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# Habits of Mind and the Split-Mind Effect: When Computer-Assisted Qualitative Data Analysis Software is Used in Phenomenological Research

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**Key words**: computer-assisted qualitative data analysis software; NVivo; hermeneutic phenomenology; qualitative health science research; technology

**Abstract**: When Marshall McLUHAN famously stated "the medium is the message," he was echoing Martin HEIDEGGER's assertion that through our use of technology we can become functions of it. Therefore, how does adopting computer-assisted qualitative data analysis software affect our research activities and, more importantly, our conception of research? These questions are explored by examining the influence NVivo had upon an interdisciplinary phenomenological research project in health ethics. We identify the software's effects and situate our decision to use it within the Canadian health sciences research landscape. We also explore the challenges of remaining true to our project's philosophical foundations, as well as how NVivo altered our being-in-the-world as researchers. This case demonstrates McLUHAN's claim that new technologies invariably initiate new practices and modes of being, and urges researchers to attend to how we are both shaping and being shaped by software.

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## 1. Introduction

When Marshall McLUHAN (2003 [1964]) famously stated "the medium is the message," he was articulating how it is the *form* of new technologies rather than their content or uses that changes individuals and society. Technologies change the way we perceive our world, and our relation to the world comes to embody their very character—they become a "social bond" (p.34). It might be said that McLUHAN was building on Martin HEIDEGGER's (1977 [1954]) claim about the all-pervasiveness of our techno-scientific understanding of being: we perceive everything (including ourselves) as "standing-reserves," as things to be ordered or problems to be solved. Taking the two positions together—that through our use of technology we become functions of it—we must consider the effects when new technology is readily taken up. [1]

Currently, academic research is seeing the increasing use of computer-assisted qualitative data analysis software (CAQDAS) in new and often novel ways (see EVERS, SILVER, MRUCK & PEETERS, 2011). Originally developed by researchers themselves and continuously revised to meet their changing needs (GIBBS, FRIESE & MANGABEIRA, 2002), CAQDAS programs are designed to assist with data storage and analysis, research management, and theory development. They range from simple "code and retrieve" programs to more complex systems enabling multimedia analysis, hyperlinking, and model development. CAQDAS promises greater rigor and validity to data analysis (EVERS, 2011; SIN, 2007; WEBB, 1999; WELSH, 2002) by routinizing coding and analysis (EVERS, 2011; ROBERTS & WILSON, 2002) and thus reducing researcher bias (BAUGH, HALLCOM & HARRIS, 2010). Analysis can also be improved as predefined protocols aid handling ambiguous data (ATHERTON & ELSMORE, 2007). Researchers familiar with a program can increase the speed and complexity of coding (ROBERTS & WILSON, 2002; WELSH, 2002) while remaining close to their original data (SAILLARD, 2011), thus saving time (BAUGH et al., 2010; MOSELEY, MEAD & MURPHY, 1997) for developing richer interpretation and better analysis (MORISON & MOIR, 1998). Further, CAQDAS programs enable researchers to handle larger data sets (ATHERTON & ELSMORE, 2007; BAUGH et al., 2010) while avoiding "data overload" (WEBB, 1999), and many enable management of multiple data formats in one convenient digital location (EVERS, 2011; JOHNSTON, 2006; WILTSHIER, 2011; WOODS & DEMPSTER, 2011). Some programs even allow multiple researchers to simultaneously access their data thereby facilitating research collaboration (WOODS & DEMPSTER, 2011). However, the most cited reason for adopting the software is that it provides material evidence of the analytic process (EVERS, 2011) by tracking researcher decision-making through digital notes or "memos" linked to particular data, thus allowing researchers to "think in a visible way" (KONOPÀSEK, 2008, ¶56). The memo "audit trail" "facilitates rigour of methodology and the transparency of method ... that in essence constitutes research that is accountable, innovative, and effective" (BONG, 2002, ¶44).[1] According to Robyn SMYTH (2006), such a trail offers the evidence of credibility,

1 Indeed, it is suggested that a researcher's memos should form a significant portion of his or her report (KONOPÀSEK, 2008).

confirmability, dependability, transferability, and auditability required of any trustworthy qualitative research. [2]

Some researchers, however, advise caution. They suggest that the richness and complexity of qualitative data does not readily fit with software's "quantifying" nature, thus risking loss of meaning (ATHERTON & ELSMORE, 2007; ROBERTS & WILSON, 2002). Further, there is concern over the implicit assumptions promoted by the software's structure that shape the analysis process (FRIESE, 2011; SCHÖNFELDER, 2011), including the ideas that collection and analysis are discrete, linear activities (COFFEY, HOLBROOK & ATKINSON, 1996; ROBERTS & WILSON, 2002), that coding is the only way to manage data (ATHERTON & ELSMORE, 2007; COFFEY et al., 1996), and that all qualitative research follows a similar pattern in seeking to generate higher-level analysis, if not outright theory (ATHERTON & ELSMORE, 2007). There are concerns that the ease of the "code and retrieve" function can distance researchers from their data (MORISON & MOIR, 1998; WEBB, 1999) and that, rather than merely serving research ends, coding can become a priority (JOHNSTON, 2006; ROBERTS & WILSON, 2002; WELSH, 2002) and be conflated with analysis (BONG, 2002; COFFEY et al., 1996). Coding mechanization may supersede critical reflection (EVERS, 2011; MORISON & MOIR, 1998) and data analysis (MacMILLAN, 2005), thus stifling researcher creativity (ROBERTS & WILSON, 2002) and making analysis activities and research results prescriptive (JOHNSTON, 2006; ROBERTS & WILSON, 2002), if not simply weak (COFFEY et al., 1996). [3]

