Introduction: One of the first and most challenging tasks for a group working collectively to analyze text documents is the development of a common set of analytic concepts grounded in the data. ATLAS.ti provides a systematic way to select data segments, name and define concepts, and relate these concepts to the data segments. In ATLAS.ti, these concepts are called "codes," and the selected segments of data are called "quotations." Gradually, as the group meets to discuss their line-by-line analysis of the data, the codes are defined in relation to each other, refined into sub-codes and gradually organized into a "code book." Memos and network views help to document, rethink, and refine the development of concepts and link them to broader research questions, theoretical musings, or other literature. Once analysis of the data produces no new classes of codes, just refinements of existing codes, a study has reached a point of analytical saturation. At that point there should be a clear agreement among the team about what codes mean and when to use them in relation to specific data segments. However, the process of getting to that stage can be chaotic, especially when team-members differ in their analytical focus, theoretical assumptions, and comfort with qualitative analysis. For example, in addition to defining codes, another crucial analytical consideration is the size of quotations, e.g. whether to include interviewer probes, the surrounding paragraphs, or whether to select just one line or a few words as the unit of analysis. The scope of quotations will affect later stages of the analysis when coded quotations are retrieved and analyzed outside of their original context through search and retrieve operations. Another source of disagreement among team-members is when to create a new code or expand the defintition of an existing code. All these potential areas for disagreement must be addressed and resolved early in the process of coding.

The Code Matrix: The following is a "how to" guide for using ATLAS.ti v.5 to produce a matrix display of coding of the same text by different team members. This technique helps to illuminate areas of agreement and disagreement between analysts coding the same document or "PD". In this way, the team can more efficiently take into account theoretical and disciplinary biases of the various team members, ultimately helping them to agree on a consistent way to select and code data segments. The finished product will consist of three printouts of the "PD with margin" in landscape mode. You will then collate the three printouts in such a way so that you will be able to juxtapose on a single page the quotations and codes of two or more coders working on the same interview (see illustration on page 3). For this to work, you will need to experiment with font sizes of the PD text as well as adjusting the size of the margin area. The margin area adjustment will work differently with Rich Text PDs and Plain Text PDs. For this reason, the following instructions go into some detail about the differences between these two types of textual PDs and how to work with them.

What you will need: This method relies on old-fashioned cutting and pasting of several paper versions of the coded document. In addition to printouts of your coded PD's, you will need a paper cutter like the one pictured at the right, a stapler, and some space to collate your work. Above all you will need some patience when formatting and aligning the first few interviews you collate, but once you get the hang of it, it gets much easier.

Step One: Set up an HU and assign some PD's. Copy bundle this HU and install it on each of the coder's workstations. Copy bundling and installing are described in the manual p. 288. Assign two or three coders to code the same PD and have the coders email the HU file to you. Make sure that you label each coder's version of the HU with their initials and the date, for example by naming the HU "projectname-NS-092704.hpr5."

Step Two: Set the default font in the PD to a small size, To do this, from the Tool Bar at the top, select Extras->General Preferences. Choose the "Fonts" tab and set the font and point size for the Primary Docs (Default) to 8 pt Times or Courier, or whatever font you choose. Click "Apply" and then "Okay." Choosing a smaller font will reduce the number of pages when you print the PD with margin. This is important because you will be printing in Landscape mode and therefore can only fit so much of the PD text on each page.

Step Three: Open the first of the coder's HU's. From the PD manager window, select the PD that was coded by several coders by double clicking on it. The PD should appear with its margin and all codes and quotations brackets should show in the margin. Line numbers are very useful when you are reviewing a coded document in a meeting. To make sure line numbers appear, click on the line number button (on the left vertical tool bar marked "99"). You should see line numbers to the left of the PD text.

Rich Text vs. Plain Text: In version 5 of Atlas, you now have the option of using two file formats for textual Primary Documents: Rich Text or Plain Text files. Rich Text preserves more formatting, such as indents, **bold** or *italics* and different `fonts` and sizes. Saving a file as plain text strips all these formatting details out. ATLAS.ti's rich text capabilities work just like the text utility called "WordPad" that comes with Windows.

