



# Interrogating accountability

## An illustration of the use of Leximancer software for qualitative data analysis

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### Abstract

**Purpose** – The paper has a dual purpose, being to report on an interrogation of concepts and contexts of accountability used in the accounting literature and to illustrate the application of a qualitative data analysis software tool in this interrogation.

**Design/methodology/approach** – A content analysis was undertaken of 114 journal articles related to accountability and published in highly ranked accounting journals from 2000 to 2007.

**Findings** – Accountability is a concept used in a variety of contexts, particularly in connection with public accountabilities and accountability in the public sector, as well as within social contexts. The emphasis appears to be on accountability reporting in these settings, with less concern for the management perspective. The variety of contextual usage and categorisations of the term “accountability” indicate it has not become more precise over the period in question.

**Research limitations/implications** – Since only 21 accounting journals are sampled, there is scope for investigating accountability concepts across a broader base of publication outlets. The findings suggest that greater effort should be devoted to developing frameworks of accountability, researching accountability in relatively under-explored contexts and settings, and considerable scope for researchers to more frequently utilise computer-assisted qualitative data analysis in content analysis studies concerning accounting and accountability.

**Originality/value** – While there is anecdotal evidence of the elusive nature of accountability, this paper provides a window on conceptions of accountability employed by accounting scholars and the contexts in which accountability is discussed and researched. Further, the use of the Leximancer software tool in qualitative content analysis is demonstrated, noting that the accounting literature is currently devoid of examples of applications of this software.

**Keywords** Data analysis, Accounting, Management accountability, Public sector organizations, Computer software, Serials

**Paper type** Research paper

### 1. Introduction

Sinclair (1995, p. 221) described accountability as having a chameleon quality; being subjectively constructed, changing with context, and “residing in a bottomless swamp where the more definitive we attempt to render the concept the more murky it becomes”. In the research described in this paper we sought to explore what conceptions and what contexts of accountability are being reported, discussed, and debated in the literature, if the meaning attached to the term has become more or less precise, and what future directions for research on accountability might be suggested by the results. In a similar fashion to Thomson’s (2007, p. 35) conceptual mapping of the sustainability accounting

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literature, our research is concerned with exposing different and disparate representations of accountability as a means to “challenge and problematise [...] preconceptions of the literature” and to encourage further development of, and directions in, accountability research. We addressed this issue by using computer-assisted content analysis to examine 114 journal articles relating to accountability published in the 2000-2007 period, drawn from a set of 21 of the most highly ranked scholarly accounting journals.

A further major aspect of our research was a particular concern with demonstrating how a specific computer-aided qualitative data analysis software (CAQDAS) package could be applied in this interrogation of conceptions of accountability, recognising that CAQDAS is a significant key development in the tools available for the analysis of text in qualitative research settings (Bryman and Bell, 2003; Denzin and Lincoln, 1998, p. 381). While a stable of such computer programs are available, we chose to use Leximancer software, currently, an essentially unused tool in accounting research, and yet one which was highly appropriate for exploring the relationships of accountability with other terms and concepts, assessing the spatial relationships between these terms and concepts, and acknowledging the contextual embeddedness of conceptions of accountability appearing in the literature.

Given that this paper serves the joint purposes of exploring notions of accountability, together with illustrating the analytical protocols and applications of a particular software package in this analysis, the following two sections of the paper review the literature on accountability concepts and CAQDAS, respectively. These sections are followed by a description of the research method and the presentation of the research results. Our findings and conclusions concerning both the imprecision and diversity inherent in scholarly discussion of accountability, and the role of CAQDAS in this and other qualitative research settings in accounting, are presented in the final section of the paper.

## 2. Accountability concepts

Accountability represents an obligation to provide an account (Law and Owe, 1999), wherein there exists a relationship or bond between an accountor, who provides the account, and the accountee, who is the recipient of the account and has the power and position to respond to the given account (Stewart, 1984). Written codes dealing with the accountability of those who entrust resources to others date back to at least 2000 BC, suggesting that “the history of accountability is as old as civilization itself” (Gray and Jenkins, 1993, p. 53). The basis of accountability concepts can be viewed as deriving from a number of sources including faith-based and biblical statements (Crofts, 2009; Barlev, 2006), and the evolving nature of notions of stewardship from ancient through to medieval times (Bovens, 2005) and onward into the era of the corporation. The rise in importance of the corporation contemporaneously with the wide-spread acceptance of economic models and neoliberalism led to the emplacement of accountability within the principal-agent component of the agency theory framework (Broadbent *et al.*, 1996). More recently, there has been an emerging interest in accountability from social and environmental accounting (SEA) perspectives, conflicting with agency theory perspectives (Parker, 2005; Gray *et al.*, 1996).

Despite the long history and use of the accountability term, Bovens (2007a, p. 447) describes accountability as “appealing but elusive”, while Walker (2002, p. 62) characterises accountability as a “theoretically embedded concept, with each producing

various conflicting models of accountability". In examining the public sector, Koppell (2005, p. 94) claims "accountability is a core concept of public administration, yet disagreement about its meaning is masked by consensus on its importance and desirability". In analysing the third sector, Choudhury and Ahmed (2002, p. 561) suggest that "the traditional meaning of accountability is shifting towards an emergent accountability regime", while Dixon *et al.* (2006, p. 407) describe accountability as "a contradictory and tricky concept". Such discourse accentuates the concern that, despite the attention of numerous commentators and scholars, there appears to be little, if any, agreement on a definition of "accountability" and it has remained a vague concept with a chameleon quality, meaning different things to different people and having a changeable nature with context (Bovens, 2005; Ospina *et al.*, 2002; Sinclair, 1995; Day and Klein, 1987).

In order to resolve the ambiguity surrounding the accountability concept, several authors have attempted to develop or elaborate on frameworks in which to situate the various guises of accountability (Bovens, 2005, 2007b; Funnell and Cooper, 1998; Broadbent *et al.*, 1996; Corbett, 1996; Jabbra and Dwivedi, 1989; Day and Klein, 1987; Stewart, 1984). In the main, these frameworks are theoretic, prescriptive, or anecdotal, rather than empirically based, and are positioned in public sector settings. Such frameworks provide typologies of accountability, including: constitutional, political, and policy accountabilities; legal, probity, and fiduciary accountabilities; financial, managerial, process, performance, and program accountabilities; social, community, and public accountabilities; and personal, moral, and ethical accountabilities. Some of these frameworks propose a ladder structure of accountability, where fulfilling certain types of accountabilities, such as financial or management accountabilities, are essential to meeting other types of accountabilities, such as social and political accountabilities (Funnell and Cooper, 1998, p. 26).

