FQS FORUM: QUALITATIVE SOCIAL RESEARCH SOZIALFORSCHUNG

Volume 17, No. 3, Art. 4
September 2016

Computer Analysis of Qualitative Data in Literature and Research Performed by Polish Sociologists

Jakub Niedbalski & Izabela Ślęzak

Key words: computer-assisted qualitative data analysis; CAQDAS; qualitative research; Polish sociology

Abstract: The application of computer-assisted qualitative data analysis software (CAQDAS) in the field of qualitative sociology is becoming more popular. However, in Polish scientific research, the use of computer software to aid qualitative data analysis is uncommon. Nevertheless, the Polish qualitative research community is turning to CAQDAS software increasingly often. One noticeable result of working with CAQDAS is an increase in methodological awareness, which is reflected in higher accuracy and precision in qualitative data analysis. Our purpose in this article is to describe the qualitative researchers' environment in Poland and to consider the use of computer-assisted qualitative data analysis. In our deliberations, we focus mainly on the social sciences, especially sociology.

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1. Introduction

The development of modern computer technologies in the exact sciences and the humanities is becoming increasingly more apparent, thanks to the influence of innovative tools (e.g., specialist software) on the research process. Within the past few decades, we have observed the extremely dynamic development of computer-assisted qualitative data analysis software (CAQDAS). The list of available programs keeps getting longer (LEWINS & SILVER, 2007). The first programs were developed by researchers themselves. Nowadays, however, software is created by teams comprising scientists and IT support; many leading programs have already become well-recognised brands around the world. At the

same time, subsequent versions of the programs are being enhanced with new functions that expand the possibilities of the data analysis (SAILLARD, 2011). [1]

With this article, we are inspired by current trends in social sciences being developed in leading foreign centres for decades. We observe a growing interest in the academic and business worlds—in Poland as well—related to the capacities of CAQDAS in designing and performing qualitative research. The number of scholars, scientists, and practitioners interested in leading qualitative research is increasing, as they look for tools they can use in the analytical process. However, the application of such software is still unpopular in Poland, and the analysis of cases of its use indicates that the potential of CAQDAS in the implementation of qualitative data analysis is unfulfilled to some extent. [2]

At the same time, the publishing market in Poland, previously rather meagre, is now hosting new publications devoted to CAQDAS; their authors attempt to describe how particular programs work and present their usefulness within the framework of research carried out in various methods (first of all, grounded theory methodology). Therefore, some efforts have been made to increase the popularity of CAQDAS and legitimise computer-assisted qualitative data analysis, which has not yet been established in Polish science and is not widely recognised among the older generation of researchers. [3]

Hence, in subsequent parts of this article, we raise the following points. First of all, we outline the historical background of qualitative research practice in Poland, along with the earliest cases of CAQDAS application. Secondly, we attempt to describe the Polish literature on this subject devoted to computer-assisted qualitative data analysis. Subsequently, we discuss the results of research carried out on CAQDAS users in Poland. In this context, we are interested in the way Polish scholars perceive or use computer programs and the extent this kind of software has become popular in Poland. Finally, we share the conclusions and observations from our research and analyses, emphasising both the status of CAQDAS in Polish science as well as the transformations taking place, focussing primarily on their causes and the potential consequences of using CAQDAS in Poland. [4]

2. Methodology and Description of Research

Within the scope of research on CAQDAS use in Poland, we analysed literature pertaining to computer-assisted qualitative data analysis. Through conducting desk research, we first of all wished to provide a historical context and place the beginnings of CAQDAS use in Poland in the perspective of general methodological tendencies. Polish literature studies related to CAQDAS are not extensive and as far as we know, we succeeded in discovering all available sources. At the same time, our desk research also encompassed a review of the most significant Polish scientific magazines devoted to social sciences (especially sociology), by the authors of individual articles related to the use of CAQDAS. Consequently, we succeeded in reviewing 1,500 articles, from 2010 to June

2015.[1] Of these articles, only about 9% included information about CAQDAS use by the authors. [5]

Following our desk research, we performed unstructured interviews (PATTON, 2002) with participants of seminars and workshops devoted to CAQDAS (15 interviews),[2] as well as analysis of data from an online questionnaire focussing on qualitative data analysis, completed by Polish academic and nonacademic scholars. Anna KORDASIEWICZ and Karol HARATYK conducted the survey from 1 November to 31 December 2012, completed by 201 scholars. The communication including the questionnaire was sent to academic institutions, research companies, and nongovernmental organisations, as well as to particular researchers in Poland.[3] The main research questions in the interviews and the survey were related to the practice of qualitative data analysis and the theoretical background of such analysis. The interview and survey questions included issues regarding the application of CAQDAS in research; the process of choosing a particular software package; the reasons for choosing CAQDAS and a particular software package; the manner of using CAQDAS in carrying out research projects and its influence on those projects; and any potential limitations of CAQDAS application in research practice. [6]

In our project, similar to that of RODIK and PRIMORAC (2015), we aimed at grasping the ideas and values behind CAQDAS users' decisions and at evaluating them within the scope of their use of the software packages in their research (KARDORFF, 2004; PATTON, 2002; RITCHIE, 2003). Therefore, we decided to use quantitative data, complemented by information obtained through unstructured interviews (FLICK 2004; PATTON, 2002). [7]

In this research, we aim to verify current interest in and use of CAQDAS among Polish scholars. Hence, we were eager to identify the purposes for which

1 We made every effort to locate, as many as possible, articles published in leading Polish scientific magazines from the social sciences. We assumed our field of interest encompassed articles published within the last five years in which the authors stated clearly that the research results were based (at least to some extent) on qualitative research. As the practice of presenting methodological aspects of research (included in a separate methodological paragraph in the article) is common in Polish studies, there was no problem verifying (at a declarative level) whether (and to what extent) the authors of particular publications used computer-assisted qualitative analysis software in their work.

