

# Exploring Actor-Network Theory And CAQDAS Provisional Principles And Practices For Coding, Connecting And Describing Data Using ATLAS.ti

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## Abstract

*This paper explores how ideas from actor-network theory (ANT) can be drawn on to inform ways of using computer assisted qualitative data analysis software (CAQDAS) in an ANT-oriented project. Through this it explores some of the challenges ANT poses to conventional uses of such tools, and the resources ANT provides for re-considering their agency in research practices and possibilities for future developments.*

*CAQDAS is often associated with particular approaches to engaging with data (e.g., coding data and retrieving the codes, abstracting and reducing data to themes etc.). These approaches have become dominant enough such that they are often presented and/or interpreted as the right, or only way to work qualitatively with qualitative data. In opposition to this orthodoxy some orienting principles are proposed from the ANT literature along with its intellectual antecedent ethnomethodology.*

*The proposed principles are: freedom of movement and data, logging the inquiry using Latour's four notebooks, coding and following heterogeneous actants as cases, supporting contextual exploration of fluid and multiple ontologies, staying close to the words of the actants and working in a scale-free manner that enables shifting magnifications and assemblages to preserve detail rather than abstract it into themes. A final principle concerns the intentions of ANT-informed approaches to assemble a detailed description, which are contrasted with the intentions of approaches aligned with Grounded Theory to abstract data in order to construct an explanation.*

*These principles are explored and illustrated with detailed descriptions that draw on examples from a multi-modal ethnographic PhD research project. The project used heterogeneous data to explore the information infrastructures and classification systems used in craft beer judging. Examples of how that diverse dataset was coded and connected are used along with excerpts from a reflective journal of the struggles and ideas for using CAQDAS to illustrate ways of effectively using ATLAS.ti in ANT-oriented research projects.*

## Keywords

CAQDAS, ATLAS.ti, coding, actor-network theory, ethnomethodology, ANT-oriented projects.

## Introduction

### ***Opening Vignette: PhD Thesis Journal Entry***

*27th October 2012, PhD Journal*

*So - how the hell should I code this stuff????*

The quote above is probably a familiar sentiment to many when starting out using a computer aided qualitative data analysis software (CAQDAS) package such as ATLAS.ti. In response there are numerous guides, suggestions, prescriptions and recipes to help the novice answer that question. What the effects, influences, methodological alignments and consequences of some of that advice are is the focus of this paper.

The paper is in three parts: In the first part I introduce Actor-Network Theory through an example multi-modal ethnographic project that explored classification practices in the sensory evaluation and judging of craft beer. This provides examples and literature to propose some provisional principles for ANT-oriented research and the requirements for software to support such investigations. The second part explores how those principles can be enacted in practice and through examples using ATLAS.ti for the management, coding, connecting, visualization selecting and exporting of data to provide empirical examples for

project publications. Finally, in part three, I turn to explore the challenges posed by actor-network theory to many of the conventional assumptions that inform the advice, guidance and proposed models for using CAQDAS packages such as ATLAS.ti. The key difference I focus on is how conventional approaches to qualitative data analysis exemplified by grounded theory seek to transcend description and provide explanation whereas the explicit intention of an ANT sensibility is to provide descriptions.

### **Part One: Introducing Actor-Network Theory Empirically**

What then is actor-network theory, and how does it pose such a challenge? John Law suggests that:

Actor network theory is a disparate family of material-semiotic tools, sensibilities, and methods of analysis that treat everything in the social and natural worlds as a continuously generated effect of the webs of relations within which they are located. It assumes that nothing has reality or form outside the enactment of those relations. Its studies explore and characterize the webs and the practices that carry them. (Law, 2009, p. 141)

One of the intentions of this paper is to explore a case of using ATLAS.ti in assembling a research project oriented around these ideas, and from that propose some potential principles for entangling CAQDAS, and ATLAS.ti in particular, in ANT-inspired studies. However, in order to address those topics it will help to make a shift in recognition of John Law's argument that:

...it is possible to describe actor network theory in the abstract. .. But this misses the point because it is not abstract but is grounded in empirical case studies. We can only understand the approach if we have a sense of those case studies and how these work in practice. (Law, 2009, p. 141)

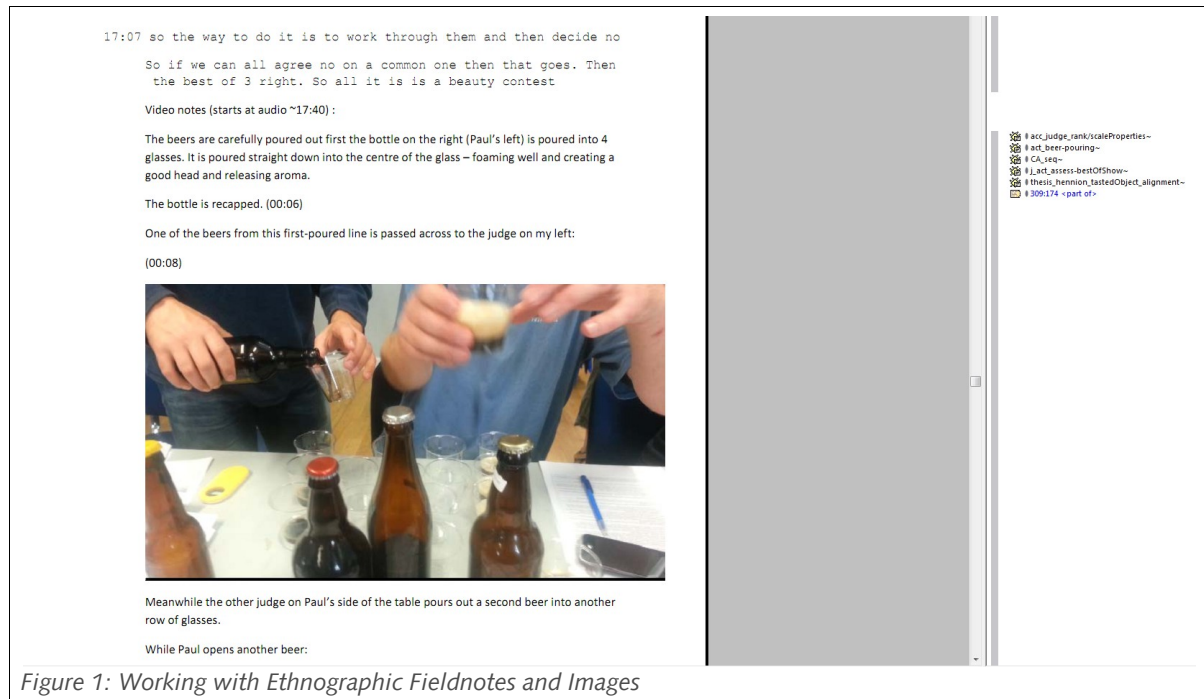
### **The Example Project**

The empirical case study that provides the examples used here was an exploration of how the recent rapid growth of "craft beer" as an industry sector has included a search for definitions of what constitutes or defines something as being a "craft beer." One of the ways in which this is achieved is through the use, construction, articulation and organization of beers into "beer styles", with the Beer Judge Certification Programme (BJCP) guidelines, that were developed for evaluating home-brewed beers, as one of the most influential. The thesis (Wright, 2014) explored the development of those style definitions and how they act as a classification technology which shapes the ways in which sensory judgments are formed and expressed, and how judges are assessed and certified.

The investigation was a multi-modal, multi-scale, multi-sited sensory ethnography drawing on both actor-network theory and ethnomethodology to trace how taste descriptions are assembled in order to enable translation into different practices. There was a particular interest in classification systems within this and how these were performed through and also shaped, ordered and sequenced tasting practices - drawing on ideas from Star (1999) about conducting an "ethnography of infrastructure."

Ethnographic fieldwork followed the trajectory of an 'actant.' This is a key concept for an ANT sensibility: that agency is distributed between both humans and non-humans, thus a non-human participant (in this

case a bottle and the beer it contained) can be followed as an 'actant' rather than the more conventionally anthropocentric following of an individual or group of human 'actor/s'. Following this actant helped to explore and consider how the situated actions, material orderings, classifications systems and classification practices of beer competition judging were achieved.



The magnification of this investigation was continuously adjusted by drawing on principles of ethnomethodology (EM) – developed by Harold Garfinkel's (1967) as well as the methodologies that have their origins in his work: conversation analysis (CA) and membership category analysis (MCA). EM in particular is one of the key and acknowledged intellectual antecedents of ANT (Latour, 2005). In the present study, approaches derived from these methodologies were used to explore the sequential and categorial aspects of judging talk and its co-ordination with writing and form-filling.

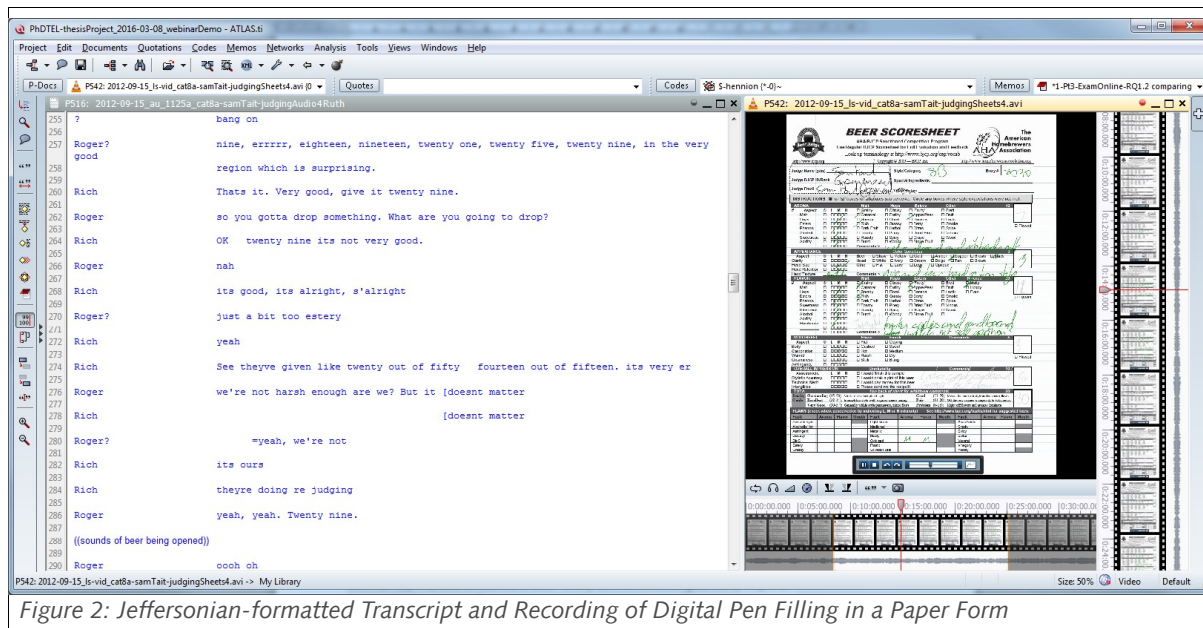


Figure 2: Jeffersonian-formatted Transcript and Recording of Digital Pen Filling in a Paper Form

Auto-ethnographic approaches were also drawn on through material-semiotic readings that explored the construction of testing experiences including multiple-choice test items in an online exam (captured through screen recordings). These were contrasted with the assembly of a blind beer tasting exam (captured through video recording, field notes, and exam documents). I used the latter to explore their enactment of models of learning and assessment.