Despite the work on the above frameworks of accountability, it appears that the essence of the term is still elusive. In discussing accountability, Schedler (1999, p. 13) contends that:

[...] without doubt the term sounds appealing. Its field of application is as broad as its potential for consensus. And its semantic root, the notion of accounting, is nicely ambivalent; it evokes narrative accounts as well as bookkeeping. But do we know what it means? Are we clear about its semantic boundaries and do we comprehend its internal structure? Not surprisingly, my answer is no: due to its relative novelty, accountability represents an underexplored concept whose meaning remains evasive, whose boundaries are fuzzy, and whose internal structure is confusing.

By way of contrast, Shenkin and Coulson (2007) suggest that the lack of consensus in defining accountability arises because it is an organic, floating and evolving construction and practice. In light of such critique and debate, we sought to explore how accountability is characterised in the academic accounting literature by applying a qualitative content analysis software package designed to analyse the semantics, context, and structure of textual materials.

### 3. Computer-aided qualitative data analysis software

In discussing accounting research Vaivio (2008, p. 64) depicts the qualitative approach as "a messy and time-consuming affair" where researchers can find themselves "drowning in data" and being "puzzled by conflicting interpretations" (O'Dwyer, 2004).

While many qualitative researchers in accounting and business manually analyse data, a growing number are opting to use CAQDAS (Modell and Humphrey, 2008; Lee and Humphrey, 2006; Beattie *et al.*, 2004; Daly *et al.*, 2004). CAQDAS, which embraces computer-aided text analysis (CATA) and computer-aided content analysis, is one strategy for mitigating the problems encountered in qualitative analysis highlighted by Vaivio (2008). Lee and Fielding (1996, pp. 2.2-2.3) view CAQDAS as an empowering technology:

[...] permitting [...] the multitooling of qualitative researchers, making available [...] a wide range of different analytic strategies [...] [and offering] a considerable improvement over the *ad hoc* procedures we suspect frequently underpinned manual analysis.

Some of the many advantages of applying CAQDAS include engagement with the research question, improved familiarity with detail and mastery over the data, and reduction of the enormity of data (Anderson-Gough, 2004, p. 380). CAQDAS utilisation can also enhance systematisation (Lesage and Wechlter, 2007), logic, transparency (Wickham and Woods, 2005), speed, and rigour (Budding and Cools, 2007) in the research and analysis process (Krippendorff, 2004).

### 3.1 CAQDAS in accounting and accountability research

As a prolegomenon to our study, we accessed a broad range of periodicals databases<sup>[1]</sup> and key conference papers, including and beyond the set of journals we analysed in the main component of our study, and which applied CAQDAS in investigations of accounting and accountability. The objective of this review was to gain an understanding of the use of CAQDAS in relevant research contexts, particularly in terms of the software programs utilised and the types of textual materials analysed. Beginning with Budding and Cools' (2007) brief listing of CAQDAS usage, which is restricted to published management accounting studies from 2000 to 2006, in Table I we provide a significantly broadened and updated summary of 39 recent studies (2004-2008) featuring CAQDAS in accounting and accountability-related research.

On the basis of the sample of studies appearing in Table I, researchers in accounting and accountability have predominantly applied CAQDAS in the analysis of transcripts of interviews obtained via field and case methods, typically using the NUD\*IST, NVivo, or ATLAS.ti packages, which are the principal CAQDAS used in research in business and the broader social sciences (Sarantakos, 2005, p. 357; Veal, 2005, p. 299; Bryman and Bell, 2003, pp. 445-6). Only two studies (Lesage and Wechlter, 2007; Fogarty and Rogers, 2005) in our sample (Table I) featured the use of CAQDAS in the analysis of scholarly literature, despite recognition of the potential to utilise such software for enhancing the management of data in this form of research (Duriau *et al.*, 2007; Wickham and Woods, 2005; di Gregorio, 2000).

While some researchers rely on CAQDAS merely for organising rather than analysing data (Pierce and Sweeney, 2005), Gaskell and Bauer (2000, p. 346) caution that even though:

CAQDAS may be seen as a welcome structure that brings transparency and discipline into qualitative analysis, albeit by technological fiat [...] they bring with them dysfunctional pitfalls which are recognized as "coding pathologies".

The problem to which Gaskell and Bauer (2000) allude is encountered in the use of numerous CAQDAS (including most of those identified in Table I) which require that

**Table I.**  
Selected accounting  
and accountability  
studies utilising  
CAQDAS, 2004-2008

Study	Topic area	CAQDAS	Textual materials analysed
Dambrin and Lambert (2008) Kabanoff and Brown (2008)	Female auditors and motherhood Managers' knowledge structures, annual reports and financial performance	NVivo Customised software	Interviews Annual reports
Whiting (2008)	Chartered accountants' work/family strategies and career success	NVivo	Interviews
Chua and Mahama (2007)	Accounting controls and performance management in inter-firm alliances	NUD *IST	Interviews, notes of meetings, notes made from corporate documents
Dambrin <i>et al.</i> (2007)	Institutionalisation of management control systems	NVivo	Interviews
Durocher <i>et al.</i> (2007)	Financial statement users in the accounting standards-setting process	NVivo	Interviews
Ezzamel <i>et al.</i> (2007)	Accountability in schools	The Ethnograph	Interviews
Fearnley and Hines (2007)	International financial reporting standards in the context of small and medium enterprises	NVivo	Interviews
Khalifa <i>et al.</i> (2007)	Changes in audit methodologies	NVivo, NUD *IST, and TextSTAT	Interviews, KPMG audit methodology texts
Lesage and Wechler (2007) Neu and Ocampo (2007)	Typology of auditing research topics Diffusion of World Bank financial and accounting practices	SPAD ATLAS.ti	Literature – journal articles on auditing Interviews
Schleicher <i>et al.</i> (2007)	Annual report narratives and share price anticipation of earnings	NUD *IST	Annual reports
Yadav <i>et al.</i> (2007)	Chief executive officers and innovation in the banking industry	DICTION	Letters to shareholders
Breton and Côté (2006)	Public opinion concerning profit and legitimacy of the banking industry	TACT	Newspaper articles

