

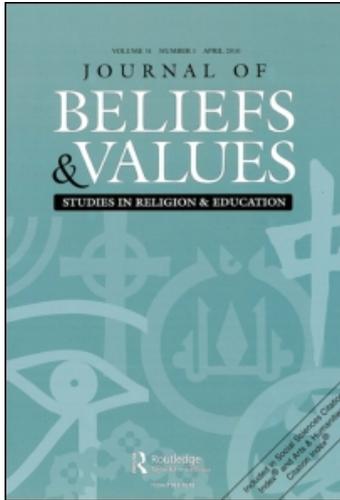
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### A multiple software approach to understanding values

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## A multiple software approach to understanding values

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Global flow of information forms a basis for active citizenship at local, regional and national levels of society. Information, exchange and education hold a potential to empower individuals for personal development, working life purposes and public life. In raising people's awareness of the ways of the world, piecemeal, factual and true *data* as well as personally held *values* play a crucial role. Here we study the potential of software packages for analysing social scientists' use of *values* in journal articles. Results show that a combination of software tools yields useful information for further research on the contents of social science articles relating to an extraordinary phenomenon.

**Keywords:** values; software method; social science; qualitative study

At times researchers combine studies of philosophical themes with the use of modern software. Thus, it is important that we bring novelty to the field of values and information technology. Long ago, Lajoie and Derry (1993) suggested such research should focus on how to use computers to support individual learning and advance the learning sciences. Today, several ISI (Web of Knowledge) journals specialise in articles on situated cognition and educational technology. Adding to the picture, journalists say that Western democracies suffer from poor ethics, standards and norms. The trend is apparent in the global economy, with excesses like bonuses, bankruptcy and plundering. Poor ethics seems to spread and corrupt politics, law enforcement and education. Adultery, speeding, bullying and shoplifting are minor moral issues compared to the Holocaust, a huge moral breakdown in Western civilisation. Regardless of scope, medium or institution, however, people relate values to moral behaviour.

In defining poor *values*, Lowen (1985, as cited in Laughlin 1995) describes narcissists as 'egoists, focused on their own interests but lacking the true *values* of the self – namely, self-expression, self-possession, dignity, and integrity'. A university homepage defines *values* in a more neutral way: **S: (n) values** (beliefs of a person or social group in which they have an emotional investment (either for or against something)) '*he has very conservatives values*'. Greenwood and Levin (1998) highlight the practical side of values, saying 'It is impossible to present any scientific finding that does not reflect the values of the researcher.' Also, in defining effective teacher characteristics, Witcher et al. (2003) define values, suggesting a list of school-related concepts like *student-centeredness*, *subject matter knowledge*, *professionalism*, *enthusiasm*, *communication*, *accessibility*, *instruction*, *fairness* and *feedback*. Senne and Rikard (2002) outline professional growth in student teachers as a combination of *prepared*, *mature*, *assertive* and *confident* values. Already now the terminology is becoming confusing.

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Values resemble abstractions like *honour* and *desire*. People use values in various contexts, for a variety of reasons and signifying a mixture of meanings. It is tempting to provide a definition of reflective, cultural or global values, but the list would be endless. Also, it is necessary to leave out *ethics*, *morals*, *standards*, *attitudes* and *goals* from the list. People distinguish between facts and values. Another contention is that everybody carries values. Furthermore, values form rather stable pre-conceptions over time, an inner state of mind. Finally, people seem to be unaware of the functioning of values. The last discovery informed the methodology for this article. Although values are individual psychological dispositions by default, people collectively share values in a social context. In counteracting on the potential dualism between Self and Other, Yaroshevsky (1989, 80) compliments Vygotsky's (1978) ambition to integrate individual actions and values with the development of social systems. In order to do so, the researcher must weave: 'the individual's brief life into the great age-long history of social being [combining] the macroscale of the life of the people down the ages and ... the microscale of the individual's routine contacts with his brethren'. The quote provides a synthesising approach to a much too common and harmful dichotomisation between individually held and collectively shared values, a central theme for this article.

According to Schwartz (1992) people build their understanding of the world on a number of categories, values and propositions. They seem to do so regardless of nationality, gender, social status or other. Without mentioning the actual method for categorising input data, Schwartz presents allegedly global values across cultures: (1) *Universalism*; (2) *Benevolence*; (3) *Conformity*; (4) *Security*; (5) *Power*; (6) *Achievement*; (7) *Hedonism*; (8) *Stimulation*; and (9) *Self-direction*. Unfortunately, Schwartz refrains from analysing if values are 'rather stable pre-conceptions over time' as suggested above. Figure 1 is a static model of the totality of human values organised according to kinship.