2 The studies referred to individuals who, as participants of workshops and seminars, were interested in acquiring knowledge about CAQDAS. The interviewees included those who already had some experience with such software and those with no knowledge at all in the field. This limitation resulted from our treatment of the interviews as complementary to the information obtained by the survey and review of scientific articles. At the same time, our goal was to use the acquired information to specify preferences, manner of usage, and opinions about CAQDAS; this could only be learned through reference to the knowledge of people with direct interest in the software or who were already using it in their work.

3 We had access to the results of research conducted by Anna KORDASIEWICZ and Karol HARATYK and published (2013) in an article entitled "Between Image and Practice: Diagnosis of the Use of Computer Assisted Qualitative Data Analysis Software in Poland". This research was carried out on an unrepresentative group of 201 people, among whom 28% worked exclusively for a university, 18% exclusively for a research company, and 46% for both, as well as 7% who performed research for other entities, mainly in nongovernmental organisations. Categorised according to sex, 64% were women and 36% men. Among the respondents, 56% belonged to the age group 25–34, another 22% to 35–44, 6% were younger than 25, and 17% older than 44.

researchers use computer software for the analysis of qualitative data, their methods, and the pros and cons—according to them—of using CAQDAS in research practice. [8]

In Section 3, we present a brief characterisation of the historical background of qualitative research practice in Poland, including characteristics of publications devoted to CAQDAS in Poland and analysis of information regarding CAQDAS presented in publications by Polish scientists. Section 4 includes practices (for the use of computer-assisted qualitative data analysis) and certain references to opinions of Polish qualitative researchers on the possibilities and limitations of CAQDAS use in research practice. Finally, we demonstrate discrepancies (between the Polish academic literature devoted to CAQDAS and the practice of computer-assisted qualitative data analysis by Polish researchers) and summarise the results of our analyses. [9]

3. The Historical Background of Qualitative Research Practice in Poland

Our review of the Polish scientific (sociological) literature led us to conclude that computer-assisted qualitative data analysis is unpopular in Poland. The status of qualitative methods is notably better; although they are still less recognised than quantitative methods, confirmations of their use are definitely more frequent than those for CAQDAS. [10]

Here, it is worth describing briefly the history and the most significant events related to the development of Polish qualitative sociology. A highly interesting and elaborate article about this topic was published in *FQS* by KONECKI, KACPERCZYK and MARCINIAK (2005), who presented the main features of Polish qualitative sociology. One of its most characteristic properties is its flavour of "romanticism", as claimed by the authors. Here, romanticism means that a greater stress is put on the individual (i.e., a particular human being) than on the collective level or on structural aspects of societies (ibid.). According to ZNANIECKI (1934), we should first concentrate on empirical facts and data, and afterwards on developing typologies and looking for regularities such as social laws (KONECKI et al., 2005). At the same time, KONECKI et al. make efforts to describe the methodological landscape of Polish qualitative sociology, in which, in their opinion, biographical methods dominated. This is indeed justified, as Polish qualitative sociology was created by such people as ZNANIECKI (1934) and CHAŁASIŃSKI (1938), who used written biographies in their studies. It is worth stressing that qualitative sociology and qualitative methods are being developed in Poland, mainly according to the tradition of Polish sociology established by ZNANIECKI and CHAŁASIŃSKI. ZNANIECKI's classic work entitled "The Method of Sociology" (1934) had significant influence on the development of qualitative sociology in Poland and around the world. We should also mention TUROWSKI and his studies of local communities (e.g., research on the village of Milejów, 1964), or DOKTOR and his research of various institutions and organisations

(e.g., research at the Cegielski factory,[4] 1964). Field research strategy in social sciences was developed, among others, by KONECKI (1992, 1994), who dealt with cultural aspects of workers' activities in industrial enterprises, or KOSTERA (1996), who focussed on cultural and symbolic aspects of organisational life. At the same time, KONECKI, as the first researcher in Poland to perform studies based on grounded theory methodology, also contributed to the development of the methodology of social studies; his book entitled "Studies on Qualitative Methodology Research. Grounded Theory" (2000) has already become a classic publication, referred to by all Polish researchers interested in this approach. This book popularised grounded theory methodology among Polish researchers, who then began to apply it gradually. As one of the first methodological books published in Poland and as a kind of handbook devoted to qualitative research methods, it sparked a search by those interested in CAQDAS in Poland for connections between computer-assisted qualitative data analysis and this research approach. As a result, publications by the younger generation of Polish researchers interested in CAQDAS clearly show their sociological imagination was shaped to a considerable degree by authors such as KONECKI and his book on grounded theory methodology. [11]

3.1 Characteristics of publications devoted to CAQDAS in Poland

Heretofore, only a handful of articles about CAQDAS have been published in Poland. Articles by BIELIŃSKI, IWAŃSKA and ROSIŃSKA-KORDASIEWICZ (2007); BROSZ (2012); BUDZISZEWSKA (2010); NIEDBALSKI (2012); NIEDBALSKI and ŚLĘZAK (2012); TRUTKOWSKI (1999); and WILK (2001) are the only Polish articles we know written prior to 2012, with reference to CAQDAS. A significant breakthrough took place in 2013, when the first of several dozen new publications in the field appeared, including articles published in general issues of scientific magazines, such as those of KORDASIEWICZ and HARATYK (2013) or NIEDBALSKI (2013a) and—a novelty in the Polish scientific literature—in the first thematic issue, wholly devoted to CAQDAS, of *Przegląd Socjologii Jakościowej* [Qualitative Sociology Review] (NIEDBALSKI, 2014a). Since then, monographs have been produced individually (NIEDBALSKI, 2013b, 2014b) and compiled into a book (NIEDBALSKI, 2014c), in which scholars who use specialist computer software on a daily basis present their knowledge, supported by long-term experience. [12]