(continued)

Study	Topic area	CAQDAS	Textual materials analysed
Coram <i>et al.</i> (2006)	Financial analysts' judgements and non-financial performance indicators	NVivo	Transcribed verbal decision protocols
Dixon <i>et al.</i> (2006)	Accountability in a microfinance organisation	NVivo	Interviews, notes of meetings, notes of client-loan officer interface
Donada and Nogatchewsky (2006)	Buyer control of suppliers in transactional relationships	NVivo	Interviews, corporate documents, press reviews, financial statements
Henry (2006)	Market reaction to narratives in earnings press releases	DICTION	Financial press releases
Irvine and Gaffikin (2006)	Researcher perspective on a qualitative accounting research project	NUD*IST	Interviews, field notes, minutes of meetings, letters, written instructions, consultants' reports, manuals, memos, financial reports
Marwata and Alam (2006)	Local government reform and accounting changes	NVivo	Interviews, regulations, speeches, policy statements, correspondence, annual reports, minutes, newsletters, conference proceedings, newspaper articles, training materials
Neu <i>et al.</i> (2006)	Financial and accounting practices of the World Bank	ATLAS.ti	Interviews
Sian (2006)	Institutional arrangements in the professionalisation of accountancy	ATLAS.ti	Interviews
Son <i>et al.</i> (2006)	Users' perceptions and uses of financial reports in Vietnam	NVivo	Interviews
Abernethy <i>et al.</i> (2005)	Building a causal performance measurement model	ATLAS.ti	Interviews
Anderson-Gough <i>et al.</i> (2005)	Professional socialisation in audit firms	The Ethnograph	Interviews

(continued)

Table I.

Table I.

Study	Topic area	CAQDAS	Textual materials analysed
Erakovic and Wilson (2005)	Organisation transformation in the public sector	NUD *IST	Annual reports
Fogarty and Rogers (2005)	Institutional theory and financial analysts' reports	NUD *IST and DICTION	Analysts' reports, annual reports, securities and exchange filings, press releases, journal articles
Handy (2005)	Accounting students' experiences of a computer-assisted tutorial	NUD *IST	Interviews, researcher notes, "think-aloud" protocols
Jas and Skelcher (2005)	Performance failure and organisational turnaround in local governments	NVivo	Interviews, observation of meetings, attitudinal surveys of staff in case organisations
Mistry (2005)	A model of supply chain management and just in time	ATLAS.ti	Interviews and researcher memos
Pierce and Sweeney (2005)	Perceptions of management control in audit firms	NUD *IST	Interviews
Budding (2004)	Accountability for results and performance in local government	NUD *IST	Interviews
Daly <i>et al.</i> (2004)	Shareholder value, financial performance, and mergers	Not disclosed – mentions only CATA	Corporate presidents' letters in annual reports
Empson (2004)	Organisational identity change and accounting firm acquisition	NUD *IST	Interviews
Kloptchenko <i>et al.</i> (2004)	Text mining and linguistic analysis of quarterly financial reports	GILTA	Financial reports
Malina and Selto (2004)	Profitability and an organisational performance measurement model	ATLAS.ti	Interviews
Rowe <i>et al.</i> (2004)	Asset protection and asset growth approaches in public healthcare organisations	NUD *IST NVivo	Interviews
Smith (2004)	Content and use of student evaluations in accounting courses	NUD *IST	Course evaluations
Sweeney and Pierce (2004)	Quality-threatening behaviour in audit firms	NUD *IST	Interviews

researchers impose or develop either an a priori data coding schema based on the research questions or theoretical frameworks supporting a study, or derive emergent, evolving and modifiable codes and categorisations drawn from the data itself. While such coding schemes furnish a “powerful conceptual grid”, it is often difficult to escape from, or see beyond, that grid (Atkinson, 1992, p. 459), and thus the researchers’ coding system may introduce unwanted or unwarranted distortions. By way of contrast, the text analytic Leximancer software that we chose to use in our study does not operate on a standard code and retrieve basis, avoiding these typical coding problems and, as a result, providing improved transparency and replicability.

### 3.2 Leximancer software

Leximancer is an Australian-developed text-mining or lexicographic tool that “can be used to analyse the content of collections of textual documents and to visually display the selected information” (Smith, 2006, 2007, p. 5; Smith and Humphreys, 2006). The program is a concept discovery system operating at the “almost fully automated end of the scale” in terms of the variety of existing CATA programs (Kabanoff and Brown, 2008, p. 154). The key capabilities of the software relate explicitly to the objectives of our research in that, being based on ontological relativity and dynamics, Leximancer (2008) searches for context and goal-dependent models of meaning in texts and whether these meanings are changing over time. The program generates word lists by assessing the contextual collocations of words through “term-occurrence information, such as co-occurrence, positions and frequencies of nouns and verbs” in text (Kamimaeda *et al.*, 2007, p. 265; Young and Denize, 2008), suggesting clusters of meaning based on word groupings. The program achieves this by:

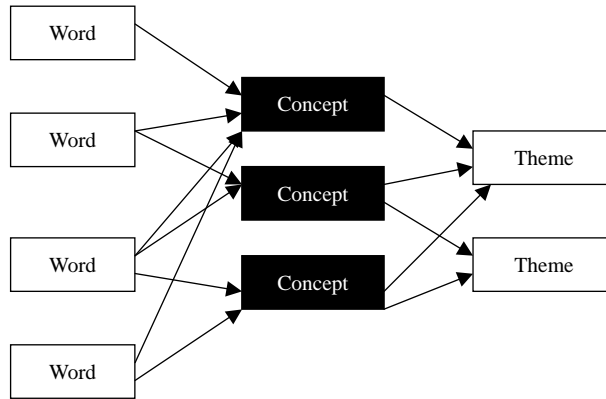
- populating a ranked list of terms using indirect and semantic extraction from the text;
- using these terms to propagate a thesaurus builder that intelligently develops classifications from “iteratively extending the seed word definitions” (Smith, 2006, p. 4) beyond the connections of merely two keywords;
- portraying weighted term classifications as concepts which go to comprise a concept index; and
- through the application of co-occurrence matrices and clustering algorithms (from computational linguistics), generating concept maps which include a third hierarchical (theme) level (Leximancer, 2008; McKenna and Waddell, 2007; Smith, 2006).

