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# HOW WE INVENT WHAT WE MEASURE: A CONSTRUCTIONIST CRITIQUE OF THE EMPIRICIST BIAS IN IS RESEARCH

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## Abstract

*This paper starts out with the discussion of two metaphysical assumptions on which IS research can be based, namely positivism and constructionism. While positivism believes in the existence of an objective and measurable world, constructionism holds that the world is a social construct. Depending on the metaphysical basis, the IS researcher chooses a methodological approach. Traditionally, positivist researchers use empirical research since this corresponds well with the metaphysical assumptions. However, even those researchers who hold constructionist beliefs and accordingly use other methodologies such as interpretivist, hermeneutic or action research tend to do empirical research.*

*The paper gives a critique of empiricism. It demonstrates that the idea that empirical research can show us the world as it is based on positivist ideas. Empiricism generally produces self-fulfilling prophecies. Empirical research can only function on the basis of a pre-conception of the world and it can only be relevant within that pre-conception. If this is so then the question remains why constructionist researchers still use empirical methods. The paper concludes by arguing that empirical research by constructionist researchers may have a value as a starting point for narratives. However, taking constructionism serious also means that empiricism's value neutrality does not exist and that IS researchers must face their social responsibilities.*

**Keywords:** Empiricism, interpretivism, IS research, methodology, metaphysics, constructionism, constructivism

## Introduction

The starting point of this paper is the observation that IS research relies strongly on empirical data. In order for a piece of research to get published in a top IS publication outlet it seems to be imperative that a certain formal structure is adhered to. Part of this formal structure is that empirical data are presented and that they are dealt with in a certain fashion. While alternative methodologies are becoming more acceptable there still is a strong empiricist bias.

In this paper I want to argue that this empiricist bias is a remnant of the positivist metaphysics that are prevalent in most natural sciences and still have a strong influence on social sciences as well. Using the theoretical basis of constructionism I will show that empiricism is in fact a circular approach, that it cannot be used to discover the objective world as it is. Rather, empirical research can only discover those facts that are implied in the theories it tries to prove or falsify. If this is true then empirical research, particularly in social sciences, cannot produce anything but self-fulfilling prophecies. For the reader who can follow me to this conclusion the implications will be clear. First, the role of empirical research will have to be redefined. While this does not mean that empirical research is useless it would mean that its importance should be reduced. Furthermore, there are far-reaching consequences for the understanding and practice of IS research. If empirical research is just one way of constructing reality then it cannot be value-neutral. The mere decision to do empirical research is a value choice and researchers consequently cannot be neutral observers. This forces researchers to follow a critical reflection of their activity which will reveal that normative questions such as ethical and political implications must be considered as an integral part of research instead of an accidental result.

In order to develop this contentious thesis I will start with a discussion of the metaphysical positions of positivism and constructionism. From there a critique of empiricism as part of the epistemology of positivism will follow. After this general philosophical part I will proceed to the way these fundamental positions are reflected in IS research today. In this section I will concentrate on the discussion of those positions and approaches that I consider to be part of the constructionist paradigm such as interpretivism, action research, or hermeneutic approaches. I will show that constructionist thoughts are gaining acceptance as part of research methodology but that the underlying metaphysics, the idea that reality is a social construction, still has not been widely accepted. Accordingly, empiricism as the methodology of positivism still has a strong influence even in those areas where positivism itself is being replaced. A critique of empirical research in IS will then lead me to the conclusion which will discuss the possible role of empirical research and the critical implications of the paper.

A word of caution: This paper aims at some of the most fundamental assumptions of the IS discipline. At the same time it is a continuation of the century-old debate between empiricism and idealism. It should be clear that it is not possible in the space of a conference paper to do justice to all of the positions and to discuss all possible objections. In order to render the paper interesting and lively I will describe the positions and differences between them as unequivocally as possible. That means that many shades of grey in real-life discussions will be blended out and some participants of these discussions may feel misrepresented. I suspect that this is necessary for papers such as this. While I thus concede that most of my theses could be more nuanced if there were more space available. However, this does not affect the main thrust of the argument, namely that empiricism in non-positivist social research is always in danger to producing self-fulfilling prophecies.

## **Positivism Versus Constructionism**

### ***Positivism***

Positivism in this paper will be understood as the philosophical doctrine that only experience can inform us about reality. Reality is believed to be objectively given. It can be perceived by our senses and represented by thoughts and language.

