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ATLAS.ti Mac – User Manual
Introduction

This User Guide is written for users with no prior experience of working with ATLAS.ti, but also for users new to the Mac version.

Please note that the Mac version has fewer features than the Windows version. We recommend to check the "Feature Matrix" every once in a while to see if your "favorite" tool has already been implemented.

In developing ATLAS.ti Mac, the aim was to create a software in which Mac users feel at home, not simply a copy the Windows version. Therefore the two versions will never be completely identical. Some of the features that were already available in the Mac version are now also implemented in ATLAS.ti 8 for Windows. The Windows version and the Mac version will continue to "learn" from each other and will continue to mutually inspire future development.
Main Concepts And Features

The concepts of primary documents, quotations, codes, and memos are the overall foundation you need to be familiar with when working with ATLAS.ti. They are complemented by a variety of special aspects such as groups, networks (=the main visualization tool), and analytic /data querying tools. All of these come together in the overall project container.

See also the following video: ATLAS.ti Mac Overview

The ATLAS.ti Project File

The most basic level of an ATLAS.ti project consist of the documents that you want to analyze, followed closely by the quotations (= individual segments/selections from these documents).

On the next level, codes are attached to quotations. Memos are essentially free texts you write in connection with your findings, observations, or methodological considerations.

A project can become a highly connected entity, a dense web of primary data, associated memos and codes, and interrelations between the codes and the data. To find your way through this web, ATLAS.ti provides powerful browsing, retrieval and editing tools.

Documents

Documents represent the data you have added to an ATLAS.ti project. These can be text, image, audio, video or geographic materials that you wish to interpret. When you add documents to an ATLAS.ti project, ATLAS.ti creates copies of these documents. Thus, your original documents do not become part of the project.

Document Groups

Documents can be grouped by any criteria that you need for your analysis. For instance, you might want to group them by gender: male and female, by age groups, education, family status, geographical region, document type, time aspects, etc. Such groups can later be used to restrict code-based searches like: "Show me all data segments coded with 'attitude towards the environment' but only for females who live in London as compared to females who live in rural areas."

You can also use document groups as a filter, for example to reduce other types of output, such as a frequency count for codes across a particular group of documents.
Quotations

A quotation is a segment/portion of a document that is deemed interesting or important by the user. Think of it as something you would mark, circle, or underline in a printed document.

In textual documents, a quotation is an arbitrary sequence of characters ranging in length from a single character to a word, a sentence, or a paragraph, even up to the entire data file. In an image, it can be any portion of the image; in an audio or video clip a segment of a certain length, etc.: more on that below.

Free quotations resemble passages "scribbled" on the margin of a book. Usually, quotations are created manually by the researcher. However, if repetitive words or phrases are contained in the text, the Auto-Coding tool can be used to automatically segment these quotations and assign a code to them (see "Auto-Coding").

Although the creation of quotations is almost always part of a broader task like coding or writing memos, “free” quotations can be created that indicate interesting parts in the primary data for which a meaningful classification has not yet been found.

Quotations As Layers

Quotations can be thought of as a transparent layer on top of a document. Technically speaking, a quotation consists of the identifier (a number) and a pair of coordinates that specify the beginning and end of the quotation that describe its position in the document. The actual content of the data you analyze is therefore not altered by the creation, deletion, or modification of quotations.

Quotations are stored inside the project file, independent of the document to which they belong.


Types Of Quotations

There are six different types of quotations (corresponding with the six different types of formats ATLAS.ti accepts):

**Text Quotations**

A textual quotation consists of an arbitrary sequence of selected characters.

Textual quotations represent (for the computer) a sequence of characters (“strings”) and can be of arbitrary size. Sentences, speech turns, or paragraphs are often the basis for the length of textual quotations. Only text offers enough "syntactical clues" to allow for searches for the occurrence of specific evidence that may support a concept. Text also offers the option for automatic segmentation as used by the Auto-Coding procedure (see "Auto-Coding").

**Graphic Quotations**

The creation, activation, and display of graphical quotations has similarities with, but also differs from, their textual counterparts:

A graphical quotation is a rectangular region inside a graphical document. From its data structure, it is identical to textual quotations, since their main attributes are also the
document number and two coordinates that mark the beginning and end, defining a rectangle through its upper left and lower right corner.

Handling graphical quotations is largely analogous to marking text passages in a textual document.

**PDF Quotations**

PDF quotations can be of a textual or of a graphical nature. The quotation references for textual quotations indicate the page number and the start and end position on the basis of character counts. For example: (start=1537 end=1745 page=1) means that this quotation is from page 1, starting at character 1537 and ending at character 1745. The reference for coded images indicates the position of the quotation within the PDF file in the following way: x=29 y=601 width=381 height=153.

**Audio And Video Quotations**

Audio and video quotations can be as short as a few milliseconds. The length of a quotation is selected on a time line. Segment starting points and length are displayed in the following format:

```
start=04:04.50 duration=00:01.61 (HH:MM:SS.ms)
```

**Geo Quotations**

Not yet implemented in the Mac version.

**Codes**

The term "code" is used in many different ways. First, we would like to define what that term means in qualitative research, and then in ATLAS.ti.

**Coding Objectives**

From a methodological standpoint, codes serve a variety of purposes. They capture meaning in the data. They also serve as handles for specific occurrences in the data that cannot be found by simple text-based search techniques.

Codes are used as classification devices at different levels of abstraction in order to create sets of related information units for the purpose of comparison (e.g., a concept like "Coping Strategy"). You can think of coding as similar to tagging.

Keep code names brief and succinct. Use their comment pane for longer elaborations.

From a "low level" tool perspective, codes are typically short pieces of text referencing other pieces of text, graphical, audio, or video data. Their purpose is to classify an often large number of textual or other data units.

The length of a code should be restricted and should not be too verbose. If textual annotations are what you want, you should use quotation comments instead.

**Memos**

Memos capture your thoughts regarding the text and are an important device for creating theory. A memo may "stand alone," or it may refer to quotations, codes, and other
memos. They can be grouped according to types (method, theoretical, descriptive, etc.), which is helpful in organizing and sorting them. As compared to comments, memos can be linked to quotations, codes or other memos. A comment is always directly linked to the object it refers to. In ATLAS.ti Mac, it is also possible to write a comment for each memo in addition to the memo content itself.

Additional reading:

Groups

Groups are a way to form clusters of documents, codes, and memos for easier handling (see "Working with Groups." Document groups can be regarded as attributes or variables. Groups can be combined using logical operators. These are called Smart Groups (see page 71).

Networks

Networks are a bit more sophisticated than groups. They allow you to conceptualize the structure by connecting sets of similar elements together in a visual diagram. With the aid of networks you can express relationships between codes, quotations, and memos. Document groups and even networks can also be "nodes" in a network. See "Working with Networks."

Figure 1: Example of a network

Nodes, Links And Relations

A node is any object that is displayed in a network. You can change their look and move them around in the Network Editor.
Relations are link prototypes used to create a link between two codes or between two quotations. An example is the "is a" (ISA) relation, which is frequently used to link concepts of different abstraction level (e.g., DOG <isa> MAMMAL).

Network Manager

The network Manager contains a list of all saved networks previously constructed by the user. It can be used to create new networks, to access or delete existing ones, or to write and edit comments.

Network Editor

The Network Editor displays and offers all editing capability to construct and refine semantic networks. In addition, it allows the visual creation and traversal of hypertext structures.

Relation Editor

Should the already built-in relations that are used to connect objects in networks prove not sufficient, you can edit them or create new ones using the Relation Editor.

Link Managers

The Link Managers provide an overview of all code-code links and of all quotation-quotation links you have created.

You find more information on the network function under "Working with Networks."

Analysis

ATLAS.ti contains multiple powerful, dedicated analytic tool to help to make sense of your data once it is coded. See "Code Tree and Code Forest".

Building Queries

For more complex search requests, a large number of query options are available in all managers. You can build queries based on object attributes like "text content", "has comments", "has memos" or "has hyperlinks", or based on code queries using Boolean, semantic, and proximity operators. All of these can also be combined.

Smart Codes

A Smart Code differs from a standard code in the following way: A standard code is directly linked with the quotations to which it is associated, while a Smart Code is a stored query, thus provides an answer to a question (in the best case) that typically consists of several combined codes. For further information, see "Working With Smart Codes" on page 115.

Code Cooccurrence Table

The Code Cooccurrence Table is a code-by-code matrix and provides frequency of code cooccurrence plus a coefficient measuring the strength of the relation between two codes. The data that belong to each cell can be displayed at the bottom of the table.

The Code Cooccurrence Table is an explanatory tool, rather than determining the codes yourself, you can ask ATLAS.ti which codes happen to co-occur in the margin area.

You find this function under the Analysis menu. For further information, see "Code Cooccurrence Table" on page 121.
**Code Document Table**

The Code Document Table displays absolute and relative frequencies of codes or code groups by documents or document group. You can also choose to display word counts of quotations rather than absolute quotation frequency. The table can be exported as Excel table. See page 125.

**Export**

Each manager features an **Export** button. You can select between creating a table in Excel format or a report in Word / Open Office, or PDF format. In addition, the quantitative results of the Code Cooccurrence Table, the Code Document Table, and the Word Cruncher can be exported to Excel.
Installing And Updating ATLAS.ti Mac

Installing ATLAS.ti Mac

After downloading ATLAS.ti for Mac, look for the file ‘ATLAS.ti Mac.dmg’ using Finder. It is likely in your download folder.

Double-click the file. You will see the red icon for the ATLAS.ti app.

Drag the red program icon into the application folder. Start ATLAS.ti from there.

If you drag the program icon from the application folder to your desktop, this will create a shortcut.

Video tutorial: Installing ATLAS.ti Mac

Installing Updates

From the main menu select: ATLAS.ti / CHECK FOR UPDATES. Follow the instructions you see on-screen.

Video tutorial: Downloading Updates

Troubleshooting

Updating does not work for you? A likely reason is that the ATLAS.ti app is not in the Applications folder.

Go to Finder and search for ATLAS.ti

Once you find it, double-click on it. You will see the red icon for the ATLAS.ti app.

Drag the red program icon into the Applications folder.

Open ATLAS.ti from the Applications folder.

Now, try again to update.

We strongly recommend keeping ATLAS.ti updated to the latest service pack at all times. Check for updates regularly to avoid problems and to obtain the latest available tools and functions.
Main Steps In Working With ATLAS.ti

The figure below illustrates the main steps of working with ATLAS.ti, starting with the creation of a project, adding documents, identifying interesting things in the data and coding them. Memos and comments can be written at any stage of the process, whereas there is possibly a shift from writing comments like adding meta information to your documents, first code nodes that later turn in to code definitions, initial thoughts about specific data segments (the ATLAS.ti quotations) to more extensive memo writing during the later stages of the analysis. Once your data is coded, it is ready to be queried using the various analysis tools provided. The insights gained can then be visualized using the ATLAS.ti network function.

Some steps must be taken in sequence. For instance, logic dictates that you cannot query anything or look for cooccurences if your data has not yet been coded. But other than that there are no strict rules. networks, in addition to presenting findings, also have an exploratory component and as such can help you to see your data from a different perspective. This may provide further ideas for coding, querying, or even further data collection.

The Process

There are two principal modes of working with ATLAS.ti, the data level and the conceptual level. The Data Level includes activities like segmentation of data files; coding text, image, audio, and video passages; and writing comments and memos. The Conceptual Level focuses on querying data and model-building activities such as linking codes to networks, in addition to writing some more comments and memos.

Data Level Work

Data level research activities include segmenting the data that you have assigned to a project into quotations, adding comments to respective passages (note-making/annotating), and coding selected text passages or data segments, secondary materials, annotations, and memos to facilitate their later retrieval. The act of comparing noteworthy segments leads to a creative conceptualization phase that involves higher-level interpretive work and theory-building.

ATLAS.ti assists you in all of these tasks and provides a comprehensive overview of your work as well as rapid search, retrieval, and browsing functions.

Within ATLAS.ti, initial ideas often find expression through their assignment to a code or memo, to which similar ideas or text selections also become assigned. ATLAS.ti provides the researcher with a highly effective means for quickly retrieving all data selections and notes relevant to one idea.

Conceptual Level Work

Beyond coding and simple data retrieval:

ATLAS.ti allows you to query your data in lots of different ways, combining complex code queries with variables, exploring relationships between codes and to visualize your findings using the network tool.
ATLAS.ti allows you to visually "connect" selected passages, memos, and codes into diagrams that graphically outline complex relations. This feature virtually transforms your text-based work space into a graphical "playground" where you can construct concepts and theories based on relationships between codes, data segments, or memos. This process sometimes uncovers other relations in the data that were not obvious before and still allows you the ability to instantly revert to your notes or primary data selection.

General Steps When Working With ATLAS.ti

The following sequence of steps is, of course, not mandatory, but describes a common "script."

- Create a project (think of it as your "idea container"), meant to enclose your data, all your findings, codes, memos, and structures under a single name.
- Next, add documents, text, graphic, audio and video files, to your ATLAS.ti project.
- Organize documents, codes, and memos using "groups" (see "Working with Groups")
- Read and select text passages or identify areas in an image or select segments on the timeline of an audio or video file that are of further interest, assign key words (codes), and write comments and memos that contain your thinking about the data. The Word Cruncher and auto coding tool can help you to find interesting sections in text documents. We call this the data level working phase.
- Compare data segments based on the codes you have assigned; possibly add more data files to the project.
- Query the data based on your research questions utilizing the different tools ATLAS.ti provides. The key words to look for are: Simple Retrieval, Code Cooccurrence, Codes Documents Table, Smart Codes, and Building Queries. All of these can be found in the chapter on "Code Tree and Code Forest".
- Build semantic, prepositional or terminological networks from the codes you have created. These networks, together with your codes and memos, form the framework for emerging theory. Look for the chapter "Working with Networks."
- Finally, compile a written report based on the memos you have written throughout the various phases of your project and the networks you have created.
The Interface

Below you see the main features of the ATLAS.ti Mac interface:

Video Tutorial: ATLAS.ti Mac: Interface

Figure 3: The ATLAS.ti Mac user interface

Figure 4: Entity representation

Figure 5: Hide or show optional panes
Personalize Your Screen

A number of panes that you see in the default interface view can be hidden (e.g., the navigator or the inspector). If hiding is possible, you see a little icon or a text "Hide" / "Show" that you can click.

Finding Your Way Around The Software

If you are not sure where to find a function, just search for it under Help. For instance you want to know where the Relation Manager is. Typing in the first letters of a search term, shows a list of hits.

When selecting an entry that seems to be the one that you are looking for, it will show you where you can find it. Click on the selected hit in the list, and ATLAS.ti Mac will open up the function for you.
Creating A New Project

Video tutorial: Creating a new project

When you open ATLAS.ti Mac for the first time, you are presented with two options: Create a new project, or import an existing one from other ATLAS.ti applications.

Select CREATE A NEW ATLAS.ti PROJECT and enter a project name:

Another option is to select: PROJECT / NEW from the main menu.

Importing Projects From ATLAS.ti 7.5 For Windows

Update your ATLAS.ti for Windows to version 7.5.16 or higher.

Export your project(s) via PROJECT / EXPORT / MAC TRANSFER BUNDLE.

Move the Transfer Bundle file to your Mac or to a location where it can be accessed from your Mac.

On the Mac, simply double-click on the exported file, or select PROJECT / IMPORT PROJECT...

Video tutorial: ATLAS.ti Mac – Transfer Project From ATLAS.ti 7 Win

Export your project(s) selecting FILE / EXPORT. Create a project bundle file.

Move the Project Bundle file to your Mac or to a location where it can be accessed from your Mac.
On the Mac, simply double-click on the exported file, or select **Project / Import Project**...

**Importing Projects From ATLAS.ti 8 For Windows**
- Export your project(s) selecting **File / Export**. Create a project bundle file.
- Move the Project Bundle file to your Mac or to a location where it can be accessed from your Mac.
- **On the Mac, simply double-click on the exported file, or select Project / Import Project**...

  Video tutorial: [ATLAS.ti 8 Windows-Exporting the Project](#)

**Importing Projects From IPad And Android**
- In your ATLAS.ti iPad app, select a project and tap the **Export** button.
- On your Mac, select **Project / Import iPad Project**.

**Importing Projects From Android**
- This functionality is currently not implemented.

**Exporting Projects From Mac To Windows**
- Select **Project / Export Project**. Save the file to your hard disk, an external or a cloud drive.
- Open ATLAS.ti 8 for Windows and Select the option **Import Project Bundle**. If ATLAS.ti 8 is already open, select **File / New / Import Project Bundle**.

**Project Transfer, Duplication, Backup & Password Protection**

**Project Transfer**
In order to transfer a project to a different computer, you have to export it. You also need to export a project when you want to merge it with another project.

  The same procedure applies, when you want to transfer a project to ATLAS.ti 8 for Windows.

- Select **Project / Export Project**. Save the file to your hard disk, an external or a cloud drive.
You can open the project by double-clicking on the file (assuming that ATLAS.ti for Mac is installed on this computer), or select Project / Import Project from the main menu.

**Project Duplication**
- Select Project / Open.
- Select a project and right click on the project name. Select the option: Duplicate.

The project that you want to duplicate needs to be closed.

**Project Backup**
One way to backup your project is to export it and then to store the copy of the project at a different location (see Project Transfer). Currently you cannot determine yourself where ATLAS.ti for Mac stores your project files. By default, they are stored in the application folder for ATLAS.ti. If you want to add this location to your routine backup, e.g. using Time Machine, this is the location:

```
~/Library/Application Support/ATLAS.ti
```

**NOTE:** Never make any changes to this folder! If you do, this may corrupt your projects and you lose data. This cannot be fixed, and even our Support cannot magically reconstruct your project data if this folder was manipulated.

**Password Protection**
Under the Project menu, you find an option to set a password for your project, or to delete it.
- To set a password, select Project / Change Password.

As stated in the dialogue, a password cannot be recovered—also not from our technical team! (If it could, your project could also be hacked by someone else.) Thus, you need must make sure that not to forget the password. Store it in a secure place.

- To remove a password from your project, select Project / Delete Password.
Project Merge

The Merge Tool reunites projects that were originally divided for analytical or economical reasons. Its main purpose is the support of teams. It brings together the contributions of different members of a research team. A common scenario is the analysis of different sets of documents by different team members, sharing a common code base. Another application is that different researchers code the same documents in the process of developing a code system, or for the purpose of checking inter-coder agreement. Of course, the single researcher can also benefit from this function using the merge facility to help organize large projects.

Main Concepts Of Merging

Target And Source Projects

The target project is the project into which another project, called the 'source project' is merged. The target project has to be loaded first before invoking the Merge Project option.

To prevent accidental overwriting an existing project, you may want to create a new project first into which you merge all projects, or duplicate the target project before you begin the merge process (see "Project Duplication").

Merge Strategy

The default option is to unify all objects that are identical and to add all objects that do not yet exist in the target project. Please read the next section for a more detailed explanation on what identical entities are in ATLAS.ti (see below).

To provide some examples:

Groups are additive: Group G with documents {1, 2, 3} merged with Group G' with docs {3, 4} will result in G(merged) = {1, 2, 3, 4}. The same applies to comments: If you have a code C that should merge with C', C(merged) will always have a comment if only one of those codes had a comment.

