THESIS FOR THE DEGREE OF LICENTIATE

Recapturing the Spirit of Quality

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In loving memory of Ingemar

Abstract

It is well known that Walter A. Shewhart and W. Edwards Deming are seen as two of the founders of the modern quality movement. In this thesis, a review of their writings has been done, in order to reinvestigate the philosophical influences in their work. During this research journey, influences and connections to the conceptualistic pragmatist Clarence Irving Lewis were identified. Thus, studies of his most renowned work "Mind and World Order-outline of a theory of knowledge" (1929) were conducted. The results of these studies include the notion of 'a priori' which influence the way we interpret and understand the world. Lewis urges us to be our own philosophers as the final responsibility of ones own life lies upon ourselves. He argues that by reflection we can understand ourselves and others and thus be able to cooperate. These ideas are traceable in both Shewhart's and Deming's ideas concerning a theory of quality. The statement, about the spirit gone lost in quality work, is here argued, that this could be a result of a gap between a profound understanding of the theory of quality with its philosophical roots and an ordinary view upon quality work in organisations.

Furthermore, a few illustrations of the applicability of the ideas derived from the philosophical influences of Lewis are presented. Here, the major contribution from these studies lies in the claim that organisations need to create an understanding and awareness of possible conflicts in organisations due to different 'a priori'. Thus, organisations need to recognise possible threats due to these differences when wanting to e.g. improve the organisation. However, these differences should not always be seen as threats to organisational processes, but also as enablers for e.g. creativity. Organisations thus need to find a balance in their strive for organisational consensus which, it is argued, could be done by e.g. stimulating reflection processes.

Key words: Deming, Lewis, Pragmatism, Shewhart, Theory of Quality, Quality Work

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Appended Articles

Article A

Mauléon, C. & Bergman, B. (2002) *On the Theory of Knowledge in the Quality Movement- C.I. Lewis' Contribution to Quality Pioneers.* Proceedings of the 8th Annual Research Seminar, Fordham University, New York. February 2002, pp. 156-164.

Article B

Mauléon, C., Bergman, B., & Alänge, S. (2003). *Common Concepts for Common Action: Sense Making or Senseless Making in Organizations?* Article presented at the EGOS Colloqium (European Group for Organization Studies), July 2003, Copenhagen.

Article C

Gauthereau, V., Mauléon, C. & Dekker, S. (2003) *A Pragmatist Framework for Safety Improvement in Health-Care.* Submitted for publication.

1. Prelude to a quality odyssey

> *"Lastly, I would address one general admonition to all - that they consider what are the true ends of knowledge, and that they seek it not either for pleasure of the mind, or for contention, or for superiority to others, or for profit, or fame, or power, or any of these inferior things, but for the benefit and use of life…"*
>
> Sir Francis Bacon, 1561-1626

I began this research journey within the field of Quality in the fall of 1998 when attending an introductory course on the subject. With a background as a student of social sciences it was a challenge to pursue a traditionally looked upon engineering's course. After finalising the course my curiosity was triggered. I wanted to learn more and consequently applied for a masters course in the subject. Soon enough, I came in contact with the writings of what some would call the founders of the modern quality movement, Walter A. Shewhart and W. Edwards Deming.

After studying some of Deming's and Shewhart's writings I discovered connections between their line of reasoning in their theories to the philosophical area. It was interesting and intriguing to see how statisticians merged philosophy into their theories as I had a preconception that people within this area probably would not bother about it. But these two scholars would definitely prove me wrong.

While reading the texts of Shewhart and Deming I came across multiple references to the philosopher Clarence Irving Lewis and found that many of the profound insights in both Shewhart's and Deming's writings could be said to have been influenced by Lewis. It therefore seemed natural to study Lewis' original work, and it is here my true research journey begins. While studying Lewis and connecting his theories to Shewhart and Deming it dawned upon me that maybe it is here, somewhere, that one can find an explanation to why quality work is looked upon with such lack of interest and commitment among people subjected to quality work in organisations today. Maybe it is due to the loss of the philosophical roots that the spirit has gone lost in quality work?

What is interesting with the area of quality is that both Shewhart and Deming saw the importance of bringing a philosophical perspective into the work of

quality - a perspective which included an understanding of the mind and psychology of the human being. And Shewhart already in 1931 argues the necessity to study *"…the fields of psychology, philosophy and logic; into the field of psychology because we must get some sort of picture of the way the mind works; into the field of philosophy because we need some hypothesis as to the nature of reality and the function of laws, theories and causal explanations; into the field of logic because it presents what we know about the formal methods available in the theory of deduction and induction."* (Shewhart, 1931 p. 482) if one wants to further develop the theory of quality and quality control.

Objective of this research odyssey

The aim of this thesis is thus to (re-) identify the philosophical roots of the theory of quality and further provide some illustrations of their applicability.

2. The heritage of quality pioneers

2.1 Why quality?

When I meet people and talk about my work the response is often something like *'ahhh quality, but how can you find that interesting? It's just all about standards, rules and regulations'*. As yet, I have not met many people either in my academic or personal world where someone has said *'oh how interesting, working with quality…'*. However, when meeting people and talking about quality of life, quality time with a person, most people react in a positive way and you see a glow of interest in their faces. Why is that? Why has it come to a point where we think that working with quality in organisations is just something quite boring, dull and non-stimulating? While when talking about our personal quality of life engages most people? Why do we give such different meanings to the concept of quality?

Quality as referred to in this work, is based upon Shewhart's (1931) definition, i.e. that quality in one way or other is dependant upon in what degree it satisfies human needs. And my argument about the spirit gone lost in quality is based upon an everyday common view about quality work in organisations, i.e. the notion that quality work is seen upon as something negative rather than positive. Thus, there seems to exist a gap between a positive attitude towards the concept of quality, as in quality of life, and a negative attitude towards quality work.

It is therefore argued that we need to reenergize the concept of quality in organisations and I would like to follow the philosopher Pierce's advice: *" …philosophers not only can but must adapt familiar words to new meanings, or introduce new words, as clarity demands."* (in Haack, 1999). Hopefully by exploring the philosophical roots of the theory of quality I may recapture some of the spirit gone lost in quality work today? But to be able to do this we first need to take a historical journey to see how quality has been defined throughout history.

The concept 'quality' can be traced back to some of the ancient civilisations e.g. Egypt and Greece, where quality work can be said to have begun as a simple way of inspecting a specific product. We find a quality inspector in an inscription from ancient Egypt, we also find measuring tools from ancient China and so forth. Quality thinking, has probably existed all the way back to the beginning of civilisation although we may not find traces of it today. What

we find is that the need for quality control almost always has existed, whether it be e.g. to minimize defective products or fraud in money welding. Juran (1995), also seen as one of the quality pioneers, argues that one can trace the role of the inspector all the way back to the building of the pyramids, and probably even further, and he states that it is interesting to find that the role throughout the years does not seem to have evolved in order to meet new demands. For further interesting accounts of how quality work has progressed through history read Juran's (1995) book "A history of Managing for Quality".

Even though quality work in organisations today seems more complex, we still appear to work and think about quality in the old ways, that is, as inspection. This can oftentimes be heard in organisations when talking about ISO standardisation. But working with quality involves so much more. One can find that work with e.g. Total Quality Management (TQM) in organisations have encountered the same problems which, implementation of other managerial models have met (see Park Dahlgaard, 2000). Thus, failure stories concerning the work with either quality models or other managerial models are easily found. But why is this? One explanation argued here is that it may be due to neglect of the original philosophy behind the model when working with quality. It is interesting to find that in the original theory of quality by Shewhart and Deming, knowledge about philosophy is *necessary* for working with quality. Which, as argued here, is oftentimes neglected or forgotten today (Deming, 1993, Shewhart, 1931). This is remarkable as Shewhart (1931) saw it as *necessary* for the development of the theory of quality control.

Some argue that a main point of criticism TQM gets is that organisations have become disappointed with the implementation of the model when it did not deliver what management had expected (Park Dahlgaard, 2000; Giroux & Landry, 1998). This is not uncommon criticism for any managerial model. However, some of these alleged TQM failure rates have given rise to a debate whether the companies which experienced failures really adopted TQM or not (Kroslid, 1998; Giroux & Landry, 1998). One explanation could be what Giroux & Landry (1998) argue, that a profound understanding of the model is missing and thus failure of the model could be a fact (for further discussion on this, see article C). Thus, one should not say that it is the theory of quality which has been criticised, only the possible misinterpretation of the theory organisations have done in their implementation of models derived from it.

A further example of TQM criticism is that the model, according to some scholars, does not have a consensus concerning common concepts, or consensus in terminology within the model (Dean & Bowen, 1994; Hackman

& Wadgeman, 1995). This critique is remarkable as the people working with or implementing this model, seem to have missed one of the main points which both Shewhart (1939) and Deming (1986) makes concerning the theory of quality, i.e. the importance of operational definitions. Deming (1986) argues in his book "Out of the crisis" that an operational definition puts communicable meaning into a concept and is one that men can agree on. Operational definitions are necessary for cooperation to take place and Deming (1986) argues that *"Misunderstandings between companies and between departments within a company /…/ often have their roots in failure on both sides to state in advance in meaningful terms the specifications of an item, or the specification for performance, and failure to understand the problems of measurement."* (Deming, 1986, p. 278-279).

The ideas of operational definitions could be said to have been influenced by C.I. Lewis' ideas about common concepts (see article A) and here we find one break between some of the original ideas within the theory of quality and the application of quality management models in organisations today. For further discussion on common concepts see chapter 3 or the article B.

It is thus from these first findings that I argue that the greatest loss in quality work today, is the oftentimes neglected interests or knowledge of the original philosophy of the theory of quality.

2.2 Shewhart, Deming and Pragmatism

As stated earlier, Shewhart and Deming are said to be two quality pioneers (Petersen, 1999, Wilcox, 2000) and their close connection and collaboration is clearly shown in Deming's acknowledgement of his everlasting debt to Shewhart. *"One can say that the content of my seminars /.../ and the content of my books, 'Quality, Productivity and Competitive Position' and 'Out of the crisis' are based in large part on my understanding of Dr. Shewhart's teaching."* (Deming in Kilian, 1992, p. 176-177).

Shewhart, who had a rather complex view upon how to work and study the theory of quality, gives the following definition to it and says that quality depends*"…in some way or other /…/ upon the degree to which a given quality satisfies human wants but /…/…human wants are not constant even for the same person"* (Shewhart, 1931, p. 477). He furthermore urges us to be aware of the complexity of the human mind and concludes that wants are statistical in nature. These ideas are also clearly traceable in Deming's (1993) reasoning about Profound Knowledge, where he says that to understand the work of quality and management one needs to have a deep understanding of a theory

of knowledge, variation and psychology and finally apply a systems view upon the whole organisation.

Shewhart was furthermore the inventor of the control chart which, in different shapes is used to separate variation by rational methods into two sources i.e. 'causes of chance' and 'assignable or special causes' .With 'causes of chance' the responsibility of removal lies on management and 'assignable or special causes', which are specific to a momentary event, can usually be discovered and removed by the person responsible on the job. Not only does the fact that, by identifying the assignable causes and creating an opportunity to remove them, make it possible to obtain a process within statistical control which is predictable, it also shifts focus from the single manufactured product to the process itself. This is also seen as one of the major contributions by Shewhart as this shift involves an active reflection process by management in order to understand the whole system rather than the single parts which constitute it (Shewhart, 1931; 1939).

However Shewhart, as already shown, was not only interested in statistics but also in the human nature concerning both philosophy and psychology and, it seems that he in the beginning of 1930's found the writings of C.I. Lewis. This influence can be found in Shewhart's (1939) book "Statistical Method from the viewpoint of Quality Control". But Shewhart was even before writing this book influenced by other philosophers, for example references to Whitehead can be found in his book "Economic control…" (1931). Thus, it seems that he had insights into the world of philosophy previously to reading Lewis. But maybe, in reading Lewis' (1929) "Mind and World Order" (MWO), he found someone who concluded the previous philosophical ideas he had been influenced by? (see also Wilcox, 2003). Shewhart obviously found Lewis' ideas interesting as he later on advised Deming to study them. This influence is for example shown in Deming's (1993) writings about Profound Knowledge - specifically his chapter upon a theory of knowledge and operational definitions.

But who is Clarence Irving Lewis? Lewis called himself a conceptualistic pragmatist and he belongs to the main school of American Pragmatism (C.I. Lewis, 1929, preface). His theory of conceptualistic pragmatism originates partly from his study of modern logic and partly from the influences of the classic pragmatists (C.I. Lewis, 1929; Haack, 1999). Before a deeper presentation of conceptual pragmatism is done it is necessary to give a brief introduction to what pragmatism in general is, as we today find many different ordinary definitions of the concept pragmatic in opposition to a philosophical meaning of the word.

The use of the concept 'pragmatic' needs some elaboration as this is a commonly used concept with multiple meanings. After a quick glimpse in "The Concise Oxford English Dictionary" (2002) we find that pragmatic means "…*dealing with things in a way that is based on practical rather than theoretical consideration*". In the Oxford paperback Thesaurus (2001) we find that pragmatic means, "*matter of fact, sensible, down-to-earth, commonsensical, businesslike, having both feet on the ground, hard-headed, no-nonsense*". Put together, one could probably say that e.g. a pragmatic person is someone who is more interested in the practical than in the philosophical.

The word 'pragmatism' goes back to the Greek word for 'affair' and the Greek historian Polybios called his writings 'pragmatic' meaning that they intended to be useful and instructive to the reader. Thus, this far the more ordinary use of the concept pragmatic and the ancient meaning are similar. However, pragmatism as is referred to in this thesis has its origin in American philosophy to which C.S. Peirce was the first to give this philosophical movement its name.

Pierce had a few followers as for example; William James (e.g. Philosophy of Psychology), Josiah Royce (Philosophy of Science), John Dewey (Philosophy of Science and Philosophy of Education) and later on C. I. Lewis (Philosophy of Knowledge). One of the fundamental ideas in Peirces' pragmatism is the notion of "…*the meaning of a proposition or an intellectual conception lies in its practical consequences*" (The Cambridge Dictionary of Philosophy, 1999) and the importance of a symbol should be defined by the rational behaviour it gives rise to. Peirce tries to determine meaningfulness in terms of rational usefulness (Haack, 1999).

Lewis acknowledges his debt to Peirce, James and Dewey but wanted to differentiate himself from the more orthodox pragmatism for two reasons: "*Since this point of view will be likely to acquire some sort of label…, I shall venture to give it one myself and call it "conceptualistic pragmatism". Without the earlier conceptions of Pierce, James and Dewey - especially Peirce - it would probably not have been developed. But these more orthodox pragmatists should not, of course, be made responsible for this view as a whole…*" (Lewis, 1929, p. xi).

3. Connections between conceptualistic pragmatism, quality and management

Through the studies of Lewis, in the article "On the Theory of Knowledge in the quality movement -C.I. Lewis' Contribution to Quality Pioneers" (article A), it became obvious that his thoughts on knowledge theory were an important source for the development of Shewhart's theory of quality. Later on, these influences are found in Deming's writings about continuous improvement and the use of the so-called PDSA-cycle (Plan-Do-Study-Act). However, in the article we argue that the relationship between the quality movement and its philosophical roots have weakened considerably. Which, is argued here, could be a cause of the spirit gone lost in quality work today. We therefore thought it would be worthwhile to identify some of the central ideas of Lewis in order to investigate whether we still can find validity of his thoughts in organisations today. Subsequently, we found it would be interesting to rejoin the links between the quality movement and its philosophical roots.

What was identified in article A was that knowledge theory, and the importance of knowledge for both our conceptualisation of the world and for the creation of a community for action, was at the core of the founding of the theory of quality already from the very beginning. We also find that this still lives strongly in the conceptualisation of continuous improvement as symbol-lised by the PDSA - cycle (Bergman & Mauléon, 2003). However, as argued earlier, many observers looking at the contexts and results of the application of the PDSA - cycle or other quality models, do not recognise its knowledge theory origin. Many observers classify the improvements rather as what Argyris and Schön (1974) calls single loop learning, i.e. learning which takes place without a changed mental model, i.e. without a profound change of the *a priori* using Lewis' (1929) words. This is a regrettable development as the very essence of the original meaning of the concepts behind the development of the PDSA - cycle was different (Deming, 1993). Maybe we could find a clue to the problems many organisations have encountered, when trying to apply the progressive concepts of the quality movement, with this lack of knowledge? If no changes are made in the mental models, i.e. the 'a priori' based on the experiences gained we cannot expect any dramatic results (see further article A; Bergman, & Mauléon, 2003).

The 'a priori' referred to above is taken from studies of Lewis' (1929) theory of knowledge in "Mind and World Order" (MWO). The 'a priori' according to

Lewis is simply said the 'instrument', which our mind imposes upon experience in order to interpret it (Lewis, 1929). The 'a priori' is built up by our concepts and Lewis continues by saying that our concepts give rise to our 'a priori' and it represents what our mind brings into experience. The 'a priori' is created by our mind and our mind can therefore also alter it, which in this sense gives us a free choice of selecting our 'a priori'. The *"…determination of the a priori is in some sense like free choice and deliberate action."* (Lewis, 1929, p. 232).

The way to either choose another 'a priori' or to change it is through reflection and Lewis argues*"…that reflection is but a further stretch of that critical examination of our own constructions and interpretations by which we free them from inconsistency and render them more useful."* (C.I. Lewis, 1929, p. 34) and as *"The a priori is knowable simply through the reflective and critical formulation of our own principles of classification and interpretation…"* (C.I. Lewis, 1929, p. 232) reflection is not only crucial if we need to change our 'a priori' but is also necessary if we are to cooperate with and understand other human beings (C.I. Lewis, 1929).

As for cooperation to be possible, Lewis continues, there needs to exist some common understanding. *"Meanings are identified by the relational patterns which speech and behaviour in general are capable of conveying."* (C.I. Lewis, 1929, p.109). However, the sensuously content of an experience in one mind (person A) cannot fully be conveyed to another mind (person B), but the characteristic's of a set of items in the experience of person A can be identified by person B. If he or she acknowledges that this identification belongs exclusively to some set of things is his or her own 'a priori'. This is only possible if person B has reflected upon and identified his or her own 'a priori' (C.I. Lewis, 1929). Thus, to reflect upon ones own 'a priori' gives us the means to understand others behaviour in our community and thus gives us the possibility to cooperate and change our behaviour. This is further studied in the article "Common Concepts for Common Action- Sense-Making or Senseless Making in Organisations?" (article B).

Lewis (1929) furthermore stated that through reflection we are given the possibility to change or modify our 'a priori' and in the process of doing so we may not only change our mode of interpreting experience but may also change our behaviour. In connection with behaviour Lewis (1929) not only talks about the individual's choice of 'a priori' and its concepts, he also talks about common concepts, which he argues are necessary for community of action. To identify if there exists common concepts one can study congruity of behaviour as this is the ultimate practical test of a common understanding of

common concepts (C.I. Lewis, 1929). Speech, Lewis (1929) continues, is that part of behaviour, which is most significant for common meaning and understanding and most useful for securing human cooperation. According to our interpretation of Lewis, as argued in article A, this implies that a lack of common concepts to which we all give similar meaning may cause problems in cooperation.

