LATIN SMALL LETTER L WITH MIDDLE DOT appear again, in positions 013F and 0140 of the EUROPEAN LATIN block (Unicode, 1991, pp. 180–182). The prototypical glyphs found therein are shown in figure 2.

Strictly speaking, these ISO character combinations are not characters of the Catalan alphabet, and they should soon be replaced by the *ŀl* digraph, before they get implemented in the next generation of HTML browsers and in the next generation of typesetting systems. As a matter of fact, the Ω system (Haralambous, 1994) already implements the Unicode standard. A proposal for modification has been dealt with at length at the ISO 8859 and ISO 10646 discussion lists, and it will be submitted to ISO and Unicode as soon as it is agreed by academic authorities throughout the Catalan-speaking countries.

Figure 3: Diversity of graphical representation

Protypical rendering proposal. Parallel to the discussion of the best name for denoting such a digraph with a diacritic mark, is the definition of a corresponding graphical representation or glyph.

The standard which established the glyph to be used for representing the digraph was rather loose in the definition, only stating that "it will be written by putting a raised dot between the two letters" (Actes, 1906, pp. 194–200). Neither the distance between the two letters nor the raise and size of the middle dot were established by the standard.

Such an ambiguity, probably caused by the provisional character of the standard, has originated a great diversity in the practical application which can still be found nowadays, as can be seen in the samples of figure 3. Orthographic mistakes are not unusual: text processing systems lacking a discretionary hyphenation mechanism produce a wrong hyphenation of the *ŀl* digraph, while the use of a centered dot as middle dot may lead to unexpected results when changing fonts, as can be seen in the samples of figure 4.

Already in 1923 Pompeu Fabra complained about the excessive separation between the two letters being used by printers (Fabra, 1984, pp. 310–312) and interpreted the standard in the sense that the separation had to be the same as the normal

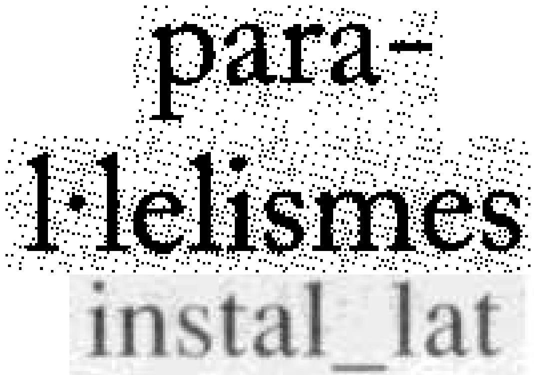

Figure 4: Non-TEX text processing

Figure 5: Early graphical representation

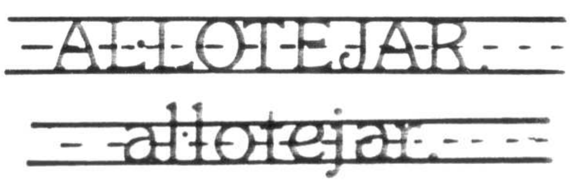

Figure 6: First standard proposal

separation between the two letters when they are not written with a middle dot. The same interpretation can be found in Pujol (1995, pp. 339–340). As a matter of fact, this interpretation prevailed until digital typography displaced traditional typography.

Figure 5 shows samples of some of the first printed representations of the digraph, taken from a 1909 edition (Guasp Printer, Palma de Mallorca), a 1926 edition (Alcover Printer, Palma de Mallorca), and from a 1934 edition (Calatayud Printer, Sóller, Mallorca) of Alcover (1896–1931).

The lack of a clear standard has motivated two additional proposals. In the first one (Mestres, 1990) the size and raise of the middle dot is discussed, although the exact place where it should go is not established (see figure 6). In the second standard proposal (Valiente, 1993) the raise of the middle dot is established, but the distance between the two letters is not discussed.

