ATLAS.ti
QUALITATIVE DATA ANALYSIS

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Thomas Muhr

INTERPRETING TEXT AND IMAGES

Interdisciplinary fundamentals of qualitative data analysis with ATLAS.ti

Lecture 1:	How the ATLAS.ti project began - Two research paradigms
Lecture 2:	Semiotics - Signs and meaning
Lecture 3:	Phenomenology - Subjective experience and the everyday life-world
Lecture 4:	The theory of communicative action
Lecture 5:	Qualitative Projects
Lecture 6:	Texts as qualitative data
Lecture 7:	Images and multimedia as qualitative data
Lecture 8:	The tool

The remaining lectures will be released in loose succession by the end of 2023.
There are plans for the lectures to then be published in book.

Translation by Fachübersetzungsdienst GmbH: Lectures 1-3
Translation by Textworks Translations: Lectures 4-9

ATLAS.ti
ACADEMY

1. LECTURE

HOW THE ATLAS.ti PROJECT BEGAN - TWO RESEARCH PARADIGMS

Ladies and Gentlemen,
Welcome to this series of lectures on *Interpreting text and images* presented by the ATLAS.ti Academy. My name is *Heiner Legewie*, I am Professor Emeritus of Clinical Psychology, Community Psychology and Public Health at the *Technical University of Berlin*. One of my main areas of research is qualitative methods.

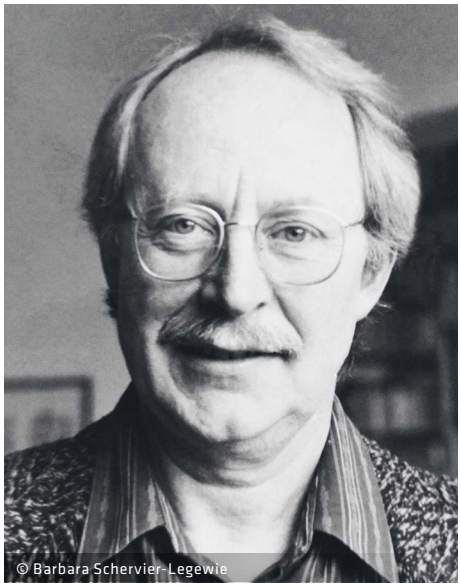

Fig. 1.01: Heiner Legewie

In this lecture series, we would like to take you on a journey to explore the interdisciplinary fundamentals of qualitative research. I will begin by talking a little bit about the origins of ATLAS.ti which came out of an interdisciplinary research project under my direction at the *Technical University of Berlin* from 1988 to 1992.

In the first part of this lecture series, we will encounter relevant findings from such diverse disciplines as *Philosophy, Semiotics, Linguistics, Sociology* and *Psychology*. In conventional introductions, these interdisciplinary fundamentals of qualitative research are most often implicitly assumed. Yet the benefit of knowing them is threefold: Firstly, you will have a better understanding of what you are doing and what your success depends on when it comes to conducting interviews, for example, or when evaluating interviews, images, or historical or multimedia documents and deducing their meaning.

You will also be able to substantiate your approach in the research process, defending it against criticism that qualitative research still faces from proponents of more quantifying and „objective" scientific methods. And finally, beyond their purely academic function, these fundamentals will also offer you a deeper, more personally enriching insight into the way in which we understand the world around us every day, specifically through communication and interpretation.

A program like this might perhaps evoke a fear in more than a few of you that in this lecture series my coauthor, *Thomas Muhr and I will be presenting you with intellectual fare that is hard to digest*. Do not fret. We will endeavor to convey even demanding theoretical approaches in a way that makes them easier to comprehend. Our goal is to make this lecture series *a fascinating intellectual adventure* and to provide you with a *rich background knowledge of the craft of qualitative research.*

These lectures deal first with the prerequisites of understanding and interpreting, then the qualities of texts and images as qualitative data. After this, *Thomas Muhr* will describe the IT tools used in computer-aided data analysis, using the development of ATLAS.ti as an example.

The lecture series is aimed primarily at empirical social scientists[1] who collect and analyze *qualitative, i.e. non-numeric, data* in psychological, pedagogical, sociological, health science or any other research contexts using observation methods, interviews, video and multimedia, or even researchers who work with historical documents.