To further investigate Lewis' ideas about common concepts "…*for community of action…*" (C.I. Lewis, 1929, p. 90) a study was conducted in the article (article B) in which the aim of the study was partially to explore Lewis' theory's applicability in organisations today. Thus, to investigate how the lack of reflection about common concepts may lead to misunderstandings and disturbances in organisations we conducted interviews with managers from different organisations. What we meant by misunderstandings in the article (article B) were disturbances in communication and interaction between individuals. What was found is that we often forget or do not realise that, when interacting with others, we have our personal previous experiences, which have created our 'a priori' that influences the way we understand and interpret experience. In the study we found some good examples of how misunderstandings occur in organisations today when one is not aware of the possible different meanings of a concept, which in the long run seemed to cause problems in cooperation. However, one of the interviewees observed that it may not always be striveable to create consensus about all concepts as this might harm the creative process within the organisation. He argued that by structuring things too much we might stifle creativity as conflicts and misunderstandings sometimes may stimulate new ideas.

It is therefore further argued in the article that misunderstandings concerning concepts not necessarily always give rise to conflict. Misunderstandings may also stimulate creativity and give rise to stimulating dialogues. We therefore summarise our study with the notion that there needs to exist an *understanding* that people put different meanings into a concept. Organisations therefore need to find a balance in their pursuit of e.g. creating common concepts as to not over structure matters in their strife for consensus. This balance, i.e. between a structured and a loose organisation, or using Burns & Stalker's (1961) words a mechanistic or organic organisation, is further argued for in articles B and C.

Another example of the unawareness of different personal 'a priori' is what we found in the study we wrote about in the article "A pragmatist framework for safety improvement in healthcare" (article C). In this article we discuss the possible problems that may arise when the author of a theory and the

interpreter of that theory have different 'a priori' and are not aware of this. This may create a problematic situation where a managerial model, which is based upon a certain theory, is to be implemented in an organisation.

In this article (article C) we had empirical support from studies conducted at a hospital by one of the authors. In the material we found that medical staff tend to turn to research expecting to find 'ready-made' solutions to, in this particular case, the problem of patient safety. We also found that part of safety literature seem to provide such solutions, independent of the original scholars intention. However, we argue that it is not always the mis-understandings by the interpreter of the text which give rise to problems. Some authors of a text may be unclear in explicitly stating their epistemo-logical assumptions, i.e. conveying their 'a priori'. Thus, we argue that the end result may be that the consumers of the research interpret results using their own 'a priori' on the role of science, which may diverge from the original authors perspective.

Gadamer gives an explanation of the occurrence of misinterpreting or simplifying theories: *"In his own field he* [i.e. the expert] *is a faithful and reliable investigator, and in general he is well aware of the particularity of his methodological assumptions and realizes that the results of his investigation have a limited relevance. Nevertheless, the problem of our society is that the longing of the citizenry for orientation and normative patterns invests the expert with an exaggerated authority."* (Gadamer, 1975, p. 312)

Recently Argyris (2003) wrote an article where he does not put the blame solely on the interpreter of a theory as Gadamer seems to do in the above citation, he talks about the problems which may arise when the author of a theory and the interpreter have different 'a priori' when giving the following example: *"Management was shooting itself in the foot by using a flawed theory of effective management. We, as scholars, were shooting ourselves in the foot by using flawed modes of theory building and flawed methodologies for research…"* (Argyris, 2003, p. 1180)

What Argyris talks about here is that in the research process it is important to realise that the reflection process from the very beginning of conducting research is of utmost importance in the possibility of creating a theory or model. As interpreted, the researcher needs to explore and understand his or her own 'a priori' when conducting research or the theory building process may be flawed. The same goes for management or the interpreter of the final theory or *"Left to their own respective (the scholars and management) devices, both*

groups created conditions /…/ where the blind were leading the blind." (Argyris, 2003, p. 1180)

Findings and contributions

To summarize, the articles briefly presented are all based upon the pragmatic philosophy of C.I. Lewis and his thought about a theory of knowledge, specifically the 'a priori'. What I see as a major contribution of this work, is the unravelling of the philosophical roots of Shewhart's and Deming's theory of quality. As it is argued that this could be a means in the pursuit of revitalising the conception of quality work. Not saying that all quality work done today is totally oblivious to the philosophical and psychological aspects both Shewhart and Deming argue are necessary in working with quality. However, these ideas seem to be neglected areas today. I thus hope that through this work, I have managed to create an awareness and interest for the need to work with what originally was the intent with Shewhart's and Deming's theory of quality. As we probably can revitalise and find part of the spirit gone lost in quality by recapturing some of their ideas, and maybe also find new ideas for future quality work in their writings.

Reading Argyris (2003) above gives a nice feedback loop to what is discussed in all articles. His arguments show that the ideas presented in articles A and C, concerning conflicts and misunderstandings due to different 'a priori', have some validation. What is also interesting is the discussion about common concepts for common action, where the findings in article B, show that conflicts in e.g. the product development process could be explained by lack of common concepts or different meanings of a concept. However, in the article we do not propose that misunderstandings and conflicts necessarily always are negative, in some cases it may be the exact opposite. Meaning that new creative solutions or ideas may rise out of such happenings. It is therefore argued that there needs to exist a balance between a structured and a loose organisation.

Thus, the major contribution from these studies lies in the claim that organisations need to create an understanding and awareness of possible conflicts in organisations due to different 'a priori'. Thus, organisations need to recognise possible threats due to these differences when wanting to e.g. improve the organisation. However, these differences should not only be seen as threats to organisational processes but also as enablers for e.g. creativity. Organisations thus need to find a balance in their strive for organisational consensus which, it is argued, could be done by e.g. stimulating reflection processes.

4. My personal research odyssey - methodological reflections

"…knowing begins and ends in experience; but it does not end in the experience in which it begins." (C.I. Lewis, 1934, p. 134).

This statement embodies the essence of my ambition with this research journey, as part of the aim of it was to change my 'a priori'. In the following, it is this change process which will be explored. However it may be too great a task and not altogether relevant for this thesis to identify exactly what my 'a priori' was before and after conducting this journey, but rather to present in what manner my 'a priori' have changed. I will connect my experiences to Argyris and Schön's (1974) single-loop and double-loop learning. Where single-loop learning occurs when a problem is detected and thereafter corrected without changing the underlying values and other features which govern behaviour. Double-loop learning occurs when a problem is detected and corrected by first changing the underlying values and other features which determine behaviour. Thus, single-loop learning remains within the accepted routines while double-loop learning requires new routines be created which are based upon a different conception of the universe (Argyris 1999; 2003). This latter statement is easily related to what Lewis (1929) would call a change of 'a priori'.

The work with this thesis is characterized by constant loops between studies, reflection and conclusions. Where the methodology used is strictly limited to qualitative methods. In the presented article, "On the Theory of Knowledge…" (article A) literature studies were conducted where the ambition was to unravel the original philosophical ideas concerning the theory of quality by Shewart and Deming. In the article "Common concepts… " (article B) interviews with a narrative perspective were conducted with the aim of studying the argument found in article A concerning common concepts for common action. Finally in the article "A Pragmatist Frame-work…" (article C) we had empirical support, through observational studies and interviews conducted by one of the authors of the article, in our theoretical reasoning, where we set the phenomenon studied in a pragmatist framework. I will leave out these last empirical studies as they were conducted by one of the other authors of the article. It would therefore be inaccurate to include them in my personal research journey illustration. For more detailed information of how the studies were conducted see Gauthereau's (2003) thesis "Work Practice, Safety and Heedfulness".

4.1 Studies for a theoretical base

In the article "On the Theory of Knowledge..." (article A) the aim was to explore the origins of Shewhart's and Deming's ideas concerning a theory of quality and its connection to knowledge theory. As we argue that the quality movement originated not solely from insights about variation but also philosophy. The way the study was pursued was first to conduct thorough readings of Deming's books "Out of the crisis" (1986) and "The New Economics" (1993). To thereafter pursue Shewhart's writings "Economic Control" (1931) and "Statistical Method from the viewpoint of quality control" (1939) as Deming clearly was influenced by these.

It was through the readings of these texts, except Shewhart's (1931) "Economic control", that references to Lewis could be found. References which seemed to have had great influence upon the forming of some of both Shewhart's and Deming's ideas. It thus became intriguing to read the original work and therefore a study of Lewis' (1929) book "Mind and the World Order" (MWO) was pursued. The reading of Lewis became a great challenge as the reasoning in it is circular, which Lewis himself acknowledges when commenting upon his writing the book *"...in writing this book, I encountered a considerable difficulty of exposition: with whatever one of the theses I should begin, the others would be more or less anticipated."* (Lewis, 1929, p. xi). It is therefore well known among the readers of Lewis that this book is not one of the easiest to pursue (see e.g. Wilcox, 2000).

One of the more humorous claims of these difficulties is the following by Deming: *"I had the unusual difficulty with it, and I recall saying to Dr. Shewhart at the end of the seventh reading that so far it had meant nothing to me. 'Stay with it' he said, 'I read it 14 times before it began to mean anything'. I wonder how he came upon it in the first place, and how he knew how important it was that he should pursue it."* (Deming in Kilian, 1992, p. 90).

The pursuit of Lewis' writings was first to examine the chapters Deming (1993) advises the reader to study in his chapter about a theory of knowledge in "The New Economics". The chapters Deming refers to are chapters 6, 7 and 8 in Lewis' "MWO". Chapter 6 concerns 'The relativity of knowledge and the independence of the real', chapter 7 'The a priori - traditional conceptions' and chapter 8 'The nature of the a priori and the pragmatic element in knowledge'.

After an initial reading of these chapters it is not possible to claim that I had understood very much. Consequently, not even single-loop learning had

occurred, I had merely read the text. Hence, a revision of the work was needed and therefore a study of the other chapters in 'MWO' was commenced. Thus, my studies had met those same difficulties which Lewis himself had cautioned the reader. The chapters are interlinked and it is difficult for a novice to enter the text, whether it be by pursuing it from the beginning or in choosing selected chapters. In my case the readings of Lewis' 'MWO' became circular and with every new turn small chips of the puzzle fell into place. Today, through the work of both articles A and B, I would claim that my understanding and learning have come as far as to say that double-loop learning has occurred in the understanding of Lewis' ideas in 'MWO'.

However, not unlike other investigations, the studies of Lewis were like opening Pandoras box. The more that was unravelled, in the search of original scholars and their influence upon Shewhart and Deming, the greater the necessity of delimiting my readings. I therefore had to let go of my studies of pragmatic philosophy and focus upon how to apply the ideas found in article A into present day concerns in organisations. Thus, the study regarding Lewis' claim for 'common concepts for common action', was conducted. The aim of this study i.e. the article "Common concepts…" (article B) was to see if we could create deeper insights and understandings of problematic occurrences in organisations by confronting Lewis' ideas to events in organisations today. Were the ideas still a helpful source for the creation of meaning in organisations today?

4.2 The narrative approach

In the article "Common concepts…" (article B) we wanted to apply Lewis' ideas concerning common concepts and reflection to misunderstandings in organisations. With misunderstandings we meant events which could cause conflicts and disturbances in the organisation. The idea was pursued as one of the findings in article A was Lewis' (1929) argument about the importance of common concepts for congruity for behaviour, which later on Deming (1986) refer to in his discussion about 'operational definitions'. We thus knew that in the 1920's and in the 1980's the idea of common concepts in organisations seemed important to pursue and therefore, also might have some validity today.

The idea of the study, was to interview people from different organisations. One day, by chance, I heard a fellow PhD student give a perfect example of a problematic event in a project. He had experienced a conflict which seemed to have originated from a misunderstanding of a certain concept in a project. Thus a first example, which could support the idea of 'common concepts for

common action', was identified. However I thought it would be interesting to see if other examples were to be found. Consequently, five interviews were conducted with people from the same PhD program. At the time of the interviews the interviewees worked part time in their respective organisations and were part time PhD students at the Fenix Executive PhD School, Chalmers University of Technology. The interviewees, both males and females, were chosen in a more or less random fashion, with one exception, the person with the first example. As all had experience from different managerial roles within their respective organisations it was anticipated that they could give colourful and vivid accounts of different occurrences related to the phenomenon studied.

An interesting fact of this study is my personal relationship with the interviewees. In what way would this relationship influence the interviews? Could any bias be identified and in what way would this show? As I had taken a couple of doctoral courses with the interviewees and therefore knew them personally I already had a mental picture, an 'a priori', about every individual. Therefore, bias is definitely something to consider as I am sure that the way the interviews were conducted were an adaptation to their different personalities. Also later on when analysing the interviews it would have been impossible for me to separate my personal perception of them and what they said in the interviews. However, I see this as something positive and suggest that it firstly, may have created a more personal and relaxed atmosphere in the interview situation. Secondly, in the later interpretation of the material this might have helped to create a vivid and colourful picture of their experiences. This would be helpful, as my aim was to create narratives of their personal account. However, in the particular analysis of the material there was a possibility that I would be a bit too narrow in my identification of certain themes in the material. To avoid this as much as possible, the other two authors of the article analysed the material as well. First we conducted our analysis' independently in order to find different themes in the material to thereafter go through the material together.

The aim of this article (article B) was to present the empirical material in the form of narratives. Therefore the interviews were conducted in a manner of open in-depth interviews, where the pursuit was to collect as colourful and vivid pictures as possible of the phenomenon studied. We followed what Czarniawska (1998) says to be the most basic form of a narrative. That is to first identify the original state of affairs, to thereafter study the actual experience of the interviewee and finally to present some of the consequences of the experience (ibid.).

Czarniawska (1998) argues that the narrative form of knowing is close to the tradition of case studies. But as the case study approach usually gives the researcher the possibility of choosing the data interpreted, the narrative seemed better suited for our purposes with the study as it aims to present the interviewees stories of their day to day life and not the, of the researcher, interpreted experiences of the interviewee. Thus, in the final presented text we tried to be as faithful to the material as possible and give the reader a truthful picture of the interviewees accounts (Czarniawska, 1998). We can also find support for our purpose in the writings of Frank, (1995) Nicholas & Gillet (1997), and Sköldberg (1994) who like Czarniawska mean that narrative studies give priority to the interviewed persons account of his or her own life and experiences.

Habermas (1968) argues that the narrative approach does not seek to present generalized knowledge, but rather to present contextual narratives as human endeavours in order to make sense of complex and ambiguous realities (Habermas, 1968; Guignon, 1997). As we never could say that what we found in our study could be generalized in any way, this would be to contradict ourselves, we took support from Habermas' and Guignon's, reasoning as we hoped to present a picture of how things were in the various situations presented by the interviewees. We furthermore presented the final manuscript of the article to the interviewees both in order to give them the possibility to comment and give feedback on our results but also and maybe more importantly as a way of giving them feedback of their own accounts and experiences so that they may continue the personal reflection process considering their investigations of their personal 'a priori'. My role as a researcher in this study was therefore, not only one of merely studying the phenomenon, but also to stimulate a reflections process within the interviewees.

In the article "A Pragmatist Framework…" (article C) we took the study of the 'a priori' one step further and wanted to see what consequences, from a pragmatic perspective, one could find when the interpretation of a theory not always coincided with the original idea of the author's purposes of the theory. This article is an interesting result of a continuous personal dialogue between Vincent Gauthereau and myself. Our dialogue began in a mutual curiosity concerning creativity and improvisation, but continued into other interesting areas. It is difficult to show how our mutual process have changed our 'a priori' and the way we perceive the world, but I would like to think that we both during the process assimilated ideas from one another and the topic areas we discussed. However, personally I would like to partly accredit our dialogue to my further reflection about how to apply Lewis' 'a priori' to

different occurrences in organisations, be them change plans, learning models or other.

4.3 Reflections over the journey now done

When looking back upon the way I have pursued my research studies one can find traces of different research perspectives in them. Yet the one I mainly seem to belong to, could be said to be aligned with the fundamental spirit of conceptual pragmatism. It would therefore be interesting to connect conceptual pragmatism to the contemporary discourse on research methodology in this section.

From an overall view the research conducted here could be said to primarily belong to the hermeneutic school. It is not difficult to see the connections between conceptual pragmatism and hermeneutics when reading "Reflexive methodology" by Alvesson & Sköldberg (2000) where they connect pragmatism and hermeneutics through symbolic interactionism.

Hermeneutics is simply said the study and interpretation of texts, politics, existentialism and so forth. The keyword is the *interpretation* of what is studied (Mårtensson & Nilstun, 1988). As most other research methodologies, hermeneutics has been subject to a breech from within. When studied, we on the one hand, find *objectivist* hermeneutics and on the other, *alethic* hermeneutics. Simply said, the difference between the two lies in the way they look upon the subject-object relationship. The objectivist hermeneutics differentiates the object-subject and sees research as having a certain objectivity in it. The alethic hermeneutics however sees this differentiation, between subject and object, as impossible, as *"Researcher- be they natural or cultural scientists - are always members of a particular, historically and culturally conditioned, ever-changing 'lifeworld', and their practices are always already laden with theory and temporality."* (Alvesson & Sköldberg, 2000, p. 57). And Rorty argues *"…that not even self-understanding is exempt from context and theory dependence."* (Rorty in Alvesson & Sköldberg, 2000). This last reference to Rorty is interesting as he is seen as one of our contemporary pragmatic philosophers. Thus, through Rorty we can link together alethic hermeneutics and contemporary pragmatism.

However, when studying the two different hermeneutical perspectives' cycles one finds that the similarities overlap the dissimilarities and that the perspectives' hermeneutical circles are complementary (Alvesson & Sköldberg, 2000). It therefore does not seem necessary for this work to further go into the

differences between the two schools of hermeneutics in relation to my research studies.

Lewis' theory of knowledge is easily linked to the hermeneutic view upon knowledge. As Lewis' (1929) ideas about 'a priori', experience and reflection are closely related to what one may say is one of the main themes within general hermeneutics i.e. *"…the meaning of a part can only be understood if it is related to the whole"* (Alvesson & Sköldberg, 2000, p. 53). It is the process of conducting a journey between the parts and the whole over and over again, in a spiral manner, which constitutes the creation of knowledge within hermeneutics (Alvesson & Sköldberg, 2000; Kvale, 1997; Starrin & Svensson, 1994).

In my interpretation, Lewis' knowledge theory conveys the same thing as he claims that: *"… knowing begins and ends in experience; but it does not end in the experience in which it begins."* (C.I. Lewis, 1934, p. 134) and *" The mind will always be capable of discovering that order which is requisite to knowledge, because a mind such as ours, set down in any chaos that can be conjured up, would proceed to elicit significance by abstraction, analysis and organisation, to introduce order by conceptual classification and categorical delimitation of the real and would, through learning from accumulated experience, anticipate the future in ways which increasingly satisfy its practical intent."* (Lewis, 1929, p.391).

Finally, with the reasoning in this chapter I hope that I have shown how my 'a priori' has changed from when I began this journey. That is, that a change has occurred in my 'a priori' considering my knowledge and understanding of Lewis' theory of knowledge and its connections to the theory of quality referred to by Shewhart and Deming.

As a means for achieving this change of 'a priori' I have throughout this research journey paused to reflect upon my actions and studies. These pauses have sometimes been voluntary and sometimes not. But they were needed in order for me to claim any kind of understanding of what was studied. As time progressed my reflection process seem to have become more and more unconscious. And even though I have not exactly dwelled upon the questions *"'What is good?', 'What is right?', 'What is valid?'"* (C.I. Lewis, 1929, p. 2) which Lewis acclaimed to be the very essence of philosophy. I argue that I have managed to follow Lewis' advice when saying that: *"… everyone both can and must be his own philosopher /…/ as in philosophy we investigate what we already know."* (Lewis, 1929, p. 2).