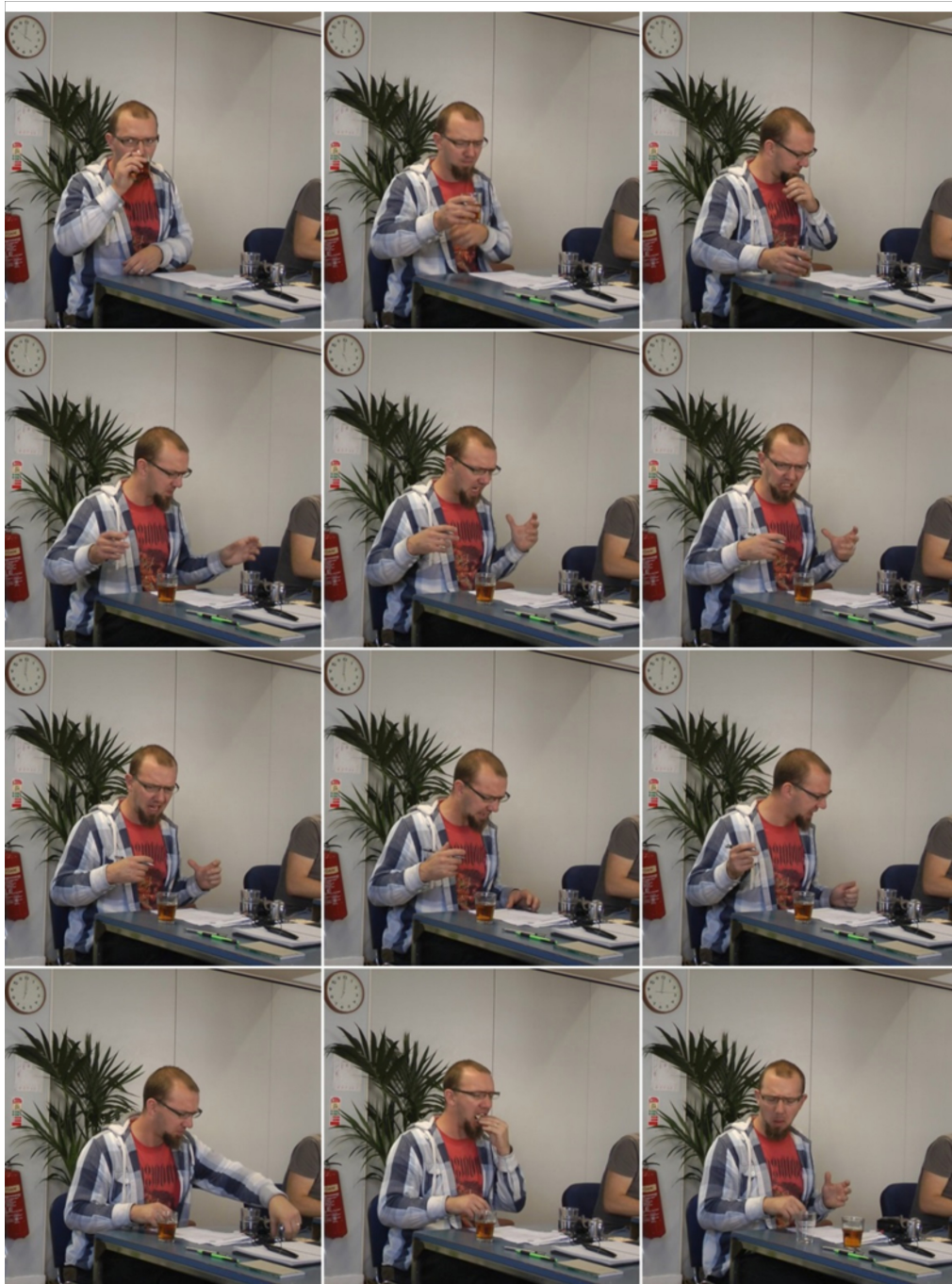


Figure 3: Auto-ethnographic Video Still Sequence (Captured using ATLAS.ti)

The data was heterogeneous: from digitized historical manuscripts to detailed transcriptions and multiple video and audio sources. The actants were diverse - with words, a bottle of beer and classification system as central "participants" equally carrying agency along with the human judges and authors. Data spanned time frames both large (from 1762 to 2012) and small (timing tenths of second pauses in transcripts). The argument of the thesis was built through a detailed description of the ways that webs of classification, association and enactment were assembled and stabilized, rather than seeking to understand the perspective of the participants or identifying "underlying themes."

I suggest that this methods assemblage (Law, 2004) challenges many of the conventional assumptions around how to use qualitative data analysis software.

However, within the thesis itself (as so often happens), my engagement with CAQDAS use was largely omitted. In the written text I had to make many choices about what to make present through inclusion and what to exclude. My use of ATLAS.ti merited only part of one paragraph within the 55,000 words of the thesis as a whole – a manifest absence. This paper seeks to develop and disseminate some of the ideas, approaches and developments I drew on in the thesis. I also seek to use this as a specimen example of ANT-in-action in order to connect these approaches back to the body of literature and assemblage of ideas and sensibilities which informed their development and thereby point to paths for others to explore, adapt and use some of these ideas.

### **Proposing Provisional Principles For A CAQDAS–ANT Assemblage: Challenges And Risks**

A core challenge in that aim, and for developing the approaches I used is that both actor-network theory and ethnomethodology vary between being relatively obfuscatory through to deliberately obtuse or objecting outright to any fixed frames for or approaches to analysis. Ethnomethodologist Paul ten Have writes that each inquiry "has to be fitted to its circumstances in each and every way" (ten Have, p146) and furthermore that "every ethnomethodological study requires the creative invention of a unique approach to the problems of gaining access to the phenomena of interest and ways to render them accessible to others'" (ten Have, 2004b, p. 171). There are no fixed frames or recipes in these waters, and the terms and ideas that swim in them are as slippery as salmon. For example, within material-semiotic approaches Annemarie Mol displays exemplary evasiveness when proposing a term that has a real relevance to this paper, and then refusing to define it, suggesting:

In order to stress that my concern is with ontologies as well as normativities, I will experiment with a novel word here: *ontonorms*. Rather than a descriptive summary, the term '*ontonorms*' is a methodological tool. My hope is that it may sensitize us to materialities and issues of good and bad at the same time. I would like to leave things as open as that, so I will not try to give a clear and distinct definition of '*ontonorms*'. Instead, I will use the fluidity and ambiguities of this term to inspire and propel an analysis of a particular practice where 'science' interferes with 'daily life' (Mol, 2013, p. 381)

With these considerations in mind the risk of extending my creative invention of a unique approach for a study concerned with classifications and the contact senses to their origins in my readings of literature in this area is that any "principles" for using CAQDAS in ANT-inspired studies would undo these very principles. Were these to become fixed: as recipes (or worse still, as a rigid set of "rules" to be followed) it would be to abandon that core commitment to situational specificity and the construction of context. I therefore emphasize that that this is not at all the intention. Instead the following principles - like Mol's *ontonorms* - are partial, contingent and exploratory rather than fixed or definite. They are proposed as a set of methodological tools and sensitizing ideas rather than prescriptions and certainly not proscriptions.



Of course such an approach is high risk if one's intentions are more pedagogical: fixed rules and sets of instructions to follow and evaluate ones progress against as a clear yardstick appeal to many. However, for those who relish the freedom and creative possibilities that open up if you "set sail in a boat without a bottom" (to use Garfinkel's aphorism – cited in Silverman (1998)). I therefore hope they may provide some useful considerations and ideas for the creative invention of other unique approaches that can also enroll the potentials and flexibility of software to support their specific inquiries.

## **Provisional Principles And Requirements For Software Support In ANT-Oriented Projects**

### **Freedom Of Movement And Data**

In his critique of ethnomethodologists' preoccupation with detailed transcripts Latour argues that this

enormously limits what counts as data, and what counts as a legitimate explanation of these data ... Why on earth should we be less free than the people we study/work with? Aren't they constantly changing instruments, focus and scale? ... why can't we go going from shop talk to photographs, to scientific writing, to science policy, and then back to instruments. (Latour, 1986, p. 545).

Such moves are part of the ethnographic methods that are something of a 'signature mode' of ANT-oriented enquiries - albeit a mode that is stretched to move beyond the "ethno-" (human) focus. That stretch may therefore incorporate ethnographies of infrastructure (Bowker, 1994; Star, 1999) explorations of documentary realities (Atkinson & Coffey, 1997; Prior, 2003) or computer code (Berry, 2011; Mackenzie, 2006) with Mol (2003) proposing the alternative term "praxiography" to emphasize a focus on *practices* rather than a presumption of focussing on *people*.

### **Latour's Four Notebooks**

Unlike more conventional approaches there is a notable lack of detail, description or direction around methods for ANT investigations. While there are often rich accounts of fieldwork and thick description of scenes, how these were selected or connected is not spelled out. There are hints in the neo-hardboiled detective story structure of Latour's (1996) experimental book "Aramis" and other sources, but the clearest explication is a mere couple of pages in Latour's (2005) book *Reassembling the Social*. He lists "the different notebooks one should keep—manual or digital, it no longer matters much", suggesting that any digital tools software should need to enable and support:

The first notebook should be reserved as a log of the inquiry itself...