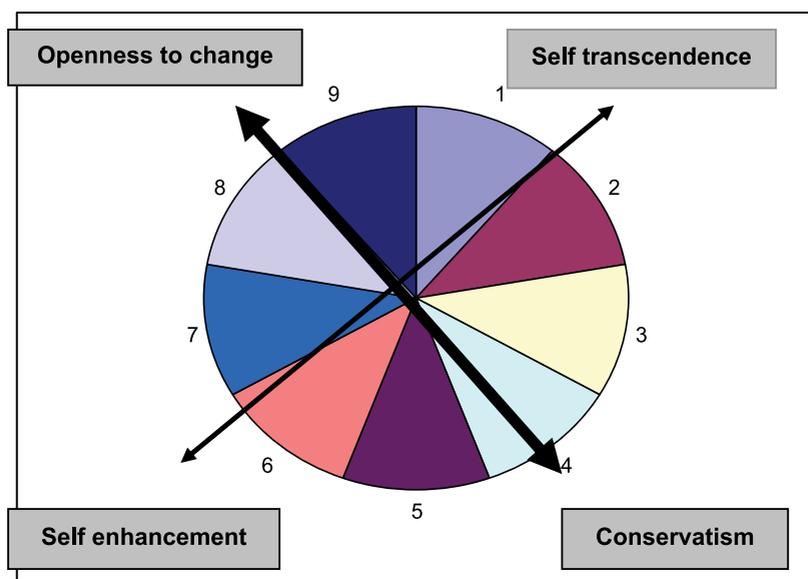


Figure 1. Proper values, ordering of values and value directions.

Complementary research (Hansson 2010) includes value directions, here given as transversals of *Self-enhancement* vs. *Self-transcendence* plus *Openness to change* vs. *Conservatism*. Clashes between people's values cause human dilemmas to appear. Such clashes, or cognitive dissonance (Festinger 1957), seem to appear in all value directions. Our study explores the 'standards of evidence' (Wilson 1994, 26–30) of one value dimension appearing between *Self-enhancement and Self-transcendence*, here translated into a difference between self-centred (individual, personal) plus collective (social, community) values. Adding to the significance of researching such a scale, Hansson (2010, 13) says 'Contradictory influences seem to appear between Self-enhancement and Self-transcendence values.' This last proposition lies at the heart of our study.

## Method

By focusing on values we will investigate the 'actual' rather than 'superficial' contents of a corpus of online social science articles. By investigating a singular concept 'values' we assess an implied rather than proven assumption of a (mis)match between what people say and mean. On this mission – and due to the fact that the authors of this article are educators – the approach and the results reflect qualitatively applied educator values. Furthermore, in making use of the data as evidence, we are (Wylie 2002, 169) 'relying on background knowledge and auxiliary hypotheses, of lading data with theory'. So, our qualitative interpretations come as a result of lived on-the-job teacher experience.

Emerging methodologies, digital texts, software packages and developing approaches to research nowadays enable for the examination of a large corpus of data. The Internet contains a vast amount of easily available texts. Modern software offers an opportunity and challenge for students, teachers, experts and researchers. The software is attractive and efficient but at times misleading, viewed with suspicion and possibly unreliable. Computer supported qualitative data analysis software (CAQDAS), includes e.g. open source *Coding analysis toolkit*, *Digital Replay System* and *Transana*. Proprietary software tools are among others *NVivo*, *The Ethnograph* and *HyperQual*. For this study we apply *Concordance*, *Atlas.ti* and *Leximancer* software on a corpus of articles downloaded from an online journal called *The Qualitative Report (TQR)*, <http://www.nova.edu/ssss/QR/>. A focus on qualitative data analysis, mixed and multiple methods characterise the contents of the journal. Just as Lincoln (2002, 9) suggests, our claims are 'based on an adequate selection of the total corpus of data', i.e. in our case a significant number of articles containing *values*.

Lewis and Ritchie (2003) say that in order for the researcher to conduct a valid study s/he may come to conclusions via *inferential generalisation* of other people (citizens) than those studied (social science authors). The researcher may also come to conclusions through *theoretical generalisation* by accounting for diverse patterns (of values) with a transparent construct (distribution of values). Our choice of method emerges from a belief that the chosen software and texts together contribute to a 'doable' in-depth study. Initially we assumed that the combination of CAQDAS-tools matches the studied object (*TQR* authors' use of values). Our educator personalities influenced the epistemological approach and choice of method. Eventually, personal, professional and social science values verified our initially intuitive sense about the importance of the studied theme, i.e. an urge to qualify *values* and relate the semantics of the concept to the beliefs of contemporary society.

We apply three CAQDAS-tools for narrowing down on *values* as portrayed in a number of social science articles, hoping to explain the *meaning of values*. In dealing with issues related to *the use of values* we could easily provide rules of conduct and/or examples of ethically valid behaviour. Rules of conduct contribute to a qualitative interpretation of the concept. Kant (1908, 195) supplies a suggestion to what he considers to be a valid teacher reaction to dishonest student behaviour: ‘The withholding of respect is the only suitable punishment for lying’. Continuing this line of rule-based reasoning Kant exposes his own (restrictive rather than prescriptive) values by suggesting that if a child ‘abuses another ... he, in turn, should be treated just as haughtily and forcefully, because his conduct is contrary to the rights of humanity’ (1908, 205). In the light of such harsh treatment, modern teachers seem to prefer to guide young people’s behaviour by means of illustrative hands-on examples, rather than by obedience to authority. For this study, we refrain from examining: (a) the ‘correct meaning’ of *values*; (b) valuable behaviour; or (c) the proper use of *values*.

### Previous research

Researchers use computer based qualitative analysis software (CAQDAS) for studying large cohorts of observation, log-book, literary, portfolio and note-taking data. The software is helpful in assisting the researchers’ laborious chores of data analysis. But ever since the successful introduction of Statistical Package for the Social Sciences (SPSS) for analysing quantitative data, there is a risk that the software alienates the researchers’ interpretations from studied activities. Also, there is a risk that the beauty of the software guides the researchers in the wrong direction. The best way for the researcher to stay clear of these temptations is to choose a combination of automatic and manual text analysis. We suggest software-driven quantitative *and* researcher controlled qualitative data analysis.

