

Exploring Congruence between Habermasian Philosophy, Mixed-Method Research, and Managing Data Using NVivo

Robyn Smyth

Robyn Smyth, PhD, Lecturer in Higher Education, The Teaching and Learning Centre, University of New England, Armidale, Australia.

Abstract: *Remaining faithful to the conceptual underpinnings of philosophy, methodological approach, and language can present researchers with dilemmas when a researcher exercises the freedom to choose mixed-method approaches to make meaning from inquiry. In this article, the author explores one approach to maintaining consistency while deriving outcomes that are trustworthy and have authenticity. She demonstrates how a researcher can remain grounded in the world of the research subject and thereby maintain authenticity and transferability. The discussion of computer-aided data management by programs such as NVivo illustrates how these tools can be usefully employed in constructivist methods to assist the researcher with the extensive bulk of qualitative research data.*

Keywords: *Keywords: Habermas, mixed-method, NVivo, qualitative, methodology*

Citation

Smyth, R. (2006). Exploring congruence between Habermasian philosophy, mixed-method research, and managing data using NVivo. *International Journal of Qualitative Methods*, 5(2), Article 3. Retrieved [date] from http://www.ualberta.ca/~iiqm/backissues/5_2/pdf/smyth.pdf

Author's note

I acknowledge the contribution of my doctoral supervisors, Drs David Laird and Ted Redden of the School of Education Studies, University of New England, Australia. Their advice, guidance and encouragement considerably improved the outcome of the research which was underpinned by the propositions explored here.

The conceptual framework for a research study influences the choice of an appropriate method (Maxwell & Loomis, 2003; Smyth, 2004). The choice of analytical tools, whether qualitative or quantitative measures, should be consistent with the philosophical and theoretical underpinnings of the study as developed in the conceptual framework. Using both qualitative and quantitative methods enables a researcher to corroborate data from different sources, enhance the richness of the investigation, and meet the challenge of considering views that might not have been considered or encountered (Miles & Huberman, 1994). The ontological, epistemological, and methodological assumptions expounded by constructivist researchers provide an apparently secure philosophical tether for many mixed-method approaches (Guba & Lincoln, 1994; Lincoln & Guba, 2000), illustrating a researcher’s freedom to use appropriate tools to make meaning from inquiry (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2003).

Constructivist theory is based on a relativist view of being (ontology) that holds as fundamental the premise that there exist multiple “socially constructed realities, ungoverned by any natural laws” (Guba & Lincoln, 1989, p. 84). Such a premise appears to be fundamentally consistent with the German philosopher Habermas’s declaration that knowledge does not exist in isolation to be discovered. Rather, it is constructed by people as they engage in daily life (Grundy, 1987b). Habermas’s framework of knowledge-constitutive interests, is applied to educational settings by Grundy (1987a) and Mezirow (1981, 1990, 2000), where it provides a bridge between knowing what knowledge is (epistemology) and the nature of reality (being). My contention is that it also provides a philosophical framework for investigations using mixed methods.

HABERMAS’S PHILOSOPHY: A BRIEF EXPLANATION

As Grundy (1987b) and Mezirow (1981) tell us, Habermas proposed that the dominant view of knowledge formation held by different individuals and groups appears to cause them to act in quite distinctive ways that can be identifiable using his analytical framework. Habermas’s three dominant views, which he called knowledge-constitutive interests, are characterized by the position an individual takes in relation to his or her actions in particular social environments, as summarized in Table 1. Although his theory acknowledges that social actions are not usually consistent with one single knowledge-constitutive interest, Habermas asserted that individuals will generally be guided in their thinking by the principles of the dominant interest on which their knowledge has thus far been constructed. For example, in the adult world, the principles underpinning dominant interests will usually have been shaped by the socialization of individuals from their childhood into their working environment(s), but most will be willing and able to act from other interests according to need and circumstance.

Emancipatory action is Habermas’s penultimate goal, because it represents freedom from the coercion of the artificial world of the technical interest, which has colonized life in the social world (Starratt, 1996; Young, 1989). This type of action goes beyond the collaborative decision-making action of the “practical interest,” wherein individuals, sometimes acting together in loosely coupled groups, aim to do what is “right” as they see it but do not strive for freedom from ideology. However, it is generally accepted that consistent action in the practical interest is a prerequisite of

<i>Dominant Interest</i>	<i>Characteristics of Action</i>	<i>Locus</i>	<i>Example</i>
Technical interest	Action on the environment	Control	When people and practices are thought of as objects to be controlled and manipulated to achieve a desired outcome
Practical interest	Action with the environment	Understanding	Meaning-making meaning is crucial. Action is based on considered judgment about people and practices
Emancipatory interest	Autonomy from the environment	Freedom from ideology	Critical insight has the potential to release individuals from dogmatism and empower them to take control of their lives in autonomous and socially responsible ways; they act collectively from authentic insight in ways that are moral, challenge ideology and imply justice and equality

Table 1 Features of Habermas’s three dominant knowledge-constitutive interests (Source: Grundy (1987b))

any concerted action in the “emancipatory interest” (Grundy, 1987b; Young, 1989).

