

METAPHOR, MEANING AND MYTH:

EXPLORING DIVERSITY IN INFORMATION SYSTEMS RESEARCH

Abstract

In striving to understand Information Systems phenomena IS researchers frequently draw on a seemingly endless array of different disciplines to inform their studies. This act has drawn both the ire and admiration of those within the field as well as those outside its porous boundaries. On the one hand IS researchers are berated for being chaotic and schizophrenic in their combined research endeavor – for producing a collective output that shows no rhyme or reason. On the other hand they are praised for being intellectually open and democratic in their approach. These reactions draw their strength from the many issues that stem from the diversity in IS research. However, the more fundamental issue of research diversity remains overlooked. This paper addresses this critical oversight by making research diversity the prime focus. The contributions it makes to current understandings of research diversity in information systems are theoretical and empirical. Theoretically, it explores research as a cognitive process by relying on the alternative lens of concepts. Empirically it examines the conceptual diversity of the organization – a key disciplinary concept. Grounded in Lakoff and Johnson’s (1980) work with metaphors, the results show that IS research may not be as diverse as was initially thought. Of the three primary views of the organization; machine, organism and culture – the study finds a distinct bias toward conceptualizing the organization as a machine. This bias, one that exists at the very core of the IS research endeavor, has important implications not only for individual researchers but the broader IS community.

Keywords: Diversity, cognition, concepts, metaphor, organization

Metaphor, Meaning and Myth: Exploring Diversity in Information Systems Research

Of all the ridiculous things that have been foisted on the long-suffering executive in the name of science and progress, the real time management information system is the silliest.

(Deardon 1966, p.123)

And so too, it could be said that of all the things the IS discipline has had to suffer, fierce and open criticism are perhaps one of the most enduring. Being a relative newcomer to the academic stage the IS discipline has, from its very beginnings, drawn on a seemingly endless array of different disciplines to inform its studies. Likewise, it has also drawn the ire of those within and outside the discipline for doing so. The key problem with this diversity, as highlighted by Deardon, was that, “It is difficult even to describe the MIS in a satisfactory way... It is nearly impossible to obtain any agreement on how MIS problems are to be analyzed, what shape their solutions might take, or how these solutions are to be implemented” (Deardon 1972, p.91). The variability and diversity inherent in the IS discipline, were problematic in that they were seen as being completely at odds with being *disciplined*. Hence, due to the fields diversity its legitimacy and credibility on the academic stage was called into question; an argument followed to this day.

While the problems of diversity have weighed heavily on the IS discipline (Benbasat and Weber 1996) the field has nevertheless managed to enjoy success. From the many excellent journals devoted specifically to the subject of IS, to the number of IS conferences available to IS researchers and practitioners, to the truly global institution the IS discipline has become. All these successes have been hard fought and hard won victories for the IS discipline, especially given its history for attracting – what some may term - the wrong type of attention. However, unlike Deardon there are many in the IS discipline who believe the reason for these successes were directly attributable to the high levels of diversity inherent in our discipline. They view their disciplinary diversity as a positive trait – one that should be further fostered and encouraged (Banville and Landry 1989, DeSanctis 2003, Hirschheim 1985,

Robey 1996). Diversity, particularly in research should be viewed, not as something to be merely tolerated, but as an “irresistible” (Hirschheim 1985 p.36) necessity. That is, for the discipline to survive and thrive over time IS academics must build on the diversity of what they actually do. The viewpoint for the proponents of diversity are perhaps best summed up by Robey’s (1996) catch-cry: *Let many flowers bloom*.

On the other hand there are those in the discipline of IS who are not as willing to accept this rather liberal view of research. This group believes in a monistic view of science (Landry and Banville 1992) and are perhaps best summed up as conservative when it comes to the levels of diversity that are acceptable in the IS discipline. Being conservative this group believe that encouraging diversity is essentially encouraging a free-for-all (Benbasat and Weber 1996). To them, the discipline has already become too diverse and we should act to prevent any further degeneration. This group believes that if we allow our discipline to become further diversified the most likely result be the ultimate starvation and death of the discipline (Benbasat and Zmud 2003). On this point the conservatives appear to agree more with Deardon’s original argument than with their own more liberal IS colleagues. That is, to them – as was the case with Deardon - consensus rather than diversity is essential for a clear identity and survival over the long term. *United we stand, divided we fall* is perhaps a phrase that best captures this groups more conservative approach to the levels of diversity acceptable in IS research.

Such differences of opinion in what levels of research diversity should be accepted have polarized the discipline for years. However, while the issues stemming from diversity in IS research have been hotly contended, little subsequent attention has been paid to the issue of research diversity itself. Namely, what do we actually mean when we talk of research diversity and how can we know when we are diverse in our research? Theoretically, this paper extends current understandings of research diversity by exploring research as a cognitive process. Empirically, it employs a critical metaphor analysis to explore the conceptual diversity of one of the discipline’s prime areas of interest - the organization. The results show that we may not be as diverse in our research as the above discussions might lead us to believe.

DIVERSITY

The issue of research diversity has certainly resulted in a great deal of soul-searching for those in the IS field. For instance, it has forced us to ask complex and at times troubling questions concerning our disciplinary identity: Who are we? What do we do? And why should anyone care? These questions have been asked by various scholars since the inception of the IS field but perhaps none more succinctly than Benbasat and Zmud (2003). Benbasat and Zmud (2003) raised these questions, in relation to what they referred to as, the “identity crisis” (p.183) of the discipline. They believed that due to the diverse set of topics IS scholars researched and taught, the discipline’s central identity was being made all too ambiguous. Furthermore, if the problem was left unattended it would threaten the viability of the IS discipline as a whole. While it was certainly not a new ‘threat’, the discussion took on a more urgent tone. That is, although various books, articles and conferences had discussed this issue over the years (Landry and Banville 1992) the rhetoric resembled more of a steady ebb and flow of discussion. This time though, many in the IS community were jolted into clear and decisive action. Action of the like that had never been seen before. In 2003 both the *Communications of the AIS* (CAIS) and the *Journal of the AIS* (JAIS) devoted special sections to debate central issues that stemmed from diversity in IS research. This resulted in at least five articles in the JAIS (DeSanctis 2003; Galliers 2003; Hirschheim and Klein 2003; Lyytinen and King 2004; Robey 1996) and an initial ten part series in the CAIS. A veritable “wave of discussion within the IS field” (Gray 2003 p.1) formed, not only over matters of identity but many other related issues such as practice (what we do) and relevance (who cares?) stemming from the central issue of research diversity.

The diversity debate within the IS field is perhaps one that was bound to occur. Similar debates have held the interest and focus of many other fields; from the closely related field of Organizational Science (see the debate between Pfeffer 1993 and VanMaanen 1995) to Philosophy, the father of all disciplines (Archard 1996, Callahan 2000, Kekes 2000, Visker 2004). In relation to these fields the debate in IS has certainly not been as visceral as that in the Organization Science field and perhaps not as contemplative

and abstract as the debate in philosophy. However, unlike these disciplines – more noticeably in the area of Philosophy - we appear to have missed a fundamental issue: what do we mean when we talk of research diversity?

The only known theoretical exploration of research diversity in Information Systems is the one provided by Benbasat and Weber (1996). They state that research diversity can be recognized in three main ways: through the diversity in the problems addressed; the diversity in the theoretical foundations and reference disciplines used to account for IS phenomena; and the diversity in the methods used to collect, analyze and interpret data. While this is a useful frame of reference it is still only one possibility. Furthermore, it is this same single theoretical explanation that has been relied on as a testament to the diversity in our research. However useful this understanding is, it tends to overlook research as a cognitive process and what this implies for diversity. Guided by theoretical understandings in fields such organizational science, philosophy and cognitive science this study attempts to address this oversight by exploring research as a cognitive process and its implications for diversity in IS research.

Prior Studies in Information Systems

A number of meta-analyses conducted on the research in the IS discipline have also been used to form conclusions about the levels of diversity in our research. For example, the study by Swanson and Ramiller (1993) was later used as a clear indication that there was indeed diversity in the IS field (Benbasat and Weber 1996; Robey 1996). However, there are very few empirical studies that have focused directly on the issue of research diversity. The only known studies to do so were conducted by Vessey et al. (2002) and more recently by Sidorova et al. (2007). The study by Vessey et al. (2002) built on the understandings of research diversity provided by Benbasat and Weber (1996) and added two further characteristics: research approach and research method. In their study they found what they believed to be a “considerable diversity in each of the key characteristics” (Vessey et al. 2002 p.129). The study by Sidorova et al. (2007) that was later re-focused into a paper about the intellectual core (2008), used latent semantic analysis to gather key research themes over a period of 20 years. While

Sidorova et al. (2007) argued that their results were richer than those of Vessey et al. (2002) their study essentially confirmed the findings of Vessey et al.'s study. That is, they revealed a "rich and varied field with a wide collection of research themes" (p.1). Therefore, both Vessey et al. (2002) and Sidorova (2007, 2008) confirmed the original observation made by Benbasat and Weber (1996) that diversity in IS research was both the "reality and the accepted norm" (p.389).

While not directly related to the issue of diversity there is one piece of research that hints at a more biased profile of IS research than the above studies assert. This study, conducted by Orlikowski and Iacono (2001) focused on the conceptualizations of the IT artifact in IS research. Rather than a broad and diverse array of conceptualizations of the IT artifact, Orlikowski and Iacono revealed something quite different. As they stated, "much IS research draws on commonplace and received notions of technology, resulting in conceptualizations of IT artifacts as relatively stable, discrete, independent and fixed." (p. 121). Although Orlikowski and Iacono's (2001) study did not make its prime focus diversity of IS research it shows how a similar problem looked at in different ways might reveal different results. That is, by looking at the same journal over the same period of time Orlikowski and Iacono (2001) came to vastly different conclusions than Vessey et al. (2002) and Sidorova et al (2007). Where Vessey et al (2002) revealed a rich and varied field Orlikowski and Iacono (2001), by focusing on the IT artifact, revealed a potentially more restricted view of IS research.