The present proposal consists of defining the character as a digraph formed by two letters, with a middle dot as diacritic mark. The middle dot has to

Figure 7: Proposed prototypical rendering

be located between the two letters and equidistant from their stems. In order to facilitate reading, the middle dot has to be centered at half the height of uppercase letters. This is due to the fact that the digraph only appears between vowels. Moreover, between the two letters there has to be the same distance as there is between the two letters when they are not written with a middle dot, in order not to break continuity of words containing the digraph.

There seems to be no definitive need for the middle dot to be smaller than a period, contrary to the proposal in Mestres (1990). Boldface fonts are the only ones out of 27 standard TEX fonts where a smaller middle dot would be, to the author's taste, aesthetically more pleasant. As a matter of fact, most (if not all) old and modern printed representations of the digraph share the fact that the middle dot and the period have the same size.

A prototypical glyph reproducing the standard proposal is presented in figure 7 and also in Appendix I for the main TEX text fonts used in LaTeX.

Implementing the proposal. In order to produce the *ĿL* and *ŀl* digraphs in TEX, an input mechanism is first needed. Reasonable choices involve the definition of active characters, font ligatures, and control sequences.

- Type `L.L` and `l.l` and make the dot (period) active. This approach was developed by Claudio Beccari in the POLYGLOT package. Although such an input convention would be quite natural for most Catalan users, making the period (or any other punctuation mark) active is rather dangerous since it may have unexpected consequences when in math mode.
- Type `L·L` and `l·l` and make the raised dot active. This approach was developed by Xavier Gràcia and is another natural input convention for Catalan users, but it hinders portability, since the raised dot does not belong to the set of ASCII visible characters.

- Type `L.L` and `l.l` and define corresponding ligatures in all text fonts, which pick up the *ĿL* digraph and the *ŀl* digraph. Although being again a natural input convention for Catalan users, it also lacks portability and the corresponding hyphenation point would be missed when using this approach.
- Type a control sequence. The names `\LL` and `\ll` were proposed in Valiente (1993) as standard control sequence names for producing the *ĿL* digraph and the *ŀl* digraph, where it is discussed that `\ll` is already assigned to the $\ll$ (much less than) relation in plain TEX and LATEX and that it only occurs when in math mode, while the *ŀl* digraph is not supposed to be typed in math mode. Although these control sequence names could eventually be mapped to a more natural input convention in a local installation, Donald Knuth suggested preemption of the `\L` and `\l` macros (since it is not usual to have to include more than an occasional phrase in Polish into Catalan text) and to rewrite `\L` and `\l` as delimited macros with `.` as the delimiter. This solution is a quite natural input convention for Catalan TEX users (it suffices to type `a\l.lot` in order to get al-lot) and it is robust, in the sense that the user gets a warning if the delimiter is omitted or if it is followed by anything other that `L` or `l`.

Typesetting the *ŀl* digraph involves either assembling together three characters, or picking up an existing *ŀl* character from a (real or virtual) font.

- Packing up three characters to form the *ŀl* digraph makes it quite difficult to get the right kerning, because the only metric information available about the characters in a font is the height, depth and width of the box enclosing them. For instance, the relative position of the stem of the two "l" letters within their enclosing box is needed in order to place the middle dot equidistant from the two stems, but this information can only be found in the METAFONT source code for the font. Even the actual diameter of a period is not guaranteed to be equal to the width of the box enclosing it.
- Since there is no *ŀl* character in any TEX text font, not even in the DC fonts, which were supposed to cover all European languages, making a special text font for these two characters, as well as replacing some character in all text fonts by the *ŀl* digraph, would also hinder portability.
- Virtual fonts represent instead a portable solution, but the difficulty in getting the right kerning still exists.
- The technique of virtual METAFONT (Haralambous, 1995) comes then to rescue, since it allows to get the metric information needed for placing the middle dot at the exact position, according to the proposed prototypical rendering.

Assembling the *ŀl* digraph from three characters was the solution presented in Valiente (1993) and an improved version is given here, as a kind of *poor man's solution* meant to be used at least until the techniques related to virtual METAFONT are available.