A consistency of praxis and a correspondence in theory seem to exist between Habermas’s view of knowledge, symbolic interactionism (Blumer, 1969), and constructivism (Guba & Lincoln, 1994; Lincoln & Guba, 2000). This convergence leads to my confidence in proposing Habermas’s framework as a conceptual foundation for choosing an appropriate qualitative method suitable for establishing the credibility, transferability, dependability, and confirmability of investigations in the social world of education (Smyth, 2002).

AN APPROPRIATE METHOD?

To make more explicit connections between Habermas’s theory and its relevance to mixed-method research, in the discussion that follows, I will explore

- connections between positivist paradigms and the technical interest,
- dissonance between positivist language and qualitative methodologies, and
- relational networks and data management using NVivo.

Historically, methodology in the social sciences, including education, has long been equated with a positivist philosophical paradigm and that limited portion of scientific inquiry that dealt only with advanced quantitative procedures. These scientific methodologies were based on the assertion that “there exists a single reality that is independent of any observer’s interest in it and which operates according to immutable natural laws, many of which have a cause-effect form” (Guba & Lincoln, 1989, p. 84).

Such inquiry ignores the underlying processes of human thought and action that influence the progress of the research. Therefore, there is a risk with such traditional normative approaches that the imposition of external form and structure reflects the perspective of a researcher and not the world of the respondents (Guba, 1990; Guba & Lincoln, 1989; Lincoln, 1990). This notion seems to be consistent with Habermas’s attribution of traditional approaches to the technical interest, wherein the emphasis is on the discovery of rules of human behavior through the application of scientific principles designed to explain, predict, and, therefore, control the environment. Habermas’s belief that action in the technical interest implies a need to control events rather than making meaning is fundamental to understanding why the positivistic view of knowledge as actual, certain, exact, reliable, valid, and verifiable might

be unsustainable in the social world (Grundy, 1987b; Guba & Lincoln, 1989; Lincoln & Guba, 2000).

Philosophies that are more recent than the positivist framework acknowledge that no part of the real world exists in isolation from the way in which the human participants in that world perceive it. Thus, there is a process of interaction (thought, observation, and action) between a researcher and the researched, making this process essentially similar between investigations in the objective scientific world and investigations in the social world. To hypothesize, the process of scientific inquiry necessarily includes a process of image making on the part of a researcher (Blumer, 1969). As each image is challenged by new discoveries and a researcher sets about the task of recasting that image to accommodate the new information, interaction occurs, so any methodology that ignores interpretative processes associated with testing our images of either the empirical or social world now appears too narrow and apparently flawed (Guba & Lincoln, 1989; Hill, 1979).

In contrast, Habermas’s practical interest, which emphasizes meaning making, collaboration, and the social good, seems to provide an appropriate philosophical basis for the analysis of the social world because it reflects the purpose of human speech and communication as the means of deriving rational, moral consensus (Grundy, 1987b). Where qualitative analysis aims to understand the richness of the subjective world of human experience from a holistic viewpoint (Miles & Huberman, 1994, p. 10), its strength lies in the ability to reflect the breadth and depth of human experience while taking into account a researcher’s role and perspective in the process. This acknowledgment that the researcher and the researched interact forms the basis of the knowledge of their world and is the foundation of constructivist inquiry through qualitative research. The construction that emerges should reflect the perspectives of both the respondents and the researcher and not rely solely on a researcher’s expressed view. If this is the case, it will reflect the unique values and judgments of the people within the contexts under scrutiny, and the research will be trustworthy (Cohen & Manion, 1994; Miles & Huberman, 1994). In Figure 1, I illustrate concisely some processes of interpretation and indicate the connections between these processes and theoretical elements. In particular, the upper portion of the diagram illustrates how one research project synthesized qualitative methodological principles (Guba & Lincoln, 1994) in a mixed-method design and remained faithful to Habermas’s practical interest, because the focus was on making meaning, demonstrated in the activities implied in the lower half of the diagram. In this case, the

