SUBJECTIVITY, CONTEXT AND PERCEPTIONS OF QUALITY IN EMPIRICAL RESEARCH

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ABSTRACT

This paper examines the role played by context and subjectivity in the epistemology of information systems research. Different assumptional frameworks underlying the opposing worldviews of positivism and interpretivism explain the differing treatments of context and subjectivity within these two frames of reference and thus the different criteria for quality that can be applied to each. The discussion examines how embedded assumptions concerning appropriate process and the ways in which we account for the research process affect the value-judgments applied to various research studies. It is argued that subjectivity has an important role to play in both positivist and interpretive research, but that this role is significant at different stages of the research life-cycle. Interpretive research is only indefensible if it is presented in the discourse of the positivist tradition. It is suggested that alternative notions of rigor and generalizability replace these traditions to legitimize interpretivism. This conclusion has significant implications for how we conduct and generalize from research in the information systems field.

KEYWORDS: *Subjectivity, Rigor, Context, Interpretive Research, Positivist Research*

Introduction

The need for innovative research in the emerging discipline of information systems (IS) has led to an increasing number of qualitative empirical studies. This need is recognized in the acceptance of qualitative research papers by high-ranking journals such as MISQ, once a bastion of quantitative research. Qualitative research tends to predominate in areas that include inquiry into the context of an information system: the social, cultural organizational and political situation in which information systems are acquired and used.

This paper examines notions of rigor in empirical research, comparing the traditions of positivism with emerging concepts of interpretive[1] research in IS. An inquiry into assumptional frameworks underlying the two worldviews is used to inform a discussion of the role of subjectivity in empirical IS research. Because in IS research (as in sociology), we deal with studies that involve "social" elements[2], the competing claims of positivism and interpretivism have led to some interesting debates. This paper argues that many of these debates hinge on the roles of two elements in research: context and subjectivity. It develops a framework that examines how these two elements form notions of quality and rigor in IS research.

Klein et al. (1991) suggest that knowledge is achieved in the struggle between positivism and antipositivism, through the competing claims of those who advocate their chosen approach. A synthesis of the two approaches arises from this struggle, which creates a new dominant approach, to which emerges a new opposition, … and so on. This paper is not an attack on deductive, positivist or quantitative approaches to empirical research in IS, although it is intended to be controversial and thought-provoking. Rather, it is an attempt to make the examination of subjectivity more explicit and to include this examination as part of the coherent theoretical framework within such research is presented. It is also an attempt to further legitimize interpretive and qualitative approaches to IS research, by separating notions of rigor from the discourse of scientific rationality and by highlighting the inherent weaknesses of that framework of rationality.

Frames Of Meaning In IS Research

As Giddens (1993) observes, the term 'paradigm' is subject to many different interpretations; it is often applied to be synonymous with theory. From Kuhn's (1970) perspective, the field of social science was subject to fundamental disagreements, concerning axioms, tenets and assumptions of the field, whereas the field of natural science was subject to much less turbulence. Instead, "waves" of disagreement toppled the (relatively) universal acceptance of one set of axioms, tenets and assumptions, to replace them with another set that was accepted by fiat. He therefore concluded that there were a set of taken-for-granted meanings that provided the basis for the conduct of 'normal science'. These meanings were replaced periodically, during a 'revolution' in which a wave of general acceptance replaced the previous set of taken-for-granted meanings with a new set. In a field, such as sociology (or information systems), which is occupied with inquiry into subjective, relativistic concepts, it is unsurprising that there is no universal paradigm to be discerned. Even in the natural sciences, Giddens (1993) claims that Kuhn (1970) exaggerates the internal unity of paradigms, leading these to be treated as closed systems, whereas there is much overlap between them and diversity of opinion within them.

Three main paradigms of IS research are identified by Walsham (1993; 1995): positivist, interpretive and critical research. A contrast between the positivist and interpretive paradigms may be used to define the fundamental controversy that underlies the generation of "grounded" theory, as these two paradigms represent the polarities of the debate. Positivist researchers adopt a position that reality exists, independently of their presence and that what is observed therefore constitutes reality. Interpretive researchers adopt the position that we cannot know reality, but that all perceptions of reality are socially constructed (Walsham, 1993). If we view reality as socially-constructed (Berger and Luckman, 1966), then not only are the perceptions of our research subjects situated within a local system of beliefs and interpretations, but so also are our own

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[1] I equate interpretivism with constructivist research, for the purposes of this paper.
[2] Dealing with human agency and/or human interactions.

perceptions, as researchers. Critical theory could be said to follow the interpretive position, in its objectivist-subjectivist dimension, concerning beliefs about reality (Burrell and Morgan, 1979). Thus, the main area where critical theory diverges from interpretivism is in the methodological area, where critical theorists separate organizational activity into two "dimensions" for analytical purposes: work and social interaction (Hirschheim and Klein, 1994). As this short paper focuses on specific issues reflecting subjectivity and context, I will deal only with the competing paradigms of positivism and interpretivism. Table 1 briefly summarizes the elements of the objective-subjective debate between the positivist and interpretive paradigms, based on the arguments of Burrell and Morgan (1979) and Walsham (1993).