Lewis (1929) concludes by saying that the final responsibility for ones life and actions rests on oneself. It is only possible to find the answers to philosophical

questions within oneself; we cannot ask for answers from others. This consc-iousness may be the most important feature in understanding oneself and in identifying ones own 'a priori' and the lack of it may become a problem when interacting with others. Mike's comment in article B is a clear example of this:

> *"…personally I never stop at being surprised over how little we understand in relation to how much we think we understand."*

5. Future research

5.1 Future odysseys into the world of quality

During the work with this thesis I found something very interesting about the research community around the 1920's. The findings clearly show how closely knit many of the philosophical communities were. Not only among one certain 'school' of philosophy but across different schools and one finds that people moved around a lot and followed friends and colleagues from one University to another. This gave rise to a number of questions. What other academic areas were close to philosophy at this time? In what way could this have influenced the development of the theory of quality?

Other areas of interests that arose during this work was to study disciplines such as psychology and organisational psychology. It would be worthwhile to study their connections to pragmatism, as some argue that psychology is sprung out of philosophy (Foucault, 1994). For example, William James was not only one of the classical pragmatists but also a psychologist. Concerning organisational psychology it would be interesting to explore possible connections to Kurt Lewin, by some called the founder of organisational studies, and later on organisational development (OD) (see e.g. Schein, 1988). Lewin worked in the 1940's-1950's, and the question is, did he have some contact with the pragmatists of that time? If this is the case, an even closer connection, between the psychological perspective and the original theory of quality by Shewhart and Deming, could be identified and explored.

In summary, it would be worthwhile to study what other areas and scholars the original theory of quality may have been influenced by. As this could give further explanations to why the implementation of quality models in org-anisations meet such resistance or indifference. Why not follow Shewhart's advice, given to the student who wants to understand and develop the theory of quality and quality control, to pursue studies in:"… *psychology, philosophy and logic; …the field of psychology because we must get some sort of picture of the way the mind works; … the field of philosophy because we need some hypothesis as to the nature of reality and the function of laws, theories and causal explanations; … the field of logic because it presents what we know about the formal methods available in the theory of deduction and induction."* (Shewhart, 1931, p. 482).

Other and final areas of interest would be to evaluate, in practice, some ideas of how to enhance and revitalise quality work in organisations. For instance,

the discussions, in articles B and C, about 'common concepts' or the mismatch between the researchers 'a priori' and the interpreters 'a priori' concerning a theory. These problems could possibly be helped by something Michael Beer once told me to study, i.e. the critical dialogue. Maybe this could be of help in excavating one another's 'a priori'? Beer argued that there needs to be an acceptance in having critical dialogues within organisations as they are an efficient way to explore and understand one another and possibly stimulate creativity. It would therefore be very interesting to study the possible ways to stimulate reflection within the individual, the group and the organisation. In connection to this one could study reflection in action. In Ollila's (2003) thesis we find an example of this, in something she calls 'Reflective leadership'. Where she first, by external influence i.e. by asking questions directly after a meeting, stimulate a reflection process within a leader at a company. This process lasted over a certain period of time, but the need for reflection-stimulating questions decreased as time passed, until they were not needed at all, as the reflection process had been internalized by the person himself (see also Ollila, 2000). This method would definitely be worthwhile to study further and integrate in future research.

Final words

Writing this thesis or perhaps framework for my articles has been like creating a piece of art. First you sketch out the contours of your motif to thereafter carefully brush-stroke by brush-stroke add colouring. With the constant awareness of when to stop, as there is a fine balance between ruining the work and to let the art piece live its own life. As my art teacher once told me: "…*be careful so you do not add* **that one** *brush-stroke too much or you will ruin the whole painting with just that one extra stroke!*" What I hope I have managed here is to create a framework and sketch up a context into which my articles fit together. I hope I haven't added that one brush-stroke too much.

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Article A

On the Theory of Knowledge in the Quality Movement -
C.I. Lewis' Contribution to Quality Pioneers

ON THE THEORY OF KNOWLEDGE IN THE QUALITY MOVEMENT
-C.I. Lewis' Contribution to Quality Pioneers-

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Abstract

The Quality Movement originated not solely from insights about variation within statistics but also from the field of philosophy, particularly epistemology. Walter. A. Shewhart and W. Edwards Deming, both seen as quality pioneers, were strongly influenced by the conceptualistic pragmatist Clarence Irving Lewis and his theory of knowledge. This is, and has often been, a neglected connection; however, in today's competitive business environment knowledge and competence have become crucial success factors. Thus the epistemology-related origin of the quality movement has become increasingly interesting and important to explore. As Sir William Naipaul just recently said in an interview*: "…if you don't know the history of a country you will not understand it."* Thus it is the historical background of Deming's and Shewhart's ideas that we are interested in exploring and tracing back in time so that we may be able to better comprehend the profound ideas they left behind but which to a large extent have been forgotten since their days.

With this paper we attempt to shed some light upon the origin of Shewhart's and Deming's ideas relating to their theory of knowledge. In doing so, we will first present a summary version of Clarence Irving Lewis' theory of knowledge as expressed in his work "Mind and the world order- outline of a theory of knowledge" (1929). Secondly, we will show a few close connections between C.I. Lewis, Shewhart and Deming.

Keywords: philosophy of quality, profound knowledge, pragmatism, theory of knowledge, epistemology

Introduction

W. Edwards Deming is best known for his important contributions to the quality movement, and as a consequence the dramatic shift in quality thinking and management, as first seen in Japan and later in the US and Europe. Particularly, his ideas concerning continuous improvement as symbolised by his learning-cycle (the PDSA-cycle) has gained worldwide recognition. In his book "The New Economics for Industry, Government, Education" (1994) Deming writes about a system of 'Profound Knowledge' which includes the four following elements; understanding variation, knowledge of psychology, appreciation of a system and theory of

knowledge. In recent years 'Profound Knowledge' has received increased attention both from practitioners and academics (e.g. Anderson et al., 1991; Braughton, W.D., 1999). This therefore makes it interesting to explore further. However, Deming himself said that, it is not possible to understand 'Profound Knowledge' unless you see it as a system. This may imply that it is necessary to describe all four components of it. However, it is beyond the scope of this article to do so. Instead the focus here is on the area of theory of knowledge and on the origins of Deming's ideas concerning his theory. We therefore see this article as a contribution to a continuous exploration of the whole system of Profound Knowledge'.

However important Deming's contributions are, one must not forget another important part of the origin of the quality movement: the invention of the control chart by Walter A. Shewhart. In different shapes, the control chart is used to separate variation by rational methods into two sources: first, the system itself or causes of chance, in which the responsibility lies on management itself and, secondly, assignable or special causes which are specific to a momentary event which usually can be discovered and removed by the person responsible for the particular job in question. The major contribution given by the control chart is the fact that, by identifying the assignable causes and creating an opportunity to remove them, it makes it possible to obtain a process within statistical control, which therefore also makes it predictable (Deming as ed. in Shewharts 1939).

Walter A. Shewhart is sometimes seen as the father of the quality movement (Petersen, 1999). And by being Deming's mentor he is said to have had the greatest single influence upon him (Blankenship & Petersen, 1999). The two met at the end of 1927 and thereafter became close friends and colleagues (Kilian, 1992). The following remark by Deming acknowledges his everlasting debt to Shewhart: *"One can say that the content of my seminars /.../ and the content of my books, 'Quality, Productivity and Competitive Position' and 'Out of the crisis' are based in large part on my understanding of Dr. Shewhart's teaching."* (Deming in Kilian, 1992, p. 176-177).

As a result of Deming's and Shewhart's collaboration Deming became the editor of Shewhart's (1939) book "Statistical Method - from the viewpoint of quality control", which is based on a series of four lectures given by Shewhart at the Graduate School of the Department of Agriculture in Washington. In reading this book one will find a number of references to publications by C.I. Lewis. And the attentive reader will find the same references in Deming's books "The New Economics" (1994) and "Out of the crisis" (1986). In Deming's sub-chapter `Theory of knowledge´ in " The new Economics" his ideas are based on C.I. Lewis' book "Mind and the world order-outline of a theory of knowledge" (1929). Here Deming advises the reader who wants to get a better understanding of his theory of knowledge to read the chapters 6, 7 or 8 in "Mind and the World-Order" by C.I. Lewis.

This awakens the curiosity of the researcher. One wants to lay the hands on the original work - the document, which so profoundly influenced Deming and Shewhart in regard to their understanding of a theory of knowledge. However, after reading a few introductory pages in C.I. Lewis' (1929) "Mind and the World-Order", one begins to understand the difficulties first encountered by both Deming and Shewhart when reading C.I. Lewis. As Deming remarked: *"I had the unusual difficulty with it,*

and I recall saying to Dr. Shewhart at the end of the seventh reading that so far it had meant nothing to me. 'Stay with it' he said, 'I read it 14 times before it began to mean anything'. I wonder how he came upon it in the first place, and how he knew how important it was that he should pursue it." (Deming in Kilian, 1992, p.90).

In our attempt to understand Shewhart's and Deming's ideas relating to their theory of knowledge we will first introduce the reader to Clarence Irving Lewis and to a summary version of his outline of a theory of knowledge. In this context we will present C.I. Lewis' ideas concerning the nature of knowledge and how it is acquired and at all possible**.** Thereafter we shall compare of C.I. Lewis', Deming's and Shewharts' ideas about a theory of knowledge in order to show the influence of C.I. Lewis in the work of the other two. This will be done by comparing a number of citations from the three authors.

Clarence Irving Lewis and His Outline of a Theory of Knowledge

Clarence Irving Lewis (1883 - 1964), professor in philosophy at Harvard University, called himself a conceptualistic pragmatist belonging to the main school of American Pragmatism[1] (C.I. Lewis, 1929, preface). His theory of conceptualistic pragmatism originated partly from his study of modern logic and partly from the influences of Royce and the classic pragmatists such as W. James, C.S. Peirce, J. Dewey and G.H. Mead, to which the first three mentioned he felt indebted (C.I. Lewis, 1929; Haack, 1999 (forthcoming)).

In e.g. Encyclopaedia Britannica (online, 2000) one can read that in the areas of epistemology and ethics C.I. Lewis worked within a Kantian framework. That is, he sought to develop philosophical concepts in the manner of Kant as rooted in empirical reality. Knowledge, C.I. Lewis believed, is possible only where there is a possibility of error. Thus he modified the traditional view of sensory experience, which regards it as a guarantee of true knowledge and certainty about reality because an individual cannot possibly be mistaken about the sheer impression given by the senses. According to C.I. Lewis, epistemological problems are instead a matter of a person's subjective interpretation, which are made on the basis of his/her sensory experiences. The only possible certainty is that provided by what C.I. Lewis calls terminating judgment, which involves a statement about reality that has been verified empirically (Encyclopaedia Britannica online, 2000; The Cambridge Dictionary of Philosophy, 1999).

Within epistemology, C.I. Lewis' book "Mind and the World-Order - Outline of a Theory of Knowledge" (1929) is considered his most significant work (Cunningham, 1994). And it is from this book that his influence upon Shewhart and Deming can be traced. Hence, a further investigation, of C.I. Lewis' ideas about a theory of knowledge as described in "Mind and the World-Order", is both interesting and challenging. In the following paragraphs we will study C.I. Lewis' (1929) "Mind and world-order"' and through quotations, which are presented with page numbers within brackets, give examples of his writings.

Knowledge is, according to C.I. Lewis, derived from learning caused by the interaction between the *"…a priori…"* (272) with its conceptual modes and the sensuously-given in *"…experience…"* (272) (391). He says that it is *"In this middle ground of trial and error, of expanding experience and the continual shift and*

modification of conception in our effort to cope with it" (272) that learning takes place (391). Furthermore*,* it is the possibility of the choice of the a priori, which, according to C.I. Lewis, represent the pragmatic element in knowledge (272).

In our attempt to make C.I. Lewis' theory of knowledge comprehensible we will now more closely describe his understanding of the a priori and experience. To C.I. Lewis, knowledge in general is about experience (34). He says that in all experience as such there is*"... the sensuous- character..."* (48, 49, 66)*,* since our whole world of experience is constructed by thought from sense-data[2] (29, 57). This means that experience in part is a product of our mind (34). C.I. Lewis continues his argument by stating that it is not possible clearly to separate 'mind' from 'experience' (25), since whatever experience may bring, our mind is there and imposes upon it its own a priori in order to structure and interpret experience (89, 230, 275).

In brief, the a priori is simply the instrument, which our mind imposes upon experience in order to interpret it (89, 230, 275). As C.I. Lewis says: *"In experience, mind is confronted with the chaos of the given. In the interest of adaptation and control, it seeks to discover within or impose upon this chaos some kind of stable order /.../. Those patterns of distinction and relationship, which we thus seek to establish, are our concepts."* (230). And it is our concepts, which give rise to our a priori (preface). Concepts thus represent what our mind brings to experience and the truth that is a priori arises from the concept itself (231).

The rise of the a priori from the concept itself happens in two ways. In the first place, there is that kind of truth, exemplified best in pure mathematics, which represents the elaboration of abstract_concepts. Such abstract concepts are completely separated from any application to experience and empirical truth. They are solely connected to knowledge of logical truths and can be said to give rise to certain knowledge only. Secondly, there is the empirical concept with its application to the given, which exhibits pre-determined principles of interpretation, the conditions of our ability to make distinctions, and to classify and relate the contents of experience, and which can give rise to probable knowledge only (231, 281).

Furthermore, C.I. Lewis also says that *"A priori truth is definitive in nature and rises exclusively from the analysis of concepts"* (preface) and that our concepts represent what our mind brings to experience in order to interpret it (230). Concepts then operate in terms of *"Patterns of distinction and relationship..."* (230). These patterns of relation should be seen as a system or as patterns distinguishing relations, i.e. A, B and C are related and interdependent (82). As C.I. Lewis says: *"The nature of a concept as such is its internal (essential or definitive) relationships with other concepts."* (83). Concepts cannot be separated into independent parts. Linked to this view is the understanding expressed by the following statement, of C.I. Lewis, which also shows the influence of logic upon his ideas: *"Logical analysis is not dissection but relation"* (82) and he continues *"...the analysis of A into B and C does not divide A into constituents B and C but merely traces a pattern of relations connecting A with B and C."* (82).

Since, according to C.I. Lewis, the a priori is created by our mind and since our mind may also alter it, we have a free choice in selecting our a priori (233). However, C.I. Lewis says, the only way we may choose another a priori or change it, is by reflection, as shown in the following statement: *"The a priori is knowable simply*

through the reflective and critical formulation of our own principles of classification and interpretation. Such legislation can be recognized as our own act because the a priori principle which, is definitive, and not a material truth of the content of experience, has alternatives. " (232) and he continues by saying that*"…the determination of the a priori is in some sense like free choice and deliberate action."* (232, 233). Through the choice of another a priori, C.I. Lewis claims that we may not only change our mode of interpreting experience but may also change our behaviour (preface, 90, 230).

In connection with behaviour C.I. Lewis not only talks about the individual's choice of a priori and its concepts, but he also talks about our common concepts, which are necessary for community of action. And congruity of behaviour is the ultimate practical test of a common understanding of common concepts. Speech, on this understanding, is that part of behaviour, which is most significant for common meaning and understanding and most useful for securing human cooperation (90). According to our interpretation of C.I. Lewis, this implies that if we do not have common concepts to which we all give similar meaning we will not be able to cooperate. These ideas may have influenced Deming's (1986, 1993) thoughts about 'Operational Definitions'.

It is noteworthy that C.I. Lewis' arguments concerning personal reflection and deliberate action constitute some of his most important explanations of how we may change our behaviour. He says that*"… everyone both can and must be his own philosopher…"* (2) This is because within philosophy questions such as 'What is good?', 'What is right?', 'What is valid?' are investigated. And given that the final responsibility for ones life and actions rests on oneself, it is as single individuals that we too have the answers to these questions; it is not possible to ask for answers from someone else (2). Therefore, according to C.I. Lewis, we both can and need to be our own philosophers since *"…in philosophy we investigate what we already know."* (2).

When we investigate what we already know, so C.I. Lewis argues, we have the possibility of changing our conceptual modes. This is because concepts, according to C.I. Lewis, are not stable but may over time be subject to change (257) as *"… everything which has a name is to be identified with certainty only over some stretch of time."* (257). In order further to explain the changeability of concepts C.I. Lewis talks about the categorical system by means of which we classify experience (272).

We always categorize our experience. It is our categories and our classifications that specify the content of experience (preface, 220, 221). When having a system of categories in place we can interpret, interrogate, comprehend and understand our experiences and give them some kind of meaning (220, 221, 237, 259, 272). For instance, the category "disease" is just a name- a word. But it has a certain meaning and this meaning is its concept. So the concept is what "fills" the word- the category. Both categories and concepts can be given up, and this may be done on pragmatic grounds. This can happen when they no longer serve a purpose (235, 268, 272). However, C.I. Lewis remarks that, usually our categories remain the same while our concepts change, which, according to him, is due to new ranges of experience or more adequate analysis of old types of experience (235, 268, 272). This kind of change, then, reflects a learning process according to C.I. Lewis (68).

However, it is not always the case that there is only one correct a priori to be applied in the interpretation of experience. There may exist alternative conceptual systems, which can give rise to alternative descriptions of experience that are equally objective and equally valid, provided there is no logical deficiency in them. If this is the case, it will be "*...determined, consciously or unconsciously, on pragmatic grounds*" (271) which conceptual system will be applied. However, it is also to be noted that C.I. Lewis argues that*"...no experience can conceivably prove them* (referring to our conceptual systems) *invalid*" (266). It is only possible to come to that conclusion through personal reflection (232).

In the foregoing we showed how, according to C. I. Lewis, knowledge is acquired and possible. We shall now attempt to explore his understanding of the nature of knowledge. Knowledge has, according to C.I. Lewis, a number of characteristics. The ones we have chosen to emphasize here are that it is interpretive, probable and predictive (37, 44, 166).

 "*All Knowledge is /.../ interpretive.*" (166). Interpretation is seen as an activity of the mind, which reflects the character of past experience; and without interpretation knowledge is not possible (195). Thus knowledge of empirical truth arises through conceptual interpretation of the given (37), which therefore, according to C.I. Lewis, results in making empirical knowledge probable only (37). In terms of probability, C.I. Lewis illustrates his pragmatic approach to knowledge by saying that: "*…pragmatism is inductive: the given experience of the moment of knowing is the basis of a probability judgement concerning the experience /.../ which would verify, and in terms of which the real nature of the object is expressible.*" (C.I. Lewis, 1934, p. 133). This argument supports the understanding expressed in his well-known statement (referred to by Shewhart in "Statistical Method" (1939)): "*... knowing begins and ends in experience; but it does not end in the experience in which it begins."* (C.I. Lewis, 1934, p. 134). And with this statement C.I. Lewis' ideas about the temporal nature of the knowledge process is clearly shown (C.I. Lewis, 1934, p. 134).

