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CODING THE DATA USING ATLAS.TI IN THE QUALITATIVE ANALYSIS OF CONCEPTUAL METAPHORS

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ABSTRACT

The integration of Computer-Aided Qualitative Data Analysis Software (CAQDAS) in quantitative research hardly requires a case to be made. Quantitative researchers exuberantly avail themselves of the plethora of digital platforms which assist in sifting through the data and computing measurements and frequencies. Qualitative research, however, does not garner such a unanimous embrace of computer-based technologies. The use of software is primarily designed to code the data. In this paper, we address the particularities of qualitative research, especially the qualitative analysis of conceptual metaphors (Lakoff and Johnson, 1980). We look into the perils that surround the coding of the data in qualitative research, and whether these perils are surmountable. Amongst the variety of digital platforms that assist in qualitative research, we zero in on Atlas.ti showing its merits, and how it could be optimised for the study of conceptual metaphors. We detail different coding types, how they are used cyclically, and how they add more depth to the analytic operation. There is a fine line between automating aspects of the research process and maintaining a commanding omnipresence over the investigation which the researcher has to tread. We provide theoretical considerations behind the utility of coding the data through Atlas.ti and practical applications of the features that it puts at the disposal of the researcher.

1.0 INTRODUCTION

To code or not to code the data in qualitative research is a soliloquy that troubles researchers as both options make solid cases. The non-numeric particularity of qualitative research, as opposed to its quantitative counterpart, occasions a number of worries susceptible to divest qualitative research of its essence should its data be unfittingly converted into code (MacLure, 2013). While the perils surrounding data conversion into code are legitimate, they can still be avoided, rendering the act of coding an opportune phase in the treatment of the data. Coding can be done manually or through the use of Computer-Aided Qualitative Data Analysis Software (CAQDAS). The use of digital platforms is meant to assist the researcher in maintaining control over the data. The researcher's involvement is not substitutable by software regardless of how performing it is. The qualitative analysis of Conceptual Metaphor in large corpora can be implemented in a number of ways (Stefanowitsch, 2006). We propose one of the models presented by Stefanowitsch (Ibid). It consists of designating a token and tracking its occurrences throughout the entire corpus. Only the metaphorical uses of the token are recorded. Then, it is broken down into source domain and target domain. These are studied to get to their underlying conceptual metaphors (Lakoff and Johnson, 1980). The analysis of the retrieved conceptual metaphors is prone to create pathways and meshes of interconnectedness.A number of digital platforms offer useful features that align with

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Stefanowitsch's model of researching conceptual metaphors in sizable data. Atlas.ti is a piece of software which is built on four distinct principles that make it align with the selected model of metaphor study (Konopásek, 2007). The platform offers practical features open to expedite the investigative process. The coding operation is circular by nature. The data are repeatedly processed through three recurring types of coding: open, axial and selective. Every coding cycle brings about supplementary elements of meaning, and warrants changes in the tapestry of the code.

1.1 Reasons for Coding the Data

Coding is a transformative action. It converts the initial text into new output referred to as code (Linneberg and Korsgaard, 2019). This code displays hidden bits of meaning. It is an important phase that precedes analysis. The analytic work that the researcher performs engages the code, and not the initial text. Coding could be done in a variety of ways. One can only use a pen, paper, and some coloured markers if the data are small in size and accessible in terms of complexity. When dealing with larger corpora, though, the use of software accelerates the workflow. Yet, there are some pitfalls that come with automation like downplaying the importance of the researcher's immersion in the data, producing mechanical codes that lack the intuitive human touch and prioritising speed over accuracy (MacLure, 2013).