A simplified model of the relationships between words, concepts, and themes in the functional structure of the software output is shown in Figure 1.

It is this analysis of relationships in textual data that provides a different view on the data compared to other CAQDAS in which blocks of text are typically coded according to certain themes. Leximancer also provides a diagrammatic view of the data, visually demonstrating how different concepts and themes are related. If a picture tells a 1,000 words, then the concept maps generated by the software are able to show, on a single page, a host of relationships, including the strength of each relationship, enabling researchers to gain a broad overview of the main themes within the data. Leximancer provides one mechanism for viewing the data with a different visual lens.



**Figure 1.**  
Simplified model  
of semantic pattern  
extraction in Leximancer



**Source:** Adapted from Leximancer (2008, p. 6)

Nevertheless, the software is only a tool and researchers must explore other avenues of analysis and bring intellectual rigour to the task of interpretation.

While the algorithmic basis of Leximancer is strongly suggestive of a quantitative and positivistic approach to the analysis of data, it is the use to which the output from the CAQDAS is put that is, for us, the defining characteristic as to whether the research project in which it is applied is qualitative or quantitative. For our purposes, Leximancer provided a means for generating and recognising themes, including themes which might otherwise have been missed or overlooked had we manually coded the data. Using the themes derived by the software, the researchers then went back to engaging directly with the data in order to further explore, and interpret, the meanings of the text. This analysis provided a basis for suggesting apparent gaps in the literature and areas which are relatively under-researched. The themes indicated by the software output are also being applied in further research on accountability which aims to assess the relevance of those themes in theory building and in alternative research settings, and the software is being applied in preliminary analysis of interview data concerning how managers conceive of accountability (Bisman, 2009; Crofts, 2008a, b, 2009).

Leximancer has been used for qualitative data analysis in academic research settings in business and the public sector, in social and cultural studies, and in research on education (Fisher and Miller, 2008; Young and Denize, 2008; Beamish *et al.*, 2006; Rooney *et al.*, 2006; Grimbeek *et al.*, 2005, 2004; Rooney, 2005). In some of these research contexts, Leximancer output has been used for explanatory and predictive purposes, more consistent with a positivist ontology. However, there appears to be a growing body of work which utilises the software in a manner accordant with our view of its capabilities and usefulness in informing research embedded within interpretive and critical paradigms. For example, in Adelstein's (2008, p. 318) Foucauldian study of knowledge work, Leximancer was "used in conjunction with a manual and interpretive genealogical discourse analysis", while Parsons (2008, p. 74), working within a constructivist episteme, used the software "to provide an overview of conceptual relationships" of community engagement by industry. Similarly, Grewal (2008, p. xv) used Leximancer in exploring "the discursive construction of knowledge-related policies within a comparative case study methodology", and others have applied the software in studies underpinned by interpretive story analysis in a public

sector setting (Young and Denize, 2008), and frame analysis in mixed methods, cross-national research (Koenig, 2006). However, after conducting a search of a large range of periodicals databases[1], we failed to unearth any articles published in accounting journals which had applied Leximancer to the analysis of data, thus rendering this report of our study an illustration of a new and unique approach to CAQDAS-based qualitative research in the discipline.

#### 4. Research method

There is a considerable body of work in accounting concerning the content analysis of literature in terms of patterns of publication in particular journals, sub-discipline areas, or within specified geographical domains (recent examples include Northcott and Doolin (2008), Walker (2007), and Watson *et al.* (2007)). However, there is a paucity of such content analysis studies which examine the usage of a particular construct or concept in the accounting literature. Exceptions include analyses of the concepts of “controlling” in management accounting and management control (Schäffer and Binder, 2008), and “trust” as reflected in articles appearing in top accounting journals (van de Ven and Verstegen, 2007). It is this limited category of exceptions with which our research matches. In order to investigate the usage of the term “accountability”, we content analysed articles relating to accountability published in top accounting journals from 2000 to 2007. A four stage process was used, with the Leximancer software tool applied to aid in the analysis of text in the second and third stages.

##### 4.1 Journal and journal article selection

The first stage in our research study involved the identification of journals in accounting to form the set from which articles were to be extracted. There is considerable contention as to what constitutes the “top” accounting journals and although a number of studies have attempted to address this conundrum (Beattie and Goodacre, 2006; Bonner *et al.*, 2006; Cassar and Holmes, 1999) dissensus remains concerning the best method of ranking journal quality, including notions as to whether undue emphasis on a limited number of rating factors favours articles based on quantitative (rather than qualitative) research methods, and on articles published in the US journals. To moderate the effects of these debates, in our research the range of accounting journals was deliberately selected to ensure the inclusion of non-US-based journals and journals publishing qualitative research. However, the selected journal set nevertheless provides a representation of “top” accounting journals, featuring all accounting journals listed in the top two tiers of the *Association of Business Schools Academic Journal Quality Guide* (Harvey *et al.*, 2007), together with the A\* and A rated accounting journals listed in the Australian Business Deans Council (2008) journal ratings list, with the exception of journals beyond the scope of accountability research, such as those dedicated to topics in actuarial studies, taxation, and finance. This exercise resulted in a set composed of 21 journals[2], of which only 14 contained articles that could be used to construct our sample. There was a spread of articles over the period covered by the research, as shown by the list of journal articles itemised in Table II. The selected journals were also compared to the range of other journal quality rankings contained in the Harzing’s (2007) *Journal Quality List*, providing confirmation that the full set represented an appropriate selection of pre-eminent journals.

