the oesteoma, the surgeon provides further information to enable the trainees to discover the line 'the little V:::', which in turn elicits 'mm' head nods from Jane, but little from Peter. It appears as if the progressive modification of the description is gradually orientated towards the absence of response from Peter. Indeed, as she raises her gaze from the surgical field, the surgeon orients towards Peter (3.e) and as she delivers the actual statement that "that's where the oesteoma is against the back wall", she looks at Peter and shapes her hand into a gestural representation of the tumour and its location in the cavity of the frontal sinus.

Fragment 3. *Transcript 2*

Maria: Can you see the line there

(1.2)

Maria: the little line there (lying) around it

Jane: Yes

Maria: do you see it at the bottom there

(1.0)

Maria: that little V:::

Jane: mm

(1.0)

3.d

Maria: Okay (.) thats where the (0.3) oesteoma (is) against the back wall

Maria: Its very ┌ very tight

Jane: └yeahs

3.e

Revealing the location of the oesteoma, until that moment, partially hidden by the surgeon's hands, the drill and blood, enables the trainees to comprehend the ways in which the surgeon is approaching the problem in this case and recognise the difficulties in discovering and removing the growth. It enables the trainees to embed the procedure within practicalities and constraints of this case, to retrospectively and prospectively make sense of

the surgeon's actions. The trainee's discovery and determination of the oesteoma, is accomplished through the surgeon's progressive attempts to align their orientation to enable them to see what is almost hidden; a series of actions that are shaped with regard to the emerging participation of Jane and Peter. The very ways in which the location and character of the oesteoma is revealed, is fashioned with regard to visual and vocal conduct of the trainees and one suspects that the even the gestural illustration for Peter arises with respect to his seeming inability to see the phenomenon in question. The perception and determination of the oesteoma's location, and the trainee's ability to comprehend how the procedure is being deployed on this occasion and the difficulties faced by the surgeon, is accomplished in and through the interaction; the surgeon progressively shaping and orientating to the participation of the trainees in order to secure, and know she has secured task relevant ways of seeing and looking that are sensitive to the practical circumstances at hand.

The illustration and instruction emerges within the developing course of the interaction and is dependent upon the surgeon configuring the co-orientation and participation of the trainees. Her successive attempts reveal the line and oesteoma are built though a series of actions that specify a particular alignment and secure an appropriate display that the objects have indeed been found and seen; they progressively emerge with regard to the seeming absence of a sequentially appropriate response from the trainees and in particular Peter. We can begin to see the ways in which the activity's accomplishment emerges through the surgeon's attempts to secure particular forms of participation; differentiating the trainee's alignment, or failure to display alignment, in the course of producing the activity.

Configuring participation and shaping conduct

The access for newcomers to learn and participate in communities of practice relies on competent members to build and sustain opportunities within the course of the interaction. Opportunities to participate and learn is interwoven with the routine ways in which particular procedures are managed and coordinated between the operation team members within the practical circumstances of the surgical operation. For example, when the participants once have established and sustained a joint involvement, moments come when the encounter between the surgeon and the trainees must be temporally abandoned in order to attend to other engagements and responsibilities. An interesting aspect of the work in operating theatres is the ways in which the engagements in stretch of instructional activities are fitted to the exigencies of ongoing practice. All participants in the operating theatre - surgeons, trainees, anaesthetists, and nurses – contribute in and through interaction to the work of interleaving the physical activities of the surgical procedures and the coordination of the surgical operation with the interactional elements of instructional sequences.

In the following fragment, we are joining the throat operation again in which Sean engages in a discussion about the case with Peter and Mark (see picture 3.d in fragment 3). On the right of Sean is the scrub nurse, Gerry, leaning on the instrument trolley waiting to pass the

next instrument. On the other side of the bed is Michael, the anaesthesiologist, standing next to the anaesthetic machine and watching the patient. When the fragment starts, Sean has just examined the throat and turns to the students to explain what he has just observed. What the following analysis will explore is the ways in which the participants in the scene in various ways contribute to the transition into the next stage of the operation. That is, the surgeon has examined the field and is now about to use another instrument for removing some of the mucus inside the throat. However, as we will see, there are various concerns that are relevant to attend to before the surgeon can initiate the next procedure: a) he is currently engaged in managing and sustaining an opportunity for Peter to examine the throat and to discuss the case with Mark; b) the scrub nurse needs to prepare the instrument and the passing have to be coordinated with the surgeon; c) and most important, a ventilation tube needs to be inserted through the airway opening to allow the anaesthesiologist to ventilate the patient and regulate the medical condition before the surgeon can proceed. Before we consider more in detail how the participants manage the instructional activity, we must examine how the concerns and responsibilities of the scrub nurse and the anaesthesiologist are attended to within the course of producing the activity.

One concern that becomes apparent for the participants is the replacement of the ventilation tube; in particular for the anaesthesiologist. The anaesthesiologist stands next to the anaesthetic machine and glances occasionally toward the scene of the surgeon; he is waiting for an opportunity to ventilate the patient (see the anaesthesiologist in 3.a, 3.b and 3.c). He can see that the surgeon is still engaged in the examination. The surgeon initiates a discussion by providing another account of the visual scene; that the bronchos actually is "better than it was" (see first row in transcript). He then invites Peter, once again, to see the passage down the throat, and starts to orientate to Mark, the other trainee, who has entered the scene from behind. Mark asks a series of questions to which the surgeon responds more directly later after the attempt to secure the illustration and instruction for Peter to see the passage in the throat. As the anaesthesiologist notices the intensifying discussion between the participants, he turns his head slowly toward the scene of the surgeon (see 3.d). Apparently, he can notice that the surgeon has engaged in a discussion with the trainees and has turned more directly towards Mark (3.d). He can also see that the surgeon has removed the instrument from the airway opening, which would enable the anaesthesiologist to get access the airway. But the ventilation tube has not yet been replaced; thus, the patient cannot be ventilated. It is interesting to notice, however, that the anaesthesiologist does not orientate directly towards the surgeon; only his gaze lands on the ventilation tube. His orientation seems to be designed not to draw any attention. The change of orientation appears to be design simply to gain an understanding of the current state of the affair at the surgical scene without displaying any demands for immediate response from the surgeon and to avoid causing disruption in the instructional activity.

Fragment 3. *Transcript 1*

3.a 3.b 3.c

Sean: Actually the bronchos is better than it was

Mark She said it lasted (a lot) longer this time

Sean: But it is still a bit narrow (1.5) do you see?

Peter: Yeah yeah

Mark: (_____)

3.d

Sean: Yeah I agree with you but we are not breaking any new (____) if you know what I mean

Mark: Yeah

Sean: But th**[**ere is no:: ra::w woun**[**d to

Mark: [(it was::) [no

The anaesthesiologist is sensitive to the progress of the instructional activity in that the ability to progress his own tasks relies on the coordination with the surgeon. When the surgeon no longer needs the access to the airway the ventilation tube can be replaced, which is an opportunity for the anaesthesiologist to fullfil his own duties, namely to ventilate the patient. A missed opportunity, however, such as that the anaesthesiologist for some reason fails to notice that the tube has been replaced, may force the anaesthesiologist to wait for a later opportunity or encourage the surgeon to delay the next procedure not to put the patient at risk. Michael, therefore, glances occasionally toward the surgical scene to notice the changing requirements of access to the airway and progress of the instructional activity. Michael's attention to the conduct of the surgeon also have as much to with his sensitivity to an emergent division of labour. This is in the beginning of the surgical operation and the participants have not yet worked out a 'working division of labour' (cf. Heath and Luff 1996, Hughes and Sharrock, 1989) concerning whom should remove and replace the ventilation tube. They do not simply rely on a formal division of labour – even though there are formal tasks and responsibilities - but they themselves work out a way of working together within the developing course of particular activities. It has been the anaesthesiologist that initially removed the ventilation tube from the throat in order to indicate for the surgeon to start the procedure. At this point, it is not clear who should do what and when.

However, the appearance of the anaesthesiologist and the importance of replacing the tube does not pass unnoticed. When the anaesthesiologist turns his head more directly towards the surgeon and starts to reach his hand towards the tube, the surgeon is already moving his hand towards the ventilation tube whilst attending to the conversation with the trainees (3.e). As the surgeon inserts the tube, the anaesthesiologist follows through his hand gesture, as if to display his shared responsibility in replacing the ventilation tube (3.f). When the ventilation tube has been properly inserted in the airway by the surgeon, the anaesthesiologist turns toward the anaesthetic machine to set the ventilator equipment and fetch the reservoir bag (3.g). He can now ventilate the patient. By virtue of his orientation to the conduct of the surgeon, he discovers the un-replaced ventilation tube. The surgeon did not have to encourage the anaesthesiologist to notice the opportunity for ventilation – which may have forced him to disrupt the instructional conversation and delay the progress of the next procedure. Moreover, the anaesthesiologist designs his own actions and appearance in the scene to preserve the ability of the surgeon to interact with the trainees and organise opportunities for learning and participation.

Fragment 3. *Transcript 2*

Mark: But it was very granular (0.5) and (___) stretching it to it flattened it

(0.5)

3.e

3.f

Sean: That is all gone now

3.g

Interestingly, as the episode continues, the surgeon demonstrates a similar kind of attention to their joint task. A few moments later, whilst the anaesthesiologist turns around and makes a few adjustments to the ventilation equipment, the surgeon starts to withdraw his engagement from the ongoing discussion by confirming to the students that "there is no granulation …

little bit mucas around" (3.h). At this point, he has shifted his attention to the instrument trolley and the preparation for the next upcoming stage of the procedure. As he silently clarifies that there is "no granulation", he glances towards the area of the anaesthesiologist and looks briefly at the patient monitor (3.i). He turns to the instrument trolley again, takes one of the instruments, and voices an instruction to the scrub nurse to assist him in the next procedure. The anaesthesiologist has now managed to set the ventilation equipment and turns around with the reservoir bag in his hand (3.j). In the one second pause, after the surgeon says "and we'll just pop in again", the anaesthesiologist produces one quick breath for the patient with the reservoir bag. As the word "gently" is uttered, the surgeon removes the ventilation tube and then inserts the instrument through the opening on the patient's throat. The surgeon continues with the next procedure and, again, can attend more directly to the participation of trainees.

Fragment 3. *Transcript 3*

Mark: But it was very granular (0.5) and (___) stretching it to it flattened it

(0.5)

Sean: That is all gone now

(0.4)

Mark: Is it?

(0.2)

Sean: Yeah (0.2) seriously (0.2) there is no granulation (0.4) little bit mucas around but

(2.0)

Sean: no actual °granulation°

(2.0)

3.h

3.i

Sean: O::kay (0.3) you can hold that end for me that would be gre::a:t (0.2) and we'll just pop in again

(1.0)

Sean: gently

3.j

It is interesting to see how opportunities for learning and participation is managed within the context of the exigencies of work in progress and how it rests upon the ability of the participants to orientate to each other's tasks and responsibilities. The surgeon is orientated prospectively to the task at hand and the upcoming activity. He is not only concerned with the progress of his own activity, but is sensitive to the ability of others to undertake their tasks and responsibilities. This is intimately connected with the ways in which he may have to shape his own conduct or even abandon what he is currently doing to allow for the smooth transition between their activities. As it is here, he seems to orientate to the upcoming juncture at which the ventilation tube has to be removed and the patient must be in a condition that allows him to continue with the next procedure; that is, that the patient has been properly ventilated and oxygenated. It is interesting to observe how the inspection of the patient monitor, on which the surgeon can see the current oxygen level, seems to allow the surgeon to understand the potential concern of the anaesthesiologist and the requirements of ventilating the patient. In this way, the surgeon seems to gear into the next stage of the activity with attention to the progress of the ventilation. He progresses his own activity so as to give the anaesthesiologist enough time to prepare the reservoir bag and implement one round of ventilation before engaging in the next stage of the procedure. As once characterised by Everett Hughes (1958): he provides another colleague with the "elbow room" for accomplishing a particular task or duty. This is the context within which the surgical trainees participate as learners of new skills and knowledge. They participate in practices that are interactional in nature and that the interaction is systematically organised and configured within the course of activities to provide resources for creating, sustaining and temporally abandon opportunities for learning and development.

One aspect of the organisation of interaction is that others who may be more or less experienced participants becomes part of the practice in and through their interaction with other competent members within the course of their activities. Thus, learners contributes to the opportunities to learning in practice. For example, it can be noticed how the trainees

themselves seems to recognise the upcoming transition into the next stage of the operation and the ways in which they find their place within the coordination of the work. In the following transcript it can be seen how one of the students, Mark, seems to notice the concerns of the surgeon and the upcoming juncture in the surgical operation. As the surgeon responds to Mark, he starts to look down at the instrument on the bed in front of him and the instruments on the trolley next to him. Mark listens to Sean and directs his gaze down on the patient. Mark can then observe how Sean reaches for the instrument on the bed (3.k). The surgeon briefly interrupts his utterance after "little bit mucas around but" and orientates his gaze at the patient monitor as he reaches for the other instrument on the trolley (3.l and 3.m). A few moments later, the surgeon asks the scrub nurse to hold the instrument for him. He sits further back in the chair, bends down over the patient and starts to remove the tube from the throat (see 3.j - in transcript 3).

Fragment 3. *Transcript 4*

3.k

Sean: Yeah (0.2) seriously (0.2) there is no granulation (0.4) little bit mucas around but

(2.0)

3.l

Sean: no actual °granulation°

3.m

(2.0)

Sean: O::kay (0.3) you can hold that end for me that would be gre::a:t (0.2) and we'll just pop in again

It is evident that Mark is responsive to the actions of the surgeon and in particular the circumstances of the next upcoming activity. When he notices Sean picking up the first instrument, he takes a few quick steps to the left (3.k – 3.m). It can be seen in the image sequence how Peter changes his position at the surgical bed. Initially, the movement away from the surgeon seems to be sensitive to the space required for the physical activity involved

in the next procedure. In fact, as we have seen in the previous fragments in this paper, the examination of the throat using the bronchoscope instrument requires some room for manoeuvering the instruments and bending down over the patient. The respectful sensitivity to the demands of the surgical activity preserves the integrity of the surgeon and saves the surgeon from unnecessary disruptions and difficulties in progressing the dominant tasks at hand: the surgical interventions and the coordination of passing instrument and monitoring the patient.

The delicate ways in which the participants accomplish to co-ordinate their overlapping tasks and activities derives from an ability of the participants to undertake their own activities within the real time contribution of others. We have seen how the surgeon seems to delay his own progress into the removal of the ventilation tube so as to provide the anaesthesiologist with enough time to ventilate the patient once. The trainee provides the "elbow room" for others, in the true sense of the words, in that he distances himself from the surgeon by stepping away from the physical space the surgeon may have to occupy in the next upcoming activity. Even though, the participants' formal status and working relationship informs their conduct, we can observe that participation and learning is as much an interactional accomplishment. The trainee's ability to participate with the surgeon and to appreciate the trade as practiced is accomplished in and through the interaction. The surgeon progressively orientates to the participation of the trainees, and other members of the operation team, in order to sustain the involvement of the trainees, and to configure his own participation that are sensitive to the practical circumstances at hand.

Conclusion

Opportunities for newcomers and learners to participate in communities of practice are pertinent to the ways in which people acquire organisational competence (Lave and Wenger 1991, Suchman 1993). The general knowledge gained from reading textbooks and attending lectures and tutorials only provides the learner and the becoming member with task-specific skills and competencies. It is in the close engagement with other practitioners within ongoing practice that the learner acquires the competence that is required not only as an individual practitioner, but as an individual within an efficient working group. However, in contrast to the prevailing characterisation of informal learning and learning in practice, we have examined materials in the operating theatre that reveal how participants are highly active in the process of producing and maintaining opportunities for participation and learning. The opportunities to discuss cases, and to see and makes sense of particular phenomena, are actively occasioned and managed within the course of producing activities. Even though the operating theatre is an environment for formal training, the opportunities for learning and participation is accomplished in and through interaction.

Competent members build and sustain opportunities and moments within interaction for others to participate and learn. The delicacy with which the surgeon enables the trainees to

comprehend current procedures and to see and make sense of the phenomena, might appear to derive from the differential status of the participants in a formal training situation; the surgeon a more senior consultant with teaching responsibilities, and the trainees two less experienced members who participate only to receive insight and knowledge about the particular case. It might also be thought that the activities of the trainees, and the nurses and the anaesthesiologist for that matter – who also are more junior practitioners - are principally concerned with listening to, and observing the surgeon or providing relevant support. However, it may have at least as much to do with the ways in which the surgeon, and other participants, shape their conduct and configure each other's participation within an activity that involves delicate collaboration between multiple individuals. The surgeon relies on being able to engender particular forms of participation and elicit displays of alignment that secure that they are seeing and making sense of a phenomena; forms of participation and alignment that provides resources for revealing a routine procedure or practice. These differential forms of participation arise with and around these instructional sequences, which demands contributions from a range of participants, including the surgeons, the trainees, the anaesthetists, and the scrub nurses. Learning in practice, both for trainees and more experienced members, is dependent on interaction; in particular because practice is embedded in interaction.

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Development of a method to study Tacit Knowledge

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Introduction

Is it because it is too difficult to study tacit knowledge that it is hard to find empirically based research on tacit knowledge in management research? And if that´s the case, why is it hard and what could be done to facilitate empirical studies on tacit knowledge?

These are questions that came up in the beginning of a research project with the aim of finding methods to do scientific research on tacit knowledge. Further studies revealed that the same problem also occurred in tacit knowledge management. There is a lack of managerial methods to support tacit management as those used to manage explicit knowledge not necessarily are appropriate for the tacit dimension of knowledge.

Tacit Knowledge is a concept that is related to many difficulties both within academia and management. This paper address two of these difficulties that tend to decrease our passion for tacit knowing, one problem related to research and one related to management. One of the main problems a researcher on tacit knowledge encounters is the difficulty to do empirical research on a topic that is by definition "abstract, self-evident, implicit and difficult to articulate". Methods in use like in-depth interviews and questionnaires do not correspond to the needs of the researcher or referent in a study on tacit knowledge. As there is a lack of methods to manage tacit knowledge the "tacit knowledge management" has mostly been neglected in organizations. This in spite of the fact that organizations devote resources to knowledge management. To manage tacit knowledge it is necessary to be consciuos of it att to be able to localize it.

This article presents a interviewing-method developed to facilitate the researchers and the managers difficulties to study or map tacit knowledge

Difficulties in research on tacit knowledge

There are many difficulties in doing research on tacit knowing: difficulties originated from differences in definitions and perspectives, these are common in all research. There are also difficulties in choosing the right method for your empirical research, also quite common to all researchers. But the nature of tacit knowledge as being personal, abstract and difficult to articulate increases both these difficulties even more.

The indistinct definition of tacit knowledge

It is hard to estimate knowledge; it is rather like a spectrum where one extreme is seen as completely tacit and implicit knowledge, and the other as completely explicit and codified knowledge (Leonard and Sensiper 1998; Augier and Vendelo 1999). The distinction of explicit and tacit knowledge according to Nonaka & Tackeuchi (1995) is: explicit as the objective and theoretical knowledge of rationality that can be stored after the use, and tacit as

the subjective and practical knowledge of experience, which only can be used in an actual situation. Knowledge resources have pertinently been described as an iceberg (Ancori, Bureth and Cohendet 2000; Haldin-Herrgard 2005). The structured, explicit knowledge is the visible top of the iceberg. This part of the knowledge resource is easy to find and recognize and therefore also easier to share. Beneath the surface, invisible and hard to express, is a momentous part of the iceberg. This hidden part symbolizes the tacit knowledge resources. Michael Polanyi (1966) expressed this as "we know more than we can tell". When Prahalad and Hamel (1990) talk about core competencies they explain it to be more than the explicit knowledge of "know-what". Core competence requires the more tacit "know-how" to put "know-what" into practice.

Discourses on tacit knowledge tend to be stormy due to differences in interpretation of the concept itself (Gustavsson 2000). Scholars seem to agree that tacit knowing is highly personal (among others Stenmark 2001; Polanyi 1958; Meso and Smith 2000; Vincenti 1990; Raghuram 1996; Davenport and Prusak 1998; Gore and Gore 1999; Wagner and Sternberg 1985; Nonaka and Konno 1998) abstract (among others Polanyi 1958, 1966; Lubit 2001; Ropo and Parviainen 1999; Meso and Smith 2000) and difficult to express (among others Polanyi 1958; 1966; Boisot 1995; Gustavsson 2000; Lubit 2001; Nonaka and Konno 1998; Wagner 1987; Cowan, David and Foray 2000). Due to these characteristics they also agree on the difficulty of tacit knowledge diffusion (Polanyi 1966; Nonaka and Takeuchi 1995; Bennett and Gabriel 1999; Leonard and Sensiper 1998; Zack 1999; Holtshouse 1998). They also agree on experience being a main source of tacit knowledge creation (Polanyi 1958; Nonaka and Takeuchi 1995; Augier and Vendelo 1999; Wagner and Sternberg 1985; Noteboom, Coehoorn and Zwan 1992). Lastly, a common opinion is that tacit knowing is related mainly to practicality (Wagner and Sternberg 1986; Cruise O´Brien 1995; Arora 1996; Noteboom, Coehoorn and Zwan 1992)

Differences, on the other hand, can mostly be found in underlying ontological assumptions, like in opinions of possibility and need for externalization of tacit knowing. On one hand, Michael Polanyi (1966) as well as Nelson and Winter (1982) and Gustavsson (2000), considers knowledge that is impossible to express as non-existent. On the other hand, Wittgenstein claims its existence (in Rolf 1991). The ability to express tacit knowing depends on various elements such as language, that is used as a tool for using knowledge. There may be a gap between knowledge and the ability to use the language to articulate it, but this gap is individual, not general. Johnson, Lorenz and Lundwall (2002) discuss that knowledge seldom can be completely codified without loosing some of its original quality. Another reason for not expressing tacit knowing is more related to the unwillingness to articulate the knowledge than to the actual ability, or even to a lack of need to articulate it (McAulay and Russell 1997). Gustavsson (2000) also considers knowledge to be tacit because it is suppressed. Polanyi (1958) asserts that it is possible to diffuse tacit knowing without any articulation, while Nonaka and Konno (1998) in their SECI-model consider a form of articulation of tacit knowledge necessary for externalization. Polanyi says that knowledge can be seen in two

dimensions: the focal and the tacit dimension. The focal dimension is knowledge about the phenomenon in focus while the tacit dimension is used as a tool to handle what is in focus. Hence the focal and the tacit knowing are complementary (Sveiby 1994). Cook and Brown (1999) argue differently, as they assert that explicit and tacit knowledge are two different sorts of knowledge and that neither can be made from, or changed into the other.