Table 1: Objective-Subjective Debates Between The Dominant Paradigms of IS Research

Paradigm	*Positivist-Objective*	*Interpretive-Subjective*
Ontological (beliefs about nature of reality)	External phenomena exist independently of the individual's perceptions	The individual makes sense of their world by the way in which they perceive and define "external" phenomena.
Epistemological (beliefs about knowledge and how we know reality)	There are essential laws that relate to all aspects of existence, independent of the observer. These laws may be *observed* from outside the situation and deductively *abstracted* to provide models that are generalizable to all contexts.	There are no absolute laws of existence, but theories that are more or less useful, depending on the perspective of the researcher. Behavior (of phenomena and people) may be *interpreted* in context and inductively abstracted to provide theories that are generalizable to similar contexts.
Human Nature (how we account for human behavior)	The behavior of phenomena and people *en masse* can be viewed as determined by the external situation or environment.	Human beings have complete autonomy: their actions are dictated by free will (which may be constrained by external forces).
Methodological (beliefs about how we apply inquiry methods)	*Scientific:* Researchers derive abstract models or laws by the use of systematic protocol and technique to construct scientific tests regarding the nature of the "real world".	*Inquiring:* Emphasizes subjective, insider accounts of situations, that can only be obtained by personal involvement in the situation. The presence of the observer affects that which is being observed.
Theoretical (beliefs about the role of theory in research)	*Deductive:* theory progresses through "conjectures and refutations"; theory can only be defended on an absence of falsifiability.	*Inductive:* theory progresses through "inductive generalizations", in which one generalizes on the basis of a sample.

While the terms positivism and interpretivism refer specifically to the epistemological position taken by researchers aligned with the different paradigms, they provide convenient (and the most commonly used) labels to distinguish between the two paradigms. There are, of course, many intermediate positions between the two absolutes given in Table 1 and most researchers would place themselves somewhere on a continuum. As Mingers (2002) elegantly argues, empirically, very few positivists would assert that what they have observed would, incontrovertibly, have happened in the way that it did, had they not been there, and very few interpretive researchers would argue that nothing exists independently of their presence. The two positions often converge. The main difference lies in how external reality is *accounted for* and the discourse within which the legitimacy of those accounts is established. Given a positivist interest in accounting for an objective, external reality vs. an interpretivist interest in accounting for the social construction of reality, definitions of what constitutes quality in research and how research findings are accounted for are very different from each of the two frames of meaning. Table 1 thus reflects a rather extremist dichotomy of interests, to reflect the basis of underlying assumptions about the nature of reality and appropriate methods of inquiry that determine criteria for assessing quality, in the two research traditions.

It is in assessing the quality of research that the two value-systems come into play most strongly. The main positivist criteria for rigor, with interpretive alternatives to these criteria are summarized in Table 2. These have been synthesized from those suggested by Eisenhardt (1989), Yin (1994), Miles and Huberman (1994), Klein and Myers (1999), Lincoln and Guba

(2000) and Babbie (2001). The criteria for quality discussed here do not constitute an exhaustive set, but are selected on the basis of agreement across reputable, knowledgeable and reflective references, that are relevant to IS research.

Table 2: Quality Criteria From The Two Worldviews

Issue of Concern	Positivist Worldview	Interpretive Worldview
Sampling of data	**Representativeness:** the data sampled represents the attributes and relationships tested, in a larger population.	**Authenticity:** the situation (subjects, behavior and context) studied is an authentic instance of the situation described, for the subject of interest.
Researcher role in the inquiry	**Objectivity:** findings are free from researcher bias, if appropriate data sampling procedures used. Assured through procedural consistency.	**Confirmability:** conclusions depend on subjects and conditions of the study, rather than the researcher. Assessed through explicit account of data collection and analysis.
Reproducibility of findings	**Reliability:** the study findings can be replicated, independently of context, time or researcher.	**Dependability/Auditability:** the study process is consistent and reasonably stable over time and between researchers.
Rigor of method	**Internal validity:** A statistical relationship is established, to demonstrate that certain conditions are associated with other conditions. **Construct validity:** The empirical data, often using "triangulation" of findings is tested to discover whether the concept being hypothesized is found in multiple situations.	**Internal consistency:** the research findings are credible and consistent, to the people we study and to our readers. In accounting for this, the findings are related to significant elements described in the research context/situation. **Construct consistency:** Concepts are compared across cases and instances, to demonstrate comparability between both constructs *and* contexts.
Generalizability of findings.	**External validity:** the researcher establishes a domain in which findings are generalizable.	**Transferability:** how far can the findings/conclusions be transferred to other contexts and how do they help to derive useful theories?