Implementing the rendering proposal at the TEX or LATEX level, as opposed to the METAFONT level, means defining appropriate `\L.L` and `\l.l` control sequences that (a) produce the right hyphenation, (b) keep the normal separation between the two letters, (c) place the middle dot at half the distance between the stems of the letters, and (d) raise the middle dot to half the height of uppercase or lowercase letter L minus half the height of the middle dot.

Correct hyphenation is obtained by introducing appropriate discretionary break points, and normal separation between the two letters can be *approximated* by the definition

```
\newskip\zzz
\def\allowhyphens{\nobreak\hskip\zzz}
\edef\Lslash{\L} % save Polish \L
\def\L.L{\allowhyphens
\discretionary{L-}{L}{%
\hbox{L}%
\hbox to 0pt{\hbox{.}\hss}%
\hbox{L}}%
\allowhyphens }
```

and similarly for lowercase, where the horizontal and vertical displacement can be determined by trial and error for each particular font, after storing the component characters in boxes in order to know their dimensions *at macro expansion time*. By expressing such displacements in terms of, say, the width of letter L, displacements will be scaled together with the font and then the rendering proposal can be implemented for any font at any magnification.

Since such displacements depend on the current font in use at macro expansion time, appropriate values for `\leftdim` (horizontal displacement) and `\raisedim` (vertical displacement) can be determined and tabulated for each text font, and they have already been computed by the author for all

TeX standard text fonts. However, a test is still needed in order to choose the right displacement values based on the *file name* of the current font. An intermediate solution, in the spirit of Valiente (1993), is the use of `\fam` (font family) values in the test, which are set by plain TeX but no longer by LaTeX, and it is the solution adopted for typesetting this article. A provisional solution for LaTeX is also given in Appendix II which tests internal `\f@family`, `\f@series` and `\f@shape` values to deduce which font is in use.

Spacing conventions

French typographical conventions dictate that a little white space should be added before the so-called *double punctuation* characters (Gaulle, 1995), as for instance in:

> Comptava que l'illa de Mallorca tenia unes 300 milles que la circuïen en torn ; i Menorca era cap a la banda de Sardenya.

These characters are COLON, SEMICOLON, EXCLAMATION MARK and QUESTION MARK. Similar conventions can be found in old Catalan texts (for instance in Reixac, 1749; Alcover, 1896–1934), also surrounding APOSTROPHE with extra white space. These conventions, however, are of no use in modern Catalan writing and they should not be encouraged by any Catalan style file.

Quoting conventions

Both double quotes (also called *saxon quotes*) and latin quotes (also called *guillemets*) find widespread use in modern Catalan texts, where their use is justified in solving the case of quotations inside quotations. While some authors prefer double quotes to latin quotes (Solà, 1990, p. 102; Pujol, 1995, p. 330), and only use latin quotes within text that is already enclosed in double quotes, other authors recommend their use the other way around, even suggesting the use of single quotes to enclose words which are already enclosed in double quotes (Joseph, 1991, pp. 149–150).

Although authors usually refer to particular aesthetic criteria justifying their choice of quoting conventions, an important aesthetic criterion seems to have been overlooked. Opening quotes may appear right after an apostrophe, and in such a case the apostrophe clashes with double quotes or with single quotes but not with latin quotes.

Therefore, the best choice in Catalan texts would be that of latin quotes, using double quotes only within text already enclosed in latin quotes, and using single quotes only within text already enclosed in double quotes already enclosed in latin quotes. Maybe the development of French guillemets was already an answer to the aesthetic question of having an apostrophe being immediately followed by double quotes or by single quotes.

Hyphenation conventions

Catalan grammar, as well as current typographical conventions, establishes that syllables consisting of a single vowel should not be left alone at the beginning or end of a line, thereby reducing the number of possible break points in all but the smallest words. One exception to this rule is the case of a word preceded by an apostrophe, in which case hyphenation is allowed *after* the vowel.