This study takes up the hint provided by Orlikowski and Iacono (2001) in that all may not be as it seems in the realm of IS research - especially, when one takes a more conceptual and focused view of the research process. However, unlike Orlikowski and Iacono (2001) and more like Vessey et al (2002) this study seeks to directly address the paucity of empirical studies concerning research diversity. Therefore, like Vessey et al (2002) it asks the same broad research question, "How diverse is IS research?" (p.131). However, this study takes up the thread already provided by Orlikowski and Iacono (2001) in its approach; it is interested in research as a cognitive process. Therefore, where Vessey et al. (2002) and

Sidorova (2007) look at research diversity from a broader perspective this study makes its contribution by looking at the same issue in a more narrow and focused way.

Related Studies in Organizational Science

While not strictly looking at diversity *per se*, some within the organizational science area have found what they believe to be a conceptual bias in their discipline. While there are no known empirical studies to back up their assertions there certainly appears to be a great deal of theoretical work combined with anecdotal evidence to suggest that such a bias does indeed exist (Adams and Ingersoll 1985). Furthermore, this conceptual bias exists at the level of organizations, their key object of interest both in research and in practice. The rationale is based on the idea that organizations can be conceptualized using three primary or root metaphors (Schultz 1995). Note that while Morgan (1997) offers a total of eight metaphors Alvesson (1993), Schultz (1995) and Smircich (1985) contend that of all these eight metaphors there are only three that can be classed as primary or root metaphors. These three metaphors are the organization as machine, organization as organism and organization as culture. These metaphors are each responsible for highlighting very different aspects of the organization and so provide a more balanced perspective of the concept. The machine metaphor views the organization as being a rational entity where attributes such as efficiency and effectiveness are critical. The organism metaphor views the organization as being driven primarily by the need to survive and adapt to its environment. The culture metaphor highlights the symbolic attributes of the organization. Each of these metaphors provides a very different view of the organization.

One of the key criticisms of some within the Organizational Science area is that there exists an overemphasis on the machine and organism metaphors both in research and in practice. By focusing on these metaphors the organization is structured and understood as a rational, stable and purpose driven entity. When viewing research as a cognitive process such structuring and understanding of organizations completely dominates the thinking and subsequent action of researchers and practitioners in the Organizational Science field.

This study builds on the foundational work of organizational science researchers by focusing on the organization – a concept of mutual interest - as the single unit of analysis. Furthermore, this study views all three root metaphors; organization as machine, organization as organism and organization as culture; as equally important to the cognitive process of researching organizations in Information Systems.

THEORETICAL FOUNDATIONS

In the IS discipline research is an integral part of disciplinary endeavors. Furthermore, we take our research seriously, which is perhaps why discussions stemming from diversity in our research have been so contentious. We realize that in order to advance our discipline we must advance our knowledge and understanding. However, knowing and understanding are impossible without thought – without employing our cognitive processes. While few would deny research is a cognitive process this is far from an open and direct acknowledgement. This is more important and significant than one might initially believe. As Bailyn (1977) states such recognition is critical as it results in a very different view of research. Rather than looking at research as a final product one looks at research as a flow of cognition – of active engagement. To explain this point, an expansion on Saunders (2005) metaphor of researchers as diamond cutters may be useful. In focusing on research as a cognitive process the emphasis is more on the activity of the ‘cutting’ so to speak; the active engagement of an artisan with his creation; not just the creation itself; the polished gleaming gem. In using this metaphor one might see how such a concentration on the active process of research rather than the static product alone might reveal some very different insights. Therefore, by focusing on research as a cognitive process the perspective and also, quite likely, the results may be quite different.

At its most basic level the cognitive process relies on the formation of concepts. As Murphy (2002) states, “concepts are the glue that holds our mental world together.” (p.1). However, while our concepts may be essential to our own mental stability we are so dependent on them they are “almost invisible to consciousness” (Fauconnier and Turner 2002 p.v). So, if we are largely unaware of our concepts how is it possible to uncover them? This is of course a critical question in relation to this study. That is, in order to

look at research as a cognitive process and the implications for diversity one must be able to examine the concepts involved in that process. One answer, provided by Fauconnier and Turner (2002), asserts that while our concepts and their formation are largely invisible to our consciousness they are made visible through language. That is, language - both written and spoken - is an important evidentiary source for revealing our concepts and the way we think. Furthermore, in relation to concept formation metaphors have long been recognized as essential to thought (Lakoff and Johnson 1980). Therefore, one way of exploring research as a cognitive process is by examining the metaphors we use in language and one way of examining our metaphors is via a Critical Metaphor Analysis (CMA).

The CMA approach is founded on two theories: metaphor theory and critical discourse analysis. The following sections provide further detail on these theories and how I have drawn on them in this study.

Metaphor theory

Metaphor is a tool so ordinary that we use it unconsciously and automatically, with so little effort that we hardly notice it. It is omnipresent...It is conventional... and it is irreplaceable. (Lakoff and Johnson 1980 p.xi)

While the use of metaphors are not new in the area of Information Systems (Couger et al. 1993; Kendall and Kendall 1993; Porra 1999, 2005; Wells et al. 2005) they are far from a mainstream concern. However, in the reference discipline of organizational science metaphorical thinking has played a significant role in advancing organizational theory as well as the discipline as a whole (Cornelissen 2006). In this study I take a similar view to Cornelissen (2006, 2005) in that metaphors are primarily cognitive and semantic in nature and vice versa. This view follows in the tradition of cognitive scientists and cognitive linguists such as Fauconnier and Turner (2002). That is, to think is to use metaphors and to use metaphors is to think. As far as this study is concerned I am interested in how variable that thinking is with respect to our research. Are our cognitive processes rich and varied or are they more rigid, biased and less flexible?

Metaphors are typically regarded as simple embellishments of language – a rhetorical flourish. However, scholars in the area of psychology, philosophy, linguistics and cognitive science assert that the power of metaphors goes much deeper than this (Fauconnier and Turner 2002, Lakoff and Johnson 1980). Metaphors are, in essence, responsible for our thought; our conceptual system is fundamentally metaphorical. The way we think is by a process of cognitive transferal or mapping. A metaphor is essentially where one thing is discussed as being, or equal to, another thing. *Organization is a machine* is an example of a metaphor. It works through a process of transferal; by establishing a cognitive link between a concrete source domain and a more abstract target domain. A metaphor maps the most salient characteristics from one to the other (Lakoff and Johnson 1980). So for example, in this study one of the metaphors I am interested in is the metaphor *organization as machine*. The cognitive process of this metaphor is revealed by the act of transferring the most salient characteristics of one concept – the machine – to another concept – the organization. Therefore, the way we think and talk about organizations is the way we think and talk about machines. We view them in terms of how efficient and effective they are, in terms of processes and products – just as we view the machine.

An important evidentiary source for the metaphors we rely on to structure and understand various phenomena is our language. Both written and spoken it is our discourse that reveals our metaphors (Lakoff and Johnson 1980). One way of examining our discourse for metaphors is through a discourse analysis.

Critical Discourse Analysis

While discourse analysis is primarily understood as a method, it is also embedded within a larger theoretical perspective on social life (Wood and Kroger 2000). In Johnstone's (2002) heuristic for conducting a discourse analysis he states:

1. Discourse is shaped by the world, and discourse shapes the world.
2. Discourse is shaped by language, and discourse shapes language.

3. Discourse is shaped by participants, and discourse shapes participants.
4. Discourse is shaped by prior discourse, and discourse shapes the possibilities for future discourse.
5. Discourse is shaped by its medium, and discourse shapes the possibilities of its medium.
6. Discourse is shaped by purpose, and discourse shapes possible purposes. (p.9)

Johnstone's heuristic is a useful basis for joining different levels and forms of discourse with sound theoretical analyses (Johnson 2005). This study relies on Johnstone's heuristic in that it recognizes that the ways in which we structure and find meaning in our world as researchers shape our discourse and vice versa.

METHOD

The purpose of this study is to explore research as a cognitive process and its implications for diversity. To explore this cognitive process I have relied on past work done by others in the area of Organizational Science; namely the notion of metaphors in structuring and understanding various phenomena. However, before I had actually progressed too far with this study I had to make two important decisions. The first concerned the area of research cognition. More specifically, I had to decide on a concept for the focus of analysis as well as decide on a data source. Both decisions were not as straightforward as they might initially appear: there were no 'perfect' candidates for either of these tasks. However, after much deliberation the organization was chosen as the target concept and the journal Information Systems Research was chosen as the data source. The main justifications for both these decisions are outlined in more detail below.

Concept Choice

The organizational concept –while it may not be the centre of IS concern – is nevertheless a significant and important concept. Since the very beginnings of IS the discipline has situated itself firmly in the ground of management and organizational studies (Power 2003). Furthermore, within the discipline it is

in a researchers best interest to situate their studies with regards to organizations. For instance, two of the most highly regarded journals in the IS discipline the *Management Information Systems Quarterly* (MISQ) and the *Information Systems Research* (ISR) journal make clear the significance of organizations in the following editorial statements:

[T]he editorial objective of the MIS Quarterly is the enhancement and communication of knowledge concerning the development of IT-based services, the management of information technology resources, and the economics and use of information technology with managerial and *organizational* implications. (MIS Quarterly 2007).