A second notebook should be kept for gathering information in such a way that it is possible simultaneously to keep all the items in a chronological order and to dispatch them into categories which will evolve later into more and more refined files and subfiles.

A third notebook for writing trials...

A fourth type of notebook should be carefully kept to register the effects of the written account on the actors whose world has been either deployed or unified (Latour, 2005, pp. 134-135).

### Following Heterogeneous Actants

One of the hallmarks of ANT's approach to engaging with social research has been to radically shift what is regarded as "assembling the social" - both extending and challenging the basis of conventional conceptualization of agency-structure debates. These are broadened to include the myriad of objects and materials as well as discourses, words and numbers and the ordering of these as all being active agents that assemble the 'social' world. If agency is distributed and the terms of an investigation are to "treat everything in the social and natural worlds as a continuously generated effect of the webs of relations within which they are located" (Law, 2009, p. 141) then there are immediate practical consequences for CAQDAS software use and the conceptualization of cases, causation and contingency.

### Supporting Contextual Exploration Of Fluid And Multiple Ontologies

One of these consequences is that fixed 'attributes' or *a priori* 'social' categories are not aligned with these sensibilities - if an actant is performing "arteriosclerosis" or "gender" or "class" in a certain way, if it is *doing* "a category", the doing will be located in those contextual practices (Mol, 1998, 2003). Therefore it should not be abstracted into external, transcendent socio-demographic categories (Callon & Latour, 1981) as "attributes", or "variables".

### Staying Close To The Words Of The Actants.

The detail and the reflexive words and actions of heterogeneous actants should be preservable and usable, not automatically substituted with the meta-language of the analyst. Explications of this are therefore worthy of considering at some length:

Do not explain your phenomenon away with something else that is not part of the phenomenon! Stay true to your materials! Do not become a kitsch- sociologist who does away with the properties of the social world with the help of external categories that do not belong to the phenomena that you want to analyze. (Guggenheim, 2011, p. 67)

We have to resist the idea that there exists somewhere a dictionary where all the variegated words of the actors can be translated into the few words of the social vocabulary. Will we have the courage not to substitute an unknown expression for a well-known one? ... We have to resist pretending that actors have only a language while the analyst possesses the meta-language in which the first is 'embedded'. (Latour, 2005, p. 49)

The detail and reflexive accounts, words and actions of heterogeneous actants are therefore an important resource and not one to be abstracted quickly.

### Scale Free

Rather than moving from situated actions and abstracting these into 'real codes' or 'real themes' data segmentation and categorization needs to be able to move seamlessly between, and also preserve, the specific and particularity of a performance. Additionally, it must be able to support tracing an explicit logic of association among situated actions and actants as they form assemblages.



Scale is a key concern in this, and the rationale for the word 'network' in the term 'actor-network theory':

Difference in relative size is obtained when a micro-actor can, in addition to enlisting bodies also enlist the greatest number of durable materials. He or she thus creates greatness and longevity making the others small and provisional in comparison. The secret of the difference between micro-actors and macro-actors lies precisely in what analysis often neglects to consider. ... Instead of dividing the subject with the social/technical, or with the human/animal. or with the micro/macro dichotomies, we will only retain for the analysis gradients of resistivity and consider only the variations in relative solidity and durability of different sorts of materials. (Callon & Latour, 1981, p. 284)

Traditional dichotomies of micro-interaction or macro-structures and the relationships between the individual and the societal are considered as performative assemblages, with analysis seeking to trace and describe how such assemblages come into being and persist or collapse. This of course has methodological consequences: there are no *a priori* scales nor pre-existing aggregates to use as explanatory variables. The traditional sociological hierarchies of ABC1C2 demographics, and categories of class and gender shift to contingent, contextual *achievements* and *assemblages*. These are therefore topics to be traced in terms of how they come to be constructed through empirical study, rather than being available as a pre-existing set of resources to explain the matters at hand.

#### **Intent: If Your Description Needs An Explanation, It's Not A Good Description**

In most cases, social explanations are simply a superfluous addition that, instead of revealing the forces behind what is said, dissimulates what has been said, as Garfinkel has never tired of showing (Latour, 2005, p. 49).

This concern with description brings me to a final key principle consideration: the intent of any analysis. It is one which Latour is particularly clear on: that the task is to describe how networks come together and stabilize or fall apart, and furthermore that "if your description needs an explanation, it's not a good description, that's all" (Latour, 2005, p. 147).

There is therefore another continuity with ethnomethodology - in that ANT seeks to write descriptions of *how* rather than create interpretations of *why*. And just as ethnomethodology is not a methodology this move subverts the term "theory" in ANT - as

the actor network approach is not a theory. Theories usually try to explain why something happens, but actor network theory is descriptive rather than foundational in explanatory terms, which means that it is a disappointment for those seeking strong accounts. Instead it tells stories about "how" relations assemble or don't (Law, 2009, p. 141).

#### **Extrapolating From The Empirical**

Having introduced the data and investigation, the opacity and lack of methodological guidance or clarity, and then attempted within that to propose a set of potential principles I now return to the opening question, and the clashes with these concepts:

**2012-10-27 (PhD Journal)**

So - how the hell should I code this stuff???

*I've been reading Susanne Frieese's book on ATLAS.ti, which is GREAT on the technical detail and on introducing a way of coding. However, her approach, whilst not explicitly wedded to the grounded theory (GT) method is still full of recommendations, cautions and suggestions for how to get as far away from the data as possible as efficiently as possible. She regularly admonishes people<sup>1</sup> for having too many codes or the codes 'still being too close to the data' (Frieese, 2012) and how you need to abstract, group and find higher-level codes to group these other ones under.*

**BUT BUT BUT**

*That is to me the absolute antithesis of ethnomethodology, conversation analysis and ANT, which all share a dedication to staying CLOSE to the data, the words and actions of the actors/actants and using their terms and voice and being really closely grounded in describing what they are doing at a fine granular level.*

These raw notes refer to the key book for ATLAS.ti users, which provide a mixture of advice, suggestions, steps to follow, and self-assessment activities by Susanne Frieese (2012, 2014). I drew on this book extensively in my project - it prevented me getting stuck in some tricky holes I had started to dig for myself and also formed a point of reference, reflection and occasional rejection for me to develop my project. However, if these ideas about abstraction are indeed the antithesis of the methodological approaches I was working with why then would I want to use software that is typically so fundamentally associated with tagging data? Why would I want to use a tool that facilitates abstraction if I wanted to stay close to the data? The answer lies in the hinterland between the intentions and methods of the project, and the previously proposed principles for such investigations. CAQDAS software here supported the investigation in multiple ways, including:

- **Data management:** Nearly 800 documents were incorporated in a year's fieldwork. These could be efficiently grouped, filtered and ordered by time, event, data type or analytic progress.
- **Exploring sequences:** While CA and EM approaches may be wedded to staying close to the data rather than abstracting it into themes, managing that data, tagging it and exploring it can be greatly facilitated by CAQDAS generally, and features of ATLAS.ti specifically. Tagging is a useful term to move away from the baggage and methodological assumptions intertwined with the term 'coding'. You can tag for example for "questions" and "response" and then, in ATLAS.ti, use queries to identify and retrieve sequential patterns such as when a question follows a question.

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<sup>1</sup> To describe Frieese's language as "admonishing" is a rather pejorative interpretation of pedagogic advice but one that points to an important consideration as I extend those initial thoughts and concerns in this paper. There is a very real risk of constructing a 'straw man' argument through selecting, and de-contextualizing particular passages from Frieese's book and misrepresenting sound pedagogical guidance (albeit, sometimes rather stridently expressed) as particularly normative or restrictive. I therefore deploy two methods to guard against that - the first being this explicit reflexive acknowledgment; the second being to draw on review comments by Susanne Frieese of a draft of this paper. These inform the revised paper and explication of my concerns, contrasts, methods and ideas set out here.

- **Exploring assemblages:** Similarly, you can tag for objects and actions in diverse data and then look at when objects and actions occur together, and how, when and where material practices are assembled.

These all make particular use of the possibilities and power of CAQDAS software but are distinctively different from the idea of abstracting from the concrete to the abstract as themes or an aiming to discover a 'core'. It is exploring the intentions and specifics of those differences and their enactments that I now turn to as I develop the argument of this paper.

## Part Two: Enacting The Principles In Empirical Practices<sup>2</sup>

### *PhD Journal: 2013-03-10\_17:26:59 - Working with recording of class 1*

*Working almost entirely with the recording of online class 1 today and then making notes between documents - linking quotes and codes. It's felt like building an effective network.*

*I've also started to associate some of the code hierarchies together but not sure if that's a good start or not - hope so! e.g., associating the code `classifying_bjcpScoreSheet-aroma` as "a property of" the code `classifying_bjcpScoreSheet-comments and scores`.*

*I've reached 428 codes - so lots of evidence that they're very descriptive and not "conceptual" yet. However, I think this is both an ANT thing (staying close to the data) and an early-stage-of-coding thing. I'm periodically making sure that I'm sorting out replication of any documents and merging any replicated codes.*

Having contingently defined some principles to explore, and explored their contrast in both, clarity of approach and intention of analysis with other qualitative analysis approaches, I now turn to consider how the principles can be achieved using ATLAS.ti, whilst also drawing comparison with some other CAQDAS packages. This is achieved through considering the practices already alluded to in the PhD journal and illustrated through my particular engagement with ideas and enactments of ANT in my PhD thesis.

### Freedom Of Movement And Data In Practice

Rather than being focused on detailed transcribed speech (and the transcription process) that is a signature of ethnomethodological research, ANT-inspired projects assemble far more heterogeneous data. While ethnographic approaches must not be assumed, they are often a signature method of ANT studies, therefore, any software must be able to support the management and exploration of the complex and varied data ethnographic methods create.