Articles like ‘Research as improvisation: Dancing among perspectives’ (Greene and Freed 2005) and ‘Tracking values in web based student teacher exchanges’ (Hansson 2010) touch on the given theme, but without specifically focusing on *values* in texts. A similar longitudinal study on ‘Mentoring qualitative research authors globally’ (Chenail et al. 2007) complements the analysed corpus. Watt (2007) provides an alternative view of the values-theme in ‘On becoming a qualitative researcher’. Another relevant article is ‘Sampling designs in qualitative research’ (Onwuegbuzie and Leech 2007). Finally, Ozkan (2004) studies the operational potential of *NVivo* software in analyses of classroom data. Previous research, however, differs from ours because we conduct a qualitative study of how the authors’ texts reflect societal values.

### Purpose of the study

We operate a multiple/mixed methodological approach, based on quantitative (software generated) and qualitative (educator interpreted) data. We wish to learn if the chosen corpus of social science articles in *TQR* corresponds to Schwartz’s (1992) outline of global values. Is there longitudinal change over the years (1990–2009) in how authors use *values*? Do software operations provide a useful-true-valid output of single-word semantics and/or real life representation? Hence, this study contains aspects of semantic analysis as well as interpretation of the surrounding (con)text, i.e.

reflecting text world conceptions and real world conceptions. Our approach delimits and extends the ground for interpretation of how the studied authors' use of *values* reflects longitudinal societal change.

### Elaborating on method

Ancient Greek philosophers knew how to separate the isolated *nomos*-meaning of words from their *logos*- or background meaning. The most advanced software packages put singular word definitions, or their *nomos*-meanings, in a logical relation to a specific context (semantic field) by relating individual meanings of neighbouring words to meaningful clusters. This process is, just as for SPSS-users, basically a hidden operation. In a comment on the drawbacks of analysing data by means of *nomos*-concepts, Lave and Wenger (1991, 121) delineate the Greek origins in terms of *focus* and *background*.

Until recently, the notion of concept was viewed as something for which clarity, precision, simplicity, and maximum definition seemed commendable. Thus the concept ... receives its meaning, not in a concise definition of its boundaries, but in its multiple, theoretically generative interconnections with persons, activities, knowing, and the world.

Lave and Wenger's (1991) approach to situated learning activities lies far from the focus of our study. Still, their emphasis on a methodologically advanced way of considering duality of singular word meaning brings clarity as to how the predominantly US-authors of the studied online journal define the textual meaning *and* their real-life understanding of *values*.

In another comment to the chosen mixed/multiple methodology, Miles and Huberman (1994, 281) warn inexperienced researchers of the often surprising challenge included in transforming and analysing large corpuses of text. Adding to their warnings, Wickham and Woods (2005) compare CAQDAS packages for analysing comprehensive corpuses of qualitative data, arguing that during the 'qualitative' research process the researcher needs to interpret, transform and categorise disparity in the data, demonstrate crucial relationships and bring out theoretical conclusions. They (Wickham and Woods 2005, 688) also highlight the similarity between corpus study and literature analysis:

a large body of material must be reduced into summarized form while retaining substance and meaning. The development and illustration of the categorization system then supports the identification of main themes and deficiencies in current knowledge, and can provide a visual illustration of the thesis argument.

However, where Wickham and Woods (2005) study software programmes for increased efficiency and analysis by means of Microsoft *Word* and *NUD\*IST* we study a threefold *Concordance*, *Atlas.ti* and *Leximancer* software application on the data. The English/Icelandic author selected the Scottish software, the Swedish author chose the German software and the Australian author picked the national software.

Also related to this study is a problem which emerges from the fact that researchers seem to confuse mixed methods (Brannen 2009) with multiple methods (Ortlipp 2008). Leech et al. (2008) distinguish between mixed and multiple methods.

Mixed methodologies are distinguished from multiple methodologies, wherein mixed methodologies refer to approaches in which quantitative and qualitative research techniques are integrated into *a single study*, whereas multiple methodologies refer to approaches in which more than one research method or data collection and analysis technique ... is used to address *research questions*. (emphasis added)

In spite of the ambitious definition, it is hard to separate a combination of (mixed) methods deployed for choosing the proper techniques of a single study and another combination of (multiple) methods for answering narrowly defined research questions. Here we define research as a basically mixed methodology for analysing quantitative and qualitative data because when we look at a problem from a certain perspective, any social science approach has twofold implications regarding method and output. To the effect of clarifying the inherent complexity of any methodological choice, Vygotsky (1978) says the researchers' method is a 'prerequisite and product; the tool and the result of the study', continuing:

In general, any fundamentally new approach to a scientific problem inevitably leads to new methods of investigation and analysis. The invention of new methods that are adequate to the new ways in which problems are posed requires far more than a simple modification of previously accepted methods.

The value of Vygotsky's (1978) contention is that we design an approach which contributes to knowledge in the field of mixed *and* multiple research methods because we use different techniques for analysing the data. Another argument is that our initial (quantitative data) software approach generated an unexpected (qualitative data) shift of direction for the succeeding rounds of data analysis.