The review processes will emphasize relevance to practice and the *organizational* realities of information systems as equally important along with academic rigor and theoretical contributions. (Sambamurthy 2007)

Therefore, IS researchers in many cases must situate their studies with regards to the organizational concept. Hence, the organization was finally chosen as the target concept for this study.

Data Source

The biggest deciding factor for the selection of ISR for this study was its ability to form a comparison with other studies. For example, articles appearing in the journal, ISR, provided the initial evidentiary base for the meta-analysis conducted by Swanson and Ramiller (1993). Furthermore, it was this study that helped seed the most current interest in the diversity debate. While it has to be admitted that the purpose of Swanson and Ramiller's meta-analysis was not to find out how diverse the field was, it certainly was taken as evidence to that effect by many in the field (Benbasat and Weber 1996). However, in the study conducted by Vessey et al. (2002) whose direct focus was diversity, the journal ISR was found to be the most representative of diversity. While other journals were included in the study ISR was pivotal in the conclusions Vessey et al. formed. That is, that research in the field was diverse. Sidorova (2007) had also included ISR as an evidentiary source for their latent semantic analysis and likewise concluded for high levels of research diversity. Therefore, the ability to form comparisons with similar - albeit arguably very

paradigmatically different - studies was the biggest deciding factor in choosing ISR as the evidentiary base.

On the decision of article selection the articles published in ISR during the period of 2000 – 2008 were selected for analysis. The reason being that from 2000 onward the editors of the journal had been visibly active in their efforts to encourage submissions that put forth a wide variety of perspectives (Benbasat 2000; Benbasat 2002; Kemerer 2003; Sambamurthy 2005). Therefore, articles published in ISR – a journal noted for disseminating research believed to be highly diverse - during the period 2000-2008, a time of active and open encouragement of a diversity in article submissions, were selected for analysis.

Application

As this study makes heavy use of metaphors it is probably a fitting time to describe the application of the Critical Metaphor Analysis approach with a metaphor of its own. In my own experience I think the metaphor, *CMA as archaeological dig*, is appropriate. That is, the approach requires a very careful and methodical approach that must be maintained for the entire length of the study. From discovery of the evidence to the final analysis, the approach demands a deliberate and steady focus. Furthermore, the ‘spoils’ of such an approach as with any archaeological dig are not predetermined; one may find relatively little at any given site and then, quite literally, may stumble across veritable riches at the next site. As with any archaeological dig the CMA approach demands that one simply be prepared to ‘dig’.

Like an archaeological dig the CMA approach provides a certain distance from a particular event or activity that occurred independently of the investigator. This has both disadvantages and advantages. With regards to the CMA in this study the disadvantage of this distance is one of effort. That is, being able to ask a person directly about their cognitive process would be much easier than having to piece together as evidenced in their papers what that process was. However, the advantage of this removal from the cognitive process is that many people are simply unaware of how they actually think – the metaphors they use in structuring and understanding various concepts. As Bailyn (1977) states, only the most self-conscious researcher is aware of their research as a cognitive process. Hence, CMA is an approach that

relieves the investigator of asking researchers to describe a process that they would be largely unaware of – an advantage that outweighs its disadvantages at least in this study.

For the CMA in this study I used a combination of both manual and computerized means. While the vast majority of researchers, appear to conduct CMA via manual means alone, research software was used as a supplementary coding tool in this study. For the analysis a manual approach was used and for coding and reporting purposes the software package HyperResearch (ResearchWare 1997) was relied on. The entire set of articles appearing in the ISR during the period 2000-2008 formed the evidentiary base for the analysis and coding.

As for the actual process of analysis I examined each article manually, line by line, for any reference to my target concept: the organization. For example, the article might mention the organization itself or a synonym such as business, firm, company etc. Once this reference to the target domain concept had been found I examined the surrounding text for any reference to the source domain concepts of machine, organism and culture. This involved searching the surrounding text for any mention of ‘machine-like’, ‘organism-like’, or ‘culture-like’ terminology. For example, when introducing an organization the author might stress ‘organism-like’ terminology such as adaptation and survival. When such text was identified it was coded using the software under the appropriate metaphor code. After this process was complete textual excerpts were examined for different sub-domain mappings. This was to determine whether the root metaphors were supported by other sub-metaphors.

RESULTS

The most significant result of this study was the unearthing of a certain bias toward the way organizations are structured and understood. That is, there was a great deal of evidence to support the notion that researchers relied on the machine metaphor – and to a lesser extent the organism metaphor - when structuring and understanding the organization. However, as shown in *table 1*, there was no corresponding evidence to suggest that the culture metaphor was used in this same process. The most compelling result from this study is that researchers favor the machine metaphor - and to a lesser extent

the organism metaphor – when they think about the organizational concept. Furthermore, rather than being flexible in our cognitive processes, the evidence suggests that IS researchers prefer the stability and rationality of the machine and organism metaphors in their efforts to structure and understand organizations.

In presenting the results for this study I will use Johnson’s (2005) format as a guide. That is, I will present the results in a more concise summary format and then in a more detailed form. The summary of results section is given simply as a means of providing the reader with a more convenient interpretation of the results: a summarized version of the key findings. In the next section I will present the detailed qualitative results. This is intended to provide the reader with a more detailed and nuanced understanding of what was found. I use Johnson’s (2005) format in the hope that the results of this study will be understood by as broad a cross-section of the IS community as possible; in my opinion it conveys a great deal of information without the disciplinary-specific or methodological jargon typically encountered in linguistic CMA studies.

Summary of results

As can be seen in *table 1* most articles relied on the machine metaphor in order to structure and understand the organizational concept. In less than half of the articles there was evidence for the use of the organism metaphor. However, it was rare for these articles to rely on organism metaphor exclusively ($151 + 69 > N$). That is, it was typically used in combination with the machine metaphor. Furthermore, despite the importance attributed to the culture metaphor by previous researchers no evidence could be found in the articles for a reliance on it.

Source domain	Target domain	N
MACHINE	ORGANIZATION	151
ORGANISM	ORGANIZATION	69
CULTURE	ORGANIZATION	0
		N=164

Table 1 Organizational metaphors and the number of referencing articles

Detail of results

It is the purpose of this section to present to the reader a richer, more detailed picture of the findings; that there is a distinct cognitive bias in how articles structured and understood the organizational concept. More specifically, this section shows that through a continual and repeated focus of rhetoric on the high-level entailments of machines, the machine metaphor emerged as the single most predominant way of conceptualising the organization in this study. Such a rich surplus of rhetoric was not available to the same extent – if at all – for the other metaphors of organism and culture. Furthermore, several strong sub-metaphors surfaced for the machine metaphor that was not visible to the same extent for the organism and culture metaphors. These sub-metaphors also helped contribute toward the overall preference of the machine in conceptualizing the organization. Therefore, through a surplus of rhetoric that was focused on the high-level entailment of machines as well as the establishment of sub-metaphors the machine metaphor emerged as the single most dominant way of structuring and understanding the organization. The following sections will outline in more detail the evidence found for each metaphor in this study.

Organization as Machine

The success of the human race can be largely attributed to our ability to create and maintain an artificial world. This artificial world is full of tools, gadgets and gizmos that are with us from birth to death allowing us to push the limitations of nature like no other species on earth. We have overcome so many of nature's constraints that we are almost removed from it. We no longer think of ourselves as 'primitive' animals, but as a sophisticated and almost 'omniscient' form of being. For instance, in many cases we do not have to rely simply on nature's bounties for our own subsistence. Through the ages, we have created so many different machines that make the production of resources necessary for our physical survival we have been able to consider matters of a more metaphysical importance. We are left to consider our complex social, political, cultural and historical arrangements - to think, to ponder, to philosophize. Our reliance on the machinery we create to make these other endeavors possible is complete. Life as we know it is almost entirely dependent on a mechanized world, so much so that it is almost impossible to imagine

how we could survive without it. Therefore, the significance and importance of machinery to the human race as a whole down to the minute details of our everyday lives is hard to over-estimate.

Perhaps because machines are such a pervasive feature of modern life they emerged as the single most dominant way of structuring and understanding organizations in this study. Machine-like terminology was frequent and repeated not only across but within articles. Moreover, when further analysis was conducted on this terminology several strong sub-metaphors were revealed. These sub-metaphors, each with their own detailed imagery, combined to create a rich and complete picture of the main machine metaphor. As shown in *table 2*, the sub-metaphor mappings for the main machine metaphor were: PURPOSE -> wealth generation; PRODUCT -> goods, services; PROCESS -> tasks, routines, operations; PART -> departments, functional areas, people, technology, hardware, software. This includes the source domains of the metaphor as well as the most common target domains discussed in the articles of ISR during the years 2000-2008. Therefore, in this study it was the sheer richness of rhetoric as well as the existence of strong sub-metaphors – factors which did not exist for the other metaphors - that contributed to the machine metaphor being the most preferred way of conceptualizing organizations in this study.

Sub-Metaphors for Organization as Machine	
<i>Source Domain</i>	<i>Target Domain</i>
Purpose	Wealth generation
Product	Goods, services
Process	Tasks, routines, operations
Part	Departments, functional areas, people, technology, hardware, software

Table 2: Machine sub-metaphors

The way in which these different sub-metaphors are hierarchically arranged allows them to be understood as components or derivatives of the one overarching metaphor (Johnson 2005). As Johnson (2005) states, the images produced by the lower mappings create cognitive space for the higher mappings” (p.630). In this study the hierarchy was as follows: A MACHINE is created for a particular PURPOSE; this

PURPOSE is reached by and through a number of PROCESSES; the PROCESSES themselves are performed by various PARTS that work together. This “multi-layering” (Johnson 2005 p.630) of metaphors helps to provide a deep and rich understanding of the main root metaphor and also results in a number of entailments.