In the case of an unsolvable conflict - Code C has a comment, and C' also has a comment - the user can define which of the two conflicting entities will win. This can currently be done only for all entities. In the future, you will be able to decide for each entity how the conflict should be resolved.

It is not possible to "subtract" entities. If one team member has deleted a code or some codings that still existing in the other project that is merged, the merged project will contain those codes or codings again.

Below a few simple merge examples will be show that illustrate the merge process currently used. First, however, you will need to understand what is meant by identical entities.

Identical Entities Explained

When an entity is created in ATLAS.ti – regardless if it is a document, a code, a quotation, a memo, a network, a group or a comment – this entity receives a unique ID, comparable to a fingerprint. When merging projects, ATLAS.ti compares the IDs of the various entities. If they have the same ID (fingerprint), they are unified. If the fingerprint is different, they are added. Thus, the name of an entity is not the decisive factor. If Tom
has created a code with the name "sunshine" and Anne also has created a code with this name in her project, these two codes are not identical as they have different IDs. If you merge Tom’s and Anne’s project, the merged project will contain two codes: sunshine and sunshine(2). If the meaning of both codes is the same and you want to keep one sunshine code only, you can merge the two codes manually (e.g. by dragging sunshine(2) onto sunshine, then select MERGE. also see "Merging Codes").

This has some consequences for the workflow in team projects. If a team wants to use a common code list, the project administrator needs to setup a Master project first adding all codes. This also applies to importing documents. If a common set of documents should be analyzed, all documents need to be added to a Master file first before distributing the project to team members.

Team projects must be set up by a project administrator before they can be distributed to team members.

![Figure 9: Work flow when setting up a team project](image)

**How To Merge Projects**

- Open a project. This will be the target project.
- Select **PROJECT / MERGE WITH PROJECT**.
- Select the source project. The source project must be an exported project (.atlpac file). If you want merge two projects that you have created on the same computer, the source project must be exported first.
- A summary report opens. If there are conflicts, you can decide which project should "win." The option "keep local changes" means that entities are only added, nothing is changed in the target project. If you want the entities in the target project to be changed based on modifications in the source project, select: "Override all local changes."
When selecting OK the merge process begins. After merging you have the option to open and save a merge report that lists all actual changes to the project depending on the chosen conflict solution.

Double-check the resulting project. You can always select **Undo**, if you do not want to keep the merged project.

**Two Examples Illustrating The Merge Strategy**

**Example 1 – Recommended Procedure**

There are two people on the team, the administrator and the team member. The administrator sets up the project, adding one document and codes 1, 2 and 3. Code 1 is orange and code 3 is light green.

The project administrator saves the project, exports it and sends it to the team member. The team member imports the project and renames it immediately (**PROJECT / RENAME**). See also Figure 9: Work flow when setting up a team project.

The team member adds a comment to code 3, continues to code the project and adds a code 4.
To prepare the project for merging, the team members saves the project, exports it and sends it back to the administrator.

The administrator starts the merge process by opening the Master project.

The next step is to select Project / Merge with Project... and to select the project sent by the team member.

The summary report looks as follows:

<table>
<thead>
<tr>
<th>Summary of all changes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users (1)</td>
</tr>
<tr>
<td>Added user &quot;team member 2&quot;</td>
</tr>
<tr>
<td>Quotations (9)</td>
</tr>
<tr>
<td>Codes (2)</td>
</tr>
<tr>
<td>Changed code '3'</td>
</tr>
<tr>
<td>Changed comment</td>
</tr>
<tr>
<td>Added code '4'</td>
</tr>
<tr>
<td>Codings (9)</td>
</tr>
</tbody>
</table>

![Figure 12: Merge report example 1](image)

In order to merge the comment written by the team member into the Master file, the option "Override all local changes in conflicts" need to be selected:

![Figure 13: Select Override all local changes if already existing items have been modified](image)

After the merge, the following entities are added to the project:

- 9 quotations and codings, and a new code 4.
- Code 3 was modified, i.e. the comment written by the team member was added.
- The document was unified as its ID was identical in both projects.

![Figure 14: Example 1: Document and Code Manager after merging](image)

**Example 2 – This is how NOT to do it**

There are two people on the team: The administrator and the team member. The administrator sets up a project, adding one document and codes 1, 2 and 3. Code 1 is orange and code 3 is light green.
A team member also sets up a project also adding document "3_Belkin parenting blog discussion" and a document called "5_NY magazine_Discussion...." The team member adds the tree codes 3, 4 and 5:

When merging these two projects, there will be two issues. As the team member also added document "3_Belkin parenting blog discussion", the merged project will contain the document twice. The content of the two documents may be the same, but they are not identical as the document was added to two different projects. Therefore they are treated by ATLAS.ti as two different documents.

Please note: Currently, duplicate documents cannot be merged manually to fix this problem! Please follow the recommended workflow when working in teams on the same set of documents (see Figure 9).

**Video tutorial:** [ATLAS.ti Mac – Merging Projects]
The summary report shows that all entities of the second project will be added, also items that have the same name:

Figure 17: Merge report example 2

The merged project looks as follows:

Figure 18: Items in the project after merging

- Document "3_Belkin parenting blog discussion" is duplicated. There is currently no merge procedure as in the Windows version to unify these documents manually if the duplication was not intended.
- Code 3 is duplicated. This is not a problem. You can simple drag code 3(2) onto code 3 in the Code Manager and select **Merge**.
- **Codes 4 and 5 are added.**
Adding Documents To A Project

Supported Formats

ATLAS.ti Mac supports text (Word (doc and docx), RTF, Open Office (odt), PDF, image, audio and video files (all file formats that Quick Time supports, currently no Windows Media files).

Importing Or Linking Documents

The standard procedure is that documents are imported. This means a copy of the document is created, converted into an ATLAS.ti compatible format and stored in an internal library.

For audio and video files you have the option to link them to your project. This avoids file duplication and saves hard disk space, as especially video files can be quite sizable.

Importing Documents

To import text, PDF or image documents to your project, select Document / Import Documents ....

An alternative to using the main menu option to add documents is to click the + button on the top left hand side of your screen (see below).

You can also drag & drop documents or folders from the Finder into the Document Manager or the navigator for documents.
Linking Multimedia Documents (Audio / Video)

Audio and video files can be linked to a project as file sizes can be quite large. When you link a file to a project, it is not copied and imported into the project. It remains at its source location and ATLAS.ti opens it from there when needed.

This means that the file should remain at this location. You should not rename or move it to a different folder. If this happens, the file can no longer be displayed in the project. If there is the need to move or rename the file, you need to let ATLAS.ti know (see below).

To link audio or video documents to your project, select **Document / Import Linked Multimedia Documents**

When you open the Document Manager, you will see the location of the file in the column “Origin”.

Modifying The Location Of A Linked Document

If a linked file was renamed or moved, you need to let ATLAS.ti know about the new file name or location.

Open the Document Manager and right-click on the document. Select the option **Use Different File** and select the renamed file, or point ATLAS.ti to the new location.

Importing A Linked File Into The Library

Another option that is available to you is to import a linked file at a later point in time (see Figure 21 above). If you do so, the file is copied and moved into the folder where ATLAS.ti stores all project related files and it will also be included in the bundled file when you export your project. Keep in mind that this might increase the file size of your project export file considerably.

Adding Video Snapshots

If you want to analyze a particular situation in your video data in more detail, you can create a snapshot from it. The snapshot will be added as new document to your project. This is how it works:

Load a video document and move to the desired position in the video.
Next click on the button **CREATE SNAPSHOT DOCUMENT**.

A new image file is created and added as new document to your project. You will immediately find it in the list of documents. The document name shows the time position at which the snapshot was taken.

![Create Snapshot Document](image)

**Figure 22**: Creating snapshots from videos

![Document List](image)

**Figure 23**: Snapshots in the document list

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**Video Tutorial** – [Snapshot Video Documents](#)
Importing Survey Data

These days, a great many surveys are conducted through online tools. A positive side effect is that (a) all data is immediately available in digital format, and (b) respondents are often willing to provide longer answers to open-ended questions. This was rarely the case with paper-and-pencil surveys. Statistical programs like SPSS™ offer some options to analyze open-ended questions, but basically require you to encode each answer with a number. A proper qualitative analysis of the answers is not possible with these tools. ATLAS.ti, however, does permit comprehensive analysis with great ease and in great depth.

A typical work flow for working with survey data looks like this:

![Work flow when importing survey data](image)

Online surveys can be created using a variety of tools. What most of them have in common is that they let you export data as Excel™ file. And this is what you need to prepare for import in ATLAS.ti (see below). Based on specific prefixes that you add to your variable names, ATLAS.ti interprets the column headers and cells of the Excel™ table in various ways and turns them into primary documents, the contents of the primary documents, primary document families, quotations, codes, comments, and code families.

Data are imported case-based. This means each row of the Excel™ table that is imported from the online survey tool is transformed into a primary document.

How Survey Data Is Treated In ATLAS.ti

To represent the results of an online survey within the framework of ATLAS.ti in the most accurate and complete manner, a few basic requirements need to be considered.

A survey broadly consists of the name of the survey, the questions, and the answers from each respondent. Questions can be of different types, such as single-choice questions (yes/no, or offering more than two options), multiple-choice questions, or open ended questions. Within the framework of ATLAS.ti these concepts are mapped as follows:

| Open-ended question: question answer | Code (and code comment) Content of a quotation | Single Choice 0/1 | Document group |
IMPORTING SURVEY DATA

This does not mean that you cannot turn a multiple-choice question into a code. It all depends on how you define the columns in your Excel table. If you turn single or multiple choice questions into codes, you later need to do some automatic coding based on the response choices available in the questionnaire.

Always remember that ATLAS.ti is not a software for analyzing statistical data, although it is possible to add information from traditional quantitative questions. A general recommendation is to include the following variables from the online survey:

- Variables describing the respondents, i.e. the classical demographic variables like age group, gender, profession, educational level, income groups, etc. Turn those variables into document groups.
- Responses to open-ended questions. Turn those into coded segments.
- Selected other variables like answers to single or multiple choice questions that are important in relation to analyzing the open-ended questions.

Preparing An Excel™ Table For Import

The following table shows the list of all available prefixes that you can add to the column headers in Excel™ in order for ATLAS.ti to interpret the cells in various ways.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>Defines the column to list the names of the primary documents. This column can be omitted. If you do not want to provide a specific name for each document, ATLAS.ti automatically creates this column. The default name for each document is case 1, case 2, case 3 and so on.</td>
</tr>
<tr>
<td>^</td>
<td>Defines the column to list the primary document’s author</td>
</tr>
<tr>
<td>&lt;</td>
<td>Ignore this column, use to exclude stuff inserted by the survey tool</td>
</tr>
<tr>
<td>.</td>
<td>Creates a document group from the field name. Currently the cell needs to contain the number 1, or the words Yes or Ja to be applied. Use for single choice questions where respondents can answer yes or no (or encoded as 1 and 0). Only the responses encoded with yes/ja or 1 become part of the document group.</td>
</tr>
<tr>
<td>:</td>
<td>Creates a document group from the field name plus cell value. Use for single choice question like gender.</td>
</tr>
<tr>
<td>#</td>
<td>Creates a document group from the field name plus the actual cell value. Use for single choice questions with more than two answer options or for multiple choice questions.</td>
</tr>
<tr>
<td>::</td>
<td>Add no prefix to all open ended questions. The text in the column header is used as code. To avoid very long code name, use a short form to indicate the question and add the full question as comment (see next row)</td>
</tr>
<tr>
<td>::</td>
<td>All text entered after two colons is added to the object’s comment field. This can be applied to cells resulting in document groups or codes.</td>
</tr>
</tbody>
</table>
By importing the above sample table, we get:

- The name, date and author of the resulting document.
- One group for Academic containing all cases with cell value 1.
- Two groups Gender::male and Gender::female
- Four groups Favorites::Beatles, Favorites::Stones, etc. The following comment is added to each document group: What bands do you listen to regularly?
- Two codes Tell us a dream and Open End. The following comment is added to the comment field of the code "Open End": How do I create a question that is interpreted as open-ended? The text in the cell is making up the document content for each case.

### How To Import Survey Data

1. Prepare an Excel table as explained above.
2. You can add the prefixes already when you prepare the online survey, or afterward by editing the resulting Excel table. The drawback of adding the prefixes to the survey is that such early applied mark-up also displays in the online survey interface and your respondents might wonder about the funny characters at the beginning of questions.
3. Editing the downloaded Excel table prior to importing it into ATLAS.ti has the advantage of not displaying unusual formatting characters to the user. A disadvantage is that you need to do this every time you download the table, for instance, because you are checking incrementally and not all respondents have filled out the questionnaire yet.
4. Save the table (as xls or xlsx file).
5. Close Excel (or at least the document that you want to import).
6. Open ATLAS.ti and select **PROJECT / IMPORT SURVEY**.
7. The import procedure starts and ATLAS.ti informs you when the data is fully imported.
8. During the import, one primary document is created from every row. Unlike "normal" documents that get their contents from files, these primary documents need to have their content (data source) created as well.
9. The creation of the textual contents is done as follows: Each row is scanned from left to right, column by column. Each cell’s content belonging to an open-ended question field is appended to the currently built document (case). In addition, each piece of appended text is also referenced as a *quotation* automatically coded with the current question.
IMPORTING SURVEY DATA

Those columns defined as variables are turned into document groups. See "Working with Groups" for further information. Special families are created for all imported documents and codes to make filtering of the survey material easy (see Figure 26 below).

Save the project.

If you import the same table repeatedly, rows with already existing documents are ignored. This way, you do not have to wait until the last respondent has filled out the questionnaire.

Video Tutorial: Importing Surveys

Analyzing Survey Data

In order to analyze survey data, you should get acquainted with the following features and functions of ATLAS.ti:

• Primary Document Groups, especially their use as data attributes (see "Purpose of Creating and Working with Groups").
• To gain a quick overview of your data and the words the respondents used, create a word frequency table using the Word Cruncher (page 40).
• Basic coding techniques in order to add some additional codes to the pre-coded responses (see "Coding Data", on page 46). The auto coding feature might also be helpful when working with survey data, see page 48.
• Code Groups (see page 67).
• The Code Document Table (see page 125).
• Creating and working with smart groups (see page 71).
• The Code Cooccurrence Table (see page 121).

Figure 26: Results of a survey import
Working With Documents

Loading Documents

All added documents can be accessed via the navigator that you find on the left-hand side of the screen, or via tabs. Once you have memos and networks later on, they can also be accessed this way.

Load one or more documents with a double-click on the document in the navigator (see below).

To close the selected document tab or all other loaded documents within a region, right click on the header area and select the appropriate option from the context menu: **CLOSE TAB** or **CLOSE OTHER TABS** (see above).

Multiple Document View

You can load multiple documents side-by-side or split your screen horizontally, or both. And this does not only apply to documents, you can also open a document and a network or a document and a memo side-by-side, or two documents side-by-side and a memo horizontally above or below (see for instance Figure 69). This is how it works:

Click on the plus sign to add a new region.
Right-click on the document tab and select **Duplicate Tab** (see left) to load an already opened document into a new region. You also find the "Duplicate Tab" option under the main menu **Windows / Duplicate Tab**.

**To Add A New Region Via Drag-And-Drop**

- First load a document, memo or network into the display area.
- Grab the document / memo / network tab that you want to move, left-click and drag it to the right, left, top or bottom border of the main screen. When a small purple bar appears, you can drop it (see Figure 29).
- If you want to replace another document / memo / network that is currently loaded, drag and drop the object tab on top of document / memo / network area (see below). Instead of just the small bar, the entire region for this object is highlighted in purple.

**Opening Multiple Windows**

To open a document, network or memo in a window of its own:

- Drag and drop the object tab outside the ATLAS.ti window and drop it there.
- Or select the option **Move Tab to New Window** from the context menu or the main menu **Windows**.

Different from the multiple-document view, the new window contains its own inspector and navigator.
The Document Manager

Open the Document Manager by clicking on the button DOCUMENTS above the document area, or select DOCUMENT / SHOW DOCUMENT MANAGER from the main menu.

If you want the Document Manager to stay on top, click the pin icon in the top right-hand corner.

The Document Manager offers the following options: You can add or remove documents to/from a project, rename documents, write document comments, review the document content, retrieve documents by document groups or more complex criteria, review and edit group membership, and create document groups.

Further options are:

**CREATING REPORTS:** Create tabular reports in Excel format of the currently displayed content of the main window, or reports in Word or PDF format. This is described in detail in the section "Data And Project Export" on page 136.

**FILTERING:** Formulate powerful queries. Clicking on the filter icon to select from a large range of options to filter project documents in a variety of ways. This is explained in detail in the section "Querying Documents" on page 131.

**ADDING AND REMOVING PROJECT DOCUMENTS**

To add a document to the project, click on the + button at the top left of the Document Manager.

To remove one or more documents, select them in the document list and click on the bin icon.

The documents will be removed from your project with no further confirmation. This means, all coding, commenting, memoing for the document(s) will also be deleted. If you removed documents by mistake, you can get them back using the Undo function.
Main Window

The main window provides an overview of the main properties of a document:

**Document Icon:** The first column indicates whether a document has a comment or not. The icon for commented documents shows a post-it.

**Document Number (#):** The second column shows the document number. All documents are numbered consecutively at the time when they are added to a project. Currently, position and numbering of the documents cannot be changed, unless you have removed documents and there are gaps. Such gaps can be closed by selecting: **Project / Renumber Documents and Quotations.**

**Document Name:** ATLAS.ti uses the file name as the document name. For survey data, the document name is taken from the Excel spreadsheet that you import.

**Type:** Indicates the document type (text, PDF, image, video or audio)

**Quotations:** Displays a bar and a number showing the number of quotations for each document.

**Comment:** If a comment has been written for the document, it is displayed in the next column.

The remaining columns in the Document Manager show the creator and modifier (name of the author who created and last modified the document), the creation date, and date of last modification.

The default order of the columns can be changed manually via drag-and-drop.

Previewing Document Content

If you select a document, its content will be displayed in the preview area (see Figure 32). Multimedia documents can be played back in this area.

Grouping Documents

You can group documents by a number of different criteria. The following grouping options are available:
If you export the content of the main window to Excel/Open Office Calc (Export as Table), selecting a "grouped by" view creates a new tab for each group in the report.

**Document Inspector**

The document inspector on the left-hand side contains:

- A field for the document name. You can edit the name here. This has no effect on the original file name of the document.
- A comment field: Use it for instance for interview minutes, meta information about the document, source information, etc.
- In Groups: here you can see to which document group(s) (if any) the document belongs. The secondary menu (right-click) gives you the option to open the Document Group Manager, or to remove the document from a group.

**Document Group Navigator**

The navigator on the left-hand side shows the list of available document groups and smart groups. The icon for regular document groups is not filled in, the icon for smart document groups is filled, and all commented groups display a post-it.

When selecting a document in the main window, all documents groups / smart groups that apply are highlighted in the navigator:

**Filtering Documents By Document Groups**

- When selecting a document group in the navigator, only the documents that belong to the selected document group remain in the list.

- **To select documents from multiple document groups** (e.g., all that have two or three children) - make sure the Venn diagram at the bottom of the navigator is set to ALL (see left). Then select two or more document groups by holding down the CMD key.

- **To select documents that fit into multiple groups** (e.g., all females who have children) make sure the Venn diagram is set to ANY (see left). Then select two or more code groups by holding down the CMD key.
Creating New Document Groups

Click the + sign at the bottom of the navigator to add a new document group or a new smart group.