Onwuegbuzie and Leech (2004) say mixed and multiple methods should help researchers define significant findings, i.e. results that carry meaning or representation. They eventually trace, for the Behavioral Sciences, such knowledge as *Verstehen*, defined as a way of understanding a finding. More specifically, in conducting mixed and multiple methods research, we take on board a combination of 'parallel mixed analysis' during the interpretative categorisation stage and 'concurrent mixed analysis' at the data analysis stage. Our approach enables for: (1) triangulation of convergent data, and (2) complementarity of the findings as we are seeking clarification of the relation between methods and results, just as Vygotsky (1978) suggests in the preceding quote. We trace (3) development from the findings of one method informing another method, actually by conducting a several runs of the data processing, hoping (4) to discover paradoxes and contradictions.

We will be able to identify a valid strategy for deploying the software; to zoom in on *values*; and to come up with feasible explanations as to why, e.g. *experience* and *values* are interrelated concepts for the 1990–2009 corpus (= single study) and why an *individual/collective* dimension is a valid combination for analysing the year 2002 (= research question) corpus. By studying the effect of three CAQDAS-platforms we will identify and elaborate on primary data. By zooming in on one year (2002) we will build on the first run of complementary software output. By analysing the output we will be able to relate the output to lived real life events.

### Characterising the data

Intuitively identified themes and connectivity concepts extracted from the corpus of articles suggest that the overall theme of the *TQR*-journal is on the 'study and use of

qualitative research data'. But before coming to this conclusion, we singled out articles containing the search word *values*, reducing the total number by approximately 30% and obtaining a relevant corpus. Hunston (2002, 20) says: '... the main argument in favour of using a corpus is that it is a more reliable guide to language use than native speaker intuition is'. But this has long been a controversial issue between Noam Chomsky and the corpus linguists. A sensible outcome of the debate is that 'the corpus and the linguist's intuition were complementary, not antagonistic' (McEnery and Wilson 2004, 25). The studied sample of *TQR*-articles contains 1,771,494 words on approximately 4000 pages. Still, the sample is small compared to the infinite corpus of English texts accessible on the Google search engine. A primary excursion into the enormous (English) corpus on *values* yielded a variety of some 20 concepts with frequencies ranging from four million to 3990 hits. The huge Internet corpus as well as our selection consists of articles representing multi-cultural and global environments, authors, issues and themes. Microsoft *Word* search functions helped find instances of *values* in the *TQR* corpus. Obviously some articles deal with moral *values* in general and other articles cover *values* specifically related to research, therapy, gender, education or other. Regardless of such differences, the studied articles form one comprehensive cohort.

Adding to the characteristics of the data, it is worth noticing that *TQR* started out as a university publication. There was an increase in the number of articles by 1997, going from an average of seven to 24 per year. In 2000, US authors provide an overwhelming majority (24) of the (30) articles. Only a few articles are South American (Brazil; Puerto Rico) or Far Eastern (India; Iran). The proportion between US and other nationalities is 278 to 119 articles. So the studied articles reflect an American way of thinking and the authors' natural feel for US values.

## Results

### *First data processing: experience and values*

Native speakers have a natural feel for languages without being translators, linguists, teachers or authors. They know that adjectives like *shrewed* or *ruthless* go well with *businessmen* and an adjective like *dedicated* frequently appears with *teachers*. In choosing the 'correct' adjective-noun combination, people intuitively assess a situation about the ways of the world. Western businessmen 'harmonise' with egoism, manipulation and cheating, and teachers go well with calling, moral standards and fostering.

*Concordance*<sup>TM</sup>, *Atlas.ti*<sup>TM</sup> and *Leximancer*<sup>TM</sup> are CAQDAS software for studying large chunks of qualitative data. The analyst's input data is a cohort of articles containing at least one mention of *values*. The preceding word processor operations form a basis for the succeeding steps of lexical-semantic data analysis.

*Concordance* is software suited for text analysis and study of language (linguistics). A search (5 August 2009) through 4000 pages of *TQR* articles related to the concept of *values* yielded: 'Words 54,288; values 637 (1.17%)'. Structuring the result is a straightforward business. Just do away with high frequency (function) words like *and*, *the*, *of*, *these*, *own* etc. Instead zoom in on content words qualifying *values*, e.g. *cultural*, *personal*, *shared*, *class*, *mean*, *core*, *family*, *underlying* and *Western*. In a position directly preceding *values*, five different words come up four times; nine different words come up three times; 29 different words, e.g. *Amish*, *educational* and

*emic*, appear twice; finally 111 words appear once in a position directly preceding *values*. The most frequent words specifying *values*, i.e. *cultural*, *personal*, *shared*, are used at an average of 20 times per word compared to the other half of 159 words preceding *values*, which appear at an average of less than 0.1 times per word. Our focus is on high-frequency adjectives preceding *values*.