**Table II.**  
Accountability  
journal articles

Journal title	Number of articles per year of publication										Total	Articles (%)
	2000	2001	2002	2003	2004	2005	2006	2007				
<i>Accounting, Auditing &amp; Accountability Journal</i>	5	2	3	1	5	4	6	6	6	32	28	
<i>Critical Perspectives on Accounting</i>	1	3	3	5		5	2	6		25	22	
<i>Financial Accountability &amp; Management</i>	1	2	2	2	5	3		1	1	16	13	
<i>Accounting, Organizations and Society</i>		1	4		3	1	3	3	3	15	13	
<i>Management Accounting Research</i>	2		1	1	2	1	1	1	1	9	8	
<i>European Accounting Review</i>	1	1	1		2	2		1		6	5	
<i>The British Accounting Review</i>					2	1				3	3	
<i>Accounting &amp; Business Research</i>	1		1							2	2	
<i>Accounting Review</i>					1					1	1	
<i>Accounting Horizons</i>								1		1	1	
<i>Contemporary Accounting Research</i>	1									1	1	
<i>Journal of Accounting, Auditing &amp; Finance</i>				1						1	1	
<i>Accounting &amp; Finance</i>								1		1	1	
<i>Auditing: A Journal of Practice &amp; Theory</i>			1							1	1	
Totals	12	10	16	10	18	17	12	20	114	100		

The selection of specific articles from each of the journals was determined by an article title and author-supplied keyword search for the term “accountability”. Where keywords were not provided in an article, the abstract was reviewed and the article selected if accountability was a significant focus or dominant theme of the paper. This procedure resulted in the addition of three articles, yielding a total sample of 114 papers for analysis. Comprising over 75 percent of the accountability articles examined, the list is dominated by four journals; *Accounting, Auditing & Accountability Journal* (28 percent), *Critical Perspectives on Accounting* (22 percent), *Financial Accountability & Management* (13 percent), and *Accounting, Organizations and Society* (13 percent), notably the foremost of the highly ranked journals which are active in publishing qualitative research on accounting.

A portable document format (pdf) copy of each article was obtained from online periodicals databases and, if the original pdf was not in electronic text-based (searchable) format, the pdf image was rescanned and converted to searchable format through an optical character recognition process. This procedure transformed the journal article to a text-based format readable by the Leximancer software.

#### 4.2 Content analysis

The second and third stages of our research comprised the CAQDAS-facilitated content analysis of the text of journal articles. Whether conducted manually or computer-aided, “content analysis is a research technique for making replicable and valid inferences from texts to the contexts of their use” (Krippendorf, 2004, p. 18). While there are several purposes of content analysis, in our study the method was used to examine the focus or attention of researchers on accountability and to describe the content and concerns of their communications (Weber, 1990, p. 9). Thus, we wanted to identify the most significant concepts and themes emerging from the journal articles on accountability.

Some commentators (Harwood and Garry, 2003) argue that the frequency counts and rankings produced by content analysis are a soft form of quantitative research. While this is a justifiable argument to the extent that specific words and attributes of text are counted, frequencies nevertheless provide an indication of the importance of elements in text (Breton and Côté, 2006). Further, content analysis is also qualitative “in that it focuses on meanings and interpretations in text” (Sarantakos, 2005, p. 299) and such “knowing [of] the context of words, behaviours, and artifacts is practically everything for determining meaning” (Brady, 2005, p. 982).

In the second stage of our study, we applied the software to develop concept lists. In the third stage, the themes and concepts were represented visually using cognitive mapping (Smith, 2007, p. 27), including relational and spatial analyses to determine relevant semantic networks (Smith, 2003), and clusters and knowledge structures of key concepts, themes, and contexts related to accountability research. Although most of the basic analytical processes were performed by the software, some manual interventions were required. An initial problem was that Leximancer included the extraction of text from the titles of periodicals, giving undue emphasis to certain words. As an example, the software automatically judged “society” to be a key theme, simply because it appeared in the journal title *Accounting, Organizations and Society*, even though its usage outside this context was minimal. Relational analysis between concepts was also distorted. For example, the relationship between accounting and accountability was very strong, simply because the terms appeared together in the journal which produced

the most accountability articles, *Accounting, Auditing & Accountability Journal*. Therefore, for the purposes of disambiguation, all significant capitalised words appearing in journal titles (termed “names” in Leximancer) were deleted from the Leximancer concept list and were thus excluded in the thematic concept analysis. Another manual intervention involved the merging of similar words into singular preliminary concepts. For example, the terms “organisation”, “organisations”, “organization”, and “organizations” all embrace a similar concept and were therefore merged. Where a term was considered to be of likely significance by the researchers it was added to the concept list as a “seed” term. The only terms added in this manner were the acronyms SEA and NPM (new public management); both terms of potential importance within the landscape of accountability.

The fourth and final phase in the research process involved confirmation of the emergent themes and concepts through manual analysis of the text contained in individual articles, as exemplified in the discussion of research results presented in this paper. Such confirmation is of added importance in contextual content analysis where the aim is to study “the research object in context [...] and understand the context through the meaningful statements of the authors found in the texts” (Sarantakos, 2005, p. 300). One of the issues in using CAQDAS for content analysis is vulnerability to:

[...] the problem of *homography*, that is individual words may have multiple literal meanings, and the problem of *context*: the theoretical meaning of a word may be altered by the presence of absence of other words (Hobolt and Klemmensen, 2005, p. 387).