Over the last few years, CAQDAS themes have started to appear within scientific discourse, as expressed by the establishment of a thematic group related to the concept of computer-assisted qualitative data analysis during the 15th Congress of the Polish Sociological Society, attended by speakers, numerous participants, and listeners interested in CAQDAS themes. The establishment of the group was dictated by a willingness, on one hand, to share individual experiences in the field

4 A company, founded in 1846 in Poznań (Poland) by Hipolit CEGIELSKI, a Polish philologist, industrialist, social activist, journalist, and politician, initially engaged in the manufacture of agricultural equipment. Nationalised after World War II, it became a major manufacturer of marine engines and electric locomotives in Poland.

of CAQDAS use and, on the other, to find and develop a common basis for future cooperation among users of such software. [13]

Furthermore, individuals interested in CAQDAS make individual attempts to develop a coherent policy regarding computer-assisted qualitative data analysis in Polish science—hence the emergence of such activities as initiating work groups, organising seminars and workshops, and submitting joint projects to various institutions that finance scientific research, seldom seen in Poland in recent years. [14]

With all the activities mentioned above, we are able to review the evolution of the process of CAQDAS popularisation in Poland. When adopting a somewhat broader time perspective, we can attempt to identify the stages of shaping and popularising CAQDAS in Poland. Outlining them briefly, the following stages can be differentiated. The first was characterised by the first mention of CAQDAS application by Polish researchers, who used early versions of programs, mainly ATLAS.ti, the first program made available to Polish researchers. This stage took place within the last years of the 20th century. The second stage, which took place at the beginning of the 21st century, was the point other CAQDAS programs appeared in Poland (dominant programs included MaxQDA, QDAminer, and NVivo). At this time, these programs were unfamiliar to a wider circle of qualitative researchers. The third stage was characterised by an increased interest in CAQDAS, especially on the part of the young generation of researchers, although the number of people with experience in this field was still insignificant. Nevertheless, this period involved the awareness of Polish researchers and their knowledge in the field of computer-assisted qualitative data analysis began to grow. All the stages mentioned above and the events accompanying them correspond to only a small fraction of the whole output of Polish science. The coming years may bring significant changes in this regard, leading to greater popularisation of CAQDAS in Poland. [15]

3.2 Analysis of information on CAQDAS presented in publications of Polish scientists

On one hand, while analysing the contents of papers about CAQDAS, we concluded they present a wide yet general perspective on using the software. On the other hand, they are focussed on detailed material pertaining to the application of a given program in the context of research using a specific methodological approach. The first aspect dominates the Polish literature on the subject to a large extent. These papers, which consist of technical analyses written in the form of instructions, also serve to legitimise CAQDAS in the Polish scientific environment, given that CAQDAS and qualitative research methods still occupy only a minor niche in the Polish setting, as the vast majority of researchers use quantitative methods in their work. Therefore, the authors of papers on CAQDAS pay significant attention to the process of "convincing" their environment of the legitimacy of software application in scientific research conducted using qualitative methods. At the same time, the way this software is described and presented by scholars striving to create a positive image of

CAQDAS through emphasising its advantages is another way of legitimising it. In most cases, they encourage the use of computer programs as a way to become familiar with the possibilities they offer, while offering useful hints for beginners as well. Much of the potential of CAQDAS lies in its capacity for facilitating and streamlining analysis, as is confirmed in almost all of the publications being issued in Poland. Simultaneously, one gets the impression that an unequivocally positive image of these programs has been created, in lieu of a critical analysis of their possibilities and practical application. As a result, publications thus far have seemingly focussed on introducing the topic while avoiding any discussion about the usefulness, possibilities, or legitimacy of the use of the computer software. Finally, CAQDAS legitimisation seems to have been achieved to a great extent through demonstrating its connections with the grounded theory approach. Attention is paid, for example, to the terminology of the ATLAS.ti program, which is derived directly from textbooks on grounded theory (BIELIŃSKI et al., 2007) to the genesis of the program and to the fact that the preface in the user's manual was written by Anselm STRAUSS (BUDZISZEWSKA, 2010). A relationship between NVivo functions and the recommendations of grounded theory methodology (GTM) has been sought (NIEDBALSKI & ŚLĘZAK, 2012). The same authors highlight that no connection necessarily exists between selecting a grounded strategy and applying CAQDAS. GTM, as a recognised methodological approach, serves as a guarantee for computer analysis, providing procedures for its conduct (BIELIŃSKI et al, 2007; KELLE, 1997). Recurring references to grounded theory in the Polish literature relating to CAQDAS may trigger a mistaken belief that the grounded approach is necessary to apply when using computer-assisted qualitative data analysis. As a consequence, we are led to believe that these references to GTM appear in the literature largely for strategic reasons, as already mentioned, to legitimise CAQDAS through association with a relatively acceptable approach that systematises qualitative research. This results in a series of similar publications, each of which rediscovers CAQDAS in some way, instead of focussing more on general developments in this field. Therefore, we believe there is dissonance between the one-sided image of CAQDAS in the literature on the subject and its application in research performed by Polish scholars. Following the interviews with researchers using CAQDAS in their work, with reference to data from a survey conducted by KORDASIEWICZ and HARATYK (2013), we attempt to compare this image with the way Polish researchers use CAQDAS and the reasons they use it. We also analyse their perception of the advantages and disadvantages of using CAQDAS. [16]