MacLure warns against a number of perils surrounding even the act of coding the data even manually (2013). The first criticism of coding about which she raises concern resides in the oversimplification of intricate phenomena. Qualitative research transcends the mere matter of measurements and statistics. However, the process of coding might debilitate the essential component of complexity when every bit of language is reduced to the simplest units. The second strand of criticism MacLure points to concerns jeopardising the inductive nature of qualitative research. She argues that while qualitative research is predominantly inductive, meaning that theories, patterns and findings should emerge during the analytic process, compartmentalising the data through the creation of codes could compromise induction. This happens when the researcher forces elements of meaning into the categories she overlays on the data, and when she discards pieces of the data that do not fit into any of the created categories, especially when these pieces are not numerous enough to warrant the emergence of a new category (Ibid). Thirdly, Coding through the extraction of categories, patterns and themes is susceptible to influence the researcher into indulging her own positions and biases. The process of coding could entice the researcher into letting some of her propensities overflow into the research.

While all of MacLure's warnings are legitimate, the problems are not inherently embedded in the process of coding itself. They are connected to some aspects of malpractice on the part of the researcher. Hence, caution coupled with constant reflection are amenable to shield coding from its surrounding pitfalls.

While Computer-Assisted Qualitative Data Analysis Software (CAQDAS) offers numerous possibilities to automate aspects of coding, it does not replace the hands-on involvement of the researcher herself. When the researcher is omnipresent over the coding process, is self-reflective and aware of the problems that MacLure enumerates, coding can deliver useful analytically exploitable outcome (Pierre and Jackson, 2014). Furthermore, the development of research over the past few years has integrated into the theory mechanisms that ensure a

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continuous practical approach which keeps the researcher alert and actively involved throughout the process. So, before we get into the different types of coding the researcher uses, it is important to indicate why coding is advantageous, and how it improves the analytic project. First, coding changes completely the researcher's approach to how reading is carried out. The way one reads a book for sport is different from the way one reads a book which one will be tested on or a book one wants to debunk. Reading with the aim of creating code is a unique type of reading. You stop at every string of meaning, and dig under the apparent for some under-the surface meaning. It takes more time, and requires a different skill-set. Second, it compartmentalises the data which makes their consultation simpler and more accessible than when one is dealing with a compact book. This can be extremely helpful when working on large texts where meaning is intertwined. The analytic process could stretch over a long period of time, and it is hard to go back to the text and pinpoint where a certain idea is located, but when one creates categories and groups, one knows exactly where everything is. Third, coding creates a backbone that the researcher fleshes out with meaning relevant to her aim. Researchers do not approach texts to study everything about them. Research is selective, and texts are large worlds that must be zeroed in on. One of the merits of coding is that it trims the data into only the elements that are relevant to what is being researched. Fourth, rigorous coding avails qualitative research with an arsenal of features that repel much of the criticism which is usually levelled at it. Much of this criticism stems from the potential overflow of subjectivity.

2.0 THE INTEGRATION OF COMPUTER-AIDED QUALITATIVE DATA ANALYSIS SOFTWARE (CAQDAS) IN RESEARCH

Large qualitative data resolutely favour the use of digital platforms in coding. This does not mean that manual coding is not a viable option, but the significant advantages that digital-coding proffers makes it a vital addition to research. There is a plethora of digital platforms, and qualitative researchers do not dither in availing themselves of these. Before selecting which platform to use, it is necessary to consider what it exactly adds to the research, and whether there are any perils of which the researcher should be wary. There is the factor of the size of the collected data. When the compiled corpora are small, they can be easily controlled and sifted through manually. More sizable corpora pose problems of time, focus and retrieval. When the data are large, and the researcher laboriously conducts manual analysis, the likelihood of error and lack of concentration naturally increases (Lewis et al., 2013). Smit tracks the emergence of computer-based data analysis software starting from the middle of the 1980s (2002). He describes how the first platforms offered only rudimentary possibilities like grouping lines of texts together, colouring parts of the text and adding titles or annotations to selected texts. Newer iterations started to incorporate more useful features that researchers welcomingly availed themselves of. Qualitative theory building is successfully implemented through the creation of networks where different nodes represent concepts, groupings, categories, themes and where the relationships between all these elements are visually represented. These relationships can be vertical, horizontal, triangular or in any geometrical shape. If we were to generally categorise the types of data-analysis digital platforms offer, we would end up with two categories. The first one includes platforms that permit basic intervention in the data. The second category includes platforms that allow the generation of codes, and ultimately the building of theories.