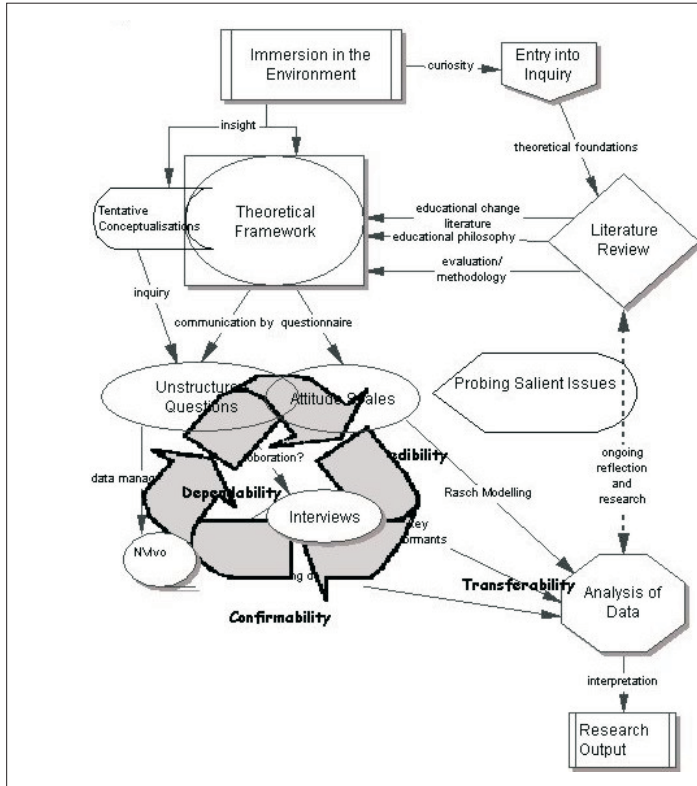


Figure 1. Methodological structure

quantitative aspect of the design supported the qualitative nature and intent of the research but did not control it.

The choice of a mixed-method approach is not inconsistent with this emphasis or philosophy. A mixed-method approach has strength, because it allows a researcher to combine the best of both qualitative and quantitative worlds with the scope to avoid the weaknesses of both (Tashakkori & Teddlie, 2003).

If the aim of an inquiry is to make meaning of, and to reflect, a given situation, then the human intellect alone has the innate flexibility and adaptability to carry out this process with integrity (Guba & Lincoln, 1989). Ideally, during an inquiry, respondents will endeavor to reach a mutually shared definition of the situation with a researcher through the process of responding to a researcher's probes (Foddy, 1994). As Figure 1 also illustrates, concept mapping is a simple yet effective way to articulate relational networks, to conceptualize broad ideas, and even to establish boundaries for a research project (K. Fraser, 1996; Maxwell & Loomis, 2003; Miles & Huberman, 1994). Mapping allows a researcher the flexibility to record ideas about the research problem authentically, quickly, and succinctly and to chart the process of making meaning.

Mixed-method approaches appear to be consistent with Habermas's philosophy (Grundy, 1987b), which

implies that an empirical methodology for inquiry in the social world is inappropriate because these approaches rely on making meaning of events in context rather than the use of scientific principles designed to discover, explain, and predict human actions. Compared to an empirical method, such an approach seems to be less intent on discovering the reality that exists and more focused on making informed judgments based on understanding.

DISSONANCE BETWEEN POSITIVIST LANGUAGE METHODS: REMAINING FAITHFUL

As human beings as well as researchers, we use language to attribute meanings to objects in a process of interpretation that represents the continuous social construction of knowledge (Grundy, 1987b). In life and as researchers, we continuously construct, modify, reinterpret, and define our actions and those of others in any given situation. Thus, we are dynamic and actively engaged with each other in the social construction of common knowledge about the world in which we live.

One part of a researcher's task is to communicate understandings to others clearly. Using the most appropriate language is fundamental, but positivist language is often used to describe qualitative research outcomes and processes. There is a dissonance between positivist language and qualitative methodologies where the terminology of reliability and validity is used to describe social inquiry. This is often surprising, because the language of constructivist approaches has the vocabulary to account for inconsistency and variability in human behavior within the process of analyzing human actions. Expressions of consistency, consensus, and trustworthiness can replace traditional positivist stridency of validity, reliability and proof (Goetz & LeCompte, 1982, 1984; Lincoln & Guba, 2000). Using Habermas's knowledge constitutive interests (Grundy, 1987b) as a guide to considering the language here, such distinctions appear to be consistent with the interpretation that positivist enquiry is action in the technical interest and constructivist enquiry as action in the practical interest (Blumer, 1969). The issue for a researcher is which language to use in a mixed-method approach! For me, a research design that is faithful to Habermas's practical interest requires appropriate use of language that reflects the socially constructed nature of the inquiry, because it seems incongruent to use language from the positivist paradigm to describe research intended to make meaning from human interaction (Smyth, 2002).

If communicating understandings to others using the most appropriate language is one part of a researcher's task, then developing a clear understanding of complex concepts by constructing knowledge about interrelated issues is the greater research task.

MAKING MEANING USING RELATIONAL NETWORKS

The derivation of relational networks for conceptualizing the research problem and processes appears consistent with constructivist philosophy when iterative development of networks allows changes to be made as a researcher constructs the knowledge required to begin, and then to proceed through, the investigation. These processes represent action in the practical interest, as making meaning of and communicating the complex environment of the research is the purpose. Analysis of relational networks assists a researcher in completing two fundamental processes (Bliss, Monk, & Ogborn, 1983). First, the process of deriving a relational network gives broad scope to thinking about the research and conceptualizing the problem. Second, it provides a means to record, code, search, condense, and link ideas and data so that deeper connections can be revealed as a researcher's analytic progression moves from lower to higher levels of abstraction, from the initial conceptualization through to the articulation of the conclusions (Miles & Huberman, 1994).