Positivism in some form or other has been an influential force in the history of philosophy and science. While it would seem most appropriate to the natural sciences because the positivity, the givenness of the objective world, initially seems clear to most of us, it also has a strong influence on social sciences. Some positivist social scientists try to apply scientific methods to human affairs (Hollis 1994, 41). These positivists include Comte, Durkheim, Weber, and Marx.

The adoption of a positivist world-view leads to consequences in epistemology and thus in research methodology. A positively given objective world can be contrasted with the subjective observer. One typical distinction of positivism is therefore that of subject and object. This usually corresponds with the Cartesian distinction of mind and body. The observer who is the subject tries to get as objective, impartial, and exact a view of reality as possible (in her mind). Positivist social sciences therefore try to eliminate or at least minimise all prejudices and prior knowledge of the researcher because these would skew the objective perception of reality (cf. Klein & Myers 1999, 76). From these metaphysical and epistemological views results a correspondence theory of truth. A statement in positivist sciences is true if and only if it describes reality as it is, if proposition and reality correspond. The preferred method of arriving at true statements is that of empirical investigation. Before we come to empirical methodologies, however, I would like to introduce a competing theory to positivism, namely constructionism.

### ***Constructionism***

Constructionism is the idea that reality is a product of social interaction. It is not objectively given but needs to be constructed by the observers. Similar viewpoints can be found throughout the history of philosophy from the ancient sceptics over all sorts of solipsists and religious thinkers to modern day phenomenology. Constructionist positions in general are attractive to those thinkers who explore the limits of positivism or realism.

One fundamental question that positivism cannot answer is how it is possible that we can perceive the world at all given that our sensory equipment is fundamentally different from the object of perception. How can we know what we know about the supposedly objective world? The answer that constructionists give is that knowledge about the world is possible because we create the world in perceiving it. This is what Kant (1995, B XVII) suggested in his Copernican turn. Another problem of positivism is that it appears to be circular. If one wants to say something about the world then one must observe it first. The difficulty is that one can never observe the world as it is but only the model that our consciousness produces from our perceptions. In order to

check whether that model is true one must make further observations that are again synthesised to a mental model. The comparison of perception and reality that is supposed to deliver truth therefore boils down to a comparison of fundamentally similar mental models. The objective world does not seem to play a role in the process.

One possible solution to this problem is that human mind has an *a priori* over external realities. There are many different variants of this type of idealist or rationalist philosophy. The one that I have chosen as the basis of my argument is constructionism. Constructionism offers the advantage that it overcomes the problems of positivism and at the same time does not fall prey to the danger of solipsism that other rationalist approaches sometimes succumb to. The fundamental idea of constructionism is that we do not live in a world of objective realities but in a world made meaningful by interaction. Meaning is constructed in communication and discourses. Individual and collective realities correspond because of the shared use of narratives. A computer in this mindset is not a computer because it is a computer but because people speak about it, use it in social practice, and give it meaning through interaction and narratives.

At its core constructionism is a metaphysical doctrine which says that social constructions not only describe reality but constitute it. Latour and Woolgar (1979) show that it is applicable to natural sciences as well. Constructionist statements are usually not meant to imply that there is nothing outside of human experience but rather that for us humans the only things that matter and thus are real are our constructions. Of course external objects those “things as such” (*Ding an sich*) as Kant called them are there and affect our senses and thus our perceptions. But what we make of these perceptions has little to do with the things and instead depends on our individual and social background. In this sense we can all see a sudden bright light in the skies but it depends on us, on our constructions, whether we call it “lightning”, “*Blitz*”, or “*éclair*”, whether we see an electromagnetic discharge, Thor's hammer, or Zeus's bolt. The real world therefore depends on our needs and goals, it is structured by our pragmatic activity (Dreyfus 1993, 272).

Accepting these constructionist premises means that we no longer think in terms of objective reality but in terms of signs that acquire their meaning in communication and discourses which produce the narratives in which we describe ourselves and the world. Drawing on Barthes and Baudrillard, Castells (2000, 403) states that “there is no separation between “reality” and symbolic representation. In all societies humankind has existed in and acted through a symbolic environment”.

