Computer-Assisted Grounded Theory Analysis With ATLAS.ti

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Abstract

In this paper I show how the various steps of a Grounded Theory analysis can be conducted in a computer-assisted environment. As the Grounded Theory approach was developed before the event of CAQDAS, the various steps and procedures have been described for manual ways of analysis. In newer books one finds references that this can of course also be accomplished in CAQDAS, but little detail is provided on the practical aspects, as if the process were self-explanatory. Based on my experience, it is not, and this applies to the application of any methodological approach in CAQDAS. Learning the various tools and features in a software does not automatically teach the user which tool is the best fit for a particular process given a particular methodological framework. In this paper I want to show how the various steps and procedures of the Strauss and Corbin approach to Grounded Theory can be translated for use in ATLAS.ti.

Keywords

CAQDAS, computer-assisted analysis, Grounded Theory, open coding, axial coding, core, memos, data integration

Overview

This paper starts out in positioning myself in telling you why I would not think twice of using or not using a computer tool for analyzing qualitative data. This is followed by presenting other points of view as they are researchers that do not share my point of view and reject the use of CAQDAS for data analysis in a Grounded Theory study. While thinking about the reasons behind it, it occurred to me that it might just be a misunderstanding of some terms: QDA software (qualitative data analysis software) versus CAQDAS (computer-aided qualitative data analysis software), and coding versus tagging. The latter pair became a very important companion in describing the difference between the methodological application of coding, as a very central component in a GT analysis, and the technical translation of it.

Before I start describing how I approached a GT analysis in ATLAS.ti, I offer a small excursion to the NCT method, which to my understanding is a generic method that can be used as backbone in any computer-assisted analysis. The methodological approach can then be built upon it. As it would be beyond the format of a paper, I cannot describe the method in detail. Moreover, you will see it applied throughout the paper by way of example.

The reminder of the paper is about how to build a GT analysis in ATLAS.ti. As sample data, I use the same data that Juliet Corbin uses in the third and fourth edition of the Basics of qualitative data analysis book (Corbin & Strauss, 2008/2015). I describe the process of open and axial coding and how to integrate data by selecting a core category. As the sample data only contains three interviews, the analysis shown here is not complete and does not involve the advanced analysis tools that ATLAS.ti offers. I have extended the analysis - however with fictional data - in another publication (Friese, 2016, forthcoming).

The methodological – technical translation of terms like concepts, dimensions, memos, open and axial coding, which tools to use for data integration, for referencing quotes and the like are summarized in form of three tables in the later part of the paper.

By Way Of An Introduction

When I tell the story of my academic development and, more specifically, my pathway to becoming a methodologist, Grounded Theory and computer-assisted qualitative data analysis are an integral part of it. Initially I was socialized at German universities and learned all about statistical methods of data analysis. For my Master's thesis at Oregon State University, USA, however, I found it useful to also collect interview data to supplement a questionnaire study (Friese, 1992). I did not know much yet about how to analyze such data. Therefore, I signed up for a seminar on "Qualitative Sociology." As part of the class, the software THE ETHNOGRAPH was introduced to us (www.qualisresearch.com). Since the content of the class had a strong philosophical focus, I was all the more intrigued by the program that appeared to offer a tangible solution for tackling practical data analysis issues. After attending another software demonstration, I asked the author of the software, John Seidel, whether he needed someone to work for him. This happened to be the case. I was just at the right place at the right time. And as the saying goes: The rest is history. This was in 1992.

While I carried out the research project for the seminar on Qualitative Sociology, I read *Basics of Qualitative Research* by Strauss/Corbin (1990) and at the same time learned how to deal with the software THE ETHNOGRAPH. At about the same time, Anselm Strauss was meeting researchers of the ATLAS project, conducted at the Technical University of Berlin (Germany) and got to play around with one of the first versions of the software ATLAS.ti (Legewie 2014). The foreword of the version 4 manual of ATLAS.ti quotes an excerpt written by Strauss on his experience with software-assisted analysis. As the manual is no longer easily accessible, I provide it at full length below:

> In my graduate student days, there were no tape recorders for making an interviewer's life easier, these arrived after World War II, passing first through the wire recorder stage. These were ponderous machines, only gradually slimming down to today's light models. Many years later, following our dreams of computers that would ease our lives as qualitative social researchers, software was devised for us. As Tesch (1990) pointed out in a relatively recent book, most of the programs were limited as tools for helping us in our qualitative analysis. At the time, she named only two or three programs that could be of much aid in generating social theory, one of them the ATLAS/ti [sic] program. This was based in part on Grounded Theory methodology and methods-methodology because of its flexible mode of operating, adapted to some sort of conceptual ordering, including the systematic generation of theory through the interplay of the researchers' brains and skills with the data; and Grounded Theory methods because many of these had been incorporated into the Atlas [sic] program.
>
> Now the program has been further elaborated and improved. It should be a considerable aid in providing both greater efficiency and more elaboration for social scientists who master its intricacies. I myself am no expert computer-based researcher, and at my age am not likely to become one, but have found no great mystery in piloting my way, during practicing sessions, around the current program's predecessor.
>
> Thomas Muhr, its author makes no claims whatever to having produced a program that will perform miracles for your research – you will have to have the ideas and the gifts to do exceptional research. But you may find the ATLAS/ti [sic] program of measurable help and stimulation for your work. Surely it is not the only program that may be useful to you, given the various purposes of

> social research, but it is among those that should be seriously considered no matter what your research aims. (Strauss, March 1996).

In the context of this paper, I would like to make a couple of points related to this statement. Today, the usefulness of a recording device is no longer criticized or its use even rejected. It is omnipresent. In the 1950s this was different. Strauss was not one of those. He rather appears to embrace the availability of new technology. When it comes to computer-assisted analysis, we can observe technophobe behavior today. Many qualitative researchers still reject the use of software to support the process of qualitative data analysis, some even vehemently – for the wrong reasons. In part it is a generational issue, but not always. Corbin for instance still works manually, but she is not strictly against the use of software (Corbin & Strauss 2015). I came one generation later and learned Grounded Theory methodology and computer-assisted analysis at the same time. For me the computer was part of it from the very beginning.

Software Criticism

In contemporary books on qualitative methods you find pointers and references to computer-assisted analysis, but no one is explaining properly how to translate manual ways of going about analysis to a computer-assisted way. It seems as it would be self-explanatory. Here are some examples: Remenyi (2014) dedicates half a page to the topic; Breuer (2009): two pages; Bryant and Charmaz (2007): four pages spread out across three chapters written by three different authors; Goulding (2002), three and a half pages; Charmaz (2014): zero pages; Seale et al. (2004): a chapter written by Udo Kelle on the historical development, application and limitations of software. Again, nothing about implementation. The fact that software is mentioned does not necessarily mean that it is embraced. On the contrary, the few sentences that have been added express dislike and rejection. When I read some of these comments given my experience and background, I am torn between head shaking and amusement. Some authors even pride themselves to not use software:

"As a risk taker and a thrill seeker, I find hand coding and hand sorting exciting, and maybe a little dangerous; every time you present your research you risk your reputation, since someone in the audience may think you're a fool, and may say no. You have no statistics, no proofs; no software evidence that your take on a scene is meaningful. Fear of public shame may be the best impetus for making sense." (Stern 2007, S. 120).

Holton (2007) makes reference to Glaser (2003) to support her argument against the use of software. Glaser even dedicated two chapters to express his disapproval of software. Glaser, by the way, does not only reject the use of software, but also the use of recording devices (Glaser 1998). One of the arguments that he as well as Holton makes is the inability of computers to replace human thinking. "Experienced classic grounded theorists continue to await a 'package' that can replicate the complex capabilities of the human brain for conceptualization of latent patterns of social behavior" (Holton 2007, p 287). This statement is based on expectations some people had in the 1960s; expectations that have long been overcome. Even in the time of "smart phones," no one would expect computer software to perform such wonders. This has already been expressed by Strauss when he writes that Thomas Muhr does not make a claim to have "produced a program that will perform miracles and that it is still the researcher that has to have the ideas and the gifts to do exceptional research" (see above).

Another reason Glaser uses against the use of software is a quote from a Ph.D. student who wrote: "I wrote day and sometimes night. I got into the 'drugless trip' and eventually the core variable of balancing came to me almost as a revelation. 'Joy to the world the core has come' "(2003, p.36). Glaser appears to overlook that software provides many places for writing. The added advantage of software is that–if you want–you can attach your writing directly to the data segments you write about. And even if you decided not to use the editors provided by the software for writing, i.e. rather prefer to write in a text processor or on paper, software is not preventing the researcher from doing that.

It is a general lack of skills and knowledge to believe that analysis is done simply through coding the data, independent of computer software. A good teacher will always tell his/her students that analysis is more than coding, and that writing, reflecting, rewriting, rereading the data, re-reflecting, re-rewriting, and so on, is essential. Corbin for instance also points this out by providing the advice that while in the process of coding data, you should always "stop and write." From the point of view of an experienced CAQDAS user, it goes without saying and lamenting that software will not present the core category to the researcher. Glaser, however, is still not finished with his critique. The final blow at the use of computer software, according to Glaser, is the process of sorting memos: "SO WHY ON EARTH WOULD THE GT RESEARCHER WANT TO BLOCK THIS STAGE OF THE PACKAGE WITH A GT computerization? The answer is there is no reason to. Computers would erode, block and remodel GT at the sorting stage. "(Uppercase as in the original, Glaser 2003, p 37).

An immediate response to this could be: Every CAQDAS package has a button or a menu option that allows the user to print out memos. After printing one could proceed to sort, rearrange and reorder the paper versions of the memos. My second response is: The sorting of memos in the manner as is required for a manual analysis is no longer necessary, as I will show later. By attaching comments and memos to data segments that at some point are also coded, and by sorting and re-arranging the codes, one sorts memos all the time throughout the process of analysis. It is also no longer necessary to copy parts of the data onto the memo (cards) as the memos are digitally linked to the data. Thus, the data can always be accessed and do not have to be part of the memo content. If you prefer, it is of course also possible to export the data segments together with their memos.

QDA Or CAQDAS?