Alternatively, you can also right-click inside the navigator to choose these options from the secondary menu. A third way of creating document groups is to select a number of documents in the main window by holding down the CMD key and to drag-and-drop them to the navigator (see also “Common Procedures” in the section on “Working with Groups.”)

Video Tutorial: ATLAS.ti Mac: Grouping Documents
Exploring Your Data - The Word Cruncher

This feature offers word "crunching" capabilities for a simple quantitative content analysis. It creates a list of word frequency counts for the selected or all (currently filtered) textual documents. An exception list can be used to control the analysis.

Creating A Word Count Table

- From the main menu, select ANALYSIS/WORD CRUNCHER. The Word Cruncher opens.
- Select one or more documents in the Documents column on the left. The table immediately fills with content. At the bottom of the table you have a few further options:
  - If you select “Separate counts by document” you get the total and relative counts for all selected documents, and separate frequency counts for each document.
  - Results can be improved by preparing adequate exceptions lists. You can add words to the exception list by right-clicking on a word in the Word Cruncher, or by editing the list.

Editing The Exception List

- Select the option EDIT LIST.

Figure 37: Example of a Word Cruncher output - comparing the word count of two documents
The first four expressions excluding the count of numbers, multiples hyphens and multiple underscores are already entered. You can de-/ activate words or expressions by clicking on the Use column. The first four entries, in addition to being useful, also serve as an example for the kinds of regular expressions you can use. For more detail see table below.

To add or delete words click the appropriate button at the bottom of the window.

The following table lists the regular expressions that can be used:

<table>
<thead>
<tr>
<th>Expression</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>\d+</td>
<td>excludes numbers of any length</td>
</tr>
<tr>
<td>-+</td>
<td>excludes strings of hyphens of arbitrary size</td>
</tr>
<tr>
<td>_+</td>
<td>excludes strings of underscores</td>
</tr>
<tr>
<td>0+</td>
<td>exclude sequences of zeros</td>
</tr>
</tbody>
</table>

**Word Cruncher Output**

Click on the button **EXPORT TABLE** to export the table to be opened in Excel, Numbers or OpenOffice Calc. Use the Numbers, Open Oice Calc or MS Excel™ functionality such as sorting by highest to lowest frequency for further exploration.

**Video tutorial:** [ATLAS.ti Mac: Word Cruncher](#)
Identifying Interesting Data Segments

Creating Quotations

It is not always desired to start setting codes immediately. You can begin by identifying interesting segments in your data, mark them and comment on them. This is exemplified below based on a video document. If you prefer to start coding your data directly, continue reading under “Coding Data.”

In a video or audio document, you create a quotation simply by highlighting an area on the audio-wave form.

For all other document types, you can either click the button Quotation from Selection, or right-click directly on the highlighted segment and select Create Quotation from the context menu (short-cut: ⌘H).

After creating a quotation, you can modify the default name and write a comment in the inspector:

Figure 40: Creating a quotation via the context menu
To keep track of your data and your thoughts, open the Quotation Manager by clicking on the Quotations button, or select QUOTATION / SHOW QUOTATION MANAGER from the main menu:

Each quotation is automatically assigned an ID and a name. The quotation ID consists of the document number and a number indicating the chronological sequence when a quotation was created in the document. The quotation name for text quotations consists of the first 100 characters of the text; the name of multimedia quotations is "quotation + ID"

Video tutorial: Creating Quotations

Renaming Quotations And Writing Comments

In the inspector on the right-hand side you can modify the quotation name and review or edit quotation comments.
Modifying The Length Of Quotations

Just drag the start or end points to a different position. The quotation bar in the margin area automatically follows. This applies to all media types (see Figure 43).

Reviewing Quotations

When you select a quotation in the list, its content is displayed in the preview area. This applies to all media types. You can read text quotations, listen to audio quotes, view image and video quotations. This is a convenient way to browse through your quotations (Figure 44).
It is critically important to distinguish between the sense of “fulfillment” in having accomplished... It is critically important to distinguish between the sense of “fulfillment” in having accomplished something with our lives and self-proclaimed “happiness.” Any amount of the latter is dependent upon some measure of the former. For many people, children provide a sense of purpose and meaning.

Figure 44: Quotation preview
Coding Data

ATLAS.ti offers several ways to code your data: Adding codes while you read/listen to or view the data, going through and using the last used code again (quick coding), using the words in the text as codes (in-vivo coding), coding with already existing codes via drag & drop, or using the auto-coding feature. All of these options are explained in detail below.

Add Coding

To code a data segment, highlight it with your mouse and select the **Add Coding** button (short-cut: `⌘`).

An alternative is to right-click on the highlighted segment and select **Add Codes** from the secondary menu.

After coding, the quotation name and the code label are displayed in the margin area (Figure 47).
Coding image, audio or video data works in the same way: Highlight the desired segment with your mouse, click the Add Coding button (or right-click and select Add Coding), and enter a code. When coding audio or video data, highlight a segment on the audio-wave form (see Figure 40).

Video Tutorial: ATLAS.ti Mac: Coding

Quick Coding

Quick Coding assigns the last used code to the current data segment. This is an efficient method for the consecutive coding of segments using the most recently used code.

Select a data segment and click on the Quick Coding button (shortcut: ⌘L), or select Add Last Used Codes from the secondary menu.

In-Vivo Coding

Use in-vivo coding when the text itself contains a useful and meaningful name for a code.

In-vivo coding creates a quotation from the selected text AND uses the selected text as the code name. If the selected text’s boundaries are not exactly what you want for the quotation, modifying the quotation’s "spread" (see "Modifying The Length Of Quotations" on page 44) is often the next step after creating the in-vivo code.

In Vivo coding can only be applied to textual primary documents.

Creating An In-Vivo Code

Mark the text passage that you want to use as an in vivo code.

Click the In Vivo Coding button, or right-click on the highlighted text segment and select Code In Vivo from the secondary menu.

If needed, change the newly created quotation boundaries.

You can either drag & drop a code from the Code Manager onto a selected data segment, or as shown in the Figure 48 below, from the navigator.
Auto-Coding

The Auto-Coding tool finds text passages, selects a specified amount of text (e.g., the exact match, or spread to the surrounding word, sentence, or paragraph), and then codes the passages with a previously selected code.

Auto-coding is useful when coding structural information (e.g., speaker turns in group interviews), or if you are dealing with a large amount of text material. Auto-coding allows you to quickly collect ideas that belong to a certain concept on the basis of words or patterns found in the text.

Video Tutorial: ATLAS.ti Mac: Auto Coding

To open the Auto-Coding Dialog, select Codes / Auto Coding from the main menu.

Figure 48: Coding via drag & drop

Figure 49: The auto-coding dialog
**Find:** A search expression can consist of single words or entire phrases. You can also create more complex search expressions using regular expressions (GREP). See "Text Search Using Regular Expressions (GREP)" on page 146.

**Code:** Click on the down arrow to choose an existing code from the list. If the code you need is not available yet, create one on the Code Manager.

**Extending:** When a matching string is found, extend the size of the segment to the following lengths:
- The exact match only
- The word surrounding the matched string
- The line surrounding the matched string
- The sentence surrounding the matched string
- The matched string expanded to paragraph boundaries
- Or the entire document.

**Scope of Search** can be the selected document only, all textual documents, or a set of texts from a document group.

**Example:** Based on the GREP search expression shown in Figure 49, all occurrences of words that contain child or toddler or baby or babies in the currently selected documents are found and the containing sentence is coded with the code “children.” The GREP OR expression (“|”) can be entered using the shortcut **ALT**+7.

You can select the option **Code All** without checking each hit, or you can review each hit by clicking the **Next** or **Previous** button. Then select **Code** for each instance that you want to code.

---

**Unlinking / Merging / Replacing Codes**

**Unlinking Codes**

- Right-click on a code in the margin area and select the option **Remove from Quotation**.

**Merging Codes**

When developing a coding schema, it may happen in the course of the analysis that two or more codes essentially mean the same thing. One cause could be the import of code lists with different names but similar meanings.

**ATLAS.ti** offers a procedure to merge synonymous codes into one resulting "target" code. This target code replaces the merged codes and "inherits" all of their references, i.e., quotations, links to other codes or memos, and their comments.

There are two ways to merge codes: A list-based method, and one that works from within the Network Editor.

- In the Code Manager select the code that you want to merge with another code.

- Drag-and-drop this code to the "target" code that you want to keep. A window opens. Select the first available option: **Merge code A into code B**. The quotations are added to the target code, and the merged code is removed from the list of codes.
If the merged code has a comment, the comment is added to the target code. If both codes have a comment, an audit trail is provided (see Figure 50)

Replacing A Code

To replace one code with another in the margin area, drag and drop a code (either from the Code Manager or the navigation pane) on top of another code in the margin area. Select the **SWAP** option from the context menu.

If you drag-and-drop a code from the margin area on top of another code in the margin area, the code you drag is unlinked from its prior location and replaces the code that it is dropped onto.
The Quotation Manager

Open the Quotation Manager by clicking on the button Quotations above the document area, or select Quotation/ Show Quotation Manager from the main menu.

If you want the Quotation Manager to stay on top, click on the pin icon in the top right-hand corner.

The Quotation Manager offers the following options: you can add and delete quotations, rename quotations, write comments, retrieve quotations by one or multiple codes, review the content of selected quotations, and review all objects that are linked to a selected quotation. Further options are:

**Creating Reports**: To create tabular reports in Excel format of the currently displayed content in the main window, or to create reports in Word or PDF format. This is described in detail in the section "Data And Project Export" on page 136.

**Filtering**: Another main function of the Quotation Manager is the formulation of queries. When clicking on the filter icon, you can select from a large range of options that allows you to query your data in a variety of ways. This is explained in detail in the section "Querying Quotations" on page 105.

**Deleting Quotations**

Select one or multiple quotations (by holding down the cmd key for multiple selection) and click on the trash icon. The selected quotations will be deleted with no further confirmation.

**Main Window**

The main window provides an overview of the main properties of a quotation:

**Quotation Icon**: The first column indicates whether a quotation has a comment or not. The icon for commented quotations shows a post-it.

**Quotation ID (#)**: The second column shows the quotation ID. It consists of the document number and a number indicating the chronological sequence when a quotation was created in the document. Thus, quotation 9:5 comes from document 9 and was the fifths quotation that was created in this document.

**Quotation Name**: The default name for textual quotations is the first 100 characters of the quotation. The name for multimedia quotations is "Quotation + ID". All quotation names can be edited in the Inspector (see below).

**Text Content**: The column "text content" displays the first line of textual quotations; nothing for all multimedia quotation.
The next columns list the document name to which a quotation belongs, codes that are attached to it, the total number of codes attached to a quotation, and the comment, in case a quotation comment has been written. This can be done in the Inspector.

**LOCATION:** This column shows start positions and length by number of characters for textual quotations, start position and duration for audio and video quotations, x and y coordinates, as well as width and height by pixels for image quotations. For PDF and image quotations, page numbers are provided as well.

The remaining columns in the Quotation Manager show the creator and modifier (name of the author who created and last modified the quotation), the creation date and date of last modification.

The default order of the columns can be changed manually via drag-and-drop.

**Previewing Quotation Content**

If you select a quotation, its content will be displayed in the preview area (see Figure 53). Multimedia quotations can also be played in this area.

Previews can only be shown for one quotation at a time. If you select multiple quotations, the preview is not available. To preview multiple quotations by codes, open the Code Manager (see page 56).

**Grouping Quotations**

You can group quotations by a number of different criteria. This offers a first level query. If combined with a code selection in the navigator, you can already combine two criteria, e.g. viewing quotations for a particular code by documents, or document groups. The following grouping options are available:

If you export the content of the main window to Excel/ OpenOffice Calc (Export as Table), selecting a “grouped by” view creates a new tab for each group in the report.
Quotations Inspector

The inspector for quotations on the left-hand side contains:

- A field for the quotation name. You can edit the name here, e.g. summarizing the quote or adding titles for multimedia data
- Information about the document it belongs to.
- A comment field: for notes / ideas / summaries / interpretations of the selected quotation.

Links: the link field shows all existing direct links to other objects. These can be links to codes, memos and other quotations (= hyperlinks). The hyperlink relation is shown in gray (here: supports). With a click on the right-arrow you can view the linked object in context.

Each linked object has a secondary menu offering you object specific functions:

Quotation Navigator

The navigator on the left-hand side shows the list of codes/super codes that already exist in the project and the frequency of application. The icon for regular codes is not filled in, the icon for smart code groups is filled, and all commented codes/super codes display a post-it.

When selecting a quotation in the main window, all codes and super codes that apply are highlighted in the navigator.

Filtering Quotations By Codes / Super Codes

When selecting a code (super code) in the navigator, the list of quotation is filtered only showing the quotations coded with that code.
To select quotations coded by any of the selected codes: Make sure the Venn diagram at the bottom of the navigator is set to ANY (see left). Then select two or more codes in the navigator by holding down the CMD key.

To select quotations that are coded with two or more codes: Make sure the Venn diagram is set to ALL (see left). Then select two or more codes in the navigator by holding down the CMD key.
The Code Manager

Open the Code Manager by clicking on the button **CODES** above the document area, or select **CODE/SHOW CODE MANAGER** from the main menu.

If you want the Code Manager to stay on top, click on the pin icon in the top right-hand corner.

The Code Manager offers the following options: You can add and delete codes, edit a code name, write code comments, add code colors, retrieve coded segments, create code groups or use the Manager for drag & drop coding. Further, you can review code frequency and density, group membership and all objects linked to a code. Additional options are:

- **CREATING REPORTS:** To create tabular reports in Excel format of the currently displayed content of the main window, or to build and export reports in Word or PDF format. This is described in detail in the section "Data And Project Export" on page 136.

- **FILTERING:** Another option is to query your codes. When clicking on the filter icon, you can select from a large range of options that allows you to filter your codes in a variety of ways. This is explained in detail in the section "Querying Codes" on page 127.

**ADDING AND DELETING CODES**

- To add a code, click the **+** button at the top left of the Code Manager.

- To delete codes, select one or multiple codes and click on the trash bin icon. In a second step you will be asked whether all quotations that are no longer linked to any code should also be deleted.

**Main Window**

The main window provides an overview of the main properties of a code:

- The first column indicates whether the code is a regular code (diamond not filled in) or a smart code (diamond filled in) and whether it has a comment or not (attached post-it).

- The second column shows the code color (see "Adding Code Color")

- The third column shows the code name.

- The next two columns indicate the code frequency and density:
  - **Frequency** (indicated by the quotation icon): Number of quotations coded with the code
  - **Density** (Indicated by the code icon) is the number of linkages to other codes that the user has created.

- The density column is followed by one that shows the number of code groups the code belongs to (see "Working with Groups" on page 67), and a field that displays the code comment. Code comments are also shown in the inspector on the right hand side of the Manager (see "Code Inspector")

- The remaining columns in the Code Manager show the creator and modifier (name of the author who created and last modified the code), the creation date and date of last modification.

- The default order of the columns can be changed manually via drag-and-drop.
Adding Code Color

Click on the circle in the "color column" just before the code name and select a color for each code. Code colors can also be set or modified in the inspector (see below).

In Figure 58 below you see how code colors are displayed in the margin.

![Adding code colors and display in margin area](image)

Reviewing Coded Quotations

At the bottom of the main window, all quotations coded with the currently selected code are shown including references. Click on the right-arrow on the right-hand side to view a selected quotation in context.
Figure 59: Previewing quotations coded with a selected code

Grouping Codes

The Grouped by... option that you find in all object managers allows you to sort your codes by the following criteria:

Figure 60: Grouped by... options in Code Manager

Figure 61 below shows the list of codes sorted by code groups:
If you export the content of the main window to Excel/ Open Office Calc (Export as Table), selecting a "grouped by" view creates a new tab for each group in the report.

**Code Inspector**

The Code Inspector on the left-hand side contains:

- A field for the **Code Name**: You can edit any code name there.
- A field for the **Code Color**: Click on the circle if you want to change the code color.
- **Comment**: Use the comment field to write a code definition or other notes like a first interpretation or summary of all segments coded with this code.
- **In Groups**: Here you can see to which code groups the code belongs. Right-click to open the Group Manager or to remove the code from the Code Group. You can also open the Group Manager by clicking on the right-arrow.

- **Links**: The link field shows all existing direct links to other objects. These can be links to codes, memos and quotations. As code-code links can be named, the name of the relation is shown in gray (here: view and express). With a click on the right-arrow you can view the linked object in context.
Each linked object has a secondary menu offering you object specific functions:

Code Group Navigator

The navigator on the left-hand side shows the list of available code groups and smart groups. Similar to the code icons, the icon for regular code groups is not filled in, the icon for smart code groups is filled, and all commented groups display a post-it.

When selecting a code in the main window, all code groups / smart groups that apply are highlighted in the navigator:

Filtering Codes By Code Groups

When selecting a code group in the navigator, only the codes that belong to the selected code group remain in the list.
To select codes from multiple groups: Make sure the Venn diagram at the bottom of the navigator is set to ANY (see left). Then select two or more code groups by holding down the \textit{CMD} key.

To select codes that occur in two or more groups: Make sure the Venn diagram is set to ALL (see left). Then select two or more code groups by holding down the \textit{CMD} key.

Creating New Code Groups

Click on the $+$ sign at the bottom of the navigator to add a new code group or a new smart group. Alternatively, you can also right-click inside the navigator to chose these options from the secondary menu. A third way of creating code groups is to select a number of codes in the main window by holding down the \textit{CMD} key and to drag-and-drop them to the navigator (see also "Common Procedures" on page 68 in the section on "Working with Groups".

Video Tutorial: ATLAS.ti Mac: Grouping the Project Codes

Building A Code Hierarchy

A frequent question is how to add a structure to the otherwise flat code list in ATLAS.ti. The easiest way to work with higher and lower order codes is to structure your codes alphabetically in the Code Manager, e. g., according to the basic pattern below:

category A\_sub 1
category A\_sub 2
category A\_sub 3
category B\_sub 1
category B\_sub 2
category B\_sub 3
etc.

As a means to visualize the beginning of a category, you can enter a free code that is not linked to any quotation, as shown below. Such a main category code might initially be empty, but may proof to be quite handy during further coding work. You may come across some data that fits the category but there is no fitting sub code yet, or you are unsure where to put it. Then you can use the main category code to collect these instances. Once a number of instances are collected, you can review them and think some more about them. By reading through or viewing/listening to a couple of examples it becomes often easier to decide how to code it. You may decide to create a new sub code or decide that an existing sub code fits after all. Adding colors will also help you to distinguish between different types of level of codes.

\begin{verbatim}
CATEGORY A
category A\_sub 1
category A\_sub 2
category A\_sub 3
\end{verbatim}

\begin{verbatim}
CATEGORY B
category B\_sub 1
category B\_sub 2
category B\_sub 3
\end{verbatim}

A further possibility is to sort codes by numbers (or numbers and letters):

\begin{verbatim}
1 CATEGORY A
\end{verbatim}
The sorting order is:
(1) Special characters (* + ' # _ : . ; , etc.)
(2) numbers, and
(3) letters.

Therefore, it is not a good idea to use prefixes like 1.1., 1.1.1, 2, 2.1, 2.1.2 etc. Such a numbering scheme will necessarily wreak havoc with your intended sorting order ("10" will be sorted before "2"). When using numerals, always use "01," "02," "03," or and so on.