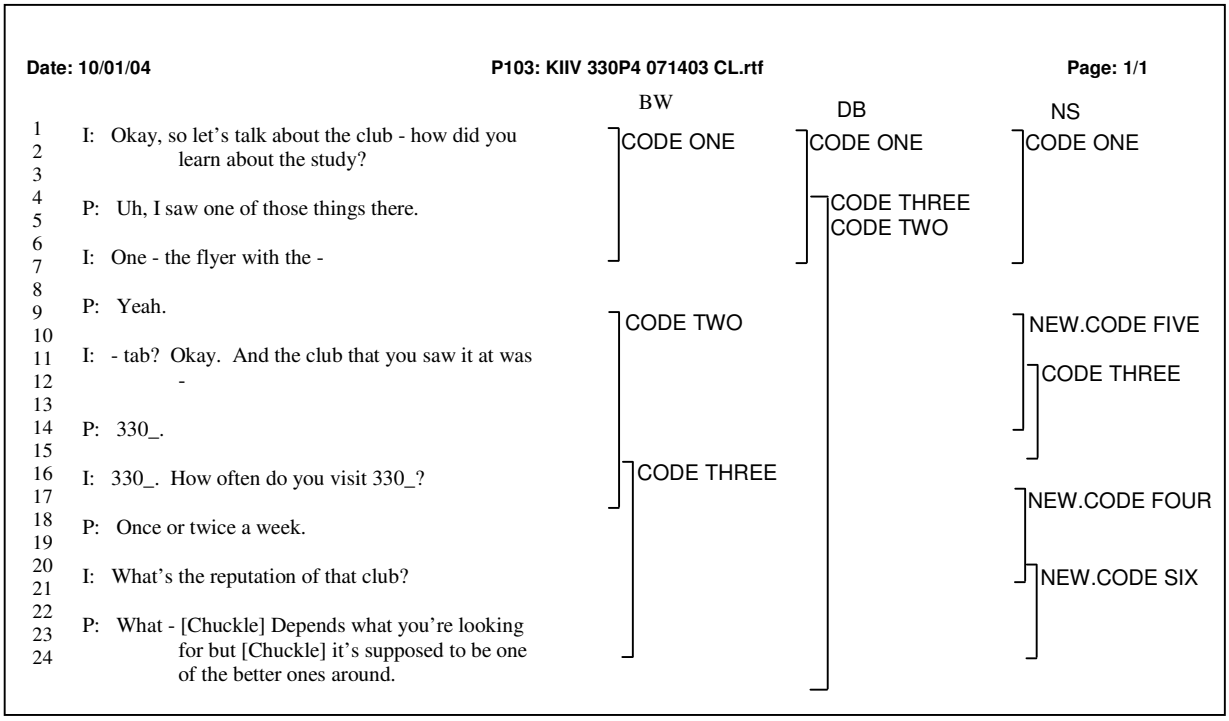
Wrapping and Line Numbers: Line numbering in ATLAS.ti works differently for Rich Text and Plain text documents. Plain text documents with line breaks will allow you to have each line numbered, while Rich Text documents only allow you to have each paragraph numbered. To give your PD's line numbers, use your word processing program to give your documents a wide margin on the right side of the page. I set my right margin at 4.5 inches. To make paragraphs in this text document insert two line breaks between each paragraph or speech turn. Use your word processor's "save as" function to save the document as "text with line breaks." Assign this new file to ATLAS.ti and open it as a PD. Because ATLAS.ti numbers lines according to presence of line breaks, each line of a plain text PD will have a line number. Rich Text PD's will only have numbers for each paragraph. As you adjust the size of the coding margin in Atlas, you will also notice a difference in the way the lines of Plain Text PDs and Rich Text PD's wrap as you adjust the position of the divider. Because there are no line breaks in Rich Text PDs, the text flows as you adjust the size of ATLAS.ti's margin display area. To format a matrix with several margins of codes, print Rich Text PDs with a wide right margin and a small font. With Plain text PDs, the lines have a fixed length and if you push the code margin to far to the left, these lines will begin to wrap and break up your line numbers.

Step Four: Now we are ready to print the first PD. To print just the first page as a test of our margin settings in Step Three, use your mouse to select and highlight the first few paragraphs of the PD. Go to the Documents -> Output -> Print with Margin. In the printer dialog box, choose Landscape Layout and in click the Page Range button next to "Selected." Click "Print." Examine the printed test page. Once you have found the correct ratio between PD text column and the margin area column by adjusting the font size and the position of the margin divider, remember these settings because you will want to recreate them exactly with the other HU's. Print the entire PD with margin.

Step Five: Open the next coder's HU and the same PD. Repeat steps three and four for each of the HU's. Make sure that your line numbers are identical in each version, for example that page 3 of each printed PD starts with the same line number and that you have the same total number of pages in each printout. If, not adjust the settings so that these match. The only difference should be the quotations and codes in the margin areas.

Step Six: Find a table where you can lay our your print outs into neat piles near your paper cutter and stapler. Take one of the printouts and cut off the white space to the right of the margin coding. This will cut off the page numbers, so be sure to keep these pages in order.