Yet the wider field of the humanities, communication, cultural, artistic, political and historical sciences, urban planning, economics, investigative journalism, artistic research and large-scale project management also deals with qualitative data, in the broadest sense, any time we work with language or visual documents. This impressive wealth of applications is evidenced by the many different institutions that use ATLAS.ti (see https://atlasti.com/customers).

So, if you work with qualitative data in any of the areas mentioned, even outside of empirical social research, you too will benefit from this lecture series, even if perhaps not every lecture will be relevant to you. Below, in Section 2, you will find an overview of the lectures to help you find ones that are relevant for you and which can be used independently of one another.

1. HOW THE ATLAS.ti PROJECT BEGAN

This lecture series came into existence in the 90s in parallel with the development of the ATLAS.ti software system. I would like to take a brief look at this backstory so that you can better grasp how these two developments came about concurrently.

As a young academic at university and at the *Max Planck Institute of Psychiatry* in Munich, I grew up exclusively on quantitative and experimental research methods. After being appointed Chair of Clinical Psychology at the *Technical University of Berlin*, I launched the borough-wide *Advising in Moabit* project, together with a group of students. Working with mentally ill and at-risk people, it became clear to me how little standardized questionnaires and statistics could help us to understand the everyday problems of the people who came to see us. Participant observation methods and conversations, or interviews, on the other hand, promised much more direct access to the conditions, in which mental health and mental illness exist. It was about two different approaches to investigation and research, *Measuring* and *Understanding*, which I will address in more detail in the final section of this first lecture.

In order to also research the everyday lives of people outside of the advice center, I moved to a deprived neighborhood in West Berlin, the *Stephanviertel* district of Moabit, in 1980 where I lived for a year and a half, exploring this foreign world like an ethnologist.

A second important research project was a more extensive study on the psychological consequences of environmental threats, for which we conducted around 60 lengthy open interviews after the *nuclear disaster at Chernobyl in 1986*. By the end, we found ourselves faced with the task of evaluating more than 1000 pages of interview transcripts. Which at the time still meant working with paper and pen, and scissors and glue. In this *Copy & Paste era*, all quotes that were relevant for each code or keyword would be cut out from the transcribed texts, arranged according to category and glued onto a large poster-sized piece of paper or pinned to a cork board. Relationships between the codes were then marked with colored arrows. The walls of our rooms back then looked like intriguing pieces of written artwork.

[1] We make every effort to use gender-neutral language but adhere to the relevant grammar rules, hence for us the unavoidable generic masculine form includes women, men and non-binary persons.

Fig. 1.02: „Understanding Texts – Concepts, Methods, Tools"

These two projects gave rise to the idea of developing a software system that would help to evaluate interview texts. With research funding from the *Technical University of Berlin*, we were able to launch the interdisciplinary research project ATLAS in 1989. In German, the acronym *ATLAS.ti* stands for: „*A*rchiv für *T*echnik, *L*ebenswelt und *A*lltags-Sprache", or „Archive for Technology, Life-World and Everyday Language", with the *.ti* representing *t*ext *i*nterpretation.

The collaboration of psychologists, linguists and computer scientists created a unique intellectual atmosphere where the problems of qualitative research were discussed from different disciplinary perspectives. Published in 1994, the volume *Texte verstehen* (*Understanding Texts*) brings together our interdisciplinary approaches.

At the time, the social science community was still not taking qualitative research particularly seriously. Computer-aided analysis of text and multimedia therefore simultaneously constituted a groundbreaking scientific advance for qualitative research by documenting each individual step of an evaluation, allowing it to be reconstructed. The design of the ATLAS.ti software system, and also my accompanying lecture series, was heavily influenced by, among other things, a dialog with American sociologist *Anselm Strauss (1916 – 1996)*. His *Grounded Theory Method* – developed together with *Bernie Glaser (b. 1930)* – is a research style and a strategy that allows us to develop theoretical concepts from qualitative data (see Lecture 5). After we met during a long interview (see *Legewie & Schervier-Legewie 2004*, https://www.qualitative-research.net/index.php/fqs/article/view/562) *Anselm* became my mentor for qualitative methods in the 90s and we remained connected as friends and colleagues until his death.

With its diversity of methods and the flexibility of its design, Grounded Theory inspired the design of ATLAS.ti. In order to avoid any misunderstanding of ATLAS.ti as a software system designed chiefly for working in the style of Grounded Theory, however, I would like to emphasize at this point that from the very outset, our goal was to develop a tool which was suitable for the full range of different approaches and methods in qualitative research: genuine hermeneutic text interpretation as well as different other approaches to qualitative data analysis including quantitative evaluation strategies. All these techniques are equally supported by ATLAS.ti. I will come back to this versatility at various different points throughout this lecture series.

