Citation Style Language Documentation

Release 1.0.1-dev

Rintze M. Zelle

Dec 23, 2021
## Contents

1 Primer — An Introduction to CSL ................................................. 1
2 Guide to Translating CSL Locale Files ...................................... 17
3 CSL 1.0.2 Specification .......................................................... 25
CHAPTER 1

Primer — An Introduction to CSL

by Rintze M. Zelle, PhD

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Table of Contents

• Primer — An Introduction to CSL
  – Preface
  – What is CSL?
  – Citation Formats
    * In-text Styles
      • “author-date” & “author” Styles
      • “numeric” Styles
      • “numeric” Compound Styles
      • “label” Styles
    * Note Styles
  – The CSL Ecosystem
    * Independent and Dependent Styles
    * Locale Files
    * Item Metadata
1.1 Preface

This primer is an introduction to the Citation Style Language (CSL), an open XML-based language to describe the formatting of citations and bibliographies. For a more technical and in-depth description of CSL, see the CSL Specification.

1.2 What is CSL?

If you ever wrote a research paper, you probably included references to other works. Referencing is important in scholarly communication, as it provides attribution, and links together published research. However, manually formatting references can become very time-consuming, especially when you're dealing with multiple journals that each have their own citation style.

Luckily, reference management software can help out. Programs like Zotero, Mendeley, and Papers not only help you manage your research library, but can also automatically generate citations and bibliographies. But to format references in the desired style, these programs need descriptions of each citation style in a language the computer can understand. As you might have guessed, the Citation Style Language (CSL) is such a language.

1.3 Citation Formats

There are hundreds, if not thousands of different citation styles in use around the world. Fortunately, most citation styles fall within a few basic categories. CSL distinguishes between the following types:
1.3.1 In-text Styles

Citation styles can be divided in two main categories. The first category consists of in-text styles, where a citation in the sentence directly points to one or multiple entries in the bibliography. CSL subdivides this category in author-date, author, numeric and label styles.

Each citation points to one or more bibliographic entries. In CSL, each individual pointer is called a cite. For example, the citation “(Doe et al. 2002, Smith 1997)” contains two cites: one to a 2002 publication by Doe et al., and one to a 1997 publication by Smith. In the context of CSL, bibliographic entries are sometimes also called references.

“author-date” & “author” Styles

Cites of author-date styles show author names and the date of publication, e.g. “(Van der Klei et al. 1991; Zwart et al. 1983)”, whereas cites of author styles only show names, e.g. “(Gidijala et al.)”. Bibliographic entries are typically sorted alphabetically by author.

Note that many style guides use the confusing term “Harvard” to refer to author-date formats, even though most of these styles have no connection to Harvard University. There is also no such thing as a single official “Harvard” style.

Example Bibliography


“numeric” Styles

Cites of numeric styles consist of numbers, e.g. “[1, 2]” and “[3]”. Bibliographic entries are typically sorted either alphabetically by author, or put in the order by which they have been first cited.

Example Bibliography


“numeric” Compound Styles

Compound styles are a variation of the numeric in-text style format. With these styles, popular in the field of chemistry, bibliographic entries may contain multiple references. Once a citation has defined such a bibliographic entry (e.g. “[2]”), it becomes possible to cite individual items within the entry (e.g., “[2b]”). This format is not yet supported by CSL.

Example Bibliography


“label” Styles

Cites of label styles consist of short keys, e.g. “[GBKv2008]” and “[ZwVH1983; vaHV1991]”. These keys are also included in the bibliographic entries. CSL has limited support for this format, since it currently doesn’t allow for (style-specific) customisation of the key format.

Example Bibliography


1.3.2 Note Styles

The second category of citation styles consists of note styles. Here a marker, which can be a number or a symbol, is added to the sentence when works are cited, e.g. “∗0” and “†0”. Each marker points to a footnote or endnote. CSL styles do not control which number formats or symbols are used for the markers, which is left to the word processor. In contrast to in-text citations, footnotes and endnotes typically contain all information required to identify the cited works. Some note styles include a bibliography to give an overview of all cited works, and to describe the works in more detail.

1.4 The CSL Ecosystem

To understand how CSL works, let’s start by taking a look at the various bits and pieces of the CSL ecosystem:

0 "Voyage to St. Kilda" (3rd edit. 1753), p. 37.
1.4.1 Independent and Dependent Styles

Styles! Everything in the world of CSL revolves around styles. But not all CSL styles are alike. There are two types: independent styles and dependent styles.

An independent CSL style has two functions: first, it needs to define a citation format. What does the format look like? Is it an “author-date” style, or a “note” style? Are cites ordered alphabetically, or by date? Should bibliographic entries include DOIs? What punctuation and capitalization should be used? Does the year of publication come before or after the title? Etcetera, etcetera. Secondly, the CSL style must describe itself. We call this self-describing information style metadata, and it can include the title of the journal for which the CSL style was created, a link to that journal’s website, the name of the creator of the CSL style, etc.

A dependent CSL style, on the other hand, only contains style metadata. Instead of providing a definition of a citation format, a dependent style simply refers to an independent CSL style (its “parent”), whose citation format will be used instead.

Dependent styles come in handy when multiple CSL styles share the same citation format. Take a publisher which uses a single citation format for all its journals. If we were limited to using independent CSL styles, every journal’s CSL style would need to contain a full definition of the citation format, even though it would be the same for each journal. This would produce a collection of bulky styles that are hard to maintain. If the publisher makes a change to its citation format, we would have to update every single independent CSL style.

Dependent styles solve these problems. For example, the journals “Nature Biotechnology”, “Nature Chemistry”, and “Nature” all use the same citation format. We therefore created dependent CSL styles for “Nature Biotechnology” and “Nature Chemistry” that both point to our independent CSL style for “Nature”. Since they don’t define a citation format, dependent styles are a fraction of the size of an independent style. And, if the Nature Publishing Group ever decides to change the “Nature” citation format across its journals, we only have to correct the citation format in the “Nature” CSL style, without having to touch any of its dependents.
1.4.2 Locale Files

I have a little secret to share with you: most independent styles aren’t fully independent.

Take the reference below:


You can describe this citation format in an independent CSL style by hard-coding all language-specific information into the style. For example, you can put the text “Retrieved from” before the URL, and use “YYYY, Month DD” as the date format. However, such a style would only be usable in US English. If you later need a German variant of this citation format, you would have to change all the translations and date formats within the style.

Fortunately, independent CSL styles can rely on the CSL locale files for translations of common terms, localized date formats, and grammar. For example, we can rewrite our CSL style to use the “retrieved” and “from” CSL terms, and to use the localized “text” date format. If we then set the locale of the style to US English, this style will retrieve the term translations and localized date format from the US English CSL locale file, which will produce the reference as written above. But if we switch the style locale to German, the German locale file will be used instead, producing:


So with CSL locale files, it becomes possible to write CSL styles that are largely language-agnostic. As illustrated above, such styles can easily switch between different languages. However, languages are complex, and CSL’s automatic localization doesn’t support the peculiarities of all languages for which we have locale files. But even if you find that you need to modify a CSL style to adapt it to your language of preference, language-agnostic styles have value, since they’re easier to translate.

Locale files have the added benefit that we only need to define common translations, date formats, and grammar once per language. This keeps styles compact, and makes locale data easier to maintain. Since citation formats for a given language don’t always agree on a translation or date format, CSL styles can selectively overwrite any locale data that is defined in the locale files.

1.4.3 Item Metadata

Next up are the bibliographic details of the items you wish to cite: the item metadata.

For example, the bibliographic entry for a journal article may show the names of the authors, the year in which the article was published, the article title, the journal title, the volume and issue in which the article appeared, the page numbers of the article, and the article’s Digital Object Identifier (DOI). All these details help the reader identify and find the referenced work.

Reference managers make it easy to create a library of items. While many reference managers have their own way of storing item metadata, most support common bibliographic exchange formats such as BibTeX and RIS. The citeproc-js CSL processor introduced a JSON-based format for storing item metadata in a way citeproc-js could understand. Several other CSL processors have since adopted this “CSL JSON” format (also known as “citeproc JSON”).

1.4.4 Citing Details

For a given citation format, the way citations and bibliographies look not only depends on the metadata of the cited items, but also on the context in which these items are cited. We refer to this type of context-specific information as the citing details.
For instance, the order in which items are cited in a document can affect their order in the bibliography. And in “note” styles, subsequent cites to a previously cited item are often written in a more compact form. Another example is the use of locators, which guide the reader to a specific location within a cited work, such as the page numbers within a chapter where a certain argument is made, e.g. “(Doe 2000, pp. 43-44)”.

1.4.5 CSL Processors

With CSL styles, locale files, item metadata and citing details in hand, we now need a piece of software to parse all this information, and generate citations and bibliographies in the correct format: the CSL processor.

Most reference managers use one of the freely available open source CSL processors, such as citeproc-js.

1.5 Understanding CSL Styles

By now you’ve learned what CSL is, how it can be used, and how its different parts and pieces fit together. We’re now ready to dive into the CSL styles themselves, and look at their XML code.

1.5.1 XML Basics

If you’re new to XML, this section gives a short overview of what you need to know about XML in order to read and edit CSL styles and locale files. For more background, just check one of the many XML tutorials online.

Let’s take a look at the following dependent CSL style:

```xml
<?xml version="1.0" encoding="utf-8"?>
<info>
  <title>Applied and Environmental Microbiology</title>
  <link href="http://www.zotero.org/styles/applied-and-environmental-microbiology" rel="self"/>
  <link href="http://www.zotero.org/styles/american-society-for-microbiology" rel="independent-parent"/>
  <link href="http://aem.asm.org/" rel="documentation"/>
  <category citation-format="numeric"/>
  <category field="biology"/>
  <issn>0099-2240</issn>
  <eissn>1098-5336</eissn>
  <updated>2014-04-30T03:45:36+00:00</updated>
  <rights license="http://creativecommons.org/licenses/by-sa/3.0/">This work is licensed under a Creative Commons Attribution-ShareAlike 3.0 License</rights>
</info>
</style>
```

There are several concepts and terms you need to be familiar with. These are:

- **XML Declaration.** The first line of each style and locale file is usually the XML declaration. In most cases, this will be `<?xml version="1.0" encoding="utf-8"?>`. This declaration makes it clear that the document consists of XML, and specifies the XML version (“1.0”) and character encoding (“utf-8”) used.

- **Elements and Hierarchy.** Elements are the basic building blocks of XML documents. Each XML document contains a single root element (for CSL styles this is `<style/>`). If an element contains other elements, this
parent element is split into a start tag (<style>) and an end tag (</style>). In our example, the <style/> element has one child element, <info/>. This element has several children of its own, which are grandchildren of the grandparent <style/> element.

Element tags are always wrapped in less-than (“<”) and greater-than (“>”) characters (e.g., <style/>). For empty-element tags, “>” is preceded by a forward-slash (e.g., <category/>), while for end tags, “<” is followed by a forward-slash (e.g., </style>). Child elements are typically indented with spaces or tabs to show the different hierarchical levels. We use 2 spaces per level in our CSL styles and locale files.

In the rest of this primer we will use the prefix “cs:” when referring to CSL elements (e.g., cs:style instead of <style/>).

• Attributes and Element Content. There are two ways to add additional information to elements.

First, XML elements can carry one or more attributes. The order of attributes on an element is arbitrary, but every attribute needs a value. For example, the <style/> element carries the version attribute, set to a value of “1.0” (this indicates that the style is compatible with the latest CSL 1.0.x release).

Secondly, elements can store non-element content between their start and end tags. For example, the title of the style, “Applied and Environmental Microbiology”, is stored as the content of the <title/> element.

• Escaping. To avoid ambiguity in defining the structure of XML files, some characters need to be substituted when used for other purposes, e.g. when used in attribute values or element content. The escape sequences are:

- &lt; for <
- &gt; for >
- &amp; for &
- &apos; for '
- &quot; for "

For example, the link http://domain.com/?tag=a&amp;id=4 is escaped as <link href="http://domain.com/?tag=a&amp;id=4"/>.

• XML Comments. You can use XML comments to add clarifying information to a XML file. Comments start with <!-- and end with -->, and are ignored by the CSL processor.

• Well-formedness and Schema Validity. Unlike HTML, XML is unforgiving when it comes to markup errors. Any error, like forgetting an end tag, having more than one root element, or incorrect escaping will break the entire XML document, and prevent it from being processed.

To make sure that a CSL style works correctly, it must follow the XML specification. An error-free XML file is called “well-formed”. But to be considered “valid” CSL, a well-formed CSL style must also follow the rules specified by the CSL schema. This schema describes all the various CSL elements and attributes, and how they must be used.

You can use a CSL validator to check a CSL style for any errors. Remember that only well-formed and valid CSL files can be expected to work properly.

1.5.2 Anatomy of a Dependent Style

As explained above, dependent CSL styles are much more compact that their independent counterparts, since they don’t actually have to define a citation format. Dependent styles are also very common, and their style metadata is similar to that of independent styles, so they are a good starting point for learning CSL. Let’s take a closer look at the dependent style above, line by line.

```xml
<?xml version="1.0" encoding="utf-8"?>
```
The XML declaration.

```
<style xmlns="http://purl.org/net/xbiblio/csl" version="1.0" default-locale="en-US">
   ...
</style>
```

The start and end tags of the `cs:style` root element. Its `xmlns` attribute specifies that all elements in the style are part of CSL, while the `version` attribute indicates CSL version compatibility. The `default-locale` attribute tells the style to generate citations and bibliographies in a certain language (in this case US English).

```
<!-- Generated with https://github.com/citation-style-language/utilities/tree/master/...
   \rightarrow generate_dependent_styles/data/asm -->
```

Most of our dependent styles are automatically generated from spreadsheet data. This XML comment makes it clear that this style has been generated, and contains a link to the spreadsheet.

```
<info>
   ...
</info>
```

The `cs:info` section is used to store most of the style’s metadata.

```
<title>Applied and Environmental Microbiology</title>
```

The title of the style.

```
<id>http://www.zotero.org/styles/applied-and-environmental-microbiology</id>
```

The style ID, which is used by reference managers to identify styles and tell them apart.

```
<link href="http://www.zotero.org/styles/applied-and-environmental-microbiology" rel="self"/>
```

The style’s “self” link. This URL links to an online copy of the style. For simplicity, we use the same URL as style ID and “self” link for our repository styles.

```
<link href="http://www.zotero.org/styles/american-society-for-microbiology" rel="independent-parent"/>
```

Dependent styles need to link to an independent parent style, whose citation format will be used. Here we use the citation format from the CSL style for the American Society for Microbiology.

```
<link href="http://aem.asm.org/" rel="documentation"/>
```

It’s much easier to maintain our collection of CSL styles if each style’s purpose is clear. We therefore require that all our repository styles contain at least one “documentation” link. In this case, to the journal’s home page.

```
<category citation-format="numeric"/>
<category field="biology"/>
```

To help cataloguing our styles, we specify the citation format with the `citation-format` attribute on `cs:category`. Similarly, we assign each style to one or more fields of study, using the `field` attribute.

```
<issn>0099-2240</issn>
<eissn>1098-5336</eissn>
```

When a CSL styles is created for a journal, we store the journal’s print ISSN and electronic ISSN in the `cs:issn` and `cs:eissn` elements, respectively.

1.5. Understanding CSL Styles
1.5.3 Anatomy of an Independent Style

Finally, a real independent CSL style, one that actually defines a citation format! Well, okay, maybe it’s not exactly a realistic style. Most independent styles in our repository are quite a bit bigger than the simplified example style below. But our “author-date” style below is valid CSL, and still has the same overall design as any other independent style.

```xml
<?xml version="1.0" encoding="utf-8"?>
<style xmlns="http://purl.org/net/xbiblio/csl" class="in-text" version="1.0">
  <info>
    <title>Example Style</title>
    <id>http://www.zotero.org/styles/example</id>
    <link href="http://www.zotero.org/styles/apa" rel="template"/>
    <link href="http://www.example.com/style-guide/" rel="documentation"/>
    <author>
      <name>John Doe</name>
      <email>JohnDoe@example.com</email>
    </author>
    <contributor>
      <name>Jane Doe</name>
    </contributor>
    <contributor>
      <name>Bill Johnson</name>
    </contributor>
    <category citation-format="author-date"/>
    <category field="science"/>
    <updated>2014-10-15T18:17:09+00:00</updated>
    <rights license="http://creativecommons.org/licenses/by-sa/3.0/">This work is licensed under a Creative Commons Attribution-ShareAlike 3.0 License</rights>
  </info>
  <locale xml:lang="en">
    <terms>
      <term name="no date">without date</term>
    </terms>
  </locale>
  <macro name="author">
    <names variable="author" initialize-with="."/>
  </macro>
  <macro name="issued-year">
    <choose>
      <if variable="issued">
        <date variable="issued">
          <date-part name="year"/>
        </date>
      </if>
    </choose>
  </macro>
</style>
```

(continues on next page)
To understand the style above, let's first look at the child elements of the cs:style root element:

```xml
<?xml version="1.0" encoding="utf-8"?>
<style>
  <info/>
  <locale/>
  <macro/>
  <macro/>
  <citation/>
  <bibliography/>
</style>
```

Compared to a dependent style, which only has the cs:info child element, we see several additional elements here. In addition to cs:info, we see cs:locale, cs:macro, cs:citation, and cs:bibliography.