While there is disagreement over the risks and benefits of CAQDAS and over whether it is fundamentally incompatible with the philosophical bases of qualitative research and certain methodologies (BANNER & ALBARRAN, 2009), most researchers appear to agree on three points. The first is that CAQDAS programs are tools designed to aid the research process and not a methodology in themselves (BAUGH et al., 2010; DRISKO, 1998; EVERS et al., 2011).[2] The second is that however one chooses to pursue research, whether manually or with CAQDAS, "the prerequisite of really effective qualitative analysis, it could be said, is efficient, consistent and systematic data management" (GIBBS et al., 2002, ¶11). The third point is that ultimately, "the central analytical task in qualitative research ... cannot be computerized" (KELLE, 1995, p.3), though one may find evidence of one's analysis process in the CAQDAS program (KONOPÀSEK, 2008). Analysis will always be bound by the researcher's abilities; while computer programs may enhance those abilities, they will never replace them (EVERS et al., 2011).[3] [4]

But can the question of the place of CAQDAS in qualitative research be as simple as merely deciding if one should or should not use it? If we are to take seriously McLUHAN's and HEIDEGGER's views of technology, we need to inquire into how

2 Some researchers, however, argue that CAQDAS supports some methodologies, such as grounded theory methodology, more than others.

3 In 1984, Peter CONRAD explored the limits of the use of computers within qualitative research, stressing that researchers need to recognize they should not be limited by the computer's function.

technology affects our research beyond technical facilitations or impediments. While program users and trainers like Elif Kuş SAILLARD (2007) readily recognize there is an "implicit effect of software architecture on the way researchers conduct analysis" (¶70), we must consider how CAQDAS adoption affects our conceptions of and relationships to qualitative research beyond mere activity. How does it change our being-in-the-world as qualitative researchers? In this article, we explore these questions by examining the effects that a CAQDAS program, NVivo 8, had upon a Canadian interdisciplinary phenomenological research project in health ethics. In identifying the software's effects—how it both expanded and constrained certain possibilities and practices—we explore how the software changed our very relationship with and perception of the research and ourselves. From the outset it should be noted that NVivo's use in this project was not the "ideal" use as put forth by its developers. This case does, however, reveal the messy reality of how CAQDAS often comes to be used in real-life research. Further, it demonstrates the pervasive influence that CAQDAS can have on research, researchers, and conceptions of research alike; effects we must closely attend to and seriously consider given the software's increasing prevalence. [5]

## 2. The Canadian Health Sciences Landscape and the Rise of CAQDAS

Before the specific research project is considered, it is necessary to understand the landscape of health sciences in Canada as this informed the research team's very decision to use a CAQDAS program. The terrain is shifting in multiple, sometimes contradictory ways, creating a research environment in which CAQDAS is increasingly perceived as a necessary component. Most noticeably, within the country's health sciences and healthcare systems there is a growing conflict between the evidence-based practice (EBP) movement and those researchers, clinicians, and policy makers who believe it is vital that professional practice be informed by *various* ways of knowing. Premised on the belief that institutional policies and individual practitioners' decision-making should derive from research that is measurable, predictive, follows the scientific method (NOLAN, 2008), and is scientifically verifiable (ROLFE, SEGROTT & JORDAN, 2008), the EBP movement challenges the acceptability of all other research being undertaken. The "gold standard" becomes research using randomized control trials or meta-analyses (SACKETT, ROSENBERG, GRAY, HAYNES & RICHARDSON, 1996). While basing one's decisions on "evidence" may seem reasonable, reducing what we consider valid knowledge to a narrow definition of what is "evidentiary" is problematic (HOLMES, MURRAY, PERRON & McCABE, 2008). Evidence-based practice's definition of "acceptable" evidence does not account for quality and value judgments, thus limiting practitioners to a single, highly codified form of knowledge (HOLMES & GAGNON, 2008; PORTER & O'HALLORAN, 2009). Further, the very demand for measurable, predictive, and preferably quantitative (i.e., "objective") data ignores the subjectivity inherent in all forms of inquiry and reifies our concept of knowledge (HOLMES & GAGNON, 2008). According to David HOLMES, a leading researcher opposed to the domination of EBP, "the evidence-based movement colonizes health sciences by

an all-encompassing research paradigm, thus producing a dominant ideology that excludes alternative forms of knowledge" (HOLMES & GAGNON, 2008, p.663). [6]