*ATLAS.ti* offers a systematic approach to analysing poorly structured deep-interview or observation data. It supports an intuitive and bottom-up way of analysing qualitative text and speech data. The researcher may conduct a structured (deductive) and creative (inductive) investigation into how people include phenomena, situations and/or real life activities in their thinking, attitudes and objectives, thus helping the researcher keep a comprehensive solution in sight and/or discover irregularities and paradoxes, i.e. find out about relations and arguments without initially knowing what to search for. Applying the software on a corpus of texts calls for the researcher's input of a code to every 'hit' of *values*. The coding categories are the result of the researcher's shared inductive, qualitative and bottom-up process. Therefore, and contrary to the other software output, the Swedish researcher's objectives, experience and characteristics influenced his coding, generating *explicit*, *general*, *community*, *multi-cultural*, *socio-cultural*, *educational*, *school culture*, *research*, *profession-oriented*, *social-science*, *family*, *personal-moral* etc. values. *Atlas.ti* helped visualise the researchers' understanding and conceptualisation of a comprehensive semantic field related to *values*.

*Leximancer* highlights semantic relations and proximity between words, indicating how sentences and texts make up a structured lexical field. The software also delivers cause-effect analyses by 'automatic taxonomy discovery and adaptive thesaurus learning'. Quantitative frequencies in Table 1 supply relevant information on the (*implicitly* intended and understood) meanings that social science authors attach to *values* in the studied journal. *Leximancer* output of concepts related to *values* for the years 1990–2009 offers hits ranging from a frequency of 4006 to 277: *experience*, *school*, *family*, *individual*, *community*, *relationship* and *social* values. The software identified 1556 references to *values* in all. The lowest number (67) was for the years 1990/1991 and highest number (254) was for the year 2007, presumably because the majority of articles were issued during the latter years. Alternatively people have become aware of their values over the years.

*Leximancer* is a mysterious and productive interpreter of the data; first because some results appear out of the blue and second because the output is inspiring. Automatic-semantic software logics for qualitative data analysis resemble SPSS automatic-numerical logics for quantitative data. There is, however, a reference point to the hidden software process. Table 1 illustrates *Leximancer* operational logics (relevance) of *values* linked to major concepts.

Table 1 provides the balancing of frequencies and 'relevance' of concepts related to *values*. It is a reasonable ambition for the researcher to reconstruct the hidden logics of the programme for doing so, offering, in our case, a trajectory of how *values* and *experience* possibly go together. Already at this stage of the process, *Leximancer* gives direction as to where further research should go.

Operational software processes are transparent for *Concordance* and *Atlas.ti* but they are hidden for *Leximancer*. Output, i.e. quantitative frequency tables, is similar, again, for *Concordance* and *Atlas.ti* but different for *Leximancer*. So, while *ATLAS.ti* and *Concordance* have a basis in linguistics, *Leximancer* is based on 'unsupervised semantic mapping', an algorithm originally developed for analysing advertising and PR (Fisk et al. 2009). The software has been deployed to minimise

Table 1. Ranked concepts based on 'like' words.

Words	Count	Relevance
Experience	4006	40%
Social	277	28%
School	2597	26%

human error in the navy, to evaluate media reporting and to assess on-line discussion groups. The time taken to sift the selected passages of text is infinitesimal when compared to using the semantic-lexical approach of *Concordance* and *Atlas.ti*. But learning about values by means of software generated *quantitative* data is a quick fix procedure of limited value. We need to conduct a matching *qualitative* data processing operation.

### *Experience and values*

Educational research needs to focus on emerging global ethics. In doing so, there are methodological options for gathering, categorising and structuring empirical data. Expected outcomes cover: (1) validation of values, (2) value directions (e.g. Self-enhancement vs. Self-transcendence), (3) value categorisations, (4) identifying values, and (5) value descriptions. The results of our study indicate what (3) characterises values and what would be the proper method for (4) identifying specific values related to a certain context.

As it often happens in applications of basically mixed methods (Niglas 2009), the character of one output starts a chain of reactions for the researchers; i.e. one finding leads to the search for another. *Leximancer* was the only software indicating *experience* as a high frequency key word related to *values*. Therefore we need to provide a feasible explanation to the software generated combination of *values* and *experience*.

In summing up the first run of the software, *Concordance* output of data appears as a *grammatical* 'semantic field mind-map' of concepts qualifying *values*, e.g. *Western, shared, core* and *family*. Near synonymous key words are *goals, ethics, norms, attitudes, interests, beliefs* and *biases*. The odd man out would be *system* and *working practices*. For *Atlas.ti*, output data appears as an *intuitive* 'semantic field mind-map' of concepts related to *values*. Also, the *Systemic-regulative* category in *Atlas.ti* matches the *systems* category in *Concordance*. However, output data for the latter defines *Social Science* as a distinction between *objective-truth* values and *religious-moral* values. *Leximancer* output data appears as a *creative* 'semantic field mind-map', made up of key words, frequencies and relevance (Table 1) related to *values*, e.g. *experience, social, school, family, relationship, community* and *individual* values. Put differently, the format for software output of the data offers an opportunity for mind-mapping. We would like to learn how the *TQR*-authors define *values* based on *experience*. We wish to learn what would be the software *and* the analysts' rationale behind the combination. Figure 2 is a synthesis of the CAQDAS output, focusing on a transversal indicating a coupling of *reflection, experience* and *values* with *Western, shared, social* etc. values.