### Style Structure

To understand the style above, let's first look at the child elements of the cs:style root element:
What do these elements do?

- The required cs:info element fulfills the same function in independent styles as it does in dependent styles: it stores the style metadata.
- The optional cs:locale elements can be used to overwrite the locale data from the locale files.
- The optional cs:macro elements can be used to store CSL code for use by cs:citation, cs:bibliography, or other cs:macro elements.
- The required cs:citation element defines the format of citations.
- The optional cs:bibliography element defines the format of the bibliography.

With this in mind, let’s step through the style, starting with the cs:style element.

**cs:style Root Element**

```xml
<style xmlns="http://purl.org/net/xbiblio/csl" class="in-text" version="1.0">
  ...
</style>
```

We’ve already come across the xmlns and version attributes when we looked at the cs:style element of our dependent style. The class attribute is new. It tells the CSL processor whether it is an “in-text” or “note” style.

**cs:info Element**

The style metadata for independent styles is usually more expansive than for dependent styles:

```xml
<info>
  <title>Example Style</title>
  <id>http://www.zotero.org/styles/example</id>
  <link href="http://www.zotero.org/styles/example" rel="self"/>
  <link href="http://www.zotero.org/styles/apa" rel="template"/>
  <link href="http://www.example.com/style-guide/" rel="documentation"/>
  <author>
    <name>John Doe</name>
    <email>JohnDoe@example.com</email>
  </author>
  <contributor>
    <name>Jane Doe</name>
  </contributor>
  <contributor>
    <name>Bill Johnson</name>
  </contributor>
  <category citation-format="author-date"/>
  <category field="science"/>
  <updated>2014-10-15T18:17:09+00:00</updated>
  <rights license="http://creativecommons.org/licenses/by-sa/3.0/">This work is licensed under a Creative Commons Attribution-ShareAlike 3.0 License</rights>
</info>
```

The title, style ID, “self” link, categories, time stamp, and license work the same, but there are differences. First, independent styles don’t depend on a parent style. Instead we usually provide a “template” link to indicate which style was used as a starting point for creating the current style (CSL styles are rarely written from scratch, since it’s usually much faster to adapt an existing one). In this case, the template was the APA style. We also like to include one or more “documentation” links that point to an online description of the citation format in question.
To acknowledge the creators of CSL styles, their names and contact information can be added to the style. In this case, we have one author and two contributors. Authors usually have done most of the work in creating the style, whereas contributors have provided small improvements.

**cs:citation and cs:macro Elements**

Let’s jump down now to the macros and cs:citation element. The purpose of the cs:citation element is to describe the format of citations (or, for “note” styles, the format of footnotes or endnotes).

```xml
<macro name="author">
  <names variable="author">
    <name initialize-with="."/>
  </names>
</macro>

<macro name="issued-year">
  <choose>
    <if variable="issued">
      <date variable="issued">
        <date-part name="year"/>
      </date>
    </if>
    <else>
      <text term="no date"/>
    </else>
  </choose>
</macro>

<citation et-al-min="3" et-al-use-first="1">
  <sort>
    <key macro="author"/>
    <key macro="issued-year"/>
  </sort>
  <layout prefix="(" suffix=")" delimiter="; ">
    <group delimiter=" ">
      <text macro="author"/>
      <text macro="issued-year"/>
    </group>
  </layout>
</citation>
```

The code above generates citations like “(A.C. Smith et al., 2002; W. Wallace, J. Snow, 1999)”. To understand how this citation format is encoded in CSL, let’s first focus on the cs:layout element of cs:citation. Its prefix and suffix attributes define the parentheses around the citation, while the value of the delimiter attribute ("; " separates neighboring cites. The format of each individual cite is defined by the contents of cs:layout, which consists of the output of the “author” and “issued-year” macros, separated by the value of the “delimiter” attribute (", ") on the cs:group element.

The “author” macro prints the names stored in the “author” name variable of the cited item. The initialize-with attribute on cs:name specifies that given names should appear as initials, and that each initial is followed by the attribute’s value (".").

The “issued-year” macro starts with a test, defined with the cs:choose element. If the cited item has a date stored in its “issued” date variable, the year of this date is printed. Otherwise, the style prints the value of the “no date” term.

You might wonder why we didn’t just put the CSL code from the two macros directly into the cs:citation element. What are the advantages of using macros? Well, in the example above, the use of macros simplifies the structure of cs:citation, making it easier to follow. In addition, both macros are called a total of four times in the style (twice
in `cs:citation`, and twice in `cs:bibliography`). Without macros, we’d have to repeat the CSL code of these macros multiple times. Macros thus allow for more compact styles.

We’re not done yet. The `cs:citation` element carries two attributes, `et-al-min` and `et-al-use-first`. Together, they specify that if an item has three or more “author” names, only the first name is printed, followed by the value of the “et al” term.

Finally, `cs:citation` contains the `cs:sort` element, which itself contains two `cs:key` elements. This section specifies how cites within a citation are sorted. The first sorting key consists of the output of the “author” macro (CSL is smart enough to sort names by the family name first, and by initials second). Any cites with the same output for the first key are then sorted by the second sorting key, which is the output of the “issue-year” macro.

### `cs:bibliography` Element

Whereas `cs:citation` is responsible for citations and cites, the `cs:bibliography` element is used to define the format of bibliographic entries.

```xml
<macro name="author">
  <names variable="author">
    <name initialize-with="."/>
  </names>
</macro>
<macro name="issued-year">
  <choose>
    <if variable="issued">
      <date variable="issued">
        <date-part name="year"/>
      </date>
    </if>
    <else>
      <text term="no date"/>
    </else>
  </choose>
</macro>

<bibliography>
  <sort>
    <key macro="author"/>
    <key macro="issued-year"/>
    <key variable="title"/>
  </sort>
  <layout suffix="." delimiter="", "
    <group delimiter=".
      <text macro="author"/>
      <text macro="issued-year"/>
      <text variable="title"/>
      <text variable="container-title"/>
    </group>
    <group>
      <text variable="volume"/>
      <text variable="issue" prefix="(" suffix=")"/>
    </group>
    <text variable="page"/>
  </layout>
</bibliography>
```

The `cs:bibliography` section of our example style really only works well for a single type of items: journal articles. It generates bibliographic entries in the form of:

How were we able to define this format? First, the structure of cs:bibliography is very similar to that of cs:citation, but here cs:layout defines the format of each individual bibliographic entry. In addition to the “author” and “issued-year” macro, the bibliographic entries also show each item’s “title” and “container-title” (for journal articles, the “container-title” is the title of the journal), the “volume” and “issue” in which the article was printed, and the pages (“page”) on which the article appeared. The style uses the prefix and suffix attributes to wrap the journal issue number in parentheses, and relies on the suffix and delimiter attributes on the cs:layout and cs:group elements to place the rest of the punctuation.

The cs:bibliography element also contains a cs:sort element, with three keys: the “author” and “issued-year” macros, and, as a third key, the item’s “title”.

cs:locale Element

The last section of our style is cs:locale. As we wrote above, CSL locale files allow CSL styles to quickly translate into different languages. However, sometimes it’s desirable to overwrite the default translations.

```xml
<locale xml:lang="en">
    <terms>
        <term name="no date">without date</term>
    </terms>
</locale>
```

The translation for the “no date” term in the CSL locale file for US English is, not very surprising, “no date”. However, for our example style, I wanted to use “without date” instead. To overwrite the default translation, we can use the cs:locale element as shown above. For an item without an issued date, this would result in a citation like “(D. Williams, without date)”. The xml:lang attribute on cs:locale is set to “en”, which tells the style to overwrite the “no date” translation whenever the style is used in English. If we used the style in German, the style would still print the translation from the German locale file (“ohne Datum”).

1.6 Diving Deeper

You finished the primer. Good job! If you’re interested in learning more about CSL, you’re now well prepared to start reading the CSL Specification and our other documentation on the Citation Style Language website.

1.7 Feedback

Questions or feedback? Contact us on Twitter at @csl_styles.
CHAPTER 2

Guide to Translating CSL Locale Files

by Rintze M. Zelle, PhD

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Table of Contents

- Guide to Translating CSL Locale Files
  - Preface
  - Getting Started
  - Translating Locale Files
    * xml:lang
    * Locale File Metadata
    * Grammar Rules
    * Date Formats
    * Terms
      · Abbreviations
      · Plurals
      · Forms
      · AD/BC
      · Punctuation
2.1 Preface

This document describes how you can help us improve the language support of Citation Style Language (CSL) styles by translating the CSL locale file of your favorite language.

CSL styles are either bound to one particular locale (e.g. the “British Psychological Society” CSL style will always produce citations and bibliographies in British English), or they (automatically) localize, e.g. to a user-selected locale, or to the locale of the user’s operating system.

All CSL styles, both those with and without a fixed locale, rely on locale files for default localization data, which consists of translated terms commonly used in citations and bibliographies, date formats, and grammar rules. Storing localization data in separate files has several benefits: translations are easier to maintain, styles are more compact (although styles can still include their own localization data to override the defaults), and styles can be (mostly) language-agnostic.

Below we will describe the structure of a locale file, give instructions on how to translate all its parts, and explain how you can submit your translations. See the CSL specification for more in-depth documentation on the structure and function of locale files.

2.2 Getting Started

The CSL locale files are kept in a GitHub repository at https://github.com/citation-style-language/locales/.

Each locale file contains the localization data for one language. Locale files are named “locales-xx-XX.xml”, where “xx-XX” is a BCP 47 language code (e.g. the locale code for British English is “en-GB”). The repository wiki lists the locale code, language, and translation status of all locale files in the repository.

If you find that a locale file already exists for your language, but that its translations are inaccurate or incomplete, you can start translating that file. If there is no locale file for your language, copy the “locales-en-US.xml” file and start from there. Don’t worry about finding the correct BCP 47 locale code for a new language; we’ll be happy to look it up when you submit your new locale file.

Modifications to existing locale files can be made directly via the GitHub website. New locale files can be submitted as a “gist” or through a pull request. For details, see the instructions on submitting CSL styles. If you edit a locale file on your own computer, use a suitable plain text editor such as TextWrangler for OS X, Notepad++ for Windows, or jEdit.

2.3 Translating Locale Files

When translating locale files, leave the overall structure of the locale file untouched. It makes life easier for us if you don’t remove existing elements, introduce new ones, or move stuff around (exceptions are discussed below).
2.3.1 xml:lang

At the top of the locale file you’ll find the `locale` root element. The value of its `xml:lang` attribute should be set to the same language code used in the file name of the locale file. For the locales-en-US.xml locale file, this is “en-US”:

```xml
<locale xmlns="http://purl.org/net/xbiblio/csl" version="1.0" xml:lang="en-US">
```

2.3.2 Locale File Metadata

Directly below the `locale` root you’ll find an `info` element. Here you can list yourself as a translator using the `translator` element. Optionally you can include contact information such as a website or email address. A locale file can list multiple translators. The `rights` element indicates under which license the locale file is released. All locale files in our repository use the same Creative Commons license, so you don’t have to change anything here. The `updated` element is used to keep track of when the locale file was last updated. Feel free to ignore it if the format looks too intimidating.

```xml
<info>
  <translator>
    <name>John Doe</name>
    <email>john.doe@citationstyles.org</email>
    <uri>http://citationstyles.org/</uri>
  </translator>
  <rights license="http://creativecommons.org/licenses/by-sa/3.0/">This work is licensed under a Creative Commons Attribution-ShareAlike 3.0 License</rights>
  <updated>2012-07-04T23:31:02+00:00</updated>
</info>
```

2.3.3 Grammar Rules

Next up is the `style-options` element:

```xml
<style-options punctuation-in-quote="true"/>
```

This element is used to define localized grammar rules, as described in the Locale Options section in the CSL specification.

2.3.4 Date Formats

CSL styles can render dates in either non-localizing or localizing formats:

```xml
<style>
  <!-- use of non-localized date format -->
  <macro name="accessed">
    <date variable="accessed" suffix="", ">
      <date-part name="month" suffix=" "/>
      <date-part name="day" suffix="", "/>
      <date-part name="year"/>
    </date>
  </macro>
  <!-- use of localized date format -->
</style>
```

(continues on next page)
Each locale file defines two localized date formats: a numeric format (e.g. “2012/9/3”), and a textual format, where the month is written out in full (e.g. “September 3, 2012”).

To localize a date format, place the date-part elements for “day”, “month”, and “year” in the desired order. Use the prefix and suffix attributes (on the date-part elements), or the delimiter attribute (on the date element) to define punctuation before, after, and between the different date-parts. When using affixes, make sure that dates that only consist of a year and a month, or of only a year, still render correctly. For example, the US English localized “text” date format,

```xml
<date form="text">
  <date-part name="month" suffix=" ">
  </date-part>
  <date-part name="day" suffix="", ">
  </date-part>
  <date-part name="year"/>
</date>
```

will produce dates like “September 3, 2012”, “September 2012”, and “2012”. Compare this to

```xml
<date form="text">
  <date-part name="month"/>
  <date-part name="day" prefix=" ">
  </date-part>
  <date-part name="year" prefix="", ">
  </date>
</date>
```

which gives the same correct complete date (“September 3, 2012”), but which produces incorrect output for dates that don’t have a day, or don’t have a day and month (“September, 2012” and “, 2012”, respectively).

To read more about customizing date formats, see the Localized Date Formats and Date-part sections in the CSL specification.

### 2.3.5 Terms

The terms element makes up the last section of the locale file, and contains all the term translations. Below we discuss the different types of terms, and how to translate them.

In its simplest form, a term consists only of a term element with the name attribute indicating the term name, and with the translation enclosed between the start and end tag:

```xml
<terms>
  <term name="et-al">et al.</term>
</terms>
```

See the Terms section in the CSL specification.

### Abbreviations

When translating abbreviations such as “et al.”, always include periods where applicable.
Plurals

Many terms have translations for both the singular and plural form. In this case, the term element contains a single (for singular) and a multiple (for plural) element, which enclose the translations:

```
<terms>
  <term name="edition">
    <single>edition</single>
    <multiple>editions</multiple>
  </term>
</terms>
```

Forms

Terms can also vary in their ‘form’, which is indicated with the “form” attribute on the term element. The different forms are “long” (the default), “short” (abbreviated form of “long”), “verb”, “verb-short” (abbreviated form of “verb”), and “symbol”. Examples of the different forms:

```
<terms>
  <term name="editor">
    <single>editor</single>
    <multiple>editors</multiple>
  </term>

  <term name="editor" form="short">
    <single>ed.</single>
    <multiple>eds.</multiple>
  </term>

  <term name="editor" form="verb">edited by</term>
  <term name="editor" form="verb-short">ed.</term>

  <term name="paragraph">
    <single>paragraph</single>
    <multiple>paragraph</multiple>
  </term>

  <term name="paragraph" form="symbol">
    <single>¶</single>
    <multiple>¶¶</multiple>
  </term>
</terms>
```

AD/BC

The “ad” and “bc” terms are used to format years before 1000. E.g. the year “79” becomes “79AD”, and “-2500” becomes “2500BC”.

See the AD and BC section in the CSL specification.

Punctuation

The terms “open-quote”, “close-quote”, “open-inner-quote”, “close-inner-quote”, and “page-range-delimiter” define punctuation.

2.3. Translating Locale Files
When a CSL style renders a title in quotes through the use of the `quotes` attribute, it uses the “open-quote” and “close-quote” terms. When the title contains internal quotes, these are replaced by “open-inner-quote”, “close-inner-quote”. For example, with

```xml
<terms>
  <term name="open-quote">"</term>
  <term name="close-quote">"</term>
  <term name="open-inner-quote">'</term>
  <term name="close-inner-quote">'</term>
  <term name="page-range-delimiter">-</term>
</terms>
```

styles can render titles as

```
“Moby-Dick”
“Textual Analysis of ‘Moby-Dick’”
```

The “page-range-delimiter” terms is used to connect the first and last page of page ranges, e.g. “15–18” (it’s default value is an en-dash).

See the Quotes and Page Ranges sections in the CSL specification.

**Ordinals**

CSL styles can render numbers (e.g., “2”) in two ordinal forms: “long-ordinal” (“second”) and “ordinal” (“2nd”). Both forms are localized through the use of terms.

The “long-ordinal” form is limited to the numbers 1 through 10 (the fallback for other numbers is the “ordinal” form). Each of these ten numbers has its own term (“long-ordinal-01” through “long-ordinal-10”).

Things are different for the “ordinal” form. Here, terms are only used to define the ordinal suffix (“nd” for “2nd”). Furthermore, terms and numbers don’t correspond one-to-one. For example, the “ordinal” term defines the default suffix, which is used for all numbers (unless, as described below, exceptions are introduced through the use of the terms “ordinal-00” through “ordinal-99”).

CSL also supports gender-specific ordinals (both for “long-ordinal” and “ordinal” forms). In languages such as French, ordinal numbers must match the gender of the target noun, which can be feminine or masculine. E.g. “1re édition” (“édition” is feminine) and “1er janvier” (“janvier” is masculine). See the relevant section below.