All terms preceding a colon (:) indicate the main category name; the terms following the underscore or colon constitute sub codes. Other projects may require additional sub levels. But don’t overdo it!

As main category code and sub code names may contain more than one word, an empty space is not sufficient to separate the two levels of coding. Therefore it is best to use one of the special characters that you find on your keyboard to visually separate levels of coding.

Beginners often stuff lengthy treatises into a code name, blurring the distinction between codes, comments, and memos and thereby mistaking codes for their more appropriate siblings.

If you find yourself using more than a few words as a code, consider using quotation comments or the code comment instead.
Working With Memos

Memos are explanatory and descriptive texts that may be associated with other "objects" like quotations, codes, or other memos. Memos can also "stand alone"—simply as part of an HU. They can contain methodological notes; they can be used as a bulletin board to exchange information between team members; you can use them to write notes about the analytic process, keeping a journal of to-dos. Memos may also serve as a repository for symbols, text templates, and embedded objects that you may want to insert into documents or other memos.

Difference Between Memos And Codes

Code names are— or should be— succinct, dense descriptors for concepts emerging during the stage of closely studying the data. They often reduce complex findings to crisp placeholders and/or theoretically relevant concepts.

Like codes, memos have names. These names, or titles, are used for displaying memos in browsers, and help to find specific memos. Just like code names, a memo’s title should be short and concise. Don’t confuse the name with its content!

How Memos And Comments Differ

Memos are very similar to comments in that both are intended to hold lengthy texts, as opposed to codes that simply name a concept. Comments exclusively belong to one entity.

Comments are not displayed in browsers separately from the object to which they are attached. Memos can either be free-standing, or they can be linked to quotations, codes and other memos. Further it is also possible to write a comment for each memo, e.g. a team member can comment on an interpretation written by another colleague. Or you can write a comment to yourself, for instance that you need to revisit this memo, or that this memo is an important building block for answering a particular research question, etc.

Video Tutorial: ATLAS.ti Mac: Working with Memos

Creating A New Memo

1. Open the Memo Manager by clicking on the Memos button or select Memo / Show Memo Manager from the main menu.
2. Click on the + sign to add a new memo. Enter a name.
3. Double-click to open it. It will open as a new tab.

Loading Memos

You can also open a memo into its own region, so that you can see both the memo and your data. To do so, drag the memo tab to the right, left, top or bottom edge of the document area. Once you see a blue band, you can drop it (see Figure 68).
WORKING WITH MEMOS

You are free to split your screen vertically or horizontally (see also “Multiple Document View”).

To link a memo to a data segment, drag & drop it from the Memo Manager onto a quotation, or select a memo in navigator and drag & drop it from there.

When selecting a memo in the margin area, the inspector on the right-hand side is displaying the detailed information for this memo (see Figure 70).
The Memo Manager

Open the Memo Manager by clicking on the button Memos above the document area, or select Memo / Show Memo Manager from the main menu.

If you want the Memo Manager to stay on top, click on the pin icon in the top right-hand corner.

The Memo Manager offers the following options: You can add and delete memos, edit memo names, write memo comments, create memo groups or use the Manager for drag & drop linking. Further, the number of links to quotations and codes are displayed, and you can review group membership and all objects linked to a memo. Further options are:

Creating Reports: to create tabular reports in Excel format of the currently displayed content of the main window, or to build and export reports in Word or PDF format. This is described in detail in the section "Data And Project Export" on page 136.

 Filtering: Another option is to filter memos by various criteria.. This is explained in detail in the section "Querying Memos" on page 130.

Adding and Deleting Memos

To add a memo click on the + button at the top left of the Memo Manager.

To delete memos, select one or multiple memos and click on the bin icon.

Main Window

The main window provides an overview of the main properties of a memo:

The first column whether a memo has comment or not (attached post-it).

Name: The second column shows the memo title.

The next two columns indicate the number of quotations and codes the memo is linked to:

Comment: If you have written a comment for a memo (this is in addition to the content of the memo), it will be shown here.

Length: This column displays the total number of characters that you have written as memo content.

The remaining columns in the Memo Manager show the creator and modifier (name of the author who created and last modified the code), the creation date and date of last modification.

Figure 7: Frequency of linked quotations and codes
The default order of the columns can be changed manually via drag-and-drop.

**Grouping Memos**

The **GROUPED BY...** option that you find in all object managers allows you to sort your codes by the criteria depicted in Figure 72.

If you export the content of the main window to Excel/ OpenOffice Calc (**EXPORT AS TABLE**), selecting a "grouped by" view creates a new tab for each group in the report.

**Memo Inspector**

The Memo Inspector on the left-hand side contains:

- **A field for the memo TITLE**: You can make changes to the title there.
- **COMMENT**: Use the comment field to write a comment on the memo. This can be useful if you work in a team and want to comment on a memo someone else has written. Or it could also be a note to yourself; for instance, if this is a memo that you later want to use in chapter x or y of your thesis or research report.
- **IN GROUPS**: Here you can see to which memo groups the memo belongs. Right-click to open the Group Manager, or to remove the memo from the Memo Group. You can also open the Group Manager by clicking on the right-arrow.
- **LINKS**: The link field shows all existing direct links to other objects. These can be links to codes, other memos and quotations. With a click on the right-arrow you can view the linked object in context.

Each linked object has a secondary menu offering you object specific functions:

*secondary menu for code links*

*secondary menu for memo links*

*secondary menu for quotation links*
Memo Group Navigator

The navigator on the left-hand side shows the list of available memo groups and smart groups. The icon for regular memo groups is not filled in, the icon for smart memo groups is filled, and all commented groups display a post-it.

When selecting a memo in the main window, all memo groups / smart groups that apply are highlighted in the navigator (see left).

Filtering Memos By Memo Groups

- When selecting a memo group in the navigator, only the memos that belong to the selected memo group remain in the list.

- **To select memos from multiple groups:** Make sure the Venn diagram at the bottom of the navigator is set to ANY (see left). Then select two or more memo groups by holding down the CMD key.

- **To select memos that are included in two or more groups:** Make sure the Venn diagram is set to ALL (see left). Then select two or more memo groups by holding down the CMD key.

Creating New Memo Groups

Click on the + sign at the bottom of the navigator to add a new memo group or a new smart group. Alternatively, you can also right-click inside the navigator to chose these options from the secondary menu. A third way of creating memo groups is to select a number of memos in the main window by holding down the CMD key and to drag-and-drop them to the navigator (see also "Common Procedures" on page 68 in the section on "Working with Groups").
Working With Groups

Just as codes describe sets of quotations, groups cluster Primary Documents, Codes, and Memos. One important objective is to manage large amounts of objects by classifying them into subsets, e.g., all theoretical codes, all documents from respondents of a certain age group or location, all memos related to a theme, etc.

Objects of the same type can be a member of multiple groups. For example, the interview transcript of Eva Smith, can be a member of document group Gender: female and a member of document group Location: city.

Unlike networks, which can contain objects of different types as nodes, groups can only contain one type of object. For example, a code can never be a member of a memo group.

Video Tutorials:
- Working with document groups
- Grouping the project codes

Purpose Of Creating And Working With Groups

Partitioning objects into groups reduces the number of "chunks" requiring the researcher’s attention. Groups are often used for filtering purposes. The navigators in the managers offer a convenient way to create them and to set them as filters. The "grouped by" option also makes use of groups and you can use them to display your data in different ways.

Example: When conducting an interview study with respondents from various backgrounds and locations, document groups can be created to classify the respondents into:
- Female / Male
- Marital status
- Age Group 1 (20-30), Age Group 2 (31-40), Age Group 3 (41-50)
- Educational level, etc.

Once implemented, you can use document groups to compare and contrast answers of different groups of respondents, or check whether they are differences between locations, across time or type of documents. For example, you can ask for all quotations coded by Code_A and Code_B that occur in documents of white-collar female respondents from location B. Thus, document groups in effect can be used as variables. Figure 77 shows how document groups can be used as filters: The manager only shows documents of married female respondents.
The Document Group table function provides a convenient way to import and export variables (feature not yet implemented).

**Code groups** can be used to loosely group codes that belong together. You can use them to sort, filter and organize your codes in the Code Manager in the navigator. Other than in networks where specific relationships between codes need to be defined, in code groups it is not necessary to specify the ways in which codes relate to each other.

Use **memo groups** to sort, filter, and organize your memos.

**Common Procedures**

In the following, the general procedures for working with groups are described.

Groups can be created in both the Group Manager and the navigator of the respective managers. The navigators are better integrated into the regular work-flow. Thus, for daily regular activities it is easier to use the navigators.

**Creating Groups In The Navigator**

If you are familiar with the Windows version of ATLAS.ti, groups are the equivalent to "families." Groups can be used for sorting and organizing purposes, and to set filters.
Open one of the Managers. Click on the plus sign at the bottom of the Groups pane or right-click inside the Groups pane and select New Group. Enter a group name.

Add members to the group via drag and drop from the list of documents / codes / or memos in the respective manager.

Filtering By Group In A Manager
- If you click on a group, the items in the manager are filtered and only the members of the selected group are listed (see Figure 77).
- Click on Show all (Object Name) to reset the filter.

Removing An Item From A Group
- In a manager:
- Click on the item that you want to remove in the main window.
- Right-click on the respective family in the inspector on the right hand side and select the option Remove from Group.
- Or: Remove an item in the Group Manager:

Open the Group Manager, e.g. via the main menu (Show Documents- / Codes- / Memos Group Manager), or double-click on a group; or right-click on a group in a manager. Then select: Open in Group Manager.

Select one or more objects from the list “In Group” and click on the button with the double arrows pointing to the right “Not in Group.” Or double-click each item. For further instructions see the section on the Group Manager below and Figure 81.

The Group Manager

In the Group Manager, you can search for groups, rename groups, write descriptive comments, review creation and modification dates, add new code groups by clicking on the + button, add and remove group members, sort the list by codes and smart groups, filter the list by a number of criteria (see below), and export the list to Excel or Open Office Calc.

Opening A Group Manager

In the main menu, under Documents, Codes, and Memos you find an option to open the respective group manager. You can also open a Group Manager via a context menu in any of the object managers, or simply double-click on a group to open the Group Manager.
WORKING WITH GROUPS

Adding And Removing Group Members

Select one or more objects from the list "Not in Group" and click on the button with the double arrows pointing to the left "In Group." Or double-click each item.

Select one or more objects from the list "In Group" and click on the button with the double arrows pointing to the right "Not in Group." Or double-click each item.

Filtering The List Of Groups

To filter groups, click on the filter icon on the top right of the group manager.

Figure 80: Group Manager

Figure 81: Adding and removing an item to / from a group

Figure 82: Creating a group filter
To add a filter rule, click on the plus sign as highlighted in Figure 83.

Next, select one of the available options (see Figure 86) to create the filter you are interested in.

The following filter are available for groups:

![Figure 83: Filter options in Group Managers](image)

All available operators are explained in detail in the section "Four Boolean operators are available: XOR (exactly one), AND (All), OR (any) and NOT (none). " on page 97. The process of building a query is explained in the next section on "Working With Smart Groups".

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## Working With Smart Groups

Smart groups are combinations of other groups. They can also contain other smart groups. You can build complex groups incrementally from existing groups using a set of powerful Boolean operators. You can either generate temporary groups using the Venn diagram in the navigation panel, or you can create and store smart groups in the Smart Group Editor.

### Purpose Of Smart Groups

The purpose of smart groups is to use them as filter in your ongoing analysis. For instance you may want to examine the difference in attitude among respondents who have an engineering degree only, an MBA only and both an engineering degree and MBA. Via smart groups you prepare the filter you need and combine them with a code query, or use them to prepare a Codes-Primary Documents-Table.

### Creating Temporary Smart Groups

You can create new groups based on AND and OR (ALL or ANY) operations using the Venn diagram in the navigation pane for groups. For instance, as shown in Figure 84 you can select two code groups by holding down the **cmd** key. If you want to display all codes from both groups, set the Venn diagram to OR (ANY).
If you are interested in the intersection of two groups, use AND (ALL). You can switch between Or (ANY) and AND (ALL) by clicking on the Venn diagram.

Another way to create smart groups is via the smart group editor.

**The Smart Group Editor**

Open the smart group tool via a right-click inside the group navigation panel. Select the option **New Smart Group**.

You can combine groups using Boolean operators. Each operator is explained below and an example is provided.

**OR: Any Of The Following Are True**

The OR operator retrieves all objects (i.e., documents) that are added to any of the groups used in the expression. The query in Figure 87 will give you all respondents that have an MBA or an engineering degree including those respondents that have both. This results in a total of 17 retrieved documents.
WORKING WITH GROUPS

XOR: Exactly One Of The Following Is True

At least one of..., "excluding the case where ALL conditions match. The XOR operator asks that "EXACTLY one of..." the conditions must meet. It translates into everyday "either-or." Example: you want to group all respondents that either have an engineering degree or an MBA (excluding those respondents who have both an engineering degree and an MBA). This results in a total of 11 retrieved documents.

AND: All Of The Following Are True

The AND operator finds quotations that match ALL the conditions specified in the query. In Figure 90, the smart document group contains all respondents that both have a MBA and an engineering degree. This results in a total of 6 retrieved documents.

None Of The Following Are True (NOT)

The NOT operator tests for the absence of a condition. Technically, it subtracts the findings of the non-negated term from all other available objects of the same type. If you select "none of the following are true" and the group "engineering degree," you retrieve all respondents that have an MBA or other degrees. This results in a total of 20 retrieved documents. If your data set also contains other data like reports that are not grouped in any "degree group", you retrieve all other documents that have not been grouped as degree: engineer.

If you only want to retrieve respondents with an MBA that do not have an engineer degree, select:
All smart groups are listed in the navigator together with the other groups. They are automatically named by ATLAS.ti: Smart Group 1, Smart Group 2, Smart Group 3 and so on. The group icon is filled in (see left). It is recommended to rename the smart groups after creation in order to remember what they contain.

A smart group can be edited at any time. To do so, right-click on a smart group and select **EDIT SMART GROUP**. This opens the Smart Group Editor again.
Working With Hyperlinks

A network with text (or other media) as nodes is often referred to as a hypertext. The original sequential text is de-linearized, broken down into pieces that are then reconnected, making it possible to traverse from one piece of data to another piece of data regardless of their original positions.

The procedures described so far have focused on working with codes. Direct linking of data segments (quotations) to other data segments offers similar flexibility in choosing and defining relations.

What Codes Cannot Do

Perhaps we should ask a different question first: How can you express that statement X in text A contradicts statement Y in text B, or how can you retrieve all contradictory statements of a specific utterance if all you have is codes and their associations with the data?

The "code & retrieve" paradigm, which is so prevalent for many systems supporting the qualitative researcher, is not adequate for certain types of analysis. In formal terms, attaching codes to chunks of data creates named sets of segments with almost no internal structure. This is not to say that partitioning lots of text segments into sets is not useful. On the contrary, classification leads to manageable amounts of segments that later can be retrieved with the help of the attached code words. But this may not be the only way you want to look at your data.

The hypertext concept introduces explicit relations between passages. These links have to be built manually and result from an intellectual effort. The system cannot decide for you that segment x is in contradiction to segment y. But after the work of establishing the links, you can make semantically richer retrievals, e.g. "show me all statements that are contradictory of statement x."

Hypertext allows you to create different paths through the data you are analyzing. For example, you may create a timeline different from the strict sequence of the original text. The concept of hypertext introduces explicit relations between passages. While a
code offers fast access to sets of data segments, it defines only a simple relation between them, namely equivalence.

Hyperlinks, which directly relate data segments, express more differentiated relationships between quotations: contradiction, support, illustration, and a great many more.

No code is required to connect a quotation Q1 with one that contradicts it (Q2).

Cross-references between text passages are very common even in conventional media such as books—just think of religious and juridical texts, literature, journals etc. Footnotes and end notes are another common deviation from the pure linearity of sequential text. However, in conventional media, not much navigational support is provided for “traversing” between the pieces of data that reference each other.

Computer-related hypertext applications include, for example, online help systems that display operational information in suitable small chunks (as compared to lengthy printed information), but with a considerable amount of linkage to other pieces of information. The most well-known hypermedia structure is the World Wide Web with its textual, graphical and other multimedia information.

Graphical Hyperlink Maps

ATLAS.ti incorporates procedures for creating and browsing hypertext structures. It allows for two or more quotations being connected using named relations. Further, you can create graphical maps (using networks) to make parts of your hyperspace accessible in a convenient way. Hyperlinks may connect quotations (textual, graphical, multimedia) across documents (inter-textual links) or may link segments within the same primary document (inter-textual links). The natural boundary for hyperlinks, like all structures in ATLAS.ti, is your project. Figure 94 below shows a networks based on a number of hyperlinks and a few codes. Other node types can also be included in the network, like, for instance, a memo.

Figure 94: Example of a hyperlink network including some code and document nodes
Creating Hyperlinks

Creating Hyperlinks In The Quotation Manager

To link two quotations to each other, simply drag one quotation (source) and drop it on top of another quotation (target) – either in the Quotation Manager or in the margin area.

Next, select one of the offered relations. If the offered relations do not suit your needs, you can create new relations in the Relations Manager. From the main menu select: QUOTATIONS / SHOW RELATION MANAGER. (see also "Defining New Hyperlink Relations."

Creating Hyperlinks In The Margin Area

Like the method described above, creating hyperlinks in the margin area is best suitable for connecting two quotations that are in close proximity to each other. If they are not, utilize the multi-document view for linking (see "Utilizing The Multi-Document View For Creating Hyperlinks."

Select a quotation bar in the margin area (the source).

Hold down the left mouse button and drag the bar onto another quotation bar (the target).

Release the left mouse button. The Relation menu opens. Select a relation.

Display Of Hyperlinks In The Margin Area

Hyperlinks in the margin area are colored in gray. If a transitive link was selected (e.g. "supports"), the source link points to the right. Vice versa, the target link points to the left (see Figure 96). Symmetric links point in both directions. Whether a link is directed or non-directed can be specified in the Link Manager, see "Defining New Hyperlink Relations."
WORKING WITH HYPERLINKS

Utilizing The Multi-Document View For Creating Hyperlinks

- Open two documents side-by-side (see "Multiple Document View").
- Grab a quotation bar and drag it across to the document in the second tab and drop it onto another quotation bar.
- Select a relation.

Modifying Hyperlink Relations

Using The Link Manager

- Open the Link Manager via QUOTATION / SHOW LINK MANAGER.
WORKING WITH HYPERLINKS

In the Relation column, click on a relation and select the desired relation.

Using The Quotation Inspector

Open the Quotation Manager and select a quotation with hyperlink in the main window. All hyperlinks are shown on the right hand side in the Inspector in the Links section.

Right-click on a hyper-linked quotation and select Change Relation from the secondary menu:

Defining New Hyperlink Relations

The procedure for defining or editing hypertext relations is equivalent to the methods described for editing code-code relations (see also "Working with Networks").

Open the Relation Manager from the Quotation’s main menu: Quotation / Show Relation Manager; or select Open Relation Manager from the secondary menu in the Links section of the Quotation Inspector (see Figure 99). The same secondary menu comes up if you right-click on a hyperlink in the margin area.

In the Relation Manager on the + button to add a new relation.