## **Research Methodology**

Like all theories constructionism runs into problems. First, there is the danger of solipsism that all individual constructions encounter. If the world is the subject's construction then it is not clear how social interaction can be possible. This view, which is sometimes called radical constructivism (cf. Foerster, von 2001; Watzlawik 2001), is overcome, however, through the social component of constructionism, through discourses and shared narratives. Another problem is that of discourse. If we agree on discourses as the fundamental building block of reality then we have to admit that real-life discourses tend to be skewed and dominated by power relationships. If this is true then the question must be what role discourses can and should have (Ulrich, W. 2001). This leads us to the probably most serious problem of constructionism, towards its apparent relativism and randomness. If truth is the result of social construction and can at best be defined as a consensus of the affected parties then truth becomes relative to the consensus at hand. Worse, if this is true and there are no claims to absolute truths in constructionism, then constructionism itself cannot claim to be a true theory or even a theory that might be verifiable. Finally, it is not possible to say why a particular construction is accepted at one point in time and then changes to another one. There seem to be no criteria that allow us to evaluate whether a particular construction is good and viable or not. This, however, contradicts our everyday experience where theories seem to progress toward the better and more adequate.

It is far beyond the confines of this paper to address these problems. Let it suffice to say that there are starting points that may help the constructionst overcome them. On the one hand there might be something like a universal structure in the idea of discourses itself as discourse theoreticians such as Apel (1980) or Habermas (1981) have tried to show. On the other hand evolutionary theories may offer a way to explain why some constructions are more viable than others.

But despite the difficulties of constructionism one can find an increasing number of researchers in IT and IS who rely on it because it offers a way of avoiding the positivist problems. The range of adoption of constructionist principles in IS research is quite diverse. Some researchers see the construction of technology as a complementary perspective to the objectivist view of technology (Orlikowski & Barley 2001, 149). Others are looking for empirical verification of the constructed character of technology (Fulk 1993, 928). A final group subscribes wholeheartedly to constructionism and admits to radical ideas such as “Technology is

socially constructed; its character and implications depended on how it is organized, supplied, accessed and utilized in the context of corporate strategies, market structures and public policies” (Riis 1997, 448).

Since the idea of this paper is to give a critique of empiricism in IS research it is necessary to give a brief description of empiricism and its difficulties which I will do in the next section.

## Empiricism

Empiricism in this paper was defined as the epistemology of positivism. This definition could be called too narrow because empiricism has been established as a philosophical doctrine for centuries. However, empiricism and positivism go hand in hand and for our purposes this characterisation will suffice. Empiricism can now briefly be defined as the idea that the source of all knowledge is experience (Gergen 1999, 10). The scientist can determine the truth about the phenomena by observing them. Good observation leads to good data and good data lead to valid research findings.

While this model may seem convincing at first sight it is clearly simplistic. Even the most convinced empiricist must admit that observation is not a neutral activity but that it needs to rely on theory. Empiricists would contend that empirical data are needed to verify or falsify theories which is the usual reason given for undertaking empirical research. The empirical model thus becomes more complex with empirical data serving the validation of theories and theories serving as the basis of empirical research. In this view theory and empiricism are equal in that both are needed at the same time. It is thus pointless to ask which one is more important (Artz 2000, 78).

The central criticism of empiricism in this paper takes up the question of the relationship of theory and practice and takes it one step further. Theory is not only the basis and eventual aim of empirical research, it is also the only possible way of judging empirical results. Empirical research is therefore based on theoretical ideas, aims to verify or falsify theories and on top of that needs theory in order to check its success. Empiricism can therefore be characterised as a circular process that is based in all of its steps on theory and the alleged relationship to an objective world disappears along the way.

An empirical scientist might say that a theory is true if all of the available empirical data corresponds with the description or prediction of the theory. One might ask how such a proposition could be justified. The answer cannot be found in empirical research because collecting more data to prove the theory would be a course of action that is already committed to the theory (cf. Gergen 1999, 227). Again, we have the problem of circularity of empiricism. Collins give the example of a fictional entity called “tharg” that explains the problem of circularity quite nicely and is therefore worth quoting in length here:

“In the natural sciences problems arise in experiments that try to detect disputed phenomena. To know whether ‘thargs’ exist one must build a good tharg detector and look. But one can only determine if one has a good tharg detector by exposing it to thargs and observing the outcome. But one can only know if thargs are there to be found by building a good tharg detector and looking for them. But to know whether one has a good tharg detector one must know whether thargs exist and so on ad infinitum. Discovering (or discovering the nonexistence of) thargs is a process exactly coextensive with finding out how to build a good tharg detector” (Collins 1990, 185).