The south-west/north-east transversal in Figure 2 is part of a dynamic model over how *reflection, experience* and *values* are interrelated processes and outcomes. Compared to the static transversal of values in Figure 1, this dynamic model holds

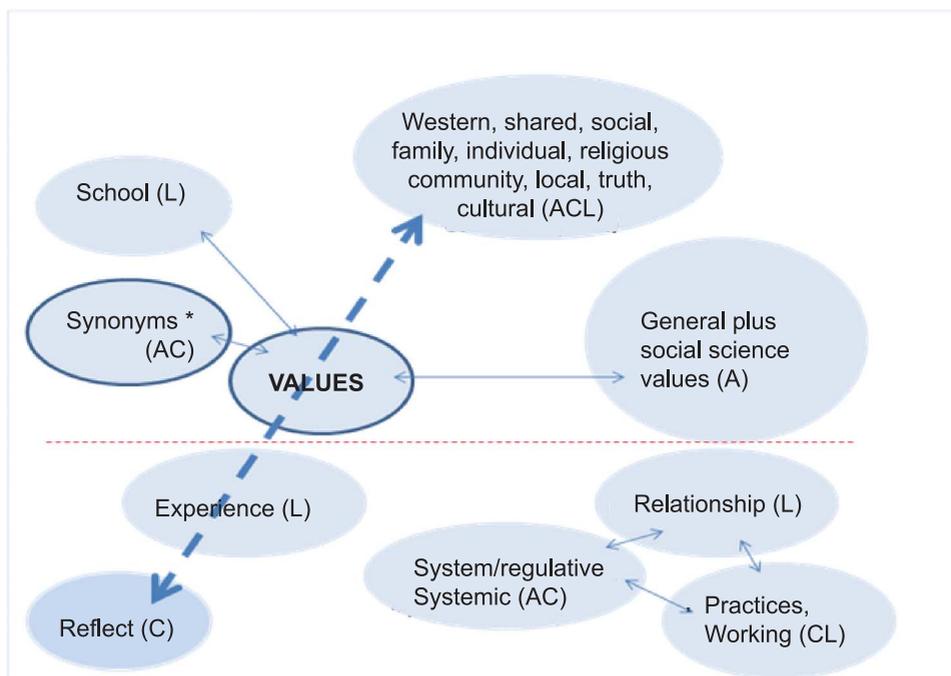


Figure 2. Synthesising *Concordance* (C), *Atlas.ti* (A) and *Leximancer* (L) results.

more to it than an assumedly coincidental combination of software generated output. In Figure 2 we presuppose an input action by an initiator/agent/subject/ in a social system of acting-communicating-interacting people. If the input is significant, people reflect over new pieces of information. After reflection the subject transforms the original input/action into individual experience. Depending on the quality of people's individual – or lived – experience, the 'contents' of the transformative process among comparatively stable values provides a supporting recourse, helping people's *logically* driven (1) values formation, their *socially* driven (2) values conformation and *needs* driven (3) values confirmation. This primary result motivated a second run on the data, more specifically the result inspired a search for needs driven (3) values confirmation between software reported data and real life perceptions.

Finally, there must be some input/action to a social system of communicating and interacting people. If the input is significant people tend to reflect over the new pieces of information. After reflection the input/action becomes an individual experience. Depending on the quality of their individually 'lived', i.e. first-hand experience, the 'contents' of that process helps people, maintaining 'cognitive balance' in naturally occurring and dynamic (1–3) processes.

### ***Individual and collective values***

Now, contrary to *Concordancer* and *Atlas.ti*, *Leximancer* produced yet another interesting result as we changed output format into graphics. The software highlighted *Individual* for the year 2002-corpus – a result which inspired an in-depth and detailed complementary analysis of *values*. And as a consequence, we conducted an inter-rater reliability test of the output. Find the overall 'values-landscape' in Figure 3. It is worth

noticing that here output consists of key words rather than as than grammatical (adjective) qualification of values.

Figure 3 illustrates a significant peak in the distribution of values for 2002, but it also hides some facts. In processing *Leximancer* data on a *Microsoft Excel* spreadsheet, we discovered that from 1990 to 2001 the relative frequency of extreme collective (i.e. social, community) values was at a higher level than extreme self-centred (i.e. individual, personal) values. But from 2002 to 2009 the opposite was the case – the relative frequency of self-centred values was at a higher level than collectively shared values. And even more stunningly, in the year 2002, there was a remarkable shift in the distribution of values; 60% of all self-centred values (2002–2009) appeared that year. For the year 2002 alone, 74% of all values were on the individual side.

Put differently, after experiencing a threat from the outside so clearly beyond individual and collective control, the static transversal in Figure 1 and the dynamic transversal in Figure 2 together help explain (a) the direction of change and the (b) functioning of the change of values. Generally speaking, US citizens take on board, cherish and embody individualistic (Self-enhancement: power, achievement) values. According to this study, after 2001 the strengthening of such values is exceptional.

### Individual and societal values

During the inter-rater reliability test we deployed a 10-step (1–10) individual-collective scale for a second run of qualitative data analysis. In order to illustrate the coding procedure, find an illustration from the 2002 cohort:

An in-depth examination of their utterly different cultural behaviours showed that these behaviours served different cultural intentions within each culture reflecting their particular *sociocultural* values. An anthropological Grounded Theory methodology was used to develop a *three-construct grounded model* of different values, which emerged from observations, and analyses of these different cultural behaviours. (emphasis added)

The authors of this article interpreted-classified-coded values for this example as *sociocultural* (= class/cultural values) plus *different values* (= scientific values). The objective of our analysis at this stage was to try and find an explanation to the software