Hyphenation of a word before or after an apostrophe has to be avoided, while keeping the break point after the vowel following the apostrophe. The solution given in Valiente (1993) is to set `\catcode`\'=11` in order to include the pattern `'2h` in the language-specific pattern file, and to set `\lefthyphenmin=1` and `\righthyphenmin=3`. It is clear that such a solution is not sufficient, even when setting `\lefthyphenmin=2` and `\righthyphenmin=2`.

Another important exception to consider, found in modern publications but not yet covered by any style book, is the case of a word preceded by opening quotes or followed by closing quotes. In such a case the quotes should count as another character in the account for `\lefthyphenmin`, in such a way that, for instance, ``` ``u-na'' ``` could also be broken.

Punctuation conventions

When in math mode, TeX treats the comma as a punctuation mark and the period (decimal point) as an ordinary symbol, putting a little extra space after the comma. In order to get the right spacing in a large decimal number such as 1,234,567.89

```
$1{,}234{,}567.89$
```

has to be written (Knuth, 1990, p. 134) instead of just

```
$1,234,567.89$
```

According to Catalan orthography, however, the roles of the comma and the decimal point are reversed, and a similar phenomenon happens in other European languages, among them Czech, French, German and Polish. The same number is expressed in Catalan by either 1.234.567,89 or 1 234 567,89 and would have to be written

`$1.234.567{,}89$`

or

`$1\,234\,567{,}89$`

in order to get the right spacing. This does not seem to be a practical solution, given the wider use of the comma as decimal separator in Catalan than as separator for large numbers in English.

Foreign typographical conventions

The `catalan` option of the `babel` package (release 3.4) in LaTeX supports several typographical conventions that have been taken from the `spanish` option but which do not reflect modern Catalan typographical conventions.

Masculine and feminine ordinal indicators, which consist of a raised symbol such as “1º” or “1ª” in Spanish, correspond to abbreviations by contraction, without the final period, of their respective names in Catalan (Solà, 1990, p. 75; Pujol, 1995, p. 227), as shown in the following table.

Ordinal	Name		English	Spanish		Catalan	
first	primer	primera	1^{st}	1º	1ª	1r	1a
second	segon	segona	2^{nd}	2º	2ª	2n	2a
third	tercer	tercera	3^{rd}	3º	3ª	3r	3a
fourth	quart	quarta	4^{th}	4º	4ª	4t	4a
fifth	cinquè	cinquena	5^{th}	5º	5ª	5è	5a
sixth	sisè	sisena	6^{th}	6º	6ª	6è	6a

The letter N TILDE does not belong to the Catalan alphabet. Whenever it appears in a Spanish word, for instance, temporarily switching to that language makes the right typographical conventions apply to that word. Hyphenation is perhaps the most important one of such conventions; switching to Spanish would produce the right hyphenation for the first last name of the author, `Va-lien-te`, and switching to Italian would produce the right hyphenation for the second last name of the author, `Fe-ru-glio`, instead of `Va-li-en-te` and `Fe-ru-gli-o` which would be produced under Catalan hyphenation rules.

Uppercase and lowercase mappings differ from language to language. For instance, in French and Spanish LATIN SMALL LETTER E WITH ACUTE ACCENT may map to LATIN CAPITAL LETTER E. In Catalan, however, diacritic marks have to be preserved in uppercase form, although the influence of Spanish press in Catalan-speaking countries has resulted in non-accented uppercase characters found in Catalan texts as well (Joseph, 1991, pp. 103–132).

In TeX the argument of `\uppercase` and `\lowercase` is converted to uppercase form or to lowercase form using the `\uccode` and `\lccode` tables, which only cover characters from a font and not composite characters obtained with macros such as ``\`a``. In the latest versions of TeX, however, ``\uppercase{\`a}`` becomes ``\`A`` but ``\uppercase{\`{\i}}`` and `\lowercase{\'I}` both become `\'i` instead of `\'{\i}`. The situation does not really get solved unless fonts containing accented characters are used, which constitutes just another reason to switch to DC fonts.