**Terms for “ordinal” numbers**

Terms for the “ordinal” form follow special rules to make it possible to render any number in the “ordinal” form (e.g., “2nd”, “15th”, “231st”), without having to define a term for each number.

The logic for defining ordinal suffixes with terms is described at [Ordinal Suffixes](#), and won’t be revisited here. Instead, we’ll look at an example.

In English, there are four different ordinal suffixes in use: “st”, “nd”, and “rd” are used for numbers ending on 1, 2, and 3, respectively, while “th” is used for numbers ending on 0 and 4 through 9. Exceptions are numbers ending on “11”, “12”, and “13”, which also use “th”.

To capture this logic, we start by defining the “ordinal” term as “th”, which is the most common suffix. Then, we define the terms “ordinal-01”, “ordinal-02”, and “ordinal-01” as “st”, “nd”, and “rd”, respectively. By default (i.e., when the term elements don’t carry a match attribute), the terms “ordinal-00” through “ordinal-09” repeat at intervals of 10. For example, the term “ordinal-01” overrides the “ordinal” term for numbers 1, 11, 21, 31, etc. At this point, we would get “ordinal” numbers such as “1st”, “2nd”, “3rd”, “4th”, “21st”, “67th”, and “101st”, but we would also get the incorrect “11st”, “12nd” and “13rd”. For these cases, we define the terms “ordinal-11”, “ordinal-12”, and
““ordinal-13” as “th”. By default, the terms “ordinal-10” though “ordinal-99” repeat at intervals of 100. For example, the term “ordinal-11” overrides the “ordinal” and “ordinal-01” terms for numbers “11”, “111”, “211”, etc. So, in total, we need the following seven terms:

```
<terms>
  <term name="ordinal">th</term>
  <term name="ordinal-01">st</term>
  <term name="ordinal-02">nd</term>
  <term name="ordinal-03">rd</term>
  <term name="ordinal-11">th</term>
  <term name="ordinal-12">th</term>
  <term name="ordinal-13">th</term>
</terms>
```

Fortunately, many languages have simpler “ordinal” numbers. E.g., for German all “ordinal” numbers receive a period as the suffix, so it suffice to define the “ordinal” term:

```
<terms>
  <term name="ordinal">.</term>
</terms>
```

**Gender-specific Ordinals**

To use gender-specific ordinals, we first need to define the gender of several target nouns: the terms accompanying the number variables (it is probably sufficient to specify the gender for “edition”, “issue”, and “volume”) and the month terms (“month-01” through “month-12”, corresponding to January through December). This is done by setting the gender attribute on the “long” (default) form of these terms to either “masculine” or “feminine”.

Secondly, we need to define “feminine” and “masculine” variants of the ordinal terms, which is done with the gender-variant attribute (set to “masculine” or “feminine”).

A minimal example for French:

```
<?xml version="1.0" encoding="UTF-8"?>
<locale xml:lang="fr-FR">
  <terms>
    <term name="edition" gender="feminine">
      <single>éd.</single>
      <multiple>ditions</multiple>
    </term>
    <term name="edition" form="short">é.</term>
    <term name="month-01" gender="masculine">janvier</term>
    <term name="long-ordinal-01" gender-form="masculine">premier</term>
    <term name="long-ordinal-01" gender-form="feminine">première</term>
    <term name="long-ordinal-01">premier</term>
    <term name="long-ordinal-02">deuxième</term>
    <term name="long-ordinal-03">troisième</term>
    <term name="long-ordinal-04">quatrième</term>
    <term name="long-ordinal-05">cinquième</term>
    <term name="long-ordinal-06">sixième</term>
    <term name="long-ordinal-07">septième</term>
    <term name="long-ordinal-08">huitième</term>
    <term name="long-ordinal-09">neuvième</term>
    <term name="long-ordinal-10">dixième</term>
  </terms>
</locale>
```
In this example, the “edition” term is defined as feminine, and the “month-01” term (“janvier”) is defined as masculine. For French, of the “long-ordinal” terms, only “long-ordinal-01” has gender-variants (“premier” for masculine, “première” for feminine). To cover cases where no gender is defined for the target noun (e.g., a style author might redefine a term like “edition” but forget to specify the gender), also a neuter variant of “long-ordinal-01” is defined without the gender attribute. The “ordinal” term defines the default suffix. The only exceptions are for the number 1 when the target noun is either feminine or masculine (with match set to “whole-number”, the term does not repeat), e.g. “1re édition” but “11e édition”.

For more information, see the Gender-specific Ordinals section in the CSL specification.

2.4 Submitting Contributions

To submit changes to an existing locale file, or to submit a new locale file, follow the submission instructions for CSL styles.

2.5 Questions?

Questions? Contact us on Twitter at @csl_styles, or create an issue on GitHub here.
CHAPTER 3

CSL 1.0.2 Specification

Principal Authors Rintze M. Zelle, PhD, Brenton M. Wiernik, Frank G. Bennett, Jr., Bruce D’Arcus, Denis Maier with additional contributions from Julien Gonzalez, Sebastian Karcher, Sylvester Keil, Cormac Relf, Lars Willighagen, and other CSL contributors.

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Table of Contents

- **CSL 1.0.2 Specification**
  - Introduction
    - Terminology
  - Namespacing
  - Whitespace Handling
  - File Types
    - Independent Styles
    - Dependent Styles
    - Locale Files
  - XML Declaration
  - Styles - Structure
    - The Root Element - **cs:style**
    - Child Elements of **cs:style**
· Info
· Citation
· Bibliography
· Macro
· Locale
· Locale Fallback

– Locale Files - Structure
  · Info
  · Terms
    · Ordinal Suffixes
    · Long Ordinals
    · Gender-specific Ordinals
  · Localized Date Formats
  · Localized Options

– Rendering Elements
  · Layout
  · Text
  · Date
    · Date-part
    · Date Ranges
    · AD and BC
    · Seasons
    · Approximate Dates
  · Number
  · Names
    · Name
    · Name-part Order
    · Name-part Formatting
    · Et-al
    · Substitute
      · Label in cs:names
  · Label
  · Group
  · Choose

– Style Behavior
* Options
  · Citation-specific Options
  · Disambiguation
  · Cite Grouping
  · Cite Collapsing
  · Note Distance
  · Bibliography-specific Options
  · Whitespace
  · Reference Grouping
  · Global Options
  · Hyphenation of Initialized Names
  · Page Ranges
  · Name Particles
  · Inheritable Name Options
  · Locale Options

* Sorting
  · Sorting Variables
  · Sorting Macros

* Range Delimiters

* Formatting

* Affixes

* Delimiter

* Display

* Quotes

* Strip-periods

* Text-case
  · Sentence Case Conversion
  · Title Case Conversion
  · Non-English Items

– Appendix I - Categories

– Appendix II - Terms

* Type Terms

* Name Variable Terms

* Number Variable Terms

* Locators
3.1 Introduction

The Citation Style Language (CSL) is an XML-based format to describe the formatting of citations, notes and bibliographies, offering:

- An open format
- Compact and robust styles
- Extensive support for style requirements
- Automatic style localization
- Infrastructure for style distribution and updating
- Thousands of freely available styles (Creative Commons BY-SA licensed)

For additional documentation, the CSL schema, styles, and locales, visit the CSL project home, citationstyles.org.

3.1.1 Terminology

The key words MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL, are to be interpreted as described in IETF RFC 2119.

3.2 Namespacing

The CSL XML namespace URI is “http://purl.org/net/xbiblio/csl”. The namespace prefix cs: is used throughout this specification when referring to CSL elements, but is generally omitted in favor of a default namespace declaration (set with the xmlns attribute) on the root cs:style or cs:locale element.
3.3 Whitespace Handling

CSL styles are valid XML, but CSL processors MUST NOT normalize attribute values by trimming leading or trailing whitespace from attributes which define text that is intended for output:

- after-collapse-delimiter
- cite-group-delimiter
- delimiter
- initialize-with
- name-delimiter
- names-delimiter
- prefix
- range-delimiter
- sort-separator
- suffix
- year-suffix-delimiter
- value

3.4 File Types

There are three types of CSL files: independent and dependent styles (both types use the “.csl” extension), and locale files (named “locales-xx-XX.xml”, where “xx-XX” is a language dialect, e.g. “en-US” for American English).

3.4.1 Independent Styles

Independent styles contain formatting instructions for citations, notes and bibliographies. While mostly self-contained, they rely on locale files for (default) localization data.

3.4.2 Dependent Styles

A dependent style is an alias for an independent style. Its contents are limited to style metadata, and doesn’t include any formatting instructions (the sole exception is that dependent styles can specify an overriding style locale). By linking dependent styles for journals that share the same citation style (e.g., “Nature Biotechnology”, “Nature Nanotechnology”, etc.) to a single independent style (e.g., “Nature Journals”), there is no need to duplicate formatting instructions.

3.4.3 Locale Files

Each locale file contains a set of localization data (term translations, localized date formats, and grammar options) for a particular language dialect.
3.5 XML Declaration

Each style or locale should begin with an XML declaration, specifying the XML version and character encoding. In most cases, the declaration will be:

```xml
<?xml version="1.0" encoding="UTF-8"?>
```

3.6 Styles - Structure

3.6.1 The Root Element - cs:style

The root element of styles is `cs:style`. In independent styles, the element carries the following attributes:

- **class** Determines whether the style uses in-text citations (value “in-text”) or notes (“note”).
- **default-locale (optional)** Sets a default locale for style localization. Value must be a locale code.
- **version** The CSL version of the style. Must be “1.0” for CSL 1.0-compatible styles.

In addition, `cs:style` may carry any of the global options and inheritable name options. Of these attributes, only **version** is required on **cs:style** in dependent styles, while the **default-locale** attribute may be set to specify an overriding style locale. The other attributes are allowed but ignored.

An example of `cs:style` for an independent style, preceded by the XML declaration:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<style xmlns="http://purl.org/net/xbiblio/csl" version="1.0" class="in-text" default-locale="fr-FR"/>
```

3.6.2 Child Elements of `cs:style`

In independent styles, the `cs:style` root element has the following child elements:

- **cs:info** Must appear as the first child element of `cs:style`. Contains the metadata describing the style (style name, ID, authors, etc.).
- **cs:citation** Must appear once. Describes the formatting of in-text citations or notes.
- **cs:bibliography (optional)** May appear once. Describes the formatting of the bibliography.
- **cs:macro (optional)** May appear multiple times. Macros allow formatting instructions to be reused, keeping styles compact and maintainable.
- **cs:locale (optional)** May appear multiple times. Used to specify (overriding) localization data.

In **dependent styles**, **cs:style** has only one child element, **cs:info**.

**Info**

The `cs:info` element contains the style’s metadata. Its structure is based on the Atom Syndication Format. In independent styles, `cs:info` has the following child elements:
**cs:author** and **cs:contributor** (optional)  
**cs:author** and **cs:contributor**, used to respectively acknowledge style authors and contributors, may each be used multiple times. Within these elements, the child element **cs:name** must appear once, while **cs:email** and **cs:uri** each may appear once. These child elements should contain respectively the name, email address and URI of the author or contributor.

**cs:category** (optional)  
Styles may be assigned one or more categories. **cs:category** may be used once to describe how in-text citations are rendered, using the **citation-format** attribute set to one of the following values:

- “author-date” - e.g. “... (Doe, 1999)”
- “author” - e.g. “... (Doe)”
- “numeric” - e.g. “... [1]”
- “label” - e.g. “... [doe99]”
- “note” - the citation appears as a footnote or endnote

**cs:category** may be used multiple times with the **field** attribute, set to one of the discipline categories (see Appendix I - Categories), to indicates the field(s) for which the style is relevant.

**cs:id**  
Must appear once and contain a stable, unique identifier to establish the identity of the style. For historical reasons, existing styles may use URIs, but new styles should use a UUID to guarantee stability and uniqueness.

**cs:issn/cs:eissn/cs:issnl** (optional)  
The **cs:issn** element may be used multiple times to indicate the ISSN identifier(s) of the journal for which the style was written. The **cs:eissn** and **cs:issnl** elements may each be used once for the eISSN and ISSN-L identifiers, respectively.

**cs:link** (optional)  
May be used multiple times. **cs:link** must carry two attributes: **href**, set to a URI (usually a URL), and **rel**, whose value indicates how the URI relates to the style. The possible values of **rel**:

- “self” - style URI
- “template” - URI of the style from which the current style is derived
- “documentation” - URI of style documentation

The **cs:link** element may contain content describing the link.

**cs:published** (optional)  
May appear once. The contents of **cs:published** must be a timestamp, indicating when the style was initially created or made available.

**cs:rights** (optional)  
May appear once. The contents of **cs:rights** specifies the license under which the style file is released. The element may carry a **license** attribute to specify the URI of the license.

**cs:summary** (optional)  
May appear once. The contents of **cs:summary** gives a (short) description of the style.

**cs:title**  
Must appear once. The contents of **cs:title** should be the name of the style as shown to users.

**cs:title-short** (optional)  
May appear once. The contents of **cs:title-short** should be a shortened style name (e.g. “APA”).

**cs:updated**  
Must appear once. The contents of **cs:updated** must be a timestamp that shows when the style was last updated.

The **cs:link**, **cs:rights**, **cs:summary**, **cs:title** and **cs:title-short** elements may carry a **xml:lang** attribute to specify the language of the element’s content (the value must be an xsd:language locale code). For **cs:link**, the attribute can also be used to indicate the language of the link target.

In dependent styles, **cs:link** must be used with **rel** set to “independent-parent”, with the URI of the independent parent style set on **href**. In addition, **cs:link** may not be used with **rel** set to “template”.

An example of **cs:info** for an independent style:
Citation

The `cs:citation` element describes the formatting of citations, which consist of one or more references (“cites”) to bibliographic sources. Citations appear in the form of either in-text citations (in the author (e.g. “[Doe]”), author-date (“[Doe 1999]”), label (“[doe99]”) or number (“[1]”) format) or notes. The required `cs:layout` child element describes what, and how, bibliographic data should be included in the citations (see Layout). `cs:layout` may be preceded by a `cs:sort` element, which can be used to specify how cites within a citation should be sorted (see Sorting). The `cs:citation` element may carry attributes for Citation-specific Options and Inheritable Name Options. An example of a `cs:citation` element:

```xml
<citation>
  <sort>
    <key variable="citation-number"/>
  </sort>
  <layout>
    <text variable="citation-number"/>
  </layout>
</citation>
```

A note to CSL processor developers In note styles, a citation is often a sentence by itself. Therefore, the first character of a citation should preferably be uppercased when there is no preceding text in the note. In all other cases (e.g. when a citation is inserted into the middle of a pre-existing footnote), the citation should be printed as is.

Bibliography

The `cs:bibliography` element describes the formatting of bibliographies, which list one or more bibliographic sources. The required `cs:layout` child element describes how each bibliographic entry should be formatted. `cs:layout` may be preceded by a `cs:sort` element, which can be used to specify how references within the bibliography should be sorted (see Sorting). The `cs:bibliography` element may carry attributes for Bibliography-specific Options and Inheritable Name Options. An example of a `cs:bibliography` element:

```xml
<bibliography>
  <sort>
    <key macro="author"/>
  </sort>
  <layout>
    (continues on next page)
  </layout>
</bibliography>
```
Macro

Macros, defined with `cs:macro` elements, contain formatting instructions. Macros can be called with `cs:text` from within other macros and the `cs:layout` element of `cs:citation` and `cs:bibliography`, and with `cs:key` from within `cs:sort` of `cs:citation` and `cs:bibliography`. It is recommended to place macros after any `cs:locale` elements and before the `cs:citation` element.

Macros are referenced by the value of the required `name` attribute on `cs:macro`. The `cs:macro` element must contain one or more `rendering elements`.

The use of macros can improve style readability, compactness and maintainability. It is recommended to keep the contents of `cs:citation` and `cs:bibliography` compact and agnostic of item types (e.g. books, journal articles, etc.) by depending on macro calls. To allow for easy reuse of macros in other styles, it is recommended to use common macro names.

In the example below, cites consist of the item title, rendered in italics when the item type is “book”:

```xml
<macro name="title">
  <choose>
    <if type="book">
      <text variable="title" font-style="italic"/>
    </if>
    <else>
      <text variable="title"/>
    </else>
  </choose>
</macro>
<citation>
  <layout>
    <text macro="title"/>
  </layout>
</citation>
</style>
```

Delimiters from any ancestor delimiting element are not applied within the output of a `<text macro="..."/>` element (see `delimiter`).

Locale

Localization data, by default drawn from the “locales-xx-XX.xml” locale files, may be redefined or supplemented with `cs:locale` elements, which should be placed directly after the `cs:info` element.

The value of the optional `xml:lang` attribute on `cs:locale`, which must be set to an `xsd:language` locale code, determines which languages or language dialects are affected (see `Locale Fallback`).

See `Terms`, `Localized Date Formats` and `Localized Options` for further details on the use of `cs:locale`.

An example of `cs:locale` in a style:
Locale Fallback

Locale files provide localization data for language dialects (e.g. “en-US” for American English), whereas the optional cs:locale elements in styles can either lack the xml:lang attribute, or have it set to either a language (e.g. “en” for English) or dialect. Locale fallback is the mechanism determining from which of these sources each localizable unit (a date format, localized option, or specific form of a term) is retrieved.

For dialects of the same language, one is designated the primary dialect. All others are secondaries. At the moment of writing, the available locale files include:

<table>
<thead>
<tr>
<th>Primary dialect</th>
<th>Secondary dialect(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>de-DE (German)</td>
<td>de-AT (Austria), de-CH (Switzerland)</td>
</tr>
<tr>
<td>en-US (English)</td>
<td>en-GB (UK)</td>
</tr>
<tr>
<td>es-ES (Spanish)</td>
<td>es-CL (Chile), es-MX (Mexico)</td>
</tr>
<tr>
<td>fr-FR (French)</td>
<td>fr-CA (Canada)</td>
</tr>
<tr>
<td>pt-PT (Portuguese)</td>
<td>pt-BR (Brazil)</td>
</tr>
<tr>
<td>zh-CN (Chinese)</td>
<td>zh-TW (Taiwan)</td>
</tr>
</tbody>
</table>

Locale fallback is best described with an example. If the chosen output locale is “de-AT” (Austrian German), localizable units are individually drawn from the following sources, in decreasing order of priority:

A. In-style cs:locale elements
   1. xml:lang set to chosen dialect, “de-AT”
   2. xml:lang set to matching language, “de” (German)
   3. xml:lang not set

B. Locale files
   4. xml:lang set to chosen dialect, “de-AT”
   5. xml:lang set to matching primary dialect, “de-DE” (Standard German) (only applicable when the chosen locale is a secondary dialect)
   6. xml:lang set to “en-US” (American English)

If the chosen output locale is a language (e.g. “de”), the (primary) dialect is used in step 1 (e.g. “de-DE”).

Fallback stops once a localizable unit has been found. For terms, this even is the case when they are defined as empty strings (e.g. <term name="and"/> or <term name="and"></term>). Locale fallback takes precedence over fallback of term forms (see Terms).
3.7 Locale Files - Structure

While localization data can be included in styles (see Locale), locale files conveniently provide sets of default localization data, consisting of terms, date formats and grammar options.

Each locale file contains localization data for a single language dialect. This locale code is set on the required `xml:lang` attribute on the `cs:locale` root element. The same locale code must also be used in the file name of the locale file (the “xx-XX” in “locales-xx-XX.xml”). The root element must carry the `version` attribute, indicating the CSL version of the locale file (must be “1.0” for CSL 1.0-compatible locale files). Locale files have the same requirements for `namespacing` as styles. The `cs:locale` element may contain `cs:info` as its first child element, and requires the child elements `cs:terms`, `cs:date` and `cs:style-options` (these elements are described below). An example showing part of a locale file:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<locale xml:lang="en-US" version="1.0" xmlns="http://purl.org/net/xbiblio/csl">
  <style-options punctuation-in-quote="true"/>
  <date form="text">
    <date-part name="month" suffix=" "/>
    <date-part name="day" suffix="", "/>
    <date-part name="year"/>
  </date>
  <date form="numeric">
    <date-part name="year"/>
    <date-part name="month" form="numeric" prefix="-" range-delimiter="/"/>
    <date-part name="day" prefix="-" range-delimiter="/"/>
  </date>
  <terms>
    <term name="no date">n.d.</term>
    <term name="et-al">et al.</term>
    <term name="page">
      <single>page</single>
      <multiple>pages</multiple>
    </term>
    <term name="page" form="short">
      <single>p.</single>
      <multiple>pp.</multiple>
    </term>
  </terms>
</locale>
```

3.7.1 Info

The `cs:info` element may be used to give metadata on the locale file. It has the following child elements:

- **cs:translator (optional)** `cs:translator`, used to acknowledge locale translators, may be used multiple times. Within the element, the child element `cs:name` must appear once, while `cs:email` and `cs:uri` each may appear once. These child elements should contain respectively the name, email address and URI of the translator.

- **cs:rights (optional)** May appear once. The contents of `cs:rights` specifies the license under which the locale file is released. The element may carry a `license` attribute to specify the URI of the license, and a `xml:lang` attribute to specify the language of the element’s content (the value must be an `xsd:language` locale code).

- **cs:updated (optional)** May appear once. The contents of `cs:updated` must be a `timestamp` that shows when the locale file was last updated.
3.7.2 Terms

Terms are localized strings (e.g. by using the “and” term, “Doe and Smith” automatically becomes “Doe und Smith” when the style locale is switched from English to German). Terms are defined with `<cs:term>` elements, child elements of `<cs:terms>`. Each `<cs:term>` element must carry a `name` attribute, set to one of the terms listed in Appendix II - Terms.

Terms are either directly defined in the content of `<cs:term>`, or, in cases where singular and plural variants are needed (e.g. “page” and “pages”), in the content of the child elements `<cs:single>` and `<cs:multiple>`, respectively.

Terms may be defined for specific forms by using `<cs:term>` with the optional `form` attribute set to:

- “long” - (default), e.g. “editor” and “editors” for the “editor” term
- “short” - e.g. “ed.” and “eds.” for the term “editor”
- “verb” - e.g. “edited by” for the term “editor”
- “verb-short” - e.g. “ed.” for the term “editor”
- “symbol” - e.g. “§” and “§§” for the term “section”

If a style uses a term in a form that is undefined (even after Locale Fallback), there is fallback to other forms: “verb-short” first falls back to “verb”, “symbol” first falls back to “short”, and “verb” and “short” both fall back to “long”. In addition, the terms “long-ordinal-01” to “long-ordinal-10” fall back to the set of ordinal suffix terms. If no locale or form fallback is available, the term is rendered as an empty string.

The `match`, `gender`, and `gender-form` attributes can be used on `<cs:term>` for the formatting of number variables rendered as ordinals (e.g. “first”, “2nd”). See Ordinal Suffixes and Gender-specific Ordinals below.

Term content should not contain markup such as LaTeX or HTML. Superscripted Unicode characters can be used for superscripting.

Ordinal Suffixes

Number variables can be rendered with `<cs:number>` in the “ordinal” form, e.g. “2nd” (see Number). The ordinal suffixes (“nd” for “2nd”) are defined with terms.

The “ordinal” term defines the default ordinal suffix. This default suffix may be overridden for certain numbers with the following terms:

- “ordinal-00” through “ordinal-09” - by default, a term in this group is used when the last digit in the term name matches the last digit of the rendered number. E.g. “ordinal-00” would match the numbers “0”, “10”, “20”, etc. By setting the optional `match` attribute to “last-two-digits” (“last-digit” is the default), matches are limited to numbers where the two last digits agree (“0”, “100”, “200”, etc.). When `match` is set to “whole-number”, there is only a match if the number is the same as that of the term.

- “ordinal-10” through “ordinal-99” - by default, a term in this group is used when the last two digits in the term name match the last two digits of the rendered number. When the optional `match` attribute is set to “whole-number” (“last-two-digits” is the default), there is only a match if the number is the same as that of the term.

When a number has matching terms from both groups (e.g. “13” can match “ordinal-03” and “ordinal-13”), the term from the “ordinal-10” through “ordinal-99” group is used.

Ordinal terms work differently in CSL 1.0.1 and later than they did in CSL 1.0. When neither the style or locale file define the “ordinal” term, but do define the terms “ordinal-01” through “ordinal-04”, the original CSL 1.0 scheme is used: “ordinal-01” is used for numbers ending on a 1 (except those ending on 11), “ordinal-02” for those ending on a 2 (except those ending on 12), “ordinal-03” for those ending on a 3 (except those ending on 13) and “ordinal-04” for all other numbers.
The “ordinal” term, and “ordinal-00” through “ordinal-99” terms, behave differently from other terms when it comes to Locale Fallback. Whereas other terms can be (re)defined individually, (re)defining any of the ordinal terms through cs:locale replaces all previously defined ordinal terms.

Long Ordinals

Number variables can be rendered with cs:number in the “long-ordinal” form, e.g. “second” (see Number). The long ordinal terms (e.g. “second” for “2”) are defined with the “long-ordinal-01” through “long-ordinal-10” terms. Long ordinal forms are available for the numbers 1 through 10. For other numbers “long-ordinal” falls back to “ordinal”.

For the numbers 1 through 10 in “long-ordinal” form, the match attribute is always treated as “whole-number”. For other numbers rendered in “long-ordinal” form, the optional match attribute follows the behavior described in Ordinal Suffixes (“last-two-digits” is the default).

Gender-specific Ordinals

Some languages use gender-specific ordinals. For example, the English “1st” and “first” translate in French to “1er” and “premier” if the target noun is masculine, and “1re” and “première” if the noun is feminine.

Feminine and masculine variants of the ordinal terms (see Ordinals) may be specified by setting the gender-form attribute to “feminine” or “masculine” (the term without gender-form represents the neuter variant). There are two types of target nouns: a) the terms accompanying the number variables, and b) the month terms (see Months). The gender of these nouns may be specified on the “long” (default) form of the term using the gender attribute (set to “feminine” or “masculine”). When a number variable is rendered with cs:number in the “ordinal” or “long-ordinal” form, the ordinal term of the same gender is used, with a fallback to the neuter variant if the feminine or masculine variant is undefined. When the “day” date-part is rendered in the “ordinal” form, the ordinal gender is matched against that of the month term.

The example below gives “1re éd.” (“1st ed.”), “1er janvier” (“January 1st”), and “3e édition” (“3rd edition”):

```xml
<?xml version="1.0" encoding="UTF-8"?>
<locale xml:lang="fr-FR">
  <terms>
    <term name="edition" gender="feminine">
      <single>édition</single>
      <multiple>éditions</multiple>
    </term>
    <term name="edition" form="short">éd.</term>
    <term name="month-01" gender="masculine">janvier</term>
    <term name="ordinal">
      <term name="ordinal-01" gender-form="feminine" match="whole-number">re</term>
      <term name="ordinal-01" gender-form="masculine" match="whole-number">er</term>
    </term>
  </terms>
</locale>
```

3.7.3 Localized Date Formats

Two localized date formats can be defined with cs:date elements: a “numeric” (e.g. “12-15-2005”) and a “text” format (e.g. “December 15, 2005”). The format is set on cs:date with the required form attribute.

A date format is constructed using cs:date-part child elements (see Date-part). With a required name attribute set to either day, month or year, the order of these elements reflects the display order of respectively the day, month, and year. The date can be formatted with formatting and text-case attributes on the cs:date and cs:date-part
elements. The `delimiter` attribute may be set on `cs:date` to specify the delimiter for the `cs:date-part` elements, and `affixes` may be applied to the `cs:date-part` elements.

Note Affixes are not allowed on `cs:date` when defining localized date formats. This restriction is in place to separate locale-specific affixes (set on the `cs:date-part` elements) from any style-specific affixes (set on the calling `cs:date` element), such as parentheses. An example of a macro calling a localized date format:

```xml
<macro name="issued">
  <date variable="issued" form="numeric" prefix="(" suffix=")"/>
</macro>
```

### 3.7.4 Localized Options

There are two localized options, `limit-day-ordinals-to-day-1` and `punctuation-in-quote` (see `Locale Options`). These global options (which affect both citations and the bibliography) are set as optional attributes on `cs:style-options`.

### 3.8 Rendering Elements

Rendering elements specify which, and in what order, pieces of bibliographic metadata are included in citations and bibliographies, and offer control over their formatting.

#### 3.8.1 Layout

The `cs:layout` rendering element is a required child element of `cs:citation` and `cs:bibliography`. It must contain one or more of the other rendering elements described below, and may carry `affixes` and `formatting` attributes. When used within `cs:citation`, the `delimiter` attribute may be used to specify a delimiter for cites within a citation. For example, a citation like “(1, 2)” can be achieved with:

```xml
<citation>
  <layout prefix="(" suffix=")" delimiter=",">,
  <text variable="citation-number"/>
  </layout>
</citation>
```

#### 3.8.2 Text

The `cs:text` rendering element outputs text. It must carry one of the following attributes to select what should be rendered:

- `variable` - renders the text contents of a variable. Attribute value must be one of the standard variables. May be accompanied by the `form` attribute to select the “long” (default) or “short” form of a variable (e.g. the full or short title). If the “short” form is selected but unavailable, the “long” form is rendered instead.

- `macro` - renders the text output of a macro. Attribute value must match the value of the `name` attribute of a `cs:macro` element (see `Macro`).

- `term` - renders a term. Attribute value must be one of the terms listed in `Appendix II - Terms`. May be accompanied by the `plural` attribute to select the singular (“false”, default) or plural (“true”) variant of a term, and by the `form` attribute to select the “long” (default), “short”, “verb”, “verb-short” or “symbol” form variant (see also `Terms`).
• value - renders the attribute value itself.

An example of cs:text rendering the “title” variable:

```xml
<text variable="title"/>
```

cs:text may also carry affixes, display, formatting, quotes, strip-periods and text-case attributes.

### 3.8.3 Date

The cs:date rendering element outputs the date selected from the list of date variables with the required variable attribute. A date can be rendered in either a localized or non-localized format.

Localized date formats are selected with the optional form attribute, which must be set to either “numeric” (for fully numeric formats, e.g. “12-15-2005”), or “text” (for formats with a non-numeric month, e.g. “December 15, 2005”). Localized date formats can be customized in two ways. First, the date-parts attribute may be used to show fewer date parts. The possible values are:

- “year-month-day” - (default), renders the year, month and day
- “year-month” - renders the year and month
- “year” - renders the year

Secondly, cs:date may have one or more cs:date-part child elements (see Date-part). The attributes set on these elements override those specified for the localized date formats (e.g. to get abbreviated months for all locales, the form attribute on the month-cs:date-part element can be set to “short”). These cs:date-part elements do not affect which, or in what order, date parts are rendered. Affixes, which are very locale-specific, are not allowed on these cs:date-part elements.

In the absence of the form attribute, cs:date describes a self-contained non-localized date format. In this case, the date format is constructed using cs:date-part child elements. With a required name attribute set to either day, month or year, the order of these elements reflects the display order of respectively the day, month, and year. The date can be formatted with formatting attributes on the cs:date-part elements, as well as several cs:date-part-specific attributes (see Date-part). The delimiter attribute may be set on cs:date to specify the delimiter for the cs:date-part elements, and affixes may be applied to the cs:date-part elements.

For both localized and non-localized dates, cs:date may carry affixes, display, formatting and text-case attributes.

### Date-part

The cs:date-part elements control how date parts are rendered. Unless the parent cs:date element calls a localized date format, they also determine which, and in what order, date parts appear. A cs:date-part element describes the date part selected with the required name attribute:

**“day”** For “day”, cs:date-part may carry the form attribute, with values:

- “numeric” - (default), e.g. “1”
- “numeric-leading-zeros” - e.g. “01”
- “ordinal” - e.g. “1st”

Some languages, such as French, only use the “ordinal” form for the first day of the month (“1er janvier”, “2 janvier”, “3 janvier”, etc.). Such output can be achieved with the “ordinal” form and use of the limit-day-ordinals-to-day-1 attribute (see Locale Options).

**“month”** For “month”, cs:date-part may carry the strip-periods and form attributes. In locale files, month abbreviations (the “short” form of the month terms) should be defined with periods if applicable (e.g. “Jan.”,
“Feb.”, etc.). These periods can be removed by setting *strip-periods* to “true” (“false” is the default). The *form* attribute can be set to:

- “long” - (default), e.g. “January”
- “short” - e.g. “Jan.”
- “numeric” - e.g. “1”
- “numeric-leading-zeros” - e.g. “01”

**“year”** For “year”, *cs:date-part* may carry the *form* attribute, with values:

- “long” - (default), e.g. “2005”
- “short” - e.g. “05”

*cs:date-part* may also carry *formatting*, *text-case* and *range-delimiter* (see *Date Ranges*) attributes. Attributes for *affixes* are allowed, unless *cs:date* calls a localized date format.

**Date Ranges**

The default delimiter for dates in a date range is an en-dash (e.g. “May–July 2008”). Custom range delimiters can be set on *cs:date-part* elements with the optional *range-delimiter* attribute. When a date range is rendered, the range delimiter is drawn from the *cs:date-part* element matching the largest date part (“year”, “month”, or “day”) that differs between the two dates. For example,

```xml
<layout>
    <date variable="issued">
        <date-part name="day" suffix=" " range-delimiter="-"/>
        <date-part name="month" suffix=" "/>
        <date-part name="year" range-delimiter="/"/>
    </date>
</layout>
</citation>
</style>
```

would result in “1-4 May 2008”, “May–July 2008” and “May 2008/June 2009”.

**AD and BC**

The “ad” term (Anno Domini) is automatically appended to positive years of less than four digits (e.g. “79” becomes “79AD”). The “bc” term (Before Christ) is automatically appended to negative years (e.g. “-2500” becomes “2500BC”).

**Seasons**

If a date includes a season instead of a month, a season term (“season-01” to “season-04”, respectively Spring, Summer, Autumn and Winter) take the place of the month term. E.g.,

```xml
<layout>
    <date variable="issued">
        <date-part name="season" suffix=" "/>
    </date>
</layout>
</citation>
</style>
```

(continues on next page)
would result in “May 2008” and “Winter 2009”.