The metaphor of organization as a machine was manifest through a continual and repeated focus in many articles on three high-level entailments of machines. These entailments include accuracy, effectiveness and efficiency and correspond to the descriptions outlined by Pepper (1948):

- Things can be expressed in exact, quantitative terms.
- There is an effective relationship between the PARTS that contributes to the overall effectiveness of the organization.
- The efficiency of the organization is paramount, even to the exclusion of the qualities of the individual PARTS.

In the following paragraphs specific examples will be given from the articles appearing in ISR during the years 2000 through 2008. In terms of the first entailment concerning accuracy, some articles reveal the assumption that even the most ingrained human behavior can be measured and accounted for. For example, McKnight et al. (2002) state that even trust can be measured. In their study they propose 16 constructs for measuring trust in an e-commerce relationship. Furthermore, they propose that trust in this relationship can be modeled by four major constructs: disposition to trust, institution-based trust, trusting beliefs and trusting intentions. Similarly, in an article by Jiang et al. (2005) the behavior of lying is viewed as “input distortion” (p.131). They propose two methods in which this distortion provided by users can be “modified” (p.131) to increase the “accuracy” (p.131) of their expert system. From the most obvious of actions which are suited to measurement such as procurement, ordering and inventory to the most intricate of human behavior there is a continual focus in many articles on the precision with which things can be accounted for.

The effectiveness with which an organization achieves its predetermined goals, like that of the machine, is a key concern in the majority of articles reviewed. All PARTS in the machine are expected to work together to produce the most effective result. Even the relationships between people are conceptualized as interacting PARTS of the organizational MACHINE. Levina (2005), while not depending solely on the machine metaphor, still discusses the collaboration between people in terms of how effective the relationship is. Furthermore, not only is the relationship between like PARTS the subject of scrutiny but the interaction between disparate PARTS is also scrutinized in terms of how their effectiveness can be increased. Johnson and Marakas's (2000) article looks at the relationship between end-users and computers as a "construct" (p.402) and derive an empirical model of this constructs efficacy that they term the "computer self-efficacy construct" (p.402). This construct is not only accurately identified but it is measured with the specific intent of improving the "performance" (p.402) between the end-user PART and the computer PART. The overall assumption in many articles was that a clear identifiable relationship or even a law (Pepper 1948) existed between each PART of the organizational MACHINE and that this relationship could be not only accurately identified but measured.

Another dominant entailment of the MACHINE metaphor in the articles examined was a clear focus on organizational efficiency. As stated in the above paragraph, there was a clear relationship not only between how effective the relationship between the PARTS of the organizational MACHINE was but how efficient it was. The focus in many articles was on the manipulation of various PARTS of the organizational MACHINE to increase its efficiencies. For example, March et al. (2000) state "The transformation of physically networked computers into an effective and efficient distributed system requires methods and techniques for building a systems architecture, establishing rigorous controls, and optimizing the system performance." (p.329) Furthermore they state that it is this type of optimization research that will drive the organizational MACHINE toward its PURPOSE of meeting the many challenges of globalization, interactivity and high productivity. Ba et al. (2001) highlight the view that organizations, like machines, are seen as encompassing many PROCESSES that can be not only

accurately identified and measured but also modified with the goal of making them more efficient: “We believe that market-based supply chain coordination [previously described as a PROCESS] can be run efficiently with the proper information systems support.” (p.11). During the analysis, it was evident that there was a clear concern for how to maximize the efficiency of the organization and its underlying PARTS and PROCESSES in order to drive the organization toward a clearly defined PURPOSE.

Establishing an overall PURPOSE for the organization was critical to the MACHINE metaphor. The articles tended to confirm Clancy’s (1999) notion that the main purpose of the organization as machine was to generate wealth. Terms such as “profit maximizing” (Thatcher and Pingry 2004 p.268) and “profit optimizing” (Lilien et al. 2004 p.225) were used to refer to this ultimate goal of the organization. This was the case regardless of the type of firm discussed or the specific contextual conditions faced by the organization. For instance, Alavi and Leidner (2001) talk of the drive toward “economic gains” (p.3) in the post-secondary education sector and Thatcher and Pingry (2004) relate the importance of “profit-maximizing behavior” (p.268) in the healthcare industry. Articles were also quick to position their own or other research in terms of how it would enable the organization to reach its overriding purpose of wealth production. Straub et al. (2002) discuss how uses of the Internet “contribute to corporate bottom lines” (p.118) and Belanger et al. (2001), situates their study of technology requirements for telecommuters in terms of how technology enables “profitability in a global, fast-paced economy” (p.155). A repeated and consistent reference in the articles to wealth generation as the ultimate PURPOSE of the organization was critical in establishing the MACHINE as the dominant metaphor for organizations.

To drive the organization toward its PURPOSE of maximizing wealth the organization generated one or many types of PRODUCTS. The product itself was generally typified either as a good or a service or both. For example, Kauffman et al. (2000) refers to “network goods, products or services” (p.61). Many times, though, the PRODUCT is simply referred to as a “product” (e.g. Thatcher and Pingry 2004 p.268). However, some of the more interesting things that were conceptualized as a PRODUCT included

decisions (Dey and Sarkar 2000), ideas (Garfield et al. 2001) and even a post-secondary educated workforce (Alavi and Leidner, 2001). Additionally, many articles were keen to contextualize their research in terms of how it would enable efficiencies in PRODUCT creation. For example, Thatcher and Pingry (2004) state: “Investments in IT infrastructure that enable a firm to design, develop, and manufacture a product of given quality faster and cheaper increase production efficiency (or reduce the marginal cost of improving product quality).” (p.269). The PRODUCT was so critical to achieving the overall PURPOSE of the organization that not only did the authors explore the concept in detail they were also careful to contextualize their research or ideas in these terms.

Seeing the organization in terms of its underlying PROCESSES is essential in viewing it as a machine. As Basu and Blanning (2003) state, “An important purpose of organizations is to implement processes” (p.337). The PROCESS itself is seen as an operation or work that transforms a certain input into a desired output - the PRODUCT. Basu and Blanning (2003) provide further detail by defining a PROCESS as “a collection of tasks that transform a given set of inputs into a desired set of outputs. The inputs and outputs may be informational, such as documents (e.g., loan applications), or physical (e.g., raw materials or subassemblies), and the tasks may be information processing tasks such as credit checks, or physical tasks such as machining or shipment” (Basu and Blanning 2003 p.337). Articles that build on the machine metaphor see almost any kind of activity carried out in the organization as a PROCESS – and one that can be made more efficient and effective. For instance, even the formation of beliefs is seen as a PROCESS that can be modeled. When Dey and Sarkar (2000) discuss decision-making they state that there is an important sub-PROCESS involved called “belief revision” (p.1). Belief revision is an important sub-PROCESS as it contributes to the overall quality of the decision made by the decision-maker. Therefore, modeling this PROCESS precisely into a scheme that is “closed, consistent and complete” (p.1) is of the utmost importance. The user (the decision-maker) of such a scheme is expected to attach a quantifiable number to how unsure they are of particular input data. This is so uncertainty in the decision-making process can be accounted for. Paradoxically enough in this research even the unknown becomes precise,

quantifiable and knowable. Therefore, even activities that are not immediately seen as PROCESSES are structured in these terms, which in turn contributes to the pervasiveness of the MACHINE metaphor throughout the articles.

Locating and specifying the PARTS of the organization were integral to establishing the MACHINE as a dominant metaphor throughout the articles. Some of the more common things to be conceived as PARTS within the organization were IT and its associated hardware and software, departments or functional areas and even people. Just as the engineer designs the network of interconnecting PARTS to be as smooth-flowing and friction-free as possible, so too was the network of parts that make up the organization designed. There was a distinct focus on how the performance between the PARTS could be made as efficient as possible – regardless of what the PART was. One of the more interesting examples of the conceptualization of people as PARTS as well as the corresponding focus on their combined performance is visible in Garfield et al.'s (2001) article. They assert that “Many of these firms [previously described as innovative and creative] have created ‘idea factories’, in which teams brainstorm using e-mail, Web-based groupware, and face-to-face meetings, with the goal of generating ideas that change existing business paradigms” (p.322). In this statement the PARTS of the organizational MACHINE are made clear. The PARTS are the individuals who make up the teams whose clear purpose is to “generate” (p.322) ideas. These PARTS interact not only with each other but with dissimilar PARTS such as e-mail, Web-based group-ware etc. to carry out the sub-PROCESS (brainstorming and face-to-face meetings) of the main “idea generation” (p.322) PROCESS. In their conceptualization of individuals as PARTS, any human-like characteristics are removed. For example, there is no acknowledgement of individuals as PARTS having their own agendas or engaging in other irrational actions that do not align with the PURPOSE of the organizational MACHINE. They simply exist for the pre-defined purpose of producing a particular PRODUCT. Furthermore, viewing individuals as PARTS also suggests that individuals are easily changed and replaced just as a cog is in a MACHINE. Conceiving the organization as a collection

of inter-operating PARTS was vital in establishing the MACHINE metaphor as the dominant way of structuring and understanding organizations in this study.

The sub-metaphors whose source domains were PURPOSE, PRODUCT, PROCESS and PART were some of the more common sub-metaphors of the organization as machine root metaphor. These sub-metaphors were firmly established and explored in the articles. This helped ensure a rich and elaborate image of the organization to emerge from the articles. The organization is rational, purpose-driven and ultimately predictable. This metaphor allows us to feel a certain safety and security in knowing what will happen, when it will happen and why. However, there are times when a reliance on the metaphor does not seem appropriate and tends to distort the phenomena under scrutiny. For instance, constructing people as PARTS may work in some organizations such as the manufacturing or fast food industries but it has serious limitations beyond these boundaries. Nevertheless, there is a clear tendency in the articles to use the metaphor even when a different perspective seems not only appropriate but necessary.