Fig. 1.03: The author interviewing Anselm Strauss in 1990

As the „grandfather" of ATLAS.ti, I would like to introduce to you the father and creator of this software, that is now used around the world, and also the co-author of this lecture series, *Thomas Muhr*, without whom it would not have been possible to publish this lecture series here. When he's not in the lab, you'll find him guitar in hand at *www.facebook.com/midlifechrysler*.

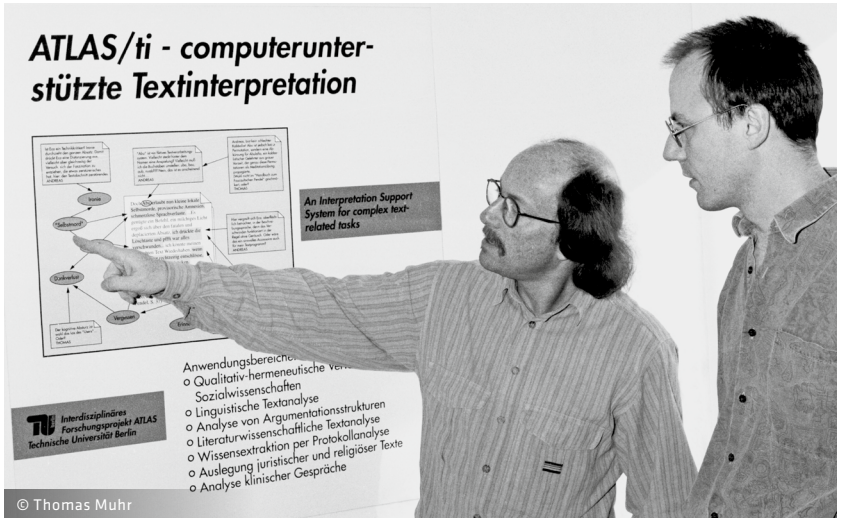

Fig. 1.04: Thomas Muhr with project coordinator Andreas Böhm[2] 1992

Thomas started out studying psychology at the *Technical University of Berlin*. After graduating, he began a computer sciences degree and we lost track of one another.

Then, when the interdisciplinary research project ATLAS (1989 – 1992) launched, an IT colleague involved in the project came to me and waxed lyrical of a computer scientist who had just finished his studies and who he wanted at all costs to bring on board our ATLAS project.

[2] I am greatful to Andreas Böhm for corrections and suggestions on these lectures.

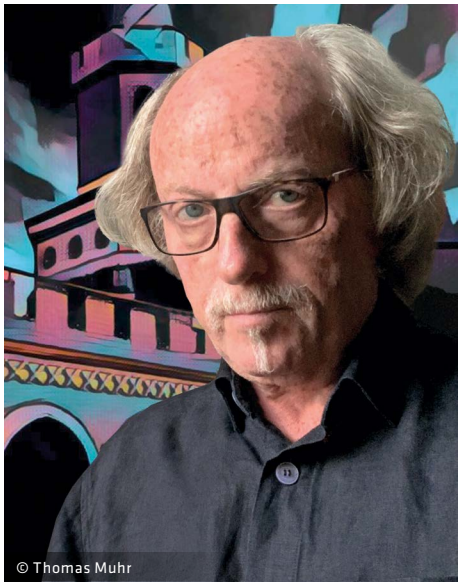

Abb. 1.05: Thomas Muhr today

His instincts were not wrong: *Thomas* was an intellectual center for the project, his ideas on how to implement the demands from our practice of interpreting texts quickly leading to an initial prototype of ATLAS.ti programmed in MS DOS (who here remembers that clunky command language, the one without the graphic interface that is so completely indispensable these days?). It was also around this time that Thomas introduced *Rapid Prototyping* as a development principle for ATLAS.ti, meaning that we as users could oversee the development of the program from the very beginning and adapt its functionality to our data analysis requirements.

Without *Thomas*, ATLAS.ti would most likely have ended its life like so many prototypes do in the „archive morgue". But *Thomas* had set himself the task of turning this prototype into a commercial, internationally competitive software system - initially in a „garage" phase due to some financial hardships. And doing so, he dedicated his professional life to ATLAS.ti.