Define the properties for the new relation and write a comment (optional). The various fields are explained in more detail below.
WORKING WITH HYPERLINKS

The following can be defined: Cosmetic and descriptive as well as structural aspects of relations.

COSMETICS

Cosmetic aspects include the name and the line. The relation name is shown when creating relations and in a network Editor. Once implemented, the symbol and short name can be used as an alternative display option in networks. Instead of a short name, you can for instance also use a different language as shown on the left. Further, you can define the width and thickness of the line and its color.

FORMAL PROPERTY

The formal property associated with a relation has a cosmetic effect and it controls the "procedural semantics" of the semantic operators in the Query Tool. When you want to utilize the semantic operators (children / parent), transitive relations need to be used.

PREFERRED LAYOUT DIRECTION

A more sophisticated "cosmetic" property is the preferred layout direction. By using this relation characteristic, the user can assert some control on the automatic layout algorithm. Indeed, this option justifies the name "semantic layout."

COMMENT

As with all entities in ATLAS.ti, a comment can be attached.

Bear in mind that a comment written for a relation is different from a comment written for a link. The comment for a relation is of a global nature and defines the relation type: e. g., what is meant by the relation "is associated with." A link using this relation connects two specific quotations. When writing a comment for this link, the meaning is local and explains why two quotations were connected using this relation.

Traversing Hyperlinks

For a better view, open up the context menu in the margin area and only select Show HYPERLINKS. Deactivate all other options.

Double-click a hyperlink in the margin to jump to the linked quotation.
WORKING WITH NETWORKS

Working With Networks

ATLAS.ti allows you to establish named links to more clearly express the nature of the relationships between concepts.

With named links, you may express a sentence like "a broken leg causes pain" by two nodes (the source node "broken leg" and the target node "pain") connected with a named link ("causes" or "is-cause-of").

The name of a link is displayed in the Network Editor as a label attached to the link midway between the two connected nodes. Six preset relations—or link types—are available in ATLAS.ti. These standard relations can be substituted, modified, or supplemented by user-defined relations. The default relations are listed in the table below. C1 and C2 are source and target nodes, respectively.

<table>
<thead>
<tr>
<th>Relation</th>
<th>Symbol</th>
<th>Short Name</th>
<th>Width</th>
<th>Color</th>
<th>Formal Attribute</th>
<th>Layout Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 is-associated-with C2</td>
<td>==</td>
<td>R</td>
<td>1</td>
<td>Black</td>
<td>Symmetric</td>
<td>○</td>
</tr>
<tr>
<td>C1 is-part-of C2</td>
<td>[]</td>
<td>G</td>
<td>1</td>
<td>Black</td>
<td>Transitive</td>
<td>(</td>
</tr>
<tr>
<td>C1 is-cause-of C2</td>
<td>=&gt;</td>
<td>N</td>
<td>1</td>
<td>Black</td>
<td>Transitive</td>
<td>(</td>
</tr>
<tr>
<td>C1 contradicts C2</td>
<td>&lt;&gt;</td>
<td>A</td>
<td>1</td>
<td>Black</td>
<td>Symmetric</td>
<td>○</td>
</tr>
<tr>
<td>C1 is-a C2</td>
<td>isa</td>
<td>0</td>
<td>2</td>
<td>Black</td>
<td>Transitive</td>
<td>(</td>
</tr>
<tr>
<td>C1 noname C2</td>
<td>*)</td>
<td>P</td>
<td>1</td>
<td>Black</td>
<td>Symmetric</td>
<td>○</td>
</tr>
</tbody>
</table>

Some of these characteristics directly affect the display of links, while others affect processing (e.g., search routines, automatic layout). A link between concepts is displayed in a Network Editor by a line with the relation's label. You can choose from three different labels: relation name, symbol and a short name.

The "formal attribute" affects both the display and processing capabilities of a relation. For example: All asymmetric relations are symbolized in the Network Editor with an arrow pointing toward the target code. Symmetric relations are displayed with an arrow at both ends.

A typical transitive relation is the is-cause-of relation: if C1 is-cause-of C2 and C2 is-cause-of C3, it follows that C1 is-cause-of C3. Transitive relations also enable the "semantic retrieval" based on parent and child nodes (see "Semantic Operators" on page 98).

The following properties are user-definable: Full name, short name, symbol, the property of the relation (symmetric, asymmetric, transitive), the width and line style (solid or dashed), and the preferred layout direction. The preferred layout direction affects the layout of a network when ATLAS.ti automatically arranges the nodes.

Video Tutorial: ATLAS.ti Mac: Working with networks

Link Vs. Relation

It is important to understand the difference between a relation (or a link type) and the link itself: There is only one "is part of" relation, but potentially many links using it. In the network below, the relation "consequence" is used only once, while the relation "strategy" is used four times.

Another way to think of links and relations is to view links as instances of relations. Links are well informed about the characteristics of relations, which define their styles. If a characteristic of a relation is changed (e.g., line width, color, symbol), these changes are propagated to all links using it.
The Role Of Relations

It is useful to understand the role that relations play in the construction of a theory. The concepts (codes) that are linked using relations represent aspects of the problem domain under investigation. On the other hand, the relations used to link these domain concepts are part of the methodology used to analyze the phenomena. As important epistemological tools they constitute the main questions that guide the development of a model or a theory.

The "Grounded Theory" method of Glaser & Strauss uses relations like "is-phenomenon," "is-context-of," "is-consequence-of," "is-condition-for," "is-strategy-for," etc., to relate concepts found during the data-oriented open coding phase.

In the analysis of argumentation structures, other relations are more suitable: e. g., "is evidence of," "is contradictory to," "warrants," etc. A medical expert attempting to capture diagnostic knowledge would use, e. g., "is-symptom-of," and "is medication for."

The Network Editor

The Network Editor offers an intuitive and powerful method to create and manipulate network structures. It favors a direct manipulation technique: You can literally "grab" codes, quotations, memos, or other objects using your cursor and move them around the screen as well as draw and cut links between them.

The following describes various methods available for creating and editing networks.

Network Characteristics

Networks have certain important characteristics:

- Several different networks on the same network are possible.
- Networks can be given names under which they are stored and accessed inside the HU.
- Networks can be commented.
- Networks are displayed and edited in the Network Editor.
- Networks allow individual layout of the nodes.
- As a node, a single object can be a member of any number of networks, just like a code can be an element of more than one code group.
- An object, e. g., a specific code, can only appear once in any network.

networks allow for a flexible but logically consistent display of the network of objects, so there are a few constraints to keep in mind:

If code A is linked to code B using the relation "is associated with," then every network that contains code A and code B will necessarily include the relation "is associated with" between the two. Furthermore, as only one link can exist between any two nodes at any given time, no network will display any other relation between those two nodes.
If however, you want to link code A and B differently in a different network, then you need to work with "dummy or modifier codes." These are empty codes, i.e. you have not used them for coding, but you need them to modify a relation.

**Node Types**

The following object classes can be displayed and edited as nodes within the Network Editor. The display characteristics of the nodes can be altered in a variety of ways.

**Codes As Nodes**

Codes are probably the most prominent objects in ATLAS.ti networks. They provide the main ingredients for models and theories.

**Memos As Nodes**

Memos in networks are often an important supplement to code networks. Several theoretical memos can be imported into a network to map out their relationship. The visual layout provides comfortable territory for moving from memo to memo to read and contemplate each individually and the relationship(s) between them.

**Documents As Nodes**

Documents as nodes are useful sometimes, but in the presence of quotations may clutter the view by myriad links. However, Document Previews as nodes make a nice graphical content table for graphical primary documents (see "View Options" for further detail).

**Quotations As Nodes**

Quotations and codes have one thing in common that is not true for the other objects. They can link to each other (quotations to quotations and code to codes) with fully qualified "first class" links using relations. The inclusion of quotations in a network supports the construction and inspection of hyperlink structures.

If you add image or video quotations, there content can be displayed if you set the view option to "Show Quotation Previews". See also page 88.

**Networks As Nodes**

Networks as nodes allow the inclusion of networks in other networks. To open the network in a new tab, right-click and select **OPEN NETWORK**.

**Groups As Nodes**

Groups are a useful device to group codes, memos, or documents. Instead of displaying all of the codes belonging to the concept, the Code group may be displayed. Or you display the group with all of its members.
Creating A New Network

To create a new network, select **Network/New Network**. This opens a tab with now content. The name network 1 / network 2 / network 3, etc is generated automatically. If you decide that you want to keep a particular network, you can rename it later in the network Manager (**Network/Show Network Manager**).

In the network manager you can enter a comment for each network. Use it for a description.

Drag and drop items from the Managers, margin area, or the navigator into the view.

The node types (document, quotation, code, memo, network) can be recognized by their entity specific icon (compare Figure 4). If you right-click on a node, you see further options that are available (Figure 104).

![Figure 103: Display of a code group with its members in a network](image)

![Figure 104: Node Types and available options](image)
**Linking Nodes In Networks**

The links between nodes in a network are real connections between the objects. Therefore, creating and removing links should not be regarded as solely "cosmetic" operations. Links make permanent changes to your entire project.

**Strong Links (First Class)**

You can link almost all ATLAS.ti objects to each other. Qualified named relations can however only be created between two codes and between two quotations, the so called hyperlinks (see also "Working with Hyperlinks").

**Weak Links (Second Class)**

Other objects can be linked, but you cannot specify the relation between them. Therefore they are called "weak links" or second class links in ATLAS.ti. These are:

- Code – memo links
- Code – quotation links (this is the same as coding)
- Memo – memo links
- Memo – quotation links
- Groups and their members (see Figure 103 above).
- Documents and their quotations

Document-quotation links cannot directly be created by the user; they can only be displayed. It is possible to display the quotations that are contained within a document via the importing neighbor option (see below), but you cannot link a quotation to a document in a network. It would not make much sense, e.g. to link a quotation from document 5 to document 3, as it does not belong to it.

**Creating Strong Links**

To link, for instance, two codes to each other, select a code node. A circle appears at the top left corner of the node. If you begin to drag starting from the circle, a line appears. Drop the line on top of another code node. A list of relation opens. Select the one that best fits the relation between the two codes.

Another way to link either two quotations to each other or two codes is via drag and drop in the respective managers.

![Figure 106: Code to code link](image-url)
To create new relations, open the Relation Manager (see "Defining New Hyperlink Relations" and "Defining New Code-Code Relations."

Creating Weak Links
To link for instance a codes to a memo, select a code node. A circle appears at the top left corner of the node. As you begin to drag, an arrow appears. Drop the arrow on top of the memo node and drop the line.

Linking Two Nodes Using Mouse And Keyboard
- Place the mouse pointer over the source node.
- Hold down the **ALT** key on your keyboard.
- Hold down the left mouse button and drag the mouse pointer to the target node.
- Release the left mouse button and the **ALT** key.
- In case you create a strong link (code-code or quote-quote link), select a relation.

Selecting Links
To select a link or a relation, simply click on the link. It turns blue. To open the context menu to either delete or flip the link, right-click.

Modifying Links
The type of a link (e.g., its relation) can currently only be changed in the Link Manager. Further options will follow.

Selecting Multiple Or All Nodes
To select all or a selected group of nodes, you can either draw a frame around all nodes with your mouse or hold down the **CMD** key and click on each node that you want to select.

Moving Nodes
By moving nodes to different positions, you can modify an initial layout created by the automatic layout procedure. To move a single node, just drag it with the mouse to the desired position.

To Move Multiple Nodes
Create a multiple selection of nodes as described above. Then grab one of the selected nodes with the mouse and move the entire group of selected nodes to a different position.
Removing Nodes From Networks

Removing nodes from the view simply takes the nodes out of a network. The nodes remain in your project. Removed nodes can be "re-imported" at any time.

Select the nodes to be excluded from the view. Right-click and select the option **REMOVE FROM NETWORK**.

Defining New Code-Code Relations

The procedure for defining or editing code-code relations is equivalent to the methods described above for defining hyperlink relations (see Defining New Hyperlink Relations).

Open the Relation Manager from the Code's main menu: **CODE / SHOW RELATION MANAGER**. Other options are to right-click on a relation in a network or in the Links section of the Code Inspector in the Code Manager and chose the option **OPEN RELATION IN MANAGER** from the secondary menu.

In the Relation Manager, click on the **+** button to add a new relation. Define the properties for the new relation and write a comment (optional). The various fields are explained in more detail below.

Relation Properties

The following can be defined: Cosmetic and descriptive as well as structural aspects of relations.

**COSMETICS**

Cosmetic aspects include the name and the line. The relation name is shown when creating relations and in a network Editor. Once implemented, the symbol and short name can be used as an alternative display option in networks. Instead of a short name, you can for instance also use a different language as shown on the left. Also, you can define the width and line style and add a color.

**FORMAL PROPERTY**

The formal property associated with a relation has a cosmetic effect and it controls the "procedural semantics" of the semantic operators in the Query Tool. When you want to utilize the semantic operators (children/parent), transitive relations need to be used.
WORKING WITH NETWORKS

PREFERRED LAYOUT DIRECTION

A more sophisticated “cosmetic” property is the preferred layout direction. By using this relation characteristic, the user can assert some control over the automatic layout algorithm. Indeed, this option justifies the name “semantic layout.”

COMMENT

As with all entities in ATLAS.ti, a comment can be attached.

Bear in mind that a comment written for a relation is different from a comment written for a link. The comment for a relation is of a global nature and defines the relation type: e.g., what is meant by the relation “is associated with.” A link using this relation connects two specific quotations. When writing a comment for this link, the meaning is local and explains why two quotations were connected using this relation.

Opening Existing Networks

You can access networks via the network Manager and via the navigator on the left hand side of your screen.

1. Select NETWORK / SHOW NETWORK MANAGER.
2. Open the navigation pane and select the network tab (see left).

View Options

The following view options for networks are available:

- Document And Quotation Previews

When selecting SHOW DOCUMENT OR QUOTATION PREVIEWS, “thumbnail” images of the documents are displayed. This also applies to image and video files and quotations. The content of video and also audio files can be started from within the network and previewed.
Further Options In Networks

A number of layout options are at your disposal (see left).

Further you have the option to remove multiple nodes from a network. To do so, select a number of nodes either by drawing a frame around them with your mouse, or by holding down the SHIFT key. Next click on the button "Remove Selected Nodes".

Code-Document connections can be displayed or hidden. Just activate or deactivate the option, depending on what you want to see in a network.

Show Code-Document Connections

Code-Document connections are virtual links as they do not really exist. They are displayed as dotted gray lines. You can use this option to compare the coding of documents. An example is shown Figure 113. Four of the six topics are discussed in both documents 3 and 5; the effects of parenting on careers is only discussed in document 3. The equivalent quantitative tool is the Code Document Table (see page 125).
 Printing Networks

1. Open the network you want to print or save as external file first.

2. Select **Project / Print.** If you click on Show Detail, you have the following options:

**Analytic Functions In Networks**

**Import Node Neighbors**

This method imports all direct neighbors of the selected nodes into the network. This option is currently available from the node's context menu. Importing direct neighbors allows you to construct a connected network step-by-step. (In a connected graph, there is always a direct or indirect path between any two nodes.)
**Import common Neighbors** imports all directly linked objects. All other options let you specifically select which objects you want to import. Below the options for the various objects types are listed:

<table>
<thead>
<tr>
<th>Quotations</th>
<th>Import Common Neighbors</th>
<th>Import Codes</th>
<th>Import Memos</th>
<th>Import Hyperlinks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Documents / Codes / Memos</strong></td>
<td>Import Common Neighbors</td>
<td>Import Codes</td>
<td>Import Memos</td>
<td>Import Quotations</td>
</tr>
<tr>
<td>Groups</td>
<td>Import Groups</td>
<td></td>
<td></td>
<td>Import Members</td>
</tr>
</tbody>
</table>

- Select the node(s) whose neighbors are to be included in the network.
- Right-click and select **Import Neighbors** from the context menu and make your choice.

**Creating Case-Based Networks**

Importing a document’s codes neighbors allows to create case-based networks. You can ask questions like: Which of the codes have been applied in which document (and where do they not occur). ATLAS.ti automatically draws light gray dashed lines between codes and the primary documents. This is how you do it:

- Create a new network: **Network / New Network**.
- Drag-and-drop two or more document nodes into it, e.g. from the navigator.
- Right-click on each document node and select the option **Import Neighbors / Import Codes**. Don’t forget to do it for all document nodes, even if results pop up immediately.

Usually a lot of different codes have been applied to a document. Therefore this option works best, if you apply a filter for codes.
The option to set a filter in networks is currently not yet implemented.

The example below compares two respondents from a survey (case 6 and 9). The survey only included two open-ended questions and therefore the number of codes is still comprehensible.

**Import Co-occurring Codes** (Not Yet Implemented)

For code nodes, there is a special import feature that exploits the spatial relations of different codings. A code co-occurs with another if it has been used to code quotations that are in close proximity: embedded, overlapping, or if two or more codes are applied to the same quotation.

Until this feature is implemented, you can use the Code Cooccurrence Table instead, see page 121.

*Figure 116: Case-based comparison using the import codes option for documents*
Code Tree And Code Forest

Video Tutorial: Code Tree and Code Forest in 10 minutes explained.

The Code Forest offers a tree-like view of your code system representing the relations that you manually have established between codes. The code forest shows all of your codes and their linkages, whereby the Code Tree only displays one code and its related codes.

As the code tree displays the code-link relations of one code only, it can only be opened if a code is selected.

Manually established relations are those that you have created either by dragging and dropping a code on top of another code either in the Code Manager or the margin area, or by linking two codes to each other in a network (see "Working with Networks" on page 81). When linking codes to each other, you need to select a relation. A relation can be transitive (e.g. is cause of), asymmetric (e.g. is property of) and symmetric (e.g. is associated with). Transitive and asymmetric relations are directed relations, symmetric relations are non-directed, which can also be seen in a network by the arrows at both ends of the link. Let's consider the following network:

It contains the following relations:
- is a <transitive>
- is cause of <transitive>
- is property of <asymmetric>
- is associated with <symmetric>

In the code forest, the above linkages look as follows:
Transitive and asymmetric relations are displayed in a hierarchical manner and symmetric relations appear twice as they are non-directed. The type of relations are displayed in the Links section of the inspector if you select a code. In the future, the links will also be displayed in the Code Forest window next to each code, similar to the display in the Windows version.

**Code Tree / Code Forest Actions**

**Rename:** You can rename a code in the Code Forest or Code Tree (in-place rename: select a code, then left-click again).

**Duplicate:** Right-click and select the duplicate option from the secondary menu. A duplicate code is a clone of the original code. Thus, the duplicate code inherits are links, relations and comments of the original code.

**Change code color:** Right-click and select the Change Color option from the secondary menu. Or select a code and change its properties in the inspector.

**Access quotations:** Select a code. Then select linked quotations from the Links section in the inspector. Or double-click a code and select quotations from the quotation list that opens.

**Code:** Use the Code Forest or Code Tree for drag-and-drop coding.

### Using The Code Forest To Implement A Hierarchical Code Structure

In principal you can use the code forest to implement a hierarchical code structure. You need to set it up in a way so that all parent codes are displayed only once and all child codes underneath its corresponding parent, as shown in Figure 119. This can be achieved by linking parent and child codes using transitive relation like "is a". 
Transitivity implies that if code A is "cause of" Code B and Code B is "cause of" code C, then Code A also is "cause of" Code C and so on.