Organization as Organism

Since the beginning of time we have attributed life and life-like processes to things that are clearly not living. For example, in ancient times primitive animism was common - thunder, lightning and wind were all conceptualized as being people. Although this may sound odd to us now we still understand many phenomena in this way. As Clancy (1999) states, most modern religions are “imbued with the idea of a benevolent creator” (p.92), a creator that is very similar to us. Even those who do not believe in religion are likely to believe in some higher guiding force and many will find it hard to accept that there “is only matter and electricity and that our own consciousness is some epiphenomenon” (p.92). Therefore, life and its processes have always provided us with a way of structuring, understanding and finding meaning in our world.

In this study, it is somewhat surprising that while the organism metaphor provides such a powerful way of understanding and structuring organizations this propensity was not more clearly reflected in the articles. Morgan (1997) asserts that viewing an organization as an organism relies on the view that it is “a living

system, existing in a wider environment on which it depends for the satisfaction of various needs” (p.33).

Following this definition there are three basic entailments of the organization as organism metaphor:

- It is a living system,
- It interacts with a larger environment,
- It must fulfill its needs.

In comparison to the machine metaphor these fundamental entailments of the organization as organism remained under-developed and under-explored. More specifically, while there were examples of rich organism-like terminology such as Moore’s (2001 p.34) article which talks of the “the current stampede [of businesses] toward electronic commerce” and Subramani and Walden’s (2001) “new breed of net firms” (p.135) the use of such terminology stopped short of forming a rich and complete image of the organization as an organism. One of the main reasons for this was a lack of clear sub-metaphors for the organism metaphors that were so evident with the machine metaphor. Moreover, while some primary entailments of the organism metaphor were explored this was done either in an anthropomorphic sense or were established only superficially in order to pursue the machine metaphor in more depth. For all these reasons the organism metaphor was dominated by the machine metaphor as a way of structuring and understanding organizations.

While the image of the organization as an organism remained, on the whole, incomplete, some articles brought into sharp focus some particular aspect or attribute of the metaphor. They did this through relying heavily on some aspect of one of the three fundamental entailments of organisms: being a living system, a focus on its interaction with the environment, and the fulfillment of needs. For example, Sabherwal and Chan (2001) take a typically organic view of the organization when they look at the alignment between IS strategy and the overall business strategy which is “widely believed to improve business performance” (p.11). This view necessarily relies on the living sub-system entailment concept of the organism metaphor – the parts acting together to influence the stability and success of the whole.

This article also builds on the organism entailment of interacting with the environment. Organizations are referred to here as having strategies that are employed in the wider environment to succeed against “competitors” (p.16), which make them “defenders, analyzers and adopters” (p.16). This type of classification is transferred from the variety of species notion apparent in organisms to that of the organization. That is, different organizations and different organizational behavior are more successful under certain conditions than others just as some species of organisms are more successful than others under certain environmental conditions. Nault and Vandebosch (2000) provide an even more arresting image of the lengths the organization as organism will go to in order to survive, “Firms such as Intel, Hewlett Packard, and Motorola have maintained their lead over several product generations by “eating their own lunch”: launching products which cannibalize their current leading products.” (p.304). While articles such as these relied heavily on some aspect of the organism metaphor there was no clear and elaborate construction of the kind of sub-metaphors that were evident in the usage of the machine metaphor either within or across articles.

The relatively weak position of the organism metaphor was further enforced by the tendency to not only mix the organism and machine metaphors but to use them anthropomorphically or in a clearly dominant-recessive way. For instance, Hu et al.’s (2004) clearly use organism-like terminology: “OES providers may have to provide more value-added services in the future, or this business model may not *survive*.” (p.246). However, it is not really clear whether the organization is being structured with the organism metaphor or not. Survival is clearly an organic trait, but what seems odd is that in this same assertion by Hu et al. (2004) it is the business model that is surviving. It is odd, because although we might say a business survives when we build on an organism metaphor we wouldn’t normally talk in terms of the model of a business surviving. That is because models are typically used in a more mechanistic way (which is essentially the way they are used here). Attributing the model to the business is reverting to the machine metaphor in order to structure the organization and not using the organism metaphor. This is a common behavior that Clancy (1999) refers to as attributing “organic, even anthropomorphic,

characteristics to inert matter” (p.92). Furthermore, despite Hu et al.’s (2004) statement of “how different types of traders and OES providers behave in electronic markets...” (p.245) which clearly attributes organism attributes to the organization, their preferred structuring of the organization through the machine metaphor is made clear not long after when they state their primary research outcome: “we established a profit maximization model and proposed an optimal service fee scheme for monopolist OES providers. Our analysis demonstrates that the OES provider may reach the optimal profit level by choosing an optimal fee rate that balances the trade-off between single trade profit gain and a moderate adoption rate. Finally, we conducted a numerical study to further explore the OES profit maximization problem” (p.245). Therefore, articles such as these contributed to the subordination of the organism metaphor in relation to the machine metaphor by using the organism only superficially as a way to understand organizations.

Organization as Culture

Human beings are essentially social creatures. Without this interaction we are more likely to suffer both mentally and physically – no surprise then that one of the most severe punishments for a person is solitary confinement based on the much older form of punishment of being banished from the tribe. In our essential interactions with others we form what is more commonly known as a culture - the shared norms, values and beliefs that bind us together. These norms, values and beliefs manifest themselves in symbolic and ideational ways (Smircich 1985). So, through myths, legends, stories, rituals, ceremonies and meetings the culture of a collective is realized. It allows us to evaluate not only our own actions within a particular collective but also the actions of others. We know not only how to act appropriately but also how we should expect others to behave (Morgan 1997). It is a code of conduct, the rules we live by. In short, the culture of a social grouping allows us to feel a certain security. This is because not only does culture give us a sense of how we should behave and interact with others, it provides us with a way of understanding our world - a world that is not entirely predictable. Therefore, culture is both the social

'glue' that binds us together and the foundation on which we structure and make sense of our social world.

While culture certainly appears to be a powerful way of understanding and making sense of our world it did not appear as a way in which organizations were conceptualized in this study. There certainly were articles that made use of culture-like terminology. For instance, in McKnight et al. (2002), who wrote that "Institution-based trust comes from sociology 1 which deals with the structures (e.g., legal protections) that make an environment feel trustworthy (e.g., the United States immigrant culture of the 1800s, Zucker 1986)" (p.339), the culture term is referenced directly. However, articles such as these only used the term infrequently and relied on the other metaphors of machine and to a lesser extent the organism to structure and understand the organization. Similarly, the few articles that relied more heavily on culture-like terminology treated culture as a variable and not as a root metaphor. For example, in Lee et al.'s (2004) article they talk of "culture-specific business knowledge" (p.117) but only in relation to "the transfer of technical knowledge between firms" (p.117) which impacts on the "benefits of congruent outsourcing strategies over non-congruent actions" (p.117). Here we see culture as a variable of organizations and in this case a feature of the organization as organism. Kirsch (2004) also talks of culture in a little more detail with comments such as "socializing individuals to a common set of norms and values" (p.375). However, later in the article these norms and values are conceptualized as a variable that requires "adjustments in control" (p.386). Therefore although culture-like terminology was visible its use was minimal and the few articles that relied more heavily on the terminology established the culture as a variable and not a root metaphor. This distinction corresponds to that as outlined by Alvesson (1993) when he states that organizations are structured and understood not as "objective tangible and measurable but as constructed by people and reproduced by the networks of symbols and meanings that unite people and make shared action possible" (p.14). Therefore, while the culture metaphor provides a real alternative to the machine and organism metaphors it was not relied on as a way of structuring and understanding organizations in this study.

DISCUSSION

In relation to exploring the diversity of our research as a cognitive process this study reveals a certain rigidity toward a particular way of thinking. It appears, at least from this study, that we do indeed have our preferences. That is, of all the available options we have for thinking, for seeking meaning and understanding about a particular area of the world we show a certain singularity of thought.

More specifically by using a critical metaphor analysis to break through the broader understandings of diversity this study revealed a distinct bias in the conceptualizations of organizations – a key concept in IS research. Relying on the understanding that organizations can be conceptualized using three root metaphors - organizations as machine, organizations as organism and organizations as culture - this study found the machine metaphor was the single most dominant way of structuring and understanding organizations. The organization as a machine emerged as such a powerful image due to the creation of several supporting metaphors. Each of these sub-metaphors – complete with detailed imagery of their own – contributed to the creation of a rich and complete picture of the organization as a machine. However, while this metaphor created great insight into the organization it also contributed to what Morgan (1997) calls ‘distortion’ of many important aspects of the organizational concept. That is, the machine metaphor hid the more life-like and symbolic aspects so important in the organizational concept – aspects best viewed through the lens of the organism and culture metaphors. However, in comparison to the powerful image of the organization as machine no similar imagery emerged for the organization as organism or the organization as culture. This resulted not only in a drastically distorted view of the organizational concept but more importantly resulted in a lack of diversity at the cognitive level.