A relational network can take two forms. Either a network conceptualized by a researcher, before data gathering, can be compared to the data or the data can be used to develop conceptualizations as the analysis proceeds (Cohen & Manion, 1994). When a relational network is forecast from a researcher's tentative conceptualizations and forms part of the research design, it assists a researcher to be more specific about the purpose of the research. Clarity of purpose, in turn, assists a researcher to encode questions more accurately and therefore to increase the potential that respondents will gain clear understanding of a researcher's intent (Foddy, 1994). Ultimately, tentative conceptualizations inform the research design and data gathering processes with subsequent analysis informing the conceptualizations as a researcher interprets and makes meaning from the data. To establish confirmability and remain consistent with the practical interest, the data should provide the source of the study's findings and not the preconceived expectation of the individual researcher acting in isolation.

Analysis of relational networks is an appropriate tool for inquiry into events in the social world because it allows a researcher to gather and scrutinize rich, holistic data. In a mixed-method design, such networks

complement and can be challenged or corroborated by quantitative data such as rating scales, frequencies, and statistical analyses. To enhance the research process, computerized software such as NVivo can be used to manage large amounts of unstructured data, so that meaning might be derived more easily, understandings can be communicated clearly (Bazeley, 2003), and to demonstrate thoroughness of data analysis.

NVIVO AS A DATA MANAGEMENT TOOL FOR CONSTRUCTIVIST INQUIRY

If a researcher's task is to develop and communicate a clear understanding of complex concepts by constructing knowledge about interrelated issues, it becomes important to record, code, search, condense, and link data authentically, so that their deep structures are revealed (Miles & Huberman, 1994; Richards, 1999). The extent of the task will be determined by the amounts of descriptive and narrative data generated during qualitative research, whereas the depth and breadth of meaning making that is possible will be influenced by the researcher's ability to interrogate data effectively.

The software program NVivo is one computerized tool that can assist a qualitative researcher, because it effectively manages large amounts of qualitative data (Bazeley, 2003; Richards, 1999). In particular, NVivo is designed to facilitate the construction of relational networks identifying the content and structure of respondents' opinions (D. Fraser, 1999; Richards, 1999). It involves the development of a tree-like structure of relationships between elements referred to as nodes. Data are coded to parent nodes and then coded more finely into a series of subservient levels, or child, grandchild, and sibling nodes that identify or relate to particular aspects or characteristics associated with each particular parent node. One or more interlinking relational networks are developed as tools to identify relationships between common themes within the often-excessive bulk of complex data gathered in qualitative studies (Bliss et al., 1983; Cohen & Manion, 1994).

A particular benefit of NVivo is its ability to increase the capability for the data to inform the research by allowing a researcher to easily

- collect unexpected data into themes by creating free nodes directly from the data;
- record and incorporate ideas, reflections, and interpretations of data into researcher's memos as the data analysis process proceeds;

- develop a model from a tentative conceptual framework as the structure of the data unfolds;
- compile models that illustrate the interconnectedness of the data by showing the arrangement of tree and free nodes in concept maps;
- search individuals' transcripts and attributes;
- collect data in categories and themes; and
- compile descriptive statistics about the number and type of responses collected to all nodes (Richards, 1999).

As a tool for constructing relational networks, NVivo has as its most important features its flexibility and its ability to honor and preserve the integrity of the multiple constructions represented in the data, and to establish dependability through an obvious audit trail (Richards, 1999). An initial relational network can be established from tentative conceptual maps or ideas and subsequently amended to preserve the integrity of respondents' various realities by adding their conceptualizations from the data. The regrounding of a researcher in the worlds of the researched is enhanced as the researcher searches for shared meaning about disparate elements of the social construction under analysis. A series of refinements of tentative models can be used to show the interconnections between the deeper structures of the data as they emerge. Thus, NVivo aids the researcher's ability to illustrate deep connections, adding strength to the method (Miles & Huberman, 1994) while remaining consistent with the philosophical underpinnings of the practical interest.

COHERENCE BETWEEN PHILOSOPHY, METHODOLOGY, AND LANGUAGE: DISCUSSING TRUSTWORTHINESS

A researcher's attempts to establish trustworthiness rely on demonstrating the robustness of the method. Here, I contend that a lack of alignment between philosophy, language, and methodology can detract from this process (Smyth, 2002). Therefore, I am using language suited to the practical interest, as my purpose is to discuss mixed-method designs where qualitative analysis is dominant.