This criticism of empiricism can be used for a constructionist interpretation of reality. True statements derived from empirical work are not true because they describe the objective world but they are only true in the context and the framework of a given social setting. Latour and Woolgar (1979, 183) go to great lengths to show that the scientifically accepted existence of a biochemical entity called “somatostatin” only makes sense in a specific network of social practices. Outside of this network the word “somatostatin” is as useful or useless as the “tharg” introduced earlier. Models of reality therefore cannot be checked or verified by contrasting them with reality but only by contrasting them with other models (Schmidt, 2000, 157).

The point of this section was to show that empiricism relies on self-fulfilling prophecies. An empirical researcher can only research what she thinks is out there and that can only be determined by looking at the available theory. An IS researcher who is interested in power will find different aspects in an organisation from a researcher interested in questions about the market value of software. The theoretical starting position determines the empirical outcome. Even though this seems quite obvious, empirical research still plays a great role in IS research. I will therefore use the next section to take a look at constructionism in IS research.

## **Constructionism in IS Research**

Like every other social activity that is undertaken by many independent individuals and organisations, IS research is complex, multi-faceted and impossible to comprehensively categorise. Nevertheless, one can introduce a distinction between research approaches that seem to be based on positivism and constructionism respectively. The different metaphysical starting points lead to different research methodologies. At first sight it would seem that positivist metaphysics lead to empirical research and constructionist metaphysics lead to narrative methods.

Within this dualism of positivism versus constructionism the positivist side is easily recognised by their use of “formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from a representative sample to a stated population” (Klein & Myers 1999, 69). The emergence of this strong positivist tradition which relies on empirical work and its statistical evaluation can probably be explained by many factors such as the computer science background of many of the researchers or the desire to establish an unassailable new academic discipline.

Researchers have realised for some time that the social nature of IS does not lend itself to positivist interpretation. Hirschheim & Klein (1994), concentrating on the problem of IS development, emphasise the view of information systems as social constructs and information systems development as a social process. One research paradigm that builds on the social construction of reality is that of interpretivism. Interpretivism “suggests that the facts are produced as part and parcel of the social interaction of the researcher with the participants” (Klein & Myers 1999, 74). Interpretivism thus overcomes the positivist dualism between object and subject and admits the influence that the researcher has on the results of the research. While the interpretivist researcher will usually remain somewhat detached from the object of her research, the next step is action research where the researcher immerses herself in the social setting she researches. The interpretivist realises the impossibility of giving an objective account of reality but still tries to remain impartial. The action researcher on the other hand tends to have other aims than the discovery of truth. “The ultimate aim of the [action] researcher is to empower those with whom he/she works to improve their condition” (Gergen 1999, 100). Constructionist researchers frequently also use other methodological approaches such as hermeneutics (cf. Gadamer 1990) or phenomenology (cf. Moran 2000).

The critic might ask what good all of this philosophical sophistry is supposed to do, when IS researchers need to solve real-life business problems. The answer is that these approaches prove to be useful in understanding the business world and that they are often able to explain human behaviour and technology development better than their positivist counterparts. Examples of this are manifold. Hermeneutics can for example explain how computer-mediated communication can play a part in the construction of meaning (Klein & Myers 1999). It can also explain other sorts of communication in organisations. Phenomenology can be used to describe managerial behaviour and it offers much better accounts of managers as embedded, situated, in-the-world than objectivist and rationalist models could do (Introna 1997; Ciborra 2002).

Other areas where constructionist, hermeneutic, or phenomenological analyses are prevalent are e-teaching and artificial intelligence (AI). While e-teaching relies on constructionism due to a predominance of constructionist theories in education (cf. Leidner & Jarvenpaa 1995; Alavi 1994; Alavi et al. 1995; Bruckman 2002), AI needs alternatives because the positivist models of an objective reality have failed (cf. Dreyfus 1993; Beavers 2002; Brooks 2002).

This is, admittedly, a very abbreviated account of IS research. There is a wealth of non-positivist IS theories and corresponding research methodologies. To name just some of the more important ones we find action research, actor-network theory, structuration theory, ethnomethodology, and others. All of these are united by the recognition that the positivist paradigm is flawed and they are based more or less explicitly on the basis of what we defined as constructionism in this paper. While it is impossible to cover all of these different theoretical starting points and all of the individuals involved I contend that they are united in an empirical basis of their research. The question thus remains: why do non-positivist researchers do empirical research?