In the IS field, as in others, there is an emerging goodwill between the positivist and interpretive "camps", that enables us to engage in open debate about alternative criteria for quality. This results in the accommodations in the interpretive worldview column of Table 2. But this accommodation also leads to misunderstandings. From a positivist position, rigor accrues through the appropriate testing of theoretical hypotheses about characteristics of, or relationships between members of a large population, based on the literature. This is accounted for by providing evidence of the consistent and appropriate use of statistical techniques that test hypotheses. An interpretivist position, on the other hand, argues that "truth" is relative and that acceptable truth is socially constructed by the community of research and practice interests within which "knowledge" is defined (Latour, 1987). In a number of examples, Latour illustrates how knowledge is constructed through general acceptance of theories by influential interest-groups and argues that it is this process that explains Kuhn's (1970) theory of how successive scientific paradigms operate via waves of belief and support. Thus, the aim of interpretive research is not to construct hypotheses on the basis of accepted theory, but to select specific cases that will provide a basis for inquiry into competing or emerging theory. Whichever perspective one adopts, the need for some sort of quality criteria is critical. The alternative is what Haig (1996) refers to as "naive Baconian induction".[3] The rest of this paper deals with two elements that are critical in understanding how quality criteria are constructed: the role of context and the role of the self in research.

The Role of Context

A major difference between positivist and interpretivist research perspectives relates to the way in which context is treated. Klein and Myers (1999) define context as "the social and historical background of the research setting". But there is

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[3] Haig (1996) is referring specifically to accusations leveled at grounded theory – but the extension to any research that does not apply suitable criteria for assessing the quality of the findings is apt.

another element of context relevant to interpretive research, which has to do with the its ability to affect actors' internal perceptions of reality. Ciborra and Lanzara (1989) assert that an IS researcher needs to examine "the set of institutional arrangements and cognitive imageries that inform, loosely but inexorably, the actors' reasoning and practice in organizations". A contextualist perspective views action as guided by expectations of normative behavior, acquired through the subconscious adoption of local conventions and sociocultural norms (Lave and Wenger, 1991), by political and organizational structures (Boland and Day, 1989; Markus, 1983) and by historical and projected future events (Klein and Myers, 1999; Pettigrew, 1990). Context and action are irrevocably interrelated: context guides action, which in turn shapes context (Giddens, 1984; Orlikowski and Robey, 1991).

Positivist research divorces the research subject from its context, by attempting to control for, rather than to include, contextual influences. The objective of research conducted from a positivist position is to generate general laws through a (largely deductive) process of abstraction, by assuming fixed and pre-existing relationships between observed phenomena (Burrell and Morgan, 1979; Giddens, 1993; Orlikowski and Baroudi, 1991). Positivist researchers tend to ignore the role of social influence and human agency in shaping observed phenomena (Klein and Myers, 1999; Orlikowski and Baroudi, 1991). Falsifying instances in a sample are often excluded from a positivist analysis, by defining each as an exception to the rules which guide the researcher's definition of a "fixed" or "comparable" context. The filtering provided by a theoretical system which allows the researcher to frame acceptable data as conforming to a certain set of rules permits the exclusion of inconvenient data samples from the analysis. Thus, the "all swans are white" rule would not be falsified by a black swan that derived from the union between a swan and a black eagle (Giddens, 1993). Generalization is enabled through the concept of external validity: the researcher establishes a theoretical domain within which findings are generalizable. Future work is permitted to build deductively on this theory, if it stays within that theoretical domain. For example, (Gefen et al., 2003)[4] test hypotheses concerning the role of trust, perceived usefulness and perceived ease-of-use in online shopping, based on prior studies that have investigated these elements separately. They use a research instrument – a survey – that excludes personal characteristics of the shopper and characteristics of the online store. Thus, they discount any affect that might result from individual factors such as gender, age, social class, education, or from store factors, such as the store not having items in stock, or having uncompetitive shipping costs. They assess the individual's prior experience with the vendor involved in the transaction. But they do not investigate whether the item involved in this particular transaction was in any was unusual. For example, if the individual wanted more detail about the book or CD than they were able to obtain at this particular store, this may well have affected perceptions of the website's perceived usefulness (which is assessed). Thus, they not discount context *per se*, but control for context, observing or assessing only those elements of it that lie within the theoretical model. This leads to an approach to inquiry that excludes the discovery of other contextual factors affecting the theory.