It is important to recognize that what HOLMES and others are responding to is occurring at the very level of practice. As EBP models are adopted, the value and legitimacy of qualitative research can go unrecognized. This raises the concern that if one's research is to affect practice, it must take on the features of being "evidence-based," either by becoming quantitative in nature or by incorporating a means of demonstrating concrete evidence for one's findings to satisfy the demand for validity (SIN, 2007; WELSH, 2002). While the former can be a difficult shift for qualitative researchers, the latter is more easily achieved through adoption of CAQDAS due to its much-touted *auditability* (WELSH, 2002), which gives the analysis process an "evidentiary" quality often found lacking in reportage of manually conducted qualitative research (JOHNSTON, 2006; SIN, 2007). Specifically, CAQDAS developers claim that—when used correctly—the software enables other researchers to examine one's data and either come to the same conclusions or see logical evidence of the basis of those conclusions (WICKHAM & WOODS, 2005).[4] Auditability comes to imply replicability. [7]

A second, related influence in Canadian health sciences is the financing of qualitative research by provincial and national funding bodies. As they build their careers, researchers are acutely aware that quantitative health research receives substantially more funding than its qualitative counterpart. In 2011, of the 1,995 grants awarded by the national funding agency for the health sciences, the Canadian Institutes for Health Research (CIHR), 60 studies were explicitly identified as qualitative in nature, with 17 more using mixed methods (CANADIAN INSTITUTES FOR HEALTH RESEARCH, 2011).[5] Until recently, much qualitative health research was funded by the Social Sciences and Humanities Research Council of Canada (SSHRC). However, as of 2009, the SSHRC ceased funding health-related research and those seeking funding were redirected to the CIHR. [8]

One difficulty in obtaining financial support for qualitative studies, particularly for those using a methodology that does not have highly codified analysis activities, is the funding bodies' requirement that researchers provide not only an in-depth description of their methodology, but also a detailed account of specific analysis activities. For example, the CIHR requests that researchers detail the process by which they will obtain their results—an expectation arising out of the very structure of quantitative research. Determining the analysis process prior to actually conducting qualitative research can be difficult, if not impossible, especially when using approaches such as hermeneutic phenomenology where there is no set process to move from data to results (see VAN MANEN, 2003 [1997]). This has led some qualitative researchers to develop ways of fitting qualitative research into the quantitative model, including counting themes (e.g.,

4 WICKHAM and WOODS (2005) argue this is especially possible if a CAQDAS protocol has been created.

5 We are not unaware of the irony of demonstrating our point with statistics. Please note, however, that several studies not included in the 77 reported here may also have been collecting qualitative data.

LEECH & ONWUEGBUZIE, 2007), quantifying qualitative data (e.g., CHI, 1997; SRNKA & KOESZEGI, 2007), and applying algorithms to determine theme frequency (e.g., KUIKEN & MIALL, 2001). Researchers who shy away from such activities may attempt to meet the CIHR's expectations by introducing CAQDAS into their research design. The introduction of a CAQDAS program can provide an identifiable process, a concrete activity one can speak of as "assisting analysis," whereby one can track a process that often occurs in conversation, thinking, and writing. For this reason, the programs are often seen to "lend a scientific gloss to qualitative research" (COFFEY et al., 1996, ¶7.6), and their mere mention is often (and inaccurately) seen to provide research with a "quality guarantee" (MacMILLAN & KOENIG, 2004). [9]

But while qualitative health science researchers are facing pressures to conform their work to the EBP movement, and to obtain funding that is allocated on increasingly stringent criteria, they are also responding to an emerging feature of the health sciences landscape that may appear contrary to the other two: an increased interest in qualitative research. In recent years, qualitative research has been of growing interest to researchers, students, and clinicians (MacDONALD, 2009). This is largely due to the perception that qualitative research speaks to aspects of health, health care, and professional practice that quantitative research can miss (FOSSEY, HARVEY, McDERMOTT & DAVIDSON, 2002; MacDONALD, 2009). A clinician's peer-review of a phenomenological article illustrates this point:

> "This manuscript was a treat ... now I have language for part of my experience that I lacked before I read this. ... This article addresses the gritty underbelly of real-life ethical choices and dilemmas. ... I look forward to seeing it in print and distributing it to our interns" (April 6, 2005, personal communication). [10]

While such responses are validation for qualitative health researchers, growing interest in their work brings with it an expanding market for CAQDAS developers. Software workshops are becoming standard fare at research conferences and as university curricular and extracurricular courses. Just as statistical analysis software has become an expected part of quantitative research, CAQDAS is increasingly becoming synonymous with qualitative research, especially in the health sciences. And with its increasing use, it is necessary to consider its broad effects on research, researchers, and conceptions of research alike. [11]

## 3. The Research Project: *Canadian Health Professionals' Experience of "Compassion Fatigue"*

The research project under consideration here was a Canadian qualitative study in health ethics based at the University of Alberta in Edmonton, Alberta. It was interdisciplinary in nature, national in scope, and used hermeneutic phenomenology. The project's purpose was to better understand health professionals' experience of "compassion fatigue," a concept that originated in media studies in the 1970s but in the early 1990s was taken up in health care. It has been described as the "cost of caring" (JOINSON, 1992), possibly resulting

from an over-identification with one's patients that causes a form of burnout. But while the term is becoming popular among health professionals, the literature remains unclear about what compassion fatigue is. Charles FIGLEY (1995), the most cited researcher on compassion fatigue, states it is the same as vicarious traumatization and secondary traumatic stress disorder, which he argues are the same as posttraumatic stress disorder—a problematic conflation. [12]

