



L^AT_EX and the different bibliography styles

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1 Introduction

Although I chose ‘style’ for the title of this article, it is perhaps best to specify right away that the article is not devoted to styles of formatting entries in a final bibliography list (i.e., a ‘style’ in BIB_TE_X terms, as defined by the `.bst` file). Rather, we will be looking at the different types of in-text citation: citation by footnote, by parenthesis labels, or by brackets. The citation style admittedly determines certain aspects of the entry-formatting style, but the two things are pretty much independent, and an article such as this one can focus on only one of them.

The twofold thesis of this article is that there are three main citation styles (the ones mentioned: footnote, brackets, and parentheses), and that L^AT_EX in 2007 provides virtually complete support for all of them. Today (but not five years ago) it is the case that the choice of citation style is not subject to what the software allows, but is really up to the user (within certain limits at least, since institutions — journals, etc. — influence the decision by enforcing one style or another).

In this circumstance, it seems like a good idea to carry out a survey of the three families of bibliographical citation and their support in L^AT_EX, and that is my purpose here.

The present article stems from a talk I gave at the 2006 Practical T_EX conference.

2 The three main style families

It is curious how proponents of each of the three styles — usually — ‘don’t like’ the other styles. They (we) tend to have strong ideas about why one of the styles (our own, usually) is best, and seldom stop to reflect how it is that whole groups of intelligent people have a directly opposite opinion. One thing is for sure: styles are roughly chosen according to discipline. As a result, in our upbringing we are usually exposed to one of the styles far more than the others. We get used to it, and then the others, when we encounter them, do feel a little odd. We conclude, naturally enough, that we don’t like them.

But the truth is that there are good reasons why each of the styles exists and is used. In this section I try to make some of these reasons explicit. I won’t hide the fact that I lean strongly toward the

footnote-style, but I will try to do the others some kind of ‘objective’ justice.

3 Bracket styles

L^AT_EX’s native support for bibliographical referencing is directed exclusively toward the family of bibliography styles where the citation is done through brackets: something like ‘[1]’ or ‘[Cas44]’.

This family of styles, most familiar for L^AT_EX users, has one immediate advantage: the expression in brackets makes sense *both* as a parenthetical comment *and* within the sentence proper. In other words, one can equally make direct reference to a publication (as in ‘see [2]’ or ‘[3] is a good reference for...’) or simply add the reference as a clarification (as in ‘this has already been proven [2]’).

Another advantage is that the brackets can be freely used in conjunction with parentheses, so that the form of the actual reference does not depend on the context. It is equally admissible to say ‘I once read a book [2] where...’ and ‘I saw once (in a book that I read [2]) that...’

This efficiency of the brackets is the main reason why this family of bibliography styles needs only one command name: `\cite`. This, and the fact that it is the natural behavior of L^AT_EX, means that I need to say little more about this style. (In fact, what I have already said was basically for purposes of comparison.)

4 Author-year styles

4.1 Introduction

When the proof of a theorem makes reference to a previously proven theorem, the author and the publication date of the previous paper are not crucial to the argument. Whoever might be interested in that proof in itself can consult the final list of references, and start the search. But for the purposes of the original argument, things like the author, the title, and year of the references are, generally, of no consequence in this kind of discourse.

On the other hand, if an author is referring to previous essays on — say — ethical perception of environmental issues, *then* information on who wrote those previous essays, when they were written, and even what they are called, can be absolutely crucial to the argument. After all, in this context it is not the same to quote a French postmodern philosopher as to quote a study by the Department of Defense.

It is in these contexts that the bracket citation style is truly insufficient. This kind of discipline — let’s call them ‘the humanities’ — has come to adopt widely an alternative kind of citation, gen-

<code>\citeaffixed</code> <code>\citeyear</code> <code>\citeasnoun</code> <code>(\citename...)</code> <code>\cite</code> <code>\possessivecite</code>	Some philosophers of science have claimed that science progresses as life <u>(notably Kuhn 1996, Koestler 1959)</u> . Kuhn started his conceptual trip with his explo- ration of the Copernican Revolution <u>(1957)</u> . At virtually the same time, at the other side of the Atlantic, the same trip was documented in <u>Koestler (1959)</u> . In musicology, Leo Treitler expresses very similar views <u>(1984, 1989, 1999)</u> . Kuhn’s ‘paradigms’ were directly addressed by musicians since 1991 <u>(McClary)</u> . There was and is, of course, opposition to Kuhn, whose ideas were always shunned by mainstream philosophy of science. Most virulent of all was the criticism by Imre Lakatos <u>(1970)</u> . In musicology, this criticism has no direct offspring, but the other extreme, the ‘anarchy of knowledge’ <u>(Feyerabend 1978)</u> , finds parallels in the diverse manifestos of postmodernist musicology, for example <u>Tomlinson’s (1984)</u> .
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Figure 1: harvard sample

erally known as author-year citation. It consists basically of embedding some of the crucial information (the author and the year) into the label of the citation: instead of ‘[1]’, one would have ‘(Cassirer, 1944)’.