4. CAQDAS Use and Evaluation Among Polish Qualitative Researchers

In the next part of the article, while referring to our own research and drawing from findings by KORDASIEWICZ and HARATYK, we attempt to verify the general trend toward the application of CAQDAS in Poland. [17]

4.1 How Polish researchers use CAQDAS

In line with our assumptions, the majority of our respondents claimed to use grounded theory. As many as 2/3 of the respondents claimed that grounded theory, understood as a working procedure within QDA software rather than a research method, was a reference point when carrying out research with CAQDAS. Apparently, this stance is a result of the nature of contemporary qualitative research in Poland, whose core is based on grounded theory. However, this stance seems unlimited to Polish literature, since, if we refer to the wider context of CAQDAS development, it turns out that a series of procedures of methodological correctness has actually been derived from GTM (cf. BONG, 2002; BRYDA, 2014; FIELDING, 2012; FIELDING & LEE, 1993, 1998).

> "I don't know, maybe I'm wrong, but when I think about working with a computer program, I immediately think of grounded theory. Maybe it's because in the majority of cases, when I read the Polish literature devoted to CAQDAS, I most often encounter grounded theory. That's why, when I should be applying my research method, I'm still intuitively searching through the program for what I remember from grounded theory" (Int.7, par.5).[5, 6] [18]

The research we conducted yielded a certain view of CAQDAS use in the research of Polish scientists. The practice encountered among qualitative researchers turns out to be the application of grounded theory as a kind of "key" or "manual" used to operate a given program, even though the same researchers admit the studies they carry out are based on a different analytical approach. This is true of program users wanting to gain recognition for their work and especially of "senior" scholars who do not use, or even oppose the use of, CAQDAS in scientific practice. As already mentioned, the connection between grounded theory and computer-assisted data analysis is emphasised by authors (of publications devoted to CAQDAS) who wish to exploit GTM's firm position as a research approach in the Polish scientific environment, so that its connection with computer-assisted qualitative data will legitimise CAQDAS as well.

> "The way things are, if you want to do something in a research project, and you want to use computer software, you also need to think about the people who will evaluate it. Because what I am about to say is neither popular nor politically correct, but unfortunately true: if you want to get a grant or other funds, or you just want your research to be supported, so nobody is able to question it afterwards, you won't

5 All translations from Polish to English are ours.

6 Int. = interview, par. = paragraph number.

> achieve anything without a recognised research method. And since grounded theory is associated by the majority with computer-assisted qualitative data analysis, it's obvious that any reasonable young scholar will refer to that method" (Int.8, par.9). [19]

As KORDASIEWICZ and HARATYK (2013) observed, the majority of researchers for whom GTM served as a significant point of reference (63% of scholars) seem to code using a so-called "starting list" of codes, often without even modifying it in the course of the analysis. While the majority of researchers seemed to code the same fragments numerous times, 35% of GTM supporters were closer to saying they used single data coding, and 49% of them applied codes as a means of finding interesting fragments of data, not as a tool for developing theories.

> "First of all I code, and afterwards, once I have coded the data, I combine the codes and search through the material, because, as I see it, this is the most important aspect. Anyway, I find a computer program useful for this, and the biggest advantage for me is that I can create codes, and then quickly and without any problems reuse them to find the data fragments in the already coded text" (Int.2, par.12). [20]

We also discovered that our respondents used the programs for qualitative data analysis first to code texts (97%) and much less often to work with other types of data. Moreover, we noticed that our respondents, despite using the above-mentioned GTM procedures, often referred to quantitative logics for data analysis. For example, 51% of them used the program to calculate the number of code applications, telling them how often a given code or codes appear in the document, in the material as a whole, or in a selected portion of cases, or to establish the scope of application for the code that tells them what part of the document or documents is encoded with a given code or codes (23%).

> "So I analyse the data in such a way that I try to be as accurate and meticulous as possible, without causing any doubts. That's why I try to base all my actions on well-known grounds. In reality it means that I code the data in detail, and afterwards I compare the fragments coded with a given code and I seek certain similarities or differences. At the same time, in order to determine the meaning of a given code in the analysis, I check the frequency of its presence in all materials. The frequency of a code's occurrence is, for me, the best indicator of the significance that may be ascribed to it in the research" (Int.8, par.5). [21]

Our research indicates that using computer software in data analysis enabled respondents to focus on actions related to searching through the developed database (39%) and coding (37%). The potential for managing code structures and for creating and transforming them freely were highly significant aspects for our respondents (29%). An important theme, one also mentioned by Uwe FLICK (2011), is that CAQDAS enables studies to be carried out through employing various qualitative data and through combining them with quantitative information. Adding this kind of analysis widens the research horizon significantly and may contribute to more extensive research results. In this context, it turns out the selection of a particular program (apart from the previously mentioned connections with GTM and the possibilities offered by particular software in terms

of the respondents' use of GTM's procedures—41%) depended not only on the ability to combine qualitative and quantitative analyses (21%), but also on the freedom to use a database by a team composed of several people (19%) and on the planned budget (18%).