On a visit to San Francisco, he also had the opportunity to introduce *Anselm Strauss* to ATLAS.ti so that he could be one of the first to test out the program and offer tips on how to develop it further. *Thomas* has continued to be involved in the development of theories and concepts in qualitative data analysis as it is presented in this lecture series.

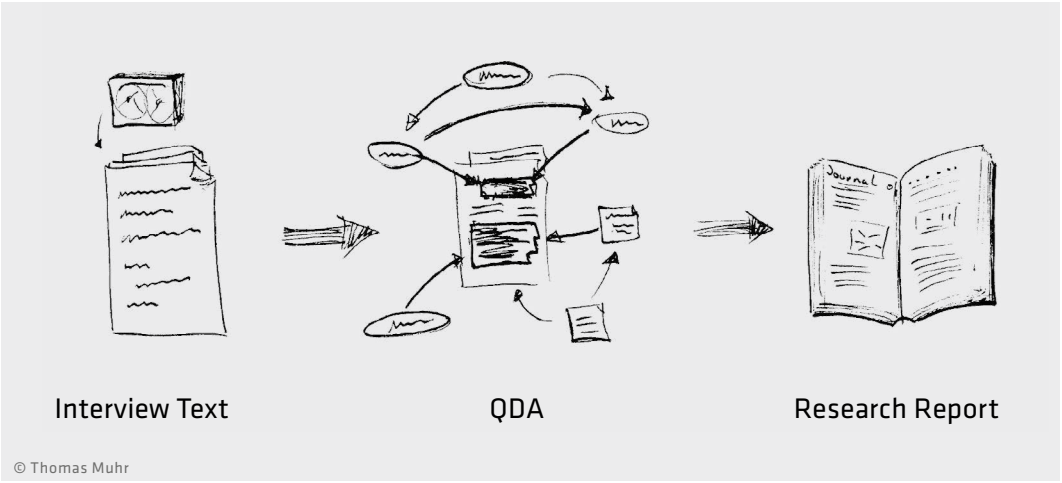

Fig. 1.06: Thomas Muhr: Sketch of ATLAS.ti data flow

I would like to take a moment here to tell you the „Story of the Red Dot" as an example of *Thomas'* perfectionist attitude to his work. He always took care of everything himself. When I visited him just before the release of the first Windows version of ATLAS.ti, he was working on the CD case for the program. He told me that he had spent the last 2 days trying to get just the right color for the red dot on the cover, and to position it exactly where it should be.I could hardly see any difference on the printouts, while Thomas insisted on getting the perfect print, just as he envisaged it.

Fig. 1.07: Red dot and ATLAS.ti logo

The attention to quality that *Thomas* exhibited over this seemingly unimportant detail shaped the design of ATLAS.ti right down to its bones. As a lover of art and active amateur musician, the aesthetics of the user interface were always just as important to him as the functionality of the program. And as it happens, the red of that red dot has survived all the changes that have been made to the design of ATLAS.ti over the years and is still in use to this day.

Now, *Thomas'* company *Scientific Software Development* (later *ATLAS.ti Scientific Software Development GmbH*) can look back on almost 30 years of international success. That first modest Windows version from the mid-90s that was only capable of analyzing texts in .txt and .rtf format has grown into a rich pallet of applications for all common document types, including multimedia. Each new version - most recently version A22 - has brought with it important innovative features like *AI-based text recognition and coding using Machine Learning*.

ATLAS.ti is now available as a native *Mac* and *Windows* version, plus *iOS* and *Android versions* and an independent web version. The web version makes getting into *Qualitative Data Analysis (QDA)* easy and allows teams to code in sync, with multiple coders able to work on the same project at the same time, plus several other features. There is also free phone and chat support worldwide for learning how to use the software. Video tutorials on specific versions are also available for all versions, plus a network of over 500 trainers and consultants (*https://atlasti.com/trainers*) who support software users locally. The lectures and webinars in the *ATLAS.ti Academy* (*https://atlasti.com/research-hub*) offer a further opportunity not only to get to know the software in all its many facets, but also to take advantage of offers on fundamentals and methodology – offers like this lecture series, for example.

2. AREAS OF FOCUS IN THE INDIVIDUAL LECTURES

In the following section, I will begin by giving you an overview of the lecture series that should help you to pick out which lectures are relevant for you:

Lecture 1, *How the ATLAS.ti project began*, introduces the topic and describes the development years of the *ATLAS.ti prototype*. In the final section, you will learn about two basic approaches or *paradigms of research*:
Quantitative , which is based on counting, measuring, mathematics and statistics, and *qualitative research*, which is based on communication and understanding.