## **Empirical Research in Constructionist IS Research**

So far I have tried to argue that there are two approaches to IS research, one based on positivism, one on constructionism. Each of these requires a distinct methodology, with positivism pointing to empiricism and constructionism pointing to interpretivism. What is interesting now is that even the constructionist and interpretivist research relies heavily on empirical data. While this takes a different form in interpretivism, namely a more discursive and less statistical one, it still seems to be imperative for all sorts of IS research to rely on empirical data. Given what was said about the shaky basis of empiricism above, this is quite surprising. The question therefore is: why is there still an empiricist bias even in constructionist research?

The most probable cause is that even constructionists find it hard to overcome the positivist view of the world that they start from. This is what Husserl would call the “natural attitude”, the idea that the world is as it is, which is the basis of positivism. This natural attitude leads to some other positivist assumptions such as the dichotomy of subject and object and the idea that the researcher can somehow gain access to reality (Introna 1997, 11). Especially in the area of IS, researchers also tend to distinguish their constructionist views, which aim at people and organisations, from a positivist belief in the reality and objectivity of technology (Grint & Woolgar 1997, 154), which is independent of social analysis.

As I have tried to show above, constructionism is based on the idea that our individual perceptions and social interactions form reality. Only on this basis can we interact with each other and with the world. Empirical observations can then only be interpreted as examples of successful social constructions. Trying to prove scientific hypotheses on these grounds will lead to self-fulfilling prophecies (cf. Beavers 2002). While the constructionist may be able to live with this, seeing it as part of a hermeneutic circle, the question remains: why do empirical research if it does not tell us what the world is really like?

## **Conclusion: The Purpose of Empirical Research**

In this paper I have argued that there are two prototypical metaphysical positions that inform IS researchers, positivism and constructionism. While positivists believe in an objective world independent of human intervention, constructionist believe that the world is a social construction. The methodological position that results from positivism is empiricism understood as the attempt to gain understanding of the real world. I have tried to show that empiricism is flawed because it cannot live up to the expectation of producing objective knowledge. It can only produce knowledge on the basis of prior knowledge and thus produces self-fulfilling prophecies. My central question was why, if this is true, constructionist researchers still use this flawed epistemology.

The answer lies in pragmatic considerations. Empirical research is publishable because it represents the current consensus regarding scientific rationality (cf. Lyytinen & Hirschheim 1988). Researchers must appear to be rational and therefore adhere to given standards. For the constructionist this is no principal problem because she understands rationality as just another social construct which plays a part in the collective meaning making. A constructionist who does empirical research, even hard core statistical positivist empirical research therefore does not have to be self-contradictory. She may just try to speak the language that renders her ideas understandable.

However, all does not end here. While empiricism and constructionism are not necessarily contradictory, the role of empiricism in constructionism changes. It can no longer be seen as a tool to produce objective knowledge of the world but as a tool to facilitate discourses and develop new narratives. In this sense empiricism does not discover reality but produces it. Constructionists using empirical methods should make this clear from the outset.

But the implications go beyond the changing epistemological status of empiricism. If we take the arguments produced so far seriously then empiricism does not become useless but its status in research is going to change drastically. Conceptual and theoretical research that looks at the foundations of our social constructions will gain in importance (Benbasat & Zmud 1999, 9). Most importantly, however, if research is no longer a value-free observation of a given reality then critical, emancipatory, and ethical aspects of IS research will gain prominence. Research must be understood as one means of producing and distributing power by shaping reality (Introna 1997, 167). This aspect is not negotiable. Insisting on objective empirical research is also a way of exerting power (cf. Polanyi, quoted in Weizenbaum 1976, 126). The openness of research to social shaping means that researchers must follow the “critical turn” (Ulrich, W. 2001b, 74), that they can no longer understand their work as value-free. If this is so then they have to think about the social impact of their work and how they want to influence it. They must take into account the ethical and political implications of their activity. This means that they have to ask whether they want to produce emancipatory (Dawson & Newman 2002) or rather conservative effects.

While it is up to the fundamental values of the individual researchers in what way they want to react to this challenge there is one thing this paper should have shown. An IS researcher who subscribes to a constructionist metaphysics has to face several consequences. First, her research design changes due to the shift in epistemology. Empirical research, while still possible, changes its methodological status. Second, and more important, the researcher can no longer claim neutrality. Understanding research as part of the process of creating reality and meaning requires researcher to face their moral, political, and social responsibilities. How this can be done is a question for further research.

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