Differences can also be found in the existence of tacit knowing as individual/collective knowledge. The definitions show us that most scholars agree on tacit knowing as individual but there are some discussions about organizational or collective tacit knowing (Madhavan and Grover 1998; Athanassiou and Nigh 2000). Brockmann and Anthony (1998) for example discuss culture as a collective form of tacit knowledge.

The difficulties in doing empirical research on tacit knowledge mainly come from the characteristics of tacit knowledge based on the definition. A summarized definition could be: *tacit knowledge is personal, abstract, practical and obtained by experience.* This definition includes four different factors that are demanding to a researcher. The indistinct definition of tacit knowledge that is a result of the scholars different perceptions of how to define tacit knowledge, also leads to difficulties in tacit knowledge studies. An example is differencies in the perception of what is and what is not possible to study empirically.

Difficulties in empirically capturing tacit knowing

The second difficulty adressed is mainly connected to difficulties in expressing tacit knowing. These difficulties have an influence on methods that are appropriate to use in empirical tacit knowledge research.

Early research on tacit knowledge has mainly been done within other fields than business. In sciences like psychology (Polanyi 1966; Brockmann & Simmonds 1997:456) and in philosophy and pedagogy (Castillo 2002:46) research on tacit knowledge has been done for a long time. The traditions as well as the methods in these sciences have differed from traditions and methods in business research and this fact has offered different possibilities to do empirical research on tacit knowledge. Methods used in those disciplines, like the electroshocks Polanyi (1966:6-9) describes, are accepted within for example psychology but seems unthinkable within business research.

Then again methods like surveys or standard interviews, used in business economics, do not fulfill the needs to capture the tacitness of knowing. In figure 1 a review of some earlier empirical studies on tacit knowledge in a business perspective shows that a variety of methods have been used. The most used methods have been interviews and questionnaires and they have been used equally much, though sometimes supported by less common methods like diaries, cases or repertory grids. There are also a few methods exclusively developed for studying tacit knowledge. One is Tacit Knowledge Inventory (TKI) by Wagner & Sternberg (1987) that uses work related questionnaires that reflect on the individual's tacit knowledge. Tacit Knowledge Survey (TKS) by Horvath, Forsythe, Bullis, Sweeney, Williams, McNally,

Wattendorf and Sternberg (1999) is another one. This is a method using 174 factors of tacit knowledge in a questionnaire that has been adapted to three different organizational levels.

Some earlier studies on tacit knowledge					
Questionnaire	**Interview**	**Observation**	**Assessment**	**Other**	**Researcher**
x	x	x	x	Pictures	Swart & Pye 2002
				Communities of practise	Gherardi & Nicolini 2000
x					Bennett & Gabriel 1999
x					Wagner & Sternberg 1987
	x		x		Amason 1996 (Brockmann)
	x			Diaries	Agor 1985, 1986
				Documents	Wally & Baum 1994 (Brockmann)
x					Athanassiou & Nigh 2000
x					Brockmann & Simmonds 1997
x	x				Guinipero, Dawley & Anthony 1999
x		x		Case	O´Brien 1995
x					Somech & Bogler 1999
	x			Repertory grid	Steward & Steward 1982
				Personal construct theory	Kelly 1955
	x	x		Case,documents, mapping, video	Wong & Radcliff 2000
	x				Lawson & Lorenzi 1999
x	x			Documents, diaries	Stenmark 2000-2001
	x				Madhavan & Grover 1998
				Case	Kreiner 2002
	x			Case	Jacob & Ebrahimpur 2001
x	(x)		x	Tacit Knowledge Surveys	Horvath et al 1999

Figure 1. *Some earlier research methods on tacit knowledge studies*

Huberman & Miles (1994) call attention to the need of transparency in qualitative research. They say that a study must be transparent enough, for others to be able to verify the conclusions, but also to be able to renew the study or the analysis, or to detect inaccuracies in the study.

The review shows that the transparency has not been sufficient in methods used, at least not in the presentations of the studies. It has been difficult to get a picture of the methods based on the articles they are presented in. Sometimes it has even been difficult to conclude what methods have been used to gather empirical information to the studies.

Apart from difficulties related to the characteristics of tacit knowledge, such as abstraction, personality, implicitness and difficulties to articulate a researcher on tacit knowledge within business has to take research traditions into consideration when choosing the right method to do an empirical study. These traditions favour methods like questionnaires and interviews. Although many of the earlier methods are based on questionnaires the suitability of a method

without direct interaction between researcher and the studied individuals must be questioned. The more abstract, personal and implicit a topic is, the more important interaction between the two parts is in order to avoid inaccuracies like misunderstandings or errors in interpretation. These are easier to avoid in interviews especially in unstructured deep-interviews as the researcher has the possibility to immediately check up on obscurities. The problem raised in these methods is the lack of support to the referent. Referents not only have difficulties in expressing in words their tacit knowing, but many of them are also uncertain of what tacit knowing is about. These problems lead to difficulties in focusing on tacit knowledge and in seizing the referents' tacit knowing.

The conclusion of this is that there is a lack of methods to do empirical research on tacit knowledge. This is a fact that I experienced when I started out doing research on tacit knowledge diffusion. After two unstructured deep-interviews with experts resulting in nothing related to diffusion of tacit knowledge the need for a better method was urgent.

Difficulties in tacit knowledge management

Difficulties in tacit knowledge management can be seen as connected to perception and language, time, value and distance. (Haldin-Herrgard 2001; 2005) To be able to address these difficulties management has to be aware of where to find tacit knowledge, the content of tacit knowledge and the importance of it.

Managers encounter difficulties when working with tacit knowledge but if the user acknowledges the use of tacit knowledge it becomes more explicit and therefore easier to manage (Brockmann & Anthony 1998) and also to share.

In business culture the concept of tacit knowledge has not been highly valued (Beardwell & Holden 2001; Lam 2000), not only due to its apparent lack of rationality (Zack 1999) but also because of difficulties in the perception of the concept itself. In a knowledge-society where personnel is regarded as "human-resources" (Beardwell & Holden 2001) or "intellectual capital" (in accordance with K-E. Sveiby and L.Edvinsson), the value of tacit knowledge should be reappraised. An encouraging sign is the increased interest within the academic circles during recent years, and although the amount of interest in tacit knowledge has been somewhat smaller (Zack 1999) it is also increasing (Augier & Vendelo 1999; Holtshouse 1998; Ropo & Parviainen 2000; Wong & Radcliff 2000).

Abstraction, and the lack of measurability, are the main reasons to how tacit knowledge is valued and a common question scholars on tacit knowledge receive is about its measurability. It is still considered too difficult, if not impossible, to measure tacit knowledge to accomplish quantification, like for example in accounting. The concept may however be more highly appreciated through methods that concretize it.

The use of mapping based on interviews instead of quantitative measurements could help to find out the nature of, as well as localize, the existing tacit knowledge in an organization. With this form of mapping management would get a simpler and more informative instrument

to work with than with a traditional measurement. In, tacit knowledge sharing for example there is a need to know what kinds of tacit knowledge exists within the organization and where/in who the tacit knowledge is. There is not a need to know the measure of it. The most common way of sharing tacit knowledge is through face-to-face interaction and in order to do this we have to know the exact possessor of the wanted tacit knowledge.

The conclusion is that there is a need of a method to localize tacit knowing and to raise the awareness of "what and where". What kind of tacit knowledge exists within the organization and who are the carriers of the tacit knowing?

Developing a method to study tacit knowledge – the process

The development process started with collecting and defining concepts describing tacit knowing (epitomes of tacit knowledge, ETK). These concepts were then systemized into two taxonomies according to natural relationships. Lastly the ETK was used to make cards to be used as tools in interviews on tacit knowing. This process include 32 interviews and three different studies. Two with experts and one mapping study in a business organization.

Epitomes of Tacit Knowledge (ETK)

M. Polanyi (1966) pointed out that the ability to express tacit knowledge depends among other things, on the used language, and therefore the difficulty to express tacit knowledge may lie in the lack of appropriate words. To counteract difficulties with tacitness a variety of expressions and epitomes are used. In everyday life different concepts for tacit knowledge are used in communication (Ryle 1950). The epitomes in this method cannot be apprehended as synonyms to tacit knowledge as there can be different meanings in them in addition to the tacit knowledge. They are rather to be seen as indicators of tacit knowing that are being used as they are symbols of tacit knowledge. Epitomes, as typical expressions or symbols, are commonly used as elucidatory examples to understand tacit knowledge. Although ETK are created for pragmatic use, academia has made use of them in scientific work. Scholars not only use them as part of vocabulary when they discuss their research, but also when they collect information on tacit knowledge. Concepts like these therefore form natural working tools for studying or mapping tacit knowledge.

Epitomes of tacit knowledge (ETK) (Haldin-Herrgard 2001; 2005) are concepts like *intuition, know-how, rule-of-thumb* and *gut feeling,* concepts that are widely used often without considering their meaning. This may result in misunderstandings and therefore such concepts need clarification.

ETK offer means of a "language" of tacit knowledge also in organizations or in work. A conceptualization of them serves as a language toolbox for mapping tacit knowledge. In a review of literature on the field of knowledge and especially tacit knowledge, concepts clarifying the definition of tacit knowledge were picked out and used in the method. For

instance the definition of Saint-Onge (1996) -" Tacit knowledge includes the intuition, perspectives, beliefs and values that people form as a result of their experiences", offers the ETK: intuition, perspectives, beliefs and values.

According to the review the most frequently used epitomes were as follows[2]:

- *Intuition* expressed as directly knowing or learning without conscious reasoning or making choices without formal analysis. (Behling & Enckel 1991 in Brockmann & Anthony 1998) Related expressions to intuition are *non-analytical behavior*, *automatic knowledge*, or *flashes of inspiration* or *insight.*
- *Skills* used as such but also with specifications like *management, people, inductive, negotiation, physical, coordination* or *cognitive skills.* This is the ETK that is most often used without any form of definition. Some other terms such as *ability, crafts and practical knowledge* are closely related and often used with the same meaning
- *Insight* used as understanding, often in a sudden form but also as "glimpses" into knowledge (one's own or others') .
- *Know–how* often expressed as the ability to put know-what into work which to a great extent, is the product of experience (Brown & Duguid 1998). Know-how is mostly used as such, but also with specifications as *practical* and *collective know-how*.
- *Beliefs* used as a set of understandings that reflect our perspective of the world. Beliefs are also expressed as *opinions* (Giunipero, Dawley & Anthony 1999) and sometimes even as *attitudes* (Leonard & Sensiper 1998; Brown & Anthony 1998).
- *Mental models* are cognitive structures formed by the abstractions of experience. They reflect our perspectives of the world around us. (Giunipero et al. 1999) Other ETK like *cognitive schema, mental maps* and *schemas* are used with same meaning.
- *Practical intelligence* expressed as "a person's ability to apply components of intelligence to everyday life" (Somech & Bogler 1999)

A variety of other epitomes relating to those mentioned above, as well as more focused forms, were identified. In total 149 ETK were collected and a pilot study with interviews on ETK reduced them to 87 ETK[3]. This decrease was due to either no answer from the respondents or a close proximity in meaning that resulted in clusters. One example is *mental model* that includes *cognitive schemes, mental maps* and *schemata*. A systematization of ETK can elucidate their meaning and facilitate their usage.

Epitomes of Tacit Knowledge are systemized in taxonomies

Earlier research on knowledge has seldom recognized the existence of different forms of tacit knowledge (Jacob & Ebrahimpur 2001). There have been few classifications of knowledge and tacit knowledge. Knowing has been classified into two dimensions: the intellectual ("knowing what") and the practical ("knowing how") (Polanyi 1966; Ryle 1950). Tacit knowledge has been classified into technical and cognitive dimensions. The technical dimension can be viewed as expertise "at one's fingertips" and it encompasses information

and expertise in relation to "know-how", whereas the cognitive dimension consists of mental models, beliefs and values and it reflects our image of reality and vision of the future (Nonaka & Takeuchi 1995; Gore & Gore 1999).

A conceptual grouping of ETK[4] according to natural relationships in the meaning scholars have given them facilitates and improves work on tacit knowledge and the mapping of it. The taxonomies this grouping results in can be used as tools in analysis of a study and as mapping basis when mapping tacit knowledge. ETK are used in interview discussions with referents and the shared meaning attained during the interviews helps the referents to externalize tacitness of knowledge as well as the interviewers to understand the information given to them. The taxonomies offer the researcher a basic chart to systemize every referents personal ETK choice in.

ETK are sorted into two taxonomies according to:

1. Extent of abstraction in **abstract** and **concrete** and actors involved in **individual, team** and **collective**
2. Activities affected, in **mental, sensory, social** and **practical** groups

Taxonomy on abstraction and actor(s)

A distinctive feature of ETK in the literature is difference in abstraction. Although the main characteristic of tacit knowledge is tacitness as abstraction, it can also be seen that extents on abstraction vary from completely abstract to quite concrete in the concepts used. This is supported by Polanyi's (1966) thoughts about a spectrum of tacitness in knowledge.

Several concepts can be considered abstract in the sense that they cannot be conveyed to others. *Intuition* as well as *hunch, gut feeling, "feeling",* and *mental-model* are included in this group. An example of this is how one of the respondents in the survey explained *intuition*:

> You have it within you, you can't explain it to someone else, only act on it in this way because you believe in it. (Author's translation)

Other ETK may in themselves be considered abstract but lead to more concrete results expressed in our behavior or in the result of our work. Examples are *insight, talent, judgement, practical intelligence* and *rule-of-thumb.*

> *Talent*, people here may have the same level of knowledge. They have the same education and so on but then there are some programmers. What is it that makes some programmers twice as good as the others? What makes them three times better than the others? It is only that some have an inbuilt ability to do things. You can't put your finger on what it is, it is only there (Author's translation)

Culture and *know-how* consist of both explicit and implicit forms of knowledge but can be recognized by an outsider or an inexperienced person. In spite of difficulties in articulating tacit knowledge many of the used ETK have high visibility both for actors and outsiders. Examples are *best-practice, skills, improvisation, genres* and *instinctive reaction*.

Another distinctive feature is based on the actors involved. Although tacit knowledge is usually perceived as highly individual (Bennett & Gabriel 1999) and personal (Boisot 1995; Polanyi 1966) many ETK refer to more collective tacit knowledge. Only an individual can feel *intuition, taste* or *gut feeling* and it is impossible to transfer it to other actors. ETK as *mental models, attitudes, know-how, judgement, skills* and *improvisation* include not only individuals as actors but also teams and groups as actors. Individuals have *mental models* and *know-how* and teams have *shared mental models* and a *collective know-how* developed by former and present members. *Best-practice, common sense,* and *culture* are exclusively collective; they do not exist without a group. These are socially or functionally based and represent collective forms of tacit knowledge.

Taxonomy on affected activity

ETK are also grouped according to which activity is affected by the tacit knowledge. Earlier scientific work has been done on cognitive/technical dimensions of tacit knowledge but literature review showed that these dimensions do not illustrate ETK completely. Activities used in the literature and in this taxonomy are **mental, sensory, social** and **practical.**

Some ETK are related to mentality and affect actions taken in **mental processes** such as problem solving. We use *intuition, insights* and *judgement* as we detect, analyze and solve problems. Cognition can also be sorted as a mental process and our *mental models* have an influence on our cognitive *abilities* as well as our *creativity*. A respondent expressed creativity as a form of tacit knowledge in the following way:

> *Creativity* is simply idea creation and so on. I understand it as when we put our ways of working into question all the time. Are we working with the right things and in the right way? It is in this process that the creativity shows (Author's translation)

Other ETK used include **sensory processes**. We often use epitomes wich include feelings, both physical and mental feelings. We have *"feelings"* as well as *gut-feelings* or we *"know in our body"*. Other forms of affection such as *artistic vision* and *taste* are also included in sensuous ETK.

> *Gut feeling* is important. You have a feeling, it is this knowledge you have and the experience. You can't pinpoint what it is that makes you feel uneasy when everything, all analysis shows that you should do something but yourself think that you should not do it (Author's translation)

Tacit knowledge influences and is influenced by our **social processes**. For example *norms* and *communication skills* that control our relationships and interaction with other people are tacit. The most extensive form of social tacit knowledge can be found in *culture*. Irrespective of the scope of culture (national or organizational) the foundation of it is in tacit knowledge concerning behavior, values, language, etc.

The study showed that much of the managers work kan be classified as social tacit knowledge, as one referent tells us:

> *Management skills* are what I understand as listening to people, discussing with them, speaking about things that perhaps are not always so nice, you can convince people. (Author's translation)

A common opinion on tacit knowledge is the practicality of it. This is reflected in a great variety of ETK used in **practical processes**. Most commonly used are not only different forms of *know-how* and *skills* but also ETK like *techniques, experience, best practice, rule-of-thumb* and *practical intelligence* fit into this group.

> *Techniques* in our job are only ways of doing things. You have to create your techniques to do things but you also have to learn them to be fast in certain things, like reaction (Authors translation)

In some ETK the expressed meaning of the concept in different situations results in a different classification. *Ability* for example, can be classed as both mental and practical epitomes depending on the meaning included in the concept. Ability as endowment may be classified as a mental ETK whereas ability as skillfulness categorize as a practical ETK.

An important tacit knowledge is the ability to grasp a holistic perspective. This can also be found in the ETK. The holistic ETK are difficult if not impossible to sort into only one group; in some ways they belong in to all groups. Examples of this are *inner* or *personal competence* that includes all four different activities.

The two taxonomies of ETK put the traditional view of tacit knowledge as being abstract, difficult to explicate, individual and practical- into question. In the first taxonomy, the systematization of ETK that scholars have used shows that much of tacit knowledge is explicated by articulation in images presented by epitomes and in work results. It also shows that only some ETK are individual and that many epitomes are used to express knowledge in teams or even general knowledge. According to the second taxonomy the practicality of tacit knowledge is not to be interpreted as only physical but rather as the ability to get things done irrespective of the type of activity.

ETK cards to study/map tacit knowledge – the result

ETK serve as tools for individuals to identify and reflect on the tacit knowledge they use in their work. In an interviewsituation a bundle of 87 cards on ETK are used as triggers to the discussion. Every card consists of only one ETK. Cards are shown one at the time and constitute the topic of discussion and as they are processed one at a time they officiate as the focus of the discussion.

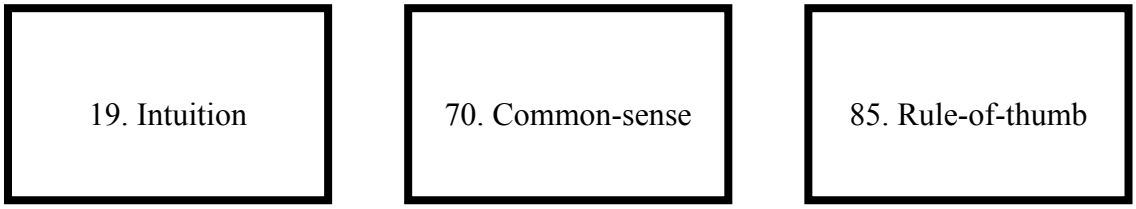

Figure 2. *Cards on Epitomes of Tacit Knowledge (ETK), nr. 19, 70 and 85*

An interview is done as follows:

- The respondent is informed of the topic of the interview, the process and that it is recorded. He/she is asked to relate to his/hers way of doing the work.
- The bundle of cards is handed over to the respondent and he/she is asked to sort out all the cards applicable to his/her work.
- After the sorting the interviewer collects the chosen cards and these form the basis of the interview.
- In the beginning the needed background information is recorded, for example; name, department and work-assignment
- The interviewer hands over one card in turn to the referent with the questions of interest.
- The interviewer can pose additional questions to guarantee understanding.

The taxonomies of ETK facilitate analysis of the mapping irrespective of if it's used for valuation or organizational development. This is a method that can be used in research done with many different research approaches for example in research done with phenomenography or etno-methodology. The choice of method of analysis can also differ and is of course depending on the data collected and the purpose of the study. In the evaluation study the method was successfully tested on both quantiative and qualitative analysis.

How to use ETK cards in interviews

The method has been tested in a study in a small financial firm to map it's tacit knowledge resources. The study was executed through interviews with 22 of the firms employees.