An interpretivist perspective views context as essential to the development of theory because of its interest in how humans construct an external reality through interpretations of socially-constructed meaning (Berger and Luckman, 1966). Thus, the behavior of research phenomena is situated within a local context. By employing observations of context, the researcher is enabled to derive theories that transcend context-free abstractions of human behavior. For example, Orlikowski (Orlikowski, 1993) was able to interpret different outcomes and impacts of technical change through the lens of changes to

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[4] The intention is not, in any way, to criticize the findings or conduct of this study. This study was selected because it is current and also because it is an excellent example of a rigorous, positivist study into a socially-situated research problem.

organizational structure, culture and reward systems. These abstractions of context and the way in which interactions between context and technology were mediated by human agency became part of the substantive theory (Glaser and Strauss, 1967) developed by Orlikowski in her research. Theory is progressed by inductive generalization from situated abstractions - abstractions in which context is represented by a set of informed conjectures, on the part of the researcher, about what elements of the context proved to be significant.

While interpretive research inquires actively into context, the utility of its findings is limited by the sample-size which is feasible when context is examined in detail. The inclusion of context in interpretive research makes generalizability more problematic. It is much more difficult (and time-consuming) to collect data that recognizes and analyzes contextual phenomena than to reduce data-collection to assumptions of commonality in context. In much interpretivist research, statements of implications for generalizability are minimal, or are based on a misreading of Yin's (1994) conclusion that findings from a sample of one are ultimately generalizable. Yin argues this position on the basis that findings from positivist studies can be *replicated* and so a sample of one is only a temporary state. The understanding is that the theory is therefore tentative and the researcher will (eventually) replicate their findings across a sufficient number of studies for these to be generalizable. Interpretivist research tends to deal much more explicitly than positivist research with questions concerning the extent to which findings are generalizable across different research contexts (Lincoln and Guba, 2000), as it cannot employ the same claims to rigor, asserted through statistical tests of internal and external validity. For example, the notion of data "triangulation" is employed to ensure internal validity in positivist research (the term is associated with correlating – or triangulating - two navigational compass bearings on a physical object, to determine its true location). The relationships between variables in two or more data samples are compared, to ensure that these relationships are consistent across samples. The use of triangulation to test for internal consistency is based on the assumption that different data samples – irrespective of their context – represent *the same total population*. This presents problems for in interpretive research, which views sampled populations as essentially unique, as they are situated within a specific sociocultural and situational context. Research findings from an interpretive perspective cannot be internally consistent, as the context will change, even for different subjects from the same research site, or for samples taken from the same research site over time. Thus, research "samples" from an interpretive perspective, represent *different populations, that may share some attributes in common*. This philosophical position puts us in an absurd situation, which is untenable if there is going to be any point to research. We all make inductive inferences from small samples all the time, in our daily lives, to produce useful abstractions – the important thing is to understand that we are doing so and to examine the implications for generalizability.

There have been various accommodations to strengthen interpretive claims for generalization by accounting for sampling consistency. These have evolved over time, as the interpretive position becomes more clearly defined. Denzin (1970) suggests that findings be triangulated by using different methods to collect different kinds of data. For example, findings from case studies may be supported by empirical observation of a similar situation. But triangulation removes much of the context from situated data, as data collected by different methods - for example, through interviews and through observation - rarely include exactly the same elements of context, which makes it more difficult to understand socially-constituted research problems. Silverman (1993) suggests that the researcher should distinguish 'how' from 'why' questions and triangulate only at the 'why' stage of theory-building. In this way, situational influences are included in the triangulation. But comparison, both within and between contexts remains problematic and so becomes a matter for debate and controversy.

Rather than making claims for construct validity, a constructivist perspective may only claim construct consistency, based on a notion of quality that attempts to ensure consistency in how separate data "samples" are analyzed. The positivist notion of conceptual validity becomes translated to an interpretive concept of conceptual consistency.

We may also wish to claim that the findings from one sample align with the findings from another, based on a notion of commonality across multiple contexts. Thus, the notion of external validity, or generalizability, translates to one of transferability between contexts. If one explicitly recognizes the significance of context, the issue of generalizability becomes an issue of transferability: how far can the findings/conclusions be transferred to other contexts and how do they help to derive useful theories? Of course, we must still produce reductionist models (limited by human cognition, if by nothing else), that represent only selected aspects of context. But by considering context explicitly, we expose our assumptions and reductions to public view and they therefore become "objectified" through debate (Mingers, 2002) . By moving to a discourse of transferability, the inclusion of context may be legitimized. Transferability attempts to understand similarities in context and so parallels the positivist quality criterion of external validity, when assessing constructivist research (Lincoln and Guba, 2000). The question asked when making a claim for transferability is how far explanations of phenomena observed in one context may be adjusted to "fit" with another context. For example, we may ask whether sufficiently thick descriptions have been provided for readers to assess the general applicability of findings to their own setting (Miles and Huberman, 1994). We can support claims to transferability with a strong sense of communicated authenticity, for example by relating our findings to significant elements in the research context (Gasson, 2003), or by exposing competing constructions of the findings and dealing with these fairly, in our discussion (Lincoln and Guba, 2000). The concept of transferability provides us with a new discourse of generalizability for research studies that are presented as situated in their local context.

