

Using computers for qualitative data analysis: an example using NUD.IST

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The nightmare that is qualitative data: “I had generated so many codes in a line-by-line analysis that they had become illegible on paper and difficult to administrate. I worried that I would only be able to fully investigate some aspects whilst, unwillingly, ignoring others. In addition, the mere thought of the amount of data that I would generate (95x 1.5 hours tape) was almost paralysing. I had images of piles of colourful paper with post-its sticking out like a hedgehog, and of paper stacks being attacked by my cat in an idle moment. In other words, I did not feel very organised and not able to present a neatly finished project that would survive the critical scrutiny of my peers” (van Hoven, 2002, np). It was then that I realised that NUD.IST might be the answer.

Introduction

Qualitative data analysis is creative, exciting and challenging, and, at the same time, worrisome, daunting, and downright frightening (as illustrated above). You are encouraged to choose methods such as in-depth interviewing or (participant) observation as a means of data collection for your dissertation, but analysing the results of in-depth interviews (a conversation with someone) remains a weak spot.

Successful qualitative studies include thorough consideration and preparation for the analysis stage. Instead of developing and trusting your own analytic skills, you may derive interpretations exclusively from existing literature using a data summary of a case, and some quotes to illustrate the text. It is essential, though, that you “get to know *your* data through *rigorous analysis* before embarking upon structuring your argument” (Holloway and Valentine, 2000, p. 129, emphasis added). In their article on how an argument can be developed, Holloway and Valentine (2000) refer to the usefulness of computer packages for identifying themes during data analysis and getting to know our data. This article illustrates

how this can be done. We briefly outline what computers can and cannot do for your research before giving an example. As we found the grounded theory approach helpful for our analysis, the discussion will be organised largely around steps taken within this method: coding, using notes, and constant comparison and theory building. In this context, we do not deal with data input or with the specific features of the software (NUD.IST). There is a useful account of these issues in Kitchin and Tate (2000) which we recommend you use in addition to this article.

Computer Software in Qualitative Research

The use of computers in qualitative research is often limited to making field notes, transcribing interviews and writing reports. In many cases, transcripts are then printed out either for content analysis, through counting a number of keywords using a matrix (see Miles and Huberman, 1994) or coding the text and sorting it by themes (using coloured pens or a scissor-approach). In particular, research activities such as coding, sorting and linking data segments, and verifying hypotheses require time, organisation and efficiency. Since the 1980s, these activities can be done using computer software. Elsewhere, various programmes (mostly earlier versions of those currently available) have been tested and reviewed, and I refer to authors such as Tesch (1990), Kelle (1995), Weitzman and Miles (1995) or Crang et al. (1997) for further reading. Although qualitative data analysis by computer is done (with great enthusiasm and efficiency) by many researchers, others have remained cautious, thinking that the use of Computer Assisted Qualitative Data Analysis Software (CAQDAS) will distance them from the 'real world' of ethnography (Coffey and Atkinson, 1996; Coffey et al., 1996; Hinchliffe et al., 1997). Figure 1 below lists some of the key advantages and concerns about CAQDAS.

ADD FIGURE 1

The key message is perhaps to be conscious of these issues. In order to avoid getting lost in your analysis it is recommended to ask peers and supervisors for feedback regularly. Not only will this help you work in a critical and reflective way, it will also keep you more focused on your research questions. In addition it is essential to understand that computers will only *help* you with your analysis, it will never do the analysis for you. A basic understanding of qualitative methodology and knowledge of analysing qualitative data by hand is absolutely recommended.

Choosing Software for Your Analysis

CAQDAS can be distinguished into three general types, namely (a) text retrievers; (b) coders-and-text-retrievers; and (c) theory-builders (Fielding, 1994; Weitzman and Miles, 1995). Figure 2 gives an overview of the capabilities of these programmes. In sum, theory builders are more advanced and have more options for analysis than text retrievers. However, programmes have become increasingly sophisticated and the boundaries between types have begun to blur.

ADD FIGURE 2

Depending on what questions you seek to answer or what phenomena you wish to explore, you have to choose between one of the above types and within these, for a specific programme. This implies that you need to be clear about what you are going to do with your data *before* you begin to learn a programme. Weitzman and Miles (1995) provide an overview

and assessment of functions of different packages which provides a useful starting point when choosing a programme.