Understanding and structuring the organization using the machine metaphor is compelling. It brings into sharp focus the ways in which, many organizations appear and behave. Many organizations, including many I have belonged to over the years, appear in a certain structural configuration very much like the machine; compartmentalized and rigid. They also engage in very teleological behavior; they act in order to achieve certain pre-specified goals. However, as many of us have experienced, even the most

bureaucratic organizations are not always rational, predictable and goal-seeking. In the most mechanical, repetitive and routinized aspects of work there are life-like and symbolic aspects at play. People are organic entities whose search for meaning in their lives has been a philosophical puzzle since ancient times. Therefore wherever people are contextualized, be it at work or home, it is impossible to escape the organic and symbolic aspects that saturate life. The organization is fated to be a place that is tainted by the inherent 'messiness' of people. Therefore understanding and structuring the organization on a solely rational perspective misses much of what goes on in organizations. While the machine metaphor certainly gives insight into the organization it represents an incomplete knowledge of what an organization is and does. It is only by using other metaphors; the organism and culture metaphors; that a more complete understanding and structuring of the organization are possible.

Strengths and Weaknesses of the Study

Like metaphors, the very strengths of a study are usually its weaknesses – so too with this study. A major strength of this study is that it is a narrow and deep exploratory study that provides rich detail at a level not considered previously. However, this is also one of its major weaknesses. In being narrow and deep it is not comprehensive or exhaustive. In being exploratory, its results are not necessarily representative. While this study finds a lack of diversity at the cognitive level, this does not necessarily mean that this is the situation for all research being conducted within the entire field of IS. Furthermore, this study is limited to one journal over a single period of time. The same results do not necessarily apply for other journals or even for the same journal over a different period of time. Furthermore, while this study has gained a great deal of insight into the conceptual diversity of IS research through a critical metaphor analysis, herein lies another major weakness. A study that relies on critical metaphor analysis is also an interpretive study. Any interpretive study is limited in that we all have different interpretations from one another. It is rarely the case that any two people will agree exactly on an event or even any two groups of people. Therefore, the typical measure of replication is hard to guarantee in such a study. While this study has its strengths these same strengths also reveal some significant weaknesses.

Some possible explanations

So why might this study have revealed such a distinct lack of flexibility in comprehending the organizational concept? There are a few obvious ones that I would like to raise here; ranging from the technical to the social. As far as the technical explanation goes perhaps it is cognitively easier to use some metaphors over others. This technical explanation is linked in a way with the social explanations – the myth of rationality and the regime of truth. The myth of rationality is the belief that the rational perspective is a myth; more a social construction than anything else. Linking this with the cognitive explanation is that metaphors are the mechanisms by which we define our social reality. As Lakoff and Johnson (1980) maintain, metaphor varies from culture to culture as do the realities they define. Therefore, if it is cognitively easier – in a certain time and place – to comprehend something using a particular metaphor then that will define the reality. Linking this with the regimes of truth, what counts as truth is dictated by the metaphors. Such regimes are socially constructed and therefore, in a given time and place working with a given metaphor to the exclusion of others constitutes what is true and real. Therefore, what has been revealed in this particular exploratory study might make more sense given these explanations.

Cognitive Ease

Perhaps one of the reasons why the machine metaphor dominates in this study might be explained by its associated cognitive ease. To explain further, to use a metaphor is to evoke a mapping from a more concrete source domain to a more abstract target domain. The source domain is typically a concept which we already have firmly established associations. This is essential to the accomplishment of transferal or mapping mechanism needed for a successful metaphor. If the associations aren't concrete then the ability of the metaphor to shed light on a given subject would be greatly hindered. Hence, the machine metaphor may be preferred in this study due to the associated cognitive ease in the metaphors underlying mappings.

In relation to this study I wonder whether the source domain of a machine is more firmly established than the organism and culture domains. Perhaps we have a more concrete understanding of machines than we

do of organisms and culture and so we tend to rely on it to a greater extent. Machines are after-all man-made constructions. There is a great deal of knowledge and understanding concerning machines that we have to have in western civilization to even be able to operate on a day-to-day basis. We have very firm associations of machines. Hence, due to this familiarity the cognitive mapping does not require a great cognitive load and still results in a useful way of understanding aspects of the world, including organizations. However, while we may have an intricate knowledge of machines it is doubtful that we have developed the same understanding of organisms; there is still much we do not understand about this particular domain. We depend more than ever on our natural world but as we have become more civilized it appears that we have also become more removed from it. It is possible that our associations with the organism concept are not as firmly established as the machine because they are not as much a part of our lived experience. As far as the culture concept the associations are not what one would call concrete; norms, values and beliefs are more idealistic than the machine or even the organism concepts. Furthermore, the cognitive load of transferring such idealistic associations to concepts that are not readily understood may simply be too high for us to use them easily. Therefore, the reason why such a preference for the machine metaphor exists in this study might be because our associations with the machine concept are more firm, and the cognitive load low, in comparison to the other metaphors.

Myth of Rationality

Another possible explanation linked to cognitive ease is the myth of rationality. The myth of rationality is an assertion about the nature of the rational perspective; put simply it is a notion that the rational perspective is more of a cultural belief than anything else. This is linked to the cognitive ease of metaphor in the following way. Lakoff and Johnson (1980) assert that metaphors are constrained by our culture. Our metaphors are developed through experience. Furthermore, depending on our unique situation we learn things in a certain way. We are immersed into a certain way of doing things through our cultural environment. Many anthropologists assert that the rational perspective is a myth. That is, we depend on the rational model not because it is true but more because of our cultural upbringing; we are conditioned

to think in a particular way. Hence, if we are conditioned in the western world to value certain perspectives more than others this will impact on our relative success or failure as individuals in society. If this is the case, the myth of rationality could be one reason why there is a preference for the machine metaphor in this study.

Given the myth of rationality the results of a certain cognitive rigidity in one of our most prestigious journals – a journal noted for its diversity - may not be all that surprising. Rather than a conscious act of bias, the rational perspective is simply a reflective of a broader – more entrenched – societal preference. As Clancy (1999) explains the concept of business as a machine relies on the rational perspective that is “a strong current in modern thought” (p.77). This rational perspective is itself believed to be a mono-myth by many anthropologists. That is, the world at large depends on the “comprehensive frame of reference, or structure of belief” (Morgan 1997 p.146) the rational perspective provides. The myth of rationality helps us to make sense of the world providing us with a way in which we can “negotiate day-to-day experience and help to make it intelligible” (Morgan 1997 p.146). Therefore, if the myth of rationality exists as a larger mono-myth in society it should not be too surprising that such a bias toward it exists in one of our journals. Our discourse as researchers is present in many forms, but of course one of the primary sources is our journals. Therefore, if our primary way of negotiating the world is through the myth of rationality then it is logical that such a bias toward it would appear in one of our journals. As Morgan (1997) elaborates “Modern organizations are sustained by belief systems that emphasize the importance of rationality, and their legitimacy in the public eye usually depends on their ability to demonstrate rationality and objectivity in action” (p.146). Therefore, as a typical modern organization and one of our top journals, ISR has much to lose if it does not conform to the myth of rationality. As a journal ISR has an enviable reputation to defend within both the IS community and the larger academic community. Therefore, if indeed this hypothesis is correct, it follows that ISR, in defending its position as a top-flight journal, may show such preferences – preferences that exist as part of a larger myth in modern society.

Regime of truth

Another possible explanation for a lack of diversity in one of our key IS journals may be more political in nature. As Introna (2003) explains about the European Journal of Information Systems; “it’s editors and reviewers ... exists within a regime of truth ... authors submitting work are disciplined by their supervisors, by the reviewers, by tenure and promotion committees and many others, which already have the status of deciding what counts as true” (p.239). It then follows that working from a primarily rational and mechanistic view of organizations may constitute truth in the IS discipline. However, as Introna (2003) later explains it is this very act of conforming that makes Information Systems a discipline. As far as venturing an explanation for this study it is possible that while diversity in metaphors allow us to see very different but equally important aspects of a concept it may prevent rudimentary coherence.

IMPLICATIONS

In the paragraphs below some preliminary observations are ventured on what this lack of diversity might imply for IS journals, individual researchers and the discipline. These implications are of course limited by the exploratory nature of the study and should be taken as such. Additionally, specific suggestions are given to challenge the status quo and broaden what is counted for truth in IS research. However, these implications and suggestions are given in the spirit of encouraging reflection and promoting further ongoing discussion in this critical area.

IS Journals

This study highlights the challenges many journals face when it comes to reinvigorating themselves with a diversity of research articles. In ISR’s case despite the open and transparent insistence of its editors for authors to submit a diversity of articles to the journal it appears that this has not yet been achieved. At least not on the alternative cognitive level of research that this study has explored. This may seem – at least on the surface – to be a rather un-winnable predicament. That regardless of how hard a journal tries to attract and publish diverse research it is destined to fail. On the other hand though, one must question how hard journals have tried to publish diverse articles. As many journal editors would already be aware

publishing articles that are not the norm for their journal is a high-risk strategy. There is a fine line that must be reached between creative and innovative research that will indeed invigorate and sustain a journal on the one hand and a schizophrenic compendium of articles that will lead to confusion of the journals readership and potential failure on the other hand. It is a difficult situation and various stakeholders – reviewers as well as editors - involved with a journal may err on the side of caution. Furthermore, as this paper has highlighted the notion of diversity is not straightforward. Authors may not understand what is asked of them when journal editors request “diverse research”, which of course makes publishing such research even more doubtful. Therefore, the challenges many journals face – especially those that are at the top of the prestige ladder – is in overly cautious behavior of editors and reviewers when it comes to the types of articles chosen for publication as well as the authors comprehension of exactly what diverse research really means.