ATLAS.ti eminently supports this requirement with its ability to work with and make connections between diverse types of data: from transcripts of shop talk - together with audio or video associated

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<sup>2</sup> The following methods are set out at a level of detail that will hopefully enable a skilled user to follow, use and adapt them. For novice ATLAS.ti users I would recommend gaining a good level of familiarity with features of ATLAS.ti and effective approaches to using it through tutorials or Friese's book. More detailed, step-by-step, explications will be published elsewhere, e.g. through the [ATLAS.ti research blog](#).

and synchronized, to photographs - with annotations and coding for both the image as a whole and sections within it, to documents - including policies and field-notes, and back to instruments.

Practical outcomes of this include multiple data sources being incorporated into field notes and the creative use of fonts, images and captions to bring data together. Smartphones support these practices easily with note-taking apps, cameras and sound or video recording all available, along with geo-location. ATLAS.ti also enables segmenting and tagging both the text and areas of images if mixed-media field-notes are imported as PDF documents. Hyperlinks can then make further connections with other media or high-resolution original images.

### **Latour's Four Notebooks: In Practice**

A more specific requirement for ANT-oriented CAQDAS use concerns Latour's proposal for four notebooks, and it is of course important to engage with the simplicity and ubiquity of their paper forms:

It might be disappointing for the reader to realize that the grand questions of group formation, agency, metaphysics, and ontology that I have reviewed so far have to be tackled with no more grandiose resources than tiny notebooks to be kept during the fully artificial procedure of fieldwork and enquiries. But I warned the reader in advance: there is nothing more rewarding to be had and there is no faster way. (Latour, 2005, p. 135)

Translating these into ways of working with these ideas through software is therefore not about "a faster way" but instead about enabling and flexibly supporting these traditional methods, rather than seeking to speed up the inquiry through using digital tools.

#### *The first notebook - a log of the inquiry itself*

There are several potential interpretations of this proposed notebook. One would be that this notebook is a primary document - it is the field notes. However I suggest there could and should also be another log of the inquiry itself once it has become entangled with using a CAQDAS package such as ATLAS.ti. This would be analogous to the "research diary" memo proposed by Susanne Frieze (2014, p. 124).

Following her advice the memo type would be renamed as either "research journal" or "notebook one - inquiry log" to clarify what it is and what it is for. The shortcut CTRL+D is then used to insert a time/data stamp above each entry. The activities, reflections, emerging ideas etc. from working on the primary data such as field notes would make this a reflective log of the progress of the inquiry as enacted within ATLAS.ti.

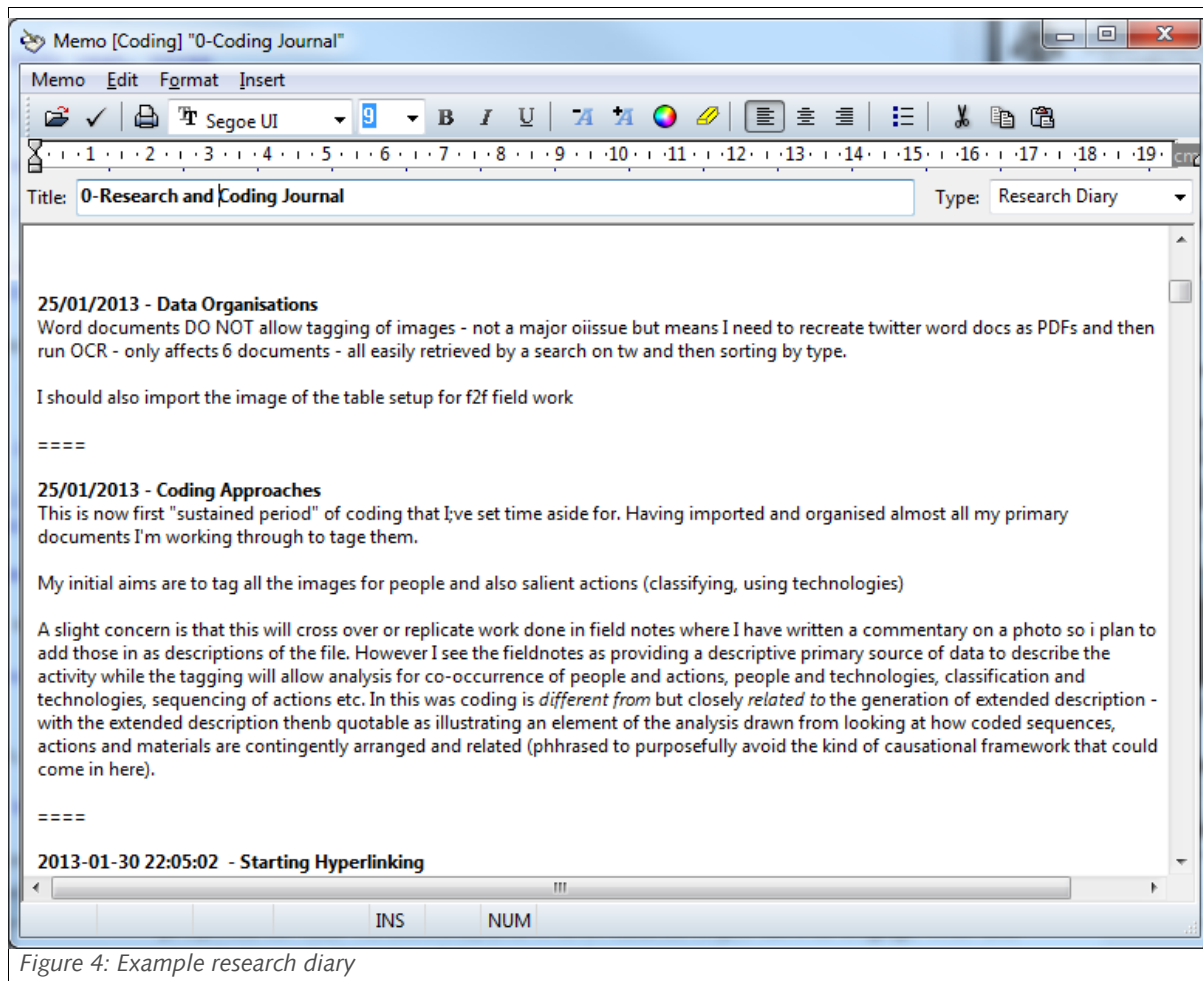


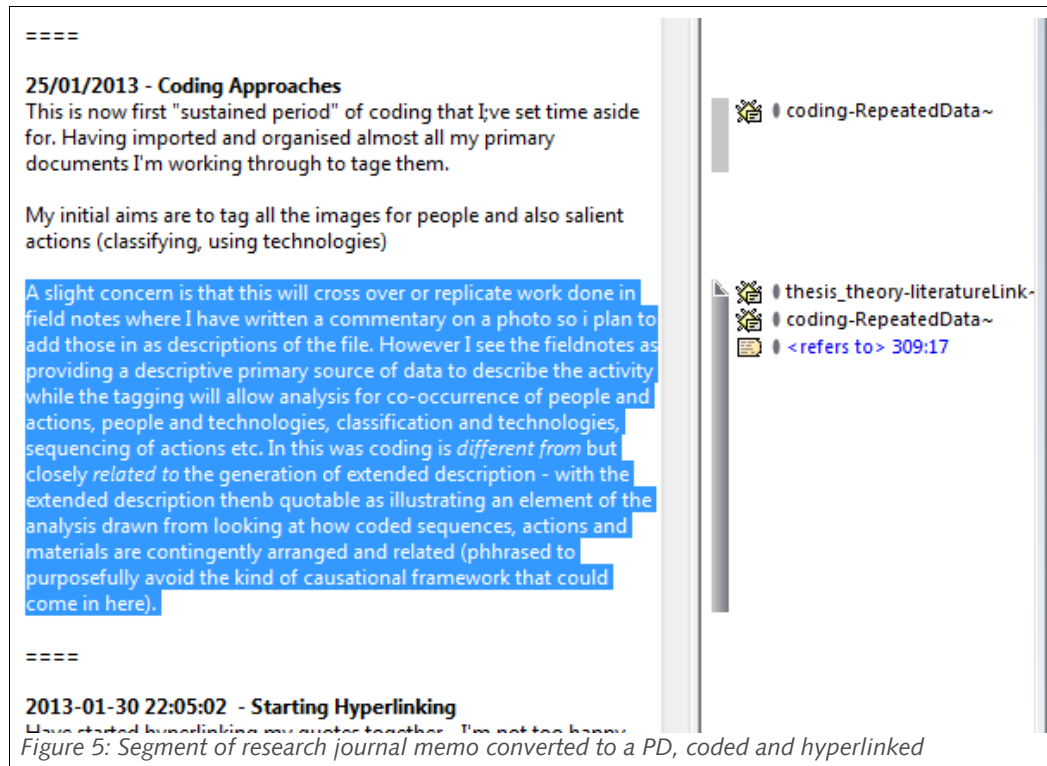
Figure 4: Example research diary

Experience shows that this memo will grow to be very long as an inquiry progresses and emerging ideas are recorded. However, it also becomes increasingly useful and relevant to link sub-sections and entries in the journal to the data they reflect on. Currently ATLAS.ti only enables linking a whole memo to quotations or codes so an interim step is needed to enable such specific linking. One solution could be to break up the journal into multiple single entries; however, such an approach risks losing the clear sequencing and readability of a single diary or journal and creating a mass of short entries.

A potential alternative solution is to create "chapters" within the overall ongoing journal. By dividing up one huge research journal memo into sections (e.g., monthly or weekly depending on the size and quantity of reflections) then they would be assigned as a primary document (PD). By converting these completed chapters to primary documents, and adding them to their own PD family (enabling exclusion from, or inclusion in, queries) they can be segmented into quotations. These quotations can then be:

- 1 - *Annotated* (e.g., with later thoughts or findings, which should also be time-stamped)
- 2 - *Hyperlinked* to other entries and data (so that connections and emerging ideas can be traced and associated within this notebook and from this notebook to the data it concerns)
- 3 - *Coded* so that they can be retrieved in queries.

The Primary document memo can still be edited a little - by editing the PD, as long as all the cautions for editing PDs are observed. This approach then enables linking this first notebook, or any long research journal type memo, with the data of the inquiry.



### The Second Notebook In Practice

The second notebook is for "gathering information in both a chronological order and dispatching them into evolving and refined categories" (Latour, 2005, p. 134). This is the most substantive area of convergence between Latour's suggestions and the functionality of a CAQDAS package such as ATLAS.ti. Working with chronological data is important and can be realized in several (complementary) ways, whilst categories with "more and more refined files and sub-files" (ibid) can be achieved through a combination of coding and creating groups/families.