Approximate Dates

Approximate dates test “true” for the is-uncertain-date conditional (see Choose). For example,

```
<date-part name="month" suffix=" ">
<date-part name="year"/>
</date>
</citation>
</style>
```

would result in “2005” (normal date) and “ca. 2003” (approximate date).

3.8.4 Number

The cs:number rendering element outputs the number variable selected with the required variable attribute. Number variables are a subset of the list of standard variables.

If a number variable is rendered with cs:number and only contains numeric content (as determined by the rules for is-numeric, see Choose), the number(s) are extracted. Variable content is rendered “as is” when the variable contains any non-numeric content (e.g. “Special edition”).

During the extraction, numbers separated by a hyphen are stripped of intervening spaces (“2 - 4” becomes “2-4”). Numbers separated by a comma receive one space after the comma (“2,3” and “2 , 3” become “2, 3”), while numbers separated by an ampersand receive one space before and one after the ampersand (“2&3” becomes “2 & 3”).

Extracted numbers can be formatted via the optional form attribute, with values:

- “numeric” - (default), e.g. “1”, “2”, “3”
- “ordinal” - e.g. “1st”, “2nd”, “3rd”. Ordinal suffixes are defined with terms (see Ordinal Suffixes).
- “long-ordinal” - e.g. “first”, “second”, “third”. Long ordinals are defined with the terms “long-ordinal-01” to “long-ordinal-10”, which are used for the numbers 1 through 10. For other numbers “long-ordinal” falls back to “ordinal”.
- “roman” - e.g. “i”, “ii”, “iii”

Numbers with prefixes or suffixes are never ordinalized or rendered in roman numerals (e.g. “2E” remains “2E). Numbers without affixes are individually transformed (“2, 3” can become “2nd, 3rd”, “second, third” or “ii, iii”).
3.8.5 Names

The cs:names rendering element outputs the contents of one or more name variables (selected with the required variable attribute), each of which can contain multiple names (e.g. the “author” variable contains all the author names of the cited item). If multiple variables are selected (separated by single spaces, see example below), each variable is independently rendered in the order specified, with one exception: when the selection consists of “editor” and “translator”, and when the contents of these two name variables is identical, then the contents of only one name variable is rendered. In addition, the “editortranslator” term is used if the cs:names element contains a cs:label element, replacing the default “editor” and “translator” terms (e.g. resulting in “Doe (editor & translator”)). The delimiter attribute may be set on cs:names to separate the names of the different name variables (e.g. the semicolon in “Doe, Smith (editors); Johnson (translator)”).

```xml
<names variable="editor translator" delimiter="; ">
  <label prefix=" (" suffix=")
  </names>
```

The cs:names element may carry affixes, display and formatting attributes.

Name

The cs:name element, an optional child element of cs:names, can be used to describe the formatting of individual names, and the separation of names within a name variable. cs:name may carry the following attributes:

- **and** Specifies the delimiter between the second to last and last name of the names in a name variable. Allowed values are “text” (selects the “and” term, e.g. “Doe, Johnson and Smith”) and “symbol” (selects the ampersand, e.g. “Doe, Johnson & Smith”).

- **delimiter** Specifies the text string used to separate names in a name variable. Default is “,” (e.g. “Doe, Smith”).

- **delimiter-precedes-et-al** Determines when the name delimiter or a space is used between a truncated name list and the “et-al” (or “and others”) term in case of et-al abbreviation. Allowed values:
  - “contextual” - (default), name delimiter is only used for name lists truncated to two or more names
  - 1 name: “J. Doe et al.”
  - “after-inverted-name” - name delimiter is only used if the preceding name is inverted as a result of the name-as-sort-order attribute. E.g. with name-as-sort-order set to “first”:
    - “Doe, J., S. Smith et al.”
  - “always” - name delimiter is always used
    - 1 name: “J. Doe, et al.”
  - “never” - name delimiter is never used
    - 1 name: “J. Doe et al.”
    - 2 names: “J. Doe, S. Smith et al.”
delimitor-precedes-last Determines when the name delimiter is used to separate the second to last and the last name in name lists (if and is not set, the name delimiter is always used, regardless of the value of delimitor-precedes-last). Allowed values:

- “contextual” - (default), name delimiter is only used for name lists with three or more names
  - 2 names: “J. Doe and T. Williams”
  - 3 names: “J. Doe, S. Smith, and T. Williams”
- “after-inverted-name” - name delimiter is only used if the preceding name is inverted as a result of the name-as-sort-order attribute. E.g. with name-as-sort-order set to “first”:
  - “Doe, J., and T. Williams”
  - “Doe, J., S. Smith and T. Williams”
- “always” - name delimiter is always used
  - 2 names: “J. Doe, and T. Williams”
  - 3 names: “J. Doe, S. Smith, and T. Williams”
- “never” - name delimiter is never used
  - 2 names: “J. Doe and T. Williams”
  - 3 names: “J. Doe, S. Smith and T. Williams”

et-al-min / et-al-use-first Use of these two attributes enables et-al abbreviation. If the number of names in a name variable matches or exceeds the number set on et-al-min, the rendered name list is truncated after reaching the number of names set on et-al-use-first. The “et-al” (or “and others”) term is appended to truncated name lists (see also Et-al). By default, when a name list is truncated to a single name, the name and the “et-al” (or “and others”) term are separated by a space (e.g. “Doe et al.”). When a name list is truncated to two or more names, the name delimiter is used (e.g. “Doe, Smith, et al.”). This behavior can be changed with the delimitor-precedes-et-al attribute.

et-al-subsequent-min / et-al-subsequent-use-first If used, the values of these attributes replace those of respectively et-al-min and et-al-use-first for subsequent cites (cites referencing earlier cited items).

et-al-use-last When set to “true” (the default is “false”), name lists truncated by et-al abbreviation are followed by the name delimiter, the ellipsis character, and the last name of the original name list. This is only possible when the original name list has at least two more names than the truncated name list (for this the value of et-al-use-first/et-al-subsequent-min must be at least 2 less than the value of et-al-min/et-al-subsequent-use-first). An example:

| A. Goffeau, B. G. Barrell, H. Bussey, R. W. Davis, B. Dujon, H. Feldmann, ... S. G. Oliver |

The remaining attributes, discussed below, only affect personal names. Personal names require a “family” name-part, and may also contain “given”, “suffix”, “non-dropping-particle” and “dropping-particle” name-parts. These name-parts are defined as:

- “family” - surname minus any particles and suffixes
- “given” - given names, either full (“John Edward”) or initialized (“J. E.”)
- “suffix” - name suffix, e.g. “Jr.” in “John Smith Jr.” and “III” in “Bill Gates III”
- “non-dropping-particle” - name particles that are not dropped when only the surname is shown (“van” in the Dutch surname “van Gogh”) but which may be treated separately from the family name, e.g. for sorting
• “dropping-particle” - name particles that are dropped when only the surname is shown (“van” in “Ludwig van Beethoven”, which becomes “Beethoven”, or “von” in “Alexander von Humboldt”, which becomes “Humboldt”)

The attributes affecting personal names:

form Specifies whether all the name-parts of personal names should be displayed (value “long”, the default), or only the family name and the non-dropping-particle (value “short”). A third value, “count”, returns the total number of names that would otherwise be rendered by the use of the cs:names element (taking into account the effects of et-al abbreviation and editor/translator collapsing), which allows for advanced sorting.

initialize When set to “false” (the default is “true”), given names are no longer initialized when “initialize-with” is set. However, the value of “initialize-with” is still added after initials present in the full name (e.g. with initialize set to “false”, and initialize-with set to “.”, “James T Kirk” becomes “James T. Kirk”).

initialize-with When set, given names are converted to initials. The attribute value is added after each initial (“.” results in “J. J. Doe”). For compound given names (e.g. “Jean-Luc”), hyphenation of the initials can be controlled with the global initialize-with-hyphen option (see Hyphenation of Initialized Names).

name-as-sort-order Specifies that names should be displayed with the given name following the family name (e.g. “John Doe” becomes “Doe, John”). The attribute has two possible values:

- “first” - attribute only has an effect on the first name of each name variable
- “all” - attribute has an effect on all names

Note that even when name-as-sort-order changes the name-part order, the display order is not necessarily the same as the sorting order for names containing particles and suffixes (see Name-part order). Also, name-as-sort-order only affects names written in scripts where the given name typically precedes the family name, such as Latin, Greek, Cyrillic and Arabic. In contrast, names written in Asian scripts are always displayed with the family name preceding the given name.

sort-separator Sets the delimiter for name-parts that have switched positions as a result of name-as-sort-order. The default value is “,” “(Doe, John”). As is the case for name-as-sort-order, this attribute only affects names in scripts that know “given-name family-name” order.

cs:name may also carry affixes and formatting attributes.

Name-part Order

The order of name-parts depends on the values of the form and name-as-sort-order attributes on cs:name, the value of the demote-non-dropping-particle attribute on cs:style (one of the global options), and the script of the individual name. Note that the display and sorting order of name-parts often differs. An overview of the possible orders:

Display order of names in “given-name family-name” scripts (Latin, etc.)

Conditions form set to “long”

Order

1) given
2) dropping-particle
3) non-dropping-particle
4) family
5) suffix

**Example**  [Vincent] [] [van] [Gogh] [III]

**Example**  [Alexander] [von] [] [Humboldt] [Jr.]

**Conditions** form set to “long”, name-as-sort-order active, demote-non-dropping-particle set to “never” or “sort-only”

**Order**

1) non-dropping-particle

2) family

3) given

4) dropping-particle

5) suffix

**Example**  [van] [Gogh], [Vincent] [], [III]

**Conditions** form set to “long”, name-as-sort-order active, demote-non-dropping-particle set to “display-and-sort”

**Order**

1) family

2) given

3) dropping-particle

4) non-dropping-particle

5) suffix

**Example**  [Gogh], [Vincent] [] [van], [III]

**Conditions** form set to “short”

**Order**

1) non-dropping-particles

2) family

**Example**  [van] [Gogh]

Sorting order of names in “given-name family-name” scripts (Latin, etc.)

N.B. The sort keys are listed in descending order of priority.

**Conditions** demote-non-dropping-particle set to “never”

**Order**

1) non-dropping-particle + family
2) dropping-particle
3) given
4) suffix

**Example** [van Gogh] [ ] [Vincent] [III]

**Conditions** demote-non-dropping-particle set to “sort-only” or “display-and-sort”

**Order**
1) family
2) dropping-particle + non-dropping-particle
3) given
4) suffix

**Example** [Gogh] [van] [Vincent] [III]

---

**Display and sorting order of names in “family-name given-name” scripts (Chinese, etc.)**

**Conditions** form set to “long”

**Order**
1) family
2) given

**Example** [Mao Zedong]

**Conditions** form set to “short”

**Order**
1) family

**Example** [Mao]

Non-personal names lack name-parts and are sorted as is, although English articles (“a”, “an” and “the”) at the start of the name are stripped. For example, “The New York Times” sorts as “New York Times”.

**Name-part Formatting**

The **cs:name** element may contain one or two **cs:name-part** child elements for name-part-specific formatting. **cs:name-part** must carry the **name** attribute, set to either “given” or “family”.

If set to “given”, **formatting** and **text-case** attributes on **cs:name-part** affect the “given” and “dropping-particle” name-parts. **affixes** surround the “given” name-part, enclosing any demoted name particles for inverted names.

If set to “family”, **formatting** and **text-case** attributes affect the “family” and “non-dropping-particle” name-parts. **affixes** surround the “family” name-part, enclosing any preceding name particles, as well as the “suffix” name-part for non-inverted names.

The “suffix” name-part is not subject to name-part formatting. The use of **cs:name-part elements** does not influence which, or in what order, name-parts are rendered. An example, yielding names like “Jane DOE”: 
Et-al

Et-al abbreviation, controlled via the `et-al-...` attributes (see Name), can be further customized with the optional `cs:et-al` element, which must follow the `cs:name` element (if present).

The `formatting` attributes may be used on `cs:et-al`, for example to italicize the “et-al” term:

```xml
<names variable="author">
    <name>
        <name-part name="family" text-case="uppercase"/>
    </name>
</names>

<names variable="author">
    <et-al font-style="italic"/>
</names>
```

The `term` attribute may also be set, to either “et-al” (the default) or “and others”, to use either term:

```xml
<names variable="author">
    <et-al term="and others"/>
</names>
```

Substitute

The optional `cs:substitute` element, which must be included as the last child element of `cs:names`, adds substitution in case the name variables specified in the parent `cs:names` element are empty. The substitutions are specified as child elements of `cs:substitute`, and must consist of one or more rendering elements (with the exception of `cs:layout`). A shorthand version of `cs:names` without child elements, which inherits the attributes values set on the `cs:name` and `cs:et-al` child elements of the original `cs:names` element, may also be used.

If `cs:substitute` contains multiple child elements, the first element to return a non-empty result is used for substitution. Substituted variables are suppressed in the rest of the output to prevent duplication. Substituted variables are considered empty for the purposes of determining whether to suppress an enclosing `cs:group`. If the variable was rendered earlier in the citation, before the “substitute” element, it is not suppressed. An example, where an empty “author” name variable is substituted by the “editor” name variable, or, when no editors exist, by the “title” macro:

```xml
<macro name="author">
    <names variable="author">
        <substitute>
            <names variable="editor"/>
            <text macro="title"/>
        </substitute>
    </names>
</macro>
```

Label in `cs:names`

A `cs:label` element (see label) may optionally be included in `cs:names`. It must appear before the `cs:substitute` element. The position of `cs:label` relative to `cs:name` determines the order of the name and label in the rendered text. When used as a child element of `cs:names`, `cs:label` does not carry the `variable` attribute; it uses the variable(s) set on the parent `cs:names` element instead. A second difference is that the `form` attribute may also be set to “verb” or “verb-short”, so that the allowed values are:
3.8.6 Label

The `cs:label` rendering element outputs the term matching the variable selected with the required `variable` attribute, which must be set to “locator”, “page”, or one of the `number variables`. The term is only rendered if the selected variable is non-empty. For example,

```xml
<group delimiter=" ">
  <label variable="page"/>
  <text variable="page"/>
</group>
```

can result in “page 3” or “pages 5-7”. `cs:label` may carry the following attributes:

- **form** Selects the form of the term, with allowed values:
  - “long” - (default), e.g. “page”/”pages” for the “page” term
  - “short” - e.g. “p.”/“pp.” for the “page” term
  - “symbol” - e.g. “§”/“§§” for the “section” term

- **plural** Sets pluralization of the term, with allowed values:
  - “contextual” - (default), the term plurality matches that of the variable content. Content is considered plural when it contains multiple numbers (e.g. “page 1”, “pages 1-3”, “volume 2”, “volumes 2 & 4”), or, in the case of the “number-of-pages” and “number-of-volumes” variables, when the number is higher than 1 (“1 volume” and “3 volumes”).
  - “always” - always use the plural form, e.g. “pages 1” and “pages 1-3”
  - “never” - always use the singular form, e.g. “page 1” and “page 1-3”

`cs:label` may also carry `affixes`, `formatting`, `text-case` and `strip-periods` attributes.

3.8.7 Group

The `cs:group` rendering element must contain one or more rendering elements (with the exception of `cs:layout`). `cs:group` may carry the `delimiter` attribute to separate its child elements, as well as `affixes`, `display`, and `formatting` attributes (applied to the output of the group as a whole). `cs:group` implicitly acts as a conditional: `cs:group` and its child elements are suppressed if a) at least one rendering element in `cs:group` calls a variable (either directly or via a macro), and b) all variables that are called are empty. This accommodates descriptive `cs:text` and `cs:label` elements. For example,
can result in “retrieved from https://doi.org/10.1128/AEM.02591-07”, but doesn’t generate output when the “URL” variable is empty.

If a \texttt{cs:group} is nested within another \texttt{cs:group}, the inner group is evaluated first: a non-empty nested \texttt{cs:group} is treated as a non-empty variable for the purposes of determining suppression of the outer \texttt{cs:group}.

When a \texttt{cs:group} contains a child \texttt{cs:macro}, if the \texttt{cs:macro} is non-empty, it is treated as a non-empty variable for the purposes of determining suppression of the outer \texttt{cs:group}.

### 3.8.8 Choose

The \texttt{cs:choose} rendering element allows for conditional rendering of \textit{rendering elements}. An example that renders the “issued” date variable when it exists, and the “no date” term when it doesn’t:

```xml
<choose>
  <if variable="issued">
    <date variable="issued" form="numeric"/>
  </if>
  <else>
    <text term="no date"/>
  </else>
</choose>
```

\texttt{cs:choose} requires a \texttt{cs:if} child element, which may be followed by one or more \texttt{cs:else-if} child elements, and an optional closing \texttt{cs:else} child element. The \texttt{cs:if} and \texttt{cs:else-if} elements may contain any number of \textit{rendering elements} (except for \texttt{cs:layout}). As an empty \texttt{cs:else} element would be superfluous, \texttt{cs:else} must contain at least one rendering element. \texttt{cs:if} and \texttt{cs:else-if} elements must carry one or more conditions, which are set with the attributes:

- **disambiguate** When set to “true” (the only allowed value), the element content is only rendered if it disambiguates two otherwise identical citations. This attempt at \textit{disambiguation} is only made when all other disambiguation methods have failed to uniquely identify the target source.