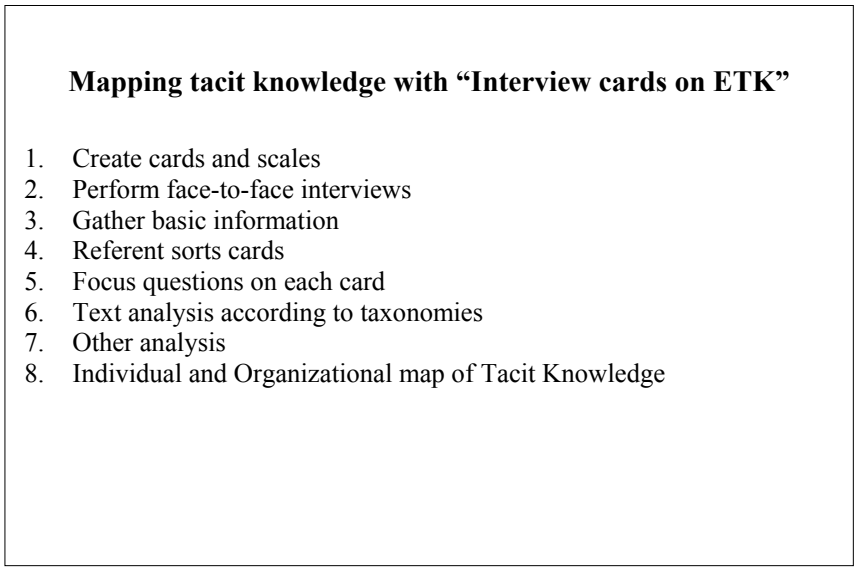

Figure 3. *The mapping process*

The mapping process is done as follows;

1. Start with creating the needed tools; as ETK are culturally based, the ETK have to be adjusted to the surrounding culture. This concerns mainly the local language used in the culture and a translation of the ETK into the language in use may be needed. When the right ETK has been decided one small card is created to each ETK. Other tools that are needed for the aim of the study can be different scales or schemes
2. The cards are preferably used in face-to-face interviews, as there often is a need for check-ups and encouragements. As the interviews tend to be long and contain narratives the use of an audio tape recorder is recommended.
3. Needed basic information such as department, work assignments, gender, age etc. are recorded. The respondent is informed of the topic of the interview, the process and that it is recorded.
4. All the cards are handed over to the respondent and he/she is asked to sort out the cards applicable to his/her work. The respondent is asked to relate to his/hers way of working. At this stage the referent is allowed to check up meanings in concepts unknown to him/her. After the sorting process is completed the interviewer collects the cards. Those not chosen are put away and the chosen cards form the basis of the interview.
5. The interview starts and the interviewer hands over one card in turn to the respondent with the questions of interest. For example in the test study the following questions are posed for card number 19 intuition:
   - What meaning has intuition got to you in your work?
   - How important is intuition to the final result of your work on a scale 1-5?

The interviewer can pose additional questions to guarantee understanding and to create a discussion on the ETK in question. In order to be able to systemize according to the taxonomies a discussion of the meaning should always be included.

6. A text analysis of the respondent's meaning of each chosen ETK is performed according to the taxonomies. As the meanings of the ETK are related to the person and the work assignment, this analysis may result in different sorting of the same ETK for different respondents. Intuition for example can be perceived as a social activity to a manager but a mental activity to a financial analyst in the same organization.
7. Additional analyses needed for the aim of the study are performed. If quantitative data has been gathered, quantitative analyses like descriptive statistics or cross-tabulation are also possible to perform.
8. To create a map of tacit knowledge the data for each respondent is related to, for example, a department, work assignments or other variables of interest. By connecting all the individual results we get a map showing the tacit knowledge resources in the organization in the form of ETK. This information can be used as a knowledge management tool to localize competence, and as a trigger to the discussion of meaning, or to assess the value employees attribute to their tacit knowledge.

Evaluation of the method and development proposals

The test study showed a lot of benefits offered by this method but also that there are some disadvantages that should be taken into consideration.

Benefits of the method

As everyone uses ETK every day to facilitate the explication of tacit knowledge, the ETK are also suitable in studying or mapping tacit knowledge. These ETK are familiar concepts although they are self-evident which leads to a lack of reflections on their meaning. The ETK cards used in the interviews served as excellent triggers for discussions and also helped referents to keep their focus on tacit knowledge. The interviews made during the development process and in the test study show that data collected with ETK is more comprehensive, focused and vivid than data from traditional deep-interviews on the same topic without the use of ETK. The respondents were able to narrate their tacit knowledge using already known words to them. But to be able to do this, there has to be a cultural aspect to the language used in the method. The ETK has to be adapted to the cultural setting, for example there were several different Swedish translations of the ETK *ability,* and the ETK *common sense* in Swedish corresponds more to "sensible mind". In every culture there can also be found unique conceps that can be used. These interviews are more structured than traditional deep-interviews without loosing the richness in the answers. Mapping tacit knowledge with ETK

has offered a method that more fulfills the researchers and referents needs to learn about and localize tacit knowledge in an organization.

The taxonomies facilitate scientific work on tacit knowledge as well as its everyday use in professional working life. A clarification of concepts prevents misunderstandings and facilitates the discussion on tacit knowledge. The taxonomies also proved to be helpful in analyzing the data, on the use of, and on the importance of tacit knowledge.

These two taxonomies indicate that the concept of tacit knowledge often defined as "abstract, practical, individual and based on experience" is too narrowly defined to illustrate all the different forms tacit knowledge can take. This applies both to abstraction and actors included as well as to activities affected. According to the ETK tacit knowledge can be abstract or concrete and it can be individual, shared in a team or even by an organization. Tacit knowledge is also more than practical knowledge according to the ETK it can also be mental, sensory or social knowledge.

The tacit knowledge maps that are created based on the interviews offer a lot of information to management on the "whats and wheres" of the tacit knowledge resources. Information to be used in tacit knowledge management activities.

Disadvantages of the method

A generalization of the use and importance of tacit knowledge is perhaps not justified based on this study, but the ETK instrument can be generally used for mapping organizational specific tacit knowledge and this in turn, may be important both for the individual and the organization. A disadvantage that also has to be considered when doing research/managing with the help of this method is on what basis the ETK cards are chosen. There is a risk that the fact that a certain ETK concept is familiar or not to a respondent, guides the choice more than the actual use of the tacit knowledge. Therefore the use of ETK is recommended to always include a discussion of the meaning of the ETK concept. As the ETK are many and the interviews tend to be long a tacit knowledge mapping is quit a large process in an organization. Therefore management should carefully consider what kind of information they need from a mapping.

Possible developments

A further development of this method could be to formalize and use the ETK cards to structure the processes of the use of tacit knowledge as some of the respondent already spontaneously did as they started to create structures with the ETK-cards. This could preferably be done when the interest is, for example in, the relationships between the parts of the personal knowledge or the process of tacit knowledge creation. To be able to use the structures of ETK cards in a study, photographing, sketching or even a chart could record them. By encouraging the respondents to tell more stories the method could also be developed into an excellent base for story telling on tacit knowledge.

The intention with the method has not been to explain all the tacit knowledge, as this still is perceived as a mission impossible. This technique has, however, made it possible to move the barrier of what parts of our knowledge we can tell about.

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Endnotes

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[2] See Haldin-Herrgard (2001; 2005) for a full list of ETK
[3] In the survey 99 Swedish ETK were used as the translation produced additional meanings in Swedish.
[4] See Haldin-Herrgard (2001; 2005) for taxonomies on ETK

From normative to tacit knowledge: analysis of the CVs of job candidates in personnel selection

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Introduction

The choice of the "right" or "best" job candidate is somewhat of a paradox. Probably every personnel manager has a similar story to recount: "The worst job candidate was selected by mistake, and turns out to be one of the best job incumbents". A straightforward conclusion is that the methodology used to select the job candidates in this particular case was unreliable. Equally we could conclude that the crucial decision to choose the right or best candidate can, itself, be wrong.

Newell and Shackleton (2001) argue that successful performance on a job is rarely dependent solely on a particular individual. The individual job exists within a complex network of structures, processes and relationships, which interacts with the actions of the particular individual employee. Therefore, a barely competent recruit can perform to a high standard if he is in a supportive environment.

The former perspective challenges the traditional model in personnel selection which emphasizes measurement, prediction and control. The main assumption is the possibility of identifying the "right person for the job". It is important to identify the job requirements through methodologies such as job analysis and to distinguish between the traits and abilities of different individuals. Furthermore the selection decision is taken at one single moment, in which all information regarding the job candidate is assessed.

The traditional model of personnel selection can be challenged in different ways. For example, selective human perception and individual political agendas prevent the objectivity required by the traditional model; the influence of implicit and tacit knowledge in decision-making increases the assessor's commitment to the chosen course of action. However, literature lacks data on job selection, to support the iterative and implicit processes involved in decision-making.

In this paper, we present data and discuss further the worth of iterative and implicit decision-making in personnel selection.

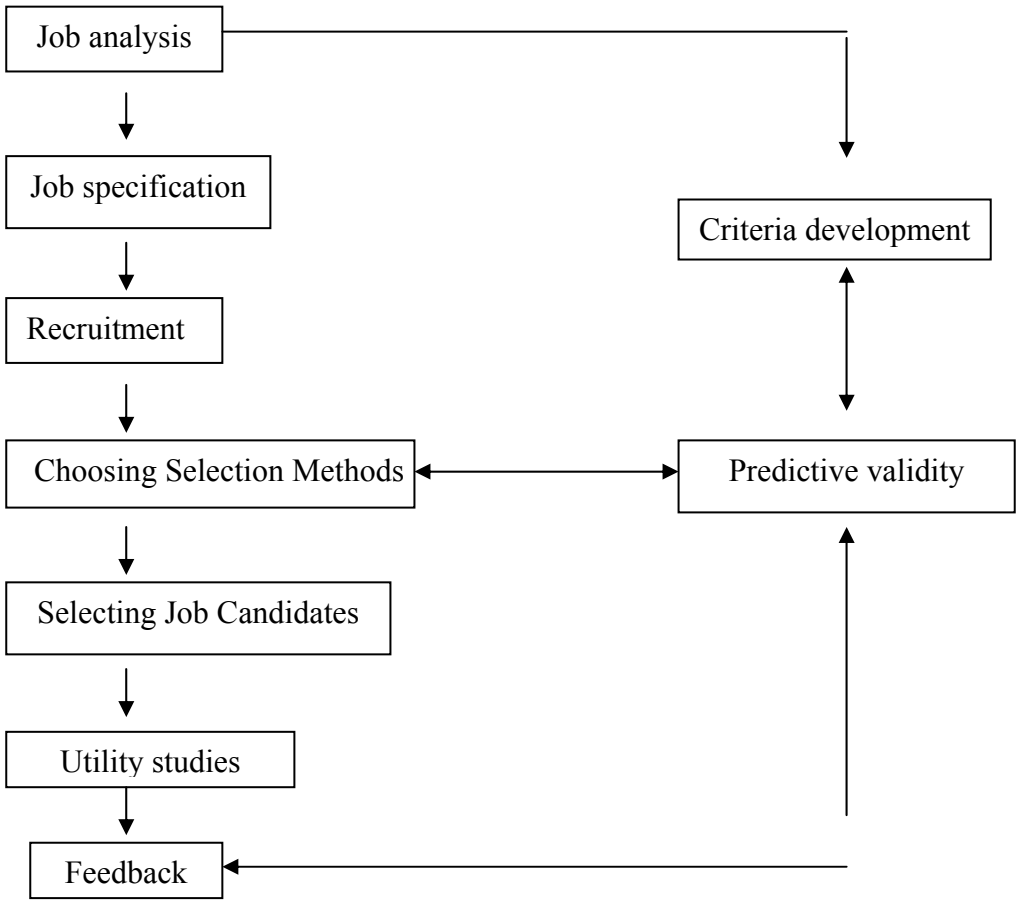
Literature review

The selection of job candidates can be conceptualized in terms of the decision-making process. Reviewing the literature, we find two different approaches in explaining decision-making: the normative-predictive model and the action-intuitive oriented model.

Selection as a normative-predictive model

Wolff (1993) argues that the normative-predictive paradigm should be considered as the only valid and reliable method for selection purposes. This methodology relies heavily on psychometric knowledge. The selection decision is based upon correlations between the

results obtained in the predictors (psychometric tests) and the assessment of job candidates in the future work context. The decision to use one or another predictor depends upon the criterion identification and the predictor's validity. For example, if we want to assess the job candidate's ability to communicate, a job interview might be a good predictor. Figure 1 shows the main steps of the predictive paradigm.



Source: adapt. Smith and Robertson, 1993

Figure 1. *Predictive paradigm*

According to the normative-predictive paradigm the decision-making process should be "rational". There is considerable literature prescribing how decisions should be made. Normative research has engendered an increasing consensus among researchers as to what kinds of decision-making should be called rational. In what concerns selection, the predictive paradigm (Figure 1) shows the different steps: 1) Understand the situation and identify the problem – job analysis; 2) Gather information and materials to help solve the problem – job specification; 3) Generate possible solutions to the problem – recruitment; 4) Systematically evaluate each solution: - assessment methods; 5) Select "best" solution – selection; and 6) Monitor and evaluate results – validation and utility studies.

On the other hand, empirical research has found ample evidence of decision-making processes that appear irrational by the normative standards (Cyert and March, 1963; Janis, 1972; Lindblom, 1959, March and Olsen, 1976; Nisbett and Ross, 1980 Tversky and Kahneman, 1974). The apparent irrationalities are not limited to insignificant decisions: people behave similarly when making major decisions on strategic issues. And the apparent irrationalities are not limited to individuals: they also happen when taken in groups (Janis, 1972). Mintzberg (1989) noted that managers do not make decisions solely based on systematic, orderly, rational data: they tend to decrease the importance of analytical evidence.

Moreover, predictive paradigm advocates agree that this model is restrictive when applied to certain types of jobs (Ribeiro, 1996). When job productivity is not exclusively dependent on one individual and requires great interdependency, the predictive model is less useful. This is particularly relevant when the process of selection relates to managerial work. Leadership, flexibility and team building are some of the criteria relevant to future job performance, and unsuited to psychometric testing. Regarding the use of psychometric tests, Smith and Abrahamsen (1992, cit. Anderson and Herriot, 1997) discuss the results of a survey in six different countries: France, Germany, Israel, the Netherlands, Norway and the United Kingdom. Interviews, application forms and CVs were used in 84% of the selection processes whereas psychometric tests (personality, cognitive) were used in filling 10 to 20% of the job vacancies. The results of this study show that the methodologies used in the selection process are not necessarily those that exhibit higher validity (Anderson and Herriot, 1997). Moreover, the correlation between the frequency of the instrument's use and its validity is negative and equal to -0,25 (Smith and Abrahamsen, 1992, cit. Anderson and Herriot, 1997). There is also empirical evidence in the USA and Portugal which supports the same trend (Muchinsky, 1986 e Ribeiro, 1996).

From the normative-predictive model emerges the concept of bias when a selector diverts from the structured and objective context of the selection process (Dipboye and Gaugler, 1993; Dipboye, 1994, 1997). Bias can be regarded as an unacceptable predisposition towards a candidate which might result in subjective assessment of job candidates. For example, the use of stereotypes promotes discriminatory judgements towards of certain groups of individuals. Anderson and Shackleton (1993) summarised some of the bias acknowledged in the selection literature: for example, the self-fulfilling prophecy, the halo effect, the first impression, the contrast effect and the *similar-to-me* effect.

However, the bias concept should be used carefully (Oliveira, 1998). In fact, the selector predisposition towards a job candidate may not follow a normative (objective, structured) selection process and even so, be considered appropriate for the organization. That is, the selector, due to his experience and knowledge of crucial attributes for "good performance" for that specific organization might refuse objective information as a result of psychometric measurements in favour of subjective information collected throughout the selection process. Werninont and Campbell (1968) make the distinction between *signs*, simple behaviours, isolated, unsystematically found (e.g., avoiding eye contact) and *samples,* defined as sets of

similar candidate characteristics collected through various selection instruments. Signs were consider potential bias due to their characteristics. More recently, Robertson and Smith (1993) recognize the value of using signs in the selection process, mainly when there are contradictory data regarding job candidates. They also suggest that the use of *samples* is appropriate in situations where job candidates should be task proficient but less relevant when there is a need to understand job candidates' idiosyncrasies unattainable through standardized and structured procedures, e.g., the individual's creativity, potential and initiative.

Selection as an action-intuitive model

The literature on decision-making presents a wide range of arguments highlighting the limitations of the normative-predictive model of decision-making. However, we will focus on the following issues: 1) the argument of action rationality in the decision-making process and 2) the argument of cognitive schema: intuition and implicit knowledge.

The argument of action rationality in the decision-making process

Recalling the normative-predictive paradigm, it is possible to suggest that decision-making is a crucial process in selection procedures. Within this perspective, the aim is to select the "right" person according to a specific job task. However, the assumption underlying the normative-predictive paradigm ignores the fact that successful performance on a job is rarely, if ever, dependent solely on a particular individual (Newell and Shackleton, 2001). There are several other factors that will affect job performance: for example, lack of resources, minimum training, lack of a supportive supervisor and colleagues, to name just a few. Rarely are selection decisions assessed. Therefore, factors that contribute to recruit job performance are not explicitly articulated, which leads to an overemphasis on the decision itself.

Brunsson (1982) argues that it is necessary to be careful in considering the outcome of the decision as an end in itself. He suggests that the process of decision-making is a means to an end, being part of a wider process, quite often leading to action. A successful action may not follow a rational decision-making process, as in the example provided above. In fact,

> "If decisions should initiate actions the irrationality is functional and should not be replaced by more rational decision procedures. Rational analysis is more appropriate where motivation and commitment offer weak benefits" (p. 36).

On the other hand, when decisions are risky and lead to illegitimate actions, there is a need for extreme motivation and commitment. For example, this might be particularly relevant when the job opening is for a demanding and upper position within the organization.

Therefore, Brunsson (1982) proposes a distinction between action rationality and decision rationality. Based on the contributions of Lindblom (1959), Brunsson (1982), and Newell and Shackleton (2001), table 2 shows the main differences between the criteria/rationality for rational decision-making and a rational action:

Action rationality	Decision rationality
Few alternatives	Multiple (all) alternatives
Consider only positive consequences	Consider all, both positive and negative consequences
Construct the objectives afterwards	Pre-definition of objectives

Table 1. *The contrast between action rationality and decision rationality*

We can point out three main differences between an action perspective and decision perspectives.

First, an action perspective considers that multiple alternatives generate uncertainty and this reduces commitment and motivation. If decision-makers are uncertain whether a proposed action is good, they are less willing to take it and to commit themselves to making it succeed. From an action point of view, few alternatives are desirable. Conversely, within the decision-making perspective, being unable to consider multiple alternatives is described as a disturbance and deficiency in decision-makers' mental abilities. Simon (1960) put forward the argument of bounded rationality. There are multiple factors, such as time, information available and cognitive resources that inhibits individuals searching for all possible solutions. The search ends when a satisfactory solution is found, instead of the optimal solution.

Second, an action perspective suggests that it may be more sensible to search for positive consequences since this reduces inconsistency which can stimulate doubt, whereas the decision-making perspective argues that decision-makers procure both positive and negative consequences. Since action depends on an individual's commitment and motivation, emotion and intuition can also play an important role (Butler 1991), and therefore it is difficult to change the course of action if the actions prove to be a mistake. The literature provides several different examples of escalation in decision-making (Drummond, 2001).

Finally, an action perspective explains the decision-making process as incremental and discontinuous, instead of a planned and continuous process. Therefore, a better strategy may be to start from the consequences and invent the objectives afterwards. Lindblom (1959) has already argued that thorough rational analysis is irrelevant to the incremental steps in American national policy. But irrationality is even more valuable for actions involving radical changes, because motivation and commitment are crucial.

Brunsson (1982, p. 29) acknowledges the use of ideology by individuals as a facilitator for action:

> "Choices are facilitated by narrow and clear organizational ideologies, and actions are facilitated by irrational decision-making procedures which maximize motivation and commitment".

At the same time, he proposes three kinds of organizational ideologies: subjective, perceived and objective. A subjective ideology is defined as individuals' cognitive structures.

A perceived ideology relates to what people think other people think. An objective ideology is a set of ideas shared by organizational members and which afford a common basis for discussion and action. In the same vein, Schein (1983, 1984, and 1991) proposes the concept of organizational culture which takes into consideration the values and norms of an organization to produce explanations of success and failure, in particular the values and norms of the organizational founder and early senior managers. More specifically, the cultural perspective sees decision-making as based on individual's assumptions and beliefs. Morgan (1986) offered the cultural metaphor as a way of providing insights about organizational processes (for example, leadership, change, organization-environment relations) which emphasises

> "the truly human nature of organizations and the need to build organization around people rather than techniques" (p. 138).

Regarding the selection procedures, Robbins (1998) argues that a company's culture derived from its founder will affect the selection process. The founder and senior managers set the general standards of what is acceptable behaviour and the new employees are socialized into the firm's values, beliefs and norms. (Bowen *et al.*, 1991 and Kristof, 1996). On the other hand, Dipboye (1997) suggests that the use of non-structured procedures might play a symbolic role in the maintenance and protection of organizational values and culture. Therefore, we propose the following figure which represents the role of organizational values and norms in personnel selection procedures.

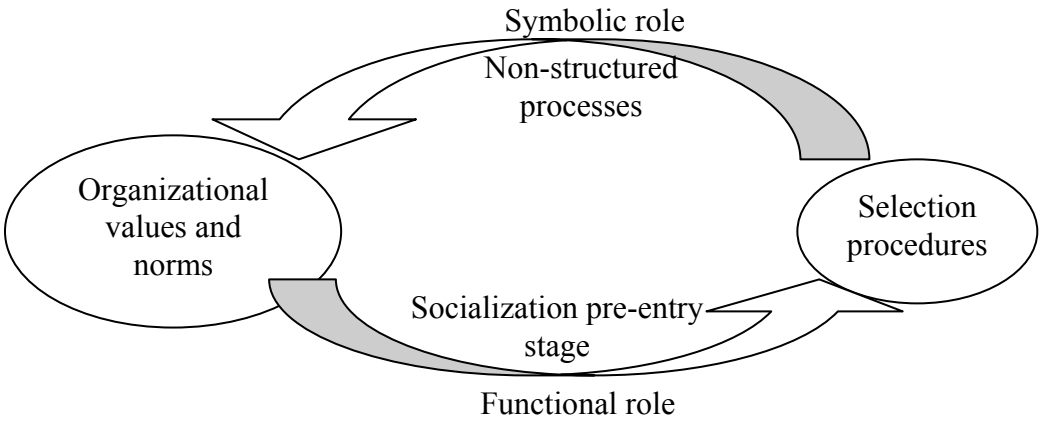


Figure 2. *The virtuous cycle of action-intuitive model in the personnel selection process*

Furthermore, Brunsson (1982) argues that the different kinds of ideologies proposed are at least partly inconsistent. Equally, reviewing the literature on organizational culture, Martin (1992) distinguishes three different perspectives, showing a certain degree of inconsistency between them. We suggest the following comparison:

Ideology framework	Culture framework
objective	Integrationist
subjective / perceived	differentiation and fragmentation

Table 2. *Comparison between the Ideology and the Culture framework*

Similarly to adopting the objective ideology, the integrationist draws our attention to what organizations' members have in common. Within this perspective, subcultures are acknowledged but they should be eliminated. From the differentiation approach emerges the idea that the organization is shaped by different subcultures which coexist

> "sometimes in harmony, sometimes in conflict, and sometimes in indifference to one another" (Martin, 1992, p. 83).