Another important characteristic of knowledge is that it is predictive (44). C.I. Lewis states that: "*… it is impossible to escape the fact that knowledge has, in some fashion and to some degree, the significance of prediction."* (44). Knowledge, as valid interpretation, concerns the relation between an experience A and another future experience B which we seek to anticipate with the help of A (165). Unless we make this anticipation of future experience we cannot have knowledge of external reality, and so cannot plan future action (195, 391)**.** This anticipation of the future may be seen as intentional*,* since an intention relates to something that transcends immediate experience. And, on our interpretation, C.I. Lewis considers this kind of anticipation of the future to be essential and crucial for meaning and any theory of knowledge (C.I. Lewis, 1934, p. 130-131). Thus empirical knowledge entails both actual observation and a correct anticipation of further possible experience (C.I. Lewis, 1934, p. 136). But this raises the question whether we must ascribe a deterministic understanding to C.I. Lewis on the ground that for him true knowledge is really true only if future experience is exactly identical with what was predicted? However the answer to this question is: no. C.I. Lewis sees prediction in terms of probability, meaning that all interpretations of experience, and therefore all empirical knowledge, is probable only, however high the degree of its probability. This is because no

verification could ever be absolutely complete (281). *"Every such judgment about the real external world remains forever at the mercy of future possible experiences."* (281). All empirical knowledge is therefore probable only and can due to its character never be exhaustive (37, 281).

To sum up, we may illustrate C.I. Lewis' ideas about his theory of knowledge with his final statement in "Mind and the World Order" (1929)*:" The mind will always be capable of discovering that order which requisite to knowledge, because a mind such as ours, set down in any chaos that can be conjured up, would proceed to elicit significance by abstraction, analysis and organisation, to introduce order by conceptual classification and categorical delimitation of the real and would, through learning from accumulated experience, anticipate the future in ways which increasingly satisfy its practical intent (391)"*

<u>Traces of C.I. Lewis' theory of knowledge in writings by Shewhart and Deming</u>

"There is no knowledge without interpretation." (C.I. Lewis, 1929, p. 195) is a fundamental statement made by C.I. Lewis and one, which both Deming and Shewhart refer to in their works. And C.I. Lewis' (1929) explanation of how our mind imposes the a priori upon experience in order to interpret it, is by Deming and Shewhart rephrased as theory, as clearly shown in Shewhart's book "Statistical Method" where he writes, *"...we can not have facts without some theory.*" (Shewhart, 1939, p. 88). And in connection with this statement, Deming, as editor, writes in a footnote *"...if there is to be any knowledge at all, some knowledge must be a priori.*" referring to C.I. Lewis (1929, p. 196).

Deming (1994) is clear on the issue that without theory experience has no meaning. For he says that it is the possession of a theory, which enables us to ask questions and learn. Paraphrasing his argument in more practical terms he also says that: *"...to copy an example of success, without understanding it in the light of a theory may lead to disaster."* (Deming, 1994, p. 103). Shewhart (1939) also argues for the importance of a theory in as much as he claims that without a theory we cannot have facts. But where Deming (1994) connects his statement to management, Shewhart (1939) connects it to statistics. The incorporation of C.I. Lewis' ideas in their writings both about management and statistics indicated in what ways Shewhart and Deming found C.I. Lewis' ideas helpful.

The similarities between C.I. Lewis' discussion about the a priori and Deming's arguments presented here are easily recognised. Shewhart on the other hand does not, as directly as Deming, refer to C.I. Lewis' thoughts about reflection and deliberate choice of a priori in his two books "Statistical Method" (1939) and " Economic Control of Quality of Manufactured product" (1931). However one can find traces of similar thoughts as C.I. Lewis' when studying the references in the appendices in his book "Economic Control" (1931). In this book Shewhart refers to contemporary philosophers like William James (1842-1910), Alfred Whitehead (1861-1947), Bertrand Russell (1872-1970) and Charlie Dunbar Broad (1887-1971). Exactly the same philosophers are referred to in C.I. Lewis' book " Mind and the world order" (1929).

In line with C.I. Lewis' arguing, *"...knowledge has, in some fashion and to some degree, the significance of prediction..."* (C.I. Lewis, 1929, p. 44), Deming (1994)

also relates theory to prediction, as one enabling the other. He states *"...rational prediction requires theory and builds knowledge through systematic revision and extension of theory based on comparison of prediction with observation."* (Deming, 1993, p. 105) and he adds that every plan is based upon *"...prediction concerning conditions, behaviour, performance of people, procedures, equipment or materials.*" (Deming, 1993, p. 106). Without prediction, experience and examples teach nothing and without prediction management would not be possible since *"Management is prediction"* (Deming 1993, p. 104).

However, all prediction is probable only (Deming, 1994). And, as if quoting C.I. Lewis' argument that knowledge is probable only since *"there is no knowledge of external reality without the anticipation of future experience* (C.I. Lewis, 1929, p. 195), Deming continues: *"No matter how strong our degree of belief, we must always bear in mind that statistical evidence is never complete."* (Deming, 1986, p. 133; compare C.I. Lewis, 1934). It is also possible that he was inspired by Shewhart who came to the conclusion that *"...any model is always an incomplete though useful picture of the conceived physical thing..."* (Shewhart, 1939, p. 19). These citations are closely connected to the three components, which, according to Shewhart (1939), constitute knowledge. See the following figure.
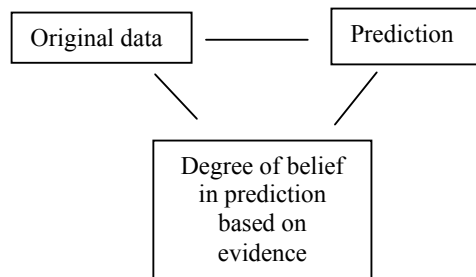

Figure 1: A schematical illustration of knowledge components (Shewhart, 1939, p. 86).

The interaction between the three components of knowledge seen in figure 1 also shows clear connections between Deming, C.I. Lewis and Shewhart. Since Deming's statement, that *"...rational prediction requires theory and builds knowledge through systematic revision and extension of theory based on comparison of prediction with observation."* (Deming, 1994, p. 105), is almost exactly the same as the one to be found in Shewharts': *"Knowledge begins in the original data and ends in the data predicted, these future data constituting the operationally verifiable meaning of the original data "* (Shewhart, 1939, p. 85). And in C.I. Lewis' words this means: *"...knowing begins and ends in experience, but it does not end in the experience in which it begun"* (C.I. Lewis, 1929, p. 134). Simply said; the observant reader may find that, the similarities shown in these examples of statements by Deming, C.I. Lewis, and Shewhart, lie in their claims of the importance of interpretation, reflection and prediction of experience.

Shewhart also connects his comment *"...knowledge begins and ends in experimental data..."* (Shewhart, 1939, p. 85) to his illustration (see fig.1) of the three components, which to his mind constitute knowledge. The dynamic dimension of the knowledge

process, seen in fig 1, is by Shewhart related to his Specification-Production-Inspection cycle (SPI-or Shewhart- cycle). He says: *"The three steps in fig.10* (which show the Shewhart- cycle) *correspond to the three steps in a dynamic scientific process of acquiring knowledge."* (Shewhart, 1939, p. 45).

It is interesting to notice that the Shewhart- cycle is the origin of Deming's Plan-Do-Study-Act cycle (PDSA- cycle). However Deming added the action part to the original SPI-cycle, which was published in the 1950's when he was invited to hold seminars in Japan. According to a private conversation between Brian Joiner and Deming, Deming exclaimed, when the Japanese talked about the Specification-, Production- and Inspection stages, that they must not forget action. "Action is the most important part", he said (according to a verbal account of by Brian Joiner). Thus, the Plan-Do-Study-Act(ion) cycle was born.

Already in the writings of C.I. Lewis the action part was emphasized, since he said that "*The ruling interest in knowledge is the practical interest of action*"(85). Indeed, C.I. Lewis developed this further in the statement: *"The significance of conception is for knowledge. The significance of knowledge is for possible action. And the significance of common conception is for community of action"* (C.I. Lewis, 1929, p. 90). C.I. Lewis' emphasis on a common conception of social processes, as a condition of community action, can also be found in Deming's work on the PDSA-cycle since the same is not only for individual learning, but also for the use of organisational learning.

It is therefore tempting to draw the conclusion that C.I. Lewis may have inspired both Shewhart and Deming and formed their understanding of the importance of the learning- or experience cycles (SPI-, PDSA-cycles) for organisations. Furthermore, it is from his work with the PDSA-cycle that Deming (1994) proceeded to develop his theory of 'Profound Knowledge'.

Closing Remarks

In order to give a full account of C.I. Lewis, Shewhart and Deming one must consider the temporal context, which to some extent they shared. It was a time of great discoveries, discoveries that were to change and overturn the deterministic understanding of the universe that had been paradigmatic at the beginning of the 20'th century. At the time when C.I. Lewis wrote "Mind and world order", Werner Heisenberg had just recently discovered the uncertainty principle and the world had learned of Albert Einstein's theory of relativity and his treatment of definition (N. Cunningham, 1994; C.I. Lewis, 1934). We must therefore bear in mind that all three were in all probability influenced by this paradigm shift. And indeed, the traces of these influences are easily seen in some of C.I. Lewis' writings (e.g. C.I. Lewis, 1934).

In future works it would be interesting to further explore C.I. Lewis' possible influence upon Shewhart and Deming as regards their claims of the importance of operational definitions. It may also be worthwhile expanding the scope of the philosophical analysis to see, for example, whether or to what extent the ideas of W. James may have influenced the works within the quality movement, as he is one of the first to claim that "theories must be found that work" (Encyclopaedia Britannica online, 2000).

Another interesting issue to explore is C.I. Lewis' discussion of our mind as a social product and of the impact common speech and understanding has on human interaction and cooperation (C.I. Lewis, 1929). In addition it would be interesting to examine further developments of C.I. Lewis' ideas in contemporary philosophy and to investigate if there are any new ideas that could inject new life in quality movement. As Deming said: *"...profound knowledge comes from the outside ..."* (Deming, 1993, p. 94).

As regards Shewhart, it would be interesting further to explore in what sense he was influenced by e.g. W. James, A. Whitehead, B. Russell and C.D. Broad, as he refers to them in "Economic Control" (1931). Shewhart even tells the reader, who wants to get a better understanding of his ideas, that:" *It may be of interest therefore to sketch briefly a course reading, which will be found helpful to the student in the application of scientific method to the further development of the theory of quality control. To do so necessarily takes us into the fields of psychology, philosophy and logic; into the field of psychology because we must get some sort of picture of the way the mind works; into the field of philosophy because we need some hypothesis as to the nature of reality and the functions of laws, theories and causal explanations; into the field of logic because it presents what we know about the formal methods available in the theory of deductions and induction."* (Shewhart, 1931, p. 482). Could it be that Shewhart already had explicitly formulated his own ideas before encountering the work of C.I. Lewis? If so maybe C.I. Lewis represented a proficient way of summarizing the various areas of psychology, philosophy and logic?

We have also noted an increasing interest in the works of C.I. Lewis not only in the field of symbolic logic but also in the field of philosophy of science, as witness Steve Fuller's book "Thomas Kuhn" (2000), which critiques Kuhns' influential book "The Structure of Scientific Revolutions" (1951): "*…C.I. Lewis anticipated many of Kuhn's most radical statements concerning the incommensurability of worldviews…"* (Fuller, 2000, p. 36).

Finally, while working with this article it has become increasingly clear that many of the profound insights of Shewhart and Deming regarding the quality movement have gone missing over the years. Thus, we have felt the need to rediscover their insights in an attempt to get a better understanding of the philosophy underlying important areas of the quality movement. In order to understand from where some of the ideas within the quality movements originate we have taken Sir William Naipauls advice and have in this article attempted to create, if not a profound analysis of Demings and Shewharts original ideas and contributions to the quality movement, at least an introductory exposition promoting a better understanding of the historical background of the movement. Our work also follows the of C.I. Lewis' advice that *"...everyone both can and must be his own philosopher."* (C.I. Lewis, 1929, p. 2). For what we have tried to do in this article is precisely to reflect upon our understanding of the quality movement in order to understand how both we ourselves and others perceive and work with the ideas of this movement.

Footnotes:

[1] Pragmatism- a philosophy based on the principle that the usefulness, workability and practicality of ideas, policies and proposals are the criteria of their merit (Encyclopaedia Britannica, 2000). It stresses the relation of theory to praxis and takes the continuity of experience and nature as revealed through the outcome of directed action as the starting point for reflection. Experience is the ongoing interaction of organism and environment. Furthermore, interests or values guide knowledge. Mayor contributors to Pragmatism are Pierce, James, Dewey and Mead (The Cambridge dictionary of philosophy, 1999).

[2] Sense-data here should not be seen as correlated with nervous processes, but rather the brute fact element in perception, illusion and dream (C.I. Lewis, 1929, p. 57).

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Article B

Common Concepts for Common Action -
Sense-making or Senseless Making in Organizations?

COMMON CONCEPTS FOR COMMON ACTION

- SENSE-MAKING OR SENSELESS MAKING IN ORGANISATIONS? -

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> *In oneself lies the whole world and if you know how to look and learn, then the door is there and the key is in your hand. Nobody on earth can give you either the key or the door to open except yourself.*
> -J. Krishnamurti-

1. Introduction

> *"If you really want someone to understand you, you need to be overly clear!!!... /.../ you need to reflect and ask control questions"*
> Eric said with great frustration.

In search of the roots of the quality movement, (see e.g. Mauléon & Bergman, 2002), we have come across the conceptualistic pragmatist C.I. Lewis and his influence on Shewhart, one of the most influential thinkers in the early quality movement (see e.g. Shewhart, 1931, 1939). It became obvious that C.I. Lewis' thoughts on knowledge theory were an important source of the central theme of continuous improvement and the use of the so-called PDSA cycle (Plan-Do-Study-Act) in the quality movement (Deming, 1986, 1993). It is no doubt that the concepts of the quality movement have been strongly influential in the discourse on management; see e.g. Cole & Scott (2000). However, the relations between the quality movement and its philosophical roots have weakened considerably. Therefore, it would be worthwhile to go back to some of the central ideas of C.I. Lewis to investigate whether there is still validity of his thoughts. Subsequently, it would be interesting to rejoin the links between the quality movement and its philosophical roots. And take a more general stance with respect to the thoughts in contemporary philosophy and its possible learning for the quality movement.

In this paper we shall dwell on one central theme in C.I. Lewis (1929), namely his arguments concerning 'common concepts for common action' and its applicability in today's organisations. In this article we present C.I. Lewis' thoughts and ideas concerning this statement and argue through our empirical research that this is still an issue to consider in today's organisations.

To find out, how the lack of reflection about common concepts may lead to misunderstandings in organisations, which can cause costly conflicts and disturbances, we conducted interviews with five managers from five different organisations. These interviewees all take part in a half-time PhD –program at Chalmers University of Technology, the Fenix Executive PhD School. What we mean by misunderstandings in this article is disturbances in communication and interaction between individuals. What the interviews show is that we often forget or do not realise that, when interacting with others, we have our personal previous experiences, which have created our "a priori" which influences the way we understand and interpret experience (see e.g. C.I. Lewis, 1929). As a consequence our personal mental models or a priori influence our behaviour (see e.g. C.I. Lewis, 1929).

In his book "Mind and the World Order - outline of a Theory of Knowledge" (1929), C.I. Lewis states that the only way to understand and ultimately develop our a priori, with its concepts, is through reflection. As personal reflection and deliberate action constitute some of his most important explanations of how we may change our behaviour. He says that *"… everyone both can and must be his own philosopher…"* (C.I. Lewis, 1929, p. 2). This is because it is within ourselves and in the interaction with others that we can investigate and reflect upon questions such as; 'What does this mean?', 'How can this be interpreted?', 'What is valid?'. And given that the final responsibility for ones life and actions rests on oneself, it is as single individuals that we too have the answers to these questions; it is not possible to ask for answers from someone else. Therefore, according to C.I. Lewis (1929), we both can and need to be our own philosophers since *"…in philosophy we investigate what we already know."* (C.I. Lewis, 1929, p.2).

This consciousness may be the most important feature in understanding oneself and the lack of it can become a problem when interacting with others. As Mike, one of the interviewees, comments as a consequence of different a priori in his organisation:

> *"…personally I never stop at being surprised over how little we understand in relation to how much we think we understand."*

However, even if it is neither possible nor desirable to create common concepts in all situations in the organisation, the important issue here is that there needs to be an increased awareness that organisational members interpret experience differently and therefore often put different meaning into what they think are the same concepts. The consequence is that we all respond and react differently.

2. Starting point

2.1 Concepts and reflection

The statement 'common concepts for common action' was made by C.I. Lewis in 1929. What did he mean by this and can it be described in today's modern organisations? We argue it can and that it does. We can also find definitions such as mental models, schemata, scripts and paradigms in contemporary management literature (see e.g. Hellgren & Löwstedt, 1997; 2001) which, like C.I. Lewis' a priori, all mean that individuals have their own unique way of interpreting experience and take action thereafter (Lewis, 1929; Hellgren & Löwstedt, 1997).

However this is not the issue here, the challenge organisations face is that we most of the time are not aware of the possibility that we put different meanings into concepts, that we define them differently (Naess, 1960). So what we need is an increased awareness and understanding of this phenomenon and one way to do this is to stimulate self-reflection (C.I. Lewis, 1929).

As a way of studying common concepts for common action in a social context we can take help from the theory of action science as this is the knowledge which human beings can implement in an action context (Argyris et al., 1985). As Hedberg (1981) says that theories of action *"...are for organisations what cognitive structures are for individuals."* (Hedberg, 1981 p. 7). And Weick (1999) argues that theories of action, just like cognitive maps interpret signals from experiences and tie the stimuli to action. Here we would like to compare action science and theories of action to C.I. Lewis' pragmatism and its demand for knowledge for action.

According to C.I. Lewis (1929), the a priori is created by our mind and our mind can also alter it, so we have a free choice in selecting our a priori. *"...the application of any particular concept to any given experience is hypothetical..."* (C.I. Lewis, 1929, preface, p. x). However, C.I. Lewis says, the only way we can choose another a priori or change it, is by reflection, as shown in the following statement: *"The a priori is knowable simply through the reflective and critical formulation of our own principles of classification and interpretation. "* (C.I. Lewis, 1929, p. 232). Through the choice of another a priori, C.I. Lewis claims that we may not only change our mode of interpreting experience but may also change our behaviour (ibid.).

In connection with behaviour C.I. Lewis (1929) not only talks about the individual's choice of a priori and its concepts, he also talks about our common concepts, important for community of action. *" The significance of common conception is for community of action..."* (C.I. Lewis, 1929, p. 90). And congruity of behaviour is the ultimate practical test of a common understanding of common concepts. Speech, on this understanding, is that element of behaviour, which is most significant for common meaning and understanding and most useful for securing human cooperation (ibid.). These ideas have influenced Deming's (1986) thoughts about 'Operational Definitions', as he says: *"...an operational definition puts communicable meaning into a concept..."* and *"…. is one that reasonable men can agree on."* (Deming, 1986, p. 276-277). Deming is another influential person within the quality movement and his ideas about community of action are easily related to the ideas of C.I. Lewis. However it was Shewhart, as mentioned earlier one of the most influential quality pioneers, who presented C.I. Lewis to Deming. Shewhart was influenced by C.I. Lewis' ideas about the 'a priori' in connection to prediction, which became one of his greatest contributions to the quality movement when he developed the original thoughts on continuous improvement. This is why Deming chose to call his improvement model i.e. the PDSA- cycle, 'the Shewhart-cycle'. This cycle has become the symbol of the 'continuous improvement' principle, which is nowadays one of the cornerstones within the quality movement.

Another philosopher, James Pierce (1868/1960) was perhaps the first to argue that scientific knowledge is legitimated by the practices of a community of inquirers. He noted that no individual can be the absolute judge of truth. No matter how strong one's inner certainty, belief might be based on prejudices that one has not realized

could be questioned (ibid.). Argyris et al. (1985) comments that the test of truth is rather that a community of investigators, beginning with different assumptions and free to criticize any aspect of each others work, converge on a set of beliefs. But the community can never be certain that their beliefs are true however they may approach truth through a self-corrective and self reflective process of rational criticism in a community of inquiry (ibid).