Glaser (2003) strongly emphasizes the difference between classic GT and "QDA" (Qualitative Data Analysis). Similarly, I have always placed value on using the term CAQDAS—Computer Aided Qualitative

Data Analysis Software—as compared to QDA software (cf. Friese, 2011). The term QDA software is easier on the lips, but it has been causing many misunderstandings. QDA software implies that the software is doing the analysis instead of being a tool assisting the researcher (who still has to do the thinking). Automation is certainly an issue these days given the massive amounts of data available. But big data analysis is not the same as qualitative data analysis even if big data may consist of qualitative, i.e. non-numeric data (Friese, 2016). Thus, we need to distinguish between the *analysis of qualitative data* and *qualitative data analysis*, whereby GT is a form of the latter. In moderation, CAQDAS packages also support the former. To tackle larger amounts of data, CAQDAS for instance provide text searching tools and automatic coding functions; whereby the type of text search offered may be as simple as looking for string of characters, up to offering built-in algorithm that can be trained by a human being and as a result deliver quite reasonable automatically coded segments. The other features supporting the analysis of qualitative data are all tools that provide numbers like cross-tabulations of codes or frequency distribution of codes that can also be related to variables. These tools might also come in handy at later stages of a qualitative data analysis, but to begin with one needs other tools that support an inductive way of working, interpretive writing, and thinking. In order to know about these tools and how to best work with them requires more than simply citing secondary sources that describe computer-assisted analysis as Glaser (1998) did; it requires active work with one or more software packages and gaining first-hand experience—at least before taking a critical stance. Knowing only one package may also lead to false conclusions through generalizations of the kind: This package does not support me in doing x and y and therefore all available CAQDAS packages are not useful (Weber, 2014). If, for instance, one were to attempt a GT analysis with QDAMiner, which is more apt to support deductive approaches, one can easily become frustrated and might reject CAQDAS to be unsuitable for GT. Another common pitfall is the translation of methodological steps to software functionality. As will be shown later in this paper, equating the GT coding process with the function to apply codes in a software package can already be troublesome.

Thus, we have two problematic issues here: The use of terminology, one implying that the software will do the analysis for you, at least for the uninitiated user; and the other ignorance or too little knowledge. As they are many studies that refer to themselves as being GT-based, irrespective of whether they have been conducted manually or computer-assisted (Morse et al. 2009), but aren't true GT studies, they are also many computer-assisted studies that are "quick and dirty" rather than presenting excellent pieces of qualitative analysis. This, however, is no reason for rejecting either GT as methodological approach or the use of software when analyzing qualitative data. As Strauss already said: Research is hard work, and without it, neither a manual nor a computer-assisted analysis will result in a good piece of academic writing.

Not all GT researchers of the first and second generation, however, condemn the use of software. Corbin, although herself preferring to analyze data manually, writes in the current issue of *Basics of*

Qualitative Data Analysis: The computer has the ability "to augment the human mind by doing a lot of the detailed and tedious work Involved in many endeavors, thus freeing up the user to be creative and thoughtful. And this is what computer programs do for qualitative analysis "(Corbin/Strauss 2015 Chapter 11, item 5207).

Coding Or Tagging?

Reflecting on the arguments put forward for not using software, it occurred to me that one reason for it could simply be a misunderstanding in terms of terminology and its application. The use of the words "code" and "coding" in the context of qualitative data analyses is probably a result of the widespread adoption of the Grounded Theory approach and it has also been embraced by almost all CAQDAS developers. But what does "coding" mean in a computer environment? It simply refers to the process of attaching a label to a data segment. Computer scientists call this "tagging" – and as I explain below this might be a much better term to use in order not to confuse it with the much more complex process of Grounded Theory coding.

Both Strauss (1998) and Corbin/Strauss (2015) mentioned that it is a possibility to write the concepts that they usually develop in the process of writing memos on index cards as labels in the margin of a document. Strauss assumed that this was probably common practice but pointed out these "codes" would then be less detailed and more difficult to sort (Strauss 1998, p. 114). Taking a look at the examples Strauss provides, the notes on the index cards contain quotes from the data, references to other related data segments, analytic reflections, pointers for theoretical sampling, and references to the coding paradigm like whether the segment represents a condition, an interaction, or a consequence, etc. This also applies to the examples provided by Corbin/Strauss (2015). Thus, what is commonly referred to as *coding* with CAQDAS is not what Glaser, Strauss, Corbin and other GT authors mean when they talk about coding in the Grounded Theory sense. GT coding is much more than just attaching a label to a data segment.

In the German edition of 1996, Strauss and Corbin define coding as "the process of data analysis" (p.43). In the 2015 edition, it is defined as delineating concepts to stand for interpreted meaning (Chapter 12). Applying this process to a computerized analysis this means: writing and tagging. Depending on the computer program you are using, the process of writing can or needs to be implemented in different ways. It is not the same in terms of functionality and mouse clicks in all programs. All programs offer a memo function, but this is not necessarily the best place to use when applying the GT way of coding in a computer environment. The first step is to understand the meaning and purpose of a specific analytic task in a methodological sense. Next you need to be familiar with the various functions your preferred software package provides in order to find and use the appropriate tool(s) for the task at hand. If viewed this way, it becomes comprehensible why some researchers reject the application of software when using

Grounded Theory methodology. In order to bridge the gap, a translation of the various methodological steps to computer mouse clicks is needed. This is what I would like to offer in the reminder of this paper.

The NCT Method As A Core Process Of Computer-assisted Data Analysis

The acronym NCT stands for Noticing, Collecting and Thinking about things. I regard the method as central to any computer-assisted analysis. It helps you to set up your research project in a computer-assisted environment, it provides guidelines with regard to building an efficient coding system and how to use the various software tools for further analysis. When I use the word efficient, I mean efficient in the sense of using available software tools to their fullest potential. I have developed the method during the more than twenty years in which I have worked with CAQDAS (Friese, 2014). Over time, certain procedures have proven to be advantageous in order to fully utilize software functionality. Based on this, I have derived a number of rules and I describe certain symptoms that help users to identify potential problematic issues when using software. The following post from Research Gate shows one typical problem that often arises when software is used, a large number of codes. What it also shows is that students often do not receive the guidance they are looking for due to a lack of translation skills:

> I'll give the example of a student who had Grounded Theory in mind ("open coding") who came to me after his round of using CAQDAS. Without a trace of irony he told me had over 200 codes and asked, "What do I do next?" I have to admit that I didn't have (an) idea what to say! (https://www.researchgate.net/post/What_is_your_experience_with_or_attitude_towards_using_software_tools_CAQDAS_in_hermeneutic_phenomenological_and_exploratory_analysis/2; last accessed January 18th, 2016).

The NCT method provides guidance for those types of situations. Two hundred codes are actually not very much; I have seen projects using 1,000 and more codes. Software will not tell you when the item that is called 'code' or 'node' is a good code. There are no red lights flashing at you when you develop too many codes, i.e. when you walk straight into what I call the code swamp. Software does not tell you when the proper level of abstraction is reached; how long a coded segment should be; and how to best label a code. You can either learn it over time by gaining your own experience, or you need someone to guide you through the process.

For the methodologically uninitiated, the NCT method can be used by itself for a content analysis of qualitative data. For those with more methodological background knowledge, it can be embedded in a larger methodological framework like Grounded Theory, phenomenology, discourse analysis, ethno methodology, mixed-methods, and the like. Depending on the chosen approach, different software functions will be more prominent than others. What always remains the same, though, is the way the coding system is built up; how you get there is a question of the methodological approach. Currently, the method has only been described as a standalone procedure, and exclusively in the context of ATLAS.ti (Friese 2012/2014). This paper is the first step in providing a more detailed instruction on how to apply the NCT method in the context of Grounded Theory methodology.

The Sample Study

The data of the sample project used here are the same that Juliet Corbin uses in the 2012 and 2015 editions of her book *Basics of Qualitative Data Analysis*. They consist of an open interview carried out by Anselm Strauss in 1987 with a Vietnam veteran who worked in the medical corps. Two others, one semi-structured with a US Marine who served in the Vietnam War, and an email conversation with a Panama, Saudi and Bosnia veteran, also US Marines, were conducted by Juliet Corbin in 2006. Initially, there are no detailed or fixed research questions. There is only a general broad interest in the subject area, the experience of a soldier in the war. The selected data material is used for demonstration purposes only and is not sufficient to derive a full theory anchored in the data. At the end of the paper, however, some ideas for further theoretical sampling are provided that highlight how one could extend this study to achieve saturation.

Open Coding - Identifying Concepts

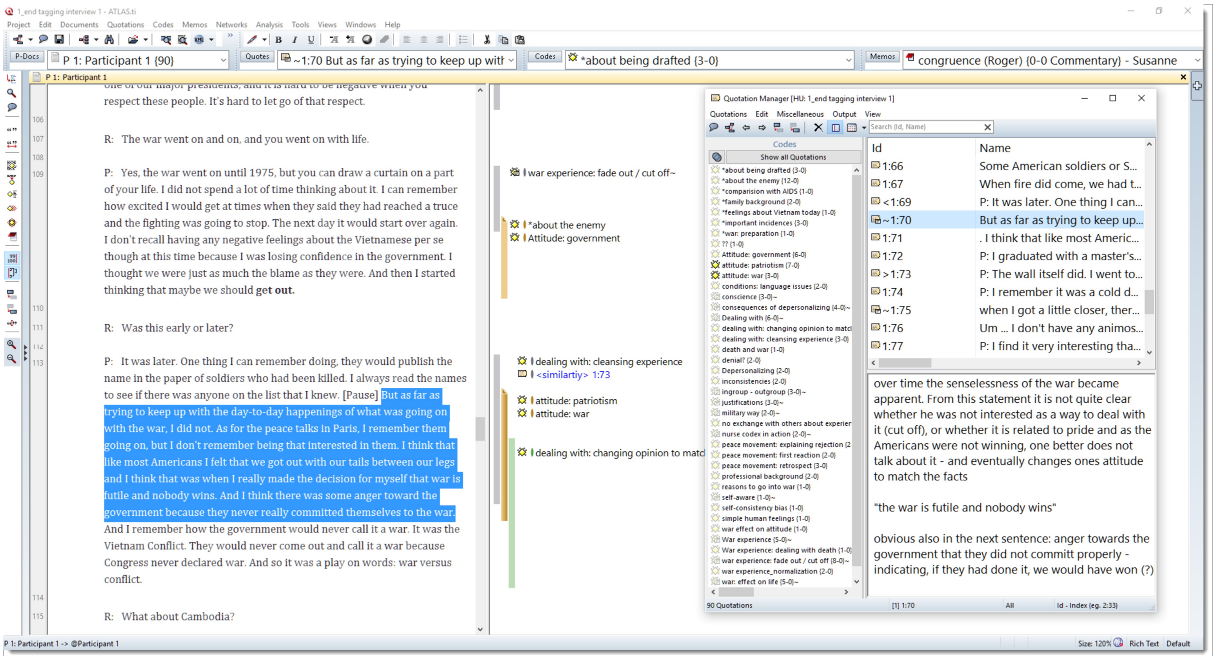
During the first phase, I read through the data and recorded the ideas and thoughts that occurred to me. I tagged the data accordingly (Notice/Collect). Deviating from J.C., I only wrote few memos at this stage. Rather, my intention was to pre-structure the material so as to take advantage of the computer early, in that it allows me quick access to the material for further analysis via the 'tags'. If you look at Table 1 which compares the developed concepts by Corbin and myself. It becomes clear that many of my tags tackle the same issues. In some instances, either Corbin or I chose a more abstract term, sometimes named a possible property or a sub-code.