Faced with a little understood phenomenon gaining prominence, the researchers simply asked: If compassion fatigue is something people are identifying as having, *what is the lived experience of having compassion fatigue?* An interdisciplinary team was gathered to reflect a range of health professions (nursing, medicine, psychology, social work, and occupational therapy), along with other expertise that would inform the project (clinical ethics, philosophy, art, and anthropology). Each of the researchers had had previous experience using a hermeneutic phenomenological approach, and many of them had used CAQDAS programs. The project received funding from the Social Sciences and Humanities Research Council of Canada (when it was still funding health-related research) and obtained ethical approval from the Health Research Ethics Board, Panel B, of the University of Alberta. Data were collected from 2007 to 2010. [13]

### 3.1 Methodology

Due to the exploratory nature of the researchers' central question, hermeneutic phenomenology was used. A form of human science inquiry, hermeneutic phenomenology seeks to describe a given phenomenon as it is lived through. Specifically, one attempts to understand and describe how one experiences a given phenomenon, as well as the meanings that emerge from that basic experience, before the experience is analyzed or theorized (MERLEAU-PONTY, 1962). Hermeneutic phenomenology is based on the assumption that there is value in understanding our basic experience of the world. If, as is often claimed in health care, professional practice should be based on the lived reality of one's patients, hermeneutic phenomenology can offer practitioners a way to understand patients' experience even when it may appear extremely foreign (VAN DEN BERG, 1972). [14]

The research team chose to follow the hermeneutic phenomenological practices articulated by Max VAN MANEN (2003 [1997]), whose approach is the most common in the health sciences (SHIN, KIM & CHUNG, 2009), and with whose work the team was familiar. According to VAN MANEN (2003 [1997]), hermeneutic phenomenology has no set method. Rather, following HEIDEGGER's notion of *method as path*, VAN MANEN argues that one's methods "need to be discovered or invented as a response to the question at hand" (p.29). But while there is no specific process for conducting hermeneutic phenomenological research projects, there is a specific outcome sought, which is to create a rich, comprehensive, and sensitive account of how a phenomenon is experienced immediately and pre-reflectively. This text does not explain or theorize the phenomenon, but describes it evocatively through an exploration of the phenomenon's *eidos,* or essence. Thus, to do phenomenological research is

essentially to do phenomenological writing. This means attending to the language used such that "it lets us see that which shines through, that which tends to hide itself" (p.130). According to Carina HENRIKSSON and Tone SAEVI (2009), successful phenomenological texts speak to readers at an intuitive as well as a cognitive level, creating a way of understanding that is embodied. Someone reading a phenomenological text understands the phenomenon similarly to one who experiences it: *from the inside.* [15]

With such a specific outcome, so distinct from other methodologies, one might ask as to the purpose of hermeneutic phenomenological research. Returning to the claim that professional practice should reflect an understanding of one's patients' experiences, phenomenology is of use to the health sciences through the development of *thoughtfulness* and *tact* (VAN MANEN, 1991). After reading the text, clinicians, policy makers, and health sciences students should be induced to greater thoughtfulness about their world and that of patients. Maurice MERLEAU-PONTY wrote that phenomenology "consists in relearning to look at the world. ... We must begin by reawakening the basic experience of the world" (1962, p.ix). A phenomenological text calls both those who undertake to write it and those who read it to become attuned to their experience of the world. In the present case, the researchers hoped that by understanding—and enabling others to understand—the experience of having compassion fatigue, further research identifying its causes and treatments, and healthcare policies with respect to persons who develop it, would be better grounded in the phenomenon's lived realities. [16]

### 3.2 The research data

The researchers decided from the outset to use the latest version of NVivo[6] as part of the analysis process. NVivo was selected due to several team members' familiarity with it and the knowledge, obtained in previous research projects, of its relative "malleability" in coding compared to other CAQDAS programs. The decision to use NVivo allowed an increase in participant numbers. In phenomenological studies using in-depth interviews, participant numbers can range from a small group of four to a nearly unmanageable 20 people. However, the research team believed that with a CAQDAS program they could effectively manage more than 20 participants. The inclusion of distinct sub-groups would allow the team to explore not just the phenomenon as experienced by health professionals in general, but also how it is experienced within different professions. This further ensured the research's relevance. Previous research into moral distress had indicated there could be professional differences affecting the experience of a phenomenon (see AUSTIN, BERGUM & GOLDBERG, 2003; AUSTIN, RANKEL, KAGAN, BERGUM & LEMERMEYER, 2005; AUSTIN, KAGAN, RANKEL & BERGUM, 2008), and the researchers wished to remain open to this possibility in the present study. In total there were six groups, five identified from the outset (by profession) and one added mid-process (nurse administrators), and a total of 53 participants. [17]

6 At the project's inception, it was NVivo 8.

The research data were elicited from one- to two-hour research conversations with each participant, during which the researcher-interviewer sought accounts of specific incidents of compassion fatigue. While the researchers wished to collect descriptions of individual experiences of compassion fatigue rather than participants' interpretations of it, the conversations rendered both. Other sources of information about compassion fatigue were added to the data to further the team's understanding of the phenomenon, including the research literature, etymological roots of the language being used, as well as related concepts (both linguistically related, such as *fatigue* and *compassion*, and related in the research, such as *burnout* and *moral distress*). The team also explored the appearance of compassion fatigue in the media and popular culture, and examined literary and other creative works that seemed to evoke the phenomenon.[7] [18]