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2.1 The Reasons behind Using Atlas.ti

Ranging from opting for Microsoft Word to building one's own platform, if one has the coding skills, the possibilities to integrate software into research are vast. Fortunately, those two extremes are not the only available options. There has been an emergence of different platforms designed to be used in qualitative research. They all have strengths and weaknesses, and it is based on these that the researcher gets to choose the most appropriate piece of software for the type of research conducted. Some of the platforms that are customarily used in qualitative research are Provalis Research Text Analytics Software, MAXDA Nvivo, Atlas.it, Dedoose and Quirkos.

It is important to stress that no digital platform is capable of doing the analytical work the researcher is set to perform. What digital platforms do is accelerate mechanistic manoeuvres that would drain much effort from the researcher should they be performed manually. Atlas.ti offers a set of features relevant to the study of conceptual metaphors (Lakoff and Johnson, 1980). Firstly, there is the possibility to tag specific PDs (Primary Documents). Hence, one of the first functions that Atlas.ti makes available is the creation of primary documents that include only the relevant chunks of data. Those PDs can themselves be grouped under specific categories which in the terminology of Atlas.ti are called "Hermeneutic Units". These units group together portions of data from different sources. Secondly, as useful as the creation of PDs is, they still can present the researcher with large segments of text, and this is where the feature of "quotations" within the PDs is useful. It allows the researcher to highlight particular sections within the primary document, thus providing further focus, and ease of access. Quotations could be used to group linguistic metaphors whose source domains emanate from the same conceptual metaphor. The quotations remain traceable to the original PDs. Thirdly, the feature termed "Coding" in Atlas.ti creates folders that comprise different "quotations" which have something in common. For example, having all metaphors that anthropomorphise an abstract concept under one code, and only one click away is an important quality-of-life improvement that saves a lot of time and efforts. The importance of the creation of codes is not merely organisational. They can be used in a variety of ways that suit the researcher's purpose.

2.2 The Four Principles of Atlas.ti

There are four main principles that Atlas.ti puts at the disposal of the researcher, and they are: “exploration, visualisation, integration and serendipity" (Konopásek, 2007). Exploration is inherently present in any tool that allows the examination of data. The fact that the platform allows the examination of data is self-evident, and does not require much explanation. The principle of visualisation that Atlas.ti offers is of paramount importance. Even with less demanding types of reading than reading data for the purpose of research, the reader frequently underlines certain words, phrases or sentences. Sometimes, the reader follows up on her thought, by writing a short remark next to the underlined text in as much as the physical properties of the physical page allows. Sometimes, this thought is discarded. Atlas.ti offers extensive possibilities to visualise every emerging thought that the exposure to the text triggers. These interventions can range from simply underlining, to highlighting, to annotating, to memoing or writing comments. All these thoughts that the researcher has while examining the data can be visualised, and are accessible at all time. In the analysis of conceptual metaphors, the researcher can visualise all the elements that are mapped from the source domain of the

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metaphor into its target domain. Visualisation gives the researcher more control over the data even when they are large, and it allows her not to miss any sudden epiphany.

Integration is a key principle in expediting the workflow. It refers to the wide possibilities of retrieval that the platform allows. After the elicitation of codes, these codes can be retrieved in a number of ways. They can be grouped together or embedded in different types of visual templates. Another type of integration the platform offers is the possibility to combine textual, video, and audio files. One fascinating feature is that researchers who work on audio, and visual data no longer need to transcribe them. The feasibility of the integration of different types of data is commanding, and it opens up numerous possibilities for different types of research.