Interestingly, C.I. Lewis, who seems to have been forgotten in main stream philosophy, has become recognized again not only for his contributions to logic, which has become interesting in today's computer science, but also because of his ideas on the 'a priori' as discussed above. Steve Fuller (2001) has recognized C.I. Lewis' contributions as more insightful and prior to those of the author of one of the most read books on the theory of science, that of Thomas Kuhn (1962) "The Structure of Scientific Revolution".

In contemporary management literature we find in relation to C.I. Lewis' a priori, concepts such as mental models, schemata, scripts etc (see e.g. Tolman, 1948; Sims & Gioia, 1986; Hellgren & Löwstedt, 2001). In essence, all these suggest that we as individuals have our own unique way of interpreting experiences and consequently interpret and understand experience differently. As mentioned above, C.I. Lewis (1929) suggests that we understand the 'here and now' through critical reflection, and that this is an ongoing process. However he does not elaborate on the influence of the social context. But today we might refer to e.g. Sztompka (1991) and Argyris & Schön (1974).

2.2 Concepts and action

In the 1950's the area of semantics became the name of the day within philosophy and was used with various different meanings (von Wright, 1957/1993). But in todays philosophy semantics means the study of the relationship between verbal expressions on the one hand and their meaning, connotation or reference on the other hand (Naess, 1960). As suggested by Potter & Wetherell (1998) we want to study the connection between language and action through a social perspective.

Action and language seem to be interconnected. Von Wright (1971) states that intentional behaviour resembles the use of language and Argyris et al. (1985) says that the competence required to understand action may be compared to the ability to speak a language. With our understanding this is a way for us as individuals to identify ourselves in the eyes of others. Argyris et al. (1985) continues and say that, like sentences in a particular language, actions make sense in a particular community of practice and the competence required to understand action is acquired with membership in the actual community (ibid.). As what a person means to present in one community may be perceived in a totally different way in another community. Therefore misunderstandings and misconceptions may arise without the person ever knowing it unless he or she is aware of this possibility or the community in which he/she belongs have come to an agreement upon a couple of common concepts.

Naess (1960) argues that within a confounded group of individuals who interact on a daily basis we find that most of what they want to communicate usually is perceived the way they want it to be perceived. And this is shown by our peers behaviour and responses. This can be compared to what C.I. Lewis said in 1929: *"We can only grasp*

another's meanings by observing the relation of his meanings to one another and to his behaviour." (Lewis, 1929, p.91).

Naess (1960) continues and says that grave misunderstandings are rare between people in the confined group as their use of language along with other habits in large are well known and determined within the same group (ibid.). However in large projects it is most common that people come from different divisions which can be situated in different cities or even countries and therefore can cause many misunderstandings and conflicts on the way.

An example of misunderstandings is that language, which in some situations is relatively well defined, can in another situation be defined in a totally different way. The definition in a proposition is relative to its context (Naess, 1960; Pålshugen, 2001). An utterance may also be directed to a certain group of individuals. For instance we may want to write this article for a certain audience to whom we, the senders, want to adapt our formulations to you, our receivers.

Another reason for misunderstanding, is that we on a daily basis don't usually need to be extremely clear on how to use our language which makes it easy to forget that we sometimes need to be overly clear and careful in other more explicit situations. But in the same time we need support so that defining something doesn't take too much time (Naess, 1960).

2.3   Methodology

In a discussion at the Fenix Executive PhD School, we encountered an example about miscommunication in an organisation but which caused great costs and delays. It was quite obvious that the mistake could have been avoided if there just would have existed better routines for communication and reflection. So this was an opportunity for us to test our ideas about 'common concepts for common action' from C.I. Lewis (1929) perspective. However as this was such an interesting issue we wanted to take the opportunity to see if we could find other or similar problems encountered by others. Therefore 5 in depth interviews were conducted with people from the same PhD school.

The interviewees were at the time of the interviews PhD students who conducted their PhD studies while working in their organisations. They had however advanced differently in their studies, at the time of the interviews, but we found after the analysis of the material that this does not seem to have influenced the interviews. As we could have suspected that the PhD students who had come further along in their studies would have given more elaborate and theory influenced answers.

The interviewees, both male and female, were chosen randomly at the Fenix school with one exception, Eric, who was the one to give the first example in a workshop at Fenix. We have chosen to rename and hide their gender as a way of keeping their identity hidden. All the PhD students see themselves as action researchers of some kind as they are both practitioners and doctoral students. One aspect to consider is the relationship the interviewer has with the interviewed. She has taken a couple of doctoral courses with the interviewed and therefore knows them personally. We see this as something positive and suggest that it may have created a more personal atmosphere in the interview situation. Which may have helped to create an even

"truer" picture of their experiences. This does not however say that it may not be possible to get a true picture without this relationship, just that it might have been more easily accessible.

However this might be looked upon with some bias as suggested by e.g. Oppenheim (1966/1992) but we suggest that the positive outcomes from the interview outweighs potential biases as it is we, the authors or narrators, who are the ones that put this narrative together (see e.g. Alvesson & Sköldberg, 2000). We conducted open interviews as our approach was to make the interviewees speak as openly as possible of their personal experiences as the aim of the interviews was to create narratives or stories in the pursuit of collecting as colourful and true picture as possible of the phenomenon studied (see e.g. Czarniawska, 1998). What we mean here as open interviews are interviews which are seen to build knowledge. As Kvale (1997) reasons, within the area of post modern constructivism, we can se the interview as: knowledge as conversation, knowledge as a story, knowledge as a context and knowledge as relation.

We will present the empirical material in the form of a narrative where we first will present the original state of affairs, thereafter present the experience and finally show the consequences. This is by Czarniawska (1998) said to be the most basic form of a narrative. She furthermore states that the narrative form of knowing is close to the tradition of case studies. But as the cases study approach usually gives the researcher the possibility of choosing the data interpreted, the narrative aims to present the interviewees stories of their day to day life in the final presented text in order to give a more "telling" material to the reader and researcher (ibid.). As Frank, (1995) Nicholas & Gillet (1997), and Sköldberg (1994) mean that narrative studies give priority to the interviewed persons account of his/her own life and experiences.

The narrative approach does not seek to present generalized knowledge (see e.g. Habermas, 1968) but rather to present contextual narratives as human endeavours in order to make sense of complex and ambiguous realities (Habermas, 1968; Guignon, 1997). As we could never say that what we have found could be generalized in any way, that would be to contradict ourselves, we take support from this reasoning as we hope to give a picture of how things does look in various situations in order to try and create some kind of framework for supporting similar ideas in the future.

The interviews, which were conducted in Swedish and thereafter translated into English, took around 1-1.5 hours and gave around 130 pages of empirical material. Three researchers studied the material first independently and thereafter together in order to find the most fruitful combination of presenting the material. The analysis of the material generated a number of categories which are presented under empirical themes. Notice that the categories are developed and constructed on the basis of the interviews. Finally the interviewees were presented with the final manuscript of the article to give them the possibility to comment and give feedback on the results.

3 Empirical themes

The interviewees have different stories to tell considering concept issues in their organisations but they all have a common theme - communication in relation to disturbances in the work processes.

In this section we will present different scenarios and reflections from the five conducted interviews in order to give you some elaborate pictures of the work situation in the different organisations. The different categories under which the scenarios are presented are categories selected form the empirical material itself.

3.1 The empty concept

<u>Chris and the development of an intranet.</u>
First we have Chris and the development of an intranet and his experiences from this project. Chris works in a multinational company. He has had many different roles within the same company but in this case he was product manager of an intranet solution. Previously he had been working with systems development with e.g. finance and invoicing where he was used to define concepts utilising a certain conceptual modelling technique. He gives a simple but important example from his time as a systems developer: *address*. Within this role Chris and his workgroup had the possibility to discuss what address really meant. They could reflect over questions like: is it the home address, the work address? Or other address?

The incidence that Chris takes up in the interview is one that he experienced when working in another department and in another role. The problem, which aroused was when he, as product manager, was ordered to develop an intranet for an external customer. Chris says that in this new department-'product development for external customers' they didn't have the tradition of considering concepts as potential problem areas.

However, the product development team were given the task to develop an intranet, but they weren't given any guidelines or standards as to what features the intranet was to have. The following gives an example of the experienced frustration of Chris.

> *"...every individual had different 'fillings' for this concept, intranet,... you see....and that was something that became totally problematic (!!!) and it took at least.../.../....yes....I think we were at it ....well not for 8 months but very well 6 months (!)...and then very much was in defining the concept (intranet). /.../ people couldn't understand why we didn't manage to develop an intranet....everybody thought, 'well you've got lots of time to develop the intranet'....and we...'yes, but we don't know what it is!!'...'we don't know what it stands for, of course it's a concept, but we don't know what it means'....'we haven't filled it!!!'.../.../....for us it became much of connecting function and definition all the time...."*

> *"...the concept definition was a result of the product development process, it wasn't an input!!....no, it was an output /.../ intranet was an input which we were given, ...we thought it was all done....but it....but instead the case was....it was an output, you see?!?!...."*

Chris talks about the ambiguity in the concept intranet as he says with great frustration and determination:

"...I think to be aware that there is a variety of understandings...of definitions ...that was what we had with intranet......that was problematic for us....it wasn't uncertainty but ambiguity!!!! ...we had so bloody many definitions of the same concept!.....and had we understood that beforehand and been able to describe and explain what kind of problem we had when we were to present this to our management...then rather we could have gotten 'ok'...to actively!! speed up this process...but now instead we were yelled at!....and it felt like we got detention in a way!......"

"...it seemed that in that! particular project it wasn't possible to just get one ....it wasn't possible to get the perfect consensus...so somewhere they had to choose.../.../... but the question is when?...when should you begin to choose?....in my case it came to 'now it just doesn't work anymore'...'now I've taken too much time , taken too much costs, now we have!!! to choose something!!' ....but then we might have done it too late?...maybe we bummed around too much??....but I don't think we ever had the ideal situation! ...where we had the definition from one day to the next...that didn't exist!...so it's somewhere in between....I don't know which but the ambiguity was created in the beginning...we needed to decrease it a bit but we surely couldn't' have decreased it fully!...at least not within that frame of costs and the time we had then..."

In the above example the problem wasn't common concepts, no they couldn't agree on what to fill the concept with. Which definition was the 'correct' one? And when were they to choose the definition? These are questions not easily answered. We have found that fear sometimes becomes an obstacle when dealing with something the interviewees call "empty concepts" As these are concepts which do not have a 'content' when first encountering them. As was the case in Chris' example.

Mike and his ideas about common concepts

Mike has a different story to tell. Mike works in a multi international company where he has had many different roles within the same company. He suggests that empty concepts may sometimes act as a driving force for change. He gives a quick example of the concept "the worlds smallest base station". This concept is something new and no one knows what is meant by it, but Mike says that they create the content of it as they go along. They create an understanding of it on the way, they don't begin to decide what it means and stands for. He goes on and gives another example with the invention of the concept 'module time'. He says:

"...in product development it always works this way:... we decide to make a new product with certain crude characteristics, certain pictures etc......but it's a long! way to go and everyone accepts this...there isn't anyone who says 'well yes... but I need to know all the details before we begin to develop'....no one says that....because that's part of the development work process....however when dealing with organisational change and other things, I think we sometimes have more difficulties....and one solution to that is to invent new concepts !!!...and in our case when

we did this organisational change thing… we created an idea!...a concept which we thought we should achieve, a framework….and we named it to a new word….which we…we called -module time- ….and this was something new…with the purpose that when we had done this then everyone should know what -module time- was….from their perspectives then….but we didn't know this beforehand….as it was a new word…we couldn't ask anyone else…no other company had this….it was a unique XX (company name) thing….-module time-…."

Mike goes on by explaining what the reason for this unique concept was but backtracks a bit in order to make the interviewer understand. He says:

"...the name is the highest level…if you should talk about these abstract levels then….I mean that the absolute highest level is the name of the phenomenon you are talking about!……but what I thought was the point then was… that when you take a new!!! name, you don't try to name it (with an existing name)….an alternative way would be to study the content of this concept -module time- and thereafter go out into the world and ask…'what does this resemble the most?'…and then …/…/…just take a concept!…..if we would have done that, in the beginning… we would at the same time have begun to reduce existing possibilities as people would have had a preconception from the beginning!!!…..and then as soon as you would take one step further and suggest something…. then someone would say 'well…that's not this concept!!..'…'ok, if not so why ?'….'well that concepts exists at so and so…and they do it this way!!…so if we do it like this instead, then it is not that concept and I don't understand anything!!'…and then the process stops!!…."

In Mikes case the "*empty concept*" gave them the possibility in the project to start up with something totally new and free from preconceptions in order to get new ideas instead of being stuck with old ones.

<u>Peter and his way of visualizing the process concept</u>
Peter works in a multi international company where he has been working as a project manager for several years. Today he works a lot with trainee groups and learning processes.

Peter identified something interesting when studying a project team in his company. The project he talks about was a project which previously had had a bad reputation where the project leader had been changed a couple of times and people just quit, but suddenly everything worked well in the project and Peter and some of his colleagues got interested in finding out the reason for the change. They wanted to know why people now were so content with working in the project. However no one could give a direct answer to the question. But in a meeting, with the people involved in the project, Peter got the idea to try and visualize the projects process flow by drawing it on a blackboard.

"...so I began to draw on the wall, on the blackboard a flow which I interpreted they had....whatever problem that came up...they drew it...and then they took care of the problem right away...even if it was a personal problem or if it was a technical problem.../.../...they brought it up in the group...unless it was too sensitive.../.../...then they discussed it...'how shall we solve this?'...in some way the solution was documented in some kind of document.../.../....so that they got some kind of overview over it...so they could show it to others and say...'we've solved this!'...and then they went back to the question again and asked...'have we really solved this problem?'... they did this collectively and quite direct...and it didn't end there...they also went back to the solution part with the document and over and over again....to see if it really had been solved!...'is it really changed ...or has the problem arisen again?'..."

As a means to use this documentation they gave the problems a personal name.

"...when they began the project they had some so called –ulcer problems- which they called them in the project....it was things that happened in the project...in which one complained about this and that.....they thought this and that was no good.....'this is not good'...etc....'ok, but then you write an ulcer document!' ...they said!!...that's quite unconventional !!!....in a reality such as the one we live in today...so they wrote a list as an ulcer document...'all these things are ulcers!!!'...'we are tired of this so and so!....so it was a piece of paper which they could show to others...."

This is another example of how you can use a totally new concept to fill the need for something new. In this case it was also a way of getting the people involved in the project committed to solving the problems, as everyone was involved in writing this *"ulcer document"!*

So the empty concept is not always looked upon as a threat, as in Chris' case, but can also be seen as a solution to something new as is the case with Mikes and Peters examples above. Where Mike argues that one way of avoiding preconceptions in a development process could be to invent new concepts and to fill them as the process goes along. And in Peters example they use a new concept partly as a way of commitment to problem solving in a project.

3.2 Open and closed concepts

Mike and module time, continued

Mike talks about how the concept may change over time in the product development process and he says as a continuation of the example with the new concept 'module time':

"...well if you allow development....if you don't... well then there won't be any development.....then you will only have copy-paste (Mike talks in regard to just taking a concept from another organisation and using it in their own)....but in this case we

wanted organisational development!!!...and then I think, you need to work with open concepts!.....and to make the process work well you need to modify the attitude towards consensus a bit!....to say that there is not one!!! interpretation of this.....but there may exist many different perspectives and that there is a value in that these perspectives are allowed to be different!!!....and to meet in the discussion until the final solution... in which we take the decision to either chose or discard that and that.....”

“...but what is problematic is here that you are not open enough, perceptive enough....for someone else's perspective...that can cause problems.....I experience that when it comes to the vertical (in the organisation) part of collectiveness in view...I feel that .../.../...there is an exaggerated belief in this!.../.../... consensus is 'the name of the game'...that... we saw it in this case... it becomes an obstacle...for understanding and the possibility to choose the right thing!”.

What we find here is that Mike talks about a balance between consensus and open and closed concepts. At some point there needs to be a closure in regards of choosing a concept it wouldn't be efficient not to mention too costly!

This could be said to be the case in Chris experience with the development of the intranet as he recalls:

“...among all these perspectives (of the intranet)....there became a problem in choosing....as it wasn't possible to discard this or that one on the basis of them being wrong....no it was an active choice!!.../.../...but /.../...I think that it anyway took too long!....it mustn't take too much time, you mustn't bum around too much!!...I think I was very consensus seeking as well!!...”

Chris reflects that one of the problems was that he might have been too consensus seeking which in his case took too much time in relation to the effectiveness of the process. He says:

“....the releasing thing with intranet was to know and to choose!...and then lock !!! (the concept!!!)...'here!!... paow!!! !..this is an intranet now!!!'...and everything else are varieties....which we must describe and relate to!!!..”

Chris continues his line of ideas and sums up:

“...well what I thought about earlier was....'ok, now this ambiguity exists which you want to decrease in the beginning to a certain degree....then you lock (the concept) in order to be able to continue....then you can ask yourself...'is there any possibility when you thereafter want to renew this concept?!?'...if you want to open up the concept intranet again!!!....in that case you could have a process document...'well, open and closed!'...”

The discussion concerning *"open and closed concepts"* is around when to choose to close them or lock them as Chris says, but then also see to the possibility to being able to open the concept again if there needs to be alterations or changes of the concept.. Chris asks for a document to handle this process. Mikes argument about open and closed concepts concern the fact that we must keep the concepts open a certain amount of time otherwise organisations will only work with copy/paste concepts and this does not stimulate renewal or creativity within organisations

3.3 Concepts and reflection

Eric and the concept 'milestones'
Eric has experience as a project leader in various projects in a multinational organisation. He has been working with a couple of medium sized projects within this company. Medium sized in relation to what this company usually works with. In the following example he talks about the problem of not seeing potential obstacles in the day-to-day life in the organisation. As these are often too close for the employees to comprehend unless they reflect. As he with great frustration and resignation says in the interview:

> *"...what happened in this case was that they, in the project that lies a bit outside (the main project)...they develop .....xxxx...and think that they work from their organisational perspective!!!....and they didn't like our project model...and he sent me a quite snappy mail where he told me that he really wasn't going to follow our milestones...no they had their own milestones to follow! (said very sarcastically)...and the first reaction was...'what a bloody as-....!!!...you work in our project!!! And you do as you're told!!!, it's as simple as that!!'...and it's not even us who have decided this ...it's another group who are main responsible for this project.../.../...and they have a model which we also follow then...and then others should follow it as well!!!...we work in the same project and then we must have the same model...it doesn't work otherwise...but they didn't think so!!...but then I calmed down..."Eric begins instead to explain what he thought had happened in the project.*

> *"...but what he had done was to confuse these milestones then...when we said that we should have passed those milestones in order to being able to pass MS3 in the main project....he said..' yes but those don't apply to us!'...the funny thing was that this was a new guy who had taken over from another who had quit or something...and the previous guy had been active in choosing these exact milestones!!!...and the funny thing was that the new guy said that 'we don't have any of those!'...but the funny thing was that we (!) didn't have any of those either!!! It was their!! nomenclature!!!...which his predecessor had developed!!!"*

Here Eric begins to give explanations to why these incidences occur in the organisation and how important it is to really understand differences within the same organisation.