Note that one of the native L^AT_EX bracket styles, `alpha`, is a compromise between the two things — in ‘Cas44’, Cas is the first three letters of the last name, and 44 is the year. However, even in this case, `alpha` is oriented more towards the sciences than the humanities: what if one cites Nietzsche, who wrote in the 1800s?

In any case, the most relevant difference between this style and the L^AT_EX default is that — for unknown reasons, I might add — author-year styles use regular parentheses instead of brackets.

This has a wealth of interesting consequences. Parentheses, unlike brackets, have a meaning other than bibliography, and, alas, the two meanings collide. I can say ‘this has already been argued (Cassirer, 1944)’. But things like ‘for this issue see (Cassirer, 1944)’ or ‘(Cassirer, 1944) is a good reference for...’ are funny. Even funnier results are produced by citations within parentheses: “I saw once (in a book I read (Cassirer, 1944)) that...”

Thus, these styles tend to feature a number of variations to the way sources are actually cited, designed to solve the dilemmas of grammar and aesthetics illustrated above. So:

- This has already been argued (Cassirer, 1944).
- For this issue see Cassirer, 1944.
- Cassirer (1944) is a good reference for...
- I read once a book (Cassirer, 1944) where...
- I saw once (in a book I read [Cassirer, 1944]) that...

The choice of the right kind of citation is probably beyond complete automation. That means that

it is the user who has to choose. And, in turn, this means that many different commands have to be available. In fact, L^AT_EX packages that support this family of styles have an unusually large number of citation commands.

4.2 Samples

I will refer to three particular packages, all very successful, that support author-year citation: `harvard`, `achicago`, and `natbib`.

Appearing at the top of this and the following two pages, we show samples of how they work, arranged so that direct comparison is possible. The notes on the left are the commands that create the relevant citations in each of the packages. The citations are underlined to make them more prominent (i.e., the underlining is *not* an effect of the packages themselves). The reader might want to take a moment to glance at these samples and get the feeling of the differences and the similarities between the three packages.

As can be readily seen, translation between the three is pretty straightforward. But it is interesting to see the different command names that the three authors chose for the several citation variants.

4.2.1 harvard

In `harvard` (the first, seminal one, by Peter Williams and Thorsten Schnier, final version 1994), the naming follows a ‘logical’ or ‘grammar-oriented’ model: citations are qualified by the grammatical function of the label in the sentence. When the citation is a noun, you use `\citenoun`; when something has to be affixed to the parenthesis *before* the citation proper, you type `\citeaffixed` (for ‘suffixes’, additions *after* the citation, the optional argument of `\cite` is used).

Some philosophers of science have claimed that science progresses as life
`\citeNP` (notably Kuhn 1996, Koestler 1959). Kuhn started his conceptual trip with his explo-
`\citeyear` ration of the Copernican Revolution (1957). At virtually the same time, at the other
`\citeN` side of the Atlantic, the same trip was documented in Koestler (1959). In musicology,
Leo Treitler expresses very similar views (1984, 1989, 1999). Kuhn’s ‘paradigms’ were
`(\citeA...)` directly addressed by musicians since 1991 (McClary).
There was and is, of course, opposition to Kuhn, whose ideas were always shunned
by mainstream philosophy of science. Most virulent of all was the criticism by
Imre Lakatos (1970). In musicology, this criticism has no direct offspring, but the other
`\cite` extreme, the ‘anarchy of knowledge’ (Feyerabend 1978), finds parallels in the diverse
Tomlinson’s `\citeyear` manifestos of postmodernist musicology, for example Tomlinson’s (1984).

Figure 2: achicago sample

4.2.2 achicago

Matt Swift, who wrote `achicago` (last version 2001), chose a ‘form’ criterion: the names of his commands follow what it is that the citation needs (the author? the year?), whether or not parentheses should be added (all commands have a `\...NP` version for ‘No-Parenthesis’), and so on. The package does not handle pre-citation notes (like the expression ‘notably’ in the sample) directly, but using these no-parenthesis commands the user can achieve similar effects.