Within this perspective, inconsistency is stressed since the cultural practices that exist in the organization are interpreted differently by different organizational employees, depending on individuals' cognitive structures and different perceptual worlds. An example is when an organizational value, such as promotion on merit, is closer to a "who-you-know" practice. Equally, this perspective emphasizes power, conflict and the differences of interests and opinions among different groups. Power acquisition and maintenance might be relevant in explaining decision-making withdrawal behaviours from standardized and objective procedures. Such behaviours would allow individuals greater ability to influence decisions by the use of their own criteria and information which support their preferences (Pfeffer, 1981). Finally, the fragmentation perspective presents culture as an ambiguous concept, which emphasizes the dynamic, paradoxical and confused state of enacted culture.

<u>The argument of cognitive schemas: intuition and implicit knowledge</u>

Cognitive schemas are crucial elements in selection procedures: collecting, selecting and processing job candidates' information (Millar, Crute and Hargie, 1993). *Schemas* refer to "organized experience" (Bartlett, 1932). More relevant for the present discussion is the complementary and dynamic concept of *schemata* which suggest that we organize new impressions or experience in relation to other previously stored cognitive structures:

> "we 'fit' current cognitions with a perceptual pattern which appears to be pre-existent in a manner which enables us to go direct to that portion of the organized setting of past responses which is most relevant to the needs of the moment" (Bartlett, 1932, p. 206).

In terms of the selection procedure, we could say that the process of finding an adequate job candidate (person-job or organization fit) depends on the selector's past experience which enables him to go direct to a solution, i.e., matching candidates' values with those of the organization.

Close to Bartlett's concept of schemata is the notion of intuition. Several other authors propose that decision-making is an intuitive process which relies on individuals' past experiences, their general sense of intuition and implicit knowledge. Intuition is a complex

construct, with multiple dimensions, often linked to implicit knowledge (Oliveira, 1998). Table 3 exhibits different contributions for the understanding of intuition and implicit knowledge.

Authors	Meaning and description
Bartlett (1932) Wittgenstein (1980, 1982) Khatri and Ng (2000)	Intuition is an iterative process of meaning attribution, implicit or innate, which involves emotion.
Polanyi (1962)	Implicit knowledge is procedural knowledge based upon experience with various degrees of conscientiousness.
Westcott (1968)	Intuition is presented as the process of reaching a conclusion on the basis of less explicit information than is ordinarily required to reach that conclusion. Intuitive knowledge may often begin its developmental course as implicit knowledge.
Cooley (1987)	Implicit knowledge refers to subjective knowledge oriented to action, as a result of experience, i.e., learning by doing.
Matte-Blanco (1975, 1988)	Intuition is the result of a logical unconscious process, which involves organizing previous experiences schemas stored in our brain.
Agor (1986, 1989)	Intuition as an individual skill, which can be improved through training.
Behling and Eckel (1989)	Six conceptualizations of intuition: a paranormal power or sixth sense; a personality trait; an unconscious process; a set of actions; individual's experience; implicit reasoning.
Clement (1994)	Intuition is a broader construct than implicit knowledge, which involves two dimensions: implicit and explicit.
Crossan et al.(1999)	Intuition as a two-dimensional construct: expert intuition (pattern recognition, past-oriented, exploitation) and entrepreneurial intuition (novel connections, future oriented, and exploration).

Table 3. *Different contributions on intuition and implicit knowledge*

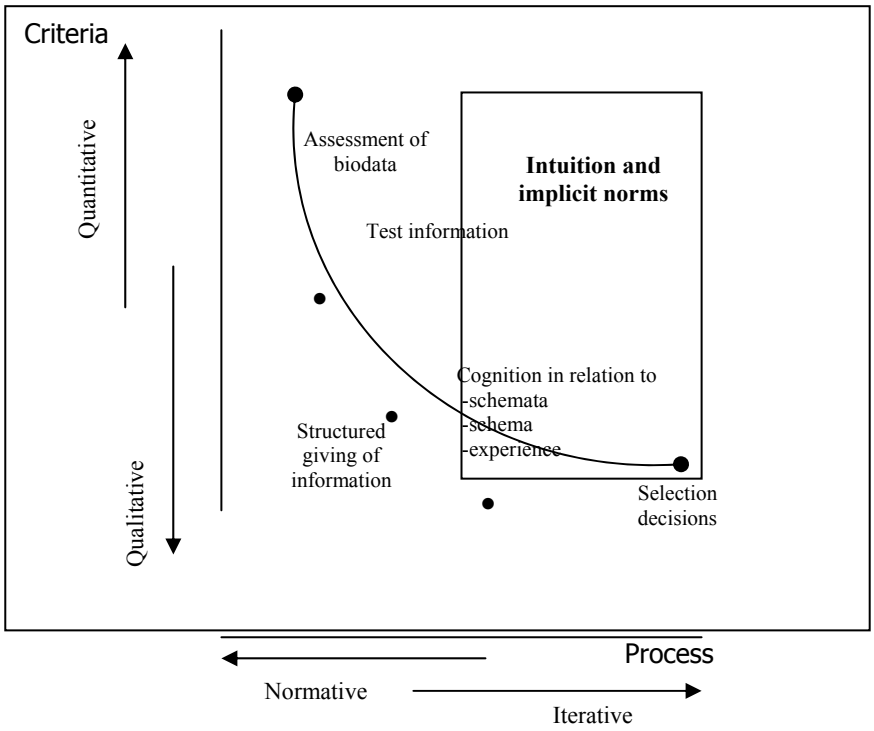
Moreover, Clement (1994) indicates that part of the knowledge used by experts in science consists of concrete physical intuitions rather than abstract verbal principles and equations. He carries on by explaining that

> "the role of these intuitions is not restricted to a start-up role in a brief period of the beginning of the problem solution – in particular they can play the important role of anchoring assumptions that underpin explanations constituting the subject's central understanding of a system" (p.204).

In the selection process, the concepts of intuition and implicit knowledge might be particularly relevant in explaining the decision-making process, that is, when the selector has to decide for or against a specific candidate. In fact, the great majority of contributions on implicit knowledge and intuition agree that its use is unconscious and based upon an individual's past experience without being aware, or fully aware, of how it is done. Particularly relevant is the concept of *logic unconscious* (Matte-Blanco, 1975, 1988) which acknowledges a certain rationale to the unconscious process of information storage. This rationale refers to a set of interrelated categories of knowledge and experience, used almost instantaneously, avoiding chaos in our daily lives by the use of unorganized information. In the same vein, Wittgenstein (1980) suggests the concept of a *fulcral point* (i.e., a moment in which managers will come to a definite judgement; confirming or refuting job candidate's suitability for a job) as the outcome of the iterative, step-by-step process of intuition.

The framework which considers intuition and implicit knowledge is useful for understanding what happens in selection, namely the process of CV analysis. For example, the "rules of the game" for CV analysis are made-up either explicitly structured or implicitly iterative. Additionally, intuition might be used "in a flash" but, underlying, there is a preconscious, step-by-step understanding of job candidates' attributes. Therefore, intuition is crucial in arriving at a definitive judgement.

Several other authors (Oliveira, 1998 and Cooley, 1987) suggest that explicit or semantic knowledge (i.e., to know what something is or means, or how and when it should be done) is used when selectors have access to biographical data and also information from tests of knowledge, skills and abilities, as well as psychometric tests. If so, these are likely to have been conducted on an objective or quasi-objective basis, and the candidates' performances are then calculated and scored. Intuition and implicit knowledge are used in selection when procedures are based on iterative processes (i.e., an individual's approach to the decision-making process in which he identifies relevant information by approximations), or when confronted with less structured information, the selector implicitly knows which criteria to use in order to obtain an effective result. Figure 3 represents a model for the decision-making process in personnel selection. It points out the use of implicit and tacit knowledge, mainly when qualitative data is assessed, and notes that it is limited when it concerns objective data, such as biographical information or psychometric tests.



Source: Oliveira, 1998 (derived from Cooley, 1987)

Figure 3. *Intuition and implicit rules influence in selection process*

More recently, however, Guimarães (2005) found evidence that implicit theories are used by selectors at an early stage in the selection process: for example, when selectors argue that they prefer to receive job candidates from specific universities, although there is no reliable ranking system in Portugal, or when selectors argue that it is possible to refuse job candidates for commercial tasks on the basis of their high grades, suggesting that recruits use their time in the university solely to study instead of developing other important competences for the future. There are differences between the selection processes employed within the public and the private sectors. Whereas in the public sector, job vacancies are publicized through a public offer by making selection criteria explicit (for instance, a specified grade is one of the criteria), in the private sector there is no obligation to do so. Anecdotal evidence shows that it is possible to find a high number of individuals from a specific university working in the public sector as a result of the generalized practice of giving high grades to students. In the very early stages of the selection process, we suggest that information is unconsciously or pre-consciously processed by selectors, through incoming schemata to pre-existent schema e (Bartlett, 1932), concerning what job candidates' attributes fit or do not fit with organizational or operational needs. The selector develops an implicit logic which allows the intended result.

The present research aims to understand the process of decision-making in the early stage of personnel selection: CV analysis. More specifically, we would like to find out if the use of

implicit or tacit knowledge by the personnel selector provides a certain degree of rationality in their actions.

Methodology

We used an inductive research approach which values empirical experience and observation. From this perspective initial questions are generated. We formulate open questions regarding a particular phenomenon, where the interrelationship between concepts predominates. We use the interview technique to collect information. Ackroyd and Hughes (1992) argue that researchers gain access to valuable information through interviewee's verbal reports difficult to achieve using any other technique. Moreover, Ruquoy (1997) suggests that interviews allows an *in loco* analysis of interviewees' attitudes, values, believes and perceptions. There are other advantages in using interviews, such as in depth information and flexibility, which brings out the interviewees' own cognitive frameworks and language (Quivy and Campenhoudt, 1992).

Sample characterization

The enterprises included in the sample were selected according to three different criteria: accessibility, marginal information output (Glaser and Strauss, 1967), and the size of the firm. The empirical research is based upon small and medium sized firms, with one exception, which represents the great majority of Portuguese business. There is a wide variety of firms with regard to business activity. The sample comprises 24 organizations in the Porto area, in which are based 11.3 % of Portuguese firms. Table 4 shows the main characteristics of the firms in the sample, e.g., type of activity, foundation year, number of workers, interviewee position and years of experience.

Firm	Foundation year	Activity	Nº employees	Interviewees		
				Experience in years	Age	Job Function
A	1938	Cables	360	5 in the firm	52	HRM
B	1951	Inox kitchen wear	240	2 in HR	25	HRT
C	2003	Hotel	200	2 in the firm	30	HRM
D	1926	Varnish and Paint	742	na	na	HRM
E	1977	Beverage	2500	na	na	HRT
F	1917	Construction	2000	na	43	HRM
G	1935	Construction accessories	400	30 in HR	52	HRT
H	Na	na	na	9 in HR	na	HRT
I	Na	Films and hardware	na	15 in HR	na	FAM
J	1998	Leisure and cultural products	700	5 in HR	27	HRM
K	1999	Construction and engineering	na	11 in the firm	na	HRT
L	1927	Textile	na	20 in the firm	na	RHM
M	1999	Tele-communications	350	12 in HR	na	RHM
N	1987	Insurance	125	na	na	BDA
O	1993	Banking	875	7 in the firm	na	RHM
P	1871	Insurance	na	17 in HRM	na	RHM
Q	1947	Automobile	920	3 in the firm	na	HRT
R	na	Health	na	17 in HRM	na	HRM
S	1985	Retail	37000	Vast	na	RHM
T	na	Human Resources	na	Little	na	RHM
U	na	Textile	250	Vast	na	HRM
V	1971	Office furniture	230	15 in the firm	52	GD
W	1987	Ceramics	68	na	46	HRM
X	1969	Watering systems, polymeric	90	8	31	HRM
Y	1942	Wine	na	20 in the firm 8 in this function	40	HRM
Z	1998	Telecommunications	2000	1 month in this firm	29	HRT
AB	1948	Electro-mechanics	1800	17 in the firm	43	HRM

Legend: na – there is no information available; HRM – Human Resource Manager; HRT – Human Resource Technician; FAM – Financial and Administrative Manager; BDA – Board of Directors Assistant; GD – General Director.

Table 4. *Characteristics of firms in the sample*

Procedures and Techniques for Collecting Information

The head of the human resources department or the person in charge of recruitment and selection procedures was interviewed using a semi-structured panel format. Denzin (1970) explains the advantages of triangulation, namely the use of multiple investigators. The interview was planned around three different parts. To begin with, we asked individuals to describe the process of recruitment and selection in the firm, more specifically how CVs were assessed. Secondly, they were invited to play a "CV assessment game". This game consisted of asking the individuals to split given CVs into three different categories: acceptable for further analysis, rejected and in stand-by, as a response to a fictional job opening for a junior position in management. Interviewees were presented with 20 CVs very similar in content and were invited to think aloud when assessing them. All job candidates were male, of similar ages, management graduates from the Portuguese Catholic University with similar graduation average grade, hobbies and extra curricula activities, with similar foreign languages and levels of computing competency. Although, the CVs were similar in content, they were very different in format (paper colour and size, letter font and content design) as shown in table 5.

We finished the interview by asking personal questions, such as the interviewees' qualifications, age, professional background and their experience in CV assessment.

CV identification	CV Characteristics
1	One page long; organized in 6 different aspects; font size 10, headings in bold and underlined.
2	Two pages long, with cover page; clip; organized in 6 different aspects; font Arial 12, printed on yellow board paper.
3	Two pages long, with a presentation letter; organized in 7 different aspects; font Arial 12; plastic binding and photo.
4	One page long; organized in 6 different aspects; font Times New Roman 12, headings 14 in bold; lacking dates.
5	One page long, with a presentation letter; clip; organized in 5 different aspects; headings size 14 uppercase and underlined, text with top justification,; no CV heading.
6	Two pages long; stapled; organized in 4 different aspects – European format.
7	Two pages long not bound together; organized in 6 different aspects, different font and sizes; headings are with the same font size as body text.
8	Two pages long not bound together; organized in 4 different aspects - European format; first page blue lettering, second page: “to be short of ink, sort of look”.
9	One page long; organized in 4 aspects; Afro-Portuguese candidate; printed on white paper; photo; linguistic data presented in table format.
10	One page long; organized in 4 aspects; printed on orange paper; font size 12; not justified.
11	Two pages long; stapled; European format; first page with blots in the first line (CV heading); misspellings.
12	One page long; organized in 5 different aspects; printed in blue ink; font size 14; full page length.
13	One page long; organized in 7different aspects; aligned at the top; concise; headings size 12 in bold and underlined.
14	One page long; organized in 6 different aspects; full page length; headings size 16 in bold.
15	Two pages long; water mark FCP (Porto football club) logo; organized in 6 different aspects; headings size 16 in upper case, bold.
16	Two pages long, organized in 7 different aspects; body text indent in Arial size 10; headings uppercase size 14 in bold.
17	One page long and a cover page; organized in 4 different aspects; headings in different font sizes and different cases; parts of the body text in bold and different sizes in line spacing.
18	Two pages long; stapled; organized in 6 different aspects; headings size 14 in uppercase; dates in bold.
19	Two pages long; stapled; organized in 6 different aspects; printed in orange ink; headings size 14 in uppercase; dates in bold.
20	One page long; organized in 6 different aspects; font Courier 12; headings underlined.
The great majority of CVs were printed on white paper using letter font Times New Roman; the main aspects were personal data, academic degrees, work experience, other activities, other qualifications and interests.	

Table 5. *Curriculum Vitae format characteristics*

Each interview was tape-recorded when authorization was obtained and took approximately two hours. As noted previously, we used a panel format interview, with three researchers. One took the lead in the interview process, putting questions, the second took notes when a tape-recorder was not used and the third took notes about the interviewee's non-verbal behaviour.

Discussion

Although the level of stand-by decision, in the great majority of the cases, is higher than the decision to accept and reject (between 30% and 71%, see table 6), it is interesting to note that, with one exception, all participants in this study agreed to play the game and were able to accept or reject the CVs presented. The person who refused to participate in the game justified her action saying that job candidates are not rejected solely on CV analysis. Furthermore, the analysis of CVs in that particular firm is "a very sophisticated process": it "takes more than one day to go through the candidates for a job vacancy, and the process uses more than one selector" (AB Interviewee). Even though interviewees were asked to respond as if they were actually involved in a selection process, there was a sense of artificiality. Therefore, the high level of stand-by decisions might be explained by the lack of pressure to reach a decision and carry out a specific course of action. Due to this particular context, we would expect that they would be involved in a more normative decision-making process, but such did not occur. A more action-intuitive approach to decision-making was used by interviewees, as we are going to explain.

The time used to assess each CV by interviewees ranged from 10 seconds to 6 minutes. We estimate that the average time for the analysis of each CV was about a minute. However, analysis of the interviews shows that the decision to accept or reject a CV appears to be an iterative process. The selector does not have a clear idea "where to go", meaning that CV analysis is "a continually moving point to which they can only approximate, rather than arrive" (Oliveira, 1998, p.16). In this particular "CV assessment game", there was a fictional job vacancy for management, but no organizational context, which increases the ambiguity concerning "where to go". For example, one of the interviewees clearly made a conditional choice regarding a set of CVs, into Rejected or Stand-by categories, arguing that CV presentation is a very important criterion to her.

Table 6 shows the results of the trial. Remember that we asked interviewees to classify CVs in three different categories: 1) those accepted (A), 2) those rejected (R), and 3) those in stand-by position (SB).

Assessment CV	Accepted	Rejected	Stand-by
1	42	8	41
2	38	0	52
3	25	13	63
4	8	38	55
5	8	38	54
6	42	8	50
7	33	21	46
8	33	21	46
9	8	54	38
10	4	67	30
11	13	29	58
12	13	46	42
13	4	50	46
14	25	25	50
15	0	58	41
16	29	8	63
17	13	38	52
18	21	13	66
19	4	25	71
20	0	42	59

Table 6. *"Game assessment" results in percentage*

The following table presents data regarding the arguments and reasons used by the interviewees to validate their decisions. Anecdotal evidence is discussed concerning different issues: departure from the normative model; the use of intuition, implicit knowledge and selector ideology to define a candidate's profile.

CV	Accepted	Rejected	Stand-by
1	Relevant work experience; good format presentation; being one page long makes the trial process easier; reasonable level of computing and language skills.	Small lettering; not attractive.	There are not a striking feature to call our attention; Internships and polls* are not explained.
2	Coordination activities (scout leader group and students union member).		Three page long = waste of paper; polls are not explained.
3	An objective and concise presentation letter; job candidate's artistic interests valued; relevant	Level of language skills is not specified.	Level of language skills is not specified; plastic binding not valued.

	work experience and computing training.		
4		Lack of information regarding driving licence; identifies football club affiliation; lacks work experience; no telephone number or email address; incomplete name (first and last); concise.	Small number of interests; few details regarding a six day trip on board of a school ship.
5		No dates; poor writing skills; template letter; incomplete; appears honest but immature.	Depends upon job vacancy.
6	European format; internship; information systematically presented.	Misspellings; editing mistakes; European format.	Depends upon job vacancy.
7	Internship abroad; work experience; computing skills; English language skills.	Bad presentation; poorly organized.	Incomplete; Level of language skills is not specified.
8	European format; Erasmus Program.	Bad presentation; slackness.	Could be written in one page; should be more concise.
9		Misspellings; photo showing job candidate wearing a beret.	
10	Paper colour.	Orange paper; difficult to read; shocking; exaggerated; level of language skills is not specified.	
11	European format.		
12	Succinct; sober paper colour; CV appeals for a future interview.	Succinct; difficult to define the candidate profile.	
13		Incomplete due to lack of job candidate's motivation; bad presentation.	
14	Dynamic person.	Badly written, job candidate prone to adventure.	Too much bold; too short.
15		FCP (Porto football club) logo; looks aggressive.	
16	Good presentation and content.	Misspellings.	Lack of language skills.
17	Good work experience; computing skills; reasonable English skills.	Succinct.	
18	Work experience relevant for a managerial career; computing skills; reasonable English skills.	Belongs to a political party.	Belongs to a political party.

19	Printed in orange.	Printed in orange; overqualified for a initial position.	Post-graduation is not relevant; printed in orange.
20		Not a professional e-mail address (nickname); hobbies (astrology and tarot); type of letter (courier); incipient look; lack of aesthetical sense, not attractive.	Insufficient (lack of information).
*A Poll Centre, within the University campus, where students find sometimes their first work experience. A blank cell means no interviewees' opinions.			

Table 7. *Interviewees "thinking aloud" reasons*

"Muddling through" CV analysis

CV 3 is rejected because the level of language skills is not specified. Although, the job candidate notes that he speaks and writes in English and speaks Spanish, he does not declare the level of competence as good, reasonable, and so on, or provide a diploma. Nevertheless, the criterion of the level of language skill is not used systematically by selectors in the decision-making process. In fact, CVs 1, 7 and 17 lack relevant information regarding language skills and other features of CVs are pointed out by selectors as their basis for rejection.