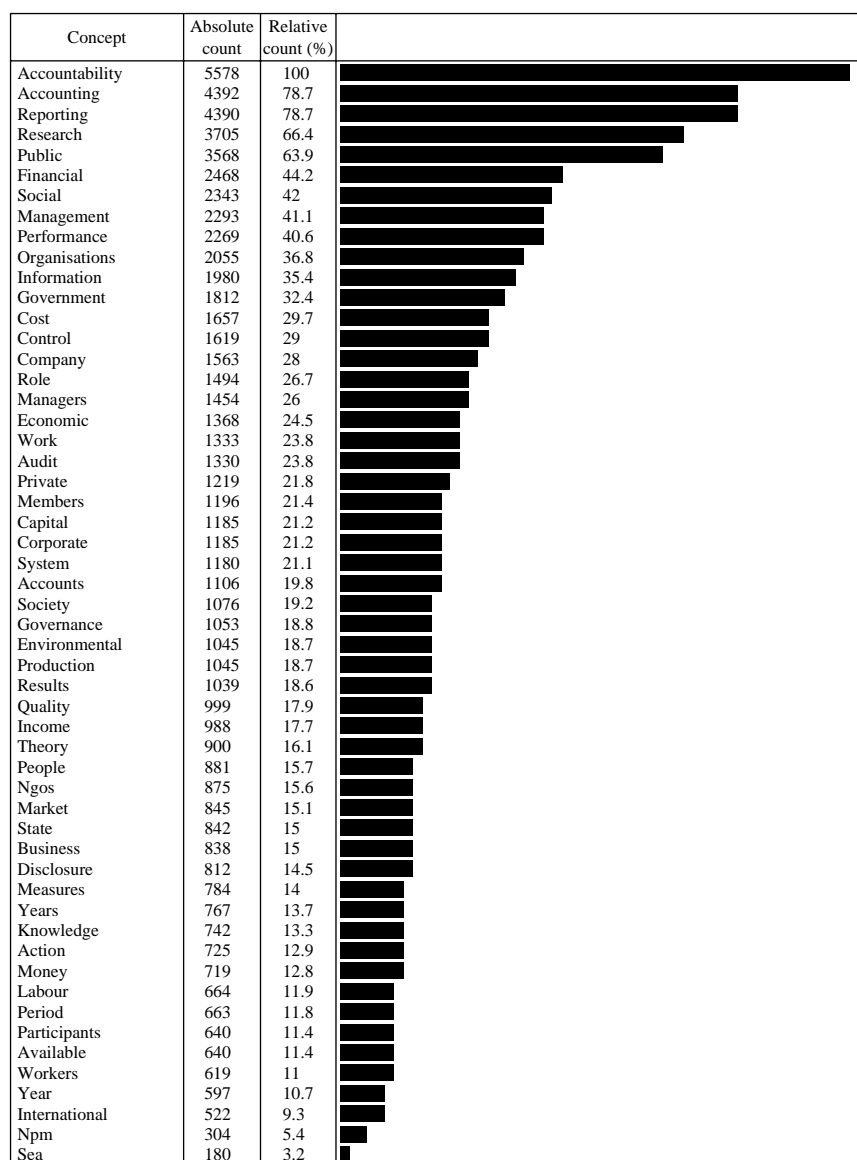
To address this concern both the computer-assisted cognitive mapping of terms and the manual confirmation of themes and concepts were designed to illustrate how concepts and themes were embedded within contexts.

## 5. Results

While Leximancer CAQDAS can generate very lengthy concept lists, we initially set the number of concepts to 60 to produce a more parsimonious list, eliminating the less salient terms without unduly sacrificing comprehensiveness. However, as a result of the manual interventions previously outlined, the final list contained 54 concepts, with relative counts ranging from 5,578 instances (100 percent) to 180 instances (3.2 percent). The final concept list (Figure 2) presents concepts in rank order according to the number of occurrences of the concept in the text of the journal articles in our dataset.

Given that our study concerned accountability, it is unsurprising to observe that “accountability” was the foremost concept in the list, mentioned 5,578 times in the 114 journal articles. As the articles selected were all from accounting journals, it was not unexpected to find that the term “accounting” ranked second. Of interest is that the concept of “reporting” was ranked third, with a count of 4,390 times occurring in the text. Table III shows the main words occurring in close proximity to the term “reporting”.

The results (Table III) reveal that reporting was relevant in a number of different contexts and that various types of reporting are frequently mentioned and are of significance within the literature on accountability. Examples include accountability in connection to: financial reporting (Forker, 2000), social reporting (Adams, 2002), performance reporting (Cavalluzzo and Ittner, 2004; Ahrens and Chapman, 2002), environmental reporting (Adams and McNicholas, 2007; Adams, 2004), and corporate reporting (Stanton and Stanton, 2002).



**Figure 2.**  
Ranked concept list

The content analysis results detailed above were based purely on the count of terms or concepts used in the text. Relational analysis was then employed to yield further insights by providing an indication of:

- how closely concepts are related to one another; and
- how often the actual concepts and significantly related terms appear close to each other in the text.

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**Table III.**  
Words relating  
to reporting

Word	Count
Report	1,310
Reports	1,270
Financial	1,056
Accountability	1,007
Accounting	897
Annual	883
Information	855
Public	678
Performance	676
Social	515
Environmental	484
Corporate	455
Management	394
Government	390

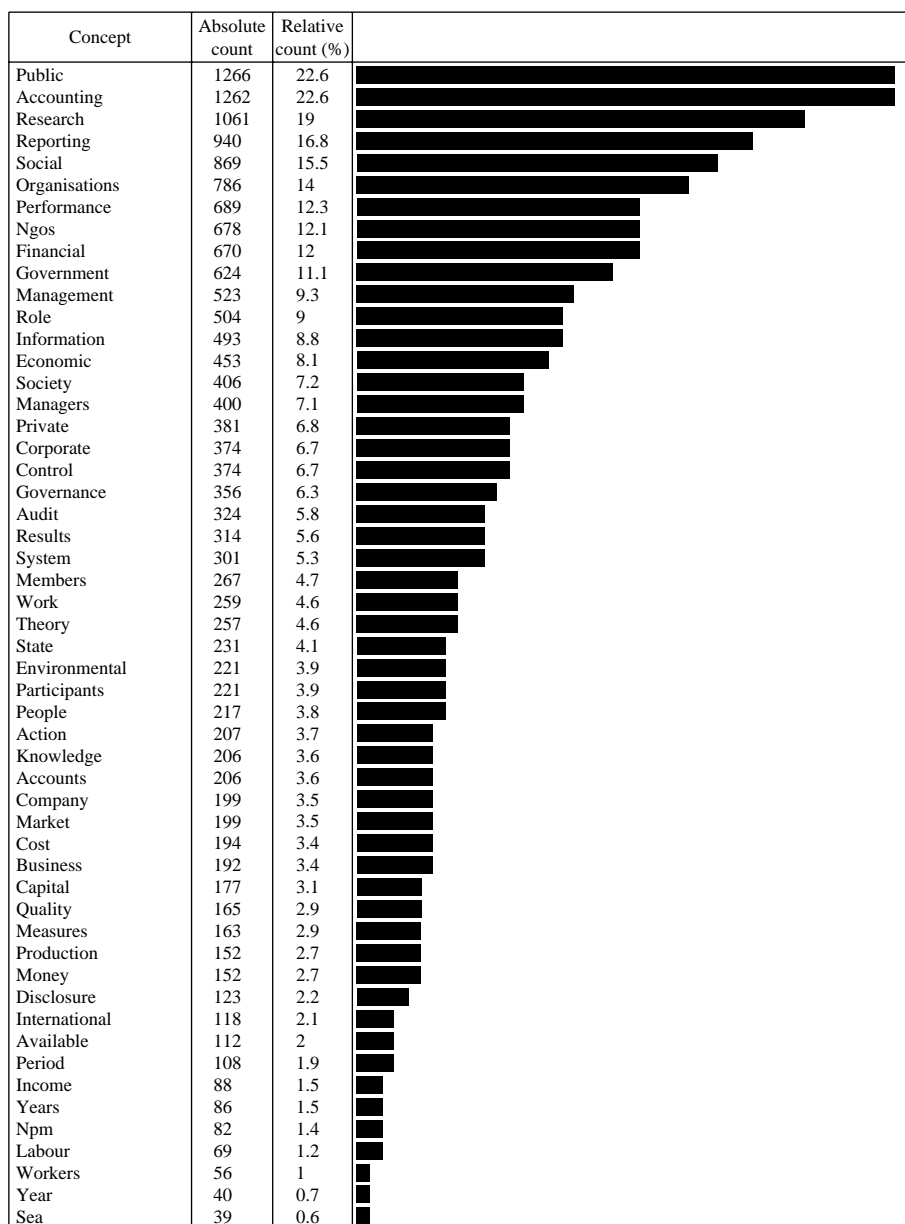
Using relational analysis, the term most closely connected to “accountability” was “public”, as shown in Figure 3.