How, then, can a researcher be satisfied that personal interpretations reflect with some authenticity the broader environment under scrutiny and that the research remains faithful to its conceptual underpinnings? Because a researcher's task is to establish trustworthiness by providing evidence that the study is appropriate, comprehensive, and significant, this is usually done by establishing the conditions that

- the arguments proposed in support of the significance and implications of the study are credible and contextually relevant;
- the conceptual framework provides an integrated foundation, based on sound theory and appropriate to the size and scope of the study;
- the research methodology is clearly stated, and participants and setting are appropriate to the study's aims;
- the conclusions effectively represent the views of the researched;
- the data collection strategies are well chosen, contextually appropriate (given any constraints such as time and cost), comprehensive, and capable of generating legitimate results;
- the data analysis is well articulated, appropriate, and auditable;
- the interpretations are well grounded in the data, feasible, and consistent without excluding plausible discrepancies;
- the researcher's biases have been addressed, and constructs devised by a researcher represent the shared views of a researcher and the researched; and
- the study contributes to understanding or refinement of theory and is replicable or generalizable to other situations (Goetz & LeCompte, 1982, 1984).

To ensure that the theoretical basis for the work is substantiated (Miles & Huberman, 1994), I would add to the list an additional point that emphasizes the need to use techniques and language based in the practical interest when the investigator intends to make meaning of events in the social world.

ALIGNING PURPOSE, CONTEXT, INTENT, OUTCOMES, AND LANGUAGE

If meaning making is the purpose of investigation of human communicative behavior, it is generally prudent for the researcher to articulate the underpinning theoretical and personal frameworks and the relevance of these contributions to the trustworthiness of the study at the outset of the research study. This is relevant because

personal experiences, general sociocultural world views, and philosophical orientations and traditions . . . [contribute to] . . . the interactive relationship between research design and the theoretical frameworks and conceptual systems developed . . . for] . . . more effective ethno-

graphic designs. (Goetz & LeCompte, 1984 p. 35)

These actions provide the interconnectedness between philosophical foundations, theory, investigation, and interpretation that are the foundations for establishing and reporting the trustworthiness of a study (Goetz & LeCompte, 1984). Once these tasks are completed, I believe that a researcher should address specific issues regarding the means of establishing trustworthiness using the language of qualitative inquiry rather than numerical measures more suited to purely quantitative approaches.

1. To establish credibility (internal validity and reliability), the researcher ensures that he or she has a close relationship, preferably from immersion in the environment, which provides contextual richness as a basis for checking, questioning and theorizing.
2. To establish confirmability (objectivity) and dependability (external reliability), the researcher acknowledges personal assumptions, beliefs, and attitudes, defines an audit trail, and returns to the environment to confirm interpretations as the investigation proceeds.
3. To establish transferability (external validity), the researcher should scrutinize the analysis for specific contextualized occurrences where data from various sources are convergent or divergent and assess the generalizability of the process (Miles & Huberman, 1994).

Implied in these activities is the need to sift and sort large quantities of structured and unstructured data, so in the following analysis, I explore how the data management tool NVivo assists with these tasks.

Credibility

Credibility depends on the resolution of design problems, which threaten the consistency and replicability of the study's findings and its ability to authentically reflect the situation under scrutiny (Goetz & LeCompte, 1984; Lincoln & Guba, 2000). Inquiry in the practical interest no longer needs to rely on statistical measures better suited to the technical interest, where precise measurability is required, but it does need to establish that a researcher has "a close and comprehensive acquaintance" (Blumer, 1969 p. 40) with the environment under scrutiny. This is easily accomplished when a researcher is a participant in the en-

vironment or has the opportunity for immersion over a significant period (Blumer, 1969; Foddy, 1994; Goetz & LeCompte, 1984; Guba & Lincoln, 1989). Authenticity is the issue here. When a close connection with the environment can be sustained over the life of the project, a researcher demonstrates credibility by

- understanding the cultural context of the participants,
- identifying and focusing on salient issues, and
- testing emergent conceptualizations in the environment.

NVivo aids this process by allowing the researcher to record personal reflections separately from participant data in memos.

A second step toward establishing credibility relates to addressing the threat of theoretical narrowness, which limits authenticity and replicability. Knowledge gained from a thorough review of literature supports the process of probing salient issues, forming tentative conceptualizations, and deriving research questions and subquestions. A research design matrix (Smyth & Maxwell, 2006) is a useful tool for this purpose, because this framework assists in planning data gathering from varying sources to test the conceptualizations, represented by the research questions, in an internally coherent manner (Miles & Huberman, 1994; Minichiello, Axford, Greenwood, & Sullivan, 1999), which guides NVivo searching.

Internally, credibility depends on the extent of convergence or divergence of opinions gathered by the research instruments. The credibility of research is most appropriately established by making judgments about the worth of unstructured data by evaluating its consistency. This can be done as part of the NVivo search process. Gathering opinions from structured and unstructured data provides additional opportunities for data to be triangulated across various data sets and adds to the evaluation of consistency (Onwuegbuzie & Teddlie, 2003) without the need for statistical measures.