Typographical rules

The previous discussion can be summarized in the following ten typographical rules.

1. Do not type `l.l` or `l·l` for the *ŀl* digraph. Use the control sequences `\L.L` (for uppercase) and `\l.l` (for lowercase) instead.
2. Do not add extra white space before COLON, SEMICOLON, EXCLAMATION MARK, QUESTION MARK and APOSTROPHE.
3. Use French guillemets as quotation marks, leaving double quotes and eventually also single quotes to quote words which already belong to a quotation.
4. Hyphenate accented and diacritized words as well. Either use the multilingual TÊX patch or switch to the T1 font encoding in LaTeX.
5. Do not use the period as decimal separator. Use the comma instead, as in `3{,}14159`.
6. Do not use foreign ordinal indicators. Type `1r`, `2n`, `3r`, `4t`, ``5\`e``, ``6\`e``, etc. to get masculine ordinal indicators, and type `1a`, `2a`, `3a`, `4a`, `5a`, `6a`, etc. to get feminine ordinal indicators.
7. Switch languages to get hyphenation and particular typographical conventions apply to foreign words.
8. Do not forget accents and diacritics in uppercase words.
9. Check out style manuals when in doubt. Authors are increasingly becoming editors and sometimes even printers ourselves.
10. Join the `CATALA-TEX` discussion list to further discuss these typographical rules and to get them implemented at your local site. Send the message

    `SUBSCRIBE CATALA-TEX Name Surnames`

    to the address

    `LISTSERV@CESCA.ES`

    and an introductory message will be sent back to your account.

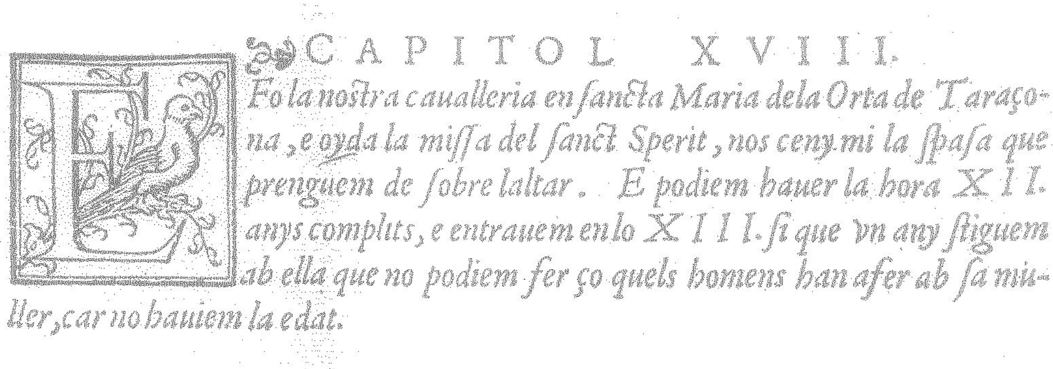
CAPITOL XVIII.
E Fo la noſtra caualleria en ſancta Maria dela Orta de Taraço-
na, e oyda la miſſa del ſanct Sperit, nos ceny mi la ſpaſa que
prenguem de ſobre laltar. E podiem hauer la hora XII.
anys complits, e entrauem enlo XIII. ſi que vn any ſtiguem
ab ella que no podiem fer ço quels homens han afer ab ſa mu-
ller, car no hauiem la edat.

Figure 8: Medieval Catalan writing

Some of these typographical rules are illustrated by the following chapter of the *Libre dels feits del rei En Jacme*, the book of facts by Jaume the Conqueror (1208–1276):

> E fo la nostra cavalleria en sancta Maria de l'Horta de Taraçona, que, oïda la missa de sent Espirit, nós cenyim l'espasa que prenguem de sobre l'altar. E podíem llaora haver dotze anys complits e entràvem en lo tretzè, sí que un any estiguem ab ella que no podíem fer ço que els hòmens han a fer ab sa muller, car no havíem l'edat.