I would argue that the way in which context is treated constitutes the most significant difference between positivist and interpretive research. In positivist studies, context is removed from the analysis, or reduced to one or two data variables, to be controlled across studies. Interpretive research treats human agency and its context as inextricably interlinked, with an understanding that context is unique for each situation researched. It is only by interpreting the situation in context and by analyzing the impact of context on the situation, that one can understand socially-situated behavior. This process is also reductionist, as is any human analytical process: reductionism is the basis of all theory-building. The difference lies in whether context is *included* in the reduced models of the research situation, or *controlled for*.

The Role of Self

A significant, but subtle distinction between positivist and interpretivist research arises in how we understand legitimate knowledge about a situation. Positivism holds that only reality immediately apprehended by the researcher can be classified as knowledge, whereas interpretivism contends that all knowledge is socially constructed and so knowledge is obtained through interactions between people. A positivist paradigm views the world as *objectively*-perceived: what is observed is what *is*. The research challenge is thus to systematically observe, record and analyze, to understand the external world. An interpretive paradigm views the world as *subjectively*-perceived: what *I* observe is a socially-constructed perception of the "external world", that derives from what sense *I* can make of observed phenomena and events, and that may not exist independently of the interpretations that *I* place on them. At the heart of the objective-subjective debate lies the role of the

self in research. This colors our perceptions of the world, what methods are appropriate to investigate external (to us) phenomena, and how we account for "reality".

Positivist research attempts to obtain objective accounts of an *external* reality, while an interpretive position focuses on *internal* reality, interpreting the subjective meaning of social action (Burrell and Morgan, 1979). An assessment of subjectivity is to what extent the *self* is included in research findings, in accounting for both subject-as-self and researcher-as-self. We attempt to understand the subject-as-self, by interpreting the meaning of others' internal worlds through their actions and explicit accounts. We also attempt to understand researcher-as-self, by acknowledge that our own perceptions are filtered through a layer of tacit knowledge, accrued from learning-by-doing and inductive generalizations from un-selfconscious observation (Schön, 1983). The need to account for tacit knowledge is well-understood in fields such as Artificial Intelligence, where expertise and knowledge is "framed" within a set of variables that define an individual's life-world or rules governing the local context. But IS research appears particularly susceptible to a tendency to deny subjective accounts of research situations. This may be because it is so often concerned with *codifying* knowledge - a process through which knowledge is objectified and reified. In the field of IS research, explicit subjectivity is often viewed as dangerous. An acknowledgement of subjectivity means that a researcher may lose any claim to "truth", independent of interpretation. Research findings are hedged around with limitations on their generalizability. The researcher loses the power to claim that their research has value:

> " Being subjective means that when you talk in the name of people or things, the listeners understand that you represent only yourself. … 'Objectivity' and 'subjectivity' are relative to trials of strength and they can shift gradually, moving from one to the other, much like the balance of power between two armies." (Latour, 1987, page 78).

Thus, there is a second meaning of subjective that has to do with a perceived lack of separation from the research subject, that reflects on the perceived value of the research. Notions of objectivity and subjectivity often depend on how a reader perceives claims to authenticity of the research account. So, although interpretivist researchers may be accused of providing subjective accounts of reality, by the same measure, so do positivist researchers. Positivist researchers construct a careful world of validity and rigor. For example, many researchers combine analytical techniques to view their data sample alternatively from a correlation perspective, to analyze relationships between elements of the data, and from a probability perspective, to draw inferences concerning the nature of the population from which their data-sample is drawn. Both of these techniques lead to findings which are treated as absolute: because of the authority conferred by their use in prior studies, the findings of the analysis become objectified. Yet, as Strauss and Corbin (1998, pages 157-8) observe, research findings are only as reliable as the contextual frame within which they are assessed. They give an example where one of the authors found that "something seemed awry with the logic" of her theory concerning the management of high-risk pregnancies by mothers-to-be. The researcher realized that she was defining risk from her perspective as a health professional, and understood that she needed to define risk intersubjectively, from the point of view of her subjects, in order to understand their behavior. Her research subjects perceived their level of risk differently than her own assessment, and often assessed the same risk differently, at different times during their pregnancy. This type of insight requires critical reflection on the way in which research conepts were constructed through interactions between the researcher and researcher subjects (Klein and Myers, 1999). Observed phenomena (or "variables", to use positivist language) cannot be defined objectively, according to a set of absolute criteria, but must be defined from a *specified* point of view, with multiple perspectives incorporated into accounts of the research

findings (Klein and Myers, 1999). The explicit inclusion of inter-subjective (as distinct from personally subjective accounts) is a major part of an interpretive worldview. An interpretive research position does not privilege external accounts over internal explanations of the data and reflects continually on the origins of those accounts during data analysis.