One of the reasons used to reject CV4 is the absence of information regarding a driving licence. We note that this information is missing in eight of the other CVs and is not used, however, as a rejection criterion. One of the criticisms of this CV is the lack of work experience. However, this is an inaccurate assessment as the candidate refers a three months internship in a bank. Moreover, the job candidate presenting CV12 has similar work experience, which is not referred to as a basis for rejection. These findings suggest that managers do not use selection criteria systematically; sometimes one criterion is crucial for a definitive judgement and at other times is completely ignored. The rules are not clearly defined, showing how an individual's decision-making process departs from the normative model explained earlier in the literature review.

"Thinking about" job candidates

We highlight the fact that the decision to reject CV5 is based upon little information. In fact, the selector in firm *L* is makes judgments concerning the job candidate's attributes, and makes assumptions about an individual's honesty and maturity. This process of social judgment is close to Asch's (1946, and Zuckier's 1984) descriptions of how impressions are formed. Interestingly, CV5 had the highest grade from the pool of job candidates (16 out of 20). According to a normative approach, we would expect that our interviewees would use the

grade, objective and measurable data, as a basis for selection, leading to a positive impression. However, this information was not mentioned by any of the interviewees. Moreover, CV5 was accepted by only 8% of the interviewees.

CV 9 is rejected by 54% of the interviewees (see table 6). Their first reaction is to laugh and wrinkle their brows. This CV belongs to an afro-Portuguese individual and includes his photo wearing a beret, which is considered inappropriate in a CV for a job opening in a managerial position. And the misuse of the Portuguese language by the candidate is used as the reason to reject his CV. However, CV6 also has the misspelling problem and it is rejected by only 8% of the interviewees. Regarding the theory of social judgemental ability, any sort of discrimination is socially unacceptable. Therefore, individuals will use any other information, even an ambiguous one; to help the decision-making process and eventually this will lead to the manifestation of the stereotype (Darley and Gross, 1983) by the selectors.

CV20 and CV15 were rejected by 42% and 58%, and none of the interviewees accepted them. CV20 was rejected mainly on the basis of its appearance and the job candidate's hobbies, considered to be inappropriate in a CV. The literature suggests that hobbies can be useful in assessing individuals' idiosyncrasies. In this case, the hobbies projected a negative image of the job candidate. These findings suggest that personnel managers classified the given CV on the basis of unsystematic evidence collected throughout the process. It resembles the use of *signs* reported by Robertson and Smith (1993).

CV15 was excluded immediately by the majority of the interviewees. All of them laughed or smiled at the sight of the FCP logo. They said that the display of such information in a CV was inappropriate, and made comments, such as "I will put it aside without a closer look" (Firm G), and "we are facing a fanatic, I think that no one would like to work with such a person" (Firm L).

These results are consistent with Clement's (1994) explanations regarding the use of intuition. He argues that experts apply their intuition when practical or naïve representations are used to describe an everyday problem. Moreover, the use of intuition is not restricted to a marginal period in the decision-making process, but plays an important predictive role in explaining job candidates' future performances.

So different so alike: when CV features lead to opposite decisions

From Table 6, we realize that some of the CVs' features inspire contradictory reactions in the interviewees leading to different decisions. For example, the orange paper colour of CV 5 is used by the great majority of the interviewees to support the decision to reject while the same feature is attractive for one of the firms; the colour of their logo is orange. Interviewees pointed out that CV 10 is very succinct. This was positive for some and negative for others, leading to different outcomes. Interestingly, CV 10 was both rejected and accepted on the basis of the same criterion – the paper colour.

In addition, when CVs with European format were presented, they inspired two different reactions. On one hand, the interviewees from firms A, J, K and X disliked this format, using this reason to reject the job candidate. X argues that this format shows an individual's lack of creativity: "… such standardization would diminish the subjective criteria used for CV analysis, for example, creativity…". Although K liked better the standardization of a CV sent through the firm's site, he did not like the European format. On the other hand, the interviewees from firms C and Y defended this format, stating that it showed an individual sense of organization, using this information to accept the job candidate.

The observed difference in the decision outcome might be explained by the organizational context and personal experience. In fact, firms A, J, K and X are embedded in an innovative context, such as telecommunications, biochemistry, leisure and culture, which can constrain selectors' perceptions and attitudes. Human Resources Managers might extrapolate job candidates' attributes, such as creativity, based upon CV characteristics. These results bear more than an objective ideology (Brunsson, 1982), and show what we could call a meta-firm ideology, that is, a set of common ideas and values exhibited by managers throughout different industries committed to a culture of organizational change.

CV 8 is an interesting example to show the rationality supporting different decision-making outcomes: to reject, to stand-by, and to accept. Firm J took approximately 50 seconds to reject the job candidate based upon the CV appearance, which gave the impression of a shortage of ink. The interviewee considered that there was an inconsistency between the job candidate's competences and the CV appearance. She used a popular saying *"a cara não condiz com a careta"* (meaning "don't take things at a face value). In fact, she argued that a candidate involved in developing a marketing plan, would never "be slack". Ross (1977) explains this behaviour using the concept of fundamental attribution error, which is the bias in attributing another's behaviour more to internal than to situational causes. However, we argue that this situation could be a good example of implicit knowledge in use. The selector is facing contradictory information, which may trigger the use of implicit rules or subjective ideology.

Firm L took approximately 6 minutes to analyse CV8. Interestingly, the job candidate was to be rejected on the grounds of CV appearance and interviewee's own experience as a father of a student who participated in the Erasmus program: "Erasmus is no end of fun, and a way to spend parents' money". Nevertheless, he recognized his cognitive schema which was trapping him towards a decision-making course of action. Therefore, he changed the direction of his decision, saying that "he deserves a second chance". Firm K took approximately 30 seconds to accept the CV based upon the candidate's competences: Erasmus Program experience, working as a volunteer and summer work experience. The poor appearance of this CV was pointed out by the interviewee. However, the interviewee said that the candidate should be able to demonstrate, in interview, that the CV appearance was an unfortunate accident, not making dispositional attributions. The literature review acknowledges the use of

an individual's experience and tacit knowledge in the decision-making process, and we argue that this use might be beneficial to the quality of the decision.

As explained before, we believe that the different rationale used for the analysis of CV8 provides a good basis for a discussion of intuition and implicit knowledge.

Conclusion

The present research leads to various conclusions. Although CVs include objective data, their analysis departs from the normative model described in the literature. We show that the use of intuition and tacit rules goes further than the final stage of the selection process, where unstructured and qualitative data is more profuse. In fact, we argue that intuition and implicit knowledge is used at the beginning of the selection process during CV analysis. Since data available in CVs are considered to be objective, the research findings contradict to some extent the ideas expressed in the literature review. In fact, implicit knowledge is used when it allows a better understanding of the candidates' attributes. It cannot be said that this option is less rational: it can be the only way to obtain information concerning job candidates' attributes relevant to the organizations, as for example, an individual's creativity.

Furthermore, the use of intuition and implicit knowledge in CV analysis is clear in entrepreneurial and problem-solving dimensions. That is, when selectors try to predict a job candidate's future behaviour based upon the individual's hobbies, and when a CV presents contradictory or ambiguous information. This can be linked to what we call meta-firm ideology: individuals in the same professional group develop a unique and common language, which is crucial for the development of their *modus operandi.*

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Phenomenology and "Pheno-Practice" of embodied and aesthetic Knowing in Organisations

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Abstract

By going back to knowing it-self phenomenologically, the paper outlines a practice-based, processual, non-reductionist and inter-relational understanding of knowing and knowledge in organisation. Based on advanced phenomenology (Merleau-Ponty) of embodied knowing an integral concept of "pheno-practice" of knowing is proposed. With this, the interior and exterior dimension as well as individual and collective spheres of knowing and its interconnected processes of intentional, behavioural, cultural and functional domains can be assessed and integrated. For overcoming a dualistic orientation then a processual turn is discussed allowing an understanding of inter-relational knowing as an emerging event. Furthermore, the paper links embodied knowing to enacted aesthetic dimensions. By concluding, implications and perspectives of integral phenomenological and pheno-practical approaches of embodied and aesthetic knowing are suggested.

"to live is to know"
(Maturana & Varela 1992: p. 174).

Introduction

The contemporary debates concerning the philosophy and management of knowledge represent a heterogeneous discourse with various different perspectives. Accordingly, the nature of knowledge, the degree to which knowledge is separable from or related to practice, and where knowledge resides as well the status and relation of explicit and implicit knowledge are investigated and interpreted in diverse ways. Recognising knowledge as a necessary constituent for business activities, added-value and organisational competitiveness it became operationalised in a plethora of so called "Knowledge Management" concepts and strategies.[2] This has led to various agreements and disagreements among researchers and practitioners and an on-going search for criteria for evaluating frameworks, methodologies and approaches, and systems of various knowledge management issues (e.g. Metaxiotis, et al. 2005; Assudani, 2005).

However, much of the current literature about the knowledge-based economy and knowledge-management has been predicated upon reductionistic, often functionalist or pragmatic assumptions about the nature of knowledge focusing on conceptualising knowledge as being static, decomposable and transferable or bound to specific (inter-)subjectivist

perspective. Accordingly knowledge is either seen as a codified object independent of (inter-)subjective realities or as generated by an autonomous, subject or inter-subjective interpretation into an independent objective reality. Both the empiristic-objective tradition of "realism" and the rationalistic-subjective tradition of "idealism" and the underlying representationistism[3] are eminently limited and problematic in their one-sidedness.[4] Following these either "objective" or "(inter-)subjective" orientations, different types of knowledge have been identified and examined **"**taxonomically" to get more effective means for generating, sharing, and managing knowledge in organizations (Tsoukas, 1996, 13). What prevail in both discourses are various classifying distinctions and dichotomies of dualistic thinking of knowledge (see e.g. Nelson and Winter 1982, Leonard-Barton 1992, 1995; Hedlund 1994, Nonaka 1994, Nonaka and Takeuchi 1995, Teece 1998, Hansen et al. 1999). With this, knowledge and knowing are understood either as resource or as process, as "objective" or "subjective", as body or mind-based, as implicit or explicit, as internal or external, immanent or transcendent etc.[5] Furthermore, aesthetic dimensions of knowing or an aesthetic understanding of knowledge have been largely ignored (Strati 2003).

What is needed instead of such reductionistic approaches is a processual, non-reductionist and relational understanding of knowing, which integrates embodied and aesthetic dimensions involved. Thus, the challenge will be to develop a reintegration of constituencies of knowledge and knowing, from which the objectifying codification or entitative approaches abstracts or which are only one-sidely focused in subjective and inter-subjective approaches. For making theory and practice of knowledge and knowing - and its questionable management - better "equipped" and more integrated, we need to get out of the prevailing "subject-object mould" and to understand the underlying dynamic process of knowing as an emergent inter-relational event. The following tries to show how advanced phenomenology helps to reach this by rearticulating an account of the lived and existential body and an extended understanding of embodiment. Considering the "absent presence" of the body (Shilling, 1993, 19; Leder 1990), and aesthetic dimensions (Küpers 2002) in social and organisational science there is a need for a "re-membering" between embodiment, aesthetics and knowing in organisations. The goal of the following is to take phenomenology not only to critise one-sided, fragmented approaches of knowledge. Moreover, particularly advanced phenomenology - as development by Merleau-Ponty (1962, 1964) - can help to render a deepened understanding and provides ways for dealing with the underlying constitutive practices relevant for (interlacing) processes of embodied and aesthetic knowing within the situated ´Dasein´ of "being-in-the-world" in which "subject" and "object" are intertwined. Thus, phenomenology provides a philosophical "base" for responding to the insufficient understanding and for developing a more integrative perspective of situated knowing in organisations. Accordingly, the concept of an integral "Pheno-Practice" of knowing will be outlined. This serves as a conceptual means for developing a more comprehensive and inclusive analyses, interpretations, and methodology for investigating and understanding processes of knowing in organisations. Consequently, what is proposed is a radical processual

turn towards the “in-between” of knowing and specific aesthetic dimensions involved. Finally, by concluding, some implications and research perspectives are discussed.

Phenomenology of knowing. From “body of knowledge” to “knowing body”

Phenomenologically, the main intention is to go back to “knowing it-self”, that is, the present, living act of knowing as (embedded) practice and process. “To return to things themselves is to return to that world which precedes knowledge, of which knowledge always speaks, and in relation to which every scientific schematization is an abstract and derivative sign - language, as is geography in relation to the countryside in which we have learnt beforehand what a forest, a prairie, or a river is" (Merleau-Ponty, 1962, ix). Returning to the “life-world” of knowing is to relate to the world in which an embodied knower meets in and co-creates with her lived-in experience the like-wise embodied known, always infused already with meaning. Accordingly, all knowledge is always embodied and mediated by the present, living process of knowing. With this, knowledge and knowing is seen as a “function” and emergent process of an inalienable “difference-unity” of an embodied “subject” and his/her embodied inter-subjective and “inter-objective” life-world, in which s/he is imbedded and actively and passively takes part. Therefore, neither “subjective”, “inter-subjective” nor “objective” dimensions can be isolated from the dynamic process of knowing itself. Through this knowing and mediated by the body and embodiment as medium human beings and “Being” itself “makes sense” of the inter-related realities of being and becoming in an on-going processes of transition of reality (er, 1995).

Consequently, the phenomenological re-turn to knowing, is primarily realised by retrieving the body and embodiment as practical and processual “base” and medium for knowing as practice. However, the body and embodiment has been marginalised as medium of organisational practices and theory (Hassard et al., 2000; Casey, 2000, 55). Facing the prevailing separation of body and consciousness (Dale & Burrell 2000; Dale, 2001) and considering the “absent presence” of the body in social theory (Shilling, 1993, 19; Leder, 1990), there is a need for a “re-membering” between body, embodiment and organisations, thus re-integrating lived, embodied experiences and processes of knowing. Following the embodied turn in social science (Hassard et al., 2000, 12) phenomenology offers possibilities for developing an understanding of a (re-)embodied organisation (Styhre, 2004) and knowing while integrating this process in its inter-relational nexus. Thus, what the following aims for is combining a phenomenological “re-turn” towards pre-subjective, pre-reflective and pre-objective constituencies with an integrative “for-warding” and inclusive transcendence towards a post-dualistic integrative and with this aesthetic perspectives of knowing. Accordingly, the proposed advanced phenomenology of Merleau-Ponty offers an approach, for not only investigating the role of embodied and aesthetic knowing, but also provides a

base for a practical, processual and integrative as well as aesthetic understanding of knowing in practices of organisations.

Phenomenology of embodied knowing in practice

Phenomenologically, organisations are interpreted as life-worlds (Husserl, 1970; Schütz & Luckman, 1972), in which processes of knowing take place. Accordingly, knowing is realised through embodied acting and experiential processes. For “inter-standing” (Taylor & Saarinen, 1994, 1, 8) the interlacing role of bodily, perceptual and expressive dimensions involved in knowing the phenomenology and ontology of Merleau-Ponty (1962, 1963) offers an important interpretative approach. His rejection of modernist version of referentialist-representalism and critique of empiristic realism and intellectualist idealism - leading him to an anti-foundationalism, anti-essentialism and non-dualism, and philosophy of (good) ambiguities - offers a relevant post-Cartesian perspectives on knowing.

According to Merleau-Ponty (1962, 453) we are first and foremost embodied beings, that is we are both a part of the world and coextensive with it, constituting but also constituted. We find the life-world meaningful primarily with respect to the ways in which we act within it, and which acts upon us as engaged and perceiving “body-subject” (Crossley 1996, 101). This acting and enactment implies that we can never know about things or encounters independent of our lived experiences as bodily-engaged beings. Therefore, “embodiment” does not simply mean “physical manifestation.” Rather, it means that the knower is being grounded in everyday, mundane experience and integrally connected to herself and her environment in an ongoing interrelation. With this, the embodied experience and knowing practices are built upon an original, pre-reflective, ambiguous “ground” or primordial horizon; on which the knower perceives[6] and “body-forths” her possibilities into the world. The primordial constituents of the lived world are not “objective” properties, but situations as modes of being-in-the-world. These situations are as much part of the “subject“ as they are of the “world”; they always have both a “subject-side” and an “object-side” which are inextricably linked to each other. Thus the "body" is the ground for our pre-reflexive yet active communion with the world. From this advanced phenomenological perspective, being embodied is always already a way of knowing and acting through “lived situations” and its (con-+-textual) encounters. Within this situatedness, the “living body” mediates between “internal” and “external” or “subjective” and “objective” as well “individual” and “collective” experiences and meaning of knowing. In Merleau-Ponty's work on embodiment there is a non-monadological sense of body-world connectedness in which the postures and initiatives of living bodies interact with an environment as those specific bodies "understand" it. It is the vivid body and the embodiment, not an occupying consciousness, which understands its world and bodies as "lived experience”. For Merleau-Ponty, experience of knowing is, in every instance, corporeally constituted, that is located within and as the pre-reflective and proto-reflective “body-subject's” incarnation. The "body-subject" is an intelligent, holistic process,

which directs behaviours in a fluid, integrative fashion, thereby coordinating relations between behaviour and environment. The knowing "body-subject-object-connection" is an experienced structure; the things outside of the body are always "encrusted" in its joints. Thus, knowing being embodied covers the "subjective" and socially situated phenomena – particularly through language and communication as expressive medium of inter-relation[7] and at the same time is related to "(inter-)objective" artefacts, institutions as structural "in-corporation".[8] The incarnate status of the perceiving "subjects" (as knowers) with their embodied pre-interpretation and situated ("objective") embedment provides not only the ontological foundations of all human knowing in general. This understanding also opens the way to a phenomenological description and interpretation of re-integrating embodied knowing in organisations. This re-integration can be based on the fundamental insight, that through their embodied, perceptual selves the „subjects" of the organising processes are situated in their environment in a tactile, visual, olfactory or auditory way. Whatever they think, feel or do, they are exposed to a synchronised field of inter-related senses (Merleau-Ponty, 1962, 207), in the midst of a world of touch, sight, smell, and sound.[9] It is through the body that the agents of the organisational process directly reach their perceived and handled „objects" and relations at work. Moreover, members of organisations know while being situated spontaneously and pre-reflectively, in accordance with their bodies and their embodiment. A phenomenological understanding systematically takes these body- and sense-related contacts and embodied nexus as base for knowing processes into consideration.

In order to approach these interrelated processes, they can be understood as embodied intention and responsiveness.[10] All involved in organizing processes always encounter perceived realities through some bodily organs, from an intentional and responsive point of seeing hearing or touching. With an intentionality and responsiveness of the bodily organs and consciousness the agent within the sphere of knowing and learning does not feel only „I think", but also „I can" or „I relate to" or "I do" (Macmurray, 1957, 84).[11] In other words, the atmosphere within knowing and also learning takes place is not only what people think about it, but primarily what they "live through" with their „operative intentionality"[12] (Merleau-Ponty, 1962, xviii) and responsiveness. This implies that the "I can" (or can not) - and "I feel" - precedes and conditions the possibility of the "I know" (Merleau-Ponty, 1962, 137). With this understanding of embodied based intentional knowing, there is a close link between what is aimed and what is given, between intention and the knowing situation. As a living body, the "knower" responds to meaningful questions, problems or claims posed to him/her through a situational context and embodied conditions, in which s/he as embodied being herself/himself takes part. Thus, as contents and practices of knowing are realised in everyday practices, there are continuous repercussions between knowing and acting.

Studying "knowledge" and processes of knowing in organizations requires capturing a sense of "phenomenological presence" and considering life-worldly practices both as source and "outcomes" of human knowing. That is, the way that knowing arises, emerges from direct and engaged participation in the embodied world of (organisational) praxis. This

understanding of "praxis" corresponds to the 'practice turn' in contemporary theory (Schatzki et al., 2001), and practice-based theorizing on knowing- and learning-in-organising (er, 1995; Gherardi, 1999; 2000). For such practice-oriented approaches of knowing (Nicolini et al., 2003; Gherardi, 2001), organizing, knowing, learning, action and practice are all mutually constitutive processes. They are all part of the micro dynamics of a "knowledge-in-use" embedded in human action and inter-action as well as "inter-passion" by which meanings of events are continually created, re-created, put in question and re-negotiated through a weaved network of emotional inter-relations. As an on-going "individual" and "social" accomplishment and dynamic process, knowing is not a static embedded capability or stable disposition of actors, but constituted and reconstituted in the dynamics of everyday practice, hence being a "knowing-in-practice" or „knowing-as-doing" (Orlikowski, 2002, 252, 271). As capacity to act, knowing is the ability of actors to intervene (or to let go) in an ongoing flow of action, or to change the course of events in situated contexts. Such contexts consist of historical, social, and cultural and material con-+-Texts[13], in which knowing take place in a variety of forms, and by use of different media. Therefore, the meaning as an experience of everyday practices of knowing are related to local ways of knowing and that, which and how is to be known correspondingly.[14] We do not experience our practice as knowledge. Rather we experience our practice as experience, and "experience is knowing" (Levinas, 1969, 62; 1998). Meanings of knowing and a knowing of meanings are both "found in" the world and "created" by human ("subject´s) active dealings with "objects".

In an embodied state of being where the material and the ideational are intimately linked, human existence and therefore knowing cannot be conflated into particular "object" or "subject"-bound paradigm, for as Crossley suggests, "there is no meaning which is not embodied, nor any matter that is not meaningful" (Crossley, 1994, 14). Thus, not only does the knowing body provide an access to the world; but "knowledge" and processes of knowing inhere also in the "things" themselves. Any "knowledge base" (of an organisation) does not only include bodies of knowledge but also knowing and knowledgeable bodies; not only enacted knowledge but also knowledge that is already action, not only situated and contextual knowledge, but also knowledge that inheres in situations and relations in such a way that we may not recognize it as knowledge or knowing. This action turn returns also to the fundamental questions concerning the quality of knowing to the practice of the knowing person in community (Shotter, 1993, 52). With all this, knowledge and process of knowing do neither only exist 'out there', manifested in external "objects", routines, or systems, nor merely 'in here', inscribed in human brains, subjective bodies, or inter-subjective communities. Rather, as outlined in the following, it is part and emerging out of an integral and processual nexus.