Lecture 2, *Semiotics*, is about the *paradigm of signs* in the exploration of the world, about fundamentals of communication, the way in which signs become signifiers, and about a theory of culture and meaning based on the use of signs.

Lecture 3, *Phenomenology*, is about the location of *subjective experience* in the physical world, the phenomenological view of our everyday live, and about conditions for understanding others.

Lecture 4 focuses on philosopher and sociologist *Jürgen Habermas' Theory of Communicative Action* which provides a comprehensive theoretical basis for human communication, and therefore also for qualitative research and for validating its results.

Lecture 5, Qualitative Projects deals with the planning and implementation of qualitative data analysis projects. In the 2nd part, Grounded Theory is introduced as a comprehensive method for developing theoretical concepts based on qualitative data.

Lecture 6, *Texts in qualitative data analysis*, begins with an introduction to text linguistics. It then presents a process model for analysis and describes individual methods using illustrative examples.

Lecture 7, *Images and multimedia in qualitative data analysis*, begins with an introduction to pictoral theory. Art history and cultural science approaches to image analysis and more recent social science methods for image and video analysis are then presented as examples.

Lecture 8, *Tools*, first sketches the computer science concept of an independent type of software that supports qualitative data analysis. The various components of this concept are then presented using the development of ATLAS.ti as an illustration.

3. TWO RESEARCH PARADIGMS: UNDERSTANDING AND MEASURING

The concept of a scientific *paradigm* (a pattern of thinking) was introduced by philosopher of science *Thomas S. Kuhn (1922 – 1996)* in his groundbreaking book *The Structure of Scientific Revolutions (1962)*. According to the general view that had previously been held, scientific progress occurs cumulatively: A continual refuting (falsification) of incorrect hypotheses in the natural sciences should produce ever more precise knowledge. *Kuhn's* starting point was a historical study of the development of physics, astronomy and chemistry. In doing so, he hit upon the central meaning of scientific patterns of thinking which direct all research in an area of study without the research community being at all aware of these in most cases.

Unlike individual theories, which can be refuted using observational data, a paradigm consists of a network of convictions and ways of thinking in the minds of the scientists in any one field which constitute the „world view" of this field, so to speak. The paradigm determines the nature of research and how theories are formed, and affects the entire scientific enterprise, from selecting which subjects are considered „worthy of study" and questioning tolerated methods, to the theories that are established and the criteria of truth that apply.

According to *Kuhn*, scientific progress - at least in the natural sciences - goes through three phases:

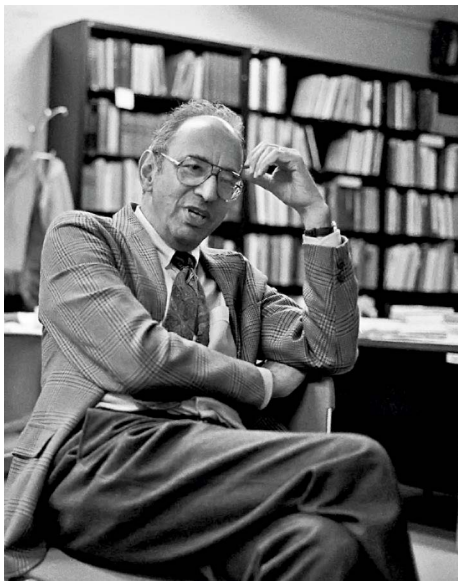

Fig. 1.09: Thomas S. Kuhn (1922 – 1996)[3]

• In the first phase of *normal science*, scientific inquiry and progress takes the form of „solving puzzles" within the context of a generally fixed paradigm. In physics, this paradigm was for centuries the Newtonian world view. Knowledge actually grows cumulatively within the paradigm.

• Yet puzzles that are „unsolvable" for the currently accepted paradigm continue to appear. This brings into question the scientific community's self-image. The general foundations are brought into doubt and a *paradigm crisis* occurs, as was the case for Newtonian physics at the end of the 19th century. In this phase, entirely new and often contradictory concepts appear as candidates for a new paradigm.