`achicago` is a full-fledged package with, quite intriguingly, several extra-bibliography odds and ends. Quotations are no longer typeset `\small`, and `\emph` translates not to `\textit` but to `\textsl`. These things can be a little annoying when one is following uses set by someone else (journals, professors, etc.). On the other hand, the `LATEX` that accompanies the package (the file `achicago.bst`) is amazingly comprehensive, providing fields for such notions as translator, original title, etc. In his introduction to the package the author enters the discussion of the pros and cons of each family of styles. More about this later.

4.2.3 natbib

The wonderful `natbib` package (by Patrick Daly, last version 2006) is the definitive word on author-year bibliography styles with `LATEX`. It builds on the `harvard` experience and offers a most complete set of customization possibilities. Extra features include an easy conversion to bracket labels, a useful system of ‘aliases’, control over punctuation and capitalization, and continued two-way support with packages like `hyperref`. The older packages `harvard` and `achicago` are very dear to me personally, but for users new to this family of styles I see no reason to rec-

ommend any package other than `natbib`.

The commands in `natbib` are named somewhat more capriciously than in its predecessors. There is no plain `\cite` (!). Instead of this, `\citep` is intended for parenthetical citations and `\citet` for citations within the text (the ones that would be ‘noun’ citations). Both commands support two optional arguments, for notes within the parentheses to either side of the citation itself.

4.3 Advantages and disadvantages of author-year

Oren Patashnik (creator of `BIBTEX`, and one who clearly doesn’t like author-year labels) has even argued that this citation style “encourages the passive voice and vague writing”. With Matt Swift (in his introduction to `achicago`), I have to say I’m not sure. But there is no denying that the parenthetical labels interrupt the flow of reading. The same reasons that in certain contexts make this style better than bracket labels—i.e., that the author and the year *are* crucial information in some kinds of argument—can be held actually *against* it. In these contexts, the title is also crucial: suppose you quote someone like Foucault; is this an interview, a popularizing essay, or a rigorous book? What the reader is to do with the citation certainly depends on this. And in that case, the reader is forced to put his finger in the book, and thus go search for the entry in the final reference list.

Or what about different editions of books, or reprints of articles? What is one to do with a citation like ‘(Descartes, 1949)’? If information about the publication is important, citations like ‘[1]’ are insufficient, but ‘(Adorno, 1976)’ is insufficient too, and sometimes even misleading.

One might then ask why it is that these styles

<code>\citep</code> <code>\citeyearpar</code> <code>\citet</code> <code>(\citeauthor{...})</code>	<p>Some philosophers of science have claimed that science progresses as life (notably Kuhn 1996, Koestler 1959). Kuhn started his conceptual trip with his exploration of the Copernican Revolution (1957). At virtually the same time, at the other side of the Atlantic, the same trip was documented in Koestler (1959). In musicology, Leo Treitler expresses very similar views (1984, 1989, 1999). Kuhn's 'paradigms' were directly addressed by musicians since 1991 (McClary).</p> <p>There was and is, of course, opposition to Kuhn, whose ideas were always shunned by mainstream philosophy of science. Most virulent of all was the criticism by Imre Lakatos (1970). In musicology, this criticism has no direct offspring, but the other extreme, the 'anarchy of knowledge' (Feyerabend 1978), finds parallels in the diverse manifestos of postmodernist musicology, for example Tomlinson's (1984).</p>
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Figure 3: natbib sample

are so widely standardized today. Well, there is a clear reason for their early appeal: unlike numeric references, and unlike footnotes, a late change to a manuscript does not require going over the whole thing to update numbers and cross references. This was extremely relevant in typewriter, WordStar or WordPerfect times (I imagine — I'm just too young to have experienced it myself!). It may even be relevant today, taking on the risks of stereotyping, with Word users, whose vast majority is not aware that this can be automated. In any case, this 'advantage' is of course rendered meaningless by the computers of today, and in particular by \TeX .

In fact, it is a little ironic that further development of computerized document preparation is even turning this advantage of author-year styles into a hindrance: more and more, citations are expected to be interactive hyperlinks. This, today, implies an *enormous* difference between typing (say, with the natbib package)

```
... (notably Tomlinson's [1984]).
and typing
... (notably Tomlinson's
[\citeyear{tomlinson1}]).
```

The first, easy to remember and type, *won't produce a link*. If you want the link, and today you certainly do, you have to use the second — and then the effort of taking care of the punctuation, command sequence, and key, seems a little like...like using a tank to kill a fly.

So, beyond the often unsurmountable institutional pressure — journals, professors, etc. — I really see no reason to use author-year styles. Above all today, that — my main point in this article — software has advanced to a point where all alternatives are equally well supported.