NUD.IST in Practice

The remainder of this article will guide you through the use of NUD.IST with examples from Anneriek's study (Poelman, 2002) on 'a gay sense of place of Brighton'. It is useful to note first what considerations motivated her choice of programme. Anneriek's study was largely exploratory and motivated by feminist methodologies. She conducted in-depth interviews rather than doing a large-scale survey. As a result, she was dealing with her respondents' imaginations and experiences, which meant that it would be unlikely that they would use exactly the same phrases to describe a phenomenon. Therefore, content analysis would not suffice. In addition, she found Strauss and Corbin's (1990) account of grounded theory useful for her analytic framework as it outlines how thick data can be analysed in a *thorough and rigorous* way. We modified the framework to accommodate time constraints –the time available for doing the fieldwork- and financial constraints –limitations of returning to the field abroad. The themes Anneriek investigated largely emerged from the data rather than being preconceived and she aimed to make sense of them by comparing the accounts of different people with each other and with the literature. Last but not least, the programme is easy to learn and there were several ways of getting help with the use of the programme. Aside from my own experience, there are extensive websites containing demos, handbooks, experiential accounts and discussion forums (see <http://www.qsr.au.com> or <http://caqdas.so.surrey.ac.uk>).

'A Queer Sense of Place of Brighton'

The general aim of the dissertation was to explore the sense of place of Brighton as experienced by lesbian, gay, bisexual and transgendered (LGBT)-people who migrate(d) to the city. To accomplish this Anneriek focussed on two aspects of the sense of place. The first one being the 'mediated sense of place' as defined by the image that the respondents had of Brighton before moving there. The second aspect was the sense of place as experienced by the interviewees who had lived in Brighton for some time. The data comprise twenty-four in-depth interviews with people aged between 21 and 67 years who currently identify themselves as a gay man, lesbian or bisexual person. Additional information was retrieved through participant observation by accompanying respondents to LGBT-venues and events.

Coding and Retrieving

When getting to know your data in order to make sense of them, it is helpful to reduce the data, for example by summarising what respondents say. We recommend using the 'expanded sourcebook' on qualitative data analysis by Miles and Huberman (1994) which illustrates various ways of reducing data. This may help you discover themes relevant to the respondents. For a rigorous analysis, you will need to go through the transcript line-by-line and summarise the text. These 'summaries', often the respondents' own words, are called codes (or nodes in NUD.IST). This process, in grounded theory, is also called 'open coding' (refer to Strauss and Corbin, 1990). The programme attaches (by hyperlinks) nodes to chunks of texts which enables you to interrogate your data by making reports indicating selected nodes. Figure 3 gives an example of such a report with nodes.

ADD FIGURE 3

Throughout the coding process, a lot of nodes are generated which need to be double checked again for overlap or hierarchical relations. In NUD.IST, the initial nodes can be stored as ‘free nodes’ in the so-called Index System (separate from where your original text is stored) (see Kitchin and Tate, 2000). These nodes are not yet ordered in any hierarchical way. The relations discovered can be presented in NUD.IST in the form of a ‘tree’ as a textual or graphical display. In so doing, the codes are grouped into a hierarchy (see figures 4 and 5).

As relations between themes begin to emerge, you may discover that you are interested in comparing respondents’ experiences by age group, sexual orientation or place of origin. If you haven’t coded all transcripts using these categories, NUD.IST enables you to do this quickly by retrieving everything a particular respondent, for example Sandra, said. This text is then stored in a separate file which you can code 20-29 (age group), lesbian (sexual orientation) and Lancashire (where from). Doing this by going through numerous amounts of paper transcripts would have been an unhappy occupation to say the least.

ADD FIGURE 4

ADD FIGURE 5

Leaving an Audit Trail by Using Notes

The examples so far indicate that NUD.IST can help your qualitative analysis proceed in an orderly and rigorous way. An important advantage is, however, that you save a record of your research activities. You leave a so-called audit trail that helps you be aware of and reflexive about validity and reliability in your analysis. In so doing, you make “explicit as many [...] theoretical decisions [...] as possible by reporting when and why judgements of significance [were] made” (Stanjek quoted in Gildchrist, 1992, p. 87). This enables other researchers to

follow your train of thought. A key technique used in grounded theory and supported by NUD.IST is memoing. There are three forms of memos: code notes, theoretical notes, and operational notes (Strauss and Cobin, 1998). The code note contains additional information on a code, such as a definition or a reason for why a specific phrase was chosen as node. For example, Anneriek defined the node 'Only place in UK' as: "Brighton is the only place in the UK that the respondent wants to live; if he/she will leave Brighton, he/she will leave the UK".