> "Computer software can certainly support researchers in their work. Especially since numerous tasks which traditionally took a lot of time can be carried out with such programs, which is, for sure, an incentive to apply them. But it is also a matter of accuracy and precision of operation, as well as the fact that with a given program you can combine various data, including qualitative with quantitative ... Of course, that's not always possible, as not every program can handle it, but you can always choose one that can manage such a task" (Int.4, par.4). [22]

Therefore, a properly designed computer program may significantly facilitate a researcher's work with certain materials. Operations that had to be carried out manually in the past are now completed faster and more easily, thanks to a computer application. Basic actions, such as coding and searching, have become relatively simple; along with the development of interfaces with other programs, the barriers between user and software seem to have shrunk. These are the CAQDAS assets our respondents appreciated the most. [23]

4.2 Observed advantages and limitations in the application of CAQDAS according to Polish users

At the same time, the image of CAQDAS in the eyes of researchers is considerably more ambivalent than is presented in the literature on the subject. We present its outline below and afterwards deliberate on the reasons for the differences. As it turns out, the theoretical, methodological, and practical effects of CAQDAS presented in the literature on the subject (e.g., making the analysis process more precise and hence more accurate, or its methodological basis and the resulting reduction in labour and time when working with data) are often described with considerably more ambiguity in our respondents' opinions. [24]

The consequences of using CAQDAS, according to the respondents, can be divided into two main categories. The first includes those related to the negative influence of CAQDAS on the methodological effects. This group includes the following beliefs: computer programs "constrain sociological imagination" (27%), limit the researcher's creativity (21%), lead to narrower interpretations (20%), are deprived of context (17%), make it difficult to grasp connections between data (17%), limit analysis to the coded contents (14%), and impose limitations related to the programs' specific internal architecture (9%). [25]

According to our interviewees, computer programs excessively structure and narrow the analyst's field of operation, which is in conflict with the spirit of qualitative data studies (cf., BRINGER, JOHNSTON & BRACKENRIDGE, 2004; LONKILA, 1995; SEALE, 2008).

> "The truth is that, for me, computer programs sort of paralyse the research—at least, I think so. You can arrange, segregate and divide everything, but you lose your flexibility and creativity somewhere. To some extent, the researcher starts working according to what's offered by the machine" (Int.4, par.11). [26]

Some of our respondents expressed a negative attitude towards the imposition by certain research methods of requirements based on options implemented in CAQDAS. Some users (almost 24%) perceived a potential threat in using the software, connected with its influence on the principles and procedures a researcher should follow while conducting research pursuant to a particular method. Moreover, some respondents (nearly 17%) treated the use of the computer program as a research method in itself. This means, for this group of respondents, CAQDAS is somehow identified as a research method on a par with other qualitative approaches. This may prove that Polish researchers' knowledge in the field of CAQDAS is insufficient, or that they incorrectly perceive the significance of computer programs within the whole research process. Often these programs, instead of being assigned the role of a tool, are ranked as a discrete research method.

> "Actually, I keep wondering if you can really put all of the items related to a research method, i.e., principles, procedures and so on, into a computer program without any problems. Do we really preserve the 'clarity' of a researcher's operation by acting in accordance with such a method? Or maybe the fact that I use a computer program makes me create a new method or modify an existing one" (Int.6, par.4). [27]

At the same time, our interviewees noticed a series of advantages offered by CAQDAS. The most frequently mentioned aspects were that these programs lead to improvements in the regularity and reliability of data analysis (27%), provide an opportunity to create visualisations (22%), enable multiple analysis of the same data (15%), enable researchers to create elaborate comparisons of data (11%), and provide an opportunity to grasp context (9%).

> "I'll put it this way: it's a great relief for me to use the software for my research. Actually, I can't imagine how I would carry out the analyses now without a computer. Let's take as an example the ability to record data, or to create connections and interdependencies between codes. These are actions that took plenty of time beforehand, and now I just need to click several times and I get what I wanted" (Int.11, par.4). [28]

Below, for ordering the information above, we present a table with the negative and positive methodological effects of CAQDAS use, as mentioned by our respondents and interviewees.

Positive methodological effects of CAQDAS use	**Negative methodological effects of CAQDAS use**
– improves the regularity of actions undertaken by the researcher – supports greater transparency of the performed analyses – enables direct insight into the analysis process at each stage – gives the analysis a more ordered character, at the same time maintaining sufficient flexibility in the researcher's actions – enables the creation of connections and interdependencies between the data	– imposes certain technical solutions related to the researcher's work within the analysis process – promotes an incorrect belief about the "reduction of responsibility" on the researcher's part for performing certain actions – contributes to excessive distancing of the researcher from the actions performed – causes a feeling of embarrassment and dependence on the technical solutions offered by a given program

Table 1: Positive and negative results of CAQDAS application mentioned by the respondents [29]

The second group of limitations refers to difficulties of nonmethodological nature. They include the previously mentioned high price of programs (18%), the problems regarding the integration of materials analysed by a team (17%), the low quality of visualisations (14%), the unavailability of software in Polish (12%), and the necessity of converting files (10%). This group also encompasses the insufficient popularity of computer programs for analysis in Poland (7%), as well as a lack of developed standards and good practices within the scope of their application (5%).

> "What I personally miss the most is that there are no Polish versions of the programs, because you may know English, but they still use different names in the software, and it takes a while before you get used to them. I presume that this may discourage some individuals from using the program, because not everyone feels okay using a foreign language" (Int.1, par.6). [30]

Furthermore, our respondents emphasised the problem of being overwhelmed by the wide variety of applications and possibilities, especially of the more advanced programs. If a given program is characterised by a long list of functions, which greatly exceeds the needs of the average scholar, the number of available options may be challenging for some, especially for inexperienced users, when using the software for the first time. This elaboration of functions results from the necessity for modern CAQDAS packages to meet the requirements of certain methodological approaches and to fulfil the needs of individual scholars and research groups working on the same project. However, as indicated by further research, the multiplicity of functions sometimes poses a challenge for researchers, who need to tackle the operational scheme of the program and its

internal logic, as well as the nomenclature applied to describe its particular functions.