Concepts J.C.	Concepts S.F.
Locating the self: at time of entry	*family background professional background reasons to go into war attitude: patriotism attitude: war *war: preparation
Volunteering versus being drafted versus draft dodging	*about being drafted
Being a noncombatant versus being a combatant	
The enemy	*about the enemy
Zones of safety and zones of conflict or killing zones	
Military systems	military way
The war experience and strategies for blocking out minimizing inconsistencies	self-consistency bias
The war experience	War experience war experience: dealing with death death and war
The culture of war and its inconsistencies	Inconsistencies self-aware conscience
Psychological survival strategies	denial? dealing with: changing opinion to match facts dealing with: cleansing experience
The enemy and psychological survival strategies	Depersonalizing consequences of depersonalizing in-group/outgroup

Concepts J.C.	Concepts S.F.
	conditions: language issues
Letting down the emotional guard	War experience: dealing with death
Moral contradictions of war and psychological survival strategies	war experience: fade out/cut off war effect on attitude
Inconsistencies within the military system	military way
Normalizing the situation: another survival strategy	war experience: normalization
Moral contradictions	nurse codex in action simple human feelings
Coming home and getting on with life	Dealing with war: effect on life war experience: fade out/cut off dealing with: dealing with: cleansing experience *feelings about Vietnam today
The American disillusionment: A new meaning of war	peace movement: explaining rejection peace movement: first reaction peace movement: retrospect dealing with: changing opinion to match facts Attitude: government
War as maturational stepping-stone: the changing self	War effect: maturation
The wall of silence	no exchange with others about experience
Breaking through the wall of silence	
Survival	
	*important incidences
	justifications

Table 1: Results of open coding of interview 1

In ATLAS.ti, this initial tagging looks as shown below. Tags are not yet sorted or colored; at this stage of analysis, we only have a simple list of terms. If you work with other programs, my recommendation is to work at this stage with a flat code list, even if, for example, NVivo and MAXQDA permit a tree structure.


1_end tagging interview 1 - ATLAS.ti
Project Edit Documents Quotations Codes Memos Networks Analysis Tools Views Windows Help
P-Docs
P 1: Participant 1 {90}
Quotes
~1:70 But as far as trying to keep up witl
Codes
*about being drafted {3-0}
Memos
congruence (Roger) {0-0 Commentary} - Susanne
P 1: Participant 1
war experience: fade out / cut off~
*about the enemy
Attitude: government
dealing with: cleansing experience
<similartiy> 1:73
attitude: patriotism
attitude: war
dealing with: changing opinion to matcl
Quotation Manager [HU: 1_end tagging interview 1]
Quotations Edit Miscellaneous Output View
Search (Id, Name)
Codes
Show all Quotations
*about being drafted {3-0}
*about the enemy {12-0}
*comparision with AIDS {1-0}
*family background {2-0}
*feelings about Vietnam today {1-0}
*important incidences {3-0}
*war: preparation {1-0}
?? {1-0}
Attitude: government {6-0}
attitude: patriotism {7-0}
attitude: war {3-0}
conditions: language issues {2-0}
conscience {3-0}~
consequences of depersonalizing {4-0}~
Dealing with {6-0}~
dealing with: changing opinion to matcl
dealing with: cleansing experience {3-0}
death and war {1-0}
denial? {2-0}
Depersonalizing {2-0}
inconsistencies {2-0}
ingroup - outgroup {3-0}~
justifications {3-0}~
military way {2-0}~
no exchange with others about experier
nurse codex in action {2-0}~
peace movement: explaining rejection {2
peace movement: first reaction {2-0}
peace movement: retrospect {3-0}
professional background {2-0}
reasons to go into war {1-0}
self-aware {1-0}~
self-consistency bias {1-0}
simple human feelings {1-0}
war effect on attitude {1-0}
War experience {5-0}~
War experience: dealing with death {1-0}
war experience: fade out / cut off {8-0}~
war experience_normalization {2-0}
war: effect on life {5-0}~
90 Quotations
[1] 1:70
All
Id - Index (eg. 2:33)
P 1: Participant 1 -> @Participant 1
Size: 120%
Rich Text
Default

one of our major presidents, and it is hard to be negative when you respect these people. It's hard to let go of that respect.

107 R: The war went on and on, and you went on with life.

109 P: Yes, the war went on until 1975, but you can draw a curtain on a part of your life. I did not spend a lot of time thinking about it. I can remember how excited I would get at times when they said they had reached a truce and the fighting was going to stop. The next day it would start over again. I don't recall having any negative feelings about the Vietnamese per se though at this time because I was losing confidence in the government. I thought we were just as much the blame as they were. And then I started thinking that maybe we should **get out.**

111 R: Was this early or later?

113 P: It was later. One thing I can remember doing, they would publish the name in the paper of soldiers who had been killed. I always read the names to see if there was anyone on the list that I knew. [Pause] But as far as trying to keep up with the day-to-day happenings of what was going on with the war, I did not. As for the peace talks in Paris, I remember them going on, but I don't remember being that interested in them. I think that like most Americans I felt that we got out with our tails between our legs and I think that was when I really made the decision for myself that war is futile and nobody wins. And I think there was some anger toward the government because they never really committed themselves to the war. And I remember how the government would never call it a war. It was the Vietnam Conflict. They would never come out and call it a war because Congress never declared war. And so it was a play on words: war versus conflict.

115 R: What about Cambodia?

Id	Name
1:66	Some American soldiers or S...
1:67	When fire did come, we had t...
<1:69	P: It was later. One thing I can...
~1:70	But as far as trying to keep up...
1:71	. I think that like most Americ...
1:72	P: I graduated with a master's...
>1:73	P: The wall itself did. I went to...
1:74	P: I remember it was a cold d...
~1:75	when I got a little closer, ther...
1:76	Um ... I don't have any animos...
1:77	P: I find it very interesting tha...

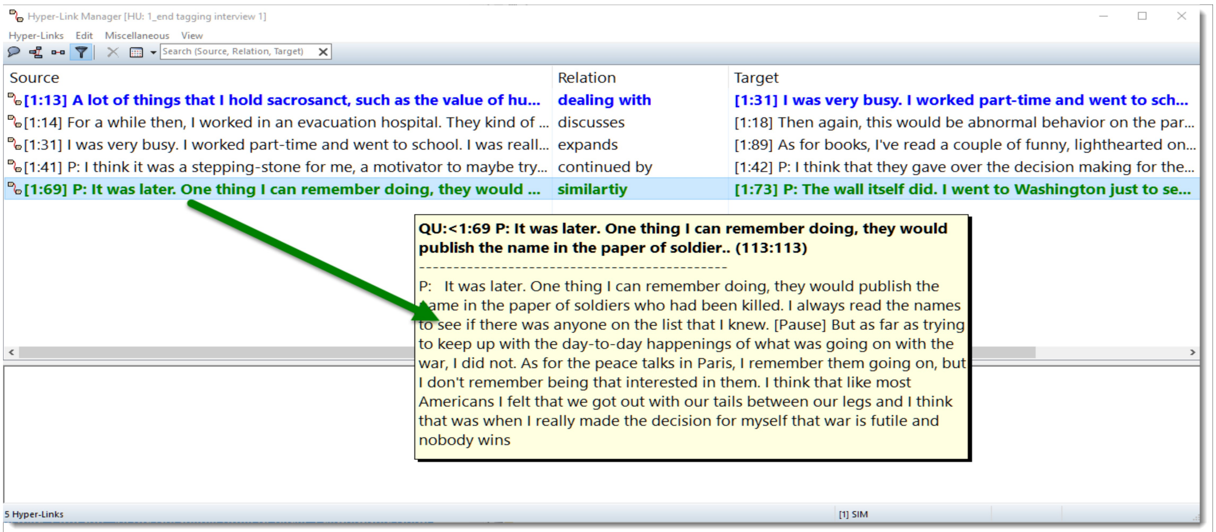
over time the senselessness of the war became apparent. From this statement it is not quite clear whether he was not interested as a way to deal with it (cut off), or whether it is related to pride and as the Americans were not winning, one better does not talk about it - and eventually changes ones attitude to match the facts

"the war is futile and nobody wins"

obvious also in the next sentence: anger towards the government that they did not committ properly - indicating, if they had done it, we would have won (?)

Figure 1: Initial phase of open coding in ATLAS.ti

Codes, hyperlinks, and associated memos (where applicable) are displayed to the right next of the text. The Quotation Manager is open (Figure 1). Quotations are marked passages, which may be coded but do not necessarily have to be. The tilde (~) and the small post-it note designate an annotated quote. The larger- than and less-than characters (< >) indicate the start or end of a hyperlink. Hyperlinks let you connect quotations in ATLAS.ti. A hyperlink can be named and commented on. Figure 2 shows the Hyperlink Manager and five links that I had created until then. In the text itself, you can jump back and forth between quotations via double-click on a hyperlink, just as if you clicked a link on the Web. This means it is not necessary to write down references and to search for them when needed—they are available instantaneously.


Hyper-Link Manager [HU: 1_end tagging interview 1]
Hyper-Links
Edit
Miscellaneous
View
Search (Source, Relation, Target)
5 Hyper-Links
[1] SIM

Source	Relation	Target
[1:13] A lot of things that I hold sacrosanct, such as the value of hu...	dealing with	[1:31] I was very busy. I worked part-time and went to sch...
[1:14] For a while then, I worked in an evacuation hospital. They kind of ...	discusses	[1:18] Then again, this would be abnormal behavior on the par...
[1:31] I was very busy. I worked part-time and went to school. I was reall...	expands	[1:89] As for books, I've read a couple of funny, lighthearted on...
[1:41] P: I think it was a stepping-stone for me, a motivator to maybe try...	continued by	[1:42] P: I think that they gave over the decision making for the...
[1:69] P: It was later. One thing I can remember doing, they would ...	similartiy	[1:73] P: The wall itself did. I went to Washington just to se...