"...the difficult thing is that you don't think !!! you have cultural differences if you sit close to each other....or are sister divisions or something....but that is what is dangerous you see....there are! differences everywhere!!...and where they aren't obvious...they often become a trap....(long silence...)...I mean if we are to work with Japanese...well then we realize that that is another problem situation....then! we have to take a course...but if we are to work with another city....with Swedes....the same company....it is obvious that it is the same language... of course it is the same culture (said sarcastically).....NO WAY!!...we have totally different...nuances so to say...which can cause just as big problems or even bigger problems..."

As "....different companies within the same group have different routines, have different development models etc...and that is...we keep on at the same terms but mean different things!...".

He talk about reflection and how it could help communication processes in the organisation but says with resignation:

"...but most often you are in a too much of a hurry!...to give feedback and ask...'was it like this you meant?'....you don't have time for that instead it's like...'yeah yeah I've got it!'...'well you know...you know how it is...'...'no'...'well... sure you know how it is...'...'no...I don't know how it is...explain it to me!...'...'yeah but...yeah...but it's like...you know!'....(Eric again)...'No!!!'....I get so! tired!!!....they don't even have the energy to think for themselves...it's just...'yeah you know!!!'...a 'yeah yeah' jargon!!!...no bastard had any idea about anything!!!...but they talked commonly anyway (said with sarcasm!)....it probably creates lots of misunderstanding and stuff!!....

To say the least Eric is very frustrated over the fact that people don't even bother to take the time to reflect in order to say comprehensive things to their fellow co-workers. This is as Eric says a potential problem area.

Chris on the other hand asks for more support from management in regards of them having a greater understanding of their problems with the development of an intranet as he says:

Management needs to "...be aware of the fact that there are multiple perceptions ...of concepts /.../ and it was problematic for us...it wasn't uncertainty but ambiguity.../.../...if we rather would have gotten active support......had the opportunity to reflect... to speed up the process , but now instead we were yelled at!"

Mike and the need of reflection
Mike gives an abstract example in which he highlights the concept 'communication' and its different meanings in the project management team and the sub teams within the same organisation. He begins by saying very firmly:

"…project management and sub teams …/…/… basically have different tasks….that is why they cannot have the same common ….project management has one! result and their process to achieve this result !!....but the sub team has another result and most probably another process to reach this!!....and that's were the difference occurs!!!...we've found that it is very easy to create a situation where you agree on an abstract level… about certain concepts…..but when you look at the local perspective…in this case vertical then….and in the hierarchy….then these common concepts meant very!! different things!……and our interpretation of this was that it was totally different situations…."

"…to take a tangible example….in a larger change process that we conducted…/…/…one of the more overall change ideas or concepts was communication…..and there existed a great consensus both horizontally and vertically in the organisation…in the dialogue!…that communication was important !!...so there! we were in agreement … in the concrete case then ….the communication perspective within product development meant …here!!....for management, that we should gather very many people together for an intense dialogue!!!!...and that was their!… perspective of this….but in one of the groups….one of the cross functional development teams……their interpretation of this was….in their! situation….'they needed a fax!!'…they needed a fax to be able to handle communication with the supplier which couldn't be on site…..that was their analysis of improving communication…."

"…and when their perception met managements perception….well then this became a conflict…in a way that management meant that 'this is not about faxes'!....it's about something bigger!.... 'enhanced communication between people and you can't reduce this big! purpose to something as banal as a fax!!'….'then you haven't understood the problem!!'…./…/…and the other group experienced of course the exact opposite!…/…/…they had understood! the message….they had worked within their context and found a solution and then they went to their management and said 'we want more faxes'…"

" …and then management has another opinion which then becomes a conflict!….and in this case then we mean that… if!! you are overly consensus driven… then that would mean… even vertically then in this case,… that everyone would come to the same conclusion!...even when you break down this abstract…'communication'…down to its different parts …and we mean that this is an impossible standpoint!!! ….not having an alternative standpoint is like…..if you're in the same company… I mean we all work with product development, then there exists… on the abstract level some!…concepts which we can relate to and agree on together that these concern us all!!!...but every!!! local level needs to thereafter do their own! interpretation of the concept

in order to understand it!.../.../...so it's important that these different perspectives are allowed to meet ...without being criticised...as right or wrong!.../.../....there needs to be an acceptance that different contexts have different perspectives on concepts...an acceptance for that!!....and secondly.../.../... its important to talk about them!!...you need! to talk about them in order to enhance a common understanding for what it is!!!!..."

In this case Mike argues how different levels in the organisation have differences in goals, which in turn create different understandings of the same concepts, and how it is necessary to be aware that you might want to reach the same goal but you are on different levels as to how to reach the goal. He continues and means that there is no 'correct' perspective only that there needs to be an awareness of different perspectives.

3.4 Concepts and action

Chris and intranet, continued
Chris talks clearly about concepts and action and gives a solution for speeding up the process with the development of the intranet. He says:

".....somewhere we had to choose ....and that is an interesting question...'yes how?'...and first of all 'when do you recognize ambiguity??...secondly...when do you recognize that now there isn't any idea to discuss anymore...now we need to make a practical choice?!?!....how do you test this??...in our case you could say that it seemed like the active choice was facilitated by the fact that we discussed something concrete, that we could begin to do !!! something...that we got something tangible...something to refer to.....so I think that when we got something and could say 'this is an intranet and that isn't'....well get something to refer to..../.../...And then to try all the time....to try these definitions not only in verbal terms but also in physical representations......so that we could act in some way!!...."

"....I think action (!!) is very important!...to...to being able to understand...we don't just understand through verbal...and the product development process has been very...well you want control!!!...- you write a plan first!!!...and then all shall commit to it...and all changes when you have written the plan are considered as...faulty steps from it..."

"...if there would have existed a process for just something like.....well so that we could have reduced this chaos!!...which we felt...so that I could act in the beginning.../.../....in this case it would have meant that management would have had to push in more money early on in the project....they would have had to put aside money for us to sit and define then...through action....as, as soon as you begin to do ! something...a lot of things begin to happen!!..."

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Chris connects the definition of the concept intranet to action and asks for a well-defined process for when to choose a definition so that they may begin to act as soon as possible as he says that action is a way of defining the concept.

Eric and miscommunication in a product development process
First Eric gives a fictive example in order to explain clearly to the interviewer what he means.

> *"...ok, if I am not supposed to produce the whole ear of this coffee cup (he points at a coffee cup)...but only half of it and a tenth of this cup and a fifth of this plate....to make this work with everyone involved in developing this coffee cup we need to have some common tools....we need to speak the same language....and we sort of must agree.....if I was only to produce this ear...then it would have been very easy...I could have done it any way I wanted...the main thing to consider was that it should fit the cup!..."*

and then he continues with a concrete example where he explains the complexity and potential problems with action too soon in product development:

> *"...we hadn't clearly !!!! written that it should be able to manage a certain temperature and a certain amount of time of use....it was something we had taken for granted...and that was not something they had done!...they had read the demand specification as it was written... and it is also such a thing...in the worst case we have to realise the fact that we cannot meet customer demands!!... we need to redesign it....and then we have a 3 month delay!...in the best case we can tell our customer that 'this will probably not become such a great problem so you can live with it in the beginning and then you can get the update later on..."*

> *"...well, that doesn't look good ...when you cannot meet your commitments... but on the other hand if we say 'we have a problem here!'....this problem isn't' a problem in the normal case but in the extreme case it may become a problem....if you want your things on time, then we have to deliver the product with this problem....then of course we will come with an update!! About three months later...and we will pay for the change of all the things and all that needs to be done!...but that is a COST!!...it's expensive to deliver defective things!...and after delivery!....so it's a 10 factor because it's not only material, it's the workload connected to it...it has to be shipped...installed...and we need to get out with assembly workers and...THAT costs money...!!"*

Chris asks for a way of getting into action as soon a possible as he sees action as part of defining a concept. Eric however, gives an example when action too soon led to great costs and efficiency loss. Thus, there is a need for balance between action and reflection.

3.5 Concepts and identity

Tom and so called insiders and outsiders in his organisation
Tom works in a national Swedish organisation where they talk about their customers as members, which in this type of organisation is a big difference. Tom has been working there for a couple of years and is now connected to the information technology department.

Tom begins his reflection by saying that he had asked around a bit in his organisation about this issue with concepts, and people gave feedback about language and its impact in the organisation.

> *"...well one track is about this ...how organisations create an identity through a certain chosen language.... which I can see very clearly here...another track is about how the organisation can run into problems when a language comes in from a different culture.../.../...and those problems are I suppose....could be both related to some kind of understanding of concepts....but it could also be that you just don't like all concepts!!!...well,...I feel that I have been close to finding a couple of situations where I have a couple of examples of how language can have double meanings which can put us in a predicament...I've been close to find situations where we....where we've ended up a little strangely... quite clearly...and...lost in....well....efficiency because we haven't known what the different things stand for!! ..."*

> *"...well...the most clear thing with language otherwise is that you can separate between those who are so called 'insiders' and those who are 'outsiders'...the short term dictionary or short terms are used extremely much here....I argue that we won't ever have to classify any document as long as we hide the short term dictionary!!...and...there exists a couple of such concepts which....well... I don't know if they create a great deal of nuisances but they could be influencing efficiency!....as people think they are quite incomprehensive....furthermore I think that they (the concepts) influence our relationship with our members and the public....by using our own internal language code..."*

> *"...I mean not the least in our external communication can these concepts become nuisances and become questionable....I get a picture that there are those who think, by using our internal language code ... that it is quite a good way to show that you are a bit trendy ...and that you know how use these short terms... and show off a bit!!...it's a bit like...' I am really one /.../ who understands the internal code!'...and at the same time the fact is that you disturb communication by using it!!!!...."*

Eric gives an example from one of the projects he worked with. In this project they worked consciously with values within the project as a way of committing people to the project and to each other.

"...in the Ax project we realised early on in the project that we had different cultures and that we spoke different languages...so we worked a lot with this in the project management...so that we would have the same values so to speak!....it was all the project leaders and then we took it with us home and checked it with our support groups who came with some more suggestions of what they thought was important and was good....and we did this a couple of cycles!...and then we wrote down a couple of suggestions which we thought were important then.../.../...and it wasn't only that we wrote these seven eight values as common values but....these came up at every !... project meeting and in all information letters or in the project magazine which came once a week....and there you were always reminded of these things...which we all had agreed on!!.../.../...so it became one common culture in the project..."

Peter gives another example of concepts and identity where talks about the conscious choice of working with and using words which the recipient of your message recognises himself or herself with.

"...I think a lot about words...especially when I'm preparing myself...../.../...so I kind of write what shall do and then ...I think ...and there ! there is a lot of strength in thinking....of what words I use....to write this message....or when I write an e-mail...it's a lot about selling things to management!...and this is important then!!!....then words are extremely important...and there I actually can manipulate! ...sometimes!!!...and use words which I know will bear fruit!...so it's kind of....I always go to my boss beforehand and talk about this.....and then listen to what he/she says...and then use those words when I write then...and I do this quite unconsciously when thinking about it....and then they recognise themselves and then they think...'oh this is nice...' (Peter smiles here...)...and that's how you do it.......and the same goes for when you talk to people.../.../...so it's conscious choices!!..."

We have found, under *"concepts and identity",* that concepts can give a feeling of belonging in a group as in Tom's case or can help create common values in a project as in Eric's case or give a feeling of recognition as in Peters case. But all cases aim to give the individual the feeling of some kind of identity and belonging.

3.6 Empirical conclusions

What the empirical material shows is how people use concepts in different ways and how this is a potential source of conflict and misunderstanding. One interesting finding from the interviews is that the interviewees, at first are quite sure that the employees in their organisation, understand things mostly in the same way. However, as the interview progresses and turns into a personal, reflection process, they realise and could all give a couple of common day examples of misunderstandings in their organisations due to a difference in understanding of the meaning of certain concepts. The interviewees also gradually realised that many conflicts in their organisations could be explained by the choice and use of various concepts. What became clear from the empirical material is that we as individuals understand things differently, we

do not always have common concepts, which is causing misunderstandings leading to decisions and actions, which may therefore lead to costly events for our organisations.

In Chris' example with intranet the problem was that, they couldn't agree on, how to define intranet and when to choose a definition. And this could be a problem when dealing with "*empty concepts*". However both Mike and Peter have other stories to tell considering empty concepts where they saw these concepts as a solution to something new. Where Mike argues that one way of avoiding preconceptions in a development process could be to invent new concepts and to fill them as the process goes along. And in Peters example they used a new concept partly as a way of commitment to problem-solving in a project.

What we find in the interviews considering "*open and closed concepts*" is that Mike talks about a balance between consensus and open and closed concepts. At some point there needs to be a closure in regards of choosing a concept or the efficiency loss and costs will be too great. Mike continues the elaboration upon closed concepts and we find that maybe what he wants is a development of the concept over time, i.e. to keep the concept open until the project leader chooses to close the concept. So the concept must first be open to all so that they could agree in large what to fill it with but at some point they need to close the concepts and decide that this is what they are going to work with. Chris' discussion concerning "open and closed concepts" is around when to choose to lock them, but also to consider the possibility of opening the concept again, if there is a need of alterations or changes of the concept. Chris asks for a document to handle this process.

When considering "*concepts and reflection*" we saw that Eric was very frustrated over the fact that people didn't even bother to take the time to reflect in order to say comprehensive things to their fellow co-workers. And Mike argues how differences in goals create different understandings of the same concepts and how it is necessary to be aware that you might want to reach the same goal but you are on different levels as to how to reach the goal. He continues and mean that there is no correct perspective only that there needs to be an awareness of different perspectives which is most easily done if there exists some kind of reflection process.

Chris connects the definition of the concept intranet to action and asks for a well-defined process for when to choose a definition so that they may begin to act as soon as possible as he says that action is a way of defining the concept. "*Concepts and action*"- in Chris' case he asks for a way of getting into action as soon a possible as he sees action as part of defining a concept. In Eric's case however he gives an example when action too soon led to great costs and efficiency loss. So what we could see here is a need for balance between action and reflection.

We have found, under "*concepts and identity",* that concepts can give a feeling of belonging in a group as in Tom's case or can help create common values in a project as in Eric's case or give a feeling of recognition as in Peters case. But all cases aim to give the individual the feeling of some kind of identity and belonging.

4   Discussion

In the previous section we drew some conclusions from our empirical material. In this section, we will further elaborate on these empirical findings and relate them to literature.

4.1   Concepts…or concepts?

Let us take a look at the concept 'concept' first of all. It is the same word all the time. However, is it the same connotation for all the interviewees and even the same for a specific interviewee all the times they use the concept 'concept' ? Of course, that is crucial if we want to investigate the consequences reported by the interviewees when obviously there have been misunderstandings – different individuals have interpreted the concept differently.

In translating from one language to another there are always risks for misinterpretations and sliding of concepts. That is not least a difficult issue when the concept studied is 'concept'. The Swedish word for concept is 'begrepp'. Interestingly, however, when we talk about a concept in product development, i.e. almost like a solution to a design problem, very often the word 'koncept' is used.

Some of the interviewees work intensely in the product development process. Here a concept may be interpreted as something like a 'product idea'; this seems to be the case when Chris talks about a certain business: an intranet solution. When as a product manager Chris was given the task to lead the development of a an intranet solution for clients on a market there were no definitions of what an 'intranet' was. The confusion that arose and the lack of procedures in the product development process, is the main theme of Chris. Even Mike seems to have the same conception. He wants the concept to be open during a long time of the development process.

Tom, however, seems to be concerned with concepts of a different kind; i.e. words used in the organisational life. Where misunderstandings arise due to the different value people put into words of different kind e.g. 'customer' or 'member'. Even the creation of local meanings or short terms of words, seems like deliberate actions in order to exclude others from correct interpretations, which can be seen as indications of creating group belonging. Eric is also preoccupied with concepts of organisational life; i.e. the co-ordination of the meaning given to certain concepts like *"milestones*". This is also the case for Peter who consciously reflects over the use of concepts and communication of values through concepts in the organisation.

4.2 Product development concepts

Some of the interviewees obviously place their concept discussion in a product development environment e.g. Chris, Mike and Eric. Of course, that should affect the way they discuss concepts. However, when Chris talks about 'intranet' he obviously use it as a kind of solution to a design problem, even though he does not know which. However, that is not what is explicitly seen from the interviews. Rather, they don't really relate to the theoretical statements and processes as usually described in mainstream product development literature. One such process is exemplified by 'the funnel' as described by many authors, see e.g. Clark & Wheelright (1993) and Khurana & Rosenthal (1998). This means that there should be a large number of

potential product ideas in the beginning of the process, which later should be reduced to a smaller number. Clausing (1994) describes a formal procedure, the so-called 'Pugh concept selection tool', for the selection of concepts / solutions to be further developed. In a recent PhD dissertation (Andersson, 2002) the funnel behaviour was clearly identified in an industry, developing modern high class-glass. In a way, the funnel idea is exactly what Chris would have needed in his quest for the intranet and which Mike argued for in his discussion of empty concepts.

Eric discussed the milestone definition and the problems that arose when a common definition was missing. Milestone models or similar models are frequent in the product development literature. In linear description of development processes, see e.g. Olson (1976), Galbraith (1982), Ulrich and Eppinger (1995), and Cooper (1996), these stages are well defined and occur in a sequence. This creates a rhythm in the product development process where many activities have to take place in parallel. However, Wolfe (1994) observed that the more complex the product the more iterations and irregularities were observed in the product development process. Even though Eric's problem seems to be of another kind, the observation by Wolfe (1994) might be a real problem especially if development takes place in product development processes, which are globally distributed.

4.3 On the use of theory

It is interesting to note that sometimes there is little use of theories which, in fact, are well known to the interviewees from their PhD education, especially, as discussed in the section above, where we have found that product development models are not clearly used in the interview situation. However, during the course of the interview e.g. Chris came up with solutions close to what is prescribed by the normative literature on product development and Mike starts out with the same assumptions without really referring to some theory to support his point of view. Don't these common concepts, from the PhD studies, support their reflection processes? And vice versa? Might it be like Pålshaugen (2001) suggests, that there is a separation between the written word and the spoken word 'the living word' and that practitioners, in this case the interviewees, over and over again find themselves in a situation where they in practice perform a 'theoretical' kind of discourse even though their theoretical understanding of themselves as practitioners makes them blind to see this point (ibid.)?

4.4 Arenas for reflection

One major finding from this study concerns the importance of creating arenas where organizational members can explore their understanding of the concepts they themselves are using as well as the general concepts used in their organizations. This exploration can take place in several ways, both as individual self-reflection, as a meeting between two individuals or as a larger group endeavor. It can consist both in arranged or formalized meetings for exploration or as a design of meeting places for informal encounters, e.g. around a coffee machine (see e.g. Allen 1977).

In this study the interviewing process itself functioned as a guided self-reflection for the interviewees. During the dialogue with the interviewer, the interviewees engage in a process of self-reflection leading them to develop new or improved knowledge based on experiences and combined with knowledge they already have. The intention

is, with the help of a dialogue, to try to make the interviewees take the more concrete, practical consequences of their own knowledge. In other words we try to help them make their own discourse more practically relevant (see e.g. Pålshaugen, 2001). Ollila (2000) describes a similar process, where the individual manager at first has a guide who asks relevant questions about a certain issue, but later on in the process, the individual him-/herself makes time and starts reflecting in action.

Focusing on other system levels, Senge (1994) provides a road map on how to develop skills and processes for group reflection and clarification of individual mental models in order to create a shared mental model within an organization. Also the use of the cycle of experience on group level provides a systematic approach to reflect and to become aware of differences in opinion and understanding among group members (Scheinberg and Alänge 2000).