While this may be a difficult position for journals it is not in my opinion an impossible one. There are several obvious areas where journals can encourage diversity in the research that they publish. The first is to give authors the courage to submit work that may not be the norm for that journal. This could be done through special issues that raise awareness in the academic community about the need for that particular journal to publish more diverse work. Furthermore, there could be more done to flesh out and discuss other alternative notions of diversity in IS research. Hopefully resulting in less limited understandings and therefore submissions of research to journals. Probably the hardest challenge is in the fostering of research and articles that are different – ones that require reviewers and editors to spend more time and effort working with authors to produce work that deviates from the norm. Such a task is admittedly a high-risk strategy. Such time and effort may be spent without any eventual pay-off. However, not doing so will arguably be worse. Editors and reviewers will almost inevitably have to move out of their comfort zones if they want to see interesting, creative and innovative work in their journals. Through actions such as these perhaps journals can indeed increase the diversity of its research articles and also their vitality over the long term.

IS Researchers

Hopefully the results of this study will give individual researchers cause to reflect over how diverse their own research is at the conceptual level. A lack of diversity in our research at the cognitive level represents a serious threat to what we do and how we impact the world around us. In terms of the problems we see, how we go about solving them and the significance of our solutions to those that rely on us. All of these areas are limited by the bias in how we structure and understand our key research concepts. Distortions at such a fundamental level not only place limitations on what we see as research but as Morgan (1997) states, and this study confirms, can create “constructive falsehoods” (p.4). This is where the reliance on a particular perspective is taken to the extreme and used inappropriately. At best research conducted under such a guise will be, illogical but at worst it could be insensitive and potentially damaging. Due to the potential impact of a biased perspective IS researchers may wish to reflect on their own conceptualizations in an effort to see how diverse they really are.

By unearthing our key conceptualizations of organizations this study has made visible a lack of diversity in our research at a cognitive level. While this may point out a lack of diversity in what we do as researchers currently, it is by no means a *fate compli*. On the contrary, if indeed diversity in our research represents “a wish for the years to come” (Rivard and Webster 2007), we have been presented with a great opportunity. Not only has this study pointed out the dominant ways in which we conceptualize organizations it also points out the alternatives. It is possible, by exploring the alternative conceptualizations in our research we have the opportunity to redress the current lack of diversity at a fundamental level.

IS Discipline

As a disciplinary community these findings have important implications. This is especially the case if there is a genuine desire on the behalf of the community for continual growth in the area of research diversity. If the desire is not empty then we may have some critical reflecting to do. Perhaps, one of the most significant areas we may have to reflect on is how we might increase the levels of diversity in our

research. One way in which diversity is believed to be increased is through the notion of an open market place of ideas and keeping the boundaries of the discipline porous (Sambamurthy 2007). Typically, our boundaries have formed with the likes of disciplines such as economics, organizational science and computer science. Perhaps we need to search further afield to non-traditional disciplines; disciplines that can provide a more intricate knowledge for developing other metaphors. Perhaps biology and anthropology may be helpful – especially with the organism and culture metaphors. However, I don't think we should always defer to other disciplines. As organizational science researchers have attested to there may not be anything very different happening on the other side of the IS disciplinary boundary. Just because we search for something we may not find all of what we need and I don't think this should discourage us; we may have to develop our metaphors further or we may have to start from scratch. Furthermore, we can take heart from the fact that metaphors can and do change (Jelinek 2004). Regardless of the situation, if the disciplines research is going to become more diverse the change will have to come from within – within individual IS researchers, IS journals, and the IS community as a whole.

While the results of this research highlight the opportunity for increasing our levels of diversity in the discipline, doing so will not be straightforward. Technically, switching metaphors requires a significant amount of effort; the associated cognitive load would almost certainly be higher – at least in the short-term. However, as stated above, it is not impossible and by exploring other disciplines and domains this may be made easier. Linked with this difficulty; historically, politically and socially; it is difficult to change a dominant view. Individuals risk being ostracized and journals and disciplines also risk their reputations. However, remaining insular comes at the expense of straitjacketing the field and those within it. Furthermore, it is important to realize that with risks come potential pay-offs and in this area the pay-offs may be very lucrative. Not only, may we have more to offer our immediate audience – those that currently rely on us for advice and expertise– but we might also broaden our audience. By increasing our diversity at such a fundamental level – a change that by all accounts is yet to occur in other disciplines –

we might secure a position of intellectual independence and leadership in the wider academic community. We must be courageous in this endeavor. It represents a rare chance in the history of the IS discipline to repay the debt of borrowing more from other disciplines than we contribute back: phenomenologically, theoretically, and methodologically.

FURTHER WORK

When conducting a study there are times when, in the attempt to answer a particular question, a myriad of other questions are spawned. I have found it to be the case with this study. That is, while the results have yielded insights into the relatively unexplored area of diversity in IS research it has given rise to a multitude of related questions. I present a few of these key questions below:

- Is the lack of conceptual diversity found in this study a more widespread phenomenon? The same approach reflected in this study could be applied to the same journal over a different time period, other IS journals, and even more broadly to other disciplines. It could also be applied by using different IS concepts and even to our concept of research.
- Is the lack of cognitive diversity medium specific? While this study has revealed a lack of conceptual diversity in a particular medium it would be interesting to see whether the results hold for other mediums. Examples include online forums and informal discussions of IS phenomena and problems. Similarly, what about IS practitioners? Are their conceptualizations as restricted as those revealed in this study? What are the similarities and differences between the two groups of IS researchers and IS practitioners?
- What are the ways in which we can explore the alternative conceptualizations of organizations in Information Systems? How do they link in with our other key concepts in Information Systems? What practical advice can we give to IS practitioners in using the organism and culture metaphors in their day-to-day working lives?

These are just some of the questions that come to mind from the results of this study. Though, to use a metaphor, the research area of diversity is virgin territory and as such holds some potentially lucrative opportunities just waiting to be explored.

References

- Adams, G., and Ingersoll, V. "The Difficulty of Framing a Perspective on Organizational Culture," in *Organizational Culture*, P.J. Frost, L.F. Moore, M.R. Louis, C.C. Lundberg and J. Martin (eds.), Sage Publications, Beverly Hills, CA, 1985, pp. 223-234.
- Alavi, M., and Leidner, D. "Research commentary: Technology-mediated learning – A call for greater depth and breadth of research," *Information Systems Research* (12:1), March 2001, pp. 1-10.
- Alter, S. "The IS Core - XI Sorting out Issues about the Core, Scope, and Identity of the IS Field," *Communications of the Association for Information Systems* (12), 2003, pp. 607-628.
- Alvesson, M. *Cultural Perspectives on Organizations* Cambridge University Press, New York, 1993.
- Archard, D. *Philosophy and Pluralism* Cambridge University Press, Cambridge, 1996.
- Ba, S., Stallaert, J., and Whinston, A. "Research Community: Introducing a Third Dimension in Information Systems Design - The Case for Incentive Alignment," *Information Systems Research* (12:3), September 2001, pp. 225-239.
- Bailyn, L. "Research as cognitive process: Implications for data analysis," *Quality and Quantity* (11:2), July 1977, pp. 97-117.
- Banville, C., and Landry, M. "Can the Field of MIS be Disciplined?," *Communications of the ACM* (32:1), January 1989, pp. 48-60.
- Basu, A., and Blanning, R. W. "Synthesis and Decomposition of Processes in Organizations," *Information Systems Research* (14:4), December 2003, pp. 337-355.
- Belanger, F., Collins, R., and Cheney, P. "Technology Requirements and Work Group Communication for Telecommuters," *Information Systems Research* (12:2), June 2001, pp. 155-176.
- Benbasat, I. "Editorial notes," *Information Systems Research* (11:3), September 2000, pp. i-ii.

- Benbasat, I. "Editorial notes," *Information Systems Research* (13:1), March 2002, pp. iii-v.
- Benbasat, I., and Weber, R. "Research Commentary: Rethinking "Diversity" in Information Systems Research," *Information Systems Research* (7:4), December 1996, pp. 389-399.
- Benbasat, I., and Zmud, R. W. "The Identity Crisis within the IS discipline: Defining and communicating the disciplines core properties," *MIS Quarterly* (27:2), June 2003, pp. 183-194.
- Callahan, D. "Universalism and Particularism: Fighting to a Draw," *Hastings Centre Report* (30:1), Jan/Feb 2000, pp. 37-44.
- Clancy, J. *The Invisible Powers: The Language of Business* Lexington Books, Oxford, 1999.
- Cornelissen, J. P. "Making Sense of Theory Construction: Metaphor and Disciplined Imagination," *Organization Studies* (27:11), November 2006, pp. 1579-1597.
- Cornelissen, J. P. "Beyond Compare: Metaphor in Organization Theory," *Academy of Management Review* (30:4), 2005, pp. 751 – 764.
- Coulson, S., and Oakley, T. "Blending Basics," *Cognitive Linguistics* (11: 3/4), 2000, pp.175-196.
- Deardon, J. "The Myth of Real-Time Management Information," *Harvard Business Review* (44), May-June 1966, pp. 123-132.
- Deardon, J. "MIS is a Mirage," *Harvard Business Review* (50:1), Jan-Feb 1972, pp. 90-99.
- Deleuze, G., and Guattari, F. *What is Philosophy* Columbia University Press, New York, 1996.
- DeSanctis, G. "The Social Life of Information Systems Research: A Response to Benbasat and Zmud's Call for Returning to the IT Artifact," *Journal of the Association for Information Systems* (4), December 2003, pp. 360-376.
- Dey, D., and Sarkar, S. "Modifications of Uncertain Data: A Bayesian Framework for Belief Revision," *Information Systems Research* (11:1), March 2000, pp. 1-16.
- El Sawy, O. "The IS Core IX: The 3 Faces of IS Identity: Connection, Immersion, and Fusion," *Communications of the Association for Information Systems* (12), November 2003, pp. 588-598.
- Fauconnier, G., and Turner, M. *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* Basic Books, New York, 2002.