QU:<1:69 P: It was later. One thing I can remember doing, they would publish the name in the paper of soldier.. (113:113)

P: It was later. One thing I can remember doing, they would publish the name in the paper of soldiers who had been killed. I always read the names to see if there was anyone on the list that I knew. [Pause] But as far as trying to keep up with the day-to-day happenings of what was going on with the war, I did not. As for the peace talks in Paris, I remember them going on, but I don't remember being that interested in them. I think that like most Americans I felt that we got out with our tails between our legs and I think that was when I really made the decision for myself that war is futile and nobody wins

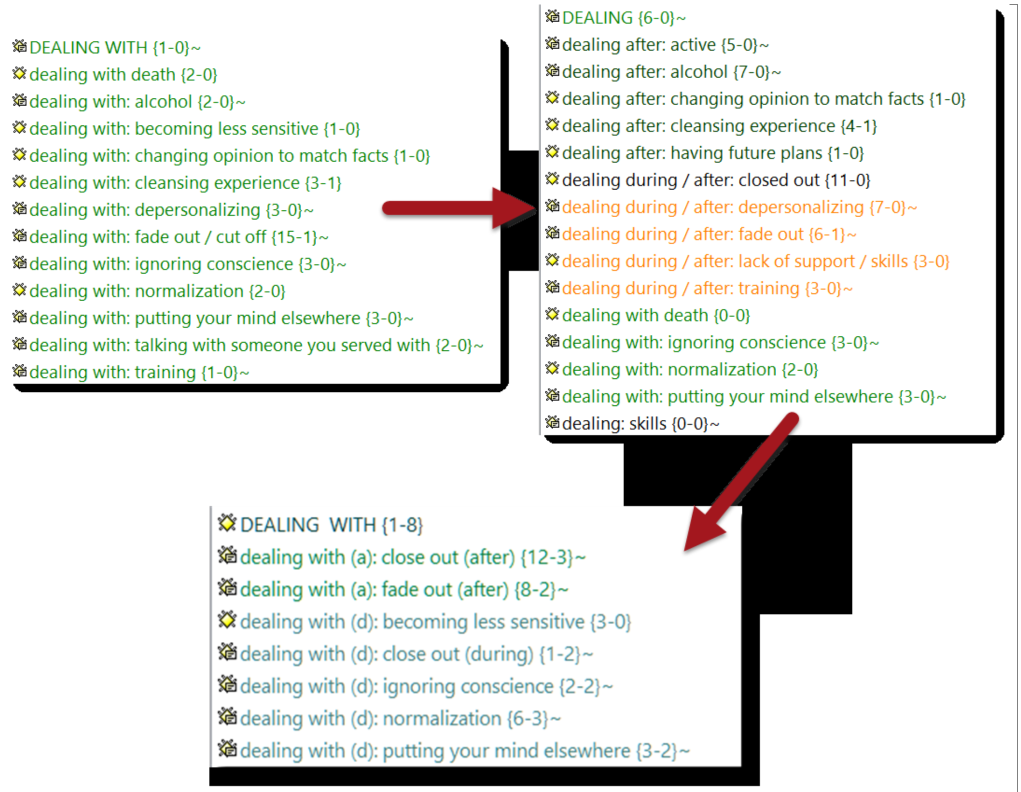
Figure 2: Hyperlink Manager in ATLAS.ti with activated quotation content

Next, I tagged the second and third interview before analyzing the data in detail through axial coding. The changes to the tag list that result from this (see Figure 3) do not reflect the process of axial coding but expand and clarify the open coding. This exemplifies that the individual steps of coding are not necessarily consecutive but blend into one another (see Strauss 1998 Corbin/Strauss 2008). Corbin/Strauss define Open Coding as

> breaking apart data and delineating concepts to stand for blocks of raw data. At the same time, one is qualifying those concepts in terms of their properties and dimensions. (Corbin/Strauss 2008, p 195).

The three tag lists shown in Figure 3 exemplify the emerging category, "dealing with." Characteristics of dealing with the war experiences are developed. Also, after tagging the third interview, a temporal dimension was introduced, after and during/after. The latter I had used when the same strategy was used during the war and also later for processing. Later on, the strategy fade out/cut off was further again differentiated as 'fade out' and 'close off', and the time dimension was assigned accordingly.

The third list contains a tag that I neither used for coding nor for linking. It is recognizable by the numbers in brackets {0-0}. It merely serves as a reminder to pay attention to the aspect 'Skills Development' in the further analysis of the data. The idea occurred while writing a comment on another text passage. The entry therefore functions like a sticky note.



DEALING WITH {1-0}~
dealing with death {2-0}
dealing with: alcohol {2-0}~
dealing with: becoming less sensitive {1-0}
dealing with: changing opinion to match facts {1-0}
dealing with: cleansing experience {3-1}
dealing with: depersonalizing {3-0}~
dealing with: fade out / cut off {15-1}~
dealing with: ignoring conscience {3-0}~
dealing with: normalization {2-0}
dealing with: putting your mind elsewhere {3-0}~
dealing with: talking with someone you served with {2-0}~
dealing with: training {1-0}~

DEALING {6-0}~
dealing after: active {5-0}~
dealing after: alcohol {7-0}~
dealing after: changing opinion to match facts {1-0}
dealing after: cleansing experience {4-1}
dealing after: having future plans {1-0}
dealing during / after: closed out {11-0}
dealing during / after: depersonalizing {7-0}~
dealing during / after: fade out {6-1}~
dealing during / after: lack of support / skills {3-0}
dealing during / after: training {3-0}~
dealing with death {0-0}
dealing with: ignoring conscience {3-0}~
dealing with: normalization {2-0}
dealing with: putting your mind elsewhere {3-0}~
dealing: skills {0-0}~

DEALING WITH {1-8}
dealing with (a): close out (after) {12-3}~
dealing with (a): fade out (after) {8-2}~
dealing with (d): becoming less sensitive {3-0}
dealing with (d): close out (during) {1-2}~
dealing with (d): ignoring conscience {2-2}~
dealing with (d): normalization {6-3}~
dealing with (d): putting your mind elsewhere {3-2}~

Figure 3: Ongoing changes in the category 'dealing with'

If your preferred software offers a tree structure, you may want to assign all "dealing with:" tags as properties to the nascent category `DEALING WITH`. When working with other programs, I also use uppercase labels for categories, given that arranging tags in a tree structure is not synonymous with analytical in-depth differentiation of different concept levels. Inexperienced researchers and scientists in particular often have a hard time with this initially (see Corbin/Strauss 2014 or Strauss 1998). The technical facility of simply shifting to different levels in the tree structure can therefore also be a marked hindrance for the analysis. Still, errors of this kind in the development of tag lists also occur when using prefixes, as is common in ATLAS.ti.

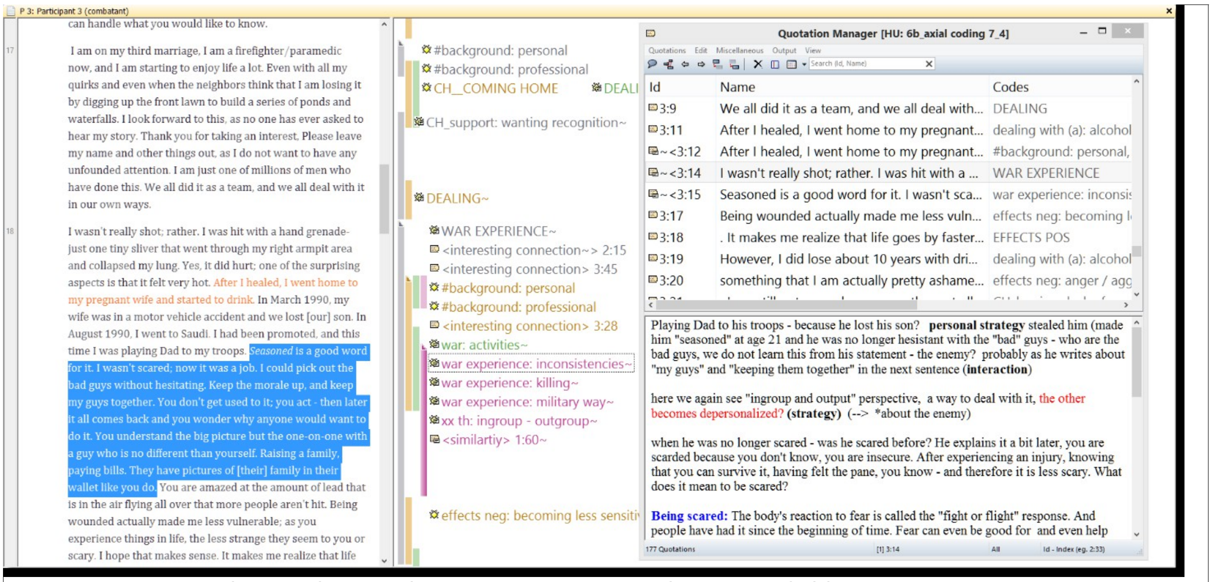
Axial Coding

Axial coding, coding along the axis of a category, is not immediately visible in the tag list. Let's look first at the definition again: In the third edition, Corbin defined axial coding as "crosscutting or relating concepts to each other" (p 195). And in more detail in the fourth edition (Corbin/Strauss 2015):

> When Researchers are coding for context, they are doing what Strauss (1987) called "axial coding". They are locating and linking action-interaction within the framework of sub concepts did give it meaning and enable it to explain what interactions are occurring, and why and what consequences real or anticipated are happening because of action-interaction. (Chapter 8, position 4126).

While tagging is no solution here, creating linkages is. Yet, easy as it is to create links in the computer, you first have to work out exactly where and how to link something meaningfully. This is only possible if you start to write. Axial coding therefore takes place in what Strauss and Corbin refer to as "memos" primarily, not during 'tagging' raw data. Figure 4 shows an example of the axial coding process. I started with the personal biographies of the veterans (tags*:* `#background: personal` and `#background: professional`), their motivations for going to war, their war experiences, and how they were perceived, described, and processed (tags: `#war experience`, with sub-codes `effects` and `dealing with`). The main purpose of using tags is to provide quick and reliable access to data, and being able to move smoothly within the data. Each interview document also has a number that is given in each quote; this makes it easy to identify a particular person/case/document. For example, P3 is the Panama, Saudi and Bosnia veteran, P1 is the medical corpsman.