> "I think that there are plenty of options which a researcher might not need, or use very rarely. I understand that different researchers have different needs, but I still believe that some concepts could be simplified" (Int.8, par.5). [31]

Sceptics, it is worth highlighting, also stress that to use computer software a researcher requires methodological, theoretical competence, as well as knowledge of the specifics and functions of a given program. A researcher who is ready to use a given program is bound to put in some time and effort to become familiar with its capacities. This is especially true for novice researchers who, when starting a project, are often unfamiliar with the specifics of the software they are about to use. In such situations, the use of CAQDAS packages may prolong the preparation of the project (see BRINGER, JOHNSTON & BRACKENRIDGE, 2006).

> "I don't dispute that computer programs may be useful, and I also support them, but I need to tell you that I had no opportunity to learn how to operate them within the course of my studies or while working on my doctoral degree. You needed to sit with the program and manual yourself and learn its operation from the beginning through trial and error. Unfortunately, it's demanding, and you need to spend some time, and if you have too little time for everything, it's not as simple as it may seem" (Int.5, par.14). [32]

Drawing attention to the positive results of CAQDAS application, our respondents emphasised such software leads first of all to speeding up the researcher's work. This general positive feature of CAQDAS, noted by almost 1/3 of the respondents, was perceived in the capacities of computer software, including fast searches for necessary information (including fragments of coded data), direct access to various kinds of data (thanks to, among others, the creation of various data comparisons), and the use of the software as a tool to facilitate data ordering (e.g., through the function of creating various sets).

> "I may not be using the full capabilities of the software, as I tend to limit myself to functions such as searching through the data, but this is the function I, myself, find crucial. Previously, I needed to go through piles of material, and now I just need to complete several actions and I get an interesting result immediately" (Int.12, par.10). [33]

CAQDAS, especially the more advanced programs, provides users with the ability to use various forms of data, such as text, audio, and video materials; some of the respondents (17%) stated this feature is especially significant for them. This group is mostly composed of respondents who combine text with images and other materials in their everyday research work.

> "Text, image and video: this combination seems perfect for me. As a result, I have the opportunity to use all kinds of data. Now I can work on different materials much more efficiently and comfortably than I did previously" (Int.14, par.7). [34]

Below, for ordering the information above, we present a table with the negative and positive nonmethodological effects of CAQDAS use, as mentioned by our respondents and interviewees.

Positive nonmethodological effects of CAQDAS use	**Negative nonmethodological effects of CAQDAS use**
– facilitates the review of large amounts of material – includes functions supporting teamwork – exerts significant influence on actions related to data integration – imposes order on particular actions undertaken by the researcher – guarantees improved protection for empirical materials, through the application of additional data-access protection – improves convenience related to the ability to archive, store, and gather data in a single location (database)	– is associated with a lack of consistency (in terms of format) with some types of data – demonstrates the excessive influence of technology on research, threatening to distance researchers from their own research – poses difficulties in certain situations in terms of adapting the program and its particular solutions to the requirements of a given research project – causes concerns regarding the schematisation of some actions undertaken by the researcher

Table 2: Positive and negative nonmethodological results of CAQDAS use mentioned by the respondents [35]

The results of our research show that a greater number of respondents (65%) noted the strengths of QDA software rather than its weaknesses (35%). Nevertheless, and more importantly, a relatively small number of respondents listed only strong or only weak aspects. Among weak aspects, the respondents expressed opinions on the negative influence of computer analysis on qualitative research methodology (31%), almost as often as they voiced complaints about the nonmethodological limitations of CAQDAS (32%). As for strong aspects, the researchers praised the technical conveniences more often than their positive influence on the quality of the performed research. The basic advantage of CAQDAS in the light of the users' opinions is, first of all, quantitative, not qualitative, in that it enables the faster acquisition of analytical results, which could be obtained without the programs over a longer period. [36]

4.3 Discrepancies between the literature on the subject and the opinions of CAQDAS users

Our research enabled us to answer the following question: What are the reasons for the dissonance between the image of CAQDAS in the literature on the subject and in the opinions of Polish users? [37]

First of all, this dissonance is related to the lack of proper educational program regarding CAQDAS at Polish universities. Half of the respondents who use computer-assisted data analysis admitted they learnt to operate the programs on their own, while a significantly smaller fraction learnt it during classes (17%), commercial training (13%), or from another person (10%).

> "I learnt it on my own ... I didn't get any special help from anyone. There were no computer-assisted analysis classes within my course of studies either. There were some classes on SPSS, but not on programs for qualitative research. That's why first of all I used manuals from the developers, and learnt by trial and error" (Int.3, par.5). [38]

Secondly, it results from time pressure and economic reasons. In this context, it is symptomatic that slightly more than half of the respondents concluded that in their research they consistently apply the directives of a certain methodology—directives described in scientific articles, course books, or recognised in the scientific environment. Meanwhile, half of them denied this, justifying their decision in terms of the financial (23%) or time (18%) constraints of the research. In numerous cases, insufficient financial resources, which made it impossible to purchase a given kind of software, created a barrier to using CAQDAS. In contrast, in nonacademic research carried out by research companies or nongovernmental organisations, financial considerations posed no barrier to using CAQDAS; nevertheless, the directives of a recognised methodology are followed consistently by only 1/3 of the researchers, while 2/3 take a more flexible approach, motivated more often by time (25%) rather than economic (16%) pressure.