- Galliers, R. D. "Change as Crisis or Growth? Toward a Trans-disciplinary View of Information Systems as a Field of Study: A Response to Benbasat and Zmud's Call for Returning to the IT Artifact," *Journal of the Association for Information Systems* (4:13), November 2003, pp. 337-351.
- Garfield, M., Taylor, N., Dennis, A., and Satzinger, J. "Research Report: Modifying Paradigms - Individual Differences, Creativity Techniques, and Exposure to Ideas in Group Idea Generation," *Information Systems Research* (12:3), September 2001, pp. 322-333.
- Gray, P. "Introduction to the Debate on the Core of the Information Systems Field," *Communications of the Association for Information Systems* (12), December 2003, pp. 781-787.
- Hirschheim, R. "Information Systems Epistemology: An Historical Perspective," in *Research Methods in Information Systems*, E. Mumford, R. Hirschheim, G. Fitzgerald and T. Wood Harper, (eds.), North Holland, Amsterdam, pp.13-35.
- Hirschheim, R., and Klein, H. K. "Crisis in the IS Field? A Critical Reflection on the State of the Discipline," *Journal of the Association for Information Systems* (4:10), October 2003, pp. 237-293.
- Hu, X., Lin, Z., Whinston, A. B., and Zhang, H. "Hope or Hype: On the Viability of Escrow Services as Trusted Third Parties in Online Auction Environments," *Information Systems Research* (15:3), September 2004, pp. 236-214.
- Jelinek, M. "Managing Design, Designing Management," in *Managing as Designing*, R. J. Boland and F. Collopy (eds.), Stanford University Press, Stanford, California, 2004, pp. 113-121.
- Jiang, Z., Mookerjee, V., and Sarkar, S. "Lying on the Web: Implications for Expert Systems Redesign," *Information Systems Research* (16:2), June 2005, pp. 131-148.
- Johnson, E. "WAR in the Media: Metaphors, Ideology, and the Formation of Language Policy," *Bilingual Research Journal* (29:3), Fall 2005, pp. 621-729.
- Johnson, R., and Marakas, G. "Research Report: The Role of Behavioral Modeling in Computer Skills Acquisition - Toward a Refinement of the Model," *Information Systems Research* (11:4), December 2000, pp. 402-417.

- Johnstone, B. *Discourse Analysis* Blackwell, Malden, 2002.
- Kauffman, R., McAndrews, J., and Wang, Y. "Opening the "Black Box" of Network Externalities in Network Adoption," *Information Systems Research* (11:1), March 2000, pp.61-82.
- Kekes, J. *Pluralism in Philosophy: Changing the Subject* Cornell University Press, London, 2000.
- Kemerer, C. F. "Editorial Notes," *Information Systems Research* (14:3), September 2003, pp. iii-v.
- Kirsch, L. J. "Deploying Common Systems Globally: The Dynamics of Control," *Information Systems Research* (15:4), December 2004, pp. 374-322.
- Lakoff, G., and Johnson, M. *Metaphors We Live By* The University of Chicago Press, Chicago, 1980.
- Lee, J. N., Miranda, S. M., and Kim, Y. M. "IT Outsourcing Strategies: Universalistic, Contingency, and Configurational Explanations of Success," *Information Systems Research* (15:2), June 2004, pp. 110-122.
- Levina, N. "Collaborating on Multiparty Information Systems Development Projects: A Collective Reflection-in-action View," *Information Systems Research* (16:2), June 2005, pp. 109-122.
- Lilien, G. L., Rangaswamy, A., Van Bruggen, G. H., and Starke, K. "DSS Effectiveness in Marketing Resource Allocation Decisions: Reality vs. Perception," *Information Systems Research* (15:3), September 2004, pp. 216-220.
- Lyytinen, K., and King, J. L. "Nothing at the Center? Academic Legitimacy in the Information Systems Field," *Journal of the Association for Information Systems* (6:5), June 2004, pp. 220-246.
- March, S., Hevner, A., and Ram, S. "Research Commentary: An Agenda for Information Technology Research in Heterogeneous and Distributed Environments," *Information Systems Research* (11:4), December 2000, pp. 327-341.
- McKnight, H., Choudhury, V., and Kacmar, C. "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology," *Information Systems Research* (13:3), September 2002, pp. 334-359.
- MIS Quarterly. "MISQ Central," MIS Quarterly, Minneapolis, viewed 4 May 2007, <<http://www.misq.org/>>

- Moore, S. "A Foundation for Flexible Automated Electronic Communication," *Information Systems Research* (12:1), March 2001, pp. 34-62.
- Morgan, G. *Images of Organization* SAGE Publications, Thousand Oaks, 1997.
- Murphy, G. *The Big Book of Concepts* Massachusetts Institute of Technology, Cambridge, 2002.
- Nault, B., and Vandebosch, M. "Research Report: Disruptive Technologies – Explaining Entry in Next Generation Information Technology Markets," *Information Systems Research* (11:3), September 2000, pp. 304-319.
- Orlikowski, W. J., and Iacono, C. S. "Research Commentary: Desperately Seeking the 'IT' in IT Research – A Call to Theorizing the IT Artifact," *Information Systems Research* (12:2), June 2001, pp. 121-134.
- Pepper, S. *World Hypotheses* University of California Press, Berkeley, 1948.
- Pfeffer, J. "Barriers to the Advance of Organizational Science: Paradigm Development as a Dependent Variable," *Academy of Management Review* (18:4), November 1993, pp. 599-620.
- Power, D. "The IS Core - II: The Maturing IS Discipline: Institutionalizing our Domain of Inquiry," *Communications of the Association for Information Systems* (12), November 2003, pp. 539-545.
- ResearchWare, Inc. "About HyperRESEARCH – Qualitative Analysis Software," *ResearchWare Inc.*, viewed 4 May 2007, <www.researchware.com/hr/index.htm>.
- Rivard, S., and Webster, J. (Program Co-Chairs) "Conference Theme/Tracks," *Association for Information Systems*, viewed 4 May 2007, <<http://business.queensu.ca/icis/themes.htm>>.
- Robey, D. "Research Commentary: Diversity in Information Systems Research: Threat, Promise and Responsibility," *Information Systems Research* (7:4), December 1996, pp. 400-408.
- Robey, D. "Identity, Legitimacy and the Dominant Research Paradigm: An Alternative Prescription for the IS Discipline: A Response to Benbasat and Zmud's Call for Returning to the IT Artifact," *Journal of the Association for Information Systems* (4), December 2003, pp. 352-359.
- Sabherwal, R., and Chan, Y. "Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders," *Information Systems Research* (12:1), March 2001, pp. 11-33.

- Sambamurthy, V. "Editorial Notes," *Information Systems Research* (16:3), September 2005, pp. 235-237.
- Sambamurthy, V. "Editorial Statement," INFORMS, viewed 4 May 2007, < <http://iol-a.informs.org/site/ISR/index.php?c=3&kat=Editorial+Statement>>.
- Saunders, C. "Editors Comments: Looking for Diamond Cutters," *MIS Quarterly* (29:1), March 2005, pp. iii-viii.
- Saunders, C. "MIS Journal Rankings," *Association for Information Systems*, 2005, viewed 6 Jan 2009, < <http://ais.affiniscap.com/displaycommon.cfm?an=1&subarticlenbr=432>>.
- Schultz, M. *On Studying Organizational Cultures* Walter de Gruyter, Berlin, 1995.
- Sidorova, A., Evangelopoulos, N., Ramakrishnan, T. "Diversity in IS research: An exploratory study using Latent Semantics", in the *Proceedings of the International Conference on Information Systems* December 2007, Montreal, CANADA.
- Sidorova, A., Evangelopoulos, N., Valacich, J. S. , & Ramakrishnan, T. "Uncovering the Intellectual Core of the Information Systems Discipline," *MIS Quarterly* (32:3), September 2008, pp.467-482.
- Smircich, L. "Is the Concept of Culture a Paradigm for Understanding Organizations and Ourselves," in *Organizational Culture*, P.J. Frost, L.F. Moore, M.R. Louis, C.C. Lundberg and J. Martin (eds.), Sage Publications, Beverly Hills, CA, 1985, pp. 55-72.
- Straub, D., Hoffman, D., Weber, W., and Steinfeld, D. "Measuring e-commerce in Net-enabled organizations: An introduction to the special issue," *Information Systems Research* (13:2), June 2002, pp. 115-127.
- Subramani, M., and Walden, E. "The Impact of E-Commerce Announcements on the Market Value of Firms," *Information Systems Research* (12:2), June 2001, pp. 135-154.
- Swanson, E. B., and Ramiller, N. C. "Information Systems Research Thematics: Submissions to a New Journal, 1987-1992," *Information Systems Research* (4:4), December 1993, pp. 299-330.
- Thatcher, M. E., and Pingry, D. E. "An Economic Model of Product Quality and IT Value," *Information Systems Research* (15:3), September 2004, pp. 268-219.
- Van Dijk, T. *Discourse as Social Interaction* Sage, London, 1997.

Van Maanen, J. "Fear and Loathing in Organization Studies," *Organization Science* (6:6), November-December 1995, pp. 687-692.

Vessey, I., Ramesh, V., and Glass, R.L. "Research in Information Systems: An Empirical Study of Diversity in the Discipline and its Journals," *Journal of Management Information Systems* (19:2), Fall 2002, pp. 129-174.

Visker, R. "Philosophy and Pluralism," *Philosophy Today* (48:2), Summer 2004, pp. 115-127.

Wood, L., and Kroger, R. *Doing Discourse Analysis: Methods for Studying Action in Talk and Text* Sage, Thousand Oaks, 2000.