Credibility is enhanced when a researcher demonstrates the freedom to use new lines of inquiry, especially negative cases. In this way, the risk that a researcher's construction of the situation under investigation is an unrepresentative view can be reduced (Miles & Huberman, 1994, p. 278). The search capabilities of NVivo allow researchers to scrutinize the data for convergence or divergence within and between individuals and groups of respondents' unstructured responses with examples of consistency and inconsistency being identified and their worthiness judged. Through scrutiny of Node Data Reports, de-

tailing the number of respondents represented and the number of opinions reported, a researcher can make decisions concerning nodes to which data are coded. Unexpected opinions can be investigated further through scrutiny of existing data from alternative data sources or by alternative means, such as key informant interviews. Judgments may then be made to expand or collapse the relational network. These actions can increase the credibility of tentative models by permitting a researcher to theorize and test understanding in the environment as the analysis proceeds. The triangular flow in Figure 1 is intended to indicate that various data sources influence a researcher's understanding and the relational network, which emerges from the investigation. This process is action consistent with the practical interest, as it illustrates how a researcher makes meaning from data and does not impose meaning.

Confirmability

Confirmability is the ability of the research process to accurately expose the perceptions of stakeholders and not to rely on a researcher's own construction to the detriment of the others (Miles & Huberman, 1994; Onwuegbuzie & Teddlie, 2003). This criterion of credibility requires a researcher to remain self-aware that personal beliefs might influence the research and its credibility. The onus is on a researcher to ascertain whether interpretations are correct, adjust any deficiencies, add new material if it is relevant to do so, remedy misinterpretations and clarify any inconsistencies (Miles & Huberman, 1994; Minichiello, Axford, et al., 1999), which can be tracked effectively using NVivo memos.

However, a researcher using a tool such as NVivo needs to be mindful that the quality of the analysis will be affected by the network structure used within the NVivo framework. To be confirmable and dependable, the system of nodes used in the analysis needs to be appropriate, sufficiently complete, and faithful to the purpose of the research. In addition, the tree of nodes should exhibit characteristics of clarity, self-consistency, flexibility, and sufficiency of detail for the analysis to be meaningful. The use of expressive or persuasive language in the definition of nodes should be avoided to reduce the tendency to ascribe to the network a greater power than it has to distinguish themes or features within the data (Miles & Huberman, 1984; Richards, 1999). A relational tree or network should demonstrate the underlying authenticity criteria of fairness by, ideally, being communicated to research stakeholders for their scrutiny and comment. For authenticity to be upheld, there must be evidence that the

variety of constructions presented within the data have been honored, communicated and faithfully portrayed (Guba & Lincoln, 1989; Lincoln & Guba, 2000). One way to present such information is in the form of concept maps, exported from NVivo as models. Throughout the analysis, such maps can be useful as reference points, which show developing relationships being explored within the data. Ideally, they should have been made available to stakeholders. The diagrams form part of the research audit trail.

Because data from individuals and groups are easily retrieved, sorted, searched, and tracked using NVivo, lines of inquiry or patterns emerging from one data source can easily be compared to those in another. No aspects of the process can be hidden using computer based data management tools. An outside researcher could use them to reanalyze the data to establish confirmability.

Dependability

When the quality and appropriateness of the inquiry process are open to scrutiny at all stages and are not found wanting, then dependability is established (Guba & Lincoln, 1989). Dependability is tightly bound to confirmability, and both aspects of the inquiry process should be auditable by reviewers of the study. Thus, the planning and process of the research include justification of a researcher's decisions and actions. NVivo can aid quality assurance by establishing that decisions and actions are derived from the context of the research and demonstrating how coherent interpretations are constructed from corroborated evidence within the data (Guba & Lincoln, 1989, p. 242f).

In the social world, a researcher aims, through interaction with the respondents, to discover what is taking place in the environment under study. Thus, a researcher needs to ensure that the research activity is enhanced by raising the quality of researcher-respondent interaction. The assumption that many researchers make concerning the innate comparability of responses to the same question is challenged by symbolic interaction theory. Only if a researcher has oriented each respondent similarly is the comparability of responses increased. Ensuring that language in each question is clear and unambiguous of meaning, singular of dimension and held within a common frame of reference; increases the comparability and dependability by decreasing the variability of responses to an acceptable level. When questioning takes the form of indirect communication via a questionnaire or telephone interview rather than directly in face-to-face communication, clarity in questioning is vital (Blumer, 1969; Foddy, 1994; Sudman & Bradburn, 1983).

Although it is generally assumed that the use of an interpretive paradigm implies the holistic interaction resulting from close physical proximity and verbal interchange, information is appropriately gathered from respondents via written responses on a questionnaire or telephone interviews. The process is more problematic but still meaningful (Hodder, 1994). Mute interaction using the written word is valuable, so documents, questionnaires, and records can all

- provide valuable insight into the context of the situation;
- highlight relevant similarities and differences;
- challenge interpretations, theories, and assumptions made erroneously from the singular standpoint of a researcher (Hodder, 1994; Maykut & Morehouse, 1994).

Comparability is measurable, and this is one circumstance in which quantitative measures can support qualitative analysis provided appropriate data collection methods have been planned. For example, rating scale analysis using Rasch modeling is a means of establishing the fit of responses to a statistical model (Karabatsos, 2000; Wright & Masters, 1982) and contributes a measure of the consistency with which attitude scales gather data. This information can be used as an indicator that questions in an instrument are generally answered in the way that a researcher intends. The statistics generated from Rasch modeling indicate whether items form a construct (reliable framework) from which interpretations can be made or further investigations conducted. They are also a measure of the clarity of communication between a researcher and the researched.