> "It's like I simply don't have time to get deeper into all the details of the research method. Of course, everything needs to be done in accordance with principles, but there's this time pressure, that you need to be on time with something, because there's someone rushing you, or you have other things to do that are piling up" (Int.1, par.8). [39]

Thirdly, this dissonance may be caused by gaps in the literature in the scope of existing methodological approaches or by the improper adaptation of CAQDAS to the approaches scholars preferred. The former concerns potential gaps in the presentation of computer-assisted qualitative data analysis in the Polish literature, the latter considerations about the potential for carrying out research in the spirit of a selected research method with the application of CAQDAS.

> "Okay, I may know how to do it, I may understand the rules—but what for, when someone else tells me he does it another way, and he does it right? I'm aware that there is no single way of working, but it is hard to communicate with others when

> everybody does it their own way. It's hard to cooperate like that, to explain or share one's thoughts with others" (Int.3, par.14). [40]

Ostensibly, in the context of any potential transformation of a cognitive character, computer software has an ambivalent influence. On one hand, it increases analytical potential through improving overall operations, shortening procedures, and ensuring compliance and effectiveness, among others, in the process of searching through the data. As GIBBS (2011, p.24) suggested, "in the case of qualitative analysis, coding is a way to arrange data, to manage raw research material. It means that all original data are preserved". On the other hand, its use requires knowledge of research methods combined with computer skills, which, for some people, especially for the older generation of researchers, may create some difficulties. This group of researchers is also characterised by the highest level of scepticism related to carrying out research with the use of CAQDAS. This may be sufficient reason to seek explanation for the slow popularisation of the application of computer software to qualitative analysis in Poland. [41]

5. Discussion

The application of computer software in analysing qualitative materials as common practice among Polish qualitative researchers remains to be inconceivable. Reasons for this state of affairs should be sought in the history of these tools and in their influence on methodological and epistemological aspects of the research (BENTON & CRAIB, 2003). NIEDBALSKI and ŚLĘZAK (2012) are among the authors stressing several significant concepts, which have posed a barrier to the wider application of computer software in qualitative analysis in Poland. [42]

First of all, it must be emphasised that researchers employing quantitative methods have had a predominant influence in Polish sociology. Researchers using qualitative methods constituted a clear minority, which, until recently, was looked down upon in Polish science. Moreover, as already mentioned, despite the rich history of qualitative research in Poland, increased interest in this field has been recorded only since the 1990s. Therefore, quantitative researchers were the first to notice the advantages of using computers and specialist software in sociological studies. As for qualitative research, the introduction of computer-assisted data analysis software began much later. Hence, the appropriate software has not become as popular and is not as deeply rooted in the awareness of Polish qualitative researchers. This might explain the insignificant number of researchers employing CAQDAS and the unwillingness and lack of trust on the part of some of them towards instruments useful in the process of analysis. [43]

The question of differences between generations is also significant. Only in recent years in Poland have scholars brought up in a highly computerised world begun to enter the world of science. For them, computer technology and its possibilities are just as natural to the researcher's work as the voice recorder and careful transcription were to earlier generations (BURSKI, 2014). Obviously, this

does not imply the existence of a strict time boundary dividing supporters and detractors of computer technology in qualitative analyses, especially since the advantages of implementing programs often lead to changes in this critical attitude, whereby the number of scientists using computer software is constantly increasing. [44]

Apparently, Polish researchers who prefer qualitative analysis have reached the point of becoming more open to the use of computer software. The result is the broader application of software in the analysis of various materials. For enthusiasts of the technology, it is clear this might serve as a stimulus to develop the field of qualitative research significantly; for sceptics, it may provoke further heated discussions and arguments with CAQDAS supporters (MILES & HUBERMAN, 2000). Therefore, some doubts may later be the cause of barrier to popularising CAQDAS further. [45]

Additional criticism is indicated in the supposed connections between CAQDAS and grounded theory. However, this can be undermined by pointing out the popularisation of this kind of software is accompanied by an increase in the wide variety of potential applications by researchers representing various approaches and employing various methods (PATTON, 2002). Interestingly, researchers of grounded theory were some of the first—in Poland as elsewhere—to make the effort to implement programs assisting qualitative analysis in their research practices. A significant role in the process may have been played by the general methodological attitude that characterised grounded theory assumptions: to limit the influence of *a priori* premises as much as possible and to rely on induction in research operations (GLASER & STRAUSS, 1967). Theoretical saturation of categories—a principle in itself, not exclusive to research performed by scholars inspired by grounded theory—is based on detailed analysis of the gathered material. One condition for its correct performance is the efficient, compliant, and systematic management of collected data. Here, actions facilitated by CAQDAS are crucial: combing through, coding, and looking for things in the data (BURSKI, 2014; EVERS, 2016). Moreover, with the development of software we can find functions that enable us to expand our range of operations: not only analysing collected material, but also synthesising and creating theories. These operations can be carried out using tools to analyse qualities and relationships within the collected materials (FRIESE, 2010). [46]

Finally, the decision to use software is one of the crucial elements of the process of research preparation, influencing the whole research process. Therefore, one fundamental concept is the high level of self-awareness related to the consequences of using such software. As indicated in the research we carried out, such self-awareness is uncommon among Polish researchers. This is demonstrated by the previously mentioned problems in determining the significance of computer software, which some respondents ranked as a discrete research method, rather than a specific tool. [47]