The principle of serendipity is the most important added value that Atlas.ti brings to the analysis of the data. To begin with, it is useful to define serendipity before placing it in the context of qualitative research. The word was coined by Horace Walpole in 1754. He derived the noun "serendipity" from an ancient Persian tale known as "The Three Princes of Serendip" (West, 1963). Succinctly put, it is the story of three princes who in the pursuit of more wisdom embark on a journey. They roam the land, and use the power of observation to discover connections between what appears to be random to ultimately make penetrative conclusions. It is something that we see galore in Conan Doyle's 1892 fictitious story of Sherlock Holmes. So, in the same way Holmes enters a crime scene and sees patterns and pieces of evidence that he connects while another less discerning observer sees nothing of the sort, the researcher immerses herself in the data, and picks up themes, patterns, categories and tropes that are not visible to the untrained eye. In short, serendipity is the capacity to use scattered and random elements of meaning to construct a logical story.

In qualitative research, serendipity is the ability to generate theory from data. This squares well with the inductive nature of qualitative research. So, while the deductive approach requires the researcher to start with a theory, and to try to either confirm it, or refute it through the analysis of the data, the inductive approach synthesises a theory from the analysis of the data. This shows how serendipity symbiotically fuses into the inductive aspect of qualitative research. Let us consider these two situations. The same data could be studied by countless readers who do not recognise any overarching theory providing the substratum upon which the data are built. Yet, when qualitative researchers analyse the same data, they unearth underlying theoretical substrata. One of the things that set apart the two groups who engage the same data is serendipity. By virtue of serendipity, the researcher creates bridges and networks between elements of meaning that appear to be unlinked.

This analytic skill of establishing links between seemingly unconnected elements is honed through reviewing existing literature. By dint of reading research that displays how networks of interconnectedness exist underneath the surface of the data, the researcher acquires mechanisms and reflexes that permit her to spot similar relationships. Another serendipous aspect of qualitative research is the emergence of higher-order links. For example, the researcher could initially identify a conceptual metaphor that connects multiple linguistic metaphors, but as research advances a newer, higher-order conceptual metaphor appears, one that groups even more elements. This gives a bird-eye view of a mesh of intertwined pathways.

Atlas.ti is a useful platform that facilitates many aspects of qualitative research. It assists the researcher in maintaining control over large data. It offers the possibility to add codes without

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the encumberance of overloading pages, and it expedites retrieval. The most useful aspect of using the platform, though, is how it sets the stage for serendipity, and the discovery of underlying theoretical substrata.

2.3 Configuring and Using Atlas.ti for Content Analysis

The aim of having recourse to the digital platform Atlas.ti is primarily to convert data into code. In Linneberg and Korsgaard's "Coding Qualitative Data", code is described as a constructed unit that transforms data by ascribing to them new interpreted meaning, and setting them for subsequent use (2019). An explanatory parallel is found in how the title of a poem as data is just one word or a collection of words, but through interpretive strategies, that one word or collection of words gains new meaning. The title of a poem usually encapsulates the main ideas of the poem, or creates intrigue for the exploration of the poem. So, the relationship between the title of a poem understood in isolation, and the title of the poem understood in how it relates to the poem is similar to the difference between data and code. Code encapsulates the essence of data. Hence, through using Atlas.ti, data are converted into sets of interpreted codes that could subsequently be utilised to detect patterns, themes and categories which are used in the building of theory.

Prior to processing the data through the digital platform, the researcher reads them with a research-oriented focus. The designated token or tokens are typed in the search bar, and are tracked throughout the file. Then, the researcher reviews each instance and decides whether the token is used literally or metaphorically. Only the metaphorical occurrences of the token are kept. These sets of metaphors are converted into code using the framework of Conceptual Metaphor Theory (Lakoff and Johnson, 1980). Each metaphor is broken down into its source domain and target domain. These are, then, used to reveal the underlying conceptual metaphors. The processed codes are in the form of conceptual metaphors.