Integral Pheno-Practice of Knowing

As we have seen understanding and enacting knowing in organisations demands a comprehensive and integrative framework and more inclusive practice-oriented approach that is suited to investigating complex, inter-related processes involved. As any single perspective is likely to be partial, limited and, maybe distorted, and for avoiding reductionistic fallacies, a holonistic view and multi-level analysis of knowing is required. As a "full" body of knowledge and considering the knowing body and embodiment requires to dynamically linking various interdependent constituencies of knowing there is the need for an integrative (methodological) framework. For this and based on the outlined phenomenological understanding, the following presents a corresponding integral "Pheno-Practice". This "Pheno-Practice" is understood as a special employment and application of phenomenology. Like classical phenomenology, pheno-practice is basically driven by the intention to clarify and understand what is at issue; that is what appears as (live-worldly) phenomena, here with regard the complex inter-relating process of knowing and its various meanings. In this sense, it strives for making accessible, describable, interpretable and practical the implicit and explicit settings and meanings of knowing at hand of individuals and groups in organisations. That is corresponding to the practical, processual, inter-relational understanding of and decentred perspective on knowing. Accordingly, pheno-practice is practicable as a style of "concrete thinking" and way to understand and deal with phenomenal reality! However, "pheno-practice" aims for "overcoming" classical phenomenology and its underlying, limited ontological and epistemological assumptions and methodologies, that is developing a post-Husserlian methodology of understanding phenomena (of knowing) in organisations (Küpers/Jäger 2005). Furthermore, pheno-practice focuses on offering critical and practical perspectives for creative and transformative processes of knowing in organisations. It aims for bridging the gap between theory and practice by providing a conceptual and practice-oriented approach to the complexities involved in knowing.

As a theoretical base for pheno-practice an over-arching integral framework (Wilber 1999, 2000a,b) is used that accommodates equally the subjective, inter-subjective and objective dimensions of knowing. This model differentiates and relates the interior and exterior dimension as well as individual and collective spheres of knowing and its specific interconnected processes of intentional, behavioural, cultural and social domains. With this the inner spheres of knowing and the external, behavioural aspects as well the collective embedment within an organizational community and culture and the external structural-functional realms of knowing can be assessed together.

The crossing of these dimensions gives four quadrants representing four different perspectives of interior-agency or self & consciousness (I), exterior agency or behaviour as enactment (Me; It), interior-communal or culture (We) and exterior-communal or system (Its). While the first quadrant involves the intra-personal or internal reality and inner knowing of a person - particularly tacit and implicit knowing -, e.g. intentional, cognitive, emotional and/or volitional processes); the second domain treats the individual/external aspects of knowing and

knowledge, as manifested in competencies, actions and use of external knowledge. The third quadrant deals with internal group issues of knowing (e.g. organization's culture, history, stories, unwritten beliefs and rules, values, worldviews) referring to a collective knowing, particularly tacit/implicit dimensions. Finally, the last quadrant covers the external group aspects of knowing and knowledge. It is the quadrant of structural or functional order and systemic mechanisms and resources, technologies as well as organizational design, strategic plans and workflow procedures, external constraints and further manifestation of collective explicit knowledge.

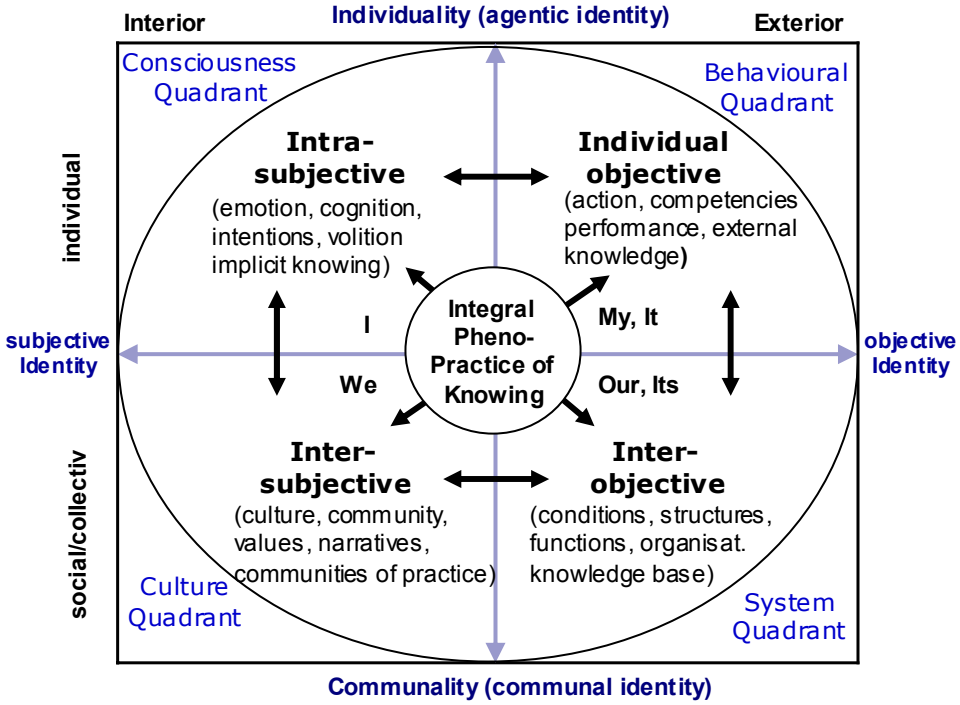

Figure 1. *Multidimensional and multilevel model of an integral pheno-practice of knowing*

Each of the four orientations would be incomplete without the others, and each depends on the others for its basic existence and sustenance. What is therefore needed is an approach, that considers All Quadrant, All Level, All Lines: (AQAL) (Wilber 2000ab, 2001). Within these four domains knowing practices and developments are played out. Furthermore, a series of different developmental stages and lines of knowing subjects and knowledge practices can be considered systematically. The stages or levels of development mark out new capacities and emergent qualities through life or situated in the context (e.g. acquiring, competing, conforming achieving, including, visioning). The developmental lines concern complex developments, like spatio-temporal, object-relations, cognitive, emotional, interpersonal, behavioural, knowledge and learning developments and ethical lines of leaders and the knowing processes.

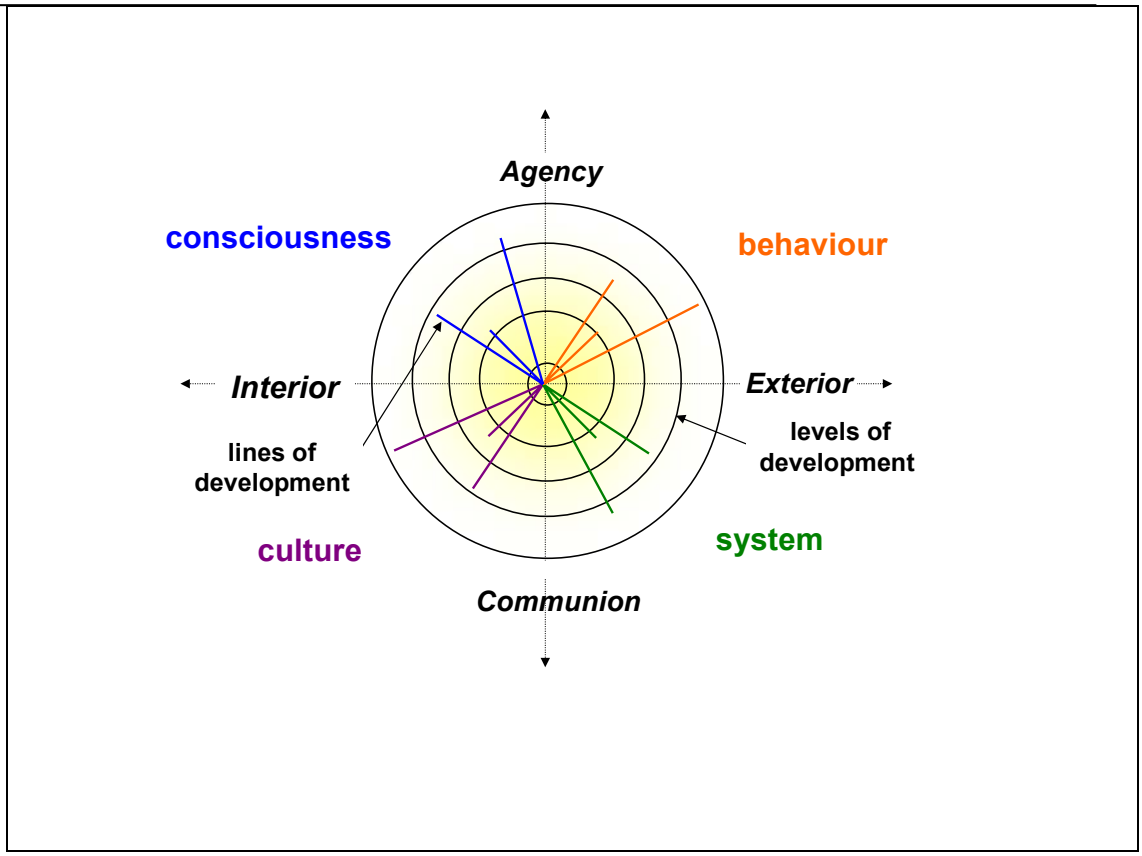

Figure 2. *Levels and Lines of development and domains of an integral pheno-practice of knowing (Edwards 2004 - modified)*

Conventional reductionistic approaches of knowledge management and organisational learning follow mostly cognitive lines, which explain the prevailing difficulties to integrate embodied tacit knowledge, implicit knowing and emotional dimensions as constitutive for knowing and learning.

The levels and lines and the quadrants are energised by the dynamics of growth and integration within an "Integral Cycle" (Edwards 2004), which keeps all these elements hanging together in a coherent and dynamic system and co-ordinates the interaction between the four-quadrants and the holonic developmental levels and lines. With its capacity to analyse, categorise and synthesise the concept of an integral cycle is a way representing the mutual interpenetration of the quadrants and their constituent structures and the dynamic relationship that exists between the quadrant domains and it co-evolution. Form this perspective the "interiors" and "exteriors" and the "individual" and "collective" dimensions of knowledge and knowing complementarily co-create each other and holonistically unfold together.

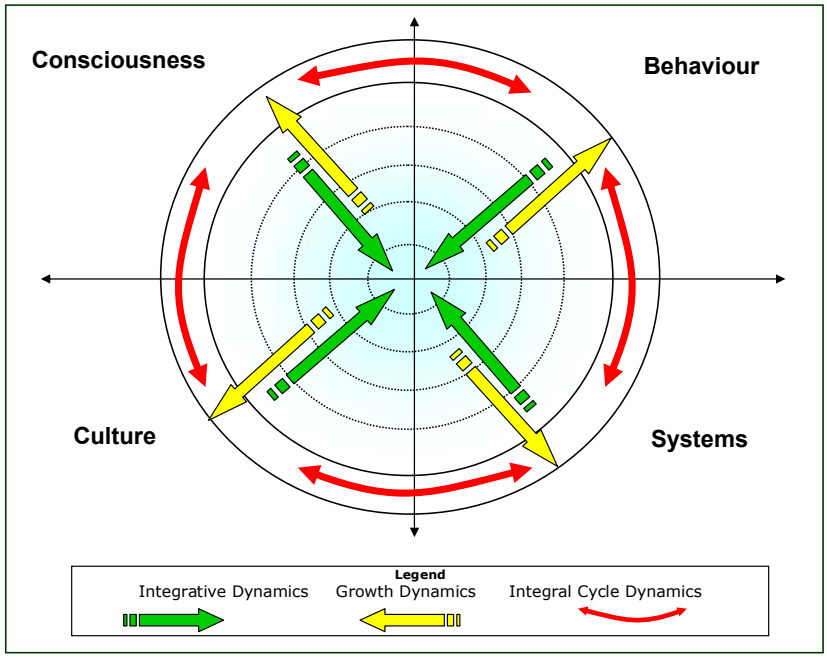

Figure 3. *Integral Cycle of Integral Knowing (Edwards 2004 - modified)*

The outlined Pheno-Practice of integral knowing carries specific methodological implications and consequences for research and methodology. Like many other qualitative methodologies, the purpose of pheno-practice is to understand the dynamic inter-relational processes of knowing, rather than explaining or predicting. Methodologically, a pheno-practical approach takes a shift of mind to seeing interrelationships in their connections rather than linear cause-effect chains, and seeing processes of non-linear change rather than regarding snapshots for control and predictability. With this, it emphasises conditions of possibility and recognises the multiplicity and interdependencies of poly-causal forces rather than simple "causal explanation". This genealogical and processual approach allows for overcoming the inherent problems and limits of an atomistic and mechanistic substantialist perspective, and simultaneously for providing access to relevant phenomena in the life-worldly and the research practice. Therefore, the calls "return to things themselves" and "let things speak for themselves" means both: back to life-worldly phenomena of knowing and "let's get down to what matters (practically)!" for practitioners, including researchers. With this, it represents a specific research methodology, understood as a practice of researchers, striving to portray phenomena of knowing from the personal, inter-subjective and contextual perspectives of those who experience them, while considering also the experiential involvement of the researcher. Thus, the primary focus, of pheno-practice as a research

methodology, is the understanding of the inter-relational structures, processes and meanings of lived experiential phenomena and perspectives. As a genuine qualitative research framework, pheno-practice provides appropriate means for capturing and interpreting the dynamics of phenomena in general and processes of knowing in particular (Küpers/Jäger 2005).

Processual Turn towards Inter-Relational Knowing. The In-Between of knowing

For overcoming a dualistic orientation, the following describes a necessary processual turn towards an inter-relational understanding of knowing. With this, the (advanced) phenomenology and gained action- and practise-oriented understanding of knowing is linked up with a (inter-)relational paradigm[15] and a radicalised processual orientation. This allows interpreting knowing as an emerging event, that is as dispersed, and "inherently indeterminate" process, continually reconfiguring (Tsoukas, 1996, 13; 22; Boland & Tenkasi, 1995, Davenport & Prusak, 1998, Cook & Brown, 1999). Such a (inter-)relational orientation is critical concerning a retained Cartesian duality of a separate inner and external nature, mind and world and its corresponding entitative discourses and its representationistic subject-object dichotomies, and centring of a singular, and in some degree knowable, real world (Bouwen, 1998; Hosking & Morley, 1991; Hosking et al., 1995). Thus, interpreting knowing as a relational event breaks or undermines the logo-centric interpretation and one-sided objectifying and comodification-orientation or "subjectifying" interpretation of knowing, knowledge and its management. Rather it opens up for a non-reductionist understanding of knowing (Styhre, 2003, 2004; Choo, 1998; Tsoukas, 1996). It not only helps to overcome entitative and insufficient approaches of knowledge, but also contributes to the development of an integrative "inter-standing" of knowing as processual and inter-relational event.

Relationally, it becomes possible to overcome a "possessive individualism" (Sampson, 1993) or "obsessive objectivism", by which knowledge is seen as an identifiable entity sui generis based on the individual or made objectively measurable. Alternatively, with a relational intelligibility in place we can shift our attention from what is "contained" within individuals, communities or an "organisational knowledge base" to what transpires between people (Sampson, 1993) and "artefacts". With this, knowing becomes factually based on embodied relational processes that are joint or "dialogically" structured activities as a kind of responsive action (Shotter, 1984, 1995; Stacey, 2000a; 2001) involved in all experiencing.[16] As an ongoing event of relating and responding, knowing develops out of a complex set of inter-actions and "inter-passion" or inter-relations between "subjects" and "objects" by which feelings, cognitions and meanings as well as artefacts, structures, functions are continually created, re-created, put in question and re-negotiated through a weaved systemic inter-network.

How to assess the "inter-" of this relational nexus; how to understand the "in-betweenism" (Kimura, 1988) of knowing? It is Merleau-Ponty`s indirect ontology of primordial „flesh",

referring to a formative medium or milieu anterior to the conceptual bifurcation into the "subjective" and the "objective", a chiasmic intertwining and reversibility, that allows to inter-stand (Taylor & Saarinen, 1994, 1, 8) the process and communicativeness of what could be called "inter-knowing" (Küpers/Jäger 2005). By going back to our actual lived bodily experience, we can (re-)discover the process of a living and knowing "in-between". This "inter-being" is part of an "inter-corporeality" within what Merleau-Ponty calls the "Wild-Being" (Merleau-Ponty, 1964) as relational and reversible chiasm.[17] This refers to the "brute fabric" or "common tissue" of meaning that is woven through all levels of experience, preceding and making possible all particular horizons and accomplishments. It manifests as the silent and invisible ontological fond - situated in an inter-corporeality - out of which self, others, and things arise in reciprocal relations. In such fields of experiences all inter-relational processes are always on the move between order and disorder that is always becoming; and never complete an active and ambiguous transcendence carrying an utopian movement (Johnson, 2003). With Merleau-Ponty, we can acknowledge the in-between of knowing, as a processual gap of an "ecart". This means a corporeal difference (Weiss, 2000) within "the Being that lies before the cleavage operated by reflection, about it, on its horizons, not outside of us and not in us, but there were the two movements cross..." (Merleau-Ponty, 1964, 95). This living in-between – understood as a ´fullness of void´ and as creative and fulfilling emptiness - is the speaking and knowing silence, pregnant with meaning. Ultimately, this in-between, is the birth-place of knowing and "individual" identity, social relationships and objective manifestations and also of creativity and added value in organisations. Therefore, the inclusion of felt embodied experience of knowing provides renewed possibilities for developing deeper, richer more textured experiences of life and knowing and how the "knower" and the "known" are enfleshed with others "being-towards-the-world".

In this processual space or intermediating realm of an in-between (Bradbury & Lichtenstein, 2000), all parties involved in and inter-playing the knowing process meet in an on-goingness' of relating. In this ´space between', agency, action and structures have (poly-)causal interdependence (Archer et al., 1998) and intertwine and co-generate "individual", "social" and "objective" inter-dependencies and inter-relations of knowing. With all this, knowing can be seen as an inter-connected web of embodied, dynamic inter-relationships in which human interpretative acts and non-human realities ceaselessly shape and maintain, both intentionally and unintentionally, the relational setting of the web and contextual disposition of the "individual" "social" and "objective" realities. By recognising the primacy of relational processes, these become media, in which knowing - as well as learning and identities - are continuously created and changed in the course of being practised. Thus, any knowing and knowledge always depends on a set of relationships to other knowings and knowledges´ in a continuous and dynamic (ex-)change. Accordingly, as (embodied) knowledge making and knowing processes are based on the presence of imbalance and discontinuity, knowledge and knowing can only be studied as a phenomenon in motion, through displacement, surprise,

controversy, and contest, taking account of the cultural specificity and context-dependency of knowledge systems (Patriotta, 2004).[18]

From such a relational perspective, organisations are dynamic constellations of relationships among forces (Hosking et al., 1995; Gergen, 1994). This implies that organisational structures and knowing processes are not substantively fixed, but rather a shifting cluster of variable elements throughout a decentred, configured mesh (Meyer et al., 1993) within a space between (Bradbury & Lichtenstein, 2000). Thus, relationality provides a decentred perspective on knowledge and knowing. The constituencies of knowing are dispersed with dynamic sets of relations. Therefore, knowledge is created and re-produced within powerful historical, embodied and with this emotional and social relations. For a relational understanding the "knower" participates (with-)in the known. S/he relates and resonates experientially to what and how s/he knows in embodied, co-presentational and practical ways in the concretised social world of every-day life. Thus, the knower and the known condition one another and, the capacity for knowing does depend on the capacity for "being known" - that is, being physically embodied in an "inter-world". This orientation allows overcoming the inherent problems and limits of empiristic-objective mechanistic, codifying and essentialistic perspectives as well as rationalististic-(inter-)subjective perspectives of knowledge and its questionable management. What the relationality and processual paradigm encourages us to do instead, is to describe inter-connections and inter-related processes through which the world of knowing in particular, and organising in general, are experienced in a continual state of becoming (Ranson et al., 1980; Chia, 1996; 2002; Whitehead 1979).

Aesthetics of Knowing - Aesthetic Knowing

As the phenomenal, practical and relational realities of knowing can be characterised by ongoing, local processes (Parker, 1992) including non-linguistic (e.g. gestures, "objects", documents etc.) and linguistic and expressive dimensions a kind of aesthetic knowing and its con-+-Text can be explored. Thus, the outlined phenomenological and processual orientation allows not only developing a much needed decentred and systemic perspective on knowing and its mutually constitutive and interconnected practices and evolution. Rather it also provides the base for integrating art and aesthetics into knowing and organising. A phenomenological understanding of aesthetics refers to the embodied senses and sensibilities that is "aisthesis"[19], actionable in implicit practices of knowing (Küpers 2002). Accordingly, a phenomenological understanding of aesthetics can be used as a way to refocus the perspective to the sensible, physical elements and embodied dimensions of organizational life and to the experiential practices of knowing which are intermediated aesthetically. In organisation studies, the aesthetic contexts and processes of have long been neglected as part of organisations and organisational behaviour and knowing. However, in recent years the importance of studying organizational aesthetics as a means of developing a greater insight

into how knowing and meanings are structured, processed and promoted within an organization have been researched (e.g. Dean et al. 1997; Gagliardi 1990, 1996; Strati 1990, 1992, 1996, 1999).