We can view positivism as a reductionist philosophy that takes an external view of the research subject, whereas interpretivism endeavors to include subject-selfconsciousness within its boundary of analysis. The concept of reflexivity (Schutz, 1932) emphasizes that all 'facts' are created by cognitive processes. The best we can achieve is to offer plausible accounts, even though some accounts might be more persuasive than others. A heterogeneity in analytical perspectives of the data collected is not a problem to be solved, but a justification for emphasizing interpretative methods. There are multiple perspectives involved in any research study: the researcher, those involved in the research situation and external observers of the situation. An understanding of reflexivity entails turning back upon oneself and examining what has been going on, in the context of the situation: understanding one's own perspective and the meanings attributed to events *because* of one's perspective and also valuing the perspective of research subjects, in explanations of their actions. This explicit reflection on one's own role in reaching findings, to detect possible biases and distortions, underlies the "principle of suspicion" in Klein and Myers (1999). In socially-situated research, the researcher must engage in *self*-conscious interpretation:

 " Sociology, unlike natural science, stands in a subject-subject relation to its 'field of study', not a subject-object world;
    it deals with a pre-interpreted world, in which the meanings developed by active subjects actually enter into the
    constitution or production of that world". (Giddens, 1993, page 154).

Of course, it is highly debatable whether truly intersubjective understanding is possible, especially given the multiple perspectives of any problem-situation that derive from the involvement of multiple people. The different problem-boundaries adopted by different actors in a situation result in different elements of a situation being included or excluded, with a different framing of problem-situations within the research context. The interpretive researcher attempts to elicit intersubjective meanings through interaction with the situation and its context (Boland and Tenkasi, 1995; Schön, 1983). It is here that relevant grounding in the situation comes into play. To achieve intersubjective understanding, one must share common meanings, language and cultural interpretations of context. There is a real danger that the researcher may "go native", adopting the internal logic of research subjects (Silverman, 1993). This is a useful perspective when attempting intersubjectivity, but precludes any generalization of findings across contexts.

One of the most significant issues of debate between positivist and interpretivist frames of reference focuses on the ways in which researcher subjectivity is accounted for. While positivism adopts a scientific perspective, that takes an external view of research subjects (what Giddens, 1993, terms subject-as-object), interpretivism privileges subjective accounts, taking an internal view of the subject's experience and attempting to understand the impact of the researcher's own systems of meaning and methods of interpretation of the data collected. While scientism emphasizes the removal of self and the <u>control</u> of the subjects and context of the study, interpretivism emphasizes the explicit inclusion of these elements, to understand how the research findings were constructed and to what extent they may be generalizable between researchers and across contexts.

Deductive Vs. Inductive Research: Life-Cycles And The Role Of Theory

It is valuable to examine the assumptions of deductive vs. inductive research at this point, as these are so often associated with positivist/quantitative vs. interpretivist/qualitative research frames. In the discussion that follows, I have associated deductive research with a positivist perspective and inductive research with an interpretive/interpretivist perspective. I acknowledge that this is not always so. For example, Eisenhardt (1989) discusses a positivist approach to inductive theory-building, using case-studies. However, given the IS literature focus here, these associations provide a useful way of discussing the problem of generalization from empirical research.

A research "life-cycle" model is useful in understanding the processes of systems stages of theory-generation and enhancement and to define assessments of quality and rigor, at each stage. The lifecycle concept used to frame Table 3 was adapted from Galliers' (1992) representations of alternative research models, Dey's (1999) discussion of stages of research and models of deductive and inductive research approaches (Babbie, 2001; Eisenhardt, 1989; Yin, 1994). Of course, any lifecycle model is an over-simplified reduction of the research process. Research very rarely follows a linear progression: there is a constant cycling between theory and data, as plans evolve with contingencies and intermediate findings. But the lifecycle concept guides the way in which research findings are accounted for, in most of the IS literature. They present a narrative of, and make explicit (or hide) the research process in different ways, to collude with notions of rigor. Even interpretivist studies must account for their findings in specific ways, to align themselves with a positivist conceptualization of how data should be collected and analyzed, for findings to be considered generalizable. A notable exception is Schultze's (2000) "confessional" account of knowledge work, which breaks with the tradition of conforming to a "controlled" research process. The majority of researchers would agree that their research process follows a very different pattern to the one presented in their writings:

" The actual research process did not match the linear presentation of this book whereby theory is described first, empirical research happens next, results are then analyzed and conclusions are drawn. Instead, the process involves such aspects as the use of theoretical insights at different stages, the modification of theory based on experience, the generation of intermediate results that lead to the reading of a different theoretical literature and the continuing revision or new enactment of past research results." (Walsham, 1993, page 245).