An operational note is a memo containing reminders to yourself such as:

The respondents words can be linked to literature: Kitchin (1999) argues that people are taught to read the cultural landscape, in order to 'know their place'. The people in power 'teach' the less powerful, for example through abuse, where they should not be, in which places they should feel out of place. I need to read more on this to see if other researcher have similar ideas.

Last but not least, theoretical notes are about thoughts and ideas on analysis. Here, ideas resulting from constant comparison can develop and you can begin to test hunches about your data. Again, an example from Anneriek (Poelman, 2002):

"Godalming is quite a nice town. It's very nice, very middle class very provincial and is a fabulous place if you're heterosexual, if your married, heterosexual in your mid-thirties and you have children or you're middle-aged or elderly and you like gardening a hell of a lot. That sort of thing they do out there. And I don't do any of those things so, you know, so I just felt: 'Really I don't belong here'." [Barbara, transgendered lesbian aged 53]

The following theoretical note was added:

Some people did experience a sense of place but their identity was not related to that sense of place; they did not feel to belong. This is different from what has in the literature been labelled ‘identifying against a place’. I would like to label it ‘negative sense of place’ (see if examples similar to this can be found in the literature).

Constant Comparison and Theory Building

It is particularly in that last phase, the testing of ideas and hunches that you will need to work closely with your data. As noted above, NUD.IST hyperlinks codes and source text. That means that you can move between the two with a mouse click. In so doing, you can easily check in what context a specific statement was made. Using one of the text search functions, you can retrieve coded segments by theme, respondent or type of base data which allows you to compare what respondents say about ‘belonging’. You can also, more specifically, investigate only what younger people experience compared with older ones by retrieving only text on ‘belonging’ from people between 20-29 and people above 65. What you do then, is called ‘decontextualising’ and ‘recontextualising’ data (i.e. rip bite-size chunks out of their original context and putting them back together in a new context). Figure 6 illustrates this; the first chunk of text (A) is an extensive account by respondent Barbara on what she likes about Brighton. Within this, Anneriek coded a few lines ‘belonging’ (B). When trying to understand what it was like to ‘belong’ in Brighton for people of the LGBT community, Anneriek compared what other respondents had said, she recontextualised her data (C).

ADD FIGURE 6

Ideally, you ‘play’ with your data in this way until nothing new emerges; this is called ‘saturation’. In most cases, this means having to go back to the field. However, also in most cases, the lack of time or money will prevent this. Nevertheless, the process we outlined will equip you with a grounded analysis that will make you more confident of the strength of your own data.

Conclusion

The example of analysing a ‘gay sense of Brighton’ using NUD.IST shows how you can analyse qualitative data in a rigorous way. From our experience, NUD.IST is easy to learn, helps you manage and organise large quantities of data, it is easy to code data and retrieve coded texts for making comparisons. All this helps you to be more confident about the value of your findings, keep going back to your data and check the audit trail developed during your analysis. However, we also listed some warnings. Many people have been critical of using computers in qualitative research as they feel it becomes too mechanistic. In addition, the perceived ease of using the computer may tempt you to collect even more data in which you then get lost. This is an important concern considering the time this analysis already takes. Another concern is the dominance of grounded theory in data analysis, a technique we also used. So we welcome the possibilities computer programmes offer for qualitative analysis, but we urge you to remain attentive to critique as well.

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FIGURE 1. Advantages and concerns about CAQDAS

Advantages	Concerns
Handling large quantities of data	Loss of overview
Easy coding and retrieving, all-inclusive text searches	Mechanistic data analysis
Easy to compare and contrast cases	Over-emphasis on 'grounded theory'
More time to explore 'thick data' as clerical tasks become easier	The machine takes over- alienation from data
	Makes qualitative research look more scientific

Sources: Coffey et al. (1996), Crang et al. (1997), Fielding and Lee (1991), Richards and Richards (1992), Tesch (1990)

FIGURE 2. Programmes and their capabilities

Type of programme	Capabilities
Text retriever	Finds individual or strings of words and creates new files for text searches. Good for content analysis. Example: WinMAX.
Coder and text retriever	Marks pieces of text for coding and sorts coded segments. It also has a retrieve and report function. Basically transfers scissor technique into the computer. Example: the Ethnograph.
Theory builder	In addition to the above functions, connections between codes and data can be made for exploring ideas and comparing cases. Some programmes display relations in a hierarchical index system. Examples: NUD.IST or ATLAS/ti.