The simplest way of achieving this is through rigorous and logical file naming that works from larger dates to smaller. Following Friese's suggestions that file names should be informative and standardized I would recommend the following format in order to prioritize chronological sorting:

yyyy-mm-dd\_hh-mm-ss-m\_data type\_event-detail.extention  
 e.g., 2012-04-01\_fn\_NHCcomp-mixedMediaFieldnotes.pdf

The illustrative file name shows that the data was generated on the date 1<sup>st</sup> April 2012 (*without hh:mm:ss – data that would be available for photographs for example*), the file naming conventions further tell me that the *data type* is fieldnotes (fn) from the *event* of the NHC Comp, the *detail* being

they are mixed media fieldnotes, and the *file extension* showing they are in PDF format. Similar principles can also be applied to code names and code family names so that they order sequentially – thereby enabling sequential cross-tabulation in a code co-occurrence table as well.<sup>3</sup>

### The Third Notebook For Writing Trials... In Practice

Writing trials: Testing out how you can account for, describe and deploy what your investigation is uncovering, is an ongoing and essential part of all qualitative research approaches. ATLAS.ti provides simple writing spaces for such trials in the form of memos. Coming with version 8, there is the promise of importing text from other spaces where such trials may be happening. In my thesis project I used Evernote a lot to make notes while mobile or with a phone or tablet of reflections on and ideas about emerging work and processes of engaging with the data. These were then copied and pasted into ATLAS.ti project log or research question memos<sup>4</sup>.

There are many other ways of engaging in "writing trials" in ATLAS.ti. Another suggestion from Friese which I found particularly useful was creating "research question memos" to connect a research question to query formulation and then to selected retrieved passages using a memo (Friese, 2014, pp. 167-173).

The first step is to write down the research question/s that are being investigated, and the aspects and ideas they may relate to within the assembled data. This is all written in the discursive language of a report rather than just as notes on technical aspects of a query. The next step is identifying potentially relevant codes and code combinations to look at each element of the query, once again these should be written down with the possible queries described in full sentences. (Your code and code family comments can help in this). The natural language questions are then translated into queries and the resulting output read through and considered. The final step is then to attach this memo to a selection of (or potentially all) the quotations returned by the query. The memo can then be created as an output with these linked quotations. This approach creates a structure for writing that can potentially outline a kind of "proto-chapter" for a thesis. The writing trial connects and documents the translation of the research questions into specific ways of working with specific data: querying and considering it, then synthesizing and identifying and finally including those selected quotations and their accompanying notes and hyperlinks to be further explicated in progressive drafts of the report.

### The Fourth Type Of Notebook... In Practice, Or As A Future Development?

The proposal for this notebook to "register the effects of the written account on the actors" (Latour, 2005, p. 135) seems to fall outside the (current) scope of CAQDAS software such as ATLAS.ti. However, I suggest that exploring these a little further does bears merit – especially with the pressure from research funding bodies to publish datasets this could be a particularly interesting area for the next generation of tool development.

<sup>3</sup> A more extended consideration of approaches and steps to work like this will be published through the ATLAS.ti [research blog](#).

<sup>4</sup> The forthcoming ATLAS.ti feature of direct import from Evernote will greatly facilitate this.



My interpretation sees this as requiring at least two steps: one is the account of the research that is being assembled through the notebook 3 trials being shared with the heterogeneous actors, the other is enabling those actors to shape the written accounts. This is easy to think of anthropocentrically as a presentation of findings to the participants and a record of their reactions, but the idea seems far more iterative and fluid in ANT as the actors could equally well be human or non-human.

I suggest that there is a clear implication of a fundamental shift of how the analytic space / program / environment could interact with the participants in the study. This could either be a link out, and then a connection back in, in order to incorporate the outcomes of the link and resulting sharing of the account. At basic levels this could be simply checking factual accuracy of transcripts but could hopefully extend to outputting emerging insights (publishing memos to a blog perhaps?), through to displaying patterns and visualization (such as network views) in interactive formats. The XML output options of ATLAS.ti could hold particular potential in this area. Bruno Latour's (2011) AIME project has developed approaches, ideas and tools for enabling audiences to interact with and contribute to an emerging text via creating annotations and connections. This sort of approach shares many features with CAQDAS packages such as ATLAS.ti and could point towards more radical opportunities for an online, collaborative and interactive direction in the future development of CAQDAS software.

### **Heterogeneous Actants In Practice**

When engaging with the heterogeneous actants of an ANT-oriented approach the conceptualization of cases shifts and thus approaches to collecting and identifying them must shift as well. A practical consequence of considering agency to be distributed requires that any investigation into webs of relations within which cases are located requires a very different orientation. Following heterogeneous actants is thus the core analytic activity. A corollary of this is that conceptualizing and coding for "cases" will shift far from differentiating human speakers in interviews or focus groups and instead will need to enable "cases" to be any number of heterogeneous actants together with ways of engaging with their relationships and performative agencies.

Coding for "cases" should therefore not be restricted to a coding structure or system oriented to differentiating human participants and associating them with invariable attributes. Instead, actants can be *anything* with the capacity to act! Prefixing cases with "actant" can be an initial way of enacting and reminding that this is a concern.

In my project the key actor followed through fieldwork was a bottle of beer. The way it was classified was of interest and the classifications that became attached to it were also traced as actants.

CLASSIFICATION_BEER	0	16
classification_beer_BJCPstyle~	43	58
classification_beer_BJCPstyle-Name~	42	2
classification_beer_BJCPstyle-Number~	23	3
classification_beer_flaws~	12	1
classification_beer_homeBrewed~	4	1
classification_beer_otherStyleGuides~	6	1
classification_beer_outOfClass~	4	1
classification_beer_profile~	6	1
classification_beer_recipe	2	1
classification_beer_recipe-matchToStyle~	10	1
classification_beer_strength~	12	1
classification_beer_temporal~	2	1
classification_beer_type(Ale,Lager,Hybrid)~	15	1
classification_beer_type(Imperial)~	1	1
classification_beer_Name~	5	1
classification_bjcp_scoringGuide~	3	0
CLASSIFICATION_BREWER~	6	2
classification_brewer-abbey	3	1
classification_brewer-trappist	3	1
CLASSIFICATION_BREWING	0	11
classification_brewing-DateTime~	10	1
classification_brewing-Ingredients~	24	3
classification_brewing-Method~	3	2
classification_brewing-Procedures~	17	2
CLASSIFICATION_BREWINGMEASUREMENTS~	45	12
classification_brewingMeasurements-Colour~	16	2
classification_brewingMeasurements-Gravity~	4	2
classification_brewingMeasurements-IBU~	9	2

Figure 6: Example code list showing varieties of classification systems in use

Coding for, and conceiving of, cases in terms of heterogeneous actants rather than "human participants" is a first step - but what does it then mean to "follow the actors?" ATLAS.ti provides ways of coding for actants and then enables a range of tools and methods to be used to help follow that actor/actant with freedom of movement across a diverse set of heterogeneous data.

It is essential to use rigorous code-naming principles - Friese's advice is invaluable

here in ensuring one is not creating compound codes and that codes sort and group effectively by name. If that is done then other tools become powerful allies:

- At the most simple level a query will collect together where that actant occurs.
- The code-co-occurrence explorer enables seeing which other codes (for other actants, ideas, etc.) this actant co-occurs with. Generating a code co-occurrence table further develops this as a linked, tabulated visual index to co-occurrences.
- If data has also been coded for time, as considered previously, this sort of cross-tabulation can enable seeing when an actant co-occurs with either a period of time or an event - and PD families can help scope this.
- A code- primary documents table report can help show where in the data (and potentially when) the actant code appears.

On the final point I must register by deep personal dislike of exporting data out of ATLAS.ti and to Excel for exploration. While I see the code co-occurrence table as a useful, and linked, way of exploring data where cells can be clicked to retrieve the underlying quotes, thus indexing and linking to occurrences and acting somewhat like an eBook index does to its pages; however something shifts when data is exported. By exporting data to Excel this vital function of connecting is broken and the numbers can all too easily become interpreted as indicative of very different things. To return to the book index analogy this could easily be akin to shifting from an index of a book showing where words occur, to a content

analysis of those page numbers and a focus or interpretation prioritizing their frequency or distribution rather than their indexical function.<sup>5</sup>

### A Challenge – "Attributes" And Their Achievement Though Codes Or Code Families?

Whilst code naming conventions can be effective for grouping codes together, using families for recording attribute data is also frequently useful. In the code family approach codes are applied for an actant (e.g., a pseudonym for a participant, a name for a category, disease, or other actant) with a prefix to group them together. If the prefix is a symbol this helps sorting, personally I like to use ¢ for cases<sup>6</sup> and @ for "attributes."

One of the challenges and potential areas for exploration in an inquiry could then be to consider the difference between externally mandated or given attributes and local performances. For example, "gender" might be locally referred to or otherwise made directly relevant to an action. This would be a localized code for a particular instance - the local performance and enactment of gender through the attribute code @\_performed-maleness.

Or the enactment of arteriosclerosis through an attribute code @\_performed-disease: arteriosclerosis.

However, it could also be interesting to compare this sort of local performance - "doing arteriosclerosis" or "doing maleness" - with the imputation of that as a transcendent *a priori* "attribute." These sort of *a priori* attributes, or socio-demographic variables, can be achieved through adding the identifying code for the actant (e.g., ¢\_Steve) to a family of case codes for "men" - that the person has a fixed diagnosis of arteriosclerosis (@FAM\_clinicalDiagnosis-artherosclerosis), or a birth-certificate attribute of being male (@FAM-males).

In order to explore and cross-tabulate the co-occurrence of a localized performance (@\_performed-maleness) with attribution of this to the person as a persistent and unchanging property of who they are (@FAM-gender-males), the latter code family can then be created as a super code. This is done through the query tool by selecting the attribute family and saving it as super code (Figure 1).

---

<sup>5</sup> Editors' note: The Mac version already allows for exploring the results of the codes-document table within the software, and the forthcoming Windows version will also integrate the table.

<sup>6</sup> To type the cent symbol '¢,' the key combination is ALT+0162 on the numeric keypad in Windows, or OPTION+4 on the Mac.