Step Seven: Take page one from the next printout and lay page one from the first printout (that you just cut) on top. Slide the bottom page to the right so that a new column of coding appears to the right of the first margin. Line up the top and bottom edges and staple this in place. Do the same with the next version of the PD. On the first page, be sure to label each margin column with the coder's initials. You should now have a legal size page that looks like this:



This type of matrix display is not intended to calculate Kappas or statistical measures of inter-coder agreement and disagreement. Miles and Huberman (1994) recommend that coders achieve an inter-rater reliability rate of above 80%. I'm not sure how often the same person coding on two different days could reach that high a level of consistency. Qualitative research is like a journey. When you return to the same locale after visiting other lands, you will experience that locale differently. The same goes for viewing the same PD at different stages of the coding process. Some ATLAS.ti users output coding tables and feed it into SPSS to calculate inter-coder reliability. However, this method can only measure agreement on codes. It would be difficult to measure agreement on quotation boundaries using a statistical method. Some teams control for this by having one team member code a document, then filter out their codes but keep the quotations. Another team member then assigns codes to those same quotations and then the codes are compared for agreement.

There are two dimensions to inter coder agreement: a. quotation boundaries and b. which codes are linked to those quotations. With reference to quotation boundaries, coders need to decide collectively whether to choose larger segments that will be linked to several codes (lumping strategy), or attach fewer codes to smaller quotations (splitting strategy). Whatever choice you make has implications for query searches. Using a lumping strategy and then searching for all quotations linked to a particular code would yield longer quotations with more context and the ability to see what other codes are linked to that quotation (either by opening up a network on that quotation or seeing them listed in the output report). Using the splitting strategy, a query search for the same code would yield shorter segments but with little of the surrounding text to provide the context. This would require further searches using proximity operators to find co-occurring codes or require one to view the quotation in the PD window to get a sense of the surrounding context and codes.

The matrix approach readily illustrates variation in coders' selection of quotation boundaries codes when analyzing the same data. This provides a platform for the whole group to debate different approaches and agree collectively on a standard approach to coding. It is helpful to edit the HU during the meeting so that you can define codes and relations together. This new HU is then edited and sent out for the next round of coding. After a few meetings comparing coders' work on several different types of data (for example interviews and field notes will require different coding strategies), you will eventually agree on a codebook

and reach saturation. At that point you can split up the task of coding the PDs among the group. As the project progresses, you may want to repeat this process periodically to check for areas of intercoder disagreement.

Atlas Team Analysis Resources

- http://www.atlasti.com/quicktour.shtml. This is a link to the ATLAS.ti 5.0 Quick Tour, which provides a brief intro to ATLAS.ti for beginners.
- http://www.atlasti.com/fullmanual.shtml. This is a link to the ATLAS.ti 5.0 Manual, a 400+ pp. Acrobat document. This version of the manual is not only more up to date, but much more readable than the previous manual thanks to editorial help from our friends at Research Talk. For information on teamwork, see the chapters on Collaboration (p. 268ff) and Project Management (p. 276ff), which address access rights and merging strategies respectively.
- http://www.cfcj-fcjc.org/docs/atlasorientation.pdf This short document is an orientation to Atlas written for a team of coders. This may be useful as a template that you can adapt for your own instructions to remotely located coders on how to log on to your project, code, and save the HU. These instructions are for ATLAS.ti 4.2 so the pictures of the buttons are out of date, but the concepts remain the same.
- http://www.listserv.gmd.de/archives/atlas-ti.html. This is a link to the archives (over 10 years of postings) of the ATLAS.ti listserv. The archive is searchable and you can find answers to just about any question this way. You can also post questions, but it's best to read the manuals and FAQ section first at http://www.atlasti.com/faq.shtml. Here is one discussion of calculating inter-rater reliability from the listserv: http://www.listserv.dfn.de/cgi-bin/wa.exe?A2=ind0211D&L=atlas-ti&P=R359&D=0&I=-3

Comparisons of Atlas with other QDA programs:

- http://www.quarc.de/software_overview_table.pdf This matrix was prepared by Susanne Friese.

- http://fmx.sagepub.com/cgi/reprint/16/4/439 R. Barry Lewis. NVivo 2.0 and ATLAS.ti 5.0: A Comparative Review of Two Popular Qualitative Data-Analysis Programs. Field Methods, Nov 2004; 16: 439 - 464. This is a follow-up to his 1998 review of NUD-IST and Atlas 4.0.

Team work with other QDA programs:

- http://www.nova.edu/ssss/QR/QR4-3/oberski.html. Ford, K. Oberski, I. & Higgins, S. (2000) Computer-aided qualitative analysis of interview data: Some Recommendations for Collaborative Working The Qualitative Report, 4(3&4).

- http://fmx.sagepub.com/cgi/reprint/15/1/63. Eleanor McLellan, Kathleen M. MacQueen, and Judith L. Neidig. (2003) Beyond the Qualitative Interview: Data Preparation and Transcription. Field Methods, 15: 63 - 84.
- http://www.cdc.gov/hiv/software/ez-text.htm - pubs. Kathleen M. MacQueen, Eleanor McLelland, Kelly Kay, and Bobby Milstein (1998) Codebook Development for Team-Based Qualitative Research. Cultural Anthropology Methods. 10(2).