## 4. The Impact of NVivo 8 on the Research Project and the Researchers

The inclusion of NVivo in the research design had numerous effects on the research activities that took place. Many of these effects were expected and seen as necessary to accommodate the program. Others proved unexpected. All, however, contributed to a general shift in how the researcher team related to and conceived of their research. The following outlines major aspects of this shift. [19]

### 4.1 Introducing "coding" to the phenomenological process

While phenomenological research demands that researchers develop a sense of a phenomenon and articulate it through writing, it can be difficult to make a case for this somewhat indeterminate process to proposal reviewers. Therefore, in addition to adopting NVivo 8 for their data management, the researchers also introduced something tangible, visible, and "auditable" to their analysis process: coding. Specifically, they introduced a practice quite common in qualitative research: identifying recurrent ideas within a data set, giving them names, and placing them in relation to one another. But while the practice of coding is common to CAQDAS programs—indeed, it forms the basis of many—coding as an analysis activity does not normally occur within hermeneutic phenomenology. While by no means prohibited, it is unnecessary. [20]

To fully understand how this changed the analysis process, one must remember there are no prescribed activities when doing hermeneutic phenomenology following VAN MANEN's approach. VAN MANEN (2003 [1997]) only insists that researchers take up a phenomenological attitude and attempt to articulate the *eidos* of the phenomenon of study. This can be done in various ways: through exploring what makes a given phenomenon unique, how the phenomenon differs from other phenomena, or how the phenomenon manifests the existentials of

7 While these additional sources of data were used to assist analysis during research team meetings and entered into NVivo, they were not coded with the same rigor as the transcripts, and their presence in the data set was often even forgotten. These items, however, were extensively used during the writing process.

corporeality, temporality, relationality, and spatiality. Ultimately, all of these means of exploration can be done only by writing the phenomenological text and, even then, these efforts serve not to "capture" and pin down the phenomenon, but rather help point to it and enable it to reveal itself (VAN MANEN, 2003 [1997]). Outside the writing of the text, then, any data manipulation such as coding serves merely as a way to familiarizing oneself with the data. [21]

So CAQDAS does not innately lend itself to the realization of VAN MANEN's hermeneutic phenomenology.[8] The programs are based upon coding, his approach is not. And while the research team had adopted NVivo 8 for the specific benefits of being able to increase participant numbers and having an analysis "audit trail," it must be stressed that the team did not view their coding as an extraneous activity introduced merely to meet funding agency demands. Rather, the researchers hoped that through the act of coding they could begin to see the essential aspects of compassion fatigue. [22]

One might ask why the researchers simply did not identify and code the apparent core aspects of the phenomenon of compassion fatigue. The answer is simply that "essences" or *eide* are not codable. They cannot be thought of as codes as the *eidos* of a phenomenon is too large and encompassing to be able to be coded satisfactorily. If it were attempted, all of one's data would be coded, for the *eidos* is inseparable from the phenomenon. To speak of the phenomenon is to invoke its *eidos.* Therefore, the team was faced with a situation where, on the one hand, they could separate data into topics having something to do with the phenomenon of compassion fatigue (codes) but which failed to identify its essence; on the other hand, they were attempting to articulate ideas that could not be marked down within the program being used to manage their data. [23]

### 4.2 Making do with many hands: The construction of an index

Adding coding to the project not only added a step in the analysis process, it changed the research's overall dynamic. As well as being pressured to validate qualitative research within a quantitative paradigm, researchers often find they have less time to actually conduct research. Introducing CAQDAS into the process introduces a time-consuming activity. Contrary to the claims of many (e.g., BANNER & ALBARRAN, 2009), CAQDAS programs are very time-consuming, particularly for users who are not intimately familiar with their function. As Jeanine C. EVERS and colleagues (2011) write, "the more expertise one has on the technical aspects of computing and QDA software, the less one remembers how difficult, time—consuming and annoying those things can be" (¶24). In this study, all but one member of the core research team were academics with a clinical practice focus. The team also included one post-doctoral fellow and several research assistants at the undergraduate, masters, and doctoral levels. Once data collection and coding began, the team quickly

8 This is not to say that CAQDAS is incompatible with all phenomenological approaches. Indeed, Paul COLAIZZI's (1978) method appears more suited than any other: one extracts from one's data significant statements and phrases, draws meaning from them, clusters those meanings into themes, and forms statements of identification from the descriptions, which are then verified with study participants (SHIN et al., 2009, p.854).

recognized that the academic-clinicians had neither the time to commit to learning or familiarizing themselves with the new version of NVivo, nor to comprehensively code every transcript—despite this being the recommended practice in order to use the inter-rater reliability feature (SIN, 2007). Unfortunately, we cannot ignore the fact that the increased speed and intensity of everyday life has moved into academia and is impacting research. Rather than having all members code every transcript in NVivo, the core research team would meet to review individual transcripts and identify relevant codes for the whole set, thus attempting to "stay close" to the data. Under the supervision of one core team member (the non-clinician), the research assistants would then review all of the transcripts and code what they believed to be each one's relevant sections. As the research assistants were assigned only on a short-term basis and as analysis began before all the interviews were completed, inter-rater reliability could not be determined even between research assistants. This is the harsh reality of research: one makes do with what one has in terms of time, people, and resources. [24]