Dependability is established when comparability is high, because such comparability is possible only if a researcher and respondents have clearly communicated their contexts one to the other (Guba & Lincoln, 1989). In the language of the practical interest, dependability is established when there is consensus, because this demonstrates that the researcher and the researched have understood their communications.

Transferability

To establish the transferability, explicit connections from the research to aspects beyond its scope, to theory, or to other contexts, should be possible because

- the sample is well enough defined and diverse to allow comparisons with other samples;

- the data are descriptive enough, and the process and outcomes generic enough, to allow other researchers to assess generalizability to other settings; and
- the theoretical basis for the work is substantiated (Miles & Huberman, 1994).

As a part of the research process, interpretations made from coding questionnaire data can be supported with NVivo's descriptive statistics about coded data. These statistics allow a researcher to gauge the extent of commonality between respondents expressing opinions similar to each other but not necessarily part of a researcher's tentative conceptualizations. Theorizing about such information can be recorded in the form of separate memos so as not to contaminate the primary data.

Unconstrained searching of data with NVivo and the creation of free nodes allows a researcher to probe complex and dynamic interactions more deeply without influencing or controlling the situation as profoundly as might have been the case using more traditionally structured positivist research approaches. In such approaches, data gathering tends to be constrained by the imposition of a predetermined objective framework, possibly inhibiting the emergence, from the data, of multifaceted images of human behavior and interaction in context-specific circumstances. NVivo assists a researcher working in the practical interest to illustrate how his or her conceptions and ideas (recorded in memos) relate to the larger world of the researched (recorded as documents in the data) and how these concepts align with or differ from other contexts, usually derived from the literature.

Auditability

NVivo is data management tool that helps a researcher to track all of the structured and unstructured data to their original sources, thus ensuring a clear audit trail. If each respondent is allocated a unique number, all information related to that respondent is stored in separate document files in NVivo. Data are retrievable using the individual respondent's identification number. If a consistent coding structure using descriptive but non-emotive language is established and can be critiqued by respondents or colleagues, then dependability can be established for unstructured data (Miles & Huberman, 1994, p. 278). The extent of authenticity emerges, as responses are scrutinized and coding proceeds. Areas of commonality or disparity in shared meaning can be identified, investigated, and compared

in a meaningful way. Scrutiny of coded passages plays a key role as a source of valuable insight, enabling a researcher to probe misinterpretations and inconsistencies, clarify salient issues, and consider the importance of data that challenged the ongoing research analysis (Miles & Huberman, 1994; Minichiello, Aroni, Timewell, & Alexander, 1995; Rolfe, Lloyd-Smith, & Richards, 1991).

Images from the data represent a snapshot of the social world of the researched taken at the time when the data were gathered. Reflective deliberation on these images results in an attribution of meaning, clarification and reification of a researcher's knowledge about the environment under scrutiny (Grundy, 1987a, 1987b). Thus, a researcher has more certainty that the process used to gather images of the social world are dependable because the portrayal of the data reflects the respondents' worlds and not a researcher's personal interpretation alone.

CONCLUSION

This exploration presented my view that the practical knowledge constitutive interest proffered by Habermas (Grundy, 1987b; Young, 1989; Mezirow, 1981, 1990, 2000) provides a conceptual basis for consistency between philosophy, methodological approach and language in mixed-method research where qualitative analyses predominate. Most particularly, it has illustrated that conceptual alignment between these elements enhances trustworthiness by demonstrating that a researcher can more faithfully investigate aspects of the social world using actions in the practical interest expressed in language appropriate to qualitative inquiry of social interaction. The discussion of computer-aided data management by NVivo, illustrated three things. First, NVivo is an appropriate tool for investigation consistent with the practical interest and, second, its memos, tracking, and modeling features enhance analysis of the extensive bulk of qualitative research data. Finally, NVivo's search capability can be used effectively to ground the research in the world of the researched thereby maintaining authenticity and transferability of social inquiry.