So far, the "memo" feature of the software has not been used up to this point. All analytical notes so far were written in the comment field for each quote. Figure 4 shows the Quotation Manager in the context of the raw data and codes. Quotation 3:14 is selected, and the detailed analysis of this quote appears in the lower part of the window (comment field). Emphasis is given to strategies and interactions observed; in other commentaries, these could also be conditions and consequences, of course, if applicable.



P 3: Participant 3 (combatant)

can handle what you would like to know.

17 I am on my third marriage, I am a firefighter/paramedic now, and I am starting to enjoy life a lot. Even with all my quirks and even when the neighbors think that I am losing it by digging up the front lawn to build a series of ponds and waterfalls. I look forward to this, as no one has ever asked to hear my story. Thank you for taking an interest. Please leave my name and other things out, as I do not want to have any unfounded attention. I am just one of millions of men who have done this. We all did it as a team, and we all deal with it in our own ways.

18 I wasn't really shot; rather. I was hit with a hand grenade-just one tiny sliver that went through my right armpit area and collapsed my lung. Yes, it did hurt; one of the surprising aspects is that it felt very hot. After I healed, I went home to my pregnant wife and started to drink. In March 1990, my wife was in a motor vehicle accident and we lost [our] son. In August 1990, I went to Saudi. I had been promoted, and this time I was playing Dad to my troops. *Seasoned* is a good word for it. I wasn't scared; now it was a job. I could pick out the bad guys without hesitating. Keep the morale up, and keep my guys together. You don't get used to it; you act - then later it all comes back and you wonder why anyone would want to do it. You understand the big picture but the one-on-one with a guy who is no different than yourself. Raising a family, paying bills. They have pictures of [their] family in their wallet like you do. You are amazed at the amount of lead that is in the air flying all over that more people aren't hit. Being wounded actually made me less vulnerable; as you experience things in life, the less strange they seem to you or scary. I hope that makes sense. It makes me realize that life

#background: personal
#background: professional
CH_COMING HOME
DEALI
CH_support: wanting recognition~
DEALING~
WAR EXPERIENCE~
<interesting connection~> 2:15
<interesting connection> 3:45
#background: personal
#background: professional
<interesting connection> 3:28
war: activities~
war experience: inconsistencies~
war experience: killing~
war experience: military way~
xx th: ingroup - outgroup~
<similartiy> 1:60~
effects neg: becoming less sensiti

Quotation Manager [HU: 6b_axial coding 7_4]

Id	Name	Codes
3:9	We all did it as a team, and we all deal with...	DEALING
3:11	After I healed, I went home to my pregnant...	dealing with (a): alcohol
~<3:12	After I healed, I went home to my pregnant...	#background: personal,
~<3:14	I wasn't really shot; rather. I was hit with a ...	WAR EXPERIENCE
~<3:15	Seasoned is a good word for it. I wasn't sca...	war experience: inconsis
3:17	Being wounded actually made me less vuln...	effects neg: becoming l
3:18	. It makes me realize that life goes by faster...	EFFECTS POS
3:19	However, I did lose about 10 years with dri...	dealing with (a): alcohol
3:20	something that I am actually pretty ashame...	effects neg: anger / agg

Playing Dad to his troops - because he lost his son? **personal strategy** stealed him (made him "seasoned" at age 21 and he was no longer hesistant with the "bad" guys - who are the bad guys, we do not learn this from his statement - the enemy? probably as he writes about "my guys" and "keeping them together" in the next sentence (**interaction**)

here we again see "ingroup and output" perspective, a way to deal with it, the other becomes depersonalized? **(strategy)** (--> *about the enemy)

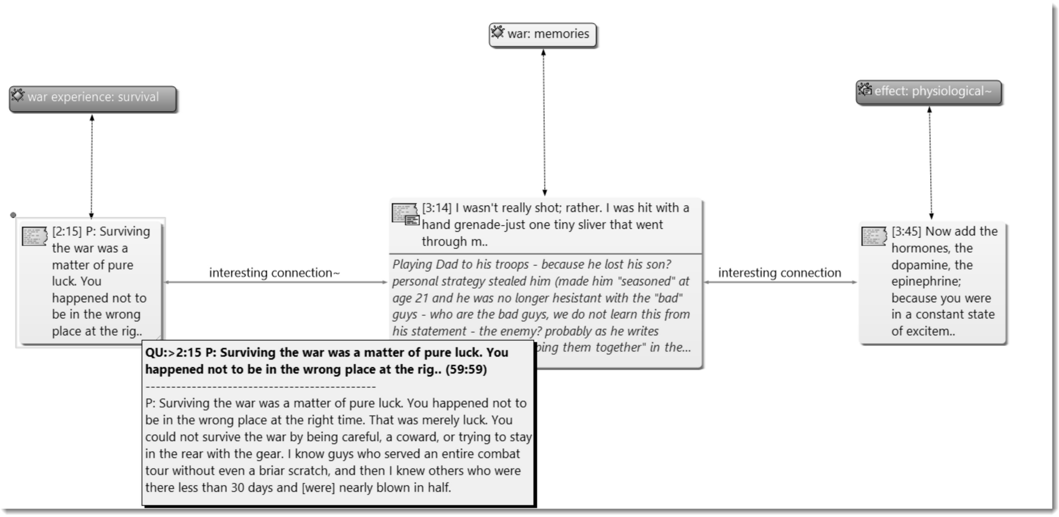
when he was no longer scared - was he scared before? He explains it a bit later, you are scarded because you don't know, you are insecure. After experiencing an injury, knowing that you can survive it, having felt the pane, you know - and therefore it is less scary. What does it mean to be scared?

Being scared: The body's reaction to fear is called the "fight or flight" response. And people have had it since the beginning of time. Fear can even be good for and even help

Figure 4: ATLAS.ti editor, with opened Quotation Manager and comment field

The commentary also contains references to other tags in the form of (`---> code name`), as a note for a possible connection. The tag which is referred to in the comment (`*about the enemy`*)* has not been further differentiated at this time. I will speak about the naming conventions in more detail below. The cross-connection to other quotations that came to mind while writing was immediately realized by creating a hyperlink. It is recognizable by the symbol < which stands for starting anchor. Hyperlinks can be accessed and visualized using the network function.

Figure 5 shows three quotes with their codes. When double-clicking a quote, the full text is displayed, optionally with comment, or in the original data context. The tilde indicates that the connection between the quotes 2:15 and 3:14 carries a comment. This comment as well can be shown with a mouse click.



[2:15] P: Surviving the war was a matter of pure luck. You happened not to be in the wrong place at the rig..

[3:14] I wasn't really shot; rather. I was hit with a hand grenade-just one tiny sliver that went through m..

Playing Dad to his troops - because he lost his son? personal strategy stealed him (made him "seasoned" at age 21 and he was no longer hesistant with the "bad" guys - who are the bad guys, we do not learn this from his statement - the enemy? probably as he writes

ping them together" in the...

[3:45] Now add the hormones, the dopamine, the epinephrine; because you were in a constant state of excitem..

QU:>2:15 P: Surviving the war was a matter of pure luck. You happened not to be in the wrong place at the rig.. (59:59)

P: Surviving the war was a matter of pure luck. You happened not to be in the wrong place at the right time. That was merely luck. You could not survive the war by being careful, a coward, or trying to stay in the rear with the gear. I know guys who served an entire combat tour without even a briar scratch, and then I knew others who were there less than 30 days and [were] nearly blown in half.

Figure 5: Visualization of the first connections

As outlined in the first part of this paper, it would be unreasonable to ask of the software to do the thinking for you. It merely provides us with objects and functions with which we can work. It does not tell us, however, how to work with them. We literally have to work this out for ourselves, unless we are lucky enough to have a good teacher. The software provides us the entity "code." Whether a code is a category, a sub-code, a dimension, or a property, must be determined by the researcher him/herself. One option is to write this down in the comment field for codes. One might be tempted to see the ability to create code trees as an advantage since it seemingly makes it easier to create sub-codes. But the same degree of reflection is still required. No software will point out the inconsistency if, for example, you create a category "Horse" and assign "dog," "animal," and "cornflower" as sub-codes. This may sound trivial, but unfortunately I have seen too many coding schemes which were set up incorrectly or inefficiently. There are certain rules to observe (Richards/Richards 1995), and if you do not know how to go about it, you quickly end up in the "back to Excel" game.

As shown in Table 1, I use uppercase for category names. Since there is no tree structure in ATLAS.ti, one uses prefixes for sub-code, e. g., for the properties of a class. Dimensions can be part of code names (as is the case in Table 2), or you separate out dimensions as their own code group and code twice, i.e., once with the sub-code, and once with the dimension. This can be advantageous for further analysis, if you want to relate dimensions to properties in the form of a table. This rule is not ATLAS.ti-specific and should be considered also when using other programs.

Meaning	In ATLAS.ti	Example

concept	Small letters, black	`Depersonalizing`
		`Conscience`
		`Ingroup-outgroup`

category	Capital letters, colored	`WAR EXPERINCE`

Sub code	Small letters, colored like all other codes in the category	`War experience: inconsistencies`
		`War experience: killing`
		`War experience: survival`

Concepts in developing a code schema	Small letters, prefixed by special character (*), black	`*about the enemy`
		`*about being drafted`

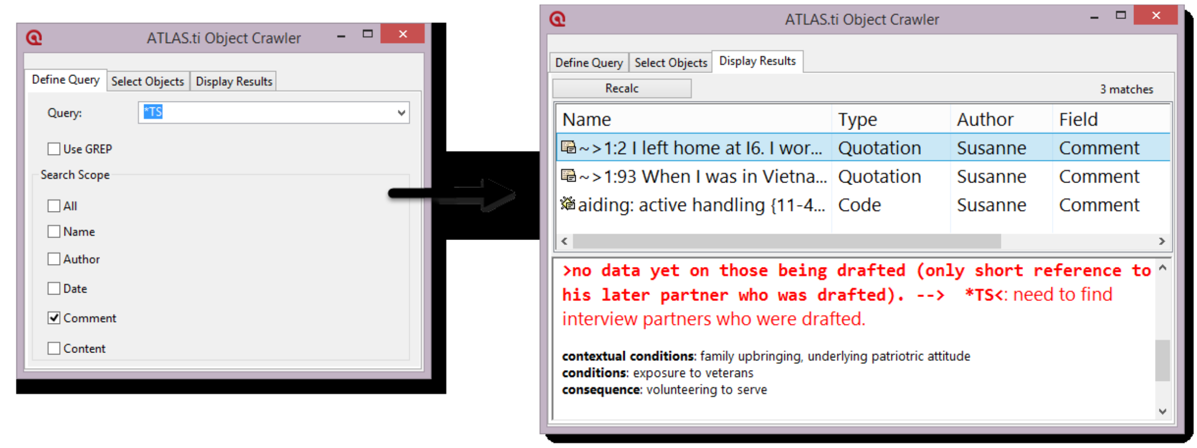
dimension	Small letters, prefixed by special character, colored	`/TIME`
		`/time: during`
		`/time: after`

Socio demographics, i.e. if you code attribute of actors, group interviews / focus group data / comments of different people on a blog, comments on YouTube videos	Small letters, prefixed by # or any other special character, grey	`#background: personal`
		`#background: professional`
		`#gender: male`
		`#gender: female`

Table 2: Syntax for the meanings of tags on the various levels

For all the tags that have not yet become a category or do not belong to one, I use an *asterisk* as a prefix. In ATLAS.ti, this has the advantage that they are automatically listed on top. All variable tags, such as family background, professional biography etc., I prefix with a *hashtag* (#). Because of the sorting order in ATLAS.ti, they appear on top of the code list. This, too, can be easily replicated in other programs and is not specific to ATLAS.ti. However, the technical implementation varies.