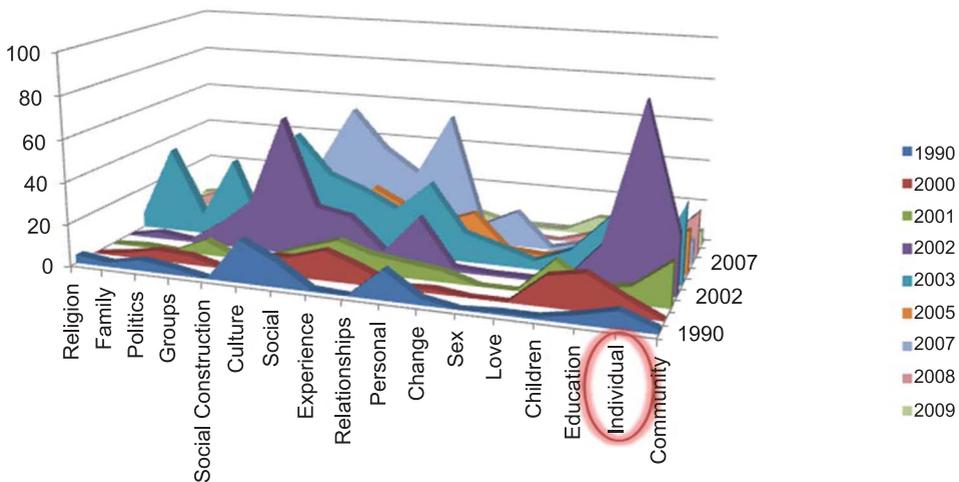


Figure 3. Thematic variation related to values.

output by searching our mind, memory and morals: What inspired the authors of the studied articles to emphasise self-centred values, in the year 2002-corpus? One option for analysing this fact would be to reconstruct *Leximancer* operations by grouped relations between semantically related lexical concepts, as given in Figure 1. This would be a much too intuitive approach. A more valid option is Hansson's (2010) *Self-enhancement and Self transcendence value directions* translated into a difference between self-centred (individual, personal) plus collective (social, community) where individual values contain *Achievement and Power* and where collective values cover *Universalism and Benevolence*. A third option would be mind-map specifications of values and the finally chosen was an intuitive 10-step ordinal scale.

In classifying degrees of individuality vs. collectivity embedded in the *TQR*-authors' use of values there is a quantitative and a qualitative dimension to consider; the quantitative dimension covering the number of people sharing certain values and the more subtle qualitative dimension covers individual-personal-private and collectively shared public values. Without discussing the details, we operated an ordinal scale ranging from the most individual (1) to the most collective (10); basically signifying the number of people sharing certain values. Then, after a peer review coding process, we reconstructed the qualitative contents for each numerical value: (1) subject, (2) family, (3) partners, (4) team, (5) guild, (6) club, (7) organisation, (8) institution, (9) nation, and (10) global.

First we classified the sentences that the software picked out for us and then we argued and commented on our classifications. Each author individually rated – without any pre-conceived, particular or explicit values categorisation in mind – the 102 sentences containing *values* that *Leximancer* had selected for us. We used an ordinal scale ranging from 1 (individual) to 10 (collective) plus 0/blank (unable to categorise). Then we compared the (95% inter-rater agreement) result on the unsupervised *Leximancer* generated Query: 'TAG:FILE\_2002txt AND WORD: *values*'.

Find examples of some of the texts we coded with high inter-rater agreement. There is, however, one exception where we failed to reach an agreement: (2002txt~4.html/1/1\_1611) 'In other words, all may have a sense of duty, but not all may make decisions that are based on seeking justice. And each situation potentially calls for a different set of values.'

*Individual values* (+1) (2002txt~3.html/1/1\_1239): 'Studies of negotiating skill, communication ability, clarity of goals and values, and even stress tolerance have attempted to provide a better understanding of the social competence of leaders who carry out successful transactions with a followership (Birnbaum, 1992; Schein, 1985; Willmer, 1993). However, these studies of the psychological traits of leaders do not look at academic deans, let alone education deans, but rather at top-level leaders in academic settings or leaders outside of academic settings.'

*Intermediate values* (+5) (2002txt~12.html/1/1\_4760): 'I believe the qualitative inquiry process reflects the values of social work theory and practice far better than the quantitative model. It is not abstract, but fleshed out.'

*Collective values* (+10) (2002txt~8.html/1/1\_3322): 'In different cultural contexts, however, other behaviours may be available to serve these same values. In sum, the theoretical significance of the four-construct explanatory model is that it has been framed in terms of etic constructs (through rigorous in-depth interpretive analysis) and emic values (by semiotic sign consistency) so that the data could test the empirical validity of the model in the Fiji context whilst the model itself would be generalisable to other multi-cultural contexts (Coffey and Atkinson, 1996).'

An inter-rater reliability test for the year 2002 show that A-rater's classification (mean 4.5) deviated by more than two steps from the two-person majority on 10 occasions; B-rater (mean 3.1) failed to form a majority with A and C on *three* occasions; and C-rater (mean 4.7) formed a one-person minority on *seven* occasions. The average for all the raters is +4; quantifying *Leximancer* output on the 'Individual' side of values. Table 2 below summarises our qualification (italics) of individual values for the studied texts and authors.

The contents of Table 2 suggest that, as the inter-rater average is +4, there are individual in group values at play in the studied articles. Foreseeable solutions (achievement) should be based on individual power in a familiar setting among a limited number of relatives in a tight group. This result modifies the extreme *Individual* stand on values which the *Leximancer* single word output suggests.