5   Concluding Remarks

In our study of the interviews we can identify two types of concepts: concepts which are related to the solution of some kind of problem or puzzle, which need to be solved, and concepts relating to the organisational life and how organising of the work processes are performed, i.e. the work often associated with problem solving. How it is important with unity for the one type of concept while it is crucial with variation in the other type of concept.

From our perspective and empirical results we find that, as often is the case, there needs to be a balance between chaos and stability. While too much stability can create a stifling and mechanical organisation with passive employees (Burns & Stalker, 1961; Moxnes, 1984; Rohlin et al., 1995), too much chaos create anxiety, insecurity and frustration, which lead to employees being afraid of taking risky decisions and refrain from action (Skard, 1977; Quinn et al., 1996; Jacobsen & Thorsvik, 1998). Standardising routines may in some cases cause creativity suffocation. Thus, we need to study the balance between chaos and stability and one way of doing this is by studying common concepts in organisations. And what we really talk about is sense making but not to the extent that it becomes senseless making! So, we want to highlight that it is not desirable to have either an over socialised view upon these matters just as having an under socialised view isn't ultimate either (Hellgren & Löwstedt, 2001). It is important to have definitive common concepts to work with, but also, to create an understanding that we may have different understandings of the concepts we work with and, that there needs to be an acceptance for different perspectives on these concepts.

Understanding the complex life in organisations *"... demands multiple sources of enlightenment and can be adequately explained only by a plurality of theories or ultimately by a multidimensional theory"* (Sztompka, 1991, p. 173). Even though Sztompka used it in a context of a social revolution we find it adequate to also place this in this context.

6 Epilogue

There are times in life when the question of knowing "*…if one can think differently than one thinks and perceive differently than one sees*" (Foucault, 1992, p. 8-9), is absolutely necessary if one is to go on looking and reflecting at all. In what does not philosophical theorizing or reflection consist, if not in the pursuit to think differently, instead of legitimating what is already known (ibid.). This could be said to be true for organisational survival as well.

In the quality movement continuous improvement is emphasized. However, to deeply understand this principle we need to have an acceptance for variation in concept perspectives. Also, arenas are needed, where people can meet in order to reflect together, enhancing their common understanding by creating common concepts for organisational life. But these arenas and this openness for variation is also necessary for sense making in order to avoid senseless making!

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Article C

A Pragmatist Framework for Safety Improvement in Health-Care

A Pragmatist Framework for Safety Improvement in Health-Care

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Abstract.

The literature around the concept of safety culture is broad. While the broadness of the concept is interesting from an academic perspective, it may confuse practitioners trying to improve safety in their organizations. As a result, practitioners may be tempted by explanations that seem straightforward and easy to put to use. Seeing the problem of 'safety culture' as something easy, however, might be detrimental to organizational progress. In this paper we analyze a portion of the literature around the concept of safety culture, and propose a view based on conceptual pragmatist philosophy that manages to combine different strands of current research. We rely in part on a case from a teaching hospital to illustrate the ideas.

1. INTRODUCTION

Interest in safety improvement in health-care is growing. A large variety of groups and individuals are working on a daily basis on wide-ranging efforts to make health-care delivery "safer" (see e.g. Dean, Schachter, Vincent, & Barber, 2002; Donchin et al., 2003; Manser & Wehner, 2002; Singer et al., 2003). In order for such improvements to really work, it may be necessary to clearly define the bases on which safety research can serve ongoing improvement initiatives. In fact, a slightly more theoretical debate around the goals of safety research could help focus the discussion, and capitalize on the different possibilities found in the literature to improve "safety cultures".

Health-Care staff have been taught what Fishman (1999) calls a "modern positivist" view of science for which science aims at defining general theories. In order to build general theories, complex processes are broken down into individual variables that are identifiable and controllable. Medical research, as does most research in natural sciences, builds on similar assumptions, which also imply that the search for general theory precedes application (see Figure 1). Medical staff thus tend to turn to research expecting to find "ready-made" solutions to the problem of patient safety. Indeed,

part of safety literature seems to provide precisely such solutions—independent of the original intention. Only few authors explicitly state their epistemological assumptions (many publishers do not give them the opportunity), so consumers of the research interpret results using their own perspective on the role of science, which may diverge from the author's perspective. In fact, as Gadamer (1975, p312) points out:

> *"In his own field he [i.e. the expert] is a faithful and reliable investigator, and in general he is well aware of the particularity of his methodological assumptions and realizes that the results of his investigation have a limited relevance. Nevertheless, the problem of our society is that the longing of the citizenry for orientation and normative patterns invests the expert with an exaggerated authority."*

In this paper we review the implications that philosophical assumptions about the nature and value of knowledge have on safety research, and in turn the utility that such results have for consumers of the research. On the one hand we identify rather positivist philosophies that seem ill-suited to dynamic issues such as safety in complex systems: work based on such philosophies may generate potential countermeasures to safety problems, but these are almost invariably focused on symptoms rather than causes and do little more than suggesting short-term, illusory fixes. On the other hand we see relativist approaches. These seem to remain true to the deeply complex, dynamic nature of most healthcare delivery systems, but are limited in providing directions for progress. We may need a third approach, which we identify as being a conceptual pragmatism philosophy. In this paper, we characterize a conceptual pragmatist view of safety research influencing improvement of safety in health-care.
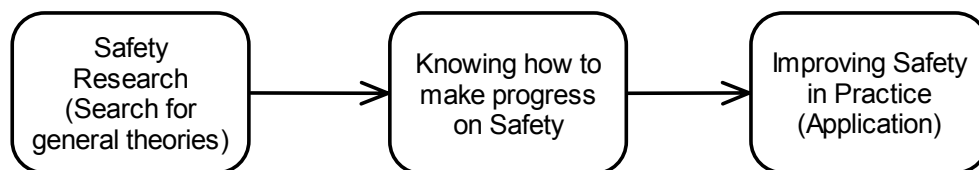

Figure 1

The discussion is built around the concept of safety culture. The literature around the concept of safety culture is analyzed and organized according to epistemological assumptions. We analyze the authors' perspectives on the nature of learning and its relations with the creation of safety in organizations. The problem is then re-centered around the current status of patient safety research. Though mainly theoretical, the discussion is supported by empirical data accumulated through one of the authors' involvement in a local project aiming at implementing a system for the reporting of adverse events at a number of clinics connected to a large teaching hospital. These empirical encounters exemplify and highlight portions of the theoretical discussion.

2. SAFETY IN ORGANIZATIONS AND SAFETY CULTURE: TWO MAJOR PERSPECTIVES.

When studying safety in organizations, understanding the organizational culture seems unavoidable. The characteristics of an organizational culture that appear to affect safety are often referred to as the 'safety culture' of the organization. After the nuclear meltdown in Chernobyl, the international community strongly criticized the "lack of safety culture", both at the plant, and also in Russia at large (IAEA 1992, p23-24). It was stressed that safety issues were not given the *"attention warranted by their significance"* (IAEA 1991, p4). From then on, and quite in phase with the American managerial discourse (Barley & Kunda, 1992), safety culture received much attention. The concept has been defined and used along many different axes, and with a certain lack of coherence between definitions. While some definitions see safety culture as a state, a goal by itself (IAEA 1991), others understand it as a process (Hudson, 1999). While some define it as a tool to measure an organization's disposition for safe operation, i.e. safety culture is used as synonymous for safe operation (e.g. Cheyne, Cox, Oliver, & Tomás, 1998; Mearns & Flin, 1999), other see it as a toolbox that enables safe operation (Weick, 1987). There have been many attempts to rearrange the concept into coherent frameworks, while trying to retain its multi-faceted nature (e.g. Cooper, 2000; Cox & Flin, 1998). No attempts, however, have been made to explicitly base these classifications on their epistemological assumptions.

A huge simplification of the literature around the concept of safety culture is to identify two main perspectives. The first perspective has recently been expressed by Reason's work (e.g. Carthey, de Leval, & Reason, 2001; Reason, 1997, 1998, 2000). This perspective emphasizes the importance of error-reporting systems in the construction of a safety culture. The second perspective has been championed recently in Vaughan's work (Vaughan, 1996). This perspective emphasizes the relativist nature of our judgment of what an "appropriate" culture is. While we refer to these two authors, we recognize the more important diversity found in literature. There is something emblematic in the work of these two authors that represents and brings together the diversity of ideas underlying their approaches.

2.1 "Engineering" a Safety Culture

2.1.1 An "informed Culture"

Reason (1997) defines an ideal safety culture as "the engine that continues to propel the system toward the goal of maximum safety health" (p195). Reason argues that a "safety culture" (which he equates to an *effective* safety culture) can be engineered through the creation of shared practices. His argument is that we can identify good practices (in Reason's terms "essential components"), design them ("fabricate"), and

"assemble" them; the result of this "social engineering" being an "effective safety culture".

He further equates the concept of 'safety culture' with that of "informed culture" (Reason, 1997, pp 196), which he describes as composed of four components: a **reporting culture**, a **just culture**, a **flexible culture** and a **learning culture**. A reporting culture is an organizational climate in which people are prepared to report their "errors" and "near-misses". A just culture is an atmosphere of trust encouraging people to provide "safety-related information". The idea of flexible cultures hails from reseach by the High-Reliability Theory group (e.g. Rochlin, 1999) and can take a number of different forms; it represents an organization's ability to reconfigure itself in the face of high-tempo operations or of certain kinds of danger. A learning culture ensures that *right conclusions* are drawn from the safety information system, and that reforms can be implemented. Reason proposes that these *different cultures* can actually be engineered.

Engineering a Reporting Culture. The first step is to get feedback. Incident reporting systems have putatively been of great help for safety improvement activities (although their value has been disputed elsewhere: see e.g. Amalberti, 2001). Such systems, indeed, must be handled with care: they can potentially do more harm than good. The reporting system should create (and can only function in) a climate of trust, and it should motivate people to reporting errors and near-misses. Reason identifies five factors that seem to determine both the quantity and the quality of the reports:

- Indemnity against disciplinary proceedings – as far as it is practicable

- Confidentiality or re-identification

- The separation of the agency or department collecting and analysing the reports from those bodies with the authority to institute disciplinary proceedings and impose sanctions.

- Rapid, useful, accessible and intelligible feedback to the reporting community

- Ease of making the report.

(Reason, 1997, p197)

Engineering a just culture. A "just culture" should not punish all "errors" and "unsafe acts" regardless of their origins and circumstances, and should not give immunity from sanction to actions that may, or did, contribute to accidents. However drawing the line between truly *bad* behaviors and unsafe-acts to which attribution of blame is "neither appropriate nor useful" (Ibid., p205), is not easy. A prerequisite is

"an agreed set of principles for drawing the line between acceptable and unacceptable actions" (Ibid., p205).

Engineering a Flexible Culture. The idea of flexible culture comes from the organizational flexibility observed in High Reliability Organizations (HRO), i.e. the capacity of HRO to effectively adapt to changing demands. In his proposal for engineering a flexible culture, Reason describes at large some of the findings of the Berkeley research group. For instance, La Porte & Thomas (1995) describe the paradox between the organization's hierarchy and a constant bargain. This ability to adapt to local constraints while maintaining a cohesion between the different actors is one of the main traits of HRO (Rochlin, 1989; Weick, 1987). Understanding these organizations as exemplary, Reason depicts how an organization should be "flexible". He seems however to forget, in his description, that HRO theorists do not know how to "engineer" such a flexible culture. HRO theorists allude to what may support such a culture, but do not propose any method to "*fabricate*" such a culture. Nor does Reason.

Engineering a Learning Culture. Reason does not expand much on this subject. He proposes that a learning process is composed of four steps: Observing – Reflecting – Creating – and Acting. He then concludes that the last one (that is to say Acting or perhaps the lack of it) is likely to cause most of the problems.

2.1.2 Learning and Safety

In this section, we analyze Reason's view on learning, and of its relations to safety in organizations. We do not pretend presenting James Reason's personal convictions, but only the perspective his work seems to convey. In fact, since he does not explicitly present such assumptions in his work, we can only present the view that seems to emerge from it.

While Reason does not make many assumptions explicit, his emphasis on error-reporting systems as a major part of a safety culture seems to reflect his understanding of what learning is, of how it can be supported, and how it affects safety. Reporting errors and near-misses seems to have two main purposes. First, error-reporting systems are thought of as increasing and developing some kind of organizational memory. This 'memory' should support members of the organization when facing problems that are new to them, but that no longer should be new to the organization. This idea of organizational memory emanates from a reification of knowledge production. The propagation of knowledge and the development of organizational memory ultimately operate some kind of alignment of individuals' behavior and that of the organization as a whole. In the long term, this is an attempt to change individuals' minds, individuals' attitudes, which in turn should change individuals' actions. Second, error-reporting systems aim at taking forth information

necessary to the redesign of the socio-technical system. "Errors", and "near-misses" are understood as natural consequences of the design of our socio-technical systems. In order to decrease the number of "errors", we need to redesign our socio technical systems. These redesigns, and the organizational changes it may imply, are to be based on the information acquired via the error-reporting systems. Error-reporting systems are the instruments that enable different actors to obtain part of the information necessary for improving the socio-technical systems. This quest for improvement is revealed from the links Reason draws between his **reporting culture** and his **learning culture**.

Reason's ideas seem to rejoin one understanding of organizational learning that Elkjær (1999) defines as a *management tool* for developing (mostly) tacit, cognitive abilities, that is to say the thinking abilities of individual members of the organization. Yet the relationship between learning and safety are not problematic to Reason. Learning is equated to progress; to the improvement of an organization's and his members' abilities. So learning must be positively correlated to safety—this is basically taken for granted. When individual- and organizational- learning occurs, the organization becomes safer. These relations seem so unproblematic for Reason that he does not even discuss the possibility of it being different. Though he discusses some problems of linking the reporting of events to "learning", there is no doubt in Reason's writings that learning can have nothing but positive consequences on safety. Individuals using scientific tools have to possibility of attaining information that, if used correctly, will lead to progress. If learning is unproblematic it is mainly because "*errors*" are regarded as constituting a natural category. Though the definition of what constitutes an error might not be unproblematic to the members of the organization, science and scientific methods can unproblematically classify actions into what is seen as natural categories: "errors", "near-misses", etc. From these classifications, adjusting, redesigning the system is not problematic.

2.2 "Cultural Deviance"

2.2.1 The Normalization of Deviance at NASA

Though Diane Vaughan's study of the Challenger disaster (Vaughan, 1996) is not specifically a study of "safety culture", it does lead to compelling conclusions about organizational culture as well as safety. When the Space Shuttle Challenger was launched in 1986, the effects of low temperature on the sealing quality of O-rings in the Solid Rocket Boosters (which help take the Shuttle into orbit) had been known before the launch, but the decision to launch was taken anyhow. When Vaughan started her study, much attention had been paid to the faulty O-rings. For instance, some authors showed how a faulty representation of data might have precipitated the wrong decision (Tufte, 1997). Later, "production pressures" and "managerial

wrongdoing" were brought out as major contributors. There were many factors (among them publicity) to motivate the "administration to press for Challenger to be up in time for the speech" (Vaughan, 1996, p13). Vaughan first traced and then rejected explanations that officials may have taken a calculated risk. Instead, most decision makers did not believe in the possibility of the accident. Vaughan's argument is that values and norms have been evolving during NASA history so that what was an unacceptable risk thirty years ago slowly became acceptable. This process of *normalization of deviance* is, according to Diane Vaughan one major explanation behind the disaster.

2.2.2 Learning and Safety

Vaughan's process of normalization of deviance could be defined as a learning process. "Normalization of deviance" is a social process during which norms and standard practices are (often unintentionally) readjusted to accommodate multiple goals, pressures and ambiguous evidence on the nature of safety and risk. The particularity of this change process is the transformation of the "deviant" into the "acceptable". What used to be unacceptable slowly becomes accepted and part of normal practice. This evolution of normality, this evolution of practice resembles the social processes described among others by Lave & Wenger (1991). Studies of how learning occurs in social settings shows that learning is an integral part of practice (rather than preceding or succeeding it); that learning is an inevitable part of individuals' participation in social life. Lave (1993) summarizes the situated perspective on knowledge and learning in the four following premises:

1. Knowledge always undergoes construction and transformation in use.

2. Learning is an integral aspect of activity in and with the world at all times. That learning occurs is not problematic.

3. What is learned is always complexly problematic.

4. Acquisition of knowledge is not a simple matter of taking in knowledge; rather, things assumed to be natural categories, such as "bodies of knowledge," "learners," and "cultural transmission," require reconcep-tualization as cultural, social products.

(Lave, 1993, p8)

What differentiates Vaughan's work and studies of situated learning is mainly the focus of inquiry. While studies of situated learning mainly focus on the learning trajectories of individuals within communities of practice, Vaughan focuses on the changes of the practice itself. With such a view on learning, relations between learning and safety are challenging. See Lave's third point: "what is learned is always

complexly problematic". Change, evolution is an integral part of practice, but the problem is now to understand whether this evolution benefits safety. Events like the Challenger accident may help us differentiate positive from negative evolutions, but such a judgment can only be made from "*our luxurious retrospective position*" (Vaughan, 1996, p416). In fact, "prior to the tragedy, this culture was working well: problems were discovered, launches were delayed while fixes were implemented, and disaster were averted" (Ibid. p418). The continual evolution of practice was not 'negative' until judged as such from hindsight provided by the accident.

While Perrow's suggestion was that accidents are normal in interactively complex and tightly coupled systems (Perrow, 1984), Vaughan's theory increases "the basic pessimism of the original model of normal accidents […]":

> "*[…] we learn that even when technical experts have time to notice and discuss signals of potential danger in a well-attended meeting prior to putting the technology into action, their interpretation of the signals is subject to errors shaped by a still-wider system that includes history, competition, scarcity, bureaucratic procedures, power, rules and norms, hierarchy, culture, and patterns of information.*"
>
> (Vaughan, 1996, p415)

Even the experts in charge of taking safety issues into consideration are not able to assess safety in an unfailing manner. Expert's judgment is contextual as much as anybody elses: it is a social and cultural product of the experts' participation in practice. Since expert judgments are cultural products, experts do not own the exclusive right of telling what is right or wrong, of telling what has positive or negative consequences for safety. And while outsiders certainly might introduce contradictory signals able to reduce the risk of accidents, they might lack expertise and authority to convince (Ibid., p417). Vaughan also suggests that "tinkering with culture can have unintended system consequences that are hard to predict" (Ibid., p418). In other words, Vaughan's perspective is that learning is not really something that one manages; In fact, "managing" it can even be dangerous. Yet "accidents can be prevented through good organizational design and management" (Ibid., p416). Vaughan even encourages pursuing every possibility to reduce the risks of accident. But from her perspective, good management and organizational design cannot prevent accidents from happening, since the definition of safety itself is a cultural and social product.

2.3 "Safety Culture" and the creation of safety in organizations

These two interpretations of culture, learning and safety are sometimes understood as two different levels of safety culture (e.g. Hudson, 1999). However, we can actually

see two different interpretations of the nature of learning behind each of these two perspectives, as well as two different interpretations of organizations. While the first interpretation leads to a quite static view of organizations, and thus to the possibility of "engineering a culture", the second interpretation produces a more dynamic view in which organizations are continuously evolving. In the one, learning can be managed, while in the other learning simply happens. In other words, these are two quite different appreciations of what social progress (and thereby progress on safety) really is.