5 Footnote citations

Maybe not for pure mathematics, but in other contexts (certainly including the *history* of mathematics) I would say there is no better option than footnote citation. \LaTeX has supported this since 2002, with the appearance of `opcit`. This package will translate `\cite` into `\footnote` (unless it occurs inside one), and append the information of the reference into the footnote.

The first time a publication is cited, the information will be full: author, title, journal/publisher, address, year, etc. Further citations of the same work, however, will abbreviate the reference into the last name, followed by the traditional '*op. cit.*' (Latin for 'cited work'). Moreover, if the same citation occurs in two successive footnotes, it will simply say '*Idem*' ('same'). The optional argument to `\cite` will be appended after the information (either full or abbreviated), separated by a comma.

`opcit` provides a starred version `\cite*` that omits the author's name (often redundant in footnotes). On the other hand, if there are several works by the same author, in which case '*op. cit.*' can be ambiguous, a mechanism to assign 'aliases' to the works (the 'hereafter' mechanism) is provided.

6 opcit 2

`opcit` was written by this author, and its first version dates from 2002. In 2006 I uploaded the second version of the package, with a complete \BIBTeX style (the first one was very limited). This second version, which owes a lot to comments and suggestions by several users, and in particular those of John Scott, fixes minor problems of the first version, and adds some extra features, notably:

- The ability to omit certain information in the

footnotes but not in the final reference list. This can be used to omit an article's page numbers when a '[p. 12]' optional argument follows, or to omit the second part of the title, information on series, original edition dates, etc. — information that is not really needed in the footnotes.

- '*op. cit.*' expressions and other 'aliases' can be hyperlinks to the footnote where the work was first cited.
- Citations can be reset (for example, at the beginning of chapters) so that a post-citation will again cite the information in full.
- Support for cross referencing between entries through `BIBTEX`'s field `crossref`.

6.1 Additions to `opcit 2`

The second version of `opcit` has been generally well received and, as far as I can judge, widely used. Some users have already made comments and suggestions, and in two cases they have contributed some pieces of code that fix or improve a couple of `opcit`'s current features. These additions, mentioned in this section, will be included in a third release I'm working on (hopefully for the summer of 2007), but for the moment they are in beta testing.

6.1.1 Hereafter improved

Eric Rauchway, a devoted "fan" of `opcit`, wrote to me some months ago about getting the "hereafter" of articles *not* italicized. ("Hereafter" is the user-defined reference to a previously cited source, that replaces the default *op. cit.* It is useful when there are citations of several works by the same author. It is desirable that articles' hereafters are not italicized, while those of books are.) He and his friend Kevin Bryant have found a solution to this, and I will include their find in a following release. The solution involves modified versions of both `opcit.sty` and `opcit.bst`. If interested, please write to me (federook@gmail.com) to get the modified files.

6.1.2 Name-swapping

The second release of `opcit` swaps the first and last name of authors for the final reference list (so that the footnote says "Ernest Gellner", but the final list says "Gellner, Ernest"). However, in some cases this it is desirable to keep the regular order: for example for Dante Alighieri. (Also, there is a problem when the author is Aristotle, since `opcit` doesn't really know what to swap, and inserts a spurious floating comma.) Patrick Gardner contributed the following solution "which might be of use to others who are using `opcit` for ancient and medieval authors" (like he is himself):

```
"\newBibCommand{\SwapNames[2]}{#1 #2}%
{#2\ifx\@empty#1\else, #1\fi}"
write$ newline$
```

This should replace line 946 (the `begin.bib` function) of `opcit.bst`. With this, `opcit` will handle "Aristotle" correctly, and putting the full name "Dante Alighieri" between braces in the bib file will then prevent name swapping.

6.2 The future of `opcit`

The main problem still facing `opcit` is a very hard-to-understand (for me, anyway) conflict with `endnote`, the package that collects the notes to be printed at the end of the document/chapter. It really would be nice to be able to turn endnotes on and off without further changes. (The fascinating discussion on footnotes-or-endnotes resembles that of the bibliography styles in that the opposing sides really hate each other; again, both have good arguments to their cause, but 'the truth' probably lies in a context-dependent approach.) I succeeded once in creating a list of endnotes from `opcit` footnotes, but the solution was far from robust, and did not really throw light on how to address the problem.

On the other hand, there are ideas and work going on regarding other compatibility issues of `opcit`. With the release of the second version, the package secures `LATEX` support for footnote-style bibliography... *in English*. But use with other languages is not directly implemented. This not only requires the modification of the `BIBTEX` style (so that particles like 'in', 'chapter', etc. are translated), but also might bring about problems with `babel`. For example, José Luis Rivera from Mexico has identified conflicts with the latter's `spanish` option, and has started working on complementing `opcit` with a Spanish `BIBTEX` style, which possibly involves some tweaking to `opcit` itself.