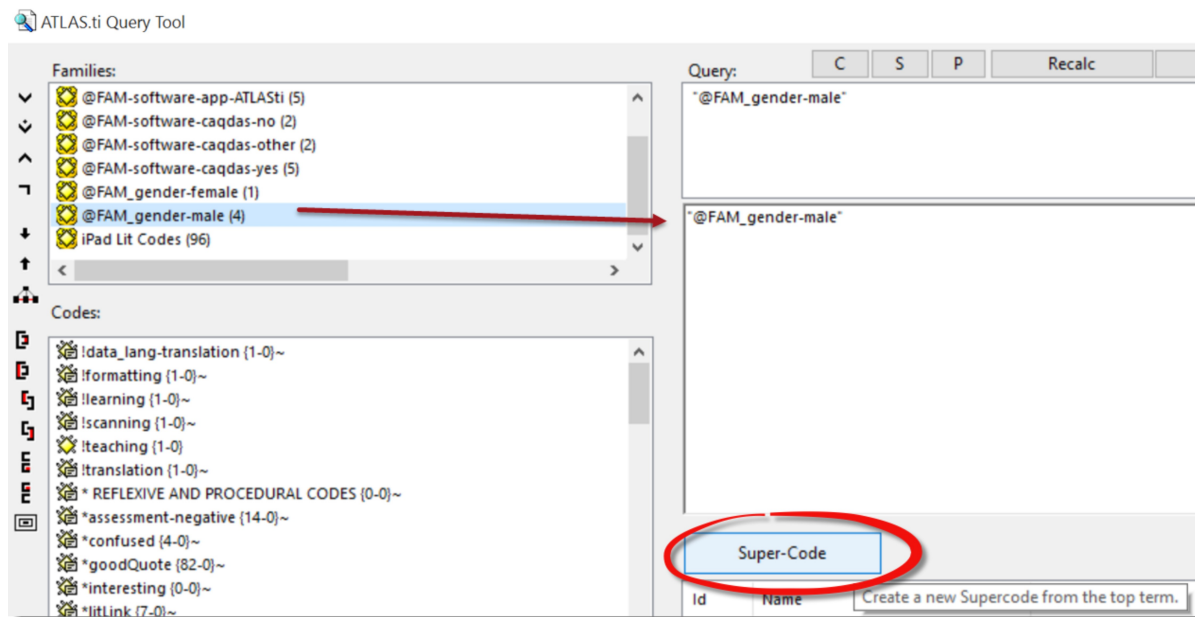


Figure 7: Creating a supercode from a code family query – the code family is added to the query stack and then saved as a super-code.

The resulting super-code can then be used in cross-tabulations in a way that family membership cannot (Figure 3).

Selected (2 of 154):

- processes-change {5-0}
- processes-transformation {4-0}

	processes-change	processes-transformation
\$@FAM_gender-female	2	2
\$@FAM_gender-male	3	2
@TT-performed_gender-f	1	1
@TT-performed_gender-r	1	2

Selected (4 of 154):

- \$@FAM\_gender-female {121-0}
- \$@FAM\_gender-male {289-0}
- @TT-performed\_gender-female {1-0}
- @TT-performed\_gender-male {3-0}

Column code result      Row code result

Figure 8: Creating a cross-tabulation in the code co-occurrence table to index and contrast the situated performance of an 'attribute' (@TT-performed\_gender codes) with externally attributed "properties" of an actor/actant through super-codes created from attribute code families (\$@FAM\_gender-codes).

Creating a super-code through this route could be merely seen as a rather roundabout way of coding for an attribute which could just as easily be done by using normal codes. However, there are other arguments for this approach: one being consistency, and another is simplicity:

- Consistency in that auto-coding regularly structured data - whether that is interview transcripts, forum posts or twitter streams - can then have the code identifying the speaker added alone. This can then be associated, through families, to multiple attributes. Selected or specific families

can then be created as super-codes for cross-tabulation purposes. This keeps case codes per quotation to a minimum and shifts attributions to families.

- Simplicity is therefore another outcome of this approach: a single "case code" is used per quotation, with *all* other codes then serving different functions.

Such an approach is analogous to the attribute tables for case codes in NVivo and enables the same sort of cross-tabulations to compare coding against attributes.

### **Supporting Contextual Exploration Of Fluid And Multiple Ontologies In Practice**

The aforementioned approach to using code families to collect together codes with a particular attribute – e.g., gender, an age-group, profession etc. is problematized by ANT. However, there is also a recognition that such *a priori* categories are powerful actors in the social world. The argument is against creating a tautological shortcut which uses what should be explained (e.g., how class is assembled and made relevant and stable in a setting) as the explanation (it's because of class). These fix ontology - the property becomes an invariable attribute rather than a contextual achievement. ANT reverses this asking not "which participants have a diagnosis of arteriosclerosis?" but rather "how are different arterioscleroses being performed through diagnostic practices?".

The preceding proposal - to code for attributes as performed but also consider using code families to classify cases - is one that seeks to use the powerful possibilities of CAQDAS packages in general, and ATLAS.ti in particular, to have both multiple ontologies and fixed categories. This enables strong links to be made between a general classification (with a demand to account for its relevance and agency) and a local performance of that. Through making comments on the quotation segments that have been collected together using either approach as well as comments on the super-codes used for cross-tabulations the local and situated can be compared, contrasted and explored against the imposed frameworks of *a priori* "social categories."

### **Staying Close To The Words Of The Actants – Ideas For Practice**

Staying close to the words of the actants is an area where ideas rooted in GT have some interesting potential for cross-pollination and re-specification for ANT. One of the terms derived from GT, and used in many CAQDAS packages including ATLAS.ti, is the concept of an "in vivo" code. The aim of using these is "to ensure that concepts stay as close as possible to research participants' own words or use their own terms because they capture a key element of what is being described" (King, 2008). However, while the use of this sort of coding in ATLAS.ti is described by Friese for she moves rapidly to suggest that "I could think of better or shorter names as code labels" and that "these first ideas could for example be developed further into a category" (Friese, 2014, pp. 92-93). As such, the place and usefulness of *in vivo* codes to capture and use the participants own reflexively deployed language is perhaps too-easily, or

too-automatically, translated into a mere place holder preceding a required re-write in the meta-language of the researchers with the intention of category formation. Whilst usable, ordered and manageable code names are important for data management the opportunity to preserve and use the specific terms and words of the actants is both an important opportunity, and one I would suggest is not abandoned too hastily in the name of efficiency. Category terms may be added as prefixes to aid code sorting but there is a possibility here to consider if the words of actants are perhaps better attuned to the investigation than reaching for substitutions.

### Scale Free Investigations In Practice

Rather than moving from micro interpretations and abstracting these into "real codes" or "real themes", an ANT sensibility proposes that data and categorization needs to be able to move seamlessly from the situated exploration and close detail of particular performances to an exploration of how these are assembled and the logic of their connections to, and associations with, other locations and assemblages.

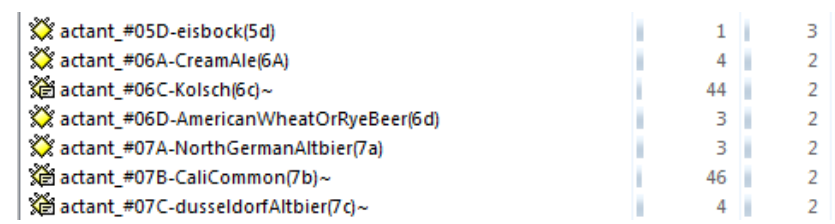
I suggest that ATLAS.ti has a particularly well developed set of tools for exactly this sort of scale-free exploration. In this approach, rather than using codes as indicators of more-or-less useful sections of data for theory development, codes are deployed in a rather different way. There is still noticing and collecting and thinking, but this is perhaps more closely aligned to descriptions of coding in its "technical sense." Noticing is attuned by the sensibilities considered above, collecting is oriented towards gathering elements of multiple data types that share a similarity. Rather than seeking to merge these tags into "real codes" at greater and greater levels of abstraction until they reach a transcendent level of explanation, the far more prolific, and therefore potentially far less frequent codes, are linked together. Linking then supports the "network" of actor-network theory to come to the fore. In ATLAS.ti the powerful potentials of transitive code-code links can be utilized to create multiple, overlapping, non-hierarchical networks which can both be visualized as network views *and* used in queries.

Working empirically helps here through an example, which elucidates the ways multiple overlapping networks that can be created and used. One of my actants was a specific category of craft beer. The generalized code-naming approach reflected the taxonomy of the system as follows:

actant\_styleNumber-SubStyleLetter\_style Name

For the style Kölsch the name was therefore: actant\_#06c-Kölsch(6c).

This particular category was organized within the classification system that was primary object of study - the BJCP style guides. That system organizes beers into 23 categories, with subclasses within each. Within category 6 there are also Cream Ale (6a), Blonde Ale (6b) and American Wheat or Rye (6d).



actant_#05D-eisbock(5d)	1	3
actant_#06A-CreamAle(6A)	4	2
actant_#06C-Kolsch(6c)~	44	2
actant_#06D-AmericanWheatOrRyeBeer(6d)	3	2
actant_#07A-NorthGermanAltbier(7a)	3	2
actant_#07B-CaliCommon(7b)~	46	2
actant_#07C-dusseldorfAltbier(7c)~	4	2

Figure 9: Code list for style actants.

Potentially these could be merged together into an overarching category incorporating A through F subcategories and named ACTANT\_#06-LIGHT-HYBRID-BEER.

Given the low incidence of each sub-set in my data this could be interpreted as logical - a case of abstracting to a higher level. However, this would have masked the differences between the subcategories and removed the granular detail. Furthermore, by keeping them distinct all the subcategories were preserved. An alternative, with some merit, would be to create a family for this collection - which could then be visualized in a network view and used in queries. Another alternative is to create a heading code - following again the principles outlined by Frieze for creating a coding structure and using capitalization - but then to take a further step. That step is to create transitive links between the sub-categories and the category heading.