The generated codes are further scrutinised in terms of how they relate to other codes, and whether they constitute higher-order themes. They are compared and juxtaposed to find patterns, connexions, themes, and causal relationships. These networks of associations are, subsequently, used to provide answers to the research questions. The coding of the data through the use of Atlas.ti makes them more propitious to analysis. Sometimes, some seemingly unrelated linguistic metaphors bear similar to adjacently similar codes, and hence are subsumed under the same themes (Linneberg and Korsgaard, 2019). The generated codes are used to rearrange the data enabling the emergence of new themes, and meanings.

Themes could, themselves, be broken down into subthemes that provide further nuance. It is important to note that in the analysis of codes, iteration is key. It is through iteration that theories are built (Srivastava and Hopwood, 2009). The identification of categories, themes, and subthemes is geared towards revealing overarching concepts that pervade through the data. Ultimately, the obtainment of codes, followed by their analysis within the framework of Lakoff and Johnson's Conceptual Metaphor Theory is amenable to escort the research to fruition, and to provide answers to its question.

2.4 The Three Coding Types

The process of coding is transformative. Data are converted into codes that yield themselves to analysis and interpretation. There are three main coding types that allow the researcher to triangulate the data, and to focus the interpretation on different poles (Williams and Moser, 2019). The three coding types are open, axial, and selective (Ibid). Alternating between the three types provides flexibility. It frees the research from linearity, and allows her to exert modification, recalibration, and consolidation. The alternation between the three coding types undoubtedly requires multiple readings of the data. Below is an exposition of each of the three types of coding.

2.4.1 Open Coding

Although all three types of coding are used, and reused cyclically in different stages of the analysis, there exists a hierarchy of coding-types. Open coding happens to be performed in the initial phase. It targets the identification of concepts and themes. Then, it readies them for categorisation. Open coding organises the data under general categorising concepts. Practically, in conducting open coding, the researcher extracts words or expressions that subsume under general concepts. This results in the emergence of general themes under which are grouped elements extracted from the coded data. At this rudimentary level, the generated codes lead to a rearrangement of the data. This initial phase in coding is also called "concept-indicator" (Chew and Eysenbach, 2010). The data are analysed. Themes are identified through the grouping of words that share some similitude. These themes are, then, used to locate general concepts. Efficient open coding is best carried out manually first. After multiple readings of the data, the researcher uses pen, paper, and markers to highlight linguistic metaphors that share similitude, and identify the themes under which these metaphors could be grouped (Williams and Moser, 2019). The main themes are identified manually. Then, qualitative research software, like Atlas.ti, is used to track more metaphors that subsume under the identified themes. The researcher's hands-on verification is necessary to confirm the occurrence of the token is truly metaphorical, and to confirm that the grouped metaphors share analytic similitude

2.4.2 Axial Coding

Axial coding represents a more complex intervention in the data than open coding does. Axial coding studies the relationships between codes. It works on the obtained themes that open coding yields. Axial coding maps networks of relationships between these themes. It operates on the premise that there are higher-order themes that are not accessible through the initial treatment of raw data which open coding executes. Instead of looking into similitude between linguistic metaphors, axial coding looks into similitude between the synthesised conceptual metaphors. If the codes that open coding provides are termed preliminary, those that axial coding generates would be described as core codes (Williams and Moser, 2019). This advanced phase in the treatment of the data requires edification of the rudimentary codes, more in-depth analysis, cross-examination of the data and some reorganisation of themes and their groupings.