- **is-numeric** Tests whether the given variables (Appendix IV - Variables) contain numeric content. Content is considered numeric if it solely consists of numbers. Numbers may have prefixes and suffixes (“D2”, “2b”, “L2d”), and may be separated by a comma, hyphen, or ampersand, with or without spaces (“2, 3”, “2-4”, “2 & 4”). For example, “2nd” tests “true” whereas “second” and “2nd edition” test “false”.

- **is-uncertain-date** Tests whether the given \textit{date variables} contain \textit{approximate dates}.

- **locator** Tests whether the locator matches the given locator types (see \textit{Locators}). Use “sub-verbo” to test for the “sub verbo” locator type.

- **position** Tests whether the cite position matches the given positions (terminology: citations consist of one or more cites to individual items). When called within the scope of \texttt{cs:bibliography}, \textit{position} tests “false”. The positions that can be tested are:
  
  - “first”: position of cites that are the first to reference an item
  - “ibid”/“ibid-with-locator”/“subsequent”: cites referencing previously cited items have the “subsequent” position. Such cites may also have the “ibid” or “ibid-with-locator” position when:
    
    - the current cite immediately follows on another cite, within the same citation, that references the same item
    
    or
    
    - the current cite is the first cite in the citation, and the previous citation consists of a single cite referencing the same item
If either requirement is met, the presence of locators determines which position is assigned:

– **Preceding cite does not have a locator**: if the current cite has a locator, the position of the current cite is “ibid-with-locator”. Otherwise the position is “ibid”.

– **Preceding cite does have a locator**: if the current cite has the same locator, the position of the current cite is “ibid”. If the locator differs the position is “ibid-with-locator”. If the current cite lacks a locator its only position is “subsequent”.

• “near-note”: position of a cite following another cite referencing the same item. Both cites have to be located in foot or endnotes, and the distance between both cites may not exceed the maximum distance (measured in number of foot or endnotes) set with the near-note-distance option (see Note Distance).

Whenever position=“ibid-with-locator” tests true, position=“ibid” also tests true. And whenever position=“ibid” or position=“near-note” test true, position=“subsequent” also tests true.

**type** Tests whether the item matches the given types (Appendix III - Types).

**variable** Tests whether the default (long) forms of the given variables (Appendix IV - Variables) contain non-empty values.

With the exception of disambiguate, all conditions allow for multiple test values (separated with spaces, e.g. “book thesis”).

The `cs:if` and `cs:else-if` elements may carry the match attribute to control the testing logic, with allowed values:

• “all” - (default), element only tests “true” when all conditions test “true” for all given test values
• “any” - element tests “true” when any condition tests “true” for any given test value
• “none” - element only tests “true” when none of the conditions test “true” for any given test value

Delimiters from the nearest delimiters from the nearest ancestor delimiting element are applied within the output of `cs:choose` (i.e., the output of the matching `cs:if, cs:else-if, or cs:else`; see delimiter).

### 3.9 Style Behavior

#### 3.9.1 Options

Styles may be configured with **citation-specific options**, set as attributes on set on `cs:citation`, **bibliography-specific options**, set on `cs:bibliography`, and **global options** (these affect both citations and the bibliography), set on `cs:style`. **Inheritable name options** may be set on `cs:style, cs:citation and cs:bibliography`. Finally, **locale options** may be set on `cs:locale` elements.

#### Citation-specific Options

**Disambiguation**

A cite is ambiguous when it matches multiple bibliographic entries\(^1\). Four methods are available to eliminate such ambiguity, which are always tried in the following order:

1. Expand names (adding initials or full given names)
2. Show more names

\(^1\) Including uncited entries in the bibliography can make cites in the document ambiguous. To make sure such cites are disambiguated, the CSL processor should include (invisible) cites for such uncited bibliographic entries in the disambiguation process.
3. Render the cite with the `disambiguate` attribute of `cs:choose` conditions testing “true”

4. Add a year-suffix

Method 1 can also be used for the separate purpose of global *name disambiguation*, covering both ambiguous and unambiguous cites throughout the document.

The four disambiguation methods can be individually activated with the following optional attributes:

**disambiguate-add-givenname [Method (1)]** If set to “true” (“false” is the default), ambiguous names (names that are identical in their “short” or initialized “long” form, but differ when initials are added or the full given name is shown) are expanded. Name expansion can be configured with `givenname-disambiguation-rule`.

An example of cite disambiguation:

<table>
<thead>
<tr>
<th>Original ambiguous cites</th>
<th>Disambiguated cites</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Doe 1950; Doe 1950)</td>
<td>(John Doe 1950; Jane Doe 1950)</td>
</tr>
</tbody>
</table>

**givenname-disambiguation-rule** Specifies (a) whether the purpose of name expansion is limited to disambiguating cites, or has the additional goal of disambiguating names (only in the latter case are ambiguous names in unambiguous cites expanded, e.g. from “(Doe 1950; Doe 2000)” to “(Jane Doe 1950; John Doe 2000)”), (b) whether name expansion targets all, or just the first name of each cite, and (c) the method by which each name is expanded.

**Expansion of Individual Names** The steps for expanding individual names are:

1. If `initialize-with` is set and `initialize` has its default value of “true”, then:
   
   (a) Initials can be shown by rendering the name with a `form` value of “long” instead of “short” (e.g. “Doe” becomes “J. Doe”).
   
   (b) Full given names can be shown instead of initials by rendering the name with `initialize` set to “false” (e.g. “J. Doe” becomes “John Doe”).

2. If `initialize-with` is not set, full given names can be shown by rendering the name with a `form` value of “long” instead of “short” (e.g. “Doe” becomes “John Doe”).

**Given Name Disambiguation Rules** Allowed values of `givenname-disambiguation-rule`:

“all-names” Name expansion has the dual purpose of disambiguating cites and names. All rendered ambiguous names, in both ambiguous and unambiguous cites, are subject to disambiguation. Each name is progressively transformed until it is disambiguated. Names that cannot be disambiguated remain in their original form.

“all-names-with-initials” As “all-names”, but name expansion is limited to showing initials (see step 1(a) above). No disambiguation attempt is made when `initialize-with` is not set or when `initialize` is set to “false”.

“primary-name” As “all-names”, but disambiguation is limited to the first name of each cite.

“primary-name-with-initials” As “all-names-with-initials”, but disambiguation is limited to the first name of each cite.

“by-cite” Default. As “all-names”, but the goal of name expansion is limited to disambiguating cites. Only ambiguous names in ambiguous cites are affected, and disambiguation stops after the first name that eliminates cite ambiguity.

**disambiguate-add-names [Method (2)]** If set to “true” (“false” is the default), names that would otherwise be hidden as a result of et-al abbreviation are added one by one to all members of a set of ambiguous cites, until no more cites in the set can be disambiguated by adding names.
If both `disambiguate-add-givenname` and `disambiguate-add-names` are set to “true”, given name expansion is applied to rendered names first. If cites cannot be (fully) disambiguated by expanding the rendered names, then the names still hidden as a result of et-al abbreviation are added one by one to all members of a set of ambiguous cites. Added names are expanded if doing so would disambiguate the ambiguous cites. This process continues until no more cites in the set can be disambiguated by adding expanded names.

In the description of disambiguation methods (1) and (2) above, we assumed that each (disambiguated) cite has an unambiguous link to its bibliographic entry. To assure that each cite does in fact uniquely identify its entry in the bibliography, detail that distinguishes cites (such as names, initials, and full given names) must be shown in the corresponding bibliography entries. If this is not the case, disambiguation methods (1) and (2) also act on all members of a set of ambiguously cited bibliographic entries, until no more entries in the set can be unambiguously cited by adding (expanded) names. Each method only takes effect on the involved bibliographic entries after it has been used to disambiguate cites.

**disambiguate condition** [Method (3)] A disambiguation attempt can also be made by rendering ambiguous cites with the `disambiguate condition` testing “true” (see Choose).

**disambiguate-add-year-suffix** [Method (4)] If set to “true” (“false” is the default), an alphabetic year-suffix is added to ambiguous cites (e.g. “Doe 2007, Doe 2007” becomes “Doe 2007a, Doe 2007b”) and to their corresponding bibliographic entries. This final disambiguation method is always successful. The assignment of year-suffixes follows the order of the bibliographies entries, and additional letters are used once “z” is reached (“z”, “aa”, “ab”, ..., “az”, “ba”, etc.). By default, the year-suffix is appended the first year rendered through `cs:date` in the cite and in the bibliographic entry, but its location can be controlled by explicitly rendering the “year-suffix” variable using `cs:text`. If “year-suffix” is rendered through `cs:text` in the scope of `cs:citation`, it is suppressed for `cs:bibliography`, unless it is also rendered through `cs:text` in the scope of `cs:bibliography`, and vice versa.

### Cite Grouping

With cite grouping, cites in in-text citations with identical rendered names are grouped together, e.g. the year-sorted “(Doe 1999; Smith 2002; Doe 2006; Doe et al. 2007)” becomes “(Doe 1999; Doe 2006; Smith 2002; Doe et al. 2007)”. The comparison is limited to the output of the (first) `cs:names` element, but includes output rendered through `cs:substitute`. Cite grouping takes places after cite sorting and disambiguation. Grouped cites maintain their relative order, and are moved to the original location of the first cite of the group.

Cite grouping can be activated by setting the `cite-group-delimiter` attribute or the `collapse` attributes on `cs:citation` (see also Cite Collapsing).

**cite-group-delimiter** Activates cite grouping and specifies the delimiter for cites within a cite group. Defaults to “,”. E.g. with `delimiter` on `cs:layout` in `cs:citation` set to “;”, `collapse` set to “year”, and `cite-group-delimiter` set to “,”, citations look like “(Doe 1999,2001; Jones 2000)”.

### Cite Collapsing

Cite groups (author and author-date styles), and numeric cite ranges (numeric styles) can be collapsed through the use of the `collapse` attribute. Delimiters for collapsed cite groups can be customized with the `year-suffix-delimiter` and `after-collapse-delimiter` attributes:

**collapse** Activates cite grouping and collapsing. Allowed values:

- “citation-number” - collapses ranges of cite numbers (rendered through the “citation-number” variable) in citations for “numeric” styles (e.g. from “[1, 2, 3, 5]” to “[1–3, 5]”). Only increasing ranges collapse, e.g. “[3, 2, 1]” will not collapse (to see how to sort cites by “citation-number”, see Sorting).
- “year” - collapses cite groups by suppressing the output of the `cs:names` element for subsequent cites in the group, e.g. “(Doe 2000, Doe 2001)” becomes “(Doe 2000, 2001)”.
• “year-suffix” - collapses as “year”, but also suppresses repeating years within the cite group, e.g. “(Doe 2000a, b)” instead of “(Doe 2000a, 2000b)”.

• “year-suffix-ranged” - collapses as “year-suffix”, but also collapses ranges of year-suffixes, e.g. “(Doe 2000a–c,e)” instead of “(Doe 2000a, b, c, e)”.

“year-suffix” and “year-suffix-ranged” fall back to “year” when disambiguate-add-year-suffix is “false” (see Disambiguation), or when a cite has a locator (e.g. “(Doe 2000a-c, 2000d, p. 5, 2000e,f)”, where the cite for “Doe 2000d” has a locator that prevents the cite from further collapsing).

**year-suffix-delimiter** Specifies the delimiter for year-suffixes. Defaults to the delimiter set on cs:layout in cs:citation. E.g. with collapse set to “year-suffix”, delimiter on cs:layout in cs:citation set to “; “, and year-suffix-delimiter set to “,”, citations look like “(Doe 1999a,b; Jones 2000)”.

**after-collapse-delimiter** Specifies the cite delimiter to be used after a collapsed cite group. Defaults to the delimiter set on cs:layout in cs:citation. E.g. with collapse set to “year”, delimiter on cs:layout in cs:citation set to “,”, and after-collapse-delimiter set to “; “, citations look like “(Doe 1999, 2001; Jones 2000, Brown 2001)”.

**Note Distance**

**near-note-distance** A cite tests true for the “near-note” position (see Choose) when a preceding note exists that a) refers to the same item and b) does not precede the current note by more footnotes or endnotes than the value of near-note-distance (default value is “5”).

**Bibliography-specific Options**

**Whitespace**

**hanging-indent** If set to “true” (“false” is the default), bibliographic entries are rendered with hanging-indent.

**second-field-align** If set, subsequent lines of bibliographic entries are aligned along the second field. With “flush”, the first field is flush with the margin. With “margin”, the first field is put in the margin, and subsequent lines are aligned with the margin. An example, where the first field is <text variable="citation-number" suffix="" />


**line-spacing** Specifies vertical line distance. Defaults to “1” (single-spacing), and can be set to any positive integer to specify a multiple of the standard unit of line height (e.g. “2” for double-spacing).

**entry-spacing** Specifies vertical distance between bibliographic entries. By default (with a value of “1”), entries are separated by a single additional line-height (as set by the line-spacing attribute). Can be set to any non-negative integer to specify a multiple of this amount.

**Reference Grouping**

**subsequent-author-substitute** If set, the value of this attribute replaces names in a bibliographic entry that also occur in the preceding entry. The exact method of substitution depends on the value of the subsequent-author-substitute-rule attribute. Substitution is limited to the names of the first cs:names element rendered.
subsequent-author-substitute-rule Specifies when and how names are substituted as a result of subsequent-author-substitute. Allowed values:

- “complete-all” - (default), when all names of the name variable match those in the preceding bibliographic entry, the value of subsequent-author-substitute replaces the entire name list (including punctuation and terms like “et al” and “and”), except for the affixes set on the cs:names element.

- “complete-each” - requires a complete match like “complete-all”, but now the value of subsequent-author-substitute substitutes for each rendered name.

- “partial-each” - when one or more rendered names in the name variable match those in the preceding bibliographic entry, the value of subsequent-author-substitute substitutes for each matching name. Matching starts with the first name, and continues up to the first mismatch.

- “partial-first” - as “partial-each”, but substitution is limited to the first name of the name variable.

For example, take the following bibliographic entries:

Doe. 1999.
Doe, Johnson & Williams. 2001.
Doe, Williams et al. 2006.

With subsequent-author-substitute set to “—”, and subsequent-author-substitute-rule set to “complete-all”, this becomes:

Doe. 1999.
—. 2000.
Doe, Johnson & Williams. 2001.
—. 2004.
—. 2005.

With subsequent-author-substitute-rule set to “complete-each”, this becomes:

Doe. 1999.
—. 2000.
Doe, Johnson & Williams. 2001.
—, — et al. 2006.

With subsequent-author-substitute-rule set to “partial-each”, this becomes:

Doe. 1999.
—. 2000.
Doe, Johnson & Williams. 2001.
—, — et al. 2006.
With `subsequent-author-substitute-rule` set to “partial-first”, this becomes:

Doe. 1999.
---. 2000.
Doe, Johnson & Williams. 2001.
---, Williams et al. 2005.

Global Options

Hyphenation of Initialized Names

`initialize-with-hyphen` Specifies whether compound given names (e.g. “Jean-Luc”) should be initialized with a hyphen (“J.-L.”, value “true”, default) or without (“J. L.”, value “false”).

Page Ranges

`page-range-format` Activates expansion or collapsing of page ranges: “chicago” (“321–28”), “expanded” (e.g. “321–328”), “minimal” (“321–8”), or “minimal-two” (“321–28”) (see also Appendix V - Page Range Formats). Delimits page ranges with the “page-range-delimiter” term (introduced with CSL 1.0.1, and defaults to an en-dash). If the attribute is not set, page ranges are rendered without reformatting.

Name Particles

Western names frequently contain one or more name particles (e.g. “van” in the Dutch name “Vincent van Gogh”). These name particles can be either kept or dropped when only the surname is shown: these two types are referred to as non-dropping and dropping particles, respectively. Theoretically, a single name might contain particles of both types (with non-dropping particles always following dropping particles), though currently we are not aware of any real-life examples. For example, the Dutch name “Vincent van Gogh”, the German name “Alexander von Humboldt”, and the Arabic name “Tawfiq al-Hakim” can be deconstructed into:

```json
{
   "author": [
      {
         "given": "Vincent",
         "non-dropping-particle": "van",
         "family": "Gogh"
      },
      {
         "given": "Alexander",
         "dropping-particle": "von",
         "family": "Humboldt"
      },
      {
         "given": "Tawfiq",
         "non-dropping-particle": "al-",
         "family": "Hakim"
      }
   ]
}
```
When just the surname is shown, only the non-dropping-particle is kept: “Van Gogh” and “al-Hakim”, but “Humboldt”.