Another aid you can rely on is easily searchable/retrievable *abbreviations*. For example, I use the abbreviation *TS when writing a note regarding theoretical sampling (see Figure 6). This symbol can be used as search term in the 'Object Crawler' to retrieve all notes on further data collection.



Query: *TS

□ Use GREP

□ All
□ Name
□ Author
□ Date
☑ Comment
□ Content

3 matches

Name	Type	Author	Field
~>1:2 I left home at I6. I wor...	Quotation	Susanne	Comment
~>1:93 When I was in Vietna...	Quotation	Susanne	Comment
aiding: active handling {11-4...	Code	Susanne	Comment

>no data yet on those being drafted (only short reference to his later partner who was drafted). --> *TS<: need to find interview partners who were drafted.

contextual conditions: family upbringing, underlying patriotric attitude
conditions: exposure to veterans
consequence: volunteering to serve

Figure 6: The Object Crawler 'searches through all fields

Along with writing during the axial coding phase, the list of tags has been changed continuously. I proceeded topic by topic; for example, the war experience, the strategies for coping with the experiences during and after the war, the explanations or justifications for the war, the public response to the Vietnam War from the perspective of veterans, etc. This makes you see connections within and across categories. The tags make it very simple to locate specific segments. Your descriptions become more focused, the connections visible. A mere reordering of tags, without dealing more closely with the data behind it, would not have this effect. While you are doing this, the tags are sorted, renamed, new categories are being formed. And with the reordering of your tags, everything written about the data is also reordered. The need for sorting memos, as highlighted by Glaser (2003), thus is eliminated. It is not a separate step but happens organically. If you so desire, you can output your written texts, with or without the raw data. If your screen is big enough, or if you work with multiple monitors, actual printing may be unnecessary. – Note that not a single ATLAS.ti "Memo" proper has been written thus far; up to now I have been using comments to write what GT calls "memos" and these are linked to quotations or codes, and are automatically reordered with them. See Table 3 for an overview how to apply ATLAS.ti functions in a GT analysis.

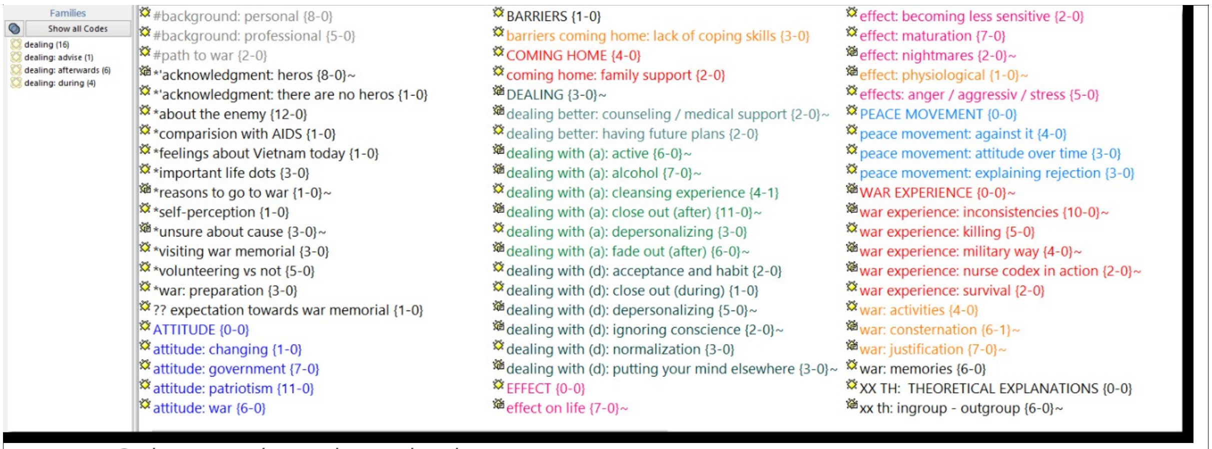
Software functions (ATLAS.ti)	Application
Code (tag)	• Initial structuring of the data • Concepts • Categories • Sub codes • Dimensions
Quotation comment	• Open and axial coding • Code notes • Notes on theoretical sampling
Code comment	• First thoughts that serve concept building • Description of properties • Summaries and interpretation of data segments tagged with the code

Table 3: Software functions and their application in GT

Integration And Visualization

For Corbin, the concept 'survival' gained importance in the process. Just working with the three sample files, for me another aspect moved into the foreground: 'coming home.' With further immersion in the data, this might have been different. Yet, it is too early to speak of a core category. Theoretical saturation has not been reached from the existing data base. Therefore, the further analysis is of a hypothetical nature. At the time I had a number of ideas on how it could be connected. I therefore called up a network view and dragged my 'coming home' code in the center. The next question was: For a soldier who had been in the war, what makes him feel that he has fully arrived back home? First of all, these are the coping strategies. So I dragged these into the network. The coping strategies are juxtaposed by factors that inhibit a successful homecoming (barriers). So I also added those codes to the network view. Next I asked myself what strategies counteract the impact of war? Are there differences between those who fought on the front lines and those who served behind the lines as paramedics? What was experienced, and did this have different effects? What coping strategies were employed during the war? What impact had the original attitude toward the war; was the experience altered by it? In other words, I worked backwards in time from the present to the past.

In order to show the process of category development, the full tag lists are shown at different points during the analysis in Figures 7 and 8. The current list, Figure 7, is to be regarded as provisional and would likely change further with the addition of more data material. Anyone familiar with the NCT method can see it in full action in Figure 7 and Figure 8. It is not possible in the context of this paper to address it in detail. Building the coding system and creating categories and sub-codes are an important part of it. You may ask how to abstract if you have tagged with too much detail. How to differentiate if the terms are too broad and if too many different things have been packed into it? For this, you need to know where to click, but you also need the methodological competence. The latter is attained only through practice. This is no different for computer-assisted analysis as with manual analysis.

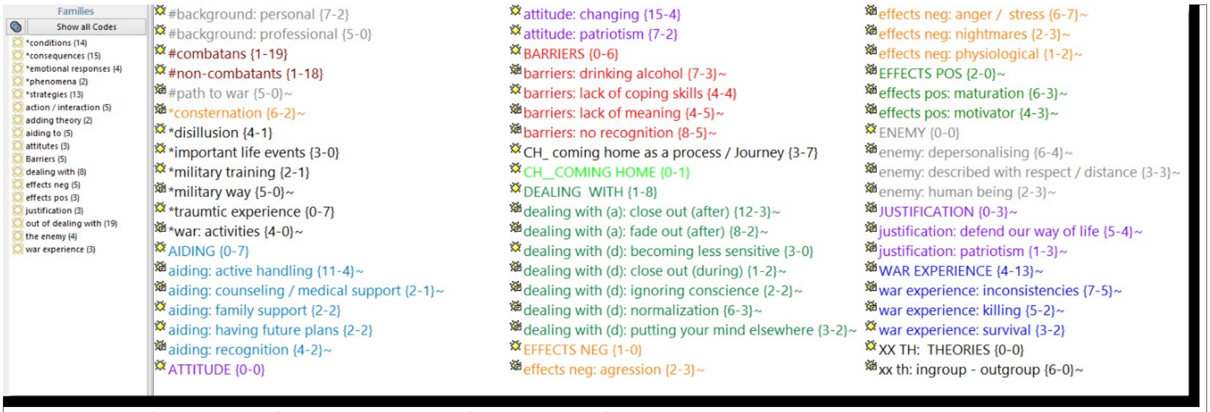


```
dealing (16)
dealing: advise (1)
dealing: afterwards (6)
dealing: during (4)
```

```
#background: personal {8-0}
#background: professional {5-0}
#path to war {2-0}
*'acknowledgment: heros {8-0}~
*'acknowledgment: there are no heros {1-0}
*about the enemy {12-0}
*comparision with AIDS {1-0}
*feelings about Vietnam today {1-0}
*important life dots {3-0}
*reasons to go to war {1-0}~
*self-perception {1-0}
*unsure about cause {3-0}~
*visiting war memorial {3-0}
*volunteering vs not {5-0}
*war: preparation {3-0}
?? expectation towards war memorial {1-0}
ATTITUDE {0-0}
attitude: changing {1-0}
attitude: government {7-0}
attitude: patriotism {11-0}
attitude: war {6-0}
BARRIERS {1-0}
barriers coming home: lack of coping skills {3-0}
COMING HOME {4-0}
coming home: family support {2-0}
DEALING {3-0}~
dealing better: counseling / medical support {2-0}~
dealing better: having future plans {2-0}
dealing with (a): active {6-0}~
dealing with (a): alcohol {7-0}~
dealing with (a): cleansing experience {4-1}
dealing with (a): close out (after) {11-0}~
dealing with (a): depersonalizing {3-0}
dealing with (a): fade out (after) {6-0}~
dealing with (d): acceptance and habit {2-0}
dealing with (d): close out (during) {1-0}
dealing with (d): depersonalizing {5-0}~
dealing with (d): ignoring conscience {2-0}~
dealing with (d): normalization {3-0}
dealing with (d): putting your mind elsewhere {3-0}~
EFFECT {0-0}
effect on life {7-0}~
effect: becoming less sensitive {2-0}
effect: maturation {7-0}
effect: nightmares {2-0}~
effect: physiological {1-0}~
effects: anger / aggressiv / stress {5-0}
PEACE MOVEMENT {0-0}
peace movement: against it {4-0}
peace movement: attitude over time {3-0}
peace movement: explaining rejection {3-0}
WAR EXPERIENCE {0-0}~
war experience: inconsistencies {10-0}~
war experience: killing {5-0}
war experience: military way {4-0}~
war experience: nurse codex in action {2-0}~
war experience: survival {2-0}
war: activities {4-0}
war: consternation {6-1}~
war: justification {7-0}~
war: memories {6-0}
XX TH:  THEORETICAL EXPLANATIONS {0-0}
xx th: ingroup - outgroup {6-0}~
```

Figure 7: Code system during the axial coding

In Figure 8, code families have been added (left column). Code families in ATLAS.ti are groups of codes that can be used as filters to access codes and their content selectively and in accordance with specific questions about them. In the example, tags were grouped according to their categories; on a secondary level, they were associated with different aspects of the coding paradigm. The selected category, `DEALING`, is included in the families `strategy` and `dealing with`, for example.