Despite the many hands that both coded and did not code the transcripts, codes were regularly reviewed and revised by the research team as a group at team meetings. Further, as the process progressed, codes were merged, divided, renamed, or simply deleted when deemed necessary. While this goes against the recommended practice of having a predetermined coding structure that is suggested by Garry AULD and colleagues (2007), it was a means of conforming to the changing data. It also allowed what initially appeared important to be superseded by that which was actually important but only appeared later in the analysis process—a common occurrence in phenomenological research. [25]

Following coding, the researchers would ask the research assistants to print select codes to assist with their writing. In this way, NVivo served as an index. A researcher would say, "I want everything about the institution" (*institutions* being a code), and NVivo would bring up all sections of the data that had been coded about healthcare institutions. This was a significant benefit for the project. [26]

### 4.3 Introducing the NVivo expert

When the team gave up collectively coding each transcript in order to accommodate both work-life demands and NVivo's role in the project, unexpected consequences emerged. Late in life, McLUHAN theorized that all new technologies do four things when introduced: they obsolesce certain practices; they enhance others; they retrieve certain past practices that had disappeared; and when pushed to an extreme, they become paradoxical, or something they were not meant to be (McLUHAN & McLUHAN, 1988). With the introduction of CAQDAS, these four changes can be traced both generally and within the compassion fatigue research project (see Figure 1).

| The equality of data in data sifting | Data shuffling |
|---|---|
| • Sorting relevant transcript sections<br>• Locating and "constructing" anecdotes<br>• Ability to address whole of relevant transcripts at once | • Coding, coding, coding, yet moving no further and finding nothing essential<br>• Data analysis becomes generalized qualitative thematic description |
| **Enhances** | **Reverses into** |
| **Retrieves** | **Obsolesces** |
| • The computer punch-card<br>• The computer expert | • Coding using cut-up hard copies and a highlighter<br>• Sorting by the cut-and-paste method<br>• Handwritten notes of one's decision-making |
| The punch-card expert | The tactility of research |

Figure 1: CAQDAS tetrad [27]

By introducing NVivo into the phenomenological research project on compassion fatigue, the role of the highlighter and handwritten notes was removed from documenting analysis, as was the cut-and-paste method for coding and data management. While these activities might have been practiced by individual researchers with their personal copies of transcripts, there was little sharing of how each researcher did their coding. Rather, codes and coding structures determined through conversation would guide a research assistant's sorting and coding of the master data set within NVivo. The necessity of managing their master data set within a computer program largely obsolesced the tactility of the joint analysis process. However, despite this loss, the researchers also gained a key advantage. NVivo could be used to effectively remove irrelevant sections of transcripts while bringing forth the relevant sections of all transcripts so none would be overlooked. With the compassion fatigue project, this feature was used not only to retrieve codes, but also to document poignant turns of phrase that might easily have been forgotten. Moreover, this function was used to remove individual interpretation and generalization in order to extract descriptions of living with compassion fatigue which could be used in the phenomenological text. Concrete descriptions were found throughout the transcripts but were frequently broken up by participant interpretation. By selective coding, extraneous material could be removed leaving for retrieval only the specific accounts of compassion fatigue. The ability to find these "gems" were of particular importance as anecdotes serve several important purposes in phenomenological research, including grounding the text in lived experience as opposed to theoretical abstraction, demonstrating insight into the embodied nature of the experience, and evoking often overlooked aspects of the phenomenon (VAN MANEN, 2003 [1997]). [28]

But while NVivo changes the procedure for culling quotable phrases and descriptions from the data, it also changes relationships among researchers and between them and their research. The fact that many on the core research team chose to neither use NVivo to code nor retrieve data introduced *the NVivo expert*,[9] unexpectedly reviving the role of the computer punch-code expert: an individual who has skills the researchers lack or choose not to practice and who, at their direction, processes their data in a way they may not fully understand. Whereas with manual research, researchers are the experts of their data management and analysis, with NVivo, data management is often outsourced to persons not fully trained (i.e., research assistants). While the core researcher team retains the responsibility for analysis and remain "close" to their data through rereading full transcripts, personal notes, and retrieved codes, they are physically distanced by their inability (either through lack of skill or lack of time) to manipulate the entire data set directly. [29]

Ability or inability to manipulate data points to another feature created by the software's introduction. When pushed to the extreme, coding simply becomes a practice of endless data shuffling. A commonly identified risk with CAQDAS (see JOHNSTON, 2006; ROBERTS & WILSON, 2002; WELSH, 2002), it is tempting to code and code and code ... and never move beyond it. Further, when coding becomes the means by which analysis takes place and supersedes one's methodology, only generalized thematic description becomes possible. For the compassion fatigue researchers, the appeal of coding risked their never exploring the phenomenon's essence. [30]

### 4.4 Fostering new, problematic habits of mind

While CAQDAS invariably changes the research process, including affecting roles and threatening project goals when relied upon too heavily, its use also engenders new *habits of mind*. Catherine ADAMS, a phenomenologist of technology, notes:

> "Just as the architectures of buildings and classrooms predispose certain pedagogies of teaching and learning, so the architectures of information and communication technologies shape and license certain ways of knowing and doing over others. Software encodes values—decisions about what is important, useful and relevant, and what is not ..." (2007, p.231). [31]

In its ease of use for certain things rather than others, technology invites its users into and thus induces, quite easily, certain ways of thinking (ADAMS, 2006). This can be particularly problematic with CAQDAS given the different philosophical bases of qualitative research and computer technology (see ROBERTS &

9 Other researchers have identified this as the "gatekeeper" (RICHARDS, 1995), but differences in power may change this person's role. A person with a high degree of power and computer skill may limit others' access to the data. In our study, however, it was not the persons with the most power who were designated this role. Rather, it was often those of lower privilege (non-academic staff or research assistants) who were seen as *working for* the core team members. Therefore this invoked the computer punch-card expert role.