### Validity of data and results

In testing the validity of our qualitative analysis we have come to some conclusions. There were 102 sentences to start with and focus of the next step of the analysis is on 10 of them (3, 5, 13, 23, 39, 40, 42, 69, 70, 93). Also, our ordinal scale is restrictive and some sentences fall outside the categorisations. Hence there is a need for a waste-basket category of sentences containing *values*, the reason being that they caused low or failing inter-rater agreement. We had to qualify those examples by negotiating and arguing complementary qualities to values, i.e. other dimensions than those considered in Table 2.

In acting as raters we tended to understand the journal authors as a homogeneous group. But we might just as well have focused on a singular author representing the whole group. So we may interpret both an individual and a collective bias in the few cases that the author seems to cover both aspects in one sentence. Another problem is that standard language use allows for two readings between world view and values taken together on the one hand and scientific analysis on the other. This makes it hard for the raters to conclude about the author's intentions; we face the problem of deciding between ambiguous versus double meanings. Does the author refer to a collective of social scientists sharing an understanding of a social science theme or does s/he illustrate an individual peer's unique ability to create and convey meaning in an isolated sentence? Sometimes the author seems to be thinking of inherently objective methods and data (= the larger community). At other times, s/he seems to be thinking of collective/objective vs. subjective/qualitative data, arguing that interpretation is an individual activity and language understanding is a collective convention, a public agreement. Finally, the wider social context decides the rating, e.g. in an extract of text where the authors are looking at the moral dimension of leadership. There is variation in the degree to which respondents provide evidence of more than one value in

Table 2. Dichotomised optional values categorisation for the studied cohort.

Individual (Self)	Collective (Other)
Achievement- <i>power</i>	Universalism-benevolence
Individual- <i>individual in group</i>	Organisation-institution
Private-personal- <i>family-group</i>	Cultural-national-global-collective
Subject, family, partners, <i>team</i> , guild, club, organisation, institution, nation, global	

responding to an issue. The problem for us is to interpret how everybody feels a sense of duty based a number of values, but at the same time accounting for the fact that very few people make decisions based on a specific value, e.g. in their search for justice. With the breach of a legal contract, there are four possible ways of understanding the functioning of values: a contract must be honoured as an agreement; consequences should follow if somebody breaches it; there is a need to protect society and individuals from the legal but harmful effects of a poor contract; and there should be a fair and balanced outcome for all parties.

### **Discussion: lone rangers or brothers in arms**

Before and after 11 September 2001 social scientists intuitively seem to have deployed social construction as a means to study what happens to people's values in times of distress. But also, statistics show the biological effects of 'collective sorrow' as indicated by a large number of aborted male fetuses. Greenberg et al. (1990) conducted experiments on terror management, finding that threats to people's lives tend to unite peers, but also distance them from those who hold different world views. Giroux (2003) assumed that the attack triggered collective patriotism as well as individual egoism. Faludi (2007) describes US citizens' psychological response to 9/11 in terms of 'cowboy swagger' vs. 'female frailty'. Littlefield (2009) studies US anxiety, fear and guilt plus deception, truth and deviance in the aftermath of the attack. In short, it is a familiar theme for social science researchers to study people's reaction to events that threaten their lives, their worldview and their values.

In times of extreme distress – which was the case after the attack on the Twin Towers – most people seem to react in either of two ways; they think 'every man to himself' or 'let's co-operate'. These categories of people intuitively express either individualist or collective values. A third category of people seem to become introvert, passive, placid, paralysed and reluctant to take action. However, our analysis of the software-generated data explores the inner voice in authors who take a stand by composing articles on social science themes. Thus they intuitively include, express and transmit their personally held values.

### ***Summarising the results***

The functioning of CAQDAS software proved to be an interesting study in and by itself. Each package was designed for the study of a large corpus of data with its own internal algorithm to deliver background data for further analysis. *Leximancer* produces results without manual supervision, highlighting aspects in the corpus that did not show up in the others. Without researcher intervention the software identified a number of concepts and interrelationships. The caveat is that while the software presents mapping and relational data, the researcher's skill in interpretation is the key to successful research.

Quantitative software and qualitative researcher analysis of the studied corpus enabled for research to draw conclusions about people's values. Analysis of the chosen corpus of social science articles verifies the validity of Schwartz's (1992) and Hansson's (2010) globally held value direction of (individual) *Self-enhancement* and (collective) *Self-transcendence*. There is a dramatic change over the years (1990–2009) in how social science authors use *values*.

We applied a valid strategy (for a single study) deploying the software; zooming in on qualification of *values*; and explaining the software generated relation between *experience* and *values*. We also explored (research questions) related to *individual/collective* dimension combined with *values*. Whatever the authors' of the studied articles try to convey to the readers comes through because of contextual (*logos*) cues. After the national trauma of 9/11 2001, US-citizens seem to stick to individualist 'winner takes it all' worldviews, relying on their individual ability to relate to other people in groups rather than closing ranks with their brethren at national level.

### **Implications for future research**

Software analysis on a sample restricted to social science research articles provides guidelines that could be valuable to students of cultural or social subjects who wish to examine their own and other people's associations plus accompanying discourses related to individuality and citizenship.

### **Notes on contributor**

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