6. Conclusions

Based on our research, we conclude there is double dissonance in Polish sociology related to CAQDAS: between the image of computer-assisted qualitative data analysis presented in the Polish methodological literature and the image perceived by the scholars who apply it, as well as between the capacities offered by the programs and the way they are applied in practice (cf. KORDASIEWICZ & HARATYK, 2013). [48]

The research results also showed that grounded theory, most commonly applied by qualitative researchers, is often seen as the basic methodology behind CAQDAS and functions more as a way of legitimising qualitative data based on CAQDAS than as an actual research method. The way computer-assisted qualitative data analysis is applied (by those who declare that grounded theory methodology is a significant point of reference) often deviates from the directives of that method. At the same time, the group of responses specifying particular research methods used by Polish researchers who employ computer programs assisting the qualitative data analysis process included discourse analysis, phenomenology, interpretative approach, anthropological approach, symbolic interactionism, and social constructivism. This methodological "dualism" is related to the trend of declaring the application of GTM procedures, while simultaneously resorting to other methodological bases for research; thus, it seems to indicate a certain inconsistency in exploiting a specific research method. Moreover, this behaviour, adopted by our respondents, shows insufficient knowledge or lack of awareness on the nature, manner, and consequences of CAQDAS application. Apparently, such behaviour occurs quite often, not only exacerbating the existing controversies among Polish qualitative researchers, but also making it impossible to adopt a more rational approach to qualitative data analysis, and thus preventing increased interest in CAQDAS in Poland. [49]

Generally speaking, in our research, we have proven that CAQDAS is still applied in Polish qualitative research in a markedly limited manner. First of all, CAQDAS is applied by a minority of qualitative data analysts. Secondly, the functions of this program are applied within a narrow scope. At the same time, the present discourse on computer-assisted qualitative data analysis reflects the dilemmas of Polish sociologists concerning the use of CAQDAS. On one hand, researchers, who use qualitative data analysis software and are enthusiastic about this technical solution, are continually forced to prove the reliability of analysis performed using CAQDAS. On the other hand, computer analysis of qualitative data is slowly being accepted as a legitimised research practice (ibid.). Nevertheless, some concerns may arise regarding the way this process is taking place (as various inconsistencies related to working with computer-assisted data analysis are often observed) and the lack of consistent actions undertaken within this scope. Therefore, it seems necessary to continue to "educate" current and future CAQDAS users, so that in their work based on the use of computer software they can take conscious steps, compliant with methodological correctness, in accord with the research approaches they adopt. [50]

Nevertheless, it must be emphasised that dynamic development in the scope of CAQDAS application is taking place in Poland. This pertains not only to technology but also to such academic disciplines as psychology, pedagogy, or political science. This development is undoubtedly supported by actions promoting CAQDAS in an academic environment, as manifested by increasing numbers of thematic groups and discussion panels organised within the scope of conferences or seminars. Here, it is worth listing events important for Polish science, such as the Sociological Meetings organised by the Polish Sociological Society, or the Transdisciplinary Seminar for Qualitative Research. The latter takes place annually in significant academic centres in Poland, bringing together representatives of various scientific disciplines and creating a venue for the exchange of knowledge and experiences, as well as for undertaking further initiatives to promote the concepts of qualitative research, including computer data analysis. In noting that such actions are becoming increasingly more popular, one can assume they can raise the level of interest in the use of CAQDAS in Poland. [51]

Acknowledgements

We thank all those who agreed to take part in our research and who spent time providing us with precious information. We thank the reviewers for their valuable comments and helpful hints, as well as all those who have been trying for many years to develop the concept of computer-assisted qualitative data analysis in Poland.

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Authors

JAKUB NIEDBALSKI works as an associate professor at the University of Lodz, Faculty of Economics and Sociology, Institute of Sociology, Sociology of Organisation & Management Department. He conducts classes in computer assisted qualitative data analysis for sociology and social analysis students. He is the author of publications devoted to CAQDAS. In his research work he focuses on the problems of social activation, adaptation and inclusion of persons with disabilities, as well as the development of social research methods in the scope of computer assisted qualitative data analyses.

Contact:

Jakub Niedbalski

Sociology of Organization & Management Department
Institute of Sociology, Faculty of Economics and Sociology
University of Lodz
Rewolucji 1905r. Nr 41/43
90-214 Lodz, Poland

Tel.: +48 42 635 52 63
Fax: +48 42 635 53 09

E-mail: jakub.niedbalski@gmail.com
URL: http://soc-org.edu.pl/PL/emp_Niedbalski/cv.php

IZABELA ŚLĘZAK works as an associate professor at the University of Lodz, Faculty of Economics and Sociology, Institute of Sociology, Sociology of Organisation & Management Department. Her research interests are focused on problems of prostitution, escort agencies and female sex work. She performs her research with the application of computer assisted qualitative data analysis. She is the author of several publications devoted to CAQDAS.

Contact:

Izabela Ślęzak

Sociology of Organization & Management Department
Institute of Sociology, Faculty of Economics and Sociology

University of Lodz
Rewolucji 1905r. Nr 41/43
90-214 Lodz, Poland

Tel.: +48 42 635 52 63
Fax: +48 42 635 53 09

E-mail: iza.slezak@gmail.com
URL: http://soc-org.edu.pl/PL/emp_Slezak/cv.php

Citation

Niedbalski, Jakub & Ślęzak, Izabela (2016). Computer Analysis of Qualitative Data in Literature and Research Performed by Polish Sociologists [51 paragraphs]. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *17*(3), Art. 4, http://nbn-resolving.de/urn:nbn:de:0114-fqs160344.