*conditions (14)
*consequences (15)
*emotional responses (4)
*phenomena (2)
*strategies (13)
action / interaction (5)
adding theory (2)
aiding to (5)
attitutes (3)
Barriers (5)
dealing with (8)
effects neg (5)
effects pos (3)
justification (3)
out of dealing with (19)
the enemy (4)
war experience (3)

#background: personal {7-2}
#background: professional {5-0}
#combatans {1-19}
#non-combatants {1-18}
#path to war {5-0}~
*consternation {6-2}~
*disillusion {4-1}
*important life events {3-0}
*military training {2-1}
*military way {5-0}~
*traumtic experience {0-7}
*war: activities {4-0}~
AIDING {0-7}
aiding: active handling {11-4}~
aiding: counseling / medical support {2-1}~
aiding: family support {2-2}
aiding: having future plans {2-2}
aiding: recognition {4-2}~
ATTITUDE {0-0}

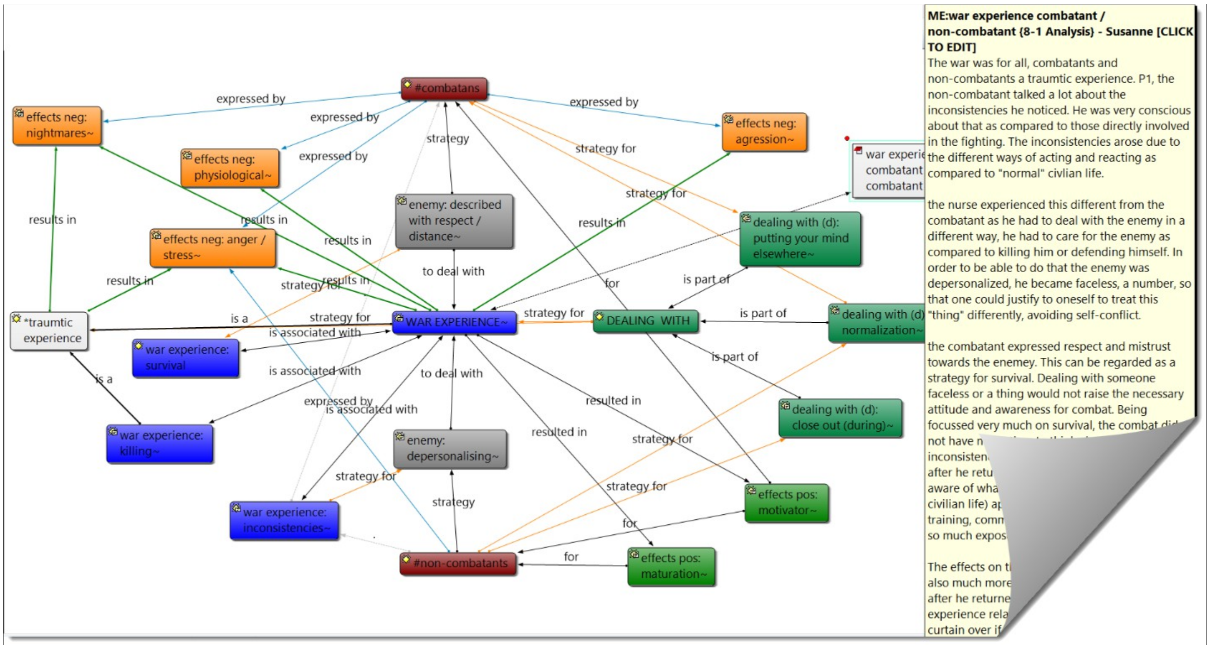
attitude: changing {15-4}
attitude: patriotism {7-2}
BARRIERS {0-6}
barriers: drinking alcohol {7-3}~
barriers: lack of coping skills {4-4}
barriers: lack of meaning {4-5}~
barriers: no recognition {8-5}~
CH_ coming home as a process / Journey {3-7}
CH_COMING HOME {0-1}
DEALING WITH {1-8}
dealing with (a): close out (after) {12-3}~
dealing with (a): fade out (after) {8-2}~
dealing with (d): becoming less sensitive {3-0}
dealing with (d): close out (during) {1-2}~
dealing with (d): ignoring conscience {2-2}~
dealing with (d): normalization {6-3}~
dealing with (d): putting your mind elsewhere {3-2}~
EFFECTS NEG {1-0}
effects neg: agression {2-3}~

effects neg: anger / stress {6-7}~
effects neg: nightmares {2-3}~
effects neg: physiological {1-2}~
EFFECTS POS {2-0}~
effects pos: maturation {6-3}~
effects pos: motivator {4-3}~
ENEMY {0-0}
enemy: depersonalising {6-4}~
enemy: described with respect / distance {3-3}~
enemy: human being {2-3}~
JUSTIFICATION {0-3}~
justification: defend our way of life {5-4}~
justification: patriotism {1-3}~
WAR EXPERIENCE {4-13}~
war experience: inconsistencies {7-5}~
war experience: killing {5-2}~
war experience: survival {3-2}
XX TH: THEORIES {0-0}
xx th: ingroup - outgroup {6-0}~

Figure 8: Code system, after integration with respect to the category 'Coming Home'

In Figure 9 we see that `coming home` has not been used for coding, only one other code is linked to it {0-1}. It is connected to the tag `coming home as process/journey`, which, in turn is connected with seven tags, and these in turn with other tags. There is a dense network of linkages, although not all of them all are directly linked to `coming home`. Since a representation of the entire network would require a larger format, I present only two partial aspects that, step by step, interrelate all the aspects that lead to `coming home` with one another. In other programs, the mapping function (MAXQDA) or the modeler in NVivo could be used.

Figure 9 shows the relational context of the category `war experience` in an ATLAS.ti network view. This includes aspects of the war experience, the consequences of these experiences, and coping strategies with these experiences, as well as the perception of the enemy, broken down by group of persons (combatants/non-combatants). For writing the summary analysis, this time an ATLAS.ti memo was used which can also be integrated with the network view and called up from there as show in Figure 9.



ME:war experience combatant / non-combatant {8-1 Analysis} - Susanne [CLICK TO EDIT]

The war was for all, combatants and non-combatants a traumtic experience. P1, the non-combatant talked a lot about the inconsistencies he noticed. He was very conscious about that as compared to those directly involved in the fighting. The inconsistencies arose due to the different ways of acting and reacting as compared to "normal" civlian life.

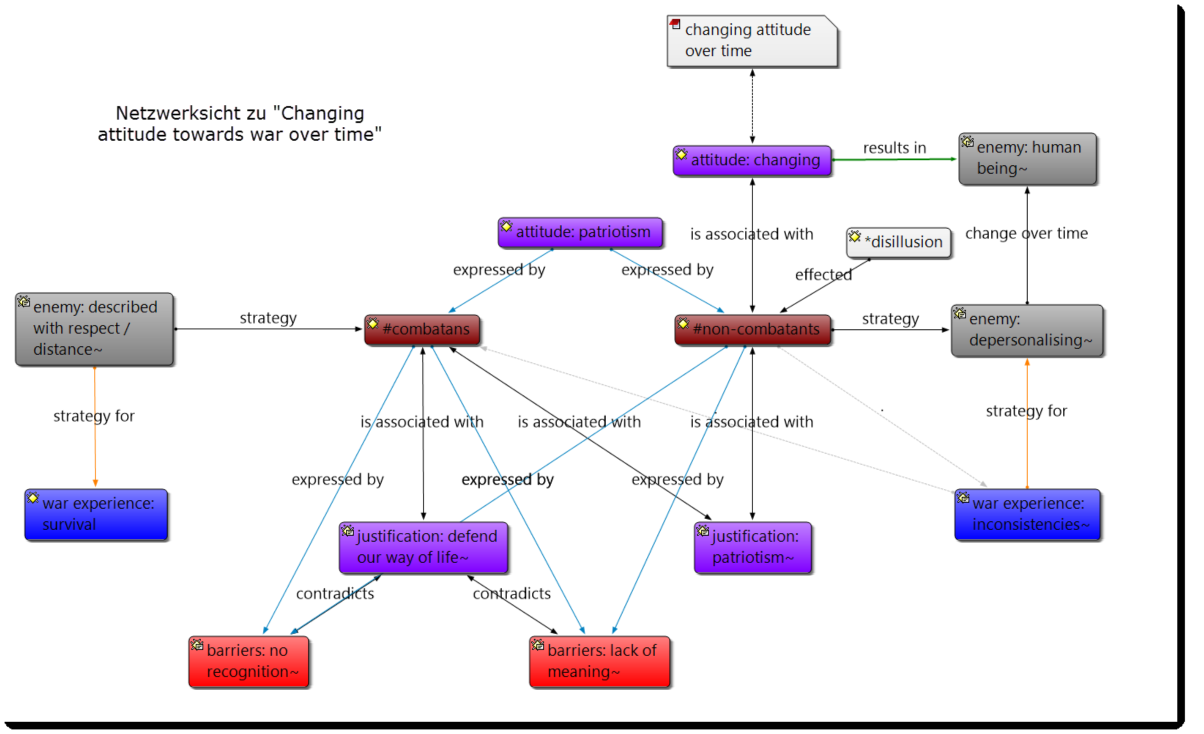
the nurse experienced this different from the combatant as he had to deal with the enemy in a different way, he had to care for the enemy as compared to killing him or defending himself. In order to be able to do that the enemy was depersonalized, he became faceless, a number, so that one could justify to oneself to treat this "thing" differently, avoiding self-conflict.