We constantly cycle between deduction and induction, during the processes of moving from abstraction to generalization and back again (Klein and Myers, 1999; Strauss and Corbin, 1998; Walsham, 1993). Thus, it is nonsense to claim that positivist research is exclusively deductive or interpretive research is exclusively inductive. Researchers from both traditions make decisions about theory from data (induction) and make decisions about data from theory (deduction). The difference, once again, lies in the way in which research findings are accounted for. While deductive approaches stress theory testing and validation, inductive approaches stress innovative theory-building. Glaser and Strauss (1967) differentiate between substantive theory (built on empirical observation and an emerging claim to generalizability) and formal theory (built on generalizability across multiple populations). The deductive model is built on the advancement of formal theory – either through its development, confirmation or refutation. The inductive model is built on an absence of formal theory and is required for formal theory to develop. It would therefore seem appropriate to postulate that in any emerging field, the majority of research would be based on the inductive approach, until a sufficient body of formal theory has developed. This

has not been the case in the IS field, because of its reliance on reference disciplines, such as the natural sciences, engineering and computer science, sociology and organizational and management studies. Conflicts between these very different traditions of research have raised issues of legitimacy, that are only now being resolved in an uneasy accommodation.

In accounting for interpretivist studies, the role of inductive reasoning (and therefore subjectivity) is made explicit: research questions are derived inductively from a review of selected literature, these are investigated through inductive processes of inquiry and analysis, then generalizations are abstracted from the findings, on which future theory may be based. Such research relies on the subjective identification and analysis of relevant data (as data collection is not guided by an "objective" research instrument). Because of the complexity involved in collecting data that is sufficiently rich that patterns may be discerned among elements that are not wholly identifiable in advance, inductive research involves a great deal of ad hoc discrimination between the significant and the insignificant. Data analysis is also subjective, as the interpretation and categorization of data is highly individual. The findings of inductive research are therefore easy to challenge, on the basis of explicit subjectivity. The *recognition* of an inductive process – the abstraction of relationships between elements of data on the basis of prior experience or sensitization on the part of the researcher - is a core difference between positivist and interpretive research. An external reality is explicitly and self-consciously interpreted by the interpretive researcher. The positivist researcher assumes (at least, for the sake of presenting their findings) that what is observed *is* reality. Hypotheses are presented as obtained through processes of deduction from existing research "knowledge", scientific tests are constructed, to confirm or refute those hypotheses, then generalizations are deduced from the claimed external validity of the hypotheses.

But deductive, positivist research approaches are also subjective. This subjectivity occurs much earlier in the research life-cycle, with the identification of suitable theories for the development of hypotheses and the design or selection of research instruments and the population to be sampled. Theories by their nature are reductionist. They include some data and exclude other data. The selection of a suitable theory on which hypotheses will be founded therefore determines which data variables will be included in the analysis and which excluded. Yet this element of theory construction remains largely unexamined by the formal accounts that we present in journal papers and books. We relieve ourselves of the responsibility for proving every element of a theory from first principles by relying on the conferred authority that citing a previous author who has done so confers (Latour, 1987). If one follows the chain of cited authors backwards, formal theories involving human agency derive not from axiomatic principles (natural scientific laws) but from inductive theory-building, often supported by small data samples. Given these constraints, generalization for positivist research is equally problematic as for inductive, interpretivist research. This subjectivity only remains unchallenged because a succession of socially-constructed claims for "truth" have accumulated through custom and practice in the natural sciences and these have been adopted uncritically by IS researchers.

Table 3 presents a summary of the role of subjectivity and rigor in positivist vs. interpretive research, classified by the stages of the research life-cycle. It can be seen that claims to rigor from the two perspectives are very different. In particular, the use of tentative language and the explicit recognition of subjectivity make it more difficult for interpretive researchers to justify the same claims to truth as positivist researchers. This is one reason why interpretive research is so often attacked as lacking rigor. However, for the reasons discussed above, positivist research claims to truth are equally susceptible to challenge. These claims only stand because of their basis in the customs and practices that have accrued in the IS field, of accounting for socially-situated research according to a discourse of scientific rationality.

Table 3: A Framework Of Rigor Related To The Stages Of A Theory-Building Research Life-Cycle