References

- Bazeley, P. (2003). Computerised data analysis for mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 385-422). Thousand Oaks, CA: Sage.
- Bliss, J., Monk, M., & Ogborn, J. (1983). *Qualitative data analysis for educational research: A guide to users of systemic networks*. Canberra, Australia: Croom Helm.
- Blumer, H. (1969). *Symbolic interactionism: Perspective and method*. Englewood Cliffs, NJ: Prentice-Hall.
- Cohen, L., & Manion, L. (1994). *Research methods in education* (4th ed.). London: Routledge.
- Foddy, W. (1994). *Constructing questions for interviews and questionnaires: Theory and practice in social research*. Cambridge, UK: Cambridge University Press.
- Fraser, D. (1999). *QSR NUD*IST Vivo: Reference guide*. Melbourne: Qualitative Solutions and Research.
- Fraser, K. (1996). *Student centred teaching: The development and use of conceptual frameworks* (Vol. 18). Canberra: Higher Education Research and Development Society of Australia.
- Goetz, J. P., & LeCompte, M. D. (1982). Problems of reliability and validity in ethnographic research. *Review of Educational Research*, 52(1), 31-60.
- Goetz, J. P., & LeCompte, M. D. (1984). *Ethnography and qualitative design in educational research*. San Diego, CA: Harcourt Brace Jovanovich.
- Grundy, S. (1987a). Critical pedagogy and the control of professional knowledge. *Discourse*, 7(2), 21-36.
- Grundy, S. (1987b). *Curriculum: Product or praxis*. Melbourne, Australia: Falmer.
- Guba, E. (1990). The alternative paradigm dialogue. In E. Guba (Ed.), *The paradigm dialogue* (pp. 17-27). Newbury Park, CA: Sage.
- Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Newbury Park, CA: Sage.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). New York: Sage.
- Hill, S. C. (1979). In search of self: The social construction of meaning in scientific knowledge through the formation of identity as a scientist. In M. R. Pusey & R. E. Young (Eds.), *Control and knowledge: The mediation of power in institutional and educational settings* (pp. 124-117-182). Canberra: Education Research Unit, Australian National University.
- Hodder, I. (1994). The interpretation of documents and material culture. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 393-402). New York: Sage.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14-26.
- Karabatsos, G. (2000). A critique of Rasch residual fit statistics. *Journal of Applied Measurement*, 1(2), 152-176.
- Lincoln, Y. S. (1990). The making of a constructivist: A remembrance of transformations past. In E. Guba (Ed.), *The paradigm dialogue* (pp. 67-87). Newbury Park, CA: Sage.
- Lincoln, Y. S., & Guba, E. G. (2000). Paradigmatic controversies, contradictions, and emerging confluences. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 163-188). Thousand Oaks, CA: Sage.
- Maxwell, J. A., & Loomis, D. M. (2003). Mixed methods design: An alternative approach. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 241-272). Thousand Oaks, CA: Sage.
- Maykut, P., & Morehouse, R. (1994). *Beginning qualitative research: A philosophic and practical guide*. London: Falmer.
- Mezirow, J. (1981). A critical theory of adult learning and education. *Adult Education*, 32(1), 3-24.
- Mezirow, J. (Ed.). (1990). *Fostering critical reflection in adulthood: A guide to transformative and emancipatory learning*. San Francisco: Jossey Bass.
- Mezirow, J. (Ed.). (2000). *Learning as transformation: Critical perspectives on a theory in progress*. San Francisco: Jossey Bass.
- Miles, M. B., & Huberman, M. A. (1984). *Qualitative data analysis: A sourcebook of new methods*. Beverly Hills: Sage.
- Miles, M. B., & Huberman, M. A. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Beverly Hills: Sage.

- Minichiello, V., Aroni, R., Timewell, E., & Alexander, L. (1995). *In-depth interviewing: Principles, techniques, analysis* (2nd ed.). Melbourne, Australia: Longman.
- Minichiello, V., Axford, R., Greenwood, K., & Sullivan, G. (Eds.). (1999). *Handbook for research methods in the health sciences*. Frenches Forrest, Australia: Pearson Education.
- Onwuegbuzie, A. J., & Teddlie, C. (2003). A framework for analysing data in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 351-383). Thousand Oaks, CA: Sage.
- Richards, L. (1999). *Using NVivo in qualitative research*. Melbourne, Australia: Qualitative Solutions and Research.
- Rolfe, S., Lloyd-Smith, J., & Richards, L. (1991, April). *Understanding mothers' experiences of infant daycare: A new approach using computer-assisted analysis of qualitative data*. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Seattle, Washington.
- Smyth, R. (2002). *Knowledge, interest and the management of educational change*. Unpublished doctoral dissertation, University of New England, Armidale, Australia.
- Smyth, R. (2004). Exploring the usefulness of a conceptual framework as a research tool: A researcher's reflections. *Issues in Educational Research*, 14(2), 167-180.
- Smyth, R., & Maxwell, T. (2006). *The research design matrix: A tool to aid supervision and research*. Unpublished manuscript.
- Starratt, R. J. (1996). *Transforming educational administration: Meaning, community, excellence*. New York: McGraw-Hill.
- Sudman, S., & Bradburn, N. M. (1983). *Asking questions: A practical guide to questionnaire design*. San Francisco: Jossey-Bass.
- Tashakkori, A., & Teddlie, C. (2003). The past and future of mixed methods research: From data triangulation to mixed model designs. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 671-701). Thousand Oaks, CA: Sage.
- Wright, B. D., & Masters, G. N. (1982). *Rating scale analysis*. Chicago: Mesa.
- Young, R. E. (1989). *A critical theory of education: Habermas and our children's future*. Sydney: Harvester Wheatsheaf.