The term “public” has a number of different meanings depending upon context. Table IV shows the chief words closely associated with the term “public”, as used in accountability contexts, encompassed concepts such as public or governmental accountability (Christensen and Skærbæk, 2007; Carnegie and West, 2005; Robinson, 2003), public-private sector distinctions (Broadbent and Laughlin, 2003; English, 2003), public spheres and spaces (Lehman, 2007; Neu, 2006), providing information to the public, being/acting in the public interest (Chand and White, 2007; Unerman and O’Dwyer, 2006; Guthrie and Parker, 2004), and providing public services.

In addition to the importance of “public” issues in connection with conceptions of accountability, the accountability-related concepts and entities list (Figure 3) also discloses that social aspects of accountability are prominent (Roberts, 1996). These aspects include social accounting and reporting (Cooper and Owen, 2007; Adams, 2002, 2004), but also embrace broader concerns in social responsibility, social accountability (O’Dwyer and Unerman, 2007; Parker, 2005), and social audit (Hill *et al.*, 2001; Owen *et al.*, 2000).

The themes and concepts related to accountability were also visually mapped using the CAQDAS. In Figure 4, circles represent primary themes, while concepts are represented by dots. The themes thus group similar concepts and contexts. The size of a concept dot is related to the frequency of occurrence of the concept in the set of articles analysed, and so the larger the dot the more often the concept appears in the text. Nearness of concepts in the cognitive map, and within themes, is indicated by the distance between dots, denoting the conjunctural nature of concepts in the text.

Four main themes emerged from the cognitive mapping process, with accountability being one of these themes. From the concepts within this theme, and noting the relative sizes of the concept dots, the map provides for the inductively-generated conclusions that accountability relates to “organisations”, the “public” and “private” spheres, and has “social” implications, and to a lesser extent “economic” ramifications. Accountability has a “role” to play, of which “accounting” is an important part. A further theme is reporting, including the various reporting types of “environmental”,



**Figure 3.**  
Accountability-related  
concepts and entities

“financial”, and “performance” reporting. “Information” and “results” are important aspects of reporting and the “audit” of results (Hill *et al.*, 2001; Owen *et al.*, 2000) is also significant. The reporting theme also intersects to a considerable extent with the public and governmental aspects of accountability. The broad management and costs themes remain relevant, but are tied somewhat less to the accountability theme than is

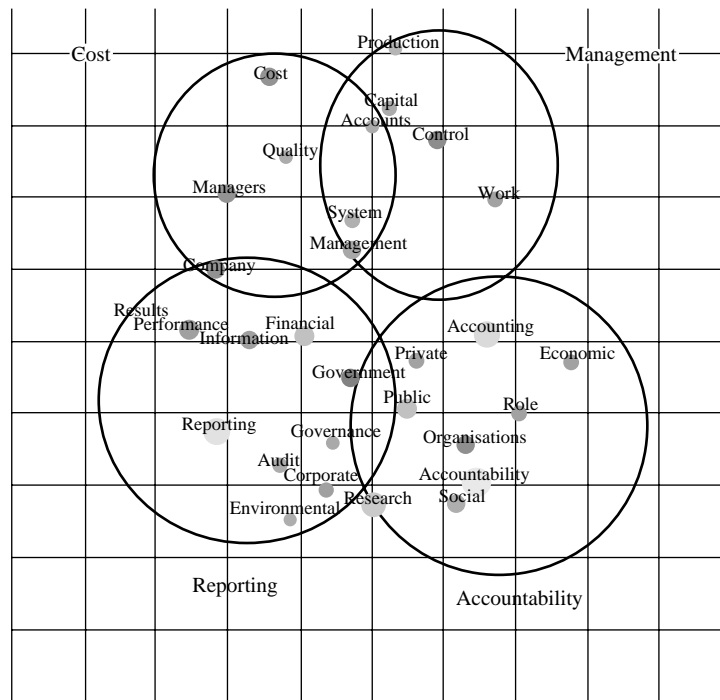


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**Table IV.**  
Words appearing  
in the “public” context

Words associated with public	Count
Accountability	1,342
Sector	1,218
Private	816
Accounting	794
Government	753
Financial	524
Management	451
Information	430
Performance	342
Interest	330
Services	315
Reporting	308
Social	304
Audit	273
Political	271



**Figure 4.**  
Cognitive map

reporting. “Accounts”, “system”, and “management” are key concepts in both the management and cost themes, where “management” is supported by a “system” or systems (Conrad, 2005) of “control” (Frow *et al.*, 2005; Toms, 2005) and “accounts” (Edwards *et al.*, 2002), with issues being related to “quality” and “costs” (Armstrong, 2002; Rouse and Putterill, 2000). Overall, accountability concepts and concerns permeate

a broad number of contexts in both the public and private sectors and across reporting, and to a lesser extent, management, and cost domains.