Phenomenologically, artistic and aesthetic-like processes are a pervading part of the fabric of organisations` everyday activities and realities. Art-like forms invariably not only reflect the life within organisation, but are often attempts to influence this very life. However, much art-like forms and processes are unrecognised as such because they address issues and preoccupations of everyday life. Pushing the limits of aesthetics by looking at the intersection of art and daily life (Novitz 1992), "enacted aesthetics" and aesthetic organising carry a tremendous potential that is important for extending our understanding and "flows" of knowing in organisations.[20]

From an integral perspective, aesthetic knowing covers all spheres and inter-relations of the pheno-practice. Accordingly, it concerns the interweaving with prior experiences and sensual faculties as base for aesthetic understanding (Strati 1999, 14; 2000). Furthermore aesthetic experiences which their inner forms of sensory and symbolic knowing are related to expressive action and ways of shared communication (Gagliardi 1996, 566), which again are integrally embedded in collective external spheres. Thus individuals and organisations are embodying aesthetic „properties" and use various aesthetic symbols and artefacts (Wasserman et al. 2000). Certain arrangements of designs and artifices are agreeable, and others the reverse, and they effect embodiment and bodily states and sensibilities in the con-+-Text of workplace settings and organisational life as well as vice versa. Moreover than having externally aesthetic artefacts or being internally "aesthetic" (e.g. beautiful) as an entity; it is also the process of organisational activities and dynamics that needs to be examined and understood if we are to study and understanding the relevance of aesthetics for knowing.

Again, processual and relational aspects are critical for an approach of organisational activities of knowing as aesthetic. Instead of static notion[21], we need to see the transformational quality realised by aesthetic dynamics of embodied and emotional processes (Cataldi 1993; Mazis 1993). As experiential action, aesthetical processes evoke specific thoughts, feelings, images and communications (Gagliardi 1996, 566). With this capacity, they bridge between various sense-making streams, allowing crossing and re-crossing from one meaning to another within dynamic constellations of negotiations.[22] Accordingly, aesthetic experiences can be understood as intentional interlace not only of inter-action but also of a responsive "inter-passion", that is they are always an embodied, perceptual and expressive, hence living communicative process of intertwined action and passion. These dimensions are particularly relevant for processes of tacit and implicit knowing.[23] As practical potentials and capabilities tacit/implicit and explicit knowing and knowledge (Polanyi 1966; Tsoukas 2003)[24] are inseparably intertwined in a "generative dance" (Cook and Brown, 1999) of aesthetic pattern of knowing through encounters (Boykin et al 1993) and "indwelling" (Polanyi, 1962:59; 1969:148; Polanyi and Prosch, 1975:37). By accessing, dealing and evaluating processes of knowing pheno-practically it becomes possible to show how members

of organisations and "organisations" are (proto-)aesthetically sensible, intentional and responsive. This in turn can be related to developing aesthetic interpretations, imaginations, judgements and (narrative) communications of knowing (Küpers 2002) as well as corresponding aesthetic competencies and a pheno-practical enactment of aesthetic intelligence understood as practical wisdom (Küpers 2005a).

Conclusion

Facing the outlined shortcoming of traditional discourses and concepts of knowledge and knowledge-management, this paper has tried to show the significance of a phenomenological and pheno-practical approach of knowing in organisations. Following the phenomenological "re-turn" to knowing it-self the embodied practice-oriented, integrative, processual and aesthetic dimensions of knowing have been discussed. By rendering the complexities of a more integrative comprehension this paper has certainly generated more openings than closings. However, what became evident is that knowing is not only realised through experiential processes, but that embodied and aesthetic experiences are always already a kind of knowing and that such processes knowing are already acting a specific practice itself. Not only reconceiving the experiential "base" of knowing, the outlined integral model of pheno-practice and the processual understanding of "inter-knowing" tried to open up new ways of a more inclusive interpretation. This allows to understand how different relevant dimensions of knowing co-evolve mutually within an embodied con-+-Textuality of "lived experiences". This opens up generating corresponding practical implications. These implications refer to creating specific conditions for developments and targeted measurements for each of the outlined phenopractical spheres of knowing and learning (Küpers2004a). As organizational knowing is being constituted and processed in changing inter-related practices, it is necessarily provisional and thus never there cannot be a given, stable or manageable knowledgeability. What will be possible is enabling and facilitating practices and capabilities of inter-knowing to emerge. As skillful inter-knowing is realised by a dynamic engagement emerging from situated practices, corresponding conditions, resources and competencies (Dreyfus & Dreyfus 1980, 2000) are required (e.g. human, social, socio-cultural, infra-structural, financial, technological), which are supportive for enacting competent knowing processes within "distributed organizing" operating effectively across various boundaries (Orlikowski, 2002).

With regard to further research, the proposed advanced phenomenological approach and pheno-practical, integral and processual framework provides a „bedrock" for more rigorous theory building, further analysis and empirical testing. In terms of methodology, the methods of phenomenology offer alternative approaches for understanding processes and patterns of knowing in organisations. Critically phenomenology can bring the researcher in closer touch with "real-word" of knowing processes, while ascertain the heterogeneous dimensions involved. As differentiated reminder of the life-world's multifaceted wholeness and

tremendous multi-dimensionality, a phenomenology and integral pheno-practice of knowing and organising is likely to serve as a helpful antidote to part-views and one-sided or reductionist methods. Methodologically, an integrative approach can contribute to re-examine the implications of variations in qualitative techniques, like appreciative inquiry, participative observation, narrative interviews etc. These contribute to render explicit and to obtain a deeper understanding of processes of knowing in and of organisations. For example, phenomenological interviews (Kvale 1983) are a powerful means for attaining an in-depth understanding of embodied, emotional, cognitive and aesthetic experiences and dimensions of knowing in their inter-relationships. For a further application and development of the integral model would be challenging to link the proposed "levels" and "lines" of the integral pheno-practice of knowing together. For example it would be interesting to show how the issues of a specific level and lines in one quadrant of knowing inter-relates reversibly to others in different quadrants and the integral nexus altogether. Moreover, work needs to be undertaken on providing guidance on how to model might be used to analyse and propose cultural change interventions or self-organising processes, for developing a knowing-oriented and learning organisation. Accordingly, it can be assumed that linking up the integral model of knowing to the discourses on organisational learning will be fruitful.

With regard to future research about conditions and effects of an embodied and aesthetic knowing it would be worthwhile to analyse in which ways these interrelated practices and processes are regulated, ordered and sustained. Investigating the influence of power and socio-political tensions would be an elusive way of understanding how interconnections between inner knowing and external knowledge on both individual and collective levels emerge or are constrained. This includes the power and political nature of the interrelation between individual and organizational priorities in relation to development that is the dynamics between macro and micro forces which shape the endogenous character of knowing, learning and organizing. One focus of this research could investigate what conventional set of "interpretive frames" (Goffman, 1959, 1974) determine the emplotted play of knowing and learning. In addition, the influence of hierarchical organisation of levels like speech acts, arid limited episodes or to life script (Cronen & Pearce, 1981) at which the knowing and learning actors can make sense of their individual and social life in the continuity of the life-world are possible research issues. In this regard, it would also be interesting to investigate "organizational identity" as an ongoing accomplishment, enacted and reinforced through situated practices related to knowing recursively. With this, further research could also explore the link between embodied and narrative knowing (Küpers 2005). One essential research avenue could be the role of communication (Lanigan, 1988; 1992; Schrag 1986) and organizational communication (Eisenberg et al. 2003; Gordon & Martinez 2004; Gudykunst et al 1985; Putnam & Jablin 2000; Shockley-Zalabak 2002), in order to develop an inquiring (Kikoski & Kikoski 2004) and proactive organisation (Kreps 1990) and corresponding communicating leadership (Witherspoon 1997) for improving processes of integrative knowing. Another field, to which the outlined approach could be linked, is

improvisation (Hatch, 1999; Crossan, 1998; Crossan et al. 1998; Crossan & Sorrenti, 1997; Mirvis 1998;, Weick, 1998; Moorman & Miner, 1998) understood as embodied performing action and proactive and creative way for organizations and its members to know and to learn. Furthermore, it would be challenging to investigate how improvisations are a kind of aesthetic practice of enacted knowing and realisation of aesthetic intelligence.

It is hoped that the phenomenological and pheno-practical frame-work proposed in the paper may provide possibilities to re-assess, re-think and further investigate the deeper relevance and put in to a more holistically oriented research and practice of the inter-related embodied and aesthetic processes of knowing and acting in life-worlds of organisations. As by taking into account the various inter-relational dimension and following the outlined practice and processual turns, a creative and integrative understanding of the constitution and development of the knowing can be attained.

All in all the integral approach as outlined in this contribution can be used to illustrate, highlight, interpret, deconstruct or re-conceive the experiential "base" of knowing processes in organisations. Leaving behind the reductionistic "flatland ontologies" (Wilber 1995) and researching the lived experience (van Manen 1990) of knowing is a challenging endeavour. But it will be a worthwhile, as it contributes for a more integral and sustainable practice of knowing in responsive organisation, and with this a corresponding reality in current and future society.

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Endnotes

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[2] Historically, the question of knowledge and knowing has been a very old quest of human beings, and particularly for philosophers and researchers of science. Although the present period of human history has been labelled as "The Age of Knowledge" and by others as the "Knowledge Society", or „global knowledge economy" (Skyrme 1997 Sheehan, 1999) knowledge and knowing have always been important to humankind and probably always will be. Moreover, even before "knowledge" became a watchword of contemporary organizations, also the world of business has always needed knowledge, and has been constituted by knowing processes, even before all the various "Knowledge Management" initiatives in organisations emerged (Stewart, 1997). With a growing trend to consider knowledge explicitly as part of the organisational resource structure and factor for competitive advantage and increased interests in process of knowing, a stronger need to understand and to manage knowledge and knowing emerged. Accordingly the research interests in knowledge, knowledge-based organizations, and knowledge management has accelerated (Kogut & Zander, 1992; Nonaka & Takeuchi, 1995; Tsoukas, 1996; Teece 1998).

[3] From a representationistic perspective, the world is considered as an aggregation of symbolised representations of what Plato called *idée*, the purely idealised existence of the world in its perfect integrity. Accordingly reality is always an imperfect "mirror image" of the perfect, objective world. With its modern Cartesian unfoldment this ideas has been extremely influential in a wide range of natural and social sciences, clearly including modern management and organisation studies as well as research on organisation knowledge in the twentieth and twenty-first century. Such a representationsistic view on knowledge is based on several general assumptions about knowledge (Aadne et al. 1996). It presupposes that knowledge is seen as a representation of a pre-given world. With this social reality is indicated as outside of an observing actor. Furthermore, human intelligence is seen as information processing and rule-based manipulation of symbols, which follows the bias of cognitive science; according to which human intelligence is largely tantamount to the characteristics and functionality of computation (Varela et al., 1991). Accordingly, knowledge results from human beings realising information processing. Moreover with this cognitivistic perspective knowledge is seen as an entity that can be stably transferred within and between human brains. Finally knowing and learning are thought of as creation of the most accurate or "truthful" representations of the objective world. Thus both are means to improve representation through acquiring information from the outside world and assimilating it to former experiences. [4] The underlying pattern of these positions can be traced back to classical theories of knowledge. On the one side, there is the empiristic-objective tradition of realism (Aristotles, Hume, Locke). For this tradition, only the particular independent objects have primary reality, that is, only their primary, (non-qualitative) properties are real; that nothing universal can be known, and in the end that the existence of the world cannot be stated with certainty. Ultimately, empiricism makes the socio-cultural world an illusion, ignoring the internal connection between the object and the act. On the other side, there is the rationalistic-subjective tradition of idealism or intellectualism (Platon, Descartes, Kant, Husserl) which is justifying knowledge as achieved by an autonomous subject about an independent object. Whereas empiricisms approach knowledge by explaining external relations between objects and causal generalisation, intellectualism reduced it to conceptual internal relations and representation, ultimately denying an independent "objective" reality. Both empiricism and intellectualism are eminently flawed positions, as Merleau-Ponty proposes: "In the first case consciousness is too poor, in the second too rich for any phenomenon to appeal compellingly to it. Empiricism cannot see that we need to know what we are looking for, otherwise we would not be looking for it, and intellectualism fails to see that we need to be ignorant of what we are looking for, or equally again we should not be searching" (Merleau-Ponty, 1962, 28). On the one hand, many approaches in conventional knowledge management discourse follow a representationistic perspective and functional, entitative and cognitive orientation, by which knowledge is explained as an object (Swan & Newell, 2000). For these often information-processing models, knowledge is an asset, an "intellectual capital" (Stewart, 1997) that can be exploited for organizational benefit (e.g., Bontis, 2002). It is perceived as a commodity that "shares attributes with money in that it seems of value only when it is moved and used" (Murray, 2000, 186). Consequently it is seen as "transferable" (McAdam & McCreedy, 1999), "convertible" (McPhee & Zaug 2000), "manageable" (Davenport & Prusak, 1998), "codifiable" (Ahonen et al., 2000), "quantifiable" (Narasimha, 2000), and "transactable" (Snowden, 2000). This static and objectified view of knowledge, which has been pervasive in the management and organization literature, has prevailed for a long time

mainly because it fits well with the mechanistic and functional understanding of traditional economical paradigms. Subsequent deductive research designs and neo-positivistic strategy tried to explain and predict knowledge and corresponding managerial practices and to evaluate the organisation of knowledge and its "exlusive benefits" (Flanagin, 2002). However, this view has been subject to strong criticism in the last two decades (e.g. Tsoukas, 1998; Hodgson, 2000; Stacey, 2000). Codified knowledge is only one aspect of knowledge that can never replace, nor be successfully applied without integrating the living process of knowing itself. An overemphasis on codified knowledge and a reduction of context and meaning in conventional knowledge management approaches and systems end up with instituted compilations of disconnected, incomplete, and useless fragments of knowledge, doomed to fail as evidenced by the actual under-utilization and failures. By attempting to 'fix' the complex world of organisations and its members through applying ill-conceived (residual) categories, insufficient entitative modelling, one-sided codifying, or universalizing orientations, such objectifying approaches underestimate the influence of human life-worldly practices and contexts. On the other hand, different approaches have stressed the subjective or inter-subjective constituencies of knowledge. Following the typical philosophical (epistemological) understanding knowledge is seen as an essentially personal item that concerns true facts about the world: knowledge is an individual's true, justified belief. Accordingly, knowledge is seen as subjectively based or inter-subjectively bound interpretation and enactment. This orientation approaches knowledge as the result or representation of knowers´ individual or mutual interpretive action and linguistic behaviour (also in communities of practice as intersubjective culture of knowledge sharing).With this, the focus has been on personal characteristics and experiences of the knowledge worker and his relation to knowledge generation, usage and application (Glastone, 2000). Accordingly, knowledge is treated as an individual or collective (stable) disposition resulting in a "subjectivist reduction", relegating any specific objects to a status of secondary reality. Following inductive research designs and hermeneutic strategy, this discourse aimed at understanding and interpreting knowledge of subjects. Particularly, tacit and implicit knowledge have been characterised as highly personal (Stenmark, 2001; Meso & Smith, 2000; Vincenti, 1990; Raghuram, 1996; Davenport & Prusak, 1998; Wagner & Sternberg, 1985; Nonaka & Konno, 1998) and obtained by subjective experience (Nonaka & Takeuchi, 1995; Augier & Vendelo, 1999; Wagner & Sternberg, 1985). Accordingly, knowing indicates a personal capability or mode of action (and feeling/passion), something individuals and groups can rely on in everyday life without being aware of it, let alone understanding it.[4] Corresponding personalisation strategy and (questionable) ways of explicating and sharing implicit knowledge have been discussed, tending again to use it as a resource. However, being non-verbal, inarticulable, unconscious, or ineffable tacit and implicit knowing cannot be explicated in written or verbal form (Patel et. al., 1999, 76; Collins, 2001a, 72; Collins, 2001b, 108; Ambrosini & Bowman 2001, 812-3; Herbig & Büssing 2003, 167; Tsoukas, 2003). Thus, it is not an "objectifiable" resource, but more an embodied capacity of practice ("Könnerschaft") (Schreyögg & Geiger, 2003). We do not only "know more than we can tell" (Polanyi, 1966, 4) with respect to our pre-comprehension of phenomena, but we are also immersed in an embodied world of experience in which the lived is always greater than the known (Merleau-Ponty, 1962). That is, life both precedes and exceeds our very effort to grasp it. Accordingly, all pre-positional and tacit knowing of reality is based on daily dealings, e. g. within an „in-corporated" environment of organising. Deprived of their tacit coefficients, all spoken or written words would be meaningless. That is, explicit knowledge must rely on being tacitly understood and applied to be knowledge at all. Such "act"-notion of implicit knowing lays focus on the capacity to mobilize our beliefs and values in action, cognitively, emotionally and practically. Therefore, also the presupposed "personal" tacit knowledge and implicit knowing are not "resources", but always a process of knowing and acting, within an "in-between" including the "(inter-) objective" dimensions. For a more detailed discussion of both strands with their pitfalls and one-sidedness and a phenomenological and process philosophical alternative see Küpers/Jäger 2005

[5] Additional ontological dualism and dichotomies of knowledge have been elaborate, for example, local vs. universal, codified vs. un-codified, canonical vs. non-canonical, procedural vs. declarative, and know-how vs. know-what etc. These taxonomic and dualistic perspectives, tend not only to reify knowledge, but to oversee how forms of knowledge and knowing – e.g. tacit and explicit knowledge - are mutually constituted and essentially inseparable (Tsoukas, 1996, 14; Küpers, 2005).

[6] The most fundamental way in which we are involved in our „life-worlds" is our corporeal perceptual relation. Perception is not simply the result of the impact of the external world (sensory experiences) on the body; for even if the body is distinct from the world it inhabits, it is not separate from it. There is only perception as it is lived in the world. According to Merleau-Ponty (1962, 242) perception is "a non-thetic (i.e., non-positing), pre-objective, pre-conscious experience. Thus, it takes place in a pre-objective realm or

"phenomenal field" which is inherently indeterminate and ambiguous. This primordial coexistence of being-in-the world reveals itself through the perceiving body as medium. The body - being an internal and external orienting centre of perception - is the inter-mediation of all practice and negotiation of meaning. As the perceiving capacity is incarnated, also consciousness is perceptual. With this, perception is not merely passive before sensory stimulation, but a creative receptivity. This implies that our cognitive system exists enmeshed in an embodied perceptual world in which we do things, where we have skills and social practices that facilitate our interaction with "objects'". In other words, our perceptual and intentional consciousness is experienced in and through our bodies: We access and process our possibilities perceptually.

[7] The embodied self can take on an identity appropriate to its own discovery only in a linguistic community. While the self finds itself already situated in a world of signs, symbols, and texts, the self participates in "constitut(ing) a linguistic world and a cultural world." (Merleau-Ponty, 1962, 197). As the self matures, reads, and listens, speaks, and observes, s/he learns various associations of words, situations, and objectivities until it acquires an identity and linguistic style for its own expressive needs. It does not posit itself prior to language, but realises itself through language as a social act. Language is not a mere representation of an outside reality, but as an activity of mutual creation and influence; it is the carrier of an ongoing co-ordination of interaction. This approach embraces the perspective, that our understanding of reality is not a one-for-one representation of what is "out there" but the result of both individual and social inter-relational processes. This process is mediated, by way of language, which alter, select, and transform our experience. Building on structural linguist approach, Merleau-Ponty emphasises the subject's lived languaged relation to the world. To view language synchronically, Merleau-Ponty argues, is to view it as enacted, and not as an abstract, universal entity, subject to gradual evolution over time. Language here is fundamentally the "living present" in speech. To speak, to communicate - to use language - is in part equivalent to becoming aware that there are only successive living presents. In by-passing Saussure's theory of "langue" which explains how speech is enacted, Merleau-Ponty favours the actual "parole". With this he refers to the signified enactment itself and emphasises the embodied dimension of the signified. This implies acknowledging language's plurality and opacity as a system of signifiers. For Merleau-Ponty, language is a creative medium and event of expression; speaking is like a performance of thought. Thinking actualises and incarnates itself in sensorial and gestural speaking. „The spoken word is a gesture, and its meaning, a world." (Merleau-Ponty, 1962, 184). Hence, the language of the speaking subject is the elaboration of an embodied sign system. Thus, language serves as a medium for expressive creativity Being mediated linguistically, meaning, truth, and self, are created by interrogation and interpretation from a lived, social and creative perspective. The linguistic expression manifests a repetitious return and extension of expressions related to the world of perception, which is already a "langage naturel" or "expression implicite". Language is the ever-recreated opening in the plenitude of being such that any cultural project of knowledge and meaning is necessarily open-ended and incomplete. We continually transcend ourselves through various modes of language. With this, the creative language gestures are "sur-significant" (Merleau-Ponty, 1962) living from what has already been said, what is, as yet unarticulated and what will be possibly expressed. By a linguistic gesticulation, a coherent deformation of pre-existent structures emerges as a movement, which throws our image of the world out of focus, distends it, and draws it toward fuller meaning (Merleau-Ponty, 1962, 78). The labour of language displace our life's centre of gravity by suggesting that we cross-check and resume our operations in terms of one another, to go beyond are own sedimented notions of self. The self, Merleau-Ponty points toward, is a field of experience as well as a field of constructive and creative activity that exists between the grounded and innovative parameters of language, which proceeds continually in transformation and metamorphosis. Moreover, language is also deeply political. The labels we give to things, the ideas evoked by a particular word or phrase, are a double-edged sword. They allow the possibility of knowing more, and of being controlled or misled. For a critical perspective concerning language and organization see Linstead & Westwood 2000.

[8] Without the bodily-perceived senses of the individual situation and intentional and volitional energies, we would not know where we are or what we are knowing or learning nor to communicate about it or be motivated to know and to learn at all. Furthermore, knowing requires embodied competencies objectified in our external actions. Finally all knowing takes place within an institutionalised, in-corporated setting of (infra-)structures as a kind of systemic embodiment. In this way, the body of the individual and the embodiment on the collective level is the very base of an integral knowing.

[9] Also Polanyi (1962, 1966, 1969) is emphasising the role of the body in our contact to the world and throughout the act of knowing in particular (Gill 2000, 44-50) as the necessary somatic equipment referring to "the trained delicacy of eye, ear, and touch" (Polanyi and Prosch, 1975:31). As Polanyi (1969:147)

remarks, "the way the body participates in the act of perception can be generalized further to include the bodily roots of all knowledge and thought. […] Parts of our body serve as tools for observing objects outside and for manipulating them".