Why Symmetric And Asymmetric Relations Cannot Be Used In A Hierarchical Code System

Although asymmetric relations are directed relations and are displayed in a tree-like manner, they are not recursive and thus are ignored by the children and parent operators. Figure 121 shows a typical asymmetric relation. The network illustrates family relations. Bob, Tina and Chris and their descendants (see Figure 122) are all part of the same family. All family members can be linked to the family node via a transitive relations like "is part of". But for most relations among family members, asymmetric relations need to be uses. Bob is the brother of Tina, but not of Chris. A transitive relation would imply that the same relation used between Bob and Tina also applies to the link between Bob and Chris.

It is possible to express the relationship using a transitive relation. But then you would need to call it "descendant of" (see Figure 122). The sibling relation between John, Mary
and Chris however cannot be expressed using a transitive relation; it requires a symmetric link. The corresponding code tree for the GRANDMA network looks like this:

As the links between the various codes are a combination of transitive, symmetric and asymmetric relations, this code tree is not strictly hierarchical. Bob is displayed as part of the stem, but also as sub-branch of Tina. Further, the codes Chris, John and Mary are displayed as sub codes of Tina, but also occur as sub codes elsewhere.

The code tree in Figure 123 is typical when using the ATLAS.ti network functionality to express conceptual relations between codes. It supports the methodological process of theory building.

Using this function to set up a hierarchical code system is an alternative application. Methodological speaking, this implies that you use the network function for descriptive purposes only. This may suit many projects well.

If you are however interested in building conceptual relations between codes, we recommend to work with prefixes instead to sort your codes in a hierarchical manner. This allows you to use code links and relations and the network function for an additional layer of analysis after coding.

The above examples would look as follows using prefixes in a flat code system:

```plaintext
CARS
  cars: Ford
  cars: Toyota
  cars: Volkswagen

EMOTIONS
  emotions: anger
  emotions: hate
  emotions: joy
  emotions: love

FRUITS
  fruits: apple
  fruits: banana
  fruits: pear

FAM X MEMBERS
  fam X members: Bob
  fam X members: Chris
  fam X members: grandma
  fam X members: John
  fam X members: Mary
  fam X members: Tina
  fam X members: Tom
```

If you want to learn more about relation types in network theory, watch the following video: [Did you ever wonder what's behind the ATLAS.ti network function?](#)
Tools For Basic And Advanced Analysis

The following options are at your disposal:

- Simple retrieval by code in the Quotation and Code Manager
- Code Cooccurrence Table
- Codes Documents Table
- Complex retrievals by a number of criteria, Boolean, semantic and proximity operators in all Managers
- The creation of smart codes also offering the full range of operators (Boolean, semantic and proximity operators).

For most of these options some basic knowledge on the available Boolean, semantic and proximity operators is necessary. Therefore, before explaining any of the tools, in the next section all operators are explained. We recommend that you first read this section. It will help you to better understand all further analysis tools.

Overview Of Main Sets Of Operators

In this section the three main sets of logical operators are explained in detail. You need to know about them, what they mean and what they do in relation to a number of different functions in the software. For example, you will come across Boolean operators when creating smart document / code or memo groups (see page 71). You need to know about all three sets when creating smart codes (see page 97), or when using the query option in all four managers (see "Querying Quotations" on page 105, "Querying Codes" on page 127, "Querying Memos" on page 130, and "Querying Documents" on page 131. Boolean and semantic operators are available as filters in the Code Cooccurrence Table (see page 121) and in order to understand the table, you need to be familiar with the proximity operators (see page 99).

**Boolean operators** allow combinations of keywords according to set operations. They are the most common operators used in information retrieval systems.

**Semantic operators** exploit the network structures that were built from the codes.

**Proximity operators** are used to analyze the spatial relations (e.g., distance, embeddedness, overlapping, co-occurrence) between coded data segments.

Boolean Operators

Four Boolean operators are available: XOR (exactly one), AND (All), OR (any) and NOT (none).

![Figure 124: Available Boolean operators](image)

OR, XOR, and AND are binary operators which need exactly two operands as input. NOT needs only one operand. However, the operands themselves may be of arbitrary
complexity. Codes, code groups, or other smart codes can be used as operands: "(A OR B) AND (NOT C AND D)."

**XOR (Exactly one of the following is true):** The XOR operator asks that "EXACTLY one of..." the conditions must meet. It translates into everyday "either-or." Example: "All quotations coded with EITHER 'Earth' OR 'Fire' (but not with both)."

**AND (All of the following are true):** The AND operator finds quotations that match ALL the conditions specified in the query. This means you have applied two or more codes to the same quotation. Example: "All quotations coded with 'Earth' AND 'Fire'." The AND operator is very selective and often produces an empty result set. "Precision" of this operator is high, but the "recall" is rather low. It produces best results when combined with less restrictive operators or when the overall number of the available text segments is large.

**OR (ANY of the following are true):** The OR operator does not really match the everyday usage of "OR." Its meaning is "At least one of..." including the case where ALL conditions match. The OR operator retrieves all data segments (i.e., quotations) that are coded with any of the codes used in the expression. Example: "All quotations coded with 'Earth' OR 'Fire'."

**NOT (None of the following are true):** The NOT operator tests for the absence of a condition. Technically, it subtracts the findings of the non-negated term from all data segments available. Given 120 quotations in the HU and 12 quotations assigned to code "Fire," the query "NOT Fire" retrieves 108 quotations - those which are not coded with "Fire." Of course, the operator can be used with an arbitrary expression as in the argument "NOT (Earth OR Fire)" which is the equivalent of "neither Earth nor Fire."

The OR operator has the potential to generate a HUGE number of hits. It has high "recall" (a lot is retrieved), but low "precision" (many of the retrieved quotations may not necessarily fit).

Venn diagrams are descriptive schemes for illustrating the different set operations associated with Boolean operators. The rectangle encloses the set of all retrievable quotations, e.g., the "document universe." The two circles represent two codes A and B. Q1 to Q5 are quotations coded with A, B, or none (Q5).

**Semantic Operators**

The operators in this section exploit connected codes resulting from previous theory-building work. While Boolean-based queries are extensional and simply enumerate the elements of combined sets (e.g., LOVE or KINDNESS), semantic operators are intentional, as they already capture some meaning expressed in appropriately linked concepts (e.g., All Children of code **POSITIVE ATTITUDES**).

The **All parents of Code** operator looks at all directly linked codes and their quotations at higher levels.

The **All children of Code** operator traverses the network from higher to lower concepts, collecting all quotations from any of the sub codes. Only transitive relations between the
codes are processed (see “Relation Properties”); all others are types ignored. When building a terminology from your codes, use the ISA relation for sub-term links.

Like the OR (any) operator in the set of Boolean operators, the 'All children of Code' operator may produce large result sets. However, because you make use of a theory, the “precision” is likely better as compared to using OR (i.e., you get only what you expect). Of course, if your network contains dubious connections (“computer ISA intelligent entity”), the quality of your retrieval will decline.

The Children of all parents of Code operator finds all quotations that are connected to the selected code or any other descendants of the same parent code. Example: “All quotations coded with Love or any other Positive Attitude, here: kindness.” See Figure 127 above.

With such a network of codes the following queries would make sense (Q1 to Q8 = quotations):

All children of Code (Positive Attitude) => {Q1, Q2, Q3, Q4, Q5}
All children of Code (Negative Attitude} => {Q6, Q7, Q8}
All children of Code (Attitude) => {Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8}.

Proximity Operators

Proximity describes the spatial relation between quotations. Quotations can be embedded in one another, one may follow another, etc. The operators in this section exploit these relationships. They require two operands as their arguments. They differ from the other operators in one important aspect: Proximity operators are non-commutative. This property makes their usage a little more difficult to learn.

Because of non-commutativity, every proximity operator comes in two versions.

Non-commutativity requires a certain input sequence for the operands. While "A OR B" is equal to "B OR A," this does not hold for any of the proximity operators: "A FOLLOWS B" is not equal to "B FOLLOWS A." When building a query, always enter the expressions in the order in which they appear in their natural language manifestation.
Another important characteristic for these operators is the specification of the operand for which you want the quotations retrieved. "A WITHIN B" specifies the constraint, but you must also specify if you want the quotations for the As or the Bs. This is done implicitly by the sequence. The code (or term) that is entered first is the one in which you are interested. If B’s quotations are requested, you have to enter "B ENCLOSES A" using the query language described below.

**Embedding Operators**

The embedding operators describe quotations that are contained in one another and that are coded with certain codes.

**Quotations enclosing quotations:** A ENCLOSES B retrieves all quotations coded with A that contain quotations coded with B.

**Quotations being enclosed by quotations:** A being enclosed by B (WITHIN) retrieves all quotations coded with A that are contained within data segments coded with B.

For example, if you want to retrieve all segments for "give: joy" related to the code "#fam: have children" (see Figure 129), you would need to enter the query as follows:

```
Is coded with  
<table>
<thead>
<tr>
<th>give: joy</th>
<th>28</th>
</tr>
</thead>
</table>

Is coded with  
| #fam: have children | 75 |
```

From the above example we learn that you begin with the code whose content you are most interested in. **Overlap Operators**

The overlap operators describe quotations that overlap one another:

**Quotations overlapping at start:** A OVERLAPS B retrieves all quotations coded with A that overlap quotations coded with B.
Quotations overlapping at end: A OVERLAPPED BY B retrieves all quotations coded with A that are overlapped by quotations coded with B. If you are interested in data segments coded with "Happiness: effect of wanting children" that co-occur with "hard work but," you click: "Happiness: effect of wanting children," "hard work but" COCCUR. If you want to read the "hard work but" segments, you enter the query the other way around, i.e. starting with the "hard work but" code.

The Co-occurrence Operator

Often when interested in the relation between two or more codes, you don't really care whether something overlaps or is overlapped by, or is within or encloses. It this is the case, you simply use the Quotation cooccurrence operator. Co-occurrence is essentially a short-cut for a combination of the proximity operators discussed above, plus the operator AND (all). AND is a Boolean operator, but also finds cooccurrence, namely if coded segments overlap 100%.

![Figure 132: Example of a quotation cooccurrence query](image)

The query shown in Figure 132 retrieves all quotations coded with '#fam: 3 or more children' that cooccur with quotations coded with codes in the code group 'Sources of happiness' in whatever way. The more general cooccurrence operator is quite useful when working with transcripts. In interviews, people often jump back and forth in time or between contexts, and therefore it often does not make much sense to use the very specific embedding or overlap operators. With other types of data they are however quite useful. Think of video data where it might be important whether action A was already going on before action B started or vice versa. Or if you have coded longer section in your data like biographical time periods in a person's life and then did some more fine-grained coding within these time periods. The WITHIN operator comes in very handy in such instances. The same applies when working with pre-coded survey data. ATLAS.ti pre-codes your questions, followed by manual or further selected auto coding. This enables you to ask for instance for all quotations coded with "topic x" WITHIN "question 5."

Adjacency Operators

The distance operators describe a sequence of disjointed quotations.

Quotations following quotations: A FOLLOWS B retrieves all quotations coded with A that follow quotations coded with B.

Quotations preceding quotations: A PRECEDES B retrieves all quotations coded with A followed by quotations coded with B.

When selecting any of the two operators, you can specify a maximum distance. Possible base units are characters and paragraphs for text, milliseconds for audio files, frames for video data and pixels for images.

Simple Retrieval In The Code Manager

Full quotation preview:
Select a code in the Code Manager. The full content of all quotations is shown in the preview area at the bottom of the main window:

![Figure 133: Preview quotations by code in the Code Manager](image)

Figure 133: Preview quotations by code in the Code Manager

View quotation in context:

- Select a code in the Code Manager. If not opened, open the inspector on the right-hand side of the Manager. All linked quotations are listed in the bottom pane of the inspector.
- Click on the right-arrow to view each quotation in context.

![Figure 134: Simple Retrieval, access of quotations via Link section in inspector](image)

Figure 134: Simple Retrieval, access of quotations via Link section in inspector

OR

- Open the Code Manager and double-click on a code. The list of quotations coded by this code opens. Click on a quotation to view it full length and in context.
Simple Retrieval In The Quotation Manager

- Open the Quotation Manager.
- Select a code in the navigator on the left-hand side. This filters the list of quotations and only those quotations linked to the selected code are shown. Click on each quotation to view its content in the preview pane at the bottom.

To view the quotations in context, make sure that the Quotation Manager stays on top by selecting the pin (top right). Double-click on each quotation to view it in context.

Simple Boolean Queries In The Quotation Manager

The simple retrieval option in the Quotation Manager can be extended to include also more than one code:

- Open the Quotation Manager. At the bottom of the screen you see a VENN diagram. You can set it to AND (= All must apply) or OR (any selected apply).
- Select two or more codes holding down the cmd key.
Boolean operators are explained in detail on page 97.

Figure 137 shows the result of an example AND query. The two codes 'fam: have children' and 'fam:t-teenagers' have been selected holding down the CMD key. The quotation list displays the resulting 6 quotations that contain all comments written by parents of teenage kids.

The quotation content is displayed in the bottom pane.

Figure 137: Running an AND query in the Quotation Manager
Querying Quotations

Those who are familiar with ATLAS.ti 7 for Windows, this is more or less equivalent to using the Query Tool. The Mac version however offers many more options to ask questions about your data. In addition to using the three group of operators (Boolean, semantic and proximity operators), you can combine a code-based search with a text search, or only search for a particular set of quotations that has comments or hyperlinks, or has been modified by a particular author, and so on. In addition, the “Grouped by” option allows you to view results by groups, which allows for an additional layer of analysis (see “Grouping Quotations” on page 52.

The following operations are available:

**Quotation attributes**:
- The options in the first block allow you to search for specific aspects of your quotations or for particular words contained in a quotation (text content), or for particular words in the quotation name (Name)

**Time stamp / User**:
- The time options allow you to query for creation and modifications dates or for the user that has created or modified a quotation

**Linkages**:
- In the next group you find options related to the type of objects a quotation can be linked to like codes, other quotations, memos or documents.

This is followed by the three groups of standard operators. For a detailed description see here: “Overview Of Main Sets Of Operators" on page 97.
Building A Query In The Quotation Manager

Sample Project

The examples presented below are based on the "Children and Happiness" project.

You can download the project file [here](#).

If you are not yet familiar with this sample project, here is a short description: The idea for this project was sparked by a journal article that summarizes relevant literature on the relationship between happiness and having children. The results based on statistical analysis show a negative correlation between measures of happiness and having children. This was picked up by a person writing a parenting blog and she posted it on her blog. The *New York Times Magazine* also published a long article about it. In turn, numerous people commented both on the blog and on the NYT article. These comments comprise one major part of the example project, and we can examine the reaction of readers being confronted with the statement: Children make you unhappy. As the documents contain responses from many different individuals, respondent characteristics like family status or gender have been coded.

Furthermore, the project also contains fictional survey data imported via an Excel spreadsheet. The survey data contain answers from 24 respondents to two open ended questions: Reasons for having and for not having children. As imported survey data in ATLAS.ti is case-based, the demographics of the respondents are represented by document groups.

Building Queries

General Principles

You start building any query by selecting the filter icon and adding one or more rules by clicking on the + button:

- Open the Quotation Manager and click on the filter icon.
- Click on the + button to begin adding rules.

To remove a rule, click on the minus (-) button.

To clear a query click on the (-) minus button.

All quotations that result from a query are displayed below the query and can be exported with a click on the Export button (see left). See also "Data And Project Export" on page 136.
If you are familiar with building queries in ATLAS.ti Windows, or work in a team and have to understand how it works in both the Mac and the Windows version: Building queries in the Mac version works exactly the opposite way as in the Windows version. The examples below illustrate this. Queries in the Windows version are entered in RPN Notation (Reversed Polish Notation). In the Mac version querying builds on the accustomed search routine implemented on Apple computers.

**<OR> Query In ATLAS.ti Windows**

You build an OR query in the Windows version as follows:
1. Double-click on Code A.
2. Double-click on Code B.
3. Select the operator OR.

**<OR> Query In ATLAS.ti Mac**

**Option 1:**
1. Set the rule in the first line to ANY.
2. Click on the + button to add a new line (= rule).
3. Select is "coded with", enter Code A into the third field.
4. Click on the + button to add a new line (= rule).
5. Select is "coded with", and enter Code B into the third field.

**Option 2:**
1. Set the rule in the first line to ALL.
2. Click on the + button to add a new line (= rule).
3. Select the operator "OR: Any of the following are true". Two new lines are added automatically.
4. Enter Code A and Code B into the third field of these two lines receptively.

![Figure 140: Simple OR query in ATLAS.ti for Mac](image1)

**A More Complex Query In ATLAS.ti Windows**

In order to illustrate further that you have to approach building a query in the Mac version in the opposite way as compared to the Windows version, here is a more complex example:

("blog entry" ENCLOSES ("effects of parenting: negative" | "effects of parenting: positive"))

This query finds all quotations where respondents write about both positive and negative effects of parenting in the same blog post.

1. Double-click on code family "effects of parenting: positive"
2. Double-click on code family "effects of parenting: negative."
3. Double-click on the code "blog entry". Click on the button $S$ to swap the two terms.
4. Select the operator "ENCLOSES".

**A More Complex Query In ATLAS.ti Mac**

The same query in the Mac version looks as follows:

![Image of a complex query in ATLAS.ti Mac]

- Start by selecting the enclosing operator **QUOTATIONS ENCLOSEING QUOTATIONS**.
- Next, enter the code **blog entry**.
- Then an embedded rule needs to be added by clicking the **EMBED RULE** button and selecting the **OR** operator.
- Lastly the two code groups **effects of parenting: positive** and **effects of parenting: negative** are added.

On the following pages, a step-by-step instruction for a number of query options is provided in order to show by way of example how to build queries in the Mac version. As the possibilities are too numerous to show them all, the emphasis is on teaching you the logic behind building queries, so that you can transfer this knowledge after a bit of practicing to your own projects.

**Finding Quotations Coded With Two Or More Codes (OR)**

- Click on the filter icon to start the query.
- For an OR query you can simply change the first line to "any" and add the codes that are you interested in.
- Click on the plus sign and select "is coded with" "Code", then select a code.
- Repeat this for the second code.

![Image of another query example]

**Finding Quotations Coded With Codes Of A Code Group Containing A Particular Word**

- Click on the filter icon to start the query.
Set the first line option to "all".
Click on + and select "is coded with".
Click on the drop down arrow in the second field and select: "Code of Group".
In the third field, select the code group. Click on + to add a new line.

As operator select "Text content". In the third field enter a word or phrase that should be contained in the quotation of the selected code group. The search can be case sensitive. Activate this option if desired.
Apart from "contains", the text search can be restricted to the beginning or end of a quotation. If you select "is", the quotation needs to be exactly the same as the entered search term.

Finding Quotations Coded With Cooccurring Codes

The result of a query in the Quotation Manager are always quotations. As the overlap of two co-occurring quotations is in most cases not a quotation (exceptions are AND occurrences), the result list will give you the quotations of the first code entered, here: all quotations coded with #fam: have children.

Click on the filter icon to start the query.
Set the first line option to "all". Click on + to add a new rule.
Select the operator "Quotation Cooccurrences". Two new lines are added automatically.
Select a code, here: "fam: have children" and "children: >happiness".