In the case of inverted names, where the family name precedes the given name, the dropping-particle is always appended to the family name, but the non-dropping-particle can be either prepended (e.g. “van Gogh, Vincent”) or appended (after initials or given names, e.g. “Gogh, Vincent van”). For inverted names where the non-dropping-particle is prepended, names can either be sorted by keeping the non-dropping-particle together with the family name as part of the primary sort key (sort order A), or by separating the non-dropping-particle from the family name and have it become (part of) a secondary sort key, joining the dropping-particle, if available (sort order B):

**Sort order A: non-dropping-particle not demoted**
- primary sort key: “van Gogh”
- secondary sort key: “”
- tertiary sort key: “Vincent”

**Sort order B: non-dropping-particle demoted**
- primary sort key: “Gogh”
- secondary sort key: “van”
- tertiary sort key: “Vincent”

The handling of the non-dropping-particle can be customized with the `demote-non-dropping-particle` option:

**demote-non-dropping-particle** Sets the display and sorting behavior of the non-dropping-particle in inverted names (e.g. “Gogh, Vincent van”). Allowed values:
- “never”: the non-dropping-particle is treated as part of the family name, whereas the dropping-particle is appended (e.g. “van Gogh, Vincent”, “Humboldt, Alexander von”). The non-dropping-particle is part of the primary sort key (sort order A, e.g. “van Gogh, Vincent” appears under “V”).
- “sort-only”: same display behavior as “never”, but the non-dropping-particle is demoted to a secondary sort key (sort order B, e.g. “van Gogh, Vincent” appears under “G”).
- “display-and-sort” (default): the dropping and non-dropping-particle are appended (e.g. “Gogh, Vincent van” and “Humboldt, Alexander von”). For name sorting, all particles are part of the secondary sort key (sort order B, e.g. “Gogh, Vincent van” appears under “G”).

Some names include a particle that should never be demoted. For these cases the particle should just be included in the family name field, for example for the French general Charles de Gaulle and the writer Jean de La Fontaine:

```json
{
    "author": [
        {
            "given": "Charles",
            "family": "de Gaulle",
        },
        {
            "given": "Jean",
            "dropping-particle": "de",
            "family": "La Fontaine",
        }
    ]
}
```
Inheritable Name Options

Attributes for the cs:names and cs:name elements may also be set on cs:style, cs:citation and cs:bibliography. This eliminates the need to repeat the same attributes and attribute values for every occurrence of the cs:names and cs:name elements.


When an inheritable name attribute is set on cs:style, cs:citation or cs:bibliography, its value is used for all cs:names elements within the scope of the element carrying the attribute. If an attribute is set on multiple hierarchical levels, the value set at the lowest level is used.

Locale Options

limit-day-ordinals-to-day-1 Date formats are defined by the cs:date element and its cs:date-part child elements (see Date). By default, when the cs:date-part element with name set to “day” has form set to “ordinal”, all days (1 through 31) are rendered in the ordinal form, e.g. “January 1st”, “January 2nd”, etc. By setting limit-day-ordinals-to-day-1 to “true” (“false” is the default), the “ordinal” form is limited to the first day of each month (other days will use the “numeric” form). This is desirable for some languages, such as French: “1er janvier”, but “2 janvier”, “3 janvier”, etc.

punctuation-in-quote For cs:text elements rendered with the quotes attribute set to “true” (see Formatting), and for which the output is followed by a comma or period, punctuation-in-quote specifies whether this punctuation is placed outside (value “false”, default) or inside (value “true”) the closing quotation mark.

3.9.2 Sorting

cs:citation and cs:bibliography may include a cs:sort child element before the cs:layout element to specify the sorting order of respectively cites within citations, and bibliographic entries within the bibliography. In the absence of cs:sort, cites and bibliographic entries appear in the order in which they are cited.

The cs:sort element must contain one or more cs:key child elements. The sort key, set as an attribute on cs:key, must be a variable (see Appendix IV - Variables) or macro name. For each cs:key element, the sort direction can be set to either “ascending” (default) or “descending” with the sort attribute. Sorting is case-insensitive. The attributes names-min, names-use-first, and names-use-last may be used to override the values of the corresponding et-al-min/et-al-subsequent-min, et-al-use-first/et-al-subsequent-use-first and et-al-use-last attributes, and affect all names generated via macros called by cs:key.

Sort keys are evaluated in sequence. A primary sort is performed on all items using the first sort key. A secondary sort, using the second sort key, is applied to items sharing the first sort key value. A tertiary sort, using the third sort key, is applied to items sharing the first and second sort key values. Sorting continues until either the order of all items is fixed, or until the sort keys are exhausted. Items with an empty sort key value are placed at the end of the sort, both for ascending and descending sorts.

An example, where cites are first sorted by the output of the “author” macro, with overriding settings for et-al abbreviation. Cites sharing the primary sort key are subsequently sorted in descending order by the “issued” date variable.
The sort key value of a variable or macro can differ from the “normal” rendered output. The specifics of sorting variables and macros:

### Sorting Variables

The sort key value for a variable called by `cs:key` via the `variable` attribute consists of the string value, without rich text markup. Exceptions are name and numeric variables:

- **names**: Name variables called via the `variable` attribute (e.g. `<key variable="author"/>`) are returned as a name list string, with the `cs:name` attributes form set to “long”, and name-as-sort-order set to “all”.

- **dates**: Date variables called via the `variable` attribute are returned in the YYYYMMDD format, with zeros substituted for any missing date-parts (e.g. 20001200 for December 2000). As a result, less specific dates precede more specific dates in ascending sorts, e.g. “2000, May 2000, May 1st 2000”. Negative years are sorted inversely, e.g. “100BC, 50BC, 50AD, 100AD”. Seasons are ignored for sorting, as the chronological order of the seasons differs between the northern and southern hemispheres. In the case of date ranges, the start date is used for the primary sort, and the end date is used for a secondary sort, e.g. “2000–2001, 2000–2005, 2002–2003, 2002–2009”. Date ranges are placed after single dates when they share the same (start) date, e.g. “2000, 2000–2002”.

- **numbers**: Number variables called via the `variable` attribute are returned as integers (form is “numeric”). If the original variable value only consists of non-numeric text, the value is returned as a text string.

### Sorting Macros

The sort key value for a macro called via `cs:key` via the `macro` attribute generally consists of the string value the macro would ordinarily generate, without rich text markup (exceptions are discussed below).

When sorting by name variables rendered within the macro, any `cs:label` elements are excluded from the sort key values. Name variables are also returned with the `cs:name` attribute name-as-sort-order set to “all”. When et-al abbreviation occurs, the “et-al” and “and others” terms are excluded from the sort key values.

There are four advantages in using the same macro for rendering and sorting, instead of sorting directly on the name variable. First, substitution is available (e.g. the “editor” variable might substitute for an empty “author” variable). Second, et-al abbreviation can be used (using either the `et-al-min/et-al-subsequent-min`, `et-al-use-first/et-al-subsequent-use-first`, and `et-al-use-last` options defined for the macro, or the overriding names-min, names-use-first and names-use-last attributes set on `cs:key`). Third, names can be sorted by just the surname (using a macro for which the form attribute on `cs:name` is set to “short”). Fourth, it is possible to sort by the number of names in a name list, by calling a macro for which the form attribute on `cs:name` is set to “count”.

Number variables rendered within the macro with `cs:number` and date variables are treated the same as when they are called via `variable`. The only exception is that the complete date is returned if a date variable is called via the `variable` attribute. In contrast, macros return only those date-parts that would otherwise be rendered (respecting the value of the `date-parts` attribute for localized dates, or the listing of `cs:date-part` elements for non-localized dates).
3.9.3 Range Delimiters

Collapsed ranges for the “citation-number” and “year-suffix” variables are delimited by an en-dash (e.g. “(1–3, 5)” and “(Doe 2000a–c,e)”).

The “locator” variable is always rendered with an en-dash replacing any hyphens. For the “page” variable, this replacement is only performed if the page-range-format attribute is set on cs:style (see Page Ranges).

3.9.4 Formatting

The following formatting attributes may be set on cs:date, cs:date-part, cs:et-al, cs:group, cs:label, cs:layout, cs:name, cs:name-part, cs:names, cs:number and cs:text:

**font-style** Sets the font style, with values:
- “normal” (default)
- “italic”
- “oblique” (i.e. slanted)

**font-variant** Allows for the use of small capitals, with values:
- “normal” (default)
- “small-caps”

**font-weight** Sets the font weight, with values:
- “normal” (default)
- “bold”
- “light”

**text-decoration** Allows for the use of underlining, with values:
- “none” (default)
- “underline”

**vertical-align** Sets the vertical alignment, with values:
- “baseline” (default)
- “sup” (superscript)
- “sub” (subscript)

3.9.5 Affixes

The affixes attributes prefix and suffix may be set on cs:date (except when cs:date defines a localized date format), cs:date-part (except when the parent cs:date element calls a localized date format), cs:group, cs:label, cs:layout, cs:name, cs:name-part, cs:names, cs:number and cs:text. The attribute value is either added before (prefix) or after (suffix) the output of the element carrying the attribute, but affixes are only rendered if the element produces output. With the exception of affixes set on cs:layout, affixes are outside the scope of formatting, quotes, strip-periods and text-case attributes set on the same element (as a workaround, these attributes take effect on affixes when set on a parent cs:group element).
3.9.6 Delimiter

The `delimiter` attribute, whose value delimits non-empty pieces of output, may be set on `cs:date` (delimiting the date-parts; `delimiter` is not allowed when `cs:date` calls a localized date format), `cs:names` (delimiting name lists from different `name variables`), `cs:name` (delimiting names within name lists), `cs:group` and `cs:layout` (delimiting the output of the child elements).

A delimiting element is any element as above which takes a `delimiter` attribute, whether the attribute is supplied or not.

Delimiters from any ancestor delimiting element are not applied within the output of a delimiting element. The following produces retrieved:  <http://example.com>:

```
<group delimiter=": ">
  <text term="retrieved" />
  <group>
    <text value="<" />
    <text variable="URL" />
    <text value=">" />
  </group>
</group>
```

3.9.7 Display

The `display` attribute (similar the “display” property in CSS) may be used to structure individual bibliographic entries into one or more text blocks. If used, all rendering elements should be under the control of a display attribute. The allowed values:

- “block” - block stretching from margin to margin.
- “left-margin” - block starting at the left margin. If followed by a “right-inline” block, the “left-margin” blocks of all bibliographic entries are set to a fixed width to accommodate the longest content string found among these “left-margin” blocks. In the absence of a “right-inline” block the “left-margin” block extends to the right margin.
- “right-inline” - block starting to the right of a preceding “left-margin” block (behaves as “block” in the absence of such a “left-margin” block). Extends to the right margin.
- “indent” - block indented to the right by a standard amount. Extends to the right margin.

Examples

(A) Instead of using `second-field-align` (see `Whitespace`), a similar layout can be achieved with a “left-margin” and “right-inline” block. A potential benefit is that the styling of blocks can be further controlled in the final output (e.g. using CSS for HTML, styles for Word, etc.).

```
<bibliography>
  <layout>
    <text display="left-margin" variable="citation-number"
          prefix="[" suffix="]"/>
    <group display="right-inline">
      <!-- rendering elements -->
    </group>
  </layout>
</bibliography>
```
(B) A per-author publication listing. With subsequent-author-substitute (see Reference Grouping) set to an empty string, the block with the author names is only rendered once for items by the same authors.

```xml
<bibliography subsequent-author-substitute=""
  <sort>
    <key variable="author"/>
    <key variable="issued"/>
  </sort>
  <layout>
    <group display="block">
      <names variable="author"/>
    </group>
    <group display="left-margin">
      <date variable="issued">
        <date-part name="year"/>
      </date>
    </group>
    <group display="right-inline">
      <text variable="title"/>
    </group>
  </layout>
</bibliography>
```

The output of this example would look like:

<table>
<thead>
<tr>
<th>Author1</th>
<th>year-publication1</th>
<th>title-publication1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>year-publication2</td>
<td>title-publication2</td>
</tr>
<tr>
<td>Author2</td>
<td>year-publication3</td>
<td>title-publication3</td>
</tr>
<tr>
<td></td>
<td>year-publication4</td>
<td>title-publication4</td>
</tr>
</tbody>
</table>

(C) An annotated bibliography, where the annotation appears in an indented block below the reference.

```xml
<bibliography>
  <layout>
    <group display="block">
      <!-- rendering elements -->
    </group>
    <text display="indent" variable="abstract"/>
  </layout>
</bibliography>
```

### 3.9.8 Quotes

The quotes attribute may set on cs:text. When set to “true” (“false” is default), the rendered text is wrapped in quotes (the quotation marks used are terms). The localized punctuation-in-quote option controls whether an adjoining comma or period appears outside (default) or inside the closing quotation mark (see Locale Options).

### 3.9.9 Strip-periods

The strip-periods attribute may be set on cs:date-part (but only if name is set to “month”), cs:label and cs:text. When set to “true” (“false” is the default), any periods in the rendered text are removed.

3.9. Style Behavior
3.9.10 Text-case

The `text-case` attribute may be set on `cs:date`, `cs:date-part`, `cs:label`, `cs:name-part`, `cs:number` and `cs:text`. The allowed values:

- “lowercase”: renders text in lowercase
- “uppercase”: renders text in uppercase
- “capitalize-first”: capitalizes the first character of the first word, if the word is lowercase
- “capitalize-all”: capitalizes the first character of every lowercase word
- “sentence”: renders text in sentence case (deprecated; do not use)
- “title”: renders text in title case

Sentence Case Conversion

Sentence case conversion (with `text-case` set to “sentence”) is performed by:

1. For uppercase strings, the first character of the string remains capitalized. All other letters are lowercased.
2. For lower or mixed case strings, the first character of the first word is capitalized if the word is lowercase. The case of all other words stays the same.

CSL processors don’t recognize proper nouns. As a result, strings in sentence case can be accurately converted to title case, but not vice versa. For this reason, it is generally preferable to store strings such as titles in sentence case, and only use `text-case` if a style desires another case.

Sentence case conversion is deprecated and will be removed in a future version.

Title Case Conversion

Title case conversion (with `text-case` set to “title”) for English-language items is performed by:

1. For uppercase strings, the first character of each word remains capitalized. All other letters are lowercased.
2. For lower or mixed case strings, the first character of each lowercase word is capitalized. The case of words in mixed or uppercase stays the same.

In both cases, stop words are lowercased, unless they are the first or last word in the string, or follow a colon. The stop words are listed in the CSL Schema file `stop-words.json`. Hyphenated word parts are treated as distinct words (e.g., “two-thirds” becomes “Two-Thirds”).

Non-English Items

As many languages do not use title case, title case conversion (with `text-case` set to “title”) only affects English-language items.

If the `default-locale` attribute on `cs:style` isn’t set, or set to a locale code with a primary language tag of “en” (English), items are assumed to be English. An item is only considered to be non-English if its metadata contains a language field with a non-nil value that doesn’t start with the “en” primary language tag.

If `default-locale` is set to a locale code with a primary language tag other than “en”, items are assumed to be non-English. An item is only considered to be English if the value of its language field starts with the “en” primary language tag.
3.10 Appendix I - Categories

- anthropology
- astronomy
- biology
- botany
- chemistry
- communications
- engineering
- generic-base - used for generic styles like Harvard and APA
- geography
- geology
- history
- humanities
- law
- linguistics
- literature
- math
- medicine
- philosophy
- physics
- political_science
- psychology
- science
- social_science
- sociology
- theology
- zoology

3.11 Appendix II - Terms

3.11.1 Type Terms

For each item type listed in Appendix III - Types, there is a corresponding term.

3.11.2 Name Variable Terms

For each of the Name Variables listed in Appendix IV - Variables, there is a corresponding term.
3.11.3 Number Variable Terms

For each of the *Number Variables* listed in *Appendix IV - Variables*, there is a corresponding term.