In interpreting these results, we also engaged in a process to manually confirm themes, concepts, and their associations by referring back to the literature examined in the study, recognising that the application of CAQDAS should not operate as a substitute for the researcher's immersion in, or interpretation of the data (Dixon *et al.*, 2006; O'Dwyer, 2004), but rather as a means for enriching the research process. For example, we found that the public-private sector dichotomy was a recurring topic in the journal article set, with one such paper making the point that "there are fundamental differences between the public and private sectors with respect to accountability requirements" (Barton, 2006, p. 268). Under the reporting theme the prominent concept of "performance" was often presented within journal articles in terms of performance reporting as an accountability mechanism, and particularly so within the climate of public sector reform. For example, one article in our set includes the statement that "performance information may be reported on an on-going basis directly to state and federal governments, and these provide further channels of accountability" (Coy *et al.*, 2001, p. 14). The concept of control, as an aspect of accountability in the management theme, implies both private sector "management accounting techniques" of control (Toms, 2005, p. 632), as well as public sector management concepts of control "aimed at limiting corruption [. . .] waste and incompetence [. . .] [where] the emphasis is control through compliance to rules and regulations" (Gendron *et al.*, 2001, p. 281).

## 6. Findings and conclusions

From the content and thematic analyses and cognitive mapping, it is apparent that the term accountability is used in myriad ways and there are exigent issues in accountability that are being researched in a diversity of contexts. Mulgan (2000, p. 555) contended accountability was an "ever-expanding concept". Our research on the concept of accountability in the period following Mulgan's observation indicates the term appears not to have developed a more precise meaning or specific contextual usage. Consequently, Sinclair's (1995) characterisation of the elusive chameleon-like quality of accountability continues to be an apposite observation. Potentially, part of this problem may arise from researchers examining "differentiated realities" without clearly stating the "worlds", "realms", or "orders" to which specific conceptions of accountability pertain (Llewellyn, 2007, p. 64). In essence this constitutes what Beattie and Thomson (2007) would describe as a transparency problem that needs to be addressed by researchers in order to promote shared meanings, better understanding of concepts, and improvements in the corpus of literature. Reference to, and the design of, improved accountability frameworks would assist in promoting greater consistency in the usage of the "accountability" concept in different contexts, and conceptual mapping exercises of the type developed in the current paper (Figure 4) could be used to underpin framework development. Such frameworks could then explicitly support empirical studies and more accurately highlight which conceptions and perspectives of accountability are investigated. However, given the limitation of our study concerning the choice of journals analysed, it may be that other accounting journals are providing different studies of, and different perspectives on, accountability, with another possibility being that the notion of accountability is achieving refinement outside the accounting discipline (for example in public policy and sociological research).

Consequently, adopting a more interdisciplinary perspective to draw upon this work may prove insightful.

The content analysis of journal articles described in this paper reveals the conflicting and often competing notions that accountability entails, and the relative abundance, or dearth, of research on accountability in particular contexts and settings. For example, the contiguous relationships of themes and concepts illustrated in the cognitive map (Figure 4) leads to the inference that the literature currently emphasises accountability within “accounting”, “financial”, and “reporting” contexts, particularly from public and social perspectives, with comparatively less concern for, or attention to, managerial accountability in respect to cost, quality, and control. Arguing from policy and regulatory perspectives, researchers such as Carnegie and West (2005) and Kloot and Martin (2001) have suggested an overemphasis on accounting and financial perspectives on accountability, at the expense of broader consideration of the qualitative and managerial facets of accountability. Our research lends weight to these arguments and illustrates that the literature is, in parallel with the policy and regulation, preoccupied with particular concepts and contexts of accountability such that financial accountability and external accountability reporting predominates, shadowing concern for the internal development of accountability mechanisms and process accountabilities. The content analysis and concept mapping also highlight the relative paucity of accountability research conducted within private sector and not-for-profit organisations in comparison to government and public sector entities. That these particular settings, concepts, and contexts of accountability are apparently under-explored in contemporary accounting literature points to fruitful research directions to remedy gaps and to elaborate on accountability models and frameworks.

A further key aim and contribution of our paper was to illustrate how a particular CAQDAS could be utilised in the content analysis of text in accounting and accountability research. Consistent with the predictions of Amernic and Craig (2007, p. 31) about digital media in the climate of corporate reform and accountability, we conclude that the increasing availability of online and machine-readable materials, including journal articles, will facilitate growth in studies employing the form of textual and content analysis, and application of CAQDAS, that we have undertaken in our study. Additional studies employing CAQDAS in the analysis of a range of textual materials, including interview transcripts, the professional literature, news media, and other sources, may well help to refine our understandings of concepts, contexts, and themes connected with accountability. Such research may assist in explication and in building improved models of accountability, as well as providing further insights into the prospects and pitfalls of CAQDAS use in accounting research. Given the conspicuous absence of computer-assisted qualitative data analysis in accounting and accountability using Leximancer, we also suggest further studies in utilising this computer program in order to better determine the benefits and deficiencies of the software in these research applications. Further, noting the apparent preference for accounting and accountability researchers to use particular brands of CAQDAS (Table I), we echo Davies *et al.* (2006) and Koenig's (2004) points that research issues and data analysis may be enriched by the use of Leximancer in conjunction with other CAQDAS. Word mapping tools, such as Leximancer, can function as useful interpretive aids in better understanding the results generated by other CAQDAS, including NVivo and ATLAS.ti. Following these research directions could enhance and elaborate on current research efforts in the discipline.

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**Notes**

1. Periodicals databases utilised included Emerald Management Xtra Complete, EBSCOhost (Business), ScienceDirect (Elsevier), SAGE Journals Online, and Wiley InterScience, as well as a more general search using Google Scholar. For each database/search engine the terms “accounting” and/or “accountability” plus “computer-aided qualitative data analysis software” and/or “CAQDAS” were applied to produce a preliminary listing of papers and articles. The articles and papers were then examined for relevance to the study and included in Table I where there was a clear accounting or accountability focus to the work and where the authors had provided a reasonably detailed discussion of the use of CAQDAS in the particular study.
2. The seven journals which did not feature relevant articles focused on accountability published in the specified time period were *ABACUS*, *Behavioral Research in Accounting*, *Journal of Accounting and Economics*, *Journal of Accounting Literature*, *Journal of Accounting & Public Policy*, *Journal of Accounting Research*, and *Review of Accounting Studies*.

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