• The paradigm crisis ends with a *scientific revolution* when the scientific community turns to a new paradigm that promises to solve the puzzles better. Thus, the geocentric view of the world was replaced by the heliocentric view during the „Copernican Revolution", while Newtonian physics was revolutionized by Einstein's theory of relativity. A new paradigm leads to a reexamining of all the questions, methods and theories of the science and to the rewriting of textbooks.

[3] Reproduced by permission of the author (see Sigurdsson 2016)

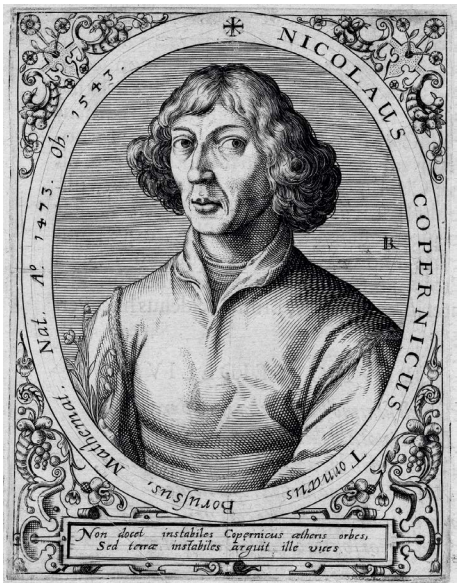

fig. 1.10: Nicolaus Copernicus (1473 – 1543)[4]

What is crucial for the discussion of scientific theory, according to *Kuhn*, is the acknowledgment that a paradigm cannot be founded purely on logic, rather it is made up of the common convictions of the scientific community.

For the theory of science, *Kuhn's* work represents a scientific revolution in itself: The truth of a theory depends first and foremost not on whether it reflects reality (*Representation theory of truth*), but rather on the consensus of experts (*Consensus theory of truth*). In other words: Scientific knowledge is literally constructed by the community of scientists through their shared perception of the problem, their concepts and their methods. This corresponds to the scientific theoretical position of *Constructivism*.

While paradigms replace one another in the highly developed natural sciences, in the social sciences it is not possible to consistently identify any strict replacement of paradigms.

Rather, what we see is different paradigms existing alongside one another either permanently or for extended periods of time. This does not appear to have anything to do with the social sciences being less advanced, rather it is due more to the fact that we can both observe and measure humans and society as physical objects and also communicate with and understand them through the use of symbols.

Understanding and *Measuring* (including *Counting* as the simplest form of measuring) are the two fundamental paradigms which social and cultural sciences are based on, together with their methodology and individual methods. On the one hand is the *hermeneutic*, or qualitative *understanding of science* if you will. (*Hermeneutics* is the art of interpreting signs, named after the Greek messenger god *Hermes*). This approach emphasizes the contexts of understanding and cultural history. On the other is the *Cartesian understanding of science* which aims at measurements and mathematical laws and can be traced back to French philosopher *René Descartes (1596 - 1650)*. A simple comparison is as follows:

[4] „Portrait of Nicolaus Copernicus" by ubleipzig is marked with CC PDM 1.0

HERMENEUTIC

- Knowledge is conditioned by historical culture
- Subject is part of cognitive process (enlightenment of the self and of objects)
- Understanding contexts of meaning as a basic methodological principle
- Forming theories by interpretation (hermeneutic circle)
- Discourse metaphor
- Aim: To change discourses
- Qualitative methods
- e.g. ATLAS.ti

CARTESIAN

- Knowledge is not bound by space and time
- Strict separation between subject and object of knowledge
- Breaking down object of knowledge into measurable „variables“
- Deduction from general, mathematical laws
- Machine metaphor
- Aim: Prediction/Control
- Quantitative methods
- e.g. SPSS

TWO PARADIGMS OF SCIENTIFIC UNDERSTANDING

The *hermeneutic understanding of science* is based on a tradition that stretches far back in human history, one of understanding nature through *interpreting signs*. According to this view, nature is a book whose words and sentences the informed person can read and interpret based on their experiential knowledge (more details in Lecture 2 on *Semiotics*). The meaning of a sign reveals itself not on the grounds of mathematical laws, but through the context, in which it finds itself.

Knowledge is not unbound from space and time, rather it is bound to the knowing subject and to the context, in which a phenomenon is embedded. In *philosophical hermeneutics*, this mode of knowing has been investigated in particular using the example of interpreting language texts (Bible, legal, historical, literary texts), as well as visual works.