Positivist Approaches	Interpretive Approaches
Research Initiation	
Positivist approaches start from a deterministic position: theories represent objective, causal relationships that can be discovered through observation (Walsham, 1993; Yin, 1994).	Interpretive approaches start from the position that reality is socially-constructed: theories are just useful constructs to make sense of the world (Walsham).
Rigor entails construction of hypotheses that are deductively constructed from extant theory and prior empirical observations. Assessed on authority of prior literature.	*Rigor entails a sufficiently deep appreciation of appropriate constructs to guide the development of research questions. Assessed on authority of, or gaps in prior literature.*
Data selection	
Relevant theory and lacunae are identified. A research "instrument" is designed (or an existing instrument identified/enhanced), which will enable precise, objective measurement of the elements of theory identified as significant (data "variables" and relationships).	Phenomena are identified as potentially significant elements of theory[5]. Multiple data collection methods and approaches may be employed to assess different types of relationships, behavior, or phenomena.
Rigor involves the objective determination of a subject-population to be sampled. Assessed on statistical tests of sample validity.	*Rigor involves identifying appropriate data and methods of data collection, to answer the research questions posed. Assessed on perceived authenticity of the account.*
Data collection	
Examples of positivist methods are numerical surveys, laboratory experiments and numerically-coded observation studies. Data collection is guided by statistically-determined sample sizes for the number of variables being observed.	Examples of interpretive methods are ethnography, participant observation and action research. Data collection is often guided by inductive, theoretical insights from earlier data collection and analysis.
Rigor is defined by the extent to which the research instrument is employed objectively and the context of the study is controlled. Assessed through procedural consistency.	*Quality criteria include the extent to which the researcher examines the impact of their biases, assumptions and influences on the study and accounts for intersubjective & multiple views of the situation.*
Data analysis	
Numerical values are assigned to each data sample collected and relationships between various aggregations of these values are deduced using statistical methods.	The collected data are coded and analyzed qualitatively and/or quantitatively, to discern concepts, themes & patterns. Analysis involves an inference of relationships between data elements, often based on inductive pattern recognition.
Rigor involves the objective and consistent use of appropriate statistical methods of analysis. Assessed through procedural consistency.	*Quality assessment takes a <u>continual</u> overview of the process to ensure internal consistency of analysis (between data samples and between analysts).*
Synthesis and theory generation	
Causal relationships between data variables are identified. These are related to existing theory and the results used to generate new theory, or to enhance or confirm existing theory.	Relationships, patterns and process-stages are identified and related to existing theory. The results are used to generate, confirm, enhance or revise existing theory, as it applies to situations with a similar context.
Rigor involves the application of statistical analysis to determine generalizability and the strength of relationships deduced from the data.	*Rigor involves the careful examination of assumptions concerning relationships and identification of context elements that may be transferable to other situations.*
Research publication	
The process is presented as guided and planned. Results are presented as the natural outcome of the process. A clear statement of the generalizability of the conclusions and limitations arising from the study is provided.	The process is most often presented as guided and planned[6] . Statements of implications for generalizability are avoided, or are based on a misreading of Yin's (1994) conclusion that findings from a sample of one are ultimately generalizable.
Rigor consists of justifying objectivity through the appropriate use of statistical methods.	*Rigor consists of making only tentative claims for generalizability and including an explicit examination of subjectivity.*

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[5] It is difficult to capture all the various shades of interpretivism in one, short table summary, as this position represents such a wide range of responses to positivism. I have attempted to use words that represent this range of opinion, without pinning it to one particular method or position, but this may not always be successful.

[6] Miles and Huberman (1994) argue that a linear (planned and guided) research presentation is often a way of justifying qualitative research in fields dominated by positivist traditions of research.

Conclusions

The positivist and interpretive paradigms for empirical research in IS may be viewed as incommensurable. The significance of this incommensurability reaches beyond the difficulty of combining methods deriving from the two paradigms. People experiencing these different 'life-worlds' can never understand each other's perspective. There are some very clear-cut distinctions between the two positions: even the terminology used by researchers working within each of the two paradigms demonstrates fundamental differences in their respective definitions of reality, truth and valid knowledge. But the distinction between positivist and interpretive worldviews represents two extremes of the spectrum and that there are many intermediate positions represented by contemporary research studies in the IS literature. Different researchers strive in different ways to overcome the incommensurability of the two philosophical positions and each of us occupies both worlds at the same time(Mingers, 2002). This paper has discussed how the way in which claims to truth are constructed derives from the traditions of positivist research and how positivist value-systems may undermine interpretivist claims to rigor. It has also discussed alternative criteria that may be accepted, to support claims to the quality of research process and findings.

I have found it useful to observe the limitation that "any claim to truth is always at risk and subject to revision as one learns from the arguments of one's opponents" (Klein et al., 1991, page 7). So, to conclude this debate, let me pose a question. *If two researchers are presented with the same data and use the same methods, applied rigorously, will they derive the same results?* To answer this question, it is important to question our assumptions about reality. If we understand reality as being "out there" - that what we see and measure, when we collect "data" is what exists, independently of our interpretation of the situation (or of the influence that our presence imposes) - then we would naturally answer "of course they would". If we understand reality as being socially constructed - that what we see is our interpretation of the world and that what others report to us is their interpretation - then we would answer "of course they would not". In that "of course" lies the internal conflict that we all tussle with, as researchers. Because the problem is that *all of us understand the world in both ways at once*. As argued above, whichever paradigm we adopt for our research, very few of us would take the extreme view that the paradigm assumes, if questioned. It is in within this fundamental contradiction that we attempt to make sense of the world by employing standards of rigor and criteria for quality. IS research can only profit from the transference of findings between studies from different worldviews. But this transference depends on an individual ability to recognize that, within their own paradigm, the other researcher has made a genuine attempt to employ reasonable criteria for quality assessment within their research paradigm, rather than opting for a one-size-fits-all model of the IS research world.

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