FIGURE 3. Coding in NUD.IST

Margin coding keys for selected nodes in document Sandra		
A:	(2 3 2 1) /Questions/Q3:Pull-factors Brighton/atmosphere/tolerance	
B:	(2 3 2 6) /Questions/Q3:Pull-factors Brighton/atmosphere/diversity	
C:	(2 3 2 12) /Questions/Q3:Pull-factors Brighton /atmosphere/cosmopolitan	
D:	(2 3 15 2) /Questions/ Q3:Pull-factors Brighton /location/sea	
E:	(2 3 15 5) /Questions/ Q3:Pull-factors Brighton /location/weather	
F:	(2 3 15 6) /Questions/ Q3:Pull-factors Brighton /location/continent nearby	
* Q3: A:	And why did you decide to move to Brighton?	14
S:	Because.... eh... a number of different things... The weather! Haha	15 E
	it rains up North a lot. It is by the sea and I find that pleasing, it is	16 D E
	close to the continent, and obviously for me of course, the sort of	17 F
	liberal attitude and the sort of cosmopolitan population of Brighton and	18 A C
	Hove and I knew that it was a very gay-tolerant and diverse and that	19 A B
	appealed to me to make my home.	20

FIGURE 5. Graphical display of tree in figure 4

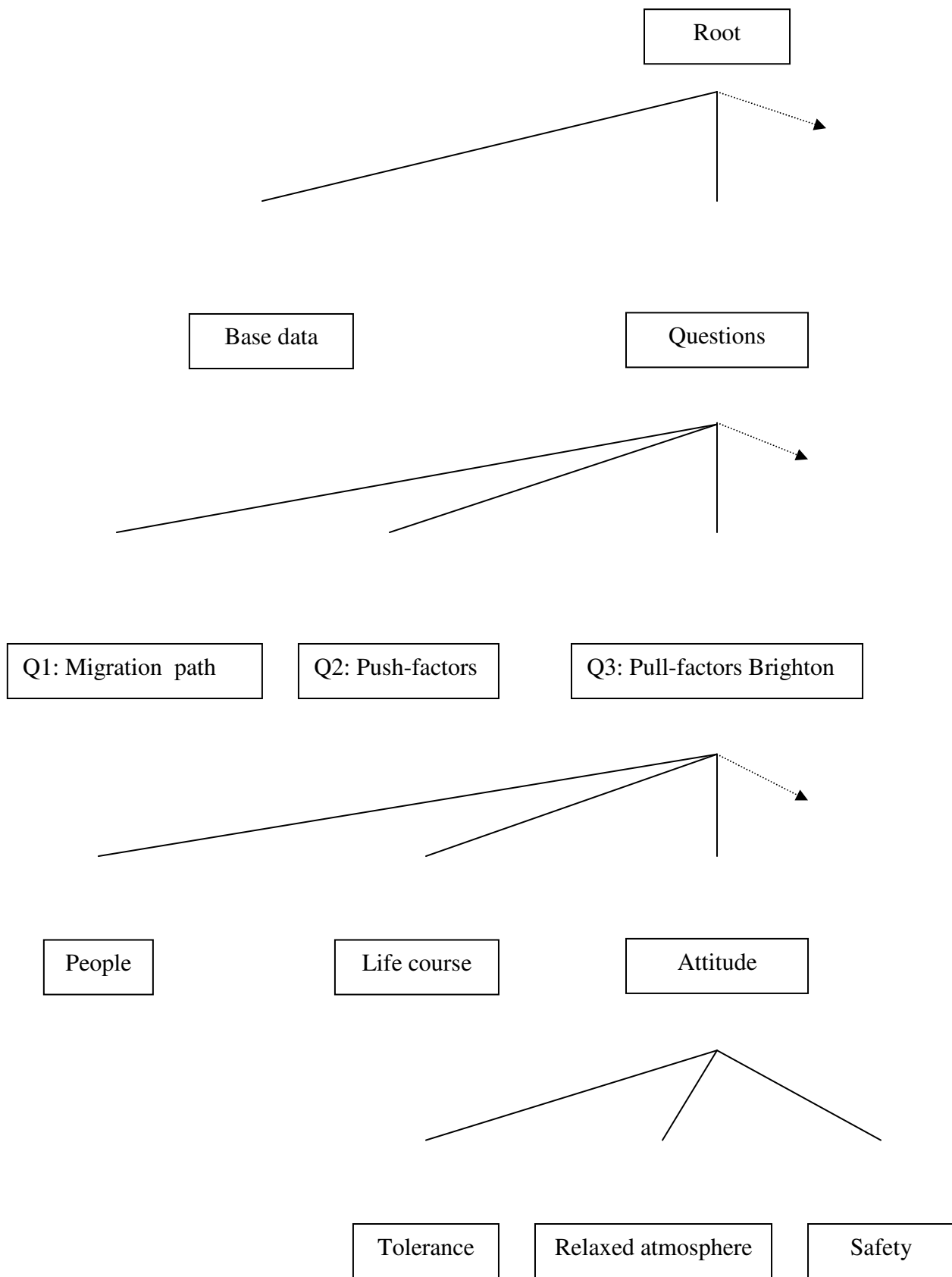


FIGURE 4. Index Tree-example: from the root to one small branch

- (0) Root
- (1) Base data
- (1.1) Questions
- (1.1.1) Questions/ Q1:Migration path
- (1.1.2.) Questions/Q2:Push-factors
- (1.1.3) Questions/Q3:Pull-factors Brighton
- (1.1.3.1) Questions/ Q3:Pull-factors Brighton /People
- (1.1.3.2) Questions/ Q3:Pull-factors Brighton /Life course
- (1.1.3.4) Questions/ Q3:Pull-factors Brighton /Attitude
- (1.1.3.4.1) Questions/ Q3:Pull-factors Brighton /Attitude/Tolerance
- (1.1.3.4.2) Questions/ Q3:Pull-factors Brighton /Attitude/Relaxed atmosphere
- (1.1.3.4.3) Questions/ Q3:Pull-factors Brighton /Attitude/Safety

FIGURE 6. Decontextualising and recontextualising 'Belonging'

A) Original quote:

“It’s really like the company I work at, I don't belong there socially. I don't really wanna be there, it's just, you know it’s kind of like a cash machine, and instead of putting your card in I go there and spend eight hours, and money comes out, so that's mainly my interest. Although having said that, there is a girls-night-out you know, with all the girls from the office on Friday. But I don't expect any of them are gonna come out, be lesbians and I'm not gonna get any snogs or anything. So yeah preferably I'm taking an opportunity to become better acquainted with the people I work with. But eh... it's just not a place I belong. Brighton, **I belong in Brighton you know; I came down here and since then I feel very calm here and I feel it's my community.** Yeah I love every part of it really, well except then Whitehawk and a few places like that. But you know there is a lot going on, I mean even if you're not gay, well you're not gay and you like it here, so... yeah. And I know a lot of people... I mean there is a huge community of non-gay people, haha, people who simply have a really good time here. It's just a nice place to live generally; there is lots of cultural things; films, music, clubs, bars, pubs, restaurants, eh... There is plenty to do, so that is why I like it, mainly and of course there's the gay-culture.” [Barbara, transgendered lesbian aged 53]

B) Decontextualised:

“I belong in Brighton you know; I came down here and since then I feel very calm here and I feel it's my community.”

C) Recontextualise:

“Brighton seems to have this thing for everyone...whenever you come here you just feel... Brighton just feels like home.”[Lisa, lesbian aged 25]

“I might go away for a bit, I might go to like London for a year or something, but I feel I’ll always come back... This is where it feels like home, cause it’s just so, it’s so...much fun, there is always something going on, there’s always things to do...there’s always new people to meet...” [Brian, gay man aged 23]

“But it [Brighton] was a place where I felt able to be myself, whatever that meant. And that has been very freeing to me, and that has been... in my life... it has been my experience of wherever I have lived, that this is the place where I can be myself, whatever that means.”

[Mary, lesbian aged 55]