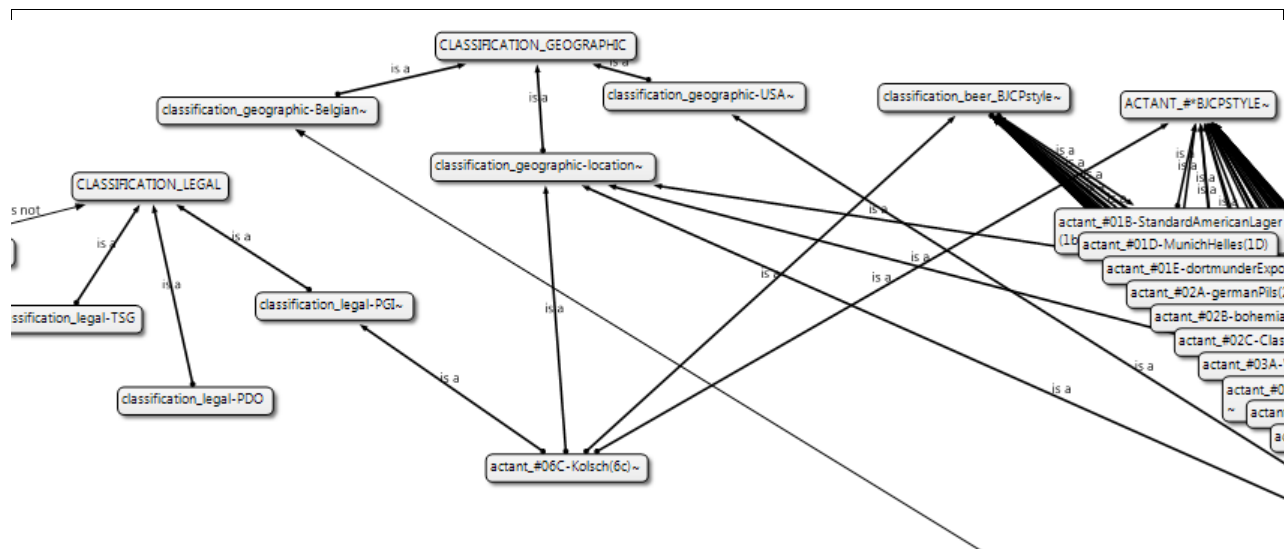


Figure 10: Visualizing multiple hierarchies of code-code relationships – these transitive links can then be used in queries and the links can also be commented on.

The difference is subtle - however I argue that it is important. By using transitive links there is the opportunity to not only define the relationship in theoretical terms, but also to add a comment explicating the specific nature of the interpreted relationship. Whilst family membership can be similarly visualized in a network the relationships are created for you by ATLAS.ti and cannot be commented. Through using semantic links you also gain additional options for:

- Classifying the nature of category membership (through creating and naming new transitive links),
- Customizable options in a network view (through enabling comments on connections),
- The same ordering and detail in query outputs as those afforded by using a code family (through using the sub/sup/sib operands).
- The relationships created in this way can be visualized through using the code tree and forest views.
- Finally, creating a super-code for purposes of cross tabulation in the code co-occurrence table, or in advanced queries can be created in the same number of steps as you would when using families (the difference being the use a sub/sup/sib query and saving as a super code).



Currently a limit with ATLAS.ti is that *only* transitive links can be queried hence recommending using, creating or defining new transitive links<sup>7</sup>.

One effect of this is that there is a shift in the number of codes and their groundedness with the balance being between larger numbers of very specific, low-frequency, codes indexing specific enactments which are detailed in situated annotations as quotation comments and their relationships and connection to higher-level category codes that are usable in queries and network views. It is therefore important to emphasize that as an approach it is as, if not more, reliant on consistency in ordering and naming of codes so that they can be easily searched for (as there will be more) or found by through the code list than an approach oriented to thematic analysis and code merging.

A significant point is that these networks can be true non-hierarchical networks rather than the sort of hierarchy shown above. The only enforcing of hierarchy is the rather unfortunate, but hopefully soon-to-change, limit requiring transitive links for use in queries. If the direction of the arrowheads is ignored then one of the truly powerful features of ATLAS.ti becomes apparent: the ability to relate codes to multiple networks through such links. This is far more flexible and powerful than the equivalent hierarchies of codes in many other CAQDAS packages. Thus, as per Figure 3, the category `Actant_#06c-Kölsch (6c)` can also be linked, transitively, to other categorization systems in which it is enmeshed. Kölsch makes a particularly useful example as being the only beer style that is legally recognized through a Protected Geographic Indicator designation - thus I can associate it with a code for `classification_legal-PGI`. This is a formalization of a broader idea of the significance of geographic and regional origin (seen for example in *Berliner Weisse*, *Flanders Red*, *Irish Stout* etc.). Therefore I can create that association through creating a transitive link to a code for `classification-geographic`.

I can then make further associations between these categories and different-order categories relating perhaps to literature, theory etc. (e.g., I drew on Antoine Hennion's (2007) conceptualization of "Devices and conditions of tasting" as well as the work of Teil and Hennion (2004).

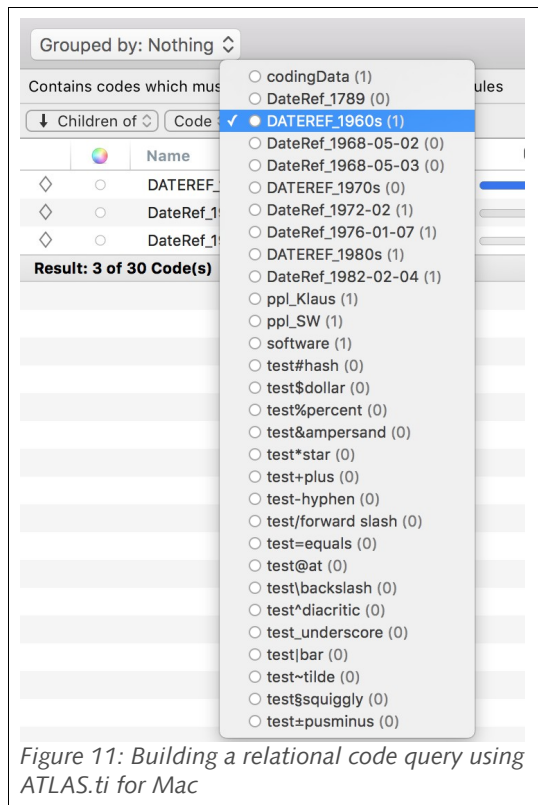
To re-iterate: These transitive links enable both network views - which are an attractive opportunity to those working with actor-network theory - as well as powerful options for querying and viewing multiple, overlapping coding networks via tree and forest views, and also preserving and detailing the specificities of the nature of these relationships through commenting on the code-code link. Crucially such an approach enables not only following actants but also visualizing and querying the way that they co-occur with other actants to form assemblages.

Such an approach makes use of some of the specific tools and options that ATLAS.ti enables to meet the complex, at times contradictory and loosely specified demands and challenges to working with data qualitatively that ANT has posed in terms of method.

<sup>7</sup>A point that is important here, but somewhat unclear in the documentation is that *any transitive link* can be used in a sub/sib/sup query, not just an "is a" link.

## Challenges To Assembling Descriptions In Practice

Given the considerations outlined a consequence is likely to be a longer code list tagging a more heterogeneous set of concerns. If the aim is not the constant refinement of codes and abstractions into



themes then longer code lists with denser connections between codes, and between quotations are a likely outcome.

If Friese's guidance on code naming, and some of the proposals here for code organization and relationship building, are used then that list should be well-structured and clearly organized. However, a significant challenge with such long lists must be acknowledged. With no search function nor filter based on code names available in the query tool a long code list can become cumbersome and slow to work with when creating queries. Whilst the Mac version has started to redefine how queries and filtering codes for these work together, the options for building queries based on code-code relationships still works with a list-selection approach for the code term (Figure 2).

Hopefully future versions will introduce options to filter such code lists when building queries rather than just forcing the scrolling and selecting of relevant codes from long lists.<sup>8</sup>

## Part Three – Exploring Intentions

Having considered the previous points practically the final principle requires a rather more theoretical discussion concerning the *intention* of using software and the purposes of the analysis it assists. For ATLAS.ti Susanne Friese's book proposes a generalized model for computer-assisted qualitative data analysis she calls the "Computer-assisted NCT Model" (2014, p. 12) which is based on the Noticing, Collecting and Thinking (NCT) approach proposed by Seidel (1998).

In her book Friese rightly laments the general lack of attention to how computer software can assist qualitative analysis and, furthermore, the implications of such omission being that it is either immediately obvious or involves no real change to manual processes. In contrast Friese proposes that using software does far more fundamentally mediate the analytic process and that computer-assisted NCT is a model that is flexible, unrestrictive and also thorough and efficient.

<sup>8</sup> Editors' note: Your wish has already been granted ☺.

In her paper on how to conduct a computer-assisted Grounded Theory analysis, also published in this volume, Frieze extends these considerations, suggesting that:

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, ethnomethodology, 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 (Frieze, 2016, p. 6).

The paper then turns to providing a clearly worked out "first step in providing a more detailed instruction on how to apply the NCT method in the context of Grounded Theory methodology."

The aims of this paper have been similar, albeit with some distinct differences. One has already been introduced but bears further consideration when drawing comparisons with Grounded Theory (GT): the deliberate avoidance of rules, recipes or set approaches in EM and ANT. These stand in stark contrast to the clearly explicated steps for conducting a GT analysis - steps and procedures and intentions do come in several different, and not necessarily complementary, 'flavors'<sup>9</sup> but are nonetheless clearly laid out and reproducible.

A second is a more substantial divide between the assumptions of grounded theory, and the way that those assumptions permeate many considerations of qualitative research including the proposal for the computer-aided NCT model. Exploring this is an important topic for consideration to see if the NCT model could still be used and adapted for the very different methodological approaches and intentions of ANT. A core consideration therefore is what would constitute "the proper level of abstraction" (Frieze, 2014, p. 6) and if, how or why one would wish to "abstract if you have tagged with too much detail" (ibid, p14).

Exploring this further and more specifically we can ask how much detail in coding would constitute "too much"? In the book Frieze presents a set of codes and then mercilessly critiques them - as they are from her PhD thesis this is an insightful exercise in development and amassed experience.<sup>10</sup> The example code list is then used to build an argument about how coding should be done.