The 18 resulting quotations are coded with the code "#fam: have children" and within or somewhere overlapping are quotations coded with "children: >happiness". If you want to focus your reading on the quotations coded with "children: >happiness", you need to enter the query the other way around:
When using proximity operators, the order of the codes may also have an effect on the resulting number of quotations. As you can see in Figure 145 and Figure 146, starting the query with "#fam: have children" results in 18 quotations; starting with the code "Children->happiness" results in 19 quotations. For more detail, read the section: “Proximity Operators” on page 99.

Finding Quotations Coded With A Selected Code Restrieted To A Document Group

1. Click on the filter icon to start the query.
2. Set the first line option to "all". Click + to add a new rule.
3. Select the operator "is code with" / "code". Select a code in the third field. Click + to add the next rule.
4. Select the operator "is in document".
5. Change the second field to "Documents of group" by clicking on the drop-down arrow.

If you now want to check what other attributes apply to the 7 quotations, change the Grouped by option to "Grouped by Document Groups" as shown in Figure 148.
Finding Quotations Coded With A Selected Code Restricted To Two (Or More) Document Groups

Let's assume you are interested in the quotations of the code "reasons for not having children: self-centeredness" in direct comparison between females and males. If you want to find all quotations of this code for both male and female (survey) respondents as in this case, the query needs to be clicked as follows:

1. As view option select "Grouped by Document Groups" at the top of the window.
2. Click on the filter icon to start the query.
3. Set the first line option to "all". Click on the + sign to add the next line.
4. Select the operator "is coded with" / "code". Select a code in the third field. Click + to add a new rule.
5. Select the operator "OR: any of the following is true". This automatically adds two further lines.
6. In each line select "is in document" and then set the second field to "Documents of group". Select the desired document group, here "Gender::female" and "Gender::male" in the third field.
7. Scroll the result pane to see the quotations of the two groups Gender::female and Gender::male.

Combining the various filter and grouping options available turn the Quotation Manager into a very powerful query tool.

Query With Embedded Terms

Queries can be as simple or as complex as you like them to be. For most users it might be sufficient to build queries with two codes or code groups. To get used to the query logic, we recommend that you start with those simple queries and over time you will feel also
be comfortable to click more complex queries. Below a few query examples are shown that use embedded terms.

EXAMPLE 1

**Based on the Children & Happiness project, the following question can be asked:** Identify those respondents who wrote a comment on the two blogs in the project and explained the research findings with self-delusion or having wrong expectations. Let’s do this step-by-step:

**Codes needed:**

![Figure 150: Codes needed for example query: embedded rule](image1)

We need to start with the #blog entry code, as its quotations enclose all quotations related to study design:

1. To start the query, click on the filter icon. Set / leave the first line option to "all".
2. Click + and select the operator "Quotations enclosing quotations". Two new lines are added.

![Figure 151: Start the query by selecting the Enclose operator first](image2)

3. Select the code "#blog entry" in the first line.
4. Next we need to embed an OR term: Click on the embed rule button and select the operator OR:

![Figure 152: Adding an Embed Rule](image3)

5. Select the codes "ex: self-delusion" and "ex: wrong expectations" to fill in the arguments for the OR query:
ATLAS.ti found 13 quotations that match this query.

EXAMPLE 2

The aim of the next query is to find all quotations coded with any of the codes in the code group "sources of happiness" of those respondents who also wrote something about reasons for having children in the same blog comment. In a second step, the query results are further filtered by document groups.

1. To start the query, click on the filter icon. Set / leave the first line option to "all".
2. Click + and select the operator "Quotations cooccurrence".
3. Two new lines are added. Change the second field to code group and select the group "Sources of happiness".

Click on the Embed Rule button and select the operator "Quotations enclosing quotations".

Two new lines are added. In the first line select the code "blog entry".

Change the second field in second line to code group and select the group "reasons for having kids".

The query result shows 18 quotations. If you now group the results by document groups, it can for instance be seen which of the quotation is contained in documents where respondents write negatively or positively about the effects of parenting. If you work with interview data, your document groups are likely to represent demographics characteristics like gender and you may want to compare female and male respondents, age groups, geographic locations, or any other characteristic you are interested in.
Figure 156: Results of the embedded query sorted by document groups
Working With Smart Codes

Smart codes are a convenient way to store queries. They are very similar in look and feel to normal codes, with one important difference: Instead of “hardwired” connections to quotations, smart codes store a query to compute their virtual references whenever needed. They “automatically” change their behavior during the course of theory building. If you have a smart code based on a query like

(Code A | Code B) COOCCUR Code C

and you add or delete quotations linked to either Code A, B or C, then the quotations linked to the smart code will automatically be adjusted.

Smart Codes can be selected in a code list (either in the Code Manager or the navigators) like any other code and they will display their quotations in an identical way. They can be recognized by the filled icon (see left). The list of quotations associated with a smart code can be displayed with a double-click, just as for any other code.

Smart Codes are not displayed in the margin area and as they are stored queries they can not be used for coding.

Smart Codes can, however, be added to code groups, to networks, and, last but not least, as powerful operands in other queries, allowing you to incrementally build complex queries.

Video Tutorial: ATLAS.ti Mac: Smart codes
Creating Smart Codes

To create a new smart code, select **Code / New Smart** from the main menu. Enter a name for your smart code and click **Create**.

This opens the smart code editor where you can define the conditions for your smart codes. Please review the section "Building Queries" on page 106 for instructions on how to build queries. In the Smart Code Tool the same principles and rules apply. Below an example is shown where first a smart code is created in order to use it in other queries.

**EXAMPLE 1: USING PROXIMITY OPERATORS**

**Question:** Do parents who report positive aspects of parenting also talk about negative aspects?

**Codes needed:**
- #fam: have children
- code group: effects parenting: negative
- code group: effects parenting: positive

To find an answer to this question, we first create a smart code that contains all comments on positive effects of parenting written by those who have children. In a second step, creating a second smart code that uses the first one, we look for all comments by parents who write something positive and negative.

1. Open the smart code editor: **Code / New Smart Code**. Enter a name, e.g. "##parents who report pos effects of parenting" and click **Create**.
2. Leave the first line option to "all".
3. A line for the first rule is already open. Change the operator to "Quotation cooccurrence". Two new lines are added.

   ![Figure 159: Smart code example 1: step 1](image)

4. Select the code "#fam:have children" in the first line. In the second line, change the second field to "Codes of group" and select the code group "effects of parenting:positive".

   ![Figure 160: Smart code example 1: creating the first smart code steps 2 to 4](image)

As we want to find statements about negative aspects of parenting within the same response, we need to start the query with the code ‘#fam: have children’. This quotation covers the full comment that the person has written (see "Proximity Operators" on page 99).

5. Close the smart code editor.
Open the smart code editor again: **Code / New Smart Code**. Enter a name, this time: "## parents who report both pos and neg effects of parenting". Click **Create**.

Next we look for statements about negative effects of parenting that occur within the comments that also include a positive effect:

![Figure 161: Smart code example 1: Creating the second smart code steps 1 to 4](image)

Select the operator "Quotations enclosing quotations". Two lines are automatically added.

In the first line, select the smart code "##parents who report pos effects of parenting".

In the second line change the second field to "Codes of group" and select the code group "effects of parenting: negative".

This results in a total of 5 quotations.

You may have noticed that the smart code name begins with two hash signs (##). As the codes are sorted in alphabetic order, this pushes the codes on top of the code list. Otherwise they "disappear" in the list of all other codes. They are recognizable by the filled-in code icon. You may also add a color (here: bright green) to recognize them easier. Another option is to add them to a code group (here: *smart codes) for quick access. The effect of the asterisk * in the code group name is that the code group 'smart codes' is on top of the list.

Another option is to use the "Grouped by:" option to sort the code list by smart codes.

![Figure 162: Quick access to smart codes](image)

**EXAMPLE QUERY 1: USING AN EMBED RULE**

Without the in-between step creating the smart code "##parents who report pos effects of parenting", the question can also be answered by building just one smart code. In order to do this, an "embed rule" needs to be used (see also "Query With Embedded Terms" on page 111.

Given example 1, one needs to start with the "enclosing operator", which needs to *embed* the following rule: #fam: have children COOCCUR with code group 'effects of parenting: positive'. The second term for the enclosing operator is the code group 'effects of parenting: negative'. Let's do this step-by-step:

1. Open the smart code editor: **Code / New Smart Code**. Enter a name, e.g. "##parents who both report pos effects of parenting EB" and click **Create**.
2. As operator select "Quotations enclosing quotations". Two new lines are added automatically.
Click on the embed button at the end of line one and select the operator "Quotation cooccurences"

In line three, the operator "Quotation Cooccurences" is added and two new lines are added automatically.

Next, select the two terms that should cooccur: the code "#fam: have children in the first line, and the code group "effects of parenting: positive in the second line. Remember to change the second field to "Codes of group".

For the second enclosing term, set the second field to "Codes of group" and as code group select "effects of parenting: negative".

If you think this is still too difficult, as you have to think through the entire query before you start clicking, use the two step option described above. With a bit of practice, formulating embedded queries probably becomes easier.

**EXAMPLE 2: COMBINING BOOLEAN AND PROXIMITY OPERATORS**

**Question:** Identify those respondents who wrote a comment on the two blogs explaining the research findings with self-delusion or having wrong expectations (see also "Query With Embedded Terms / Example 2" on page 113).

Let’s do this step-by-step again before we show you how to put it all in one query using an embedded rule:

**Codes needed:**

We first need to find all statements coded with "ex: self-delusion" and "ex: wrong expectations":

---

ATLAS.ti Mac – User Manual
Open the smart code editor: Code / New Smart Code. Enter a name, e.g. "##explanation: self-delusion or wrong expectations" and click Create.

As operator select "OR: Any of the following is true". Two new lines are added automatically. Select the codes "ex: self-delusion" and "ex: wrong expectations" in line 1 and 2 respectively.

Close the Smart Code editor.

Open the smart code editor again: Code / New Smart Code. Enter a name, e.g. "##blog comments: ex_self-delusion or wrong expectations" and click Create.

As operator select "Quotations enclosing quotations". Two lines are added automatically.

In line 1, select the code "**blog entry", in line 2, select the smart code "##explanation: self-delusion or wrong expectations":

Close the Smart Code Editor.

EXAMPLE QUERY 2 USING AN EMBED RULE

As in example 1, this query can also be solved by creating just one smart code. In order for this to work, an embed rule needs to be used again:

Open the smart code editor: Code / New Smart Code. Enter a name, e.g. "##smart code example 2: using embedded rule" and click Create.

As operator select "Quotations enclosing quotations. Two lines are added automatically.

In the first line, select the code "**blog entry"

At the end of the second line, click on the embed rule button and select the operator "Or: Any of the following are true"
The OR operator will be inserted on line 3 and two new lines are added. Select the codes "ex: self-delusion" and "ex: wrong expectations" as arguments for the OR query.

As above, the number of resulting quotations is 13.

**Editing Queries**

If you want to modify a query, open the Code Manager and right-click on a smart code. Select the option **Edit Query**.
Code Cooccurrence Table

You find the Code Cooccurrence Table under the Analysis menu. In Figure 172 below you see an example query comparing the answers provided by respondents with and without children (column codes) with regard to a number of different issues (row codes):

The operators that are used to calculate code cooccurrences are enclosing / being enclosed / overlapping at start / overlapping at end / All of the following are true. For further information on these operators see "Proximity Operators" on page 99.

To create a table as shown in Figure 172 select column and row codes on the left-hand side by ticking the boxes in front of the codes. The table fills in automatically when selecting row codes. The first number is the number of hits – how often do the code and column codes co-occur; the second number is the c-coefficient (see below for further information).

Setting Filters

It is also possible to filter the list of codes that you want to select from. To do so, click on the Filter button and then on + to create the filter you want. Below two examples are shown.
Figure 175 shows all available options to create a filter in the Code Coccurrence Table. For a detailed explanation of Boolean and semantic operators (last two sections), see “Boolean Operators”, page 97, and Proximity Operators, page 99.

What Is Displayed

Currently both, number of hits and c-coefficient are displayed. In the future, you will be able to choose which number(s) you want to see. The c-coefficient only makes sense and can be meaningfully interpreted with specific type of data and higher case numbers.

Click on a cell in the table to view the resulting quotations in the two panes at the bottom. Double-click to access a quotation in context.

 Viewing Results In Context

In order to interpret these findings, you also need to go back to the data and read what exactly these respondents have been writing. This can be done by clicking on the quotations for the row codes in the Code Coccurrence table.
The Code Cooccurrence Table can be exported to Excel. You find the export option at the bottom right of the table. The Excel table currently will contain the absolute frequency counts only.

Export

Currently the output option consists of exporting the frequencies in form in XLS / CSV (Excel) or ODS (Open Office Calc) format; other options like a full report of all cooccurring quotations will follow.

The C-Coefficient

The calculation of the c-coefficient is based on approaches borrowed from quantitative content analysis. Thus, interpreting such a coefficient is only meaningful with a sizable data set and not for an interview study with 10 respondents.

The c-coefficient should vary between 0: codes do not co-occur, and 1: these two codes co-occur wherever they are used. It is calculated as follows:

\[ c = \frac{n_{12}}{n_1 + n_2 - n_{12}} \]

whereby \( n_{12} \) is the co-occurrence frequency of two codes \( c_1 \) and \( c_2 \), whereby \( n_1 \) and \( n_2 \) are their occurrence frequency.

What you may experience is the following:

Out of range. The C-index exceeds the 0 - 1 range it is supposed to stay with.

Colored circles. Cells can have additional visual cues, e.g., a red, yellow or orange circle.

Out Of Range

The c-index (structurally resembling the Tanimoto and Jaquard coefficient, which are similarity measures) assumes separate non-overlapping text entities. Only then can we expect a correct range of values. However, ATLAS.ti’s quotations may overlap to any degree.
Case 1: Two differently coded quotations overlap, we assume no more quotations available. Let P1 be a textual document, q1 and q2 be quotations and a,b be codes. q1 is coded with a, q2 is coded with b.

Using the formula: \( c = \frac{n_{ab}}{n_a + n_b - n_{ab}} \), we get:

- \( n_{ab} = 1 \) one co-occurrence of a and b
- \( n_a = 1, n_b = 1 \) a and b each code exactly one quotation.
- \( c = \frac{1}{1 + 1 - 1} = 1 \)

Such a scenario results in the maximum co-occurrence of 1!

Case 2: q1 is coded with both codes a and b, the overlapping quotation q2 is coded with b.

\[ n_{ab} = 2 \]
\[ n_a = 1, n_b = 2 \]
\[ c = \frac{2}{1 + 2 - 2} = 2!! \]

This results in a value of twice the allowed maximum. Thus, the C index is not appropriate to correctly represent co-occurrence in redundantly overlapping texts. If the c-coefficient exceeds 1, you need to do some cleaning up and eliminate the redundant codes.

Color Indicators

Red circle: When the c-index exceeds 1 (see “Out Of Range”).

Yellow circle: An inherent issue with the C-index and similar measures is that it is distorted by code frequencies that differ too much. In such cases the coefficient tends to be much smaller than the potential significance of the cooccurrence. For instance, if you had coded 100 quotations with code "depression" and 10 with "mother" and you had 5 co-occurrences:

\[ n_{dep} = 100, n_{mother} = 10, n_{dep-mother} = 5 \]
\[ c = \frac{5}{100 + 10 - 5} = \frac{5}{105} = 0.048 \]

A c index of only 0.048 may slip your eye easily, although code "mother" appears in 50% of all its applications with code "depression." Looking from code "depression" only 5% cooccur with code "mother."

If the ratio between the codes frequencies exceeds a certain threshold (currently 5) the yellow light goes on in the cell. So whenever a cell shows the yellow marker it should invite you to look into the co-occurrences of this cell despite a low c-index.

Orange Circle: The orange circle is simply a mixture of the red and yellow conditions.
Code Document Table

The table contains either a frequency count for each code or code family per document or document family, or a word count of the coded segments per code and primary document.

The table can either show absolute or relative counts; optionally you can select to display row and column totals. And it is possible to switch the orientation of rows and columns similar to the Pivot option in Excel.

To open the tool, select **Analysis / Code Document Table** from the main menu.

**Example Query**

A useful application is a comparison across different groups of documents for a particular category of codes. Thus, you are likely to create such a table if you have a certain question in your mind. This will guide you to create the code and document groups you need to construct your query. Based on the Happiness Stage II project that can be downloaded from our website: [Download](#).

We can compare for instance the view of males and females regarding their attitude about parenting or reasons for having or not having children. For this purpose, the four code groups on effects of parenting and reasons for having / not having children were selected and the two document groups gender::female and gender::male.

The table can be exported to Excel.
Relative Counts

Relative counts are often more meaningful than absolute counts, especially if groups size is unequal. The current implementation offers a percentage relative to the total number of quotations for the selected code or code group.

For instance, negative effects of parenting (first row in Figure 181) has been mentioned in 19.23% of the quotations of all female respondents, as compared to 31.82% of all male respondents. The issue overall makes up 25% of the total number of quotations in the data set.

The four selected topics contribute to 92.31% of the coding for female respondents and to 90.91% of the codings for male respondents.

Figure 181: Code Document table displaying relative frequencies
Querying Codes

Open the Code Manager and click on the filter icon.
Click on the + button to begin adding rules.

For codes, the following query options are available:

- Code attributes
- Time stamps / user
- Linkages: links to quotations, memos, code groups, used in a selected document
- Boolean operators
- Semantic operators

The results of a code query are always codes.

**Code Query Combined With The "Grouped By" Option**

As has been described for quotations, this can also be combined with the "Grouped by" option. Figure 183 shows a query for all codes of the code group *reasons for having kids* grouped by document groups that represent various educational levels.
Finding Codes Linked To A Quotation Query

A code query can also be combined with a quotation query – however different from a quotation query, the results are codes, namely those linked to the quotations that would come up as a result of the quotation query. This is how it works:

You select the **LINKED WITH** option plus the option **QUOTATIONS OF QUERY**. In the next step you enter the quotation query as has been explained above. The query options are the same as available in the Quotation Manager, see Figure 138 on page 105.

![Code query combined with a quotation query](image183.png)

**Figure 183: Code query combined with a "grouped by" option**

![Code query combined with a quotation query](image184.png)

**Figure 184: Code query combined with a quotation query**
Endless Possibilities

The possibilities are endless. If you were to click on the *is coded with* button, the whole range of quotation operators is at your disposal again. The following example (Figure 185) shows a code query that asks for all codes that are linked to quotations that contain the word *happiness* and occur in document *Rubin’s happiness project*.

![Code query interface](image)

*Figure 185: Endless options to query your data*

Instead of *Is in Document*, you can also select *Is in Document Group* or *Is in Document of Query*... and follow up by entering a document query, and so on.
Querying Memos

1. Open the Memo Manager and click on the filter icon.
2. Click on the + button to begin adding rules.

For memos, the following query options are available:

<table>
<thead>
<tr>
<th>Memo</th>
<th>Memo attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td></td>
</tr>
<tr>
<td>Comment</td>
<td></td>
</tr>
<tr>
<td>Has Comment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Creation date</th>
<th>Time stamp / user</th>
</tr>
</thead>
<tbody>
<tr>
<td>Created by</td>
<td></td>
</tr>
<tr>
<td>Modification date</td>
<td></td>
</tr>
<tr>
<td>Modified by</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Linked with codes</th>
<th>Linkages: to codes, quotations, memos and memo groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linked with quotations</td>
<td></td>
</tr>
<tr>
<td>Linked with memos</td>
<td>Is in group</td>
</tr>
</tbody>
</table>

| OR: Any of the following are true |
| Exact: one of the following is true |
| AND: All of the following are true |
| NOT: None of the following are true |

Boolean operators

Figure 186: Query options for memos

As for quotations and codes, the results of a memo query are always memos.