WILSON, 2002):[10] "If one takes technological artifacts, such as computers and computer programs, and then applies them to research and data analysis, this grounding in a positivistic philosophical background is going to fit them to certain tasks more than others" (¶23). [32]

In the compassion fatigue research project, the habits of mind NVivo fostered in both the research assistants who were coding and the core research team were a significant issue. Indeed, it is in the very structure of NVivo that the origins of these habits of mind can be found. NVivo is relatively easy to use to code and organize codes, and that very ease led to a dependence on coding. For the most part, the research team (the core members as well as the research assistants) wanted everything to be coded before the team moved on to writing. Moreover, for those physically coding the transcripts in NVivo, everything in a transcript seemed relevant; they needed to code every piece, despite knowing logically that the data's strength was in participants' concrete descriptions and anecdotes, in the specificity of their stories. Everything else was secondary, already interpreted, data to be avoided. And yet, NVivo presents the whole of each transcript as equal and each transcript as equal to every other. How could they ignore pages of text for the one or two accounts each interview might produce? [33]

During research meetings, the question "Can we code that?" was commonly asked, reflecting the unspoken assumption that their analysis should be "enterable" into NVivo. In looking for their analysis to be reflected back to them from their master data set, the research team was looking for their work to be validated by the computer. In some ways, they came to embody the funding agency's demands for an external auditable research process. [34]

The research team likewise felt that organizing codes was paramount. There was an urgent need to find the right structure and, at times, the entire structure was reorganized. But the codes, in and of themselves, were non-phenomenological; they were not the goal of the analysis. Furthermore, much of the discussion of codes and their interrelations led to a preliminary theorizing of compassion fatigue—something to be stringently avoided in phenomenological research, but a move which is implicitly built into CAQDAS coding process (DRISKO, 1998; KONOPÀSEK, 2008). For example, there were discussions about the conditions under which compassion fatigue appears and the institution's role in its appearance and treatment. None of these discussions furthered the team's understanding of what it was like to experience compassion fatigue. On the contrary, these discussions threatened to move the team members away from their goal of articulating compassion fatigue's lived essence. [35]

Faced with the impossibility of glimpsing compassion fatigue's *eidos* through coding, the research team turned to the phenomenological existentials: the lived body of compassion fatigue, its lived space, lived time, and lived relation. They

10 Whether or not CAQDAS can accommodate philosophical positions is of great debate. Many, like ROBERTS and WILSON (2002), see a fundamental incompatibility between qualitative research and the nature of computing (its binary system), while others (such as KONOPÀSEK, 2008; SMYTH, 2006) believe that, while based on a binary system, CAQDAS is complex enough to accommodate various epistemological positions.

also began to write. No longer could they code what they were exploring and this, in itself, was indicative that they were moving beyond the superficiality of the codes toward a deeper understanding of the phenomenon. While they had originally intended to use NVivo to the end, they found themselves returning to the manual process, inadvertently taking the approach—a combination of both manual and computerized analysis—that is often deemed best (ATHERTON & ELSMORE, 2007; WELSH, 2002).[11] [36]

And, indeed, those things that were evoked by the existentials and thus resisted clear and easy codification were the very things that evoked the *eidos* of compassion fatigue. These could not be coded because they were *pointing to* the phenomenon rather than to any given transcript selection. So the researchers found themselves at a point where they could not use NVivo, finding that the software was getting in the way of their phenomenological analysis. And yet they could not *not* use it, as their data set was simply too large for them to wholly rely on printed transcripts and memory to address it in its entirety. [37]

### 4.5 The split-mind effect

What resulted can only be described as the "split-mind" effect arising in individual researchers. To cope with the situation at hand they had to be both oriented toward the mindset embedded in NVivo's structure, while simultaneously oriented away as was required by the phenomenological stance. While the research team needed NVivo to manage their data, they could not use it to facilitate phenomenological analysis. They had to turn both toward it and away from it. In this Janus-like response, they may have unintentionally adopted HEIDEGGER's ideal relation to technology: "We [should] let technical devices enter our daily life, and at the same time leave them outside, that is, let them alone, as things which are nothing absolute but remain dependent upon something higher" (2006 [1955], p.94). [38]

Like HEIDEGGER, McLUHAN (2003 [1964]) would argue that it is only by adopting this attitude that we can begin to see a new technology's *lines of force* and identify its effects upon us. But while this may be an appropriate and, indeed, possibly the only response to CAQDAS when used in phenomenological research, it must be acknowledged that this split-mind effect does not easily engender the phenomenological attitude. In fact, in the very effort it requires to hold both positions at once, the split-mind stance stands in the way of researchers' maintaining an open, attentive, wondering, oriented relation to their subject of study, a relation that VAN MANEN (2003 [1997]) argues is fundamentally important in phenomenological research. This leads to the concern that CAQDAS programs place one more thing between us and our lived experience, one more thing that must be overcome. [39]

11 It should be noted that not all researchers agree that a combination is best. KONOPÀSEK (2008), for example, argues that during the analysis process one can readily see in CAQDAS one's thinking and decision-making process. There is no need to turn away from the program, and doing so may in fact be detrimental to making visible one's analytic process.