The code list is judged as "not too bad" in terms of the number of codes (168), however their naming is merely alphabetical rather than being organized or structured by topic, concept or theme. A further critique is with regard to variance and irregularity in their relative frequency and development as codes for the underlying data:

the problem is not that too many codes have each been applied to only a few data segments. Rather, the list contains both ... What is missing is the development of subcategories on the one

<sup>9</sup> These "flavors" relate to the shifts and developments from the original 'discovery' of GT – by Glaser and Strauss (1968) - and the subsequent acrimonious split (c.f. Glaser, 1992) and separate developments by the original authors e.g., Glaser (1978, 1998) versus Strauss and Corbin (1990, 1998) .

<sup>10</sup> I must acknowledge that the same sort of ruthless critique, reflection and extent of subsequent experience has not been matched in my presentation of the coding approaches I used here, which is to their detriment.

hand and the aggregation of codes under a common denominator on the other (Frieze, 2014, p. 152).

This is then broadened out to a general rule of thumb with the concerns about levels, variance and groundedness of codes now translated to indicators of the 'healthiness' of one's project:

...if most of your codes show a very low frequency then there is still some work to be done, and the development of the coding system is not yet finished. A general rule is that a developed project should show a healthy balance between the total number of codes and the frequency of each one. (Ibid, p.138).

Exactly what constitutes a "very low frequency" is therefore implicitly linked to the coding list presented. Within that list there are two codes that tag a single "grounded" occurrence / quotation in the data. Another two tag only four quotations; there are seven codes with a 'groundedness' of four quotations; two with six quotations and three codes with seven quotations. By contrast there are seven codes with a groundedness of over 100 quotations.

The implication I have drawn, and I am sure others would, is that codes with only single-digit groundedness are "very low frequency" whilst codes that tag quotations in their tens and perhaps even twenties are "low frequency." The suggestion is therefore that such low frequencies are in need of merging in order to collect greater numbers of quotations at a higher analytic and categorical level.

I suggest that these prescriptions for building a healthy coding approach, while not specifically aligned to any one particular methodological approach, and certainly not *bound* to GT still share many underlying epistemological and ontological assumptions. Disentangling those to explicate how a process of noticing, collecting, and thinking could be used with a different analytic purpose is therefore required in order to consider what codes are doing and tagging, and how such codes could be used. The alternative risk is that prescriptions for the healthiness of interpretative codes be over-extended when codes are being used for a rather different, but no less analytic, purpose.

These prescriptions, evidently born out of many consultations with who have become lost in the "coding swamp", can be contrasted with the description and distinctions made early on in the book between what codes do in a technical/programmatic sense, and what they do in an interpretative or analytic sense. The former is described as:

Coding in a technical sense simply means assigning a label to a data segment. The data segment can be as small as one character in a text document, a few pixels in an image file, or less than a second in an audio or video file. Knowing about the mouse clicks does not yet tell you anything about how meaningful the attached label or the length of the selected segment might be (Frieze, 2014, p. 84).

An important distinction is thus drawn between coding as a method of labelling and collecting segments of data, and the meaningfulness of label or size of the data segment. A contrast is then drawn with coding as an analytic activity, which are described in a somewhat different manner:

For now, as a rule of thumb, remember that a project should only have between 120 and 300 codes. There are projects that have fewer codes and others that have more (Frieze, 2014, p. 92).

Why then would some projects have fewer and others have more codes? I suggest that one rationale cuts to a crucial divide alluded to in the preceding journal entry regarding the place and intention of social research to provide a "description" versus needing to provide an "explanation."

The intentions of the majority of approaches to qualitative data analysis are to transcend 'mere description' of the data and to move to a proposed different level of explanation. Grounded Theory represents a highly influential, particular, and generalized analytic method that exemplifies just such a move. In contrast, other, often marginalized, approaches seek instead to develop very particular explications and descriptions. Ethnomethodology and its associated approaches and their influence on Actor-Network Theory (ANT) exemplify that intent.

Thus, for ethnomethodology it is proposed that "the concepts that ethnomethodologists use are not part of a causal explanation of events and action, but of a procedural explication; they are 'procedurally descriptive'" (ten Have, 2004, p.145). Similarly for Actor-Network Theory this division is described rather more polemically by Latour who argues that:

I have never seen a good description in need of an explanation. But I have read countless bad descriptions to which nothing was added by a massive addition of 'explanations'. (Latour, 2005, p. 147)

These intentions are played out in the procedures of analysis. They stand in stark contrast to the intentions of Grounded Theory as explained by one of its founders, Barney Glaser:

Coding gets the analyst off the empirical level by fracturing the data, then conceptually grouping it into codes that then become the theory which explains what is happening in the data. Coding for conceptual ideas is a sure way to free analysts from the empirical bond of the data. It allows the researcher to transcend the empirical nature of the data - which is so easy to get lost in. (Glaser, 1978, p. 55).

The language here is all about getting away from the data where one could get lost. Ethnomethodologist Paul ten Have draws out the quasi-religious aspects in his critique of the assumptions underlying such a view:

The second polemical aspect of the GT approach surfaces again: its opposition to the 'descriptivist' kind of qualitative research. The crux of this opposition is that the empirical findings are not primarily seen as parts of a locally contextualized phenomenon, but as more or less useful indicators in the service of theory development. Therefore, the data are to be 'fractured' and the analyst has to be 'freed' from their grip on his or her mind. It is almost as if the concrete level of contextual phenomena is a sensuous world of temptation from which the analytic monk has to free himself through the purifying rituals of abstract conceptualization. Coding and comparison are essential 'transcending' strategies here: by seeing and abstractly naming patterns of similarities and differences, the spell of the concrete can be broken (ten Have, 2004, p. 142).

I suggest there are continuities here between the discourse of "transcendence" and the prescriptions for "healthiness" that Susanne Frieze proposes. To be healthy, one needs to develop coding structures so

they have a balance between the detail and their level of abstraction and categorization. This is to be achieved in part by reviewing, grouping, re-naming and merging codes together not just to avoid replication but to move them from a murky swamp of 'mere description' in a transcendent shift towards abstract conceptualization in the service of explanation. Part of this therefore encompasses a shift from the situated words of actors towards the abstracting synthesis of the analyst.

Supporting these intentions and shifts, which are shared with though not bound to Grounded Theory, is software. Paul ten Have argues that these two parallel processes have become deeply intertwined:

During the period that GT gained its present prominence in qualitative analysis, a parallel development was the creation of a number of software packages to 'assist' or 'support' qualitative data analysis. The core activity in these programs is the coding of data fragments, which seems to fit seamlessly with the central position of 'coding' in the GT approach, while most offer the possibilities to add 'memos' to codes and/or coded fragments. In this way, the 'fracturing' of the data and their 'transcendence' through rising to the conceptual level, while keeping track of the connections between concepts and indicators, as well as between concepts, is eminently supported (ten Have, 2004, p. 142)

However, such an approach is not a necessary consequence of using software, nor a necessary outcome of applying a model such as Friese's computer-assisted NCT. This isn't always recognized however ten Have does make that connection and balances the previous claim by noting that:

One way in which such programs can help in overcoming some of 'dangers' of the GT approach should also be mentioned, however. Offering the possibilities of creating multiple links between the original data and various kinds of analytic reworkings of the data-such as codes and memos-makes it easy to 'return' to the data' at any moment, which allows repeated inspections of both the data fragments themselves and the context from which they have been taken (ten Have, 2004, p. 144),

Thus coding in the technical sense, and systematic approaches to working with, organizing and constructing code lists are limited only by coding in "the technical sense" rather than in terms of normative assumptions about their meaningfulness and utility in the service of theory development.

Yet this does not mean that the computer-assisted NCT model cannot be applied or extended to ANT. As the previous proposals and their illustrations showed many of the principles based on that model do apply. However, it must be adapted in terms of intention and tweaked to meet the particular nature of an ANT investigation, and I suggest that can be helped by engaging with, and accounting for, the principles proposed in this paper and their relevance for a specific inquiry.

### **Concluding Thoughts: Unique Adequacy And Specific Requirements**

In this paper I have sketched out some contingent principles derived from the ANT literature as well as its ethnomethodological influences to propose a set of principles for choosing and using software in an ANT-inspired study. I then used examples to help illustrate how CAQDAS software, and ATLAS.ti in particular, can be effectively used in an ANT-oriented research project. This has been illustrated through

one very specific project. Finally I explored how these ideas contrast with the underlying assumptions and rationales that inform guidance on good practice and ways of learning CAQDAS software.

In conclusion I seek to draw out some specific limitations and considerations. The first being the specific nature of that project used to illustrate and develop the ideas for this paper and the danger of generalization. The principles proposed in this paper share a lot with the Mol's ontonorms - as tools, rather than fixed frames. In concluding I therefore draw on Mol again – though substituting the topic of this paper for her term 'ontonorm'

a focus to my analysis ... a productive methodological tool ... If it comes in handy, by all means experiment with *[these principles]* in your own work. If you do, the methodological possibilities of this terminological tool will be gradually fleshed out. What does the *[idea of these principles]* lead you to see in the cases that you study? Where do you hit upon its limits? How might we adapt and play with it? If we sooner or later end up discarding the *[principles]* again because it stops being a strange, terse, productive oxymoron, that is fine by me. But this is my request. Please do not define this term. Abstain from all attempts to make it definite. Let's not make a *[shift to principles for CAQDAS practice]*, but rather keep them fluid, ambivalent, dancing and gerrymandering. (Mol, 2013, p. 390)

What I have attempted to set out here are just these sorts of methodological tools, ideas, practices and descriptions which are hopefully sufficient in their detail for you to experiment with and then use, adapt or reject according to how they fit the needs of your study. Concomitantly, I also hope they are not drawn too harshly or normatively so as to stifle experimentation and adaptation.

Finally, as this only draws on one, very particular and specific performative engagement between software, ANT and a praxiographic methods assemblage, the obvious question it begs is "what do others do?" And that is a question to address empirically through exploring how software is and has been used by others with their own distinct ANT orientations and interpretations in diverse studies and alongside other assemblages of tools and techniques<sup>11</sup>. So if the ideas presented here *do* prove useful for you and your ANT-oriented study, or if they do not, please do contact the author and contribute to that ongoing exploration.

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<sup>11</sup> An early work-in-progress exposition is in Wright and Bhatt (2016)



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