In fact, the problem of safety culture seems easy if we believe that social reality can be understood objectively, and that it is therefore possible to define the general laws governing social life and human behavior. This 'objectivism' has been defined by Bernstein (1983) as a "basic conviction that there is or must be some permanent, a historical matrix or framework to which we can ultimately appeal in determining the nature of rationality, knowledge, truth, reality, goodness, or rightness" (p8). Such objectivist views thus define the "rightness" of a safety culture in characteristics that enable for instance the creation of circumstances and structures for confidential reporting to occur. These laws suggest that a correctly engineered safety culture, that is, a correctly engineered error-reporting system, will lead to high levels of safety. Yet by acknowledging the veracity of these laws, we might forget that safety is by nature both invisible and dynamic (Weick, 1987). As for instance Vaughan (1996) or Weick & Sutcliffe (2003) remind us, we may forget that safety is about managing a constantly changing system in a constantly changing environment. We may forget that safety cannot be managed by a static system.

On the other hand, the view of culture emphasized by 'relativists' is quite different. As Bernstein puts it (1983, p8):

> *"The relativist not only denies the positive claims of the objectivist but goes further. In its strongest form, relativism is the basic conviction that when we turn to the examination of those concepts that philosophers have taken to be most fundamental-whether it is the concept of rationality, truth, reality, right, the good, or norms-we are forced to recognize that in the final analysis all such concepts must be understood as relative to a specific conceptual scheme, theoretical framework, paradigm, form of life, society, or culture."*

According to relativists, our judgment of an "inappropriate" safety culture is only a hindsight judgment. In reference to the INSAG's definition of safety culture: people usually give things "the attention warranted by their significance", people usually are rational though this rationality is bounded, or local. Because of this, relativists have been accused of refusing to "judge" culture as "right" or "wrong". Such perceived

"anything goes" relativism has been criticized for being just observant. To be sure, relativists philosophies sometimes *have* tried to "improve" their objects of study, for instance through emancipation of the individuals involved (e.g. Alvesson, 1996). By proposing alternative views of social life, it was expected that the actors would use these as inputs in individual and collective reflection processes.

To summarize: on the one hand we have an objectivist view of culture that does not seem to take into account the dynamics of practice, and thus the dynamics of safety in organizations, and on the other hand we have an "anything goes" relativist view that might help us to understand after the facts, but that does not seem to help when striving for avoiding accidents to happen. Facing this impossible choice, a third approach has been proposed by philosophers refusing to see this choice as an either/or distinction (Bernstein, 1983), this approach will be referred here as conceptualistic pragmatism.

3 PATIENT SAFETY AND PRAGMATIST PHILOSOPHIES OF SCIENCE

3.1 A Conceptual Pragmatist Framework

The use of the concept 'pragmatic' needs some elaboration as this is a commonly used concept that can have multiple different meanings. After a quick glimpse in "The Concise Oxford Dictionary" (2001) we find that pragmatic means "dealing with things in a way that is based on practical rather than theoretical consideration". In the Oxford paperback Thesaurus (2001) we find that pragmatic means, "matter of fact, sensible, down-to-earth, commonsensical, businesslike, having both feet on the ground, hard-headed, no-nonsense". Put together one could probably say that a pragmatic person is someone who is more interested in the practical than in the philosophical.

The word Pragmatism goes back to the Greek word for 'affair' and the Greek historian Polybus called his writings 'pragmatic', meaning that they intended to be useful and instructive to the reader. However pragmatism as we refer to it became an influential philosophical movement during the nineteenth century through i.e. Peirce, James, Dewey and C.I. Lewis among others (Haack, forthcoming). But it was Peirce who was the pioneer within pragmatism and was the first to give this philosophical movement its name. Peirce stated that *"…the meaning of a proposition or an intellectual conception lies in its practical consequences"* (The Cambridge Dictionary of Philosophy, 1999). And it is the focus upon 'practical', which have become the most signifying about pragmatism. Pierce had a few disciples among which were William James (e.g. Philosophy of psychology), Josiah Royce (Philosophy of

Science), John Dewey (Philosophy of Science and philosophy of education) and later on C. I. Lewis (philosophy of knowledge). It was through James that Peirce's pragmatism became widely known but Peirce was dissatisfied with James' version of pragmatism and renamed his own form of pragmatism to pragmaticism which term he considered to be *'ugly enough to keep it safe from kidnappers'*. So there exists two movements: pragmatism and pragmaticism. However Peirce himself stated that "…pragmaticism is not a system of philosophy. It is only a method of thinking…*"* (A letter to Signor Calderoni, CP 8.209, c. 1905).

C.I. Lewis on the other hand called himself a conceptualistic pragmatist (see e.g. Mauléon & Bergman, to appear) and he elaborated upon something he chose to call the 'a priori'. The 'a priori' according to C.I. Lewis is simply said the 'instrument', which our mind imposes upon experience in order to interpret it (Lewis, 1929). The 'a priori' is built up by our concepts and C.I. Lewis continues by saying that our concepts give rise to our 'a priori' and it represents what our mind brings into experience (ibid.). The 'a priori' is created by our mind and our mind may therefore also alter it, which in this sense give us a free choice of selecting our 'a priori'. So the *"…*determination of the a priori is in some sense like free choice and deliberate action.*"* (Lewis, 1929, p232) and as a consequence we may also change our behavior (ibid.).

But the only way to choose another 'a priori' or to change it is through reflection. Reflection is not only crucial if we need to change our 'a prior', according to C.I. Lewis, but is also necessary if we are to cooperate with and understand other human beings. As for cooperation to exist, C.I. Lewis states that there needs to exist some common understanding and "…meanings are identified by the relational patterns which speech and behavior in general are capable of conveying" (Lewis, 1929, p109) and the sensuously content of experience in one mind cannot be conveyed to another, but the characteristic order of some set of items in the experience of person A can be identified by person B as belonging exclusively to some set of things in his/her own experience That is, if person B has reflected and explored his/her own 'a priori' (ibid.). Thus, to reflect upon ones own 'a priori' give us the means to understand others behavior and reactions in our community and thus gives us the possibility to cooperate and change our behavior (see e.g. Mauléon, Bergman, & Alänge, 2003).

It is the conceptualistic pragmatism that we choose to look upon (or use) as a third framework in this paper. But what does this third approach give? Which the other two referred to do not? Well, what we have seen while studying the objectivist, relativist and conceptualistic pragmatist approach considering learning we find that within pragmatism learning is seen as an ongoing process where knowledge evolves over time due to new experiences as C.I. Lewis says that "knowing begins and ends in experience; but it does not end in the experience in which it begins" (Lewis, 1934,

p133). What we see here is the connection between the way Reason looks upon learning-where he insists on the need to gather data in an objective manner in order to improve our systems, and Vaughan's way of looking upon learning-as being more deterministic since learning happens but cannot be managed. But C.I. Lewis' view upon learning is that we can understand that we will not after some stretch of time be at the same place as we began and therefore we need to reflect upon the possibility of changes in our behavior. As he states that the 'a priori' is changeable after reflection and therefore our behavior may also change (Lewis, 1929).

3.2 The Practice of Instigating Incident Reporting – Cues from one Case

In order to concretely define what 'usable knowledge' can be, and how it can benefit patient safety, we will make use of a real case. This case describes how a local hospital tried to tackle patient safety issues during the past two years. After the description of the case, we will describe implications of adopting a pragmatist research perspective.

A few years ago staff from the local council in charge of health-care organizations got interested in improving patient safety. These persons could be described as facilitators: their role is to support the organizational members around organizational development issues. They took upon the charge of leading the organization's plan for improving patient safety. Used to normative views of sciences, these employees first felt the need of gathering data about patient safety. But, when they opened the databases of the national incident reporting system, they soon realized the difficulty to use these data. The few incidents reported on the national level did not seem to be a good, reliable base for local improvement initiatives. Opening books, consulting research findings, studying other fields of practice, these persons discovered the problem (and consequently the solution to their problem): the national incident reporting system is not anonymous, it is not just, it does not give "*rapid, useful, accessible, and intelligent feed-back to the reporting community*", etc. Other fields seemed to have found the solution: their task was to implement such a solution to their application domain. A project developed in order to first define, and then implement a local system for incident reporting. This system, that would not replace the national system but only complement it, would make reporting "*easy*", "*just*", and "*useful*". The idea was to cooperate with a few clinics of the region in order to define this system, and then implement the system in the whole region. A "reference group" was created including practitioners (nurses, and doctors), as well as "scientific experts" (this is where the first author of the present article comes in). Some clinics volunteered and started to define their need for an incident reporting system. They soon encountered their first problem: what is an 'incident'? ("Avvilkelse" = "deviation" in Swedish) Each clinic was given the task to work out a definition. Then

representatives from the three clinics met together with the project leaders and, following long discussions came up with a common definition. The project then went on defining as simple system for reporting 'incidents', trying this system over a period of a few weeks, reflecting on the reported events, etc. In parallel with this work, discussions were started with companies selling computer-supported tools for incident reporting. Both courses of action converged to a version of a computer-supported tool that was adapted to the needs of the three clinics involved in the project.

The original plan was then that this computer-supported system would be implemented in all the clinics of the region. But it has not been the case. Instead, what had happened during the two years of the project is the emergence of an alternative understanding of the usefulness of the incident reporting system. While first understood as one of the solutions that would improve patient safety, project members realized that the complex issue of patient safety could not be solved by simply implementing an incident reporting system. Of course, project members had understood from the beginning the need to "*learn*" from the reported incidents as well. Reporting incidents would not directly lead to a safer health-care, but if the organization, and its members could "learn" from the reported events, it surely would lead to a safer health-care. What people realized along the course of the project was the need for organizational members to fully understand the utility of the incident reporting system before being able to use it. They understood the need to promulgate the understanding of "human errors" as consequences of the design of the socio-technical system, and not only as causes of accidents. They realized the need to shift the understanding of "human errors" from an unspeakable taboo, to an accepted subject of discussion. They realized the need to change the image of the "expert" as a failure-free person to somebody who can discuss and reflect upon his own mistakes. They realized that this shift-of-mind would not naturally follow the implementation of a "good" incident reporting system. Though the incident reporting system might support a shift-of-mind, it surely cannot make it happen all alone.

Today, the strategy is thus not to propose a ready made incident reporting system to the clinics who desire it, but only to the clinics that can explain why they need such an incident reporting system, and that can show how they are planning to work with patient safety issues. In fact while the original name of the project was: "Adverse-event reporting system project", it has been renamed to: "Patient Safety – inclusive adverse-event reporting" (even the term 'project' was removed)[1]. Of course, it is not thought that every clinic should reinvent the wheel, and a good balance between self-reflection and ready-made solutions should be found. A quite indicative detail is the

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[1] There are practical implications related to administrative policies that could explain why the term 'project' was abandoned. But it was clearly accompanied by the project leader's changing perspective on the nature of patient safety.

actual definition of an "Incident" ("Avvikelse" in Swedish). While a first idea was to provide the clinics with a definition of what an incident is, the discussions needed to obtain a common definition of the term seem central. In fact the discussion of what is "normal" and what is not was identified by Vaughan (1996) as an important characteristic participating to safety. Other authors have also discuss the problem of the shift of expert judgment over time (e.g. Creed, Stout, & Roberts, 1993); and supporting the organizational members' reflection about what is "safe" or not might actually be at least as important as a well functioning incident reporting system. Finding the right balance is however not an easy task.

3.3 Of the Roles of Research for Safety improvement in Health-Care

Adopting a conceptual pragmatist framework, let us now explain the roles of research in the previous project of safety improvement in health-care.

3.3.1 Providing Usable Knowledge

Since, according to conceptualist pragmatism, what is interesting is not whether knowledge is true of false, but whether it is usable, the question that we should be asking our self is how research can provide knowledge usable to practitioners working with improving patient safety? And more specifically related to the presented case, what kind of knowledge did the practitioners involved needed for improving patient safety?

First it can be said that the methods and tools provided by theorists like James Reason are surely usable in many situations. Design principles such as the confidentiality of incident reporting, or the "indemnity against disciplinary proceedings – as far as it is practicable" (Reason, 1997, p197) are surely usable guidelines. Or at least, these principles can be said to seem currently usable for practitioners. However, the usability of these guidelines should be reflected upon. Principles for safe operation that seem useful today might not be relevant tomorrow. And as, among others, Vaughan reminds us, it is when people stop reflecting upon their own set of values and norms –or as C.I. Lewis would express it, their own a-priori – that safety weakens.

3.3.2 Supporting a Critical Attitude

Thus, on top of providing practitioners with a set of principles that seem useable today, we should as well remind people to challenge the norm, to challenge the common understanding of what 'usable' knowledge is. This critical attitude has been quite well observed and described in High Reliability Organizations (HRO). For

instance, Karl Weick reminds us how operators in High Reliability Organizations see periods when nothing is happening as potentially dangerous (Weick, 1987). People in HRO understand that it is "continuous change" that produce constant outcome. Like Vaughan suggests it, Weick & Sutcliffe (2003) emphasize the need of having a critical attitude toward the shared norms and values. This critical attitude in HRO is often put in opposition with a belief of the operators to be best at what they are doing (e.g. La Porte & Consolini, 1991; Rochlin, 1993, 1999).

We need to create a higher degree of consciousness within the employees. How may this be done? If we take Ollila's example (Ollila, 2000) one way may be to have some kind of tutoring. That is to have someone reflect back to us our own behavior in certain situations. Asking questions like: Why did you do that? Why did you take that decision? How did you feel? How do you think the other person felt etc. This is a trip from being socially influenced to creating this self-reflection process within the person him/herself.

But in order to promulgate this critical attitude to practitioners we (the research community) as well need to adopt a critical attitude toward our own work. Just as Diane Vaughan explains us how experts in the organization were blind by their own a-priori, we have to recognize that researchers are not exempt of their own a-priori. Only by applying a critical attitude toward our own work will we be able to convince others (practitioners) of the necessity for such an attitude.

3.3.3 "This is not a 'deviation', this happens everyday…"

What Vaughan and others (e.g. Snook, 2000; Weick & Sutcliffe, 2003) suggest is that accidents happen when norms and values in an organization do not match the reality of today's operation. In the case described by Vaughan, norms and values changed over time, while in the case presented by Weick & Sutcliffe (2003), norms and values failed to adapt to the new environment. In both case we observe a mismatch between the norms and values in place and the reality of operations. The problem is that the definition of what is "acceptable", of what is "normal" goes unquestioned until a severe accident forces people to open their eyes. This is where the major challenge to objectivists views of safety culture lays, when the hard question to answer is not whether to report incidents, but rather the definition of an 'incident' itself.

For these reasons it seems particularly interesting to focus on how 'incidents' (in Swedish the term used was "avvikelse" = "deviation") were defined by the project team. First, participants in the project team realized the vagueness of the concept. They realized that if they were to cooperate, if the database of reported 'incidents' was to be usable, they first needed a common definition of the concept of 'incidents'. They understood the need of "common concepts for common actions" (Lewis, 1929).

Was an unreadable prescription to be considered a 'deviation', since as a nurse said: "*this is not a deviation, this happens everyday*"? Consequently, after a few meetings of talking at cross-purposes, participants in the project team decided to commonly define what was to be considered a "deviation". Each participant started discussion in his/her ward, to later take up the discussion with the other members of the project team. After working with incident reporting for a few weeks, the common definition was revised using this experience as a new input in the discussion. Moreover, members of the project team spend a considerable amount of time, in their respective wards and clinics, to inform the organization members of the meaning behind the concept. When the project was presented to organizational members not part of the project team, the common definition was presented as an important outcome of the project. The official definition is as follow: "*a deviation is when a process or an event does not follow the expected course of action*".

While a common definition seems important, we may wonder whether the discussion around what a 'deviation' is might not be more important than the definition itself. While it is evident that we need "common concepts for common actions", discussion around the concept enable organizational members to question what is acceptable, or not. As Vaughan (1996) and Weick & Sutcliffe (2003) show, it is central that we constantly revise our a-priori about what is acceptable or not. Thus, though we need common concepts, in order to cooperate, we also need to have concepts can be discussed, put into question. Just as findings from the product development field (Mauléon et al., 2003), we need to find the right balance between how open, respectively closed, a concept should be.

Thus, while the members of the project team were eager to spread "the" definition of what a deviation is, it was the role of the research community to point out to the importance of the discussions, and thus to propose a way to spread the common concept while simultaneously trying to encourage a constructive debate around this definition.

4 CONCLUSIONS: REDEFINING THE ROLES OF INCIDENT REPORTING SYSTEMS

The present work that made us analyze the concept of safety culture in the literature and its links to different epistemological views of learning, proposed a conceptual pragmatist framework in order to integrate both objectivists views of learning and more relativist ones. Adopting such a framework, we defined how we see the role of research in the current effort of improving patient safety. In conclusion we would like to redefine the roles of Incident Reporting Systems in the creation of safety.

First, it seems that we cannot deny the importance of such tools in the construction of safety. In fields like civil aviation, or offshore oil-extraction, incident reporting systems have been of great importance. They allowed individuals to gather important information that help them to redesign the complex socio-technical systems. At least, this is how their usefulness has been understood and highlighted in the literature. What the present work proposes is that incident reporting systems are indeed important tools, but not necessarily as scientific tools extracting some sort of objective information. We could see incident reporting systems as tools supporting the organization's capacity to self-reflection. Incident reporting systems seem to enable the organization to focus its attention on current work-practices; it enables the organization to reflect on itself.

In order to understand more completely this side of incident reporting systems, we need to put aside this objectivist view of learning that defines incident reporting systems in an objectivist manner (i.e. as a scientific, rational tool). Instead, we need to understand that the incident reporting systems are not the output of a linear development. There was not an original need, which eventually led to today's systems. Rather the development of the incident reporting systems has been influencing practices in the field, which in turn have been influencing the development of the system. The system composed today by actual industrial practices (often defined as culture), tools (in our case Incident reporting systems) and science (i.e. the understanding of the norm) cannot be fully understood by looking at today's configuration. Understanding the cultural values associated with tools is one step, understanding how they came to life is yet another one. In fact, incident reporting systems are such artifacts that can hardly be placed either as natural elements, or social ones. They are both natural and cultural –i.e. hybrids, as Latour would say (Latour, 1999b). Thus in order to fully understand the usefulness of incident reporting systems, we need to understand their historical development, we need to understand that characteristics (as the ones proposed by e.g. James Reason) are the output of (at least) a twenty-years long history. As stated earlier: supporting a critical attitude in practitioners should start with a critical understanding of scientific practices. If we state that work-practice cannot be understood out of its cultural-historical context, we should as well recognize that scientific practice can not either be understood out of its cultural-historical context. Recognizing the relativism of scientific practice should however not be confounded with a rejection of reality (Latour, 1999a). There is a middle way to be found between objectivism and relativism, and we believe that conceptual pragmatism should enable us to find this path, central to the long-term construction of safety.

And it seems to us that understanding the development of these tools is particularly important for health-care staff today. In fact when trying to learn from one field to another (see e.g. Ödegård, 1999; Van Vuuren, 1999), the risk to 'objectify' the

research findings is important. Moreover, staff from the health-care community seem to have been particularly pressed for working actively with patient safety. For instance, reports such as (Kohn, Corrigan, & Donaldson, 2000) have put patient safety at the top of many political agendas, and consequently rendered compulsory noteworthy engagements in patient safety issues. This 'extra' burden put on medical staff seems to increase this "*longing of the citizenry for orientation and normative patterns*" that Gadamer (1975, p312) describes and thus the dangers of patient safety issues receiving a misplaced attention.

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