The implementation of `opcit` in languages other than English will hopefully involve other users as well, and is, as I see it, the most important future extension of the package.

7 Other important things to mention

7.1 Some hybrid approaches

For the sake of completeness, a couple of packages should be mentioned that provide a kind of 'bridge' between the three main families of styles:

alpha was already mentioned to be a compromise between labels like '[1]' and labels like '(Cassirer, 1944)': it gives '[Cas44]'. See page 236. In the same vein, **natbib** has the option of typesetting labels in either of the two forms (and

also as superscripts).

cite makes bracket labels appear as superscripts, almost as footnote marks (although between [and] and without an actual footnote). The package (which also has other nice features) is extremely sophisticated, but has almost no documentation (it dates from before the `doc` package for L^AT_EX documentation). As a result, it has come to be, in effect, obsolete. Even Sebastian Rahtz, when trying to provide support for it in `hyperref`, had to give up trying to understand it.

footbib goes one step further than `cite`: the superscripted labels do actually point to a footnote. However, it is not a footnote in the full sense: it follows its own numbering, and in case there are also ‘regular’ footnotes in the page, the two sets are separated from each other.

7.2 custom-bib

This package is not directly related to the thesis of this article, but it does seem odd to omit it from a general discussion of the possibilities of bibliography in L^AT_EX.

`custom-bib` — the latest version at this writing is dated April 27th of 2007 — is another wonderfully ingenious T_EX program by Patrick Daly (the author of `natbib`) that helps the user create a totally customized BIB_TE_X style (i.e., a `.bst` file). Here we are back to the normal meaning of ‘style’: the set of rules that govern the appearance of the entries in the final reference list — whether the title is italicized, the journal number typeset in boldface, etc.

The package works in a straightforward way. Once there is a `makebst.tex` file in the system — you might have to create it by running T_EX on the file `makebst.ins` — the user runs T_EX or L^AT_EX on it: `latex makebst.tex`

Then the program will simply *ask* (!) how you want to format your entries, and from it create a BIB_TE_X style. It is a truly amazing use of T_EX’s interactive capabilities, which are usually overlooked (since interactivity is not exactly what document preparation is about, after all).

The package is tailored towards the first two style-families described above: brackets (called ‘numerical’ in `custom-bib`) and author-year. Use for `opcit`, I anticipate, would require some extra hacking on the `.djb` file (an intermediate step between `makebst.tex` and the final `.bst` file), but in principle the main difficulties here would arise from the lack of documentation in `opcit` about `custom-bib`, and maybe the other way around as well. That is, `opcit` includes some directions on how to cus-

tomize the `.bst` file, but these directions assume familiarity with BIB_TE_X’s programming language — and this familiarity is precisely what `custom-bib` is supposed to spare the user.

In any case, I am a newcomer to `custom-bib`, so not the most qualified to discuss these matters deeply. The package is mentioned here as the wonderful tool it is for deeper-than-surface bibliography handling in L^AT_EX.

8 Conclusions

I have to finish by pointing out some facts that have come to my attention since I presented a version of this article at PracT_EX 2006. For example, José Luis Rivera told me that the Modern Language Association, which is in effect the main legislator (and champion) of author-year styles, has indeed addressed the issue of some funny things like citing ‘(Aristotle, ca. –340)’. They allow a variation of style that can be called ‘author-title’: (Aristotle, *Nicomachean Ethics*). Even for modern authors, as in ‘(Derrida, Postcards)’, this has been accepted and even encouraged. This certainly is a response to the problem that often the title of a work is more crucial than the year.

The discussion can go on and on (is it the title itself, or the fact that the work is so well-known? how does this depend, once again, on context?), but one thing that has to be said is that, as far as I know, L^AT_EX has not seen any direct efforts in this direction. The MLA, certainly, has adopted this relatively recently (mid-90s is José Luis’s recollection).

I cannot claim that the discussion in the previous pages is comprehensive or complete. However, I hope that the points raised above are not obvious or trivial (they weren’t to me when I started thinking of all this), and feel that the topic is interesting, if nothing else because it shows how, here too, one little change or decision leads to more and more. In fact, people who have seen drafts of this article tend to respond rather quickly and very ‘personally’ (as in “personally, I hate footnotes”, or “I *totally* agree with this or that...”). The topic, touching on uses that habit has ingrained to the point that they enter the realm of taste, seems to reach everybody and raise very deep opinions in them. So, besides the arguably ‘useful’ fact that this article might make readers aware of possibilities that were previously unknown to them, I hope it has also provided some enjoyment.

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