## 5. Being-a-Phenomenological-Researcher-in-the-World with CAQDAS

Having returned to McLUHAN and HEIDEGGER, we must now ask: how do CAQDAS programs change the researchers who use them? While it is readily apparent how CAQDAS changed the research process, it must be asked how we, the authors, the same phenomenological researchers presented in this case study, were changed by the software? How did it change our mode of being-in-the-world as researchers, particularly as phenomenological researchers? What did we become? Several features seem to identify themselves. Though by no means a definitive or exhaustive list, we hope the following can serve as points of reflection for researchers considering using CADQAS. [40]

With CAQDAS ...

We become separate and distinct from our research. While we conduct our research, we are no longer part of it, for, like the data itself, we must "input" ourselves[12] (our hunches, interpretations, and lines of thinking) as written responses, as "memos" into the computer that holds and that now *is* our research. [41]

With CAQDAS ...

We become limited to simple written words, limited to acceptable, recorded pieces of texts, for, despite recent advances (see WOODS & DEMPSTER, 2011), sound and image analysis within CAQDAS lags far behind textual analysis, preventing images and sound from full incorporation.[13] And even when we try to incorporate them, they are often forgotten, overridden by words. And yet, even the words we have are merely faint reflections of the power and presence they once were when spoken, for CAQDAS relies upon transcription. Immediate, direct experience, direct observation disappears; no longer a worthy source of data, unless it is mediated by recording, revision. CAQDAS digitization flattens, limits, narrows our world of possible experience. [42]

With CAQDAS ...

We become certain. For CAQDAS removes the groping for understanding, the searching and grappling with that which is just beyond understanding, with that which can only be found only through writing. CAQDAS does not allow for ambiguity (ROBERTS & WILSON, 2002). Our data is truly ordered, for, in all regards, CAQDAS embodies our techno-scientific understanding of being. It forces order upon messiness. We must make definitive statements; we decide it is *this, not that*, every time we enter a code. Even the ability to revise, merge, split, and delete codes are definitive moves, not the subtle development of

12 "By means of writing comments the researcher inscribes him- or herself into the studied material so that it becomes more and more under control" (KONOPÀSEK, 2008, ¶40).

13 Christina SILVER and Jennifer PATASHNICK (2011) describe these capabilities as "blunt tools for fine purposes" (¶84).

understanding. With CAQDAS, we work with nice discrete categories, data that are only themes waiting to be identified, theories waiting to be generated. [43]

With CAQDAS ...

We become language-less. Our language becomes that of the computer, a series of ones and zeros, a statement of either *there* or *not there*, with no inherent meaning either way. The computerization process denies the role of writing in analysis by erasing the question of how do I know what I mean until I write it? Analysis ceases to be a hermeneutic event. It becomes thoughts to be caught, documented, jotted down in memos, and retraced upon reporting. It becomes the tracking of connections, the hyperlinking of evidence, the importing of literature. The writing of our texts then becomes mere objective documentation of all these things, a retrieval of memos for our research reports (KONOPÀSEK, 2008), and, at best, mere explication. The writing itself generates nothing. It is either there—1—or not—0. Language, its power and place as qualitative research, is denied. [44]

With CAQDAS ...

We, like our data, like this list of possibilities, become ordered, a theory to be articulated, a problem to be identified and eventually solved. We become, once more, *standing reserves*; all, eventually, to be stored on a machine. [45]

## 6. Conclusion

> "All objects invite us to extend or change our relationship to our world. These enhancements or transformations can be minor or profound, but the full spectrum of effects is often unanticipated and unseen until the object is integrated transparently into our lives" (ADAMS, 2006 p.390).
>
> "Any medium has the power of imposing its own assumption on the unwary. Prediction and control consists in avoiding this subliminal state of Narcissus trance. But the greatest aid to this end is simply in knowing that the spell can occur immediately upon contact, as in the first bars of a melody" (McLUHAN, 2003 [1964], p.28).

The introduction of any new technology invariably brings with it new practices, both extending and restricting human possibilities. As this exploration of NVivo adoption within a phenomenological project has demonstrated, by incorporating CAQDAS programs into research, projects can be expanded in scope and potential. However, it is also evident that CAQDAS programs can impede phenomenological analysis by creating practical conditions that are markedly *unphenomenological.* Therefore, as CAQDAS programs are more and more integrated into qualitative research projects, more and more "integrated transparently into our lives" (ADAMS, 2006, p.390), their adoption and use must be approached critically. While we as qualitative researchers may believe we are actively shaping the use of this software, we ignore at our peril how this software also shapes our research practices, our relationship to research, and ourselves as researchers. [46]

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