The edification of the codes rests upon three main pillars. Initially, the researcher should adopt a clear methodological framework that is compatible with qualitative research and with the researcher's aim in the analysis of the data. In qualitative research, there are both inductive, and deductive systems. Both of them could be used in qualitative research. But there should not be any overlap in the application of either. The researcher designates the type of analysis she is conducting, and keeps it in congruence with the specificities of the system. Therefore, The

preliminary code is subjected to both inductive, and deductive analysis respectively. Deductive analysis starts by identifying a theory, and then assessing its validity through the collection and study of data. The results of the study either confirm or refute the theory. Inductive analysis does not start with any theory to be confirmed or refuted. Inductive analysis studies the data, and the culmination of the study is the emergence of a theory. Axial coding has the researcher submit the themes to both deductive and inductive analyses. This allows a more accurate assessment of theories that have been made about the data, and the formulation of new theories. The culmination of this process explains the reason it is called axial coding. Due to the unwavering rigour in determining the codified themes, the findings of axial coding represent a nucleus, or an axis around which the rest of the analysis is built.

The second strategy that feeds into axial coding is constant comparison. As the term suggests, it is a strategy that keeps the researcher's mind alert to any change the coding of the data might prompt. Alterations, substitutions, and recalibration are likely to result from the act of constant comparison. The third strategy that is incorporated in axial coding is the line by line coding (Glaser and Strauss, 2017). Again, it is another technique designed to maintain steady momentum while engaging the data. The purpose is to actively engage every bit of text that includes metaphorical use of the token. The strategy ensures rigour in the analysis of the data. Incontrovertibly, line by line coding takes a lot of time, and drains much energy. Qualitative data analysis platforms offer possibilities to expedite and to optimise the use of line by line coding. Through the feature of the Coding Library, Atlas.ti allows the storage of all the generated codes in one folder. This enables the researcher to submit only the concordance lines that contain metaphorical use of the token to line by line coding. Within the Coding Library, the software offers possibilities to organise the codes. They can be highlighted, combined or deleted. These possibilities facilitate line by line coding especially when the data are sizable.

It is evident that the three strategies that are used in axial coding coalesce towards imbuing the analytic process with the highest level of accuracy whether it be through actively alternating deductive and inductive approaches to the analysis, engaging in constant comparisons of the previously generated codes and the new ones, or through line by line analysis. This attests to the importance of axial coding, and how it should be error-free as the efficacy of the third type of coding depends on the foundations that the second type lays down. Open coding targets the retrieval of linguistic metaphors and the identification of their source and target domains while axial coding digs up the conceptual metaphors underlying the linguistic ones. It, also, sets the scene for selective coding.

2.4.3 Selective Coding

Selective coding takes all the meticulously generated conceptual metaphors, and organises them into highly elaborated themes, groups, and concepts. It creates timeliness that highlight interconnectedness between the formerly scattered codes. This phase is the final step which reveals how these obtained codes are bound by logic. To use an analogy, the codes that axial coding generates represent sets of Lego blocks, and selective coding shows how these blocks are used to erect an edifice. The edifice in question could be building a theory, constructing a new concept, or deconstructing a fabricated reality.

Qualitative research enables the analysis of phenomena that are not quantifiable. It treads a fine line between studying phenomena that transcend calculating numerical data, and ensuring

validity and trustworthiness. The compiled data are usually varied and sizable. They are analysed primarily inductively, meaning that theories emerge during the analytic process.

3.0 CONCLUSION

Qualitative research permits the study of how theories are built, and it is for this reason that it is useful in the study of conceptual metaphors. In conducting qualitative research, all the above-discussed types of coding (open, axial and selective) are the main tools that allow the transformation of data into codes. These codes are dynamic as they keep changing with every analytic cycle. The purpose of coding the data is the detection of patterns, themes and categories and the reconstruction of how theory is built. All this impeccably meshes with the study of conceptual metaphors. The large size of the corpora, and the iterative analytic process makes it a priority to have as much control over the large data as possible. There is a wide array of Computer-Assisted Qualitative Data Analysis Platforms that put at the researcher's disposal features prone to expedite the analysis. Atlas.ti. is a platform that allows the researcher to code, annotate, and retrieve the data within the software. Yet, every piece of automated outcome has to be manually verified to weed out any misappraisals. The use of software is advantageous, but it does not obviate the researcher's omnipresence over the coding process.

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