© Thomas Muhr (after a book title by Umberto Eco)

Fig. 1.11: After the title of a book by Umberto Eco, Hermeneutics in the Middle Ages: Monks interpreting Holy Scripture

Understanding and interpreting a word or sentence is only ever possible by using the overall context, at the same time as this overall context is made up of individual words and sentences.

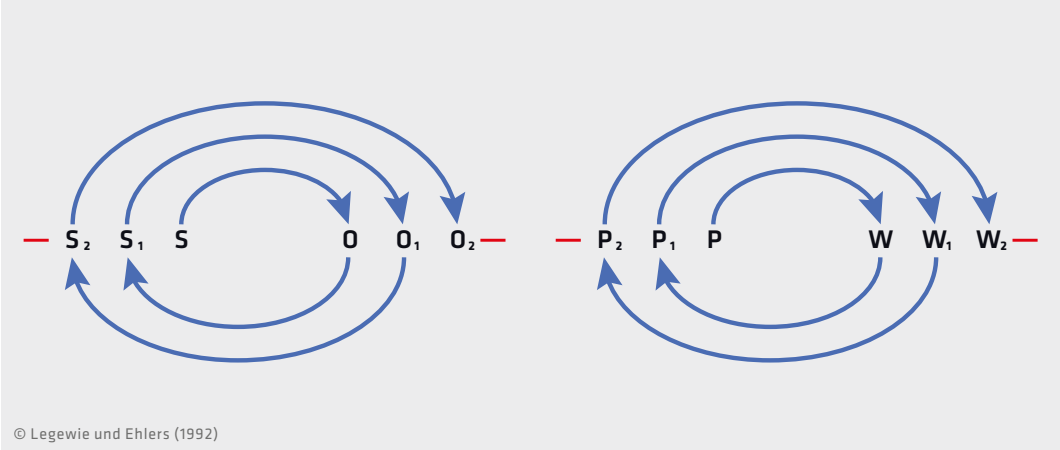

Fig. 1.12: Hermeneutic circle (after Danner 1979)

Left: **Subject-Object relationship;**
S1, S2 = Subject enriched by understanding (S),
O1, O2 = Better understood object (O)

Right: **Part-Whole relationship;**
P1, P2 = Part enriched by understanding (P),
W1, W2 = Whole enriched by understanding (W)

Interpretation moves from the detail to the whole and back to the detail in a circle (*hermeneutic circle*; see Fig.). This same circular movement also occurs between the object of knowledge (text, image, symbol) and the subject of knowledge (interpreter).

In developing ATLAS.ti, we took as our starting point the hermeneutic understanding of text interpretation. Today, when we speak of qualitative data analysis instead of text interpretation, this always also includes the hermeneutic basis of understanding and analyzing texts, images and symbols as the ineluctable first step in qualitative data analysis. At the same time, text interpretation can be followed by additional analytical steps, from the structuring of concepts explored interpretatively in graphic form, to statistical evaluations. As a toolbox for qualitative data analysis, therefore, ATLAS.ti is just as well suited to interpreting texts and multimedia only hermeneutically, as it is to taking further steps in data analysis.

The *Cartesian understanding of science* follows the philosophical tradition of *rationalism* (ratio = reason) which can be traced back to *Plato (b. 428/427 BC)*. Its most striking rendering comes from the French philosopher *René Descartes*. *Descartes* assumed a strict separation between the knowing subject (the scientist) and the object of knowledge. By breaking down the object of knowledge into measurable elements and inferring the interaction of these elements from general mathematical laws, it should be possible to calculate and predict the behavior of humans and nature like a perfect machine. Even today, these principles form not only the foundation of natural sciences and technology, but have also conquered the social sciences and even proven extremely successful in planning, bureaucracy and administration.

The *Cartesian world view* can thank its claim to making the future predictable and thus controllable for its appeal and its success. The fact that neither nature nor human beings function like clockwork - as *Descartes* imagined - is accommodated for in modern rationalism by introducing probability theory and the computer as a new machine model. The *Cartesian world view*, in unison with the Biblical command to „Subdue the earth", has established the global triumph of occidental civilization. Today, this world view is reaching its limits, as evidenced most clearly by the global environmental crisis.

But a strict contrast between Explaining and Understanding is no longer relevant in scientific theory today. In fact, it has turned out that even the exact natural sciences have to rely on interpretative understanding for their law-based explanations.