3.11.4 Locators

- appendix
- article-locator
- book
- canon
- chapter
- column
- elocation
- equation
- figure
- folio
- issue
- line
- note
- opus
- page
- paragraph
- part
- rule
- section
- sub-verbo
- supplement
- table
- timestamp
- title
- verse
- volume

3.11.5 Months

- month-01
- month-02
- month-03
• month-04
• month-05
• month-06
• month-07
• month-08
• month-09
• month-10
• month-11
• month-12

3.11.6 Ordinals

• ordinal
• ordinal-00 through ordinal-99
• long-ordinal-01
• long-ordinal-02
• long-ordinal-03
• long-ordinal-04
• long-ordinal-05
• long-ordinal-06
• long-ordinal-07
• long-ordinal-08
• long-ordinal-09
• long-ordinal-10

3.11.7 Punctuation

• open-quote
• close-quote
• open-inner-quote
• close-inner-quote
• page-range-delimiter
• colon
• comma
• semicolon
3.11.8 Seasons

- season-01
- season-02
- season-03
- season-04

3.11.9 Miscellaneous

- accessed
- ad
- advance-online-publication
- album
- and
- and others
- anonymous
- at
- audio-recording
- available at
- bc
- bce
- by
- ce
- circa
- cited
- et-al
- film
- forthcoming
- from
- henceforth
- ibid
- in
- in press
- internet
- interview
- letter
- loc-cit
• no date
• no-place
• no-publisher
• on
• online
• op-cit
• original-work-published
• personal-communication
• podcast
• podcast-episode
• preprint
• presented at
• radio-broadcast
• radio-series
• radio-series-episode
• reference
• retrieved
• review-of
• scale
• special-issue
• special-section
• television-broadcast
• television-series
• television-series-episode
• video
• working-paper

3.12 Appendix III - Types

article
A self-contained work made widely available but not published in a journal or other publication;
Use for preprints, working papers, and similar works posted on a platform where some level of persistence or
stewardship is expected (e.g. arXiv or other preprint repositories, working paper series);
For unpublished works not made widely available or only hosted on personal websites, use manuscript

article-journal An article published in an academic journal

article-magazine An article published in a non-academic magazine

article-newspaper An article published in a newspaper
bill  A proposed piece of legislation

book
A book or similar work;
Can be an authored book or an edited collection of self-contained chapters;
Can be a physical book or an ebook;
The format for an ebook may be specified using medium;
Can be a single-volume work, a multivolume work, or one volume of a multivolume work;
If a container-title is present, the item is interpreted as a book republished in a collection or anthology;
Also used for whole conference proceedings volumes or exhibition catalogs by specifying event and related variables

broadcast
A recorded work broadcast over an electronic medium (e.g. a radio broadcast, a television show, a podcast);
The type of broadcast may be specified using genre;
If container-title is present, the item is interpreted as an episode contained within a larger broadcast series (e.g. an episode in a television show or an episode of a podcast)

chapter
A part of a book cited separately from the book as a whole (e.g. a chapter in an edited book);
Also used for introductions, forewords, and similar supplemental components of a book

classic  A classical or ancient work, sometimes cited using a common abbreviation

collection  An archival collection in a museum or other institution

dataset  A data set or a similar collection of (mostly) raw data

document
A catch-all category for items not belonging to other types;
Use a more specific type when appropriate

entry
An entry in a database, directory, or catalog;
For entries in a dictionary, use entry-dictionary;
For entries in an encyclopedia, use entry-encyclopedia

entry-dictionary  An entry in a dictionary

entry-encyclopedia  An entry in an encyclopedia or similar reference work

event
An organized event (e.g., an exhibition or conference);
Use for direct citations to the event, rather than to works contained within an event (e.g. a presentation in a conference, a graphic in an exhibition) or based on an event (e.g. a paper-conference published in proceedings, an exhibition catalog)

figure
A illustration or representation of data, typically as part of a journal article or other larger work;
May be in any format (e.g. image, video, audio recording, 3D model);
The format of the item can be specified using medium

graphic
A still visual work:
Can be used for artwork or other works (e.g. journalistic or historical photographs);
Can be used for any still visual work (e.g. photographs, drawings, paintings, sculptures, clothing);
The format of the item can be specified using medium

**hearing**
A hearing by a government committee or transcript thereof

**interview**
An interview of a person;
Also used for a recording or transcript of an interview; author is interpreted as the interviewee

**legal_case** A legal case

**legislation** A law or resolution enacted by a governing body

**manuscript**
An unpublished manuscript;
Use for both modern unpublished works and classical manuscripts;
For working papers, preprints, and similar works posted to a repository, use article

**map** A geographic map

**motion_picture**
A video or visual recording;
If a container-title is present, the item is interpreted as a part contained within a larger compilation of recordings (e.g. a part of a multipart documentary)

**musical_score**
The printed score for a piece of music;
For a live performance of the music, use performance;
For recordings of the music, use song (for audio recordings) or motion_picture (for video recordings)

**pamphlet** A fragment, historical document, or other unusually-published or ephemeral work (e.g. a sales brochure)

**paper-conference**
A paper formally published in conference proceedings;
For papers presented at a conference, but not published in a proceedings, use speech

**patent** A patent for an invention

**performance**
A live performance of an artistic work;
For non-artistic presentations, use speech;
For recordings of a performance, use song or motion_picture

**periodical** A full issue or run of issues in a periodical publication (e.g. a special issue of a journal)

**personal_communication**
Personal communications between multiple parties;
May be unpublished (e.g. private correspondence between two researchers) or collected/published (e.g. a letter published in a collection)

**post**
A post on an online forum, social media platform, or similar platform;
Also used for comments posted to online items
post-weblog A blog post

regulation An administrative order from any level of government

report
A technical report, government report, white paper, brief, or similar work distributed by an institution;
Also used for manuals and similar technical documentation (e.g. a software, instrument, or test manual);
If a container-title is present, the item is interpreted as a chapter contained within a larger report

review
A review of an item other than a book (e.g. a film review, posted peer review of an article);
If reviewed-title is absent, title is taken to be the title of the reviewed item

review-book
A review of a book;
If reviewed-title is absent, title is taken to be the title of the reviewed book

software A computer program, app, or other piece of software

song
An audio recording;
Can be used for any audio recording (not only music);
If a container-title is present, the item is interpreted as a track contained within a larger album or compilation of recordings

speech
A speech or other presentation (e.g. a paper, talk, poster, or symposium at a conference);
Use genre to specify the type of presentation;
Use event to indicate the event where the presentation was made (e.g. the conference name);
Use container-title if the presentation is part of a larger session (e.g. a paper in a symposium);
For papers published in conference proceedings, use paper-conference;
For artistic performances, use performance

standard A technical standard or similar set of rules or norms

thesis
A thesis written to satisfy requirements for a degree;
Use genre to specify the type of thesis

treaty A treaty agreement among political authorities

webpage
A website or page on a website;
Intended for sources which are intrinsically online; use a more specific type when appropriate (e.g. article-journal, post-weblog, report, entry);
If a container-title is present, the item is interpreted as a page contained within a larger website

3.13 Appendix IV - Variables

3.13.1 Standard Variables

abstract Abstract of the item (e.g. the abstract of a journal article)
annotate
    Short markup, decoration, or annotation to the item (e.g., to indicate items included in a review);
    For descriptive text (e.g., in an annotated bibliography), use note instead

archive Archive storing the item

archive_collection Collection the item is part of within an archive

archive_location Storage location within an archive (e.g. a box and folder number)

archive-place Geographic location of the archive

authority Issuing or judicial authority (e.g. “USPTO” for a patent, “Fairfax Circuit Court” for a legal case)

call-number Call number (to locate the item in a library)

citation-key
    Identifier of the item in the input data file (analogous to BiTeX entrykey);
    Use this variable to facilitate conversion between word-processor and plain-text writing systems;
    For an identifier intended as formatted output label for a citation (e.g. “Ferr78”), use citation-label instead

citation-label
    Label identifying the item in in-text citations of label styles (e.g. “Ferr78”);
    May be assigned by the CSL processor based on item metadata;
    For the identifier of the item in the input data file, use citation-key instead

collection-title
    Title of the collection holding the item (e.g. the series title for a book; the lecture series title for a presentation)

container-title Title of the container holding the item (e.g. the book title for a book chapter, the journal title for a journal article; the album title for a recording; the session title for multi-part presentation at a conference)

container-title-short
    Short/abbreviated form of container-title;
    Deprecated; use variable="container-title" form="short" instead

dimensions Physical (e.g. size) or temporal (e.g. running time) dimensions of the item

division Minor subdivision of a court with a jurisdiction for a legal item

DOI Digital Object Identifier (e.g. “10.1128/AEM.02591-07”)

event Deprecated legacy variant of event-title

event-title Name of the event related to the item (e.g. the conference name when citing a conference paper; the meeting where presentation was made)

event-place Geographic location of the event related to the item (e.g. “Amsterdam, The Netherlands”)

genre
    Type, class, or subtype of the item (e.g. “Doctoral dissertation” for a PhD thesis; “NIH Publication” for an NIH technical report);
    Do not use for topical descriptions or categories (e.g. “adventure” for an adventure movie)

ISBN International Standard Book Number (e.g. “978-3-8474-1017-1”)

ISSN International Standard Serial Number

jurisdiction Geographic scope of relevance (e.g. “US” for a US patent; the court hearing a legal case)
keyword  Keyword(s) or tag(s) attached to the item

language
   The language of the item:
   Should be entered as an ISO 639-1 two-letter language code (e.g. “en”, “zh”), optionally with a two-letter
   locale code (e.g. “de-DE”, “de-AT”)

license  The license information applicable to an item (e.g. the license an article or software is released under; the
         copyright information for an item; the classification status of a document)

medium   Description of the item’s format or medium (e.g. “CD”, “DVD”, “Album”, etc.)

note     Descriptive text or notes about an item (e.g. in an annotated bibliography)

original-publisher  Original publisher, for items that have been republished by a different publisher

original-publisher-place  Geographic location of the original publisher (e.g. “London, UK”)

original-title   Title of the original version (e.g. “”, the untranslated Russian title of “War and Peace”)

part-title     Title of the specific part of an item being cited

PMCID  PubMed Central reference number

PMID   PubMed reference number

publisher  Publisher

publisher-place  Geographic location of the publisher

references
   Resources related to the procedural history of a legal case or legislation;
   Can also be used to refer to the procedural history of other items (e.g. “Conference canceled” for a presentation
   accepted as a conference that was subsequently canceled; details of a retraction or correction notice)

reviewed-genre  Type of the item being reviewed by the current item (e.g. book, film)

reviewed-title  Title of the item reviewed by the current item

scale   Scale of e.g. a map or model

source   Source from whence the item originates (e.g. a library catalog or database)

status    Publication status of the item (e.g. “forthcoming”; “in press”; “advance online publication”; “retracted”)

title     Primary title of the item

title-short
   Short/abbreviated form of title;
   Deprecated; use variable="title" form="short" instead

URL  Uniform Resource Locator (e.g. “https://aem.asm.org/cgi/content/full/74/9/2766”)

volume-title
   Title of the volume of the item or container holding the item;
   Also use for titles of periodical special issues, special sections, and the like

year-suffix  Disambiguating year suffix in author-date styles (e.g. “a” in “Doe, 1999a”)
Number Variables

Number variables are a subset of the Standard Variables.

chapter-number  Chapter number (e.g. chapter number in a book; track number on an album)
citation-number  Index (starting at 1) of the cited reference in the bibliography (generated by the CSL processor)
collection-number  Number identifying the collection holding the item (e.g. the series number for a book)
edition  (Container) edition holding the item (e.g. “3” when citing a chapter in the third edition of a book)
first-reference-note-number  Number of a preceding note containing the first reference to the item;
                              Assigned by the CSL processor;
                              Empty in non-note-based styles or when the item hasn’t been cited in any preceding notes in a document
issue  Issue number of the item or container holding the item (e.g. “5” when citing a journal article from journal volume 2, issue 5);
       Use volume-title for the title of the issue, if any
locator  A cite-specific pinpointer within the item (e.g. a page number within a book, or a volume in a multi-volume work);
         Must be accompanied in the input data by a label indicating the locator type (see the Locators term list), which
determines which term is rendered by cs:label when the locator variable is selected.
number  Number identifying the item (e.g. a report number)
number-of-pages  Total number of pages of the cited item
number-of-volumes  Total number of volumes, used when citing multi-volume books and such
page  Range of pages the item (e.g. a journal article) covers in a container (e.g. a journal issue)
page-first  First page of the range of pages the item (e.g. a journal article) covers in a container (e.g. a journal issue)
part-number  Number of the specific part of the item being cited (e.g. part 2 of a journal article);
               Use part-title for the title of the part, if any
printing-number  Printing number of the item or container holding the item
section  Section of the item or container holding the item (e.g. “§2.0.1” for a law; “politics” for a newspaper article)
supplement-number  Supplement number of the item or container holding the item (e.g. for secondary legal items
                   that are regularly updated between editions)
version  Version of the item (e.g. “2.0.9” for a software program)
volume  Volume number of the item (e.g. “2” when citing volume 2 of a book) or the container holding the item (e.g.
         “2” when citing a chapter from volume 2 of a book);
         Use volume-title for the title of the volume, if any
3.13.2 Date Variables

accessed Date the item has been accessed
available-date Date the item was initially available (e.g. the online publication date of a journal article before its formal publication date; the date a treaty was made available for signing)
event-date Date the event related to an item took place
issued Date the item was issued/published
original-date Issue date of the original version
submitted Date the item (e.g. a manuscript) was submitted for publication

3.13.3 Name Variables

author Author
chair The person leading the session containing a presentation (e.g. the organizer of the container-title of a speech)
collection-editor Editor of the collection holding the item (e.g. the series editor for a book)
compiler Person compiling or selecting material for an item from the works of various persons or bodies (e.g. for an anthology)
composer Composer (e.g. of a musical score)
container-author Author of the container holding the item (e.g. the book author for a book chapter)
contributor A minor contributor to the item; typically cited using “with” before the name when listed in a bibliography
curator Curator of an exhibit or collection (e.g. in a museum)
director Director (e.g. of a film)
editor Editor
editorial-director Managing editor (“Directeur de la Publication” in French)
editor-translator Combined editor and translator of a work;
The citation processory must be automatically generate if editor and translator variables are identical;
May also be provided directly in item data
executive-producer Executive producer (e.g. of a television series)
guest Guest (e.g. on a TV show or podcast)
host Host (e.g. of a TV show or podcast)
ilustrator Illustrator (e.g. of a children’s book or graphic novel)
interviewer Interviewer (e.g. of an interview)
narrator Narrator (e.g. of an audio book)
organizer Organizer of an event (e.g. organizer of a workshop or conference)
original-author The original creator of a work (e.g. the form of the author name listed on the original version of a book; the historical author of a work; the original songwriter or performer for a musical piece; the original
developer or programmer for a piece of software; the original author of an adapted work such as a book adapted into a screenplay)

**performer** Performer of an item (e.g. an actor appearing in a film; a musician performing a piece of music)

**producer** Producer (e.g. of a television or radio broadcast)

**recipient** Recipient (e.g. of a letter)

**reviewed-author** Author of the item reviewed by the current item

**script-writer** Writer of a script or screenplay (e.g. of a film)

**series-creator** Creator of a series (e.g. of a television series)

**translator** Translator

### 3.14 Appendix V - Page Range Formats

The page abbreviation rules for the different values of the `page-range-format` attribute on `cs:style` are:

**“chicago”** Alias for “chicago-15”; will change to be an alias for “chicago-16” in CSL v1.1.

**“chicago-15”** Page ranges are abbreviated according to the ‘Chicago Manual of Style (15th ed and earlier) rules’ (see 15th ed, section 9.64):

<table>
<thead>
<tr>
<th>First number</th>
<th>Second number</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100</td>
<td>Use all digits</td>
<td>3–10; 71–72</td>
</tr>
<tr>
<td>100 or multiple of 100</td>
<td>Use all digits</td>
<td>100–104; 600–613; 1100–1123</td>
</tr>
<tr>
<td>101 through 109 (in multiples of 100)</td>
<td>Use changed part only, omitting unneeded zeros</td>
<td>107–8; 505–17; 1002–6</td>
</tr>
<tr>
<td>110 through 199 (in multiples of 100)</td>
<td>Use two digits, or more as needed</td>
<td>321–25; 415–532; 11564–68; 13792–803</td>
</tr>
<tr>
<td>4 digits</td>
<td>If numbers are four digits long and three digits change, use all digits</td>
<td>1496–1504; 2787–2816</td>
</tr>
</tbody>
</table>

**“chicago-16”** Page ranges are abbreviated according to the Chicago Manual of Style (16th ed and later) rules (see 16th ed, section 9.61):

<table>
<thead>
<tr>
<th>First number</th>
<th>Second number</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100</td>
<td>Use all digits</td>
<td>3–10; 71–72; 92–113;</td>
</tr>
<tr>
<td>100 or multiple of 100</td>
<td>Use all digits</td>
<td>100–104; 600–613; 1100–1123</td>
</tr>
<tr>
<td>101 through 109, 201 through 209, etc. (for each multiple of 100)</td>
<td>Use changed part only, omitting unneeded zeros</td>
<td>107–8; 505–17; 1002–6</td>
</tr>
<tr>
<td>Everything else (110 through 199, 210 through 299, etc.; for each multiple of 100)</td>
<td>Use two digits, unless more digits are needed to show the changed part</td>
<td>321–25; 415–532; 1087–89; 1496–500; 11564–68; 13792–803 12991–3001</td>
</tr>
</tbody>
</table>

**“expanded”** Abbreviated page ranges are expanded to their non-abbreviated form: 42–45, 321–328, 2787–2816

**“minimal”** All digits repeated in the second number are left out: 42–5, 321–8, 2787–816
“minimal-two” As “minimal”, but at least two digits are kept in the second number when it has two or more digits long.

### 3.15 Appendix VI: Links

The CSL syntax does not have support for configuration of links. However, processors should include links on bibliographic references, using the following rules:

If the bibliography entry for an item renders any of the following identifiers, the identifier should be anchored as a link, with the target of the link as follows:

1. **url**: output as is
2. **doi**: prepend with “https://doi.org/”
4. **pmcid**: prepend with “https://www.ncbi.nlm.nih.gov/pmc/articles/”

If the identifier is rendered as a URI, include rendered URI components (e.g. “https://doi.org/”) in the link anchor. Do not include any other affix text in the link anchor (e.g. “Available from: “, “doi: “, “PMID: “).

Citation processors should include an option flag for calling applications to disable bibliography linking behavior.