When selecting Linked with Code, further options are Codes of group and Codes of query. If you select Codes of query, all query options for codes become available.

Similarly, if you select Linked with Quotations, you can also select Quotations of Query. In the latter case, all query options for quotations are at your disposal.
Querying Documents

- Open the Document Manager and click on the filter icon.
- Click on the + button to begin adding rules.

For documents, the following query options are available:

- **Document attributes and content**
- **Time stamp / User**
- **Linkages: document groups, quotations, codes**
- **Boolean operators**

The results of all document queries are documents. Figure 188 shows as example an AND query. The aim was to retrieve all documents from married female respondents.

![Figure 187: Query options for documents](image-url)

![Figure 188: Example document query](image-url)
Project Explorer

The ATLAS.ti Project Explorer provides a tree view of all objects in your project and their links. More specific views are provided by the Code Forest and Code Tree (see page 93).

The main purpose of the Project Explorer is to serve as a hierarchical content table, which may be used to navigate between the different parts of your project. Unlike the "pure" Object Managers that display only one type of object, the Project Explorer allows an integrated and structured display of all heterogeneous objects that make up an ATLAS.ti project. These are: documents, quotations, codes including smart codes, memos, groups including smart groups, and networks. The display, though, is not strictly hierarchical. You will notice some redundancy when expanding the tree view. For instance, quotations are listed under each document. As documents can also be members of document groups, their quotations appear there as well.

The Project Explorer can be launched from the main menu by selecting **Tools / Project Explorer**:

You can expand and collapse the branches of the Project Explorer tree. If a branch can be expanded, an arrow is displayed to the left of the object. Expanded branches are indicated by a down arrow. You can expand or collapse a branch with a mouse click on the arrows. Below a partly expanded branch for a memo is shown.

Expanding the **Documents** branch displays the documents; expanding this branch displays quotations, expanding those displays codes, memos, and other associated quotations.
Expanding the Codes branch displays all codes and their connections to other codes. Following the code names, the semantic relation connecting the code with its parent code is shown.

Each code appears at least once. This means that all codes are listed directly under the "Codes" branch, but may also appear further down in the sub branches if they are connected to other codes. The order in the branch and sub branches is determined by the kind of relation you have used. If a directed, i. e. a transitive relation like the <is a> relation was applied, codes are displayed hierarchically: the target code becomes the higher order code and the source code(s) the lower order code(s).

When using symmetric relations, the codes appear in at least two places since the direction/causal relation cannot be determined. See "Why Symmetric And Asymmetric Relations Cannot Be Used In A Hierarchical Code System" on page 95 for further information.

Memos linked to codes are displayed under the code branch as well.

Expanding Smart Codes allows access to the various parts of a query. Below you can see the expanded branch for the Smart Code "(+) blog entry COOCCUR Effects of parenting: positive" (see figure Figure 193). To edit the smart code, right-click the smart code and select Edit Query.

Expanding the Memos branch displays all memos and then the memos associated with other memos. On the next level, all associated codes or quotations are shown.

When expanding the Group branches, on the first level all existing groups are shown. On the next level, all members are displayed. Below the members, all objects that are usually associated with the type of object can be expanded (i. e., as described above: quotations underneath documents, codes connected to other codes, and so on).

In case you have created Smart Groups, the operators of the query are also shown. When expanding the branch of a group that is part of the query, the corresponding group members are shown.
Expanding the **Network Views** branch shows the existing networks on the first level, and all objects contained in the Network Views on the next level. On the levels below, all other linked objects are displayed.

All codes displayed in the Project Explorer can be used for drag & drop coding. Documents, codes, and memos can be dragged onto a group name in the Group Managers and are assigned to the group.

### Double-click Actions

- When double-clicking on a document, it is loaded
- When double-clicking on a quotation, it is highlighted in context.
- When double-clicking on a code, a list of quotations pops up. If only one quotation is associated with the code, it is highlighted in context.
- When double-clicking on a memo, its content is displayed.
- When double-clicking on a group, the group manager is opened.

### Using The Project Explorer For Coding

Drag & drop coding works from within the Project, Code Forest and Code Tree. In the Project Explorer, you can use the codes under the Codes tree or under the Code Groups tree. This way you can utilize the structure you have created via code-code relations (see "Error: Reference source not foundError: Reference source not foundLinking Nodes In Networks") or via code groups (see "Working with Groups").

### Renaming Objects

All objects, excluding the top-level entries like the name of the project, the container entries "Documents", "Codes", "Memos", etc., can be renamed using the "in-place" technique. Or you can rename them in the inspector.

### Context Menus Of Objects

Each object in the Project Explorer has a secondary menu. These menus can be accessed in the usual manner with a right mouse click. This selects the object, if not already selected, and opens the secondary menu, which offers a few selected object-specific operations.
Displaying And Editing Comments

To edit an object’s comment,

- Select an object and edit the comment that is displayed in the inspector.
Data And Project Export

Video tutorial: ATLAS.ti Mac-Reports in Word

Export As Report (Word/PDF)

You find an export button in each of the managers (object managers and group managers). If you click on the Export button and open the drop-down menu, you can select between Export as Table and Export as Report. If you want to create Word or PDF reports:

The first step is to select what you want to export in form of a report. The report contains all items listed in the manager.

If you want to create a report of selected items, either select the items you want in the list, or set a filter. This means, you either select an item in the navigator, e.g. a code in the Quotation Manager or a code group in the Code Manager, on the left hand side, or by clicking on the filter button. Filtering the items in the list means you formulate a query, e.g. all quotations coded with codes of a particular code group; or all quotations containing a particular word.

For a step-by-step instruction, see the following sections: “Querying Quotations” on page 105, “Querying Codes” on page 127, “Querying Memos” on page 130, or “Querying Documents” on page 131.

Next click on the drop-down menu of the Export button and select the option: Export as Report.

A preview window opens. It shows the list of items as contained in the manager. On the right-hand side, you can make further selection to extend the content included in the report. Further you can specify how the items should be grouped in the report.
The preview above contains quotation names of the code "ex: self-delusion" and was created by the user “ATLAS.ti team” in April 2016. This information is contained in the report header on top.

In order to include the full quotation content, select content on the right-hand side under Report Options. The preview changes and now also shows the full quotation content:

If you want the report to contain more detail, you can continue to select more options. All options with an arrow in front of them can be extended further and more options become available. In the addition to the quotation name and content, the preview in Figure 197 below also shows the other codes linked to the same quotation, the creating and modifying user & date, the list of documents where these codes are contained and the linked codes:
Figure 198 shows about half of the options available for creating reports for quotations. Basically, you are pretty much free in building the kind of report that you want and need for various purposes.

After you have made your selection and checked it in the preview, click on **Save** or **Print**. The Print option allows you to save the report in PDF format as well. When you select the Save option, you can save the report in doc, docx or odt format (Figure 199).
Sample Quotation Report Using Grouping

The sample report should contain all quotations that are coded with codes of the code group "effects of parenting" that contain the words "joy" or "stress". The first step is to click the query as shown in Figure 200. For more details on how to click quotation queries, see page 105.

Next, click on the Export button and select EXPORT AS REPORT from the drop-down menu. In the report header, the filter is spelled out in words:

Figure 201: Sample report preview showing filter in header

Figure 202 shows the report including quotation content grouped by codes. In addition it was selected to also show the code comments:
Sample Code Report

The following code report preview shows:
- All codes included in the code group "Study Design" + code comments
- Grouped by documents + document comments
- Plus the coded quotations for each code and their content

Video Tutorials:
- ATLAS.ti Mac: Creating a Output of the Codebook
- ATLAS.ti Mac: Creating Outputs of All Objects
Export As Table (Excel)

You can export the content of all four managers (document, quotation, code and memo) to Excel or OpenOffice Calc. If you no make no selection, all items are exported. If you only want to export selected items, you need to filter the content of the managers. The simplest option is by selecting a group in the navigator and possibly combine it with a “grouped by” view; or you formulate a more complex query by clicking on the filter icon (see left).

Click on the Export icon. Enter a file name or leave the default name. Select a location for the file and chose the desired format.

Figure 204: Exporting the content of managers to Excel / Open Office Calc

Video Tutorials:
- ATLAS.ti Mac: Output of quotations by code
- ATLAS.ti Mac: Outputs in Excel of Document Information

Exporting The Entire Project (XML/HTML)

You find an output option under the main menu of each entity type: Document, Quotation, Code, Memo and Network.

Currently, all output options refer to the entire project. You cannot for instance, export quotations of just one code. Such reports will, however, be implemented soon.

Below a few output options are shown as examples:

DOCUMENT / OUTPUT / LIST OF DOCUMENT GROUPS AND THEIR MEMBERS
Quotation / Output / Quotations by Code

Also feel free to try other output options, such as

- Codes / Output / Code book
- Codes / Output / List of Codes by Document
- Memos / Output / Memos with Content and Linked Quotations
- Network / Output / List of Code-Code Links with Comments

etc.

Video Tutorials:
- Creating output based on the entire project
- ATLAS.ti Mac: Creating a code book

Export Documents With Codes

You can print the documents with the codes on the right-hand side as you see it on your screen. The report creates a WYSIWYG printout of coded documents (What You See Is...
What You Get). Instead of printing the document, you can also save it as PDF file, mail the PDF file or add it to iBooks, etc. See Figure 207 for available options.

The print documents with codes option is available for textual primary documents, PDF and image documents.

The printout resembles the screen display at the time of creating the output. Only those margin objects are included that are currently displayed in the margin. If not everything that you want to be visible is included, adjust the margin area. To change the type of objects that are displayed, right click on a white space in the margin area to open the context menu and select the objects to be included in the output.

- Load the primary document that you want to print.
- Select PROJECT / PRINT from the main menu.

The printer dialogue window opens. Select Show Detail to see all option as shown in Figure 207. Make your choices. Select landscape view if your codes spread over several columns. If you change the settings the preview adjusts automatically. If you do not want to print the entire document, select start and end page. The pages are shown in the preview.

Prior to printing the document, you can also open a PDF preview or select other options. See Figure 208).
Export Networks

- Open the network you want to print or save as external file first.
- Select PROJECT / PRINT.
See page 90 for further detail.

Export Project

- Select PROJECT / EXPORT PROJECT. Save the file to your hard disk, an external or a cloud drive.
See page 19 for further detail.
Preparing Documents Optimized For Auto-Coding

The following instructions are useful for preparing transcriptions of focus group sessions, questionnaires, or interviews. Such data usually contains different speakers’ sections. The hints given here also apply for other documents that include sections you wish to identify for auto-coding.

When transcribing interview or focus group data, enter a blank line between speaker turns if you are going to use the auto-coding tool for coding speaker units.

It would be tedious to code speaker or section turns manually. Two things are needed: A good “marker” for which to search and, once the marker is found, a reliable identification of the unit (sentence, paragraph) to be coded.

Insert easily identifiable markup in the text to let the auto-coding pattern matcher do this for you. In combination with a few formatting rules, documents can be created that can readily support auto-coding quite a bit.

Simple examples are:

P: or <Peter> for a respondent with the name Peter

The identifier should be used exclusively to mark passages in the text that indeed relate to the person or object identified. The plain word Peter will likely also occur elsewhere in the text (for instance, when another person is referring to Peter). The markup P: or <Peter> however, is unlikely to occur elsewhere.

In order for the Auto-Coding tool to select a complete speaker section, a section delimiter is needed. As discussed above, a speaker or section turn will start with the speaker’s identifier markup. The end of a section is best marked by an empty line, i.e., two paragraph markers (see Figure 65). The text of one speaker needs to be contained within one paragraph. If you brake a speech into multiple paragraphs, only the first paragraph will be coded. When auto-coding such a document, you would choose paragraph for extending the matched text.

Figure 209: Example transcript
Text Search Using Regular Expressions (GREP)

The core of a GREP search is the inclusion of special characters in the search string that control the matching process. GREP finds instances in your data that match certain patterns.

The ATLAS.ti GREP search offers a subset of the Regular Expression language used in sophisticated text search systems. For detailed information about regular expressions see [http://en.wikipedia.org/wiki/Regular_expression](http://en.wikipedia.org/wiki/Regular_expression)

Supported GREP Expressions

<table>
<thead>
<tr>
<th>GREP Expression</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>^</td>
<td>Matches an empty string at the beginning of a line.</td>
</tr>
<tr>
<td>$</td>
<td>Matches an empty string at the end of a line.</td>
</tr>
<tr>
<td>.</td>
<td>Matches any character except a new line.</td>
</tr>
<tr>
<td>+</td>
<td>Matches at least one occurrence of the preceding expression or character.</td>
</tr>
<tr>
<td>*</td>
<td>Matches the preceding element zero or more times. For example, ab*c matches &quot;ac,&quot; &quot;abc,&quot; &quot;abbbc,&quot; etc.</td>
</tr>
<tr>
<td>?</td>
<td>Matches the preceding element zero or one time. For example, ba? matches &quot;b&quot; or &quot;ba.&quot;</td>
</tr>
<tr>
<td>[]</td>
<td>Matches a range or set of characters: [a-z] or [0-9] or [aeiou]. For example: [0-9] finds all numeric characters, while [^0-9] finds all non-numeric character.</td>
</tr>
<tr>
<td></td>
<td>Matches an empty string at a word boundary.</td>
</tr>
<tr>
<td>\B</td>
<td>Matches an empty string not a word boundary.</td>
</tr>
<tr>
<td>&lt;</td>
<td>Matches an empty string at the beginning of a word.</td>
</tr>
<tr>
<td>&gt;</td>
<td>Matches an empty string at the end of a word.</td>
</tr>
<tr>
<td>\</td>
<td>The escape character disables the special GREP functionality of the following character. For example: ] matches an opening bracket.</td>
</tr>
<tr>
<td></td>
<td>OR. Enclose ORed expressions with parentheses if OR should be restricted to certain sequences of characters or expression.</td>
</tr>
</tbody>
</table>

Examples Of GREP Searches

The expression man|woman matches "man" and "woman."

You could also use (\w)man to the same effect. H(a|e)llo matches "Hello" and "Hallo." H(a|e)+llo matches "Haaaaaallo" as well as "Heeeeeeaaaaaeeaaaaaallo."

And how about the (angry|lazy|stupid) (man|woman) (walk|run|play|fight)ing with the gr(a|e)y dog - get the idea?

<table>
<thead>
<tr>
<th>GREP Expression</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>\d</td>
<td>Matches any digit (equivalent to [0-9])</td>
</tr>
<tr>
<td>\D</td>
<td>Matches anything but a digit</td>
</tr>
<tr>
<td>\s</td>
<td>Matches a white-space character</td>
</tr>
<tr>
<td>\S</td>
<td>Matches anything but a white-space character</td>
</tr>
<tr>
<td>\w</td>
<td>Matches any word constituent character</td>
</tr>
<tr>
<td>\W</td>
<td>any character but a word constituent</td>
</tr>
</tbody>
</table>

These escapes are also allowed in character classes: [\w+] means "any character that is either a word constituent, or a plus, or a minus."

\<\s+\> matches any whole word
\<\([\[:alpha:]]+\)> matches whole words containing only alphanumeric characters.

Character classes can also include the following elements:
### GREP Expression Table

<table>
<thead>
<tr>
<th>GREP Expression</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:alnum:]</td>
<td>Any alphanumeric, i.e., a word constituent, character</td>
</tr>
<tr>
<td>[:alpha:]</td>
<td>Any alphabetic character</td>
</tr>
<tr>
<td>[:cntrl:]</td>
<td>Any control character. In this version, it means any character whose ASCII code is &lt; 32.</td>
</tr>
<tr>
<td>[:digit:]</td>
<td>Any decimal digit</td>
</tr>
<tr>
<td>[:graph:]</td>
<td>Any graphical character. In this version, this mean any character with the code &gt;= 32.</td>
</tr>
<tr>
<td>[:lower:]</td>
<td>Any lowercase character</td>
</tr>
<tr>
<td>[:punct:]</td>
<td>Any punctuation character</td>
</tr>
<tr>
<td>[:space:]</td>
<td>Any white-space character</td>
</tr>
<tr>
<td>[:upper:]</td>
<td>Any uppercase character</td>
</tr>
<tr>
<td>[:xdigit:]</td>
<td>Any hexadecimal character</td>
</tr>
</tbody>
</table>

In the following, a few search examples are presented showing the matching GREP expression in the column on the right.

<table>
<thead>
<tr>
<th>GREP expression</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>[.*]</td>
<td>Find text (of arbitrary length) enclosed within brackets. Note that the brackets have to be escaped with \ as they are themselves control characters</td>
</tr>
<tr>
<td>200[1-4]</td>
<td>Find all years between 2001 and 2004:</td>
</tr>
<tr>
<td>\d\d$</td>
<td>Find all numbers with 2 digits at the end of a line or paragraph:</td>
</tr>
<tr>
<td>M[ae]i[y]er</td>
<td>Find all &quot;Meyer&quot;s - spelled in four different ways:</td>
</tr>
<tr>
<td>^.[[:punct:]]$</td>
<td>Find all lines (paragraphs) starting with one arbitrary letter followed by a colon. If you search for a &quot;d&quot; following the colon you will have to use the Escape character: ^\d Otherwise, the letter &quot;d&quot; would be interpreted as a digit.</td>
</tr>
</tbody>
</table>

### Margin Drag & Drop

All objects populating the margin area (i.e., "margin objects") support drag & drop. The bar visualize quotations segmenting the document, and – depending on the context - the objects attached to the bars represent themselves or the link with the quotation.

The effect of a drag & drop operation depends on the objects that are involved as drag sources (those that are dragged) and targets (those onto which objects are dropped). A large variety of objects from the margin area can be dropped into the margin area. Furthermore, objects can also be dragged from other object managers and browsers.

### Move Linked Objects

When a code, memo, or a quotation is dropped on a quotation bar, a new link is created between the object and the quotation represented by the bar. You can for instance drag-and-drop quotations, codes and memos from the navigator or any of the managers.

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![Figure 210: Coding via drag and drop from the navigator](image-url)
Copy Linked Objects

An object in the margin is unlinked from its original quotation when it is dropped on another quotation bar. To keep the object from unlinking from its original place, hold down the *alt*-key when dropping. This resembles dragging objects from managers and browsers into the margin area, which does not change existing links.

You will see a green button with a plus sign if an object is copied and not moved.

Linking Quotations

Dragging a quotation bar onto another quotation bar creates a hyperlink between the two quotations.

- Open two documents side-by-side (see "Multiple Document View").
- Drag the quotation bar from one document onto the quotation bar in another document. A list of relations opens to chose from. Select one of the offered relations. If none of the existing relations adequately reflects the relation between the two quotations, you can create new relations in the relation manager (see "Defining New Hyperlink Relations"). After selecting a relation the two quotations are linked and the hyperlink is displayed in the margin area (see Figure 96).
The Edit Menu

The edit menu applies to editing text documents, comments and memos.

Some functions (such as Substitution/Transformation and Speech) are not yet available.