The quotation has been taken from a modern edition (Jaume I, 1982), whereas the oldest preserved manuscript dates back to 1343. Compare it with the printed edition presented in figure 8, taken from (Chronica, 1557).

Acknowledgements

Much of the material related to the Catalan alphabet resulted from discussions with Francesc Comellas and Xavier Gràcia (Universitat Politècnica de Catalunya), Josep M. Mestres (Institut d'Estudis Catalans), Joan Solà (Universitat de Barcelona), Josep M. Pujol (Universitat Rovira i Virgili), and Joan Alegret (Universitat de les Illes Balears). Last, but not least, Pierre MacKay has presented this paper at the 16th Annual Meeting of the TEX Users Group. Sincere thanks to them all.

Bibliography

Actes del Primer Congrés Internacional de la Llengua Catalana. Barcelona, 1906. Facsimile edition by Vicens-Vives, Barcelona, 1985.

Alcover, A. M. *Rondaies Mallorquines d'en Jordi des Racó.* Palma de Mallorca, 1896–1931.

Badia, L. *Rudiments de tipografia.* Ed. Patronal d'Assistència Social, Barcelona, 1934.

Chronica, o commentari del gloriosissim e invictissim Rey en Iacme. València, 1557. Facsimile edition by Ajuntament de València, 1994.

Coromina, E. *El 9 Nou: Manual de redacció i estil*, 3rd Edition. Ed. Eumo, Vic, 1993.

DIGEC. *Gran enciclopèdia catalana*, 2nd Edition. Ed. Enciclopèdia Catalana, Barcelona, 1989.

Fabra, P. *Converses filològiques II.* EDHASA, Barcelona, 1984.

Gaulle, B. *Notice d'utilisation du style french multilingue.* Electronic document distributed with the `french` package, Version 3.36, 1995.

Haralambous, Y. "TEX Conventions Concerning Languages." *TEX and TUG NEWS* **1**(4), 1992, pp. 3–10.

Haralambous, Y. and Plaice, J. "Ω, a TEX Extension Including Unicode and Featuring Lex-like Filtering Processes." In *EuroTEX Proceedings*, 1994, pp. 154–167.

Haralambous, Y. and Plaice, J. "Ω + Virtual METAFONT = Unicode + Typography." *Cahiers GUTenberg*, 21, 1995, pp. 1–13.

ISO, International Organization for Standardization. *Information processing — Text and office systems — Standard Generalized Markup Language (SGML).* Geneva, Switzerland, 1986. International Standard ISO 8879.

ISO, International Organization for Standardization. *Information technology — Universal Multiple-Octet Coded Character Set (UCS) — Part 1: Architecture and Basic Multilingual Plane.* Geneva, Switzerland, 1993. International Standard ISO 10646-1.

Jaume I. *Crònica o llibre dels fets.* Ed. 62, Barcelona, 1982.

Joseph, M. *Com es fa un llibre.* Ed. Pòrtic, Barcelona, 1991.

Knuth, D. E. *The TEXbook*. Addison-Wesley, Reading, Massachusetts, 9th printing, 1990.

Mestres, J. M. "A l'entorn de la ela geminada." *Escola Catalana*, **2**(66):7–8 and 2(70–72):7–10, 1990.

Mestres, J. M., Costa, J., Oliva, M. and Fité, R. *Manual d'estil.* Ed. Eumo, Barcelona, 1995. To appear.

Pujol, J. M. and Solà, J. *Ortotipografia.* Ed. Columna, Barcelona, 1995.

Reixac, B. *Instruccions per la ensenyança de minyons.* Anton Oliva, Girona, 1749. Facsimile edition by Edicions de la Universitat de Barcelona, 1983.

Riera, C. *Manual de català científic*, 2nd Edition. Ed. Claret, Barcelona, 1993.

Solà, J. and Pujol, J. M. *Tractat de puntuació*, 2nd Edition. Ed. Columna, Barcelona, 1990.

The Unicode Consortium. *The Unicode Standard: Worldwide Character Encoding. Version 1.0, Volume 1.* Addison-Wesley, Reading, Massachusetts, 1991.