The juxtaposing of the *Cartesian understanding of science* with the *hermeneutic understanding* should not be misinterpreted such that one paradigm is correct and the other incorrect. Rather, it is about different perspectives regarding the object of the social sciences that must not be played off against one another. *Neither Understanding nor Measuring can be regarded as a silver bullet in the social sciences.*

Fig. 1.13: Two basic research methods in the social sciences

Measuring or understanding-based research methods do not simply describe different aspects of social reality, rather the methods each create or construct their own reality (*constructivism in scientific theory*). Accordingly, it is wrong to assume that this or that method would describe the reality better, or lead to better, more correct results.

Under this assumption, the question is: What approach to research is appropriate for the respective question and objective? Depending on the question, understanding and measuring-based methods exist in a complementary relationship. Any claim by either of these directions to exclusive agency is to be rejected in all cases. Since both approaches allow different aspects of social reality to be described, the approach that is proving fruitful for ever more questions is a *mixed-method strategy*, i.e. an approach, in which quantitative and qualitative methods are combined such that the strengths of both strategies can be used to answer the research questions at hand.

Working with ATLAS.ti also allows mixed-method strategies to be used, such as by generating frequency tables which can be exported from ATLAS.ti for statistical evaluations. Conversely, statistical tables and graphs can be integrated into ATLAS.ti projects as documents and used in the interpretation process.

Quantitative, qualitative and mixed-method research strategies all together exist only in a social context of action, according to their objectives and research questions, which as a researcher it is worth reflecting on when collecting and analyzing data.

4. PROMPTS FOR DISCUSSION

In order to absorb the content of the lectures in greater depth, we recommend actively engaging with the content, rather than just reading it. Suitable approaches include writing short essays and discussing with colleagues. At the end of each lecture, you will find a brief set of questions that are intended to provoke you to actively engage with the material.

Look for examples of a paradigm shift in different areas of life.

- Identify occasions when you use communication or counting and measuring techniques to solve everyday problems. How do each of these problems differ?
- Think of some examples of fluid transitions between everyday understanding and the use of controlled methods of understanding (e.g. interviewing).
- Explain the meaning of the hermeneutic circle using an example (e.g. a written historical document).
- Think of some examples of scientific questions which might be better solved with either understanding-based or counting and measuring-based methods.
- What skills are required for counting and measuring-based processes, on the one hand, and understanding-based methods of data collection and analysis on the other?

5. LITERATURE

Böhm, A., Mengel, A. Muhr, Th. eds. (1994): Texte verstehen - Konzepte, Methoden, Werkzeuge. (Understanding Texts – Concepts, Methods, Tools) Universitätsverlag: Konstanz.

Crotty, Michael (1998): The Foundations of Social Research. Meaning and Perspectives in the Research Process. Sage: London.

Danner, H. (2006): Methoden geisteswissenschaftlicher Pädagogik. UTB Reinhardt: Munich.

Friese, S. (2019): Qualitative Data Analysis with ATLAS.ti. Sage: London (3rd Ed.)

Gadamer, H.-G. & Boehm, G. (1978) Hrg.: Seminar: Die Hermeneutik und die Wissenschaften. suhrkamp taschenbuch wissenschaft, Suhrkamp, Frankfurt M.

Kuhn, Th. S. (1962): The Structure of Scientific Revolutions University of Chicago Press, Chicago (50th Anniversary Ed. 2012).

Legewie, H. & Ehlers, W. (1994): Knaurs moderne Psychologie. Knaur: Munich.

Legewie, H. & Schervier-Legewie, B. (2004). „Research is hard work, there is always a bit of suffering involved. That's why it has to be fun on the other side". Anselm Strauss interviewed by Heiner Legewie and Barbara Schervier-Legewie. Forum Qualitative Social Research 5(3) (www.qualitative-research.net/index.php/fqs/article/view/562/1217).

Sigurdsson, Skuli (2016): The nature of scientific knowledge: an interview with Thomas S. Kuhn [1989]. In A. Blum, K. Gavroglu, C. Joas, & J. Renn (Eds.), Shifting paradigms: Thomas S. Kuhn and the history of science (pp. 17 – 30). Berlin: Edition Open Access.

Wolski, U. (2018). The History of the Development and Propagation of QDA Software. The Qualitative Report, 23(13), 6-20. (https://nsuworks.nova.edu/tqr/vol23/iss13/2)

Zimmermann, J. (2015): Hermeneutics: A Very Short Introduction. Oxford University Press, Oxford.