the combatant expressed respect and mistrust towards the enemey. This can be regarded as a strategy for survival. Dealing with someone faceless or a thing would not raise the necessary attitude and awareness for combat. Being focussed very much on survival, the combat di
not have n
inconsisten
after he retu
aware of wha
civilian life) ap
training, comm
so much expos

The effects on t
also much more
after he returne
experience rela
curtain over if

Figure 9: Network View 'War Experience' with Memo

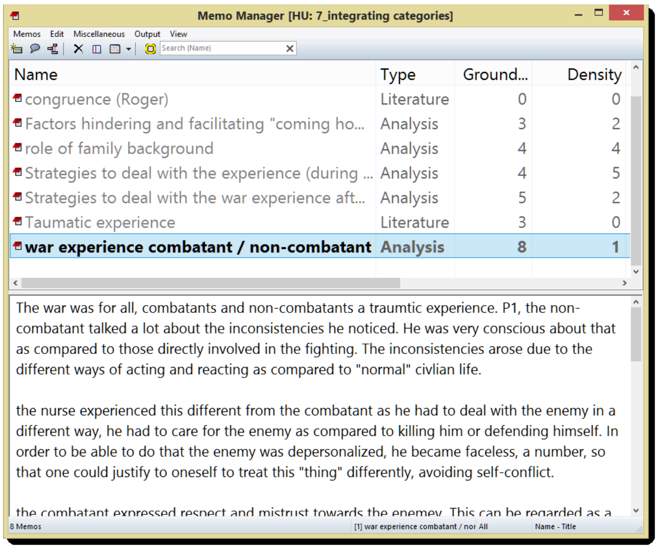
Figure 10 illustrates another partial aspect; it examines the question whether the attitude towards war changed over time, based on the war experience or other experiences.



Netzwerksicht zu "Changing attitude towards war over time"
changing attitude over time
attitude: changing
results in
enemy: human being~
attitude: patriotism
is associated with
*disillusion
change over time
expressed by
effected
enemy: described with respect / distance~
strategy
#combatans
#non-combatants
enemy: depersonalising~
strategy for
war experience: survival
justification: defend our way of life~
justification: patriotism~
war experience: inconsistencies~
contradicts
barriers: no recognition~
barriers: lack of meaning~

Figure 10: Diagram for code 'attitude: changing'

In Figure 11 you see the ATLAS.ti memos I have started to write in this process of integration. I created a memo for each partial aspect which may ultimately be helpful when focusing the analysis with respect to the core category. While writing the analysis, each memo was linked with quotes that I may want to cite in the final report (see column: Grounded). This makes them easily searchable and retrievable. The 'density' column specifies how many tags the memo is linked to. However, the actual number does not say much about the importance or significance. Like `coming home` it is not directly linked to all relevant tags, but indirectly through others. See also Figure 10.



Name	Type	Ground...	Density
congruence (Roger)	Literature	0	0
Factors hindering and facilitating "coming ho...	Analysis	3	2
role of family background	Analysis	4	4
Strategies to deal with the experience (during ...	Analysis	4	5
Strategies to deal with the war experience aft...	Analysis	5	2
Taumatic experience	Literature	3	0
war experience combatant / non-combatant	**Analysis**	**8**	**1**

The war was for all, combatants and non-combatants a traumtic experience. P1, the non-combatant talked a lot about the inconsistencies he noticed. He was very conscious about that as compared to those directly involved in the fighting. The inconsistencies arose due to the different ways of acting and reacting as compared to "normal" civlian life.

the nurse experienced this different from the combatant as he had to deal with the enemy in a different way, he had to care for the enemy as compared to killing him or defending himself. In order to be able to do that the enemy was depersonalized, he became faceless, a number, so that one could justify to oneself to treat this "thing" differently, avoiding self-conflict.

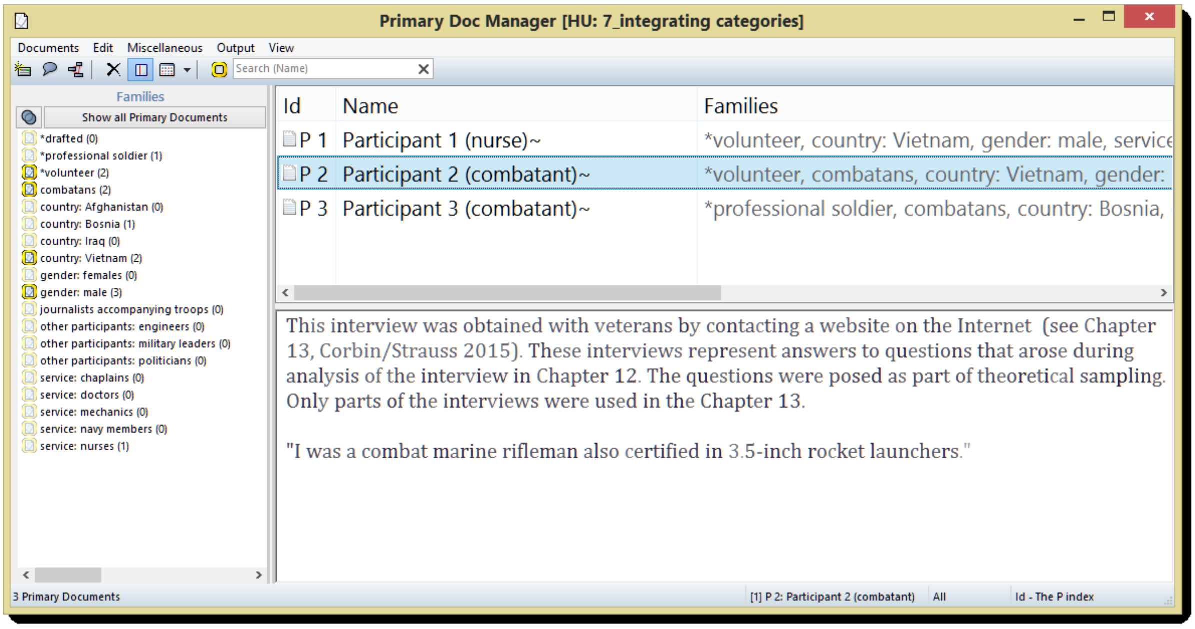
the combatant expressed respect and mistrust towards the enemey. This can be regarded as a

Figure 11: ATLAS.ti Memo Manager

Theoretical Sampling, Saturation, And Theory Building

The process described above can now be continued with additional material; the procedure remains the same: Tag your data, develop your categories, expand your axial coding while writing quotation comments, take note of interesting connections through hyperlinks, and use the network diagrams for drawing and visualizing relationships. The nodes in a network views are always directly linked to the actual data. This means you are not just juggling empty words but you can look at the underlying data at any time, re-read and re-develop their comments as well as your summary memos.

Based on Corbin's ideas (2015), Figure 12 shows which additional data could still be collected for the further development of a theory. The left column shows the existing as well as desirable document groups. Highlighted (in boldface) are those groups for which data currently exists. A great deal is thus still missing for now.


Primary Doc Manager [HU: 7_integrating categories]
Documents
Edit
Miscellaneous
Output
View
Search (Name)
Families
Show all Primary Documents

*drafted (0)
*professional soldier (1)
*volunteer (2)
combatans (2)
country: Afghanistan (0)
country: Bosnia (1)
country: Iraq (0)
country: Vietnam (2)
gender: females (0)
gender: male (3)
journalists accompanying troops (0)
other participants: engineers (0)
other participants: military leaders (0)
other participants: politicians (0)
service: chaplains (0)
service: doctors (0)
service: mechanics (0)
service: navy members (0)
service: nurses (1)

Id	Name	Families
P 1	Participant 1 (nurse)~	*volunteer, country: Vietnam, gender: male, service
P 2	Participant 2 (combatant)~	*volunteer, combatans, country: Vietnam, gender:
P 3	Participant 3 (combatant)~	*professional soldier, combatans, country: Bosnia,

This interview was obtained with veterans by contacting a website on the Internet (see Chapter 13, Corbin/Strauss 2015). These interviews represent answers to questions that arose during analysis of the interview in Chapter 12. The questions were posed as part of theoretical sampling. Only parts of the interviews were used in the Chapter 13.

"I was a combat marine rifleman also certified in 3.5-inch rocket launchers."

3 Primary Documents   [1] P 2: Participant 2 (combatant)   All   Id - The P index

Figure 12: Ideas for the collection of additional data material (theoretical sampling)

Summary

I can hardly imagine how one would handle the potentially anticipated material data manually, and, in particular, how to keep track of it. Using the software, I can not only manage the entire data material, but I can also ask important questions. Continuous comparison is a fundamental principle of Grounded Theory. Software enables me to compare statements on specific issues across different groups; e. g., do the testimonies of soldiers who served in Vietnam, in Iraq, or in Afghanistan differ from one another? Do women report different things from men? Are there similarities? Are different or similar coping strategies being employed? How is 'homecoming' experienced differently, depending on the context? These are all questions to which software can provide the data with a few clicks. This type of analysis simply cannot be performed manually with growing amounts of data; it would be too costly. The thinking process (the 'T' in the NCT process) still is the task of the researcher. As has been shown, it can be accomplished extremely well in the writing steps, i. e., aided by the comment and memo functions in the software. The creation of network views further stimulates thinking in a creative way. It helps to recognize higher-order relationships, and to integrate the data with respect to the core category. Table 4 summarizes the remaining software functions and its application.

Software function (ATLAS.ti)	Application
Hyperlinks	• References to other data segments, which would be noted on a record card when analyzing data manually • The type of link can be named like: confirms/explains/is consequence of/is strategy for/contradicts, etc. • The linked data segment can be retrieved in context, one can directly jump to it via a mouse click • Hyperlinks can also be created and displayed in network views •

Software function (ATLAS.ti)	Application
Network Views	• Recommended when working on the conceptual level • Supports the process of integration • Presentation of core category and its connections
Memo	• Research diary • Writing down ideas on theoretical concepts that might be helpful in interpreting the data • Writing up answers to research questions based on queries • Writing up the various parts that will later form the theory • Description of theory • On the technical side: creating code lists for import •
Code family/code groups (Mac) Super families/smart groups (Mac)	Technical: • Filter for easy access and retrieval • Filter for queries
Super codes/Smart codes (Mac)	Technical: • Saved queries

Table 4: Further software functions and their application in GT

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