Valiente, G. and Fuster, R. "Typesetting Catalan Texts with TeX." *TUGboat* **14**(3), 1993, pp. 252–259.

Appendix I

Prototypical rendering in font `cmr10`**.**

L·L l·l

Prototypical rendering in font `cmti10`**.**

L·L l·l

Prototypical rendering in font `cmsl10`**.**

L·L l·l

Prototypical rendering in font `cmbx10`**.**

L·L l·l

Prototypical rendering in font `cmtt10`**.**

`L·L l·l`

Prototypical rendering in font `cmss10`**.**

L·L l·l

Prototypical rendering in font `cmcsc10`**.**

L·L L·L

Appendix II

Horizontal displacement values for LaTeX font-switching internals

	`\f@family`	`\f@series`	`\f@shape`	file name	uppercase	lowercase
`\rm`	cmr	m	n	cmr10	0.44	0.50
`\it`	cmr	m	it	cmti10	0.32	0.40
`\sl`	cmr	m	sl	cmsl10	0.36	0.30
`\bf`	cmr	bx	n	cmbx10	0.39	0.48
`\tt`	cmtt	m	n	cmtt10	0.73	0.50
`\sf`	cmss	m	n	cmss10	0.50	0.59
`\sc`	cmr	m	sc	cmcsc10	0.43	0.51

Poor man's L·L and l·l definitions for LaTeX

```
\newskip\zzz \def\allowhyphens{\nobreak\hskip\zzz}
\newdimen\leftdim \newdimen\raisedim
\def\LDOTL#1#2#3{%
  \setbox0\hbox{#1}%
  \setbox1\hbox{#2}%
  \leftdim=0pt
  \raisedim=0pt
  \advance\leftdim by -#3\wd0
  \advance\raisedim by \ht0
  \divide\raisedim by 2
  \advance\raisedim by -0.5\ht1
  \allowhyphens \discretionary{#1-}{#1}{\copy0
  \hbox to 0pt{\hskip\leftdim\raise\raisedim\copy1\hss}\copy0}\allowhyphens
  }
\makeatletter
\edef\cmtt@family{cmtt} \edef\cmss@family{cmss} \edef\bx@series{bx}
\edef\it@shape{it} \edef\sl@shape{sl} \edef\sc@shape{sc}
\edef\Lslash{\L} \edef\lslash{\l} % save Polish \L and \l
\def\L.L{%
\ifx\f@family\cmtt@family      \LDOTL{L}{.}{0.73}% cmtt10
\else\ifx\f@family\cmss@family \LDOTL{L}{.}{0.50}% cmss10
\else\ifx\f@shape\sc@shape     \LDOTL{L}{.}{0.43}% cmcsc10
\else\ifx\f@series\bx@series   \LDOTL{L}{.}{0.39}% cmbx10
\else\ifx\f@shape\sl@shape     \LDOTL{L}{.}{0.36}% cmsl10
\else\ifx\f@shape\it@shape     \LDOTL{L}{.}{0.32}% cmti10
\else                          \LDOTL{L}{.}{0.44}% cmr10
\fi\fi\fi\fi\fi\fi }
\def\l.l{%
\ifx\f@family\cmtt@family      \LDOTL{l}{.}{0.50}% cmtt10
\else\ifx\f@family\cmss@family \LDOTL{l}{.}{0.59}% cmss10
\else\ifx\f@shape\sc@shape     \LDOTL{l}{.}{0.51}% cmcsc10
\else\ifx\f@series\bx@series   \LDOTL{l}{.}{0.48}% cmbx10
\else\ifx\f@shape\sl@shape     \LDOTL{l}{.}{0.30}% cmsl10
\else\ifx\f@shape\it@shape     \LDOTL{l}{.}{0.40}% cmti10
\else                          \LDOTL{l}{.}{0.50}% cmr10
\fi\fi\fi\fi\fi\fi }
\makeatother
```