[10] Responsiveness can be characterised as an embodied awareness and corresponding answering coherent behaviour particularly during dialogical interrelations (Burgoon et al., 1995; Bakhtin 1981). Being relationally-responsive considers how changing circumstance or situation of knowing and learning are 'calling for' or motivating an spontaneous and appropriate answer from those involved in a "responsive order" (Gendlin, 1992, 1997) as a living form (Shotter, 1993).

[11] As Macmurray (1957) pointed out, the concept of 'action' is inclusive: "… most of our knowledge, and all our primary knowledge, arises as an aspect of activities that have practical, not theoretical objectives; and it is this knowledge, itself an aspect of action, to which all reflective theory must refer (p. 12) … "In acting the body indeed is in action, but also the mind. Action is not blind... Action, then, is a full concrete activity of the self in which all our capacities are employed." (p. 86).

[12] The practical intentionality of embodied actions and the perceptions involved are largely habitual; learnt through enculturation, imitation, and responsiveness within a specific environment and to a community. This implies that to participate in a practice is to learn the "logic" of that practice, kept within a habitus, which produces historical anchors and ensures the correctness of practices and their constancy over time more reliably than formal and explicit rules ever can. Embodied habitual knowledge and learning are like a non-conceptual, pre-linguistic "silent practice" that is implicit in actions. However, this habituality is far from being merely a mechanistic or behaviouristic propensity to pursue a certain line of action. Habitual modes of being are constantly being altered. They are far more akin to a competence or a "flexible skill, a power of action and reaction (Crossley, 1994, 12), which can be mobilised under different conditions to achieve different effects (Merleau-Ponty, 1962, 143). The embodied habitual act of knowing (and hence learning) is a practice consisting of skill acquisition and skilful performance (Dreyfus & Dreyfus, 1980) that makes up much of our everyday activities (Dreyfus, 1996). With the possibility to modify habitual modes the embodied learning practice allows that the hardened understandings of the practical field becomes free for revision and that identities are opening for a re-evaluation, and that possibly new "strategies" of engagement can be realised. This allows innovative opportunities for an alternative (self-)description and re-description to emerge. Such re-created practice relates to an enfolding life-world constituted and shared within "inter-relations" with the co-present others.

[13] As organisational structure is anchored in shared meaning (Ranson et al., 1980), one has to see practice always in relation to the broader cultural pattern (Alvesson 1993a, 62). Thus, practice refers to pragmatic activities that are always embedded in a historical and social con-+text that gives structure and meaning to what is being done or not. Such con-+-textual understanding of practice includes both the explicit and the tacit, what is said and what is left unsaid; what is represented and what is not-represent(able), the manifest and symbolic. Con-+-Texts are reflections on the social conditions and power differentials implicit in the production, dissemination and reception of specific practices. These practices contain politically relevant issues like defined roles, the specified criteria, the codified procedures, the regulations, and the contracts that various practices make explicit for a variety of purposes. But it also includes all the implicit relations, the tacit conventions, the subtle cues, the untold rules of thumb, the recognizable intuitions, the specific perceptions, the well-tuned sensitivities, the embodied understandings, the underlying assumptions, the shared worldviews, which may never be articulated, though they are unmistakable signs of membership and are crucial to the accomplishments (Wenger, 1998, 47). *Con-+-Textuality* emphasises that it is the relationship between "texts" in a broader sense that is important. An extended understanding of "Text" implies any instance of a communicative act, spoken, gestured or written, that contains or carries relevance for performing agents. This includes non-linguistic marks, perceived traces and indirect or non-discursive forms of expressions. Con-+-Texts comprise physical, social, and cultural relations in all their layered complexity and are always changing. For a con-+-Text there is no separation between language and the world, as it is like an intermediating "milieu". Moreover, this con-+-textual realm allows to distinguish the very difference of language and world itself and other very differences as well. Such an understanding also suggests that meaning is partially a pre-reflexive "characteristic" or "property" of con-+-Texts, which comes already before conscious intentions of any speaker or interpreter and accompanies them continually. "Inter-preting" con-+-Texts is not only a process which mere deciphers textual signs or messages. The interpretative relationship is implicit in the con-+-Text itself, which is been "written" and "read". This again leaves traces, influencing further "writing" and interpretative "reading". Con-+-Texts of organisations are networks of "texts" embodying the values and norms according to specific local ontologies. They constitute options of meaning for experiences and are creating communication between individuals and patterns of

social relationships. In addition to a non-verbal interplay, and with particular word-use and discourse patterns con-+-Texts resemble "language games" - as they reflect activities in semi-institutionalised, functional areas of life as so called "life-forms" (Wittgenstein) of action. Moreover, con-+-textual inter-relations can be viewed as a) processes, in which particular possibilities are made available and co-ordinated with, contested, temporarily fixed and maintained; b) processes in which other possibilities remain unavailable or are offered but rest as 'failed co-ordinations' (Gergen, 1995). Organisation can be understood as a multi-discursive and precarious causes and/ or effects of interwoven pre-forming con-+-Texts and vice versa. As con-+-Texts are pre-forming, performances in organisations are taking place within specific constrains. The corporate performing actor is constrained con-+-textually, by her script-or expectation-ruled roles to play. This restricted con-+-text co-determines and regulates the appropriate repertoire and the potentials for improvisations and narratives, to be discussed later. Basically, we can never accede to a lived organisational reality without some connection to its con-+-Textuality from its opening and related to is syntagmatic frames of references. The pre-forming con-+-Text of performances is a all pervading differential network. Like a "textile" of traces, it refers endlessly to something other than itself, to other differential traces (Derrida, 1979, 84). Similar to the deconstructionist's much misunderstood assertion, one can say: *"there is no-outside-con-+-Text"*. This does not mean to fall into an idealistic or semiotic pan-Textuality, as con-+-Texts always relate to embodied, sensual and emotional experiential materiality and mundane time. Although we usually remain unaware of being always situated within such a con-+-textual "space", it is always from within such a complexly intertwined sphere that we responsively perform our actions, in 'answer' to the 'calls' the embodied situation exerts upon us. Pre-forming Con-+-Texts and con-+-Textual performances are always in plural as there are always a series of decentred organisational realities, linked in an "inter-performance" play of meaning. To perform in a certain enactment is also a way not to perform in other ways. Or more actively: it is useful to be reminded that it is a way of simultaneously creating and suppressing other performed plots. *Hermeneutic phenomenology* undertakes to study and interpret these organisational "for-structured" con-+-Texts. This can give rise to radically different ways of seeing. Using the understanding of organisations as "quasi-text" or a "text analogue" the embodied meaning can be made explicit by means of hermeneutic interpretation. By opening the circle of understanding into an evolving spiral the hermeneutical process itself is a creative aesthetic operation. It is an operation that unleashes meaning latent in the polysemic storehouse of con-+-texts patterns, where each figuration is open for "decon-+-Textualization" (deconfiguration) and recon-+-Textualization (reconfiguration) reflecting the performers and intepretators life-situation at a variety of levels. With this, a creation of a new semantic pertinence is possible by means of an impertinent attribution. By re-structuring and re-ordering semantic fields, we evoke emergent meanings not previously related and employed in particular con-+-Texts. Each performed con-+-Text permits a certain actualization of meaning storied in the polysemic treasure chest of the "semantic playground" sedimented in the emplotted con-+Text (Küpers, 2001). Therefore, pre-forming con-+-Texts are like open "textures" filled up with sedimentation, memories but also expectations and hopes. Similar as relational "fabrics", they are interwoven by knitting processes of negotiation of meaning twisted by emotional "threads" and aesthetic patterns.

[14] Depending on its local practices, knowing can be considered a phenomenon that is varyingly embodied, embrained, encultered, embedded and encoded (Blackler 1993; 1995, Blackler et al 1998; see also Gherardi 1999, 112;). According to Blackler et al. (1998:74) these forms of knowledge can be specified as follows: embodied knowledge as knowledge in which a physical presence is needed; involves 'knowing how'; embedded knowledge as knowledge contained in systemic routines; organisational capabilities; embrained knowledge as knowledge depending on conceptual, cognitive abilities; 'knowing that'; encultured knowledge as a process of achieving shared understandings and encoded knowledge as information that is conveyed by signs and symbols. However, Blackler et al. (ibid:72) conclude that 'in the emerging global economy, knowledge that is embrained, encultured and encoded is of growing significance compared with knowledge that is embodied or embedded'.

[15] A relational paradigm finds its theoretical underpinnings in social constructionism (Schütz, 1972; Berger & Luckman, 1966; Gergen, 1994; Harré, 1986; Shotter, 1993) and advanced phenomenology (Merleau-Ponty, 1962, 1964, 1969). This combination allows, to consider not only that any understanding of reality is always mediated by historically and culturally situated, social inter-actions respectively interpretations (Gergen, 1994, 49), but to think about them also as embodied practices, which occur in immediate, spontaneous ways of experiential dimensions and mutual responding. Accordingly relational selves and processes are not only as discursively constructed de-differentiated and signifying „beings" or abstract „object" of power and semiotics. But they need to be integrated their "material" and sensory, fleshly bodiliness and existential immediacy. "Relating" itself is a "reality-constituting practice" (Edwards &

Potter, 1992, 27) in which shared understandings are developed, negotiated, thus "socially constructed" but always between participants with their embodied experiences. This relational reality is characterised by ongoing, local processes (Parker, 1992) that include non-linguistic (e.g. gestures, "objects", documents etc.), linguistic and narrative processes (e.g. conversations, stories, rumours etc) as well as con-+-textual dimensions.

[16] Active responsiveness has been conceptualised as a perceptive, reflective and adaptive capacity that enables and facilitates process of knowing learning in organisations (Jacobs, 2003). It refers both the explicit content as well as the implicit claims and demands of questions to which organisation and management respond. Such responsivity as a dialogical answerability', would go beyond intentional acts or communicative actions as it puts the answer and thereby answerability first; Moreover, a kind of responsive rationality would suggest reflecting on the ability of organizations and management not only provides same answers for same questions but to invent productive answers to new questions.

[17] Merleau-Ponty´s indirect, corporeal ontology of reversible flesh reflects the inextricable intertwining of the human "body-subject" with the world it inhabits- the inseparability of "self-knowledge" and "object-knowledge" in the midst of fields of "in-betweeness" at the brink of non-dual "Wild Being". Just prior to collapse into complete non-duality there is this chiasmic point where the difference between the dualities begins to separate but have not yet gained the necessary escape velocity to tear apart. It is this thin space between the collapse of the antinomic opposites and the arrival at complete non-duality that Wild Being directs our attention toward. At this level we discover that there is something beyond the essencing and the eventity; a holon which is simultaneously whole and part. The holonic nature of the thing is a chiasm between the view of the thing from the outside as evenity and from the inside as „essential" epoch. We can think of the holon as establishing the chiasm between inside and outside and the ´integra´ as establishing the reversibility between different viewpoints on the same thing. These two dimensions toward the thing together establish the 'flesh,' or 'play,' or 'schizoid,' or the 'interactive heterogeneity and heterogeneous interactivity' by which the various philosophies of Wild Being describe the world.

[18] This again essentially amounts to a dynamic understanding the subtle interaction between background and foreground, absence and presence, order and disorder of a knowing within an organized setting (Patriotta 2003 2004). Sharing insights and knowledge - even well-documented "best practices" - is mediated by the present, living act of knowing. Therefore, embodied knowing and learning as complex responsive processes refers to an emerging transformation of inseparable individual and collective identities. That is, knowing and learning occur as shifts in embodied meaning, which is simultaneously individual and social. This implies a transformation of inseparable individual and collective identities, moving into the unknown, requiring considering the potential for emotions involved (Küpers/Weibler 2005).

[19] Etymologically deriving from the Greek "aisthesis", aesthetics refer to expressions ("aisth" = feel) which designate sensation and perception altogether, prior to any artistic meaning. The Greek verb "aisthanomai" denotes the capacity to perceive with the senses, sensing through physical sensory perception.

[20] According to Sandelands and Buckner (1989, p.121) "flow arises in activities that are art like" or related to aesthetic experiences. They have developed a set of criteria that they refer to as the "sine qua nons of aesthetic experience": definite boundaries, dynamic tensions, record of growth and unresolved possibility. Based on the assertion that aesthetic experience is a part of everyday organizational life, they show that it is possible to develop a complex analysis of aesthetically-rich experiences as a source of potential value for organizations.

[21] Aesthetics is a category that we create in language. Like every linguistic creation, this category is a double-edged sword that can be empowering or tranquillising. We need to realise that by labelling something as aesthetic we are articulating a view that involves us – the observers- as much as the observed in a common system. The language of aesthetic needs itself be understood as a device for connection, creation and co-ordination.

[22] Accordingly, aesthetic processes of organising need to be considered as how they are making and remaking "persons", structures and entire worlds in an ongoing process of (inter-)relating. The underlying relational processes "author-is" or constellates 'the way things (and performances) are' and not the other way around. Aesthetic relating may create multiple realities as different but equal, avoiding the imposition of one (e. g. managerial) voice. This very different view of relating sets aside traditional inside-outside distinctions such as those between "subject" and "object". Persons and worlds are not like inputs to processes, but are part of an ongoing (re-)construction in processes of relating text and con-+-Text, act and supplement. In other words, persons and their performed experiences are emergent 'creations' of relational processes.

[23] Tacit, implicit and aesthetic knowing share the same constituency of knowledge/knowing as practice. What and how individuals and collectives know tacitly and aesthetically is essentially related to its being-in-use

and learnt by being performed. The corporeality of organizational practices (Strati 2002) process the tacit, implicit and aesthetic understanding as a “knowing in practice” (Strati 2003).

[24] Polanyi (1962, 1966, 1969) - arguing for the unitary nature of all knowing - shows that the sharp distinction between tacit and explicit knowledge does not exist, but that “all knowledge is either tacit or rooted in tacit knowledge!” (1966, p. 7; see also Polanyi 1962; 1967, 195). Even if knowledge has been articulated into words or mathematical formulae, this explicit knowledge must rely on being tacitly understood and applied. Thus all codified knowledge necessarily contains a “personal coefficient” (Polanyi, 1962 x:17). Polanyi also argues that every aspect of knowledge, including explicit dimensions, is accrued over time. In a strict sense, tacit knowledge is inherently non-transferable but it becomes explicit once it is transformed. The transfer of tacit knowledge depends on the credibility of the transferer because tacit knowledge rests in the transferer's deeper awareness of the meaning of communicable details. "The transferer's teaching about which papers might be meaningless has, in fact, a meaning which can be discovered only by hitting on the same kind of indwelling as the teacher (transferer) is practicing" (Polanyi, 1966, p. 61). Until this "same kind of indwelling" can be achieved, the transferee must accept the transferer's meaning because the transferer can communicate only the knowledge which the transferee recognizes - that is, the concept of skill described by details - without the corresponding tacit knowledge which gives meaning to these details (Tsoukas, 1996). Similar to Merleau-Ponty also for Polanyi there is no purely explicit knowledge as far as, besides body mechanisms involved, focal awareness always needs the support of subsidiary awareness. For both all human perception is constituted by tactit dimensions (see Mingers 2001; Mingers & Willcocks 2004).

Stories and narration as a learning process

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Introduction

Narratives and storytelling processes within organizations have received considerable attention in recent years (Boje 2001; Boyce 1997; Cunliffe et al 2004; Czarniawska 1997) and have been recognized as a very useful way to better understand contemporary organizations. Without entering into the details of these seminal works, the crucial point of the narrative approach is that members of organizations think more in terms of the form of stories or narration than argumentatively (Zuckier 1986). For Boland and Tenkasi (1995), storytelling is a basic principle of human cognition and helps to understand how people can learn in organizations. A central argument in these studies is that narrative analysis reveals that most organizational phenomena are told, described and reported in narrative form. Van Maanen (1998) claims that narratives are not only a legitimate form of explanation but also the most appropriate vehicle for representing actions and events in organizations. Polkinghorne (1988) or Weick and Browning (1986) show that whereas organization theory usually explores organizational reality by means of an argumentative model, the reality of a company is embodied in a set of stories which provide people various devices that guide knowing and action. Brown and Duguid (1991) also contend that the narrative process is a kind of learning in a situated context. In a radical perspective, Czarniawska (1999) asserts that the organization itself can be regarded as a story and that the role of narratives is central to the understanding of the social construction of organizational phenomena.

All these propositions convey the idea of a narrative knowledge that guides people's behavior and thinking in their organization. Stories and narrative processes allow actors to articulate knowledge through discourse; they provide access to tacit knowledge that can be externalized in a discourse or text-like form. Moreover, stories and narration are also seen as central to building a community of meaning and can be understood as a sense-making device (Weick 1995): through stories, organizational members make sense of their experience and build a common meaning. For Brunner (1990) and Fisher (1987), stories and narration constitute a method of negotiating and re-negotiating meanings within organizations. Therefore we contend here that studying stories is a powerful means of understanding organizational processes and events.

Drawing on this framework, our purpose in this article is to analyze how stories and narration in an organization facilitate the socialization and learning processes between people coming from two different organizations or departments. For this purpose, we report an empirical study in which we analyze the various contents of the stories we collected. This work is mainly based on the works of Greimas (1983, 1987, 1991), Barthes (1977) and Genette (1980, 1982) and attempts to provide a typology of the different stories. We also study the role and the function of stories within the merging organizations. We suggest that stories can be seen as a learning device and represent a powerful means of acquiring and sharing tacit or difficult-to-formalize knowledge. However, in this paper, stories are not seen

only as a description of organizational reality. Referring to Bakhtin's (1981) and Kristeva's (1977) works, we also suggest that stories can be analyzed in a dynamic and inter-subjective perspective in which stories are understood as works in progress, continuously changing during the interaction process between the teller and the listener.

This paper is based on an empirical study that analyzes the post-integration process in a merger within the French Danone Group. We begin by providing a brief summary of narrative theory and we suggest that these two fields are closely linked. Next we present our empirical study. We focus our research on the commercial and R&D functions because they involved both the sharing of knowledge that was often difficult to formalize and because storytelling and narrations played a crucial role in this interaction. After the analysis of the various stories' content, we then propose a typology based on Greimas' works. The next part of the paper is devoted to the role of these stories and of the narration process as a learning device. We try to show how sharing stories also enable to create a common meaning within the new entity resulting from the merger. This leads us finally to analyze the power relationships between stories and how some of them are retained in the organization to play the role of a model or a norm guiding people's behaviors.

Theoretical framework: narratology and the storytelling process

Our theoretical framework is mainly based on literary theory and more specifically on narratology. This stream of research aims at studying the structure of stories and the various categories and roles upon which stories are organized. First, it is necessary to give a definition of stories. This can be done by referring to literary theory and narratology.

A story is generally defined as a series of logically and chronologically related events that are caused or experienced by actors (Bal, 1992). An event is the transition from one state to another state whereas actors are agents that perform actions. The term actor covers a larger arena than a more specific term such as character. It includes various acting entities that are not necessarily human. Moreover, a story has a clear beginning and ending and is organized around a plot and stable characters. This has been formalized by Aristotle (1982) who presents stories as sequences in which experiences and events are organized around plots or themes that give them some unity and logic. This coherence is based on causally linked events that are ordered in a linear and temporal sequence. As it was underlined by Ricoeur (1985) time (sequencing) and plot (storyline) are thus essential to define a story. Applying these works in an organizational context, Gabriel (2000) defines a story as having a clear beginning, middle and an end that are held by action and characters. By describing a series of actions that leads to a denouement of the intrigue, a story introduces some coherence and causality in organizational events. The story is therefore a creator of order that inserts in the same frame causally and temporally linked events. This is why Mitroff and Killman (1976) or Robinson (1981) consider that stories provide meaning to various organizational actions.

One can question the relationships between stories and underlying reality that is supposed to be represented. Such a question is a crucial issue for organizational studies. It is important to note that stories are not necessarily an objective image perfectly mirroring reality. Rather, they should be considered as interpretations of events which are re-arranged and organized around a plot to give meaningful causal structure to the sequential events. For example, Vaara (2002) emphasizes that a narrative is composed of a sequence of events that are given meaning by a plot. He also says that this plot is not necessarily intrinsic to the events themselves but imposed on them by the author. This interpretative dimension means that stories have a component of fiction. On this basis, it is legitimate to suggest that stories often result from an ex-post rationalization. But such a discrepancy between objective facts and story does not deprive stories of their power to convey tacit knowledge. On the contrary, we suggest in this paper that the plot is a precious way that organizes the data gathered from experience without reducing its singularity or removing its concrete richness. The organization of events around a plot and contrasted characters enables the conveyance of "situated" knowledge (Brown and Duguid, 2001) without mobilizing analytical demonstration. Fisher (1989), for instance, refers to a "narrative rationality," which functions in the mode not of assertion but rather of suggestion and evocation and which enables to grasp difficult to formalize knowledge. In the same vein, Robinson (1981) asserts that stories recount complex actions that are difficult to formalize. They stage events that cannot be grouped into standard and analytical categories and they allow to better understand the context and to integrate tacit knowledge. Moreover, for Cunliffe et al, (2004) the storytelling process mobilizes both reason and emotion and involves the active participation of the listener who can appropriate stories and use them in his or her own specific working environment.

Empirical study

This section now presents our empirical research. We analyzed the integration phase of two companies involved in a merger and we devoted particular attention to the phenomena of storytelling between the teams engaged in the organizational combination. The merger is thus analyzed from a perspective of socialization and mutual learning through narration. This merger involved two biscuits companies of the French group Danone: Belin and L'Alsacienne. The merger was intended to reduce costs by achieving economies of scale and by rationalizing the product portfolio. It was also a way to create a new and more powerful entity that could compete in global distribution and improve its competitive positioning. However, beyond these objectives, the Danone Group had set the additional goal of integrating the best competencies of each organization. The merger entailed a combination of physical assets, a merger of Head Offices and various departments and a combination of two cultures. The new entity ultimately combined many organizational systems of both companies, particularly in the marketing, commercial, R&D and production functions. We focus here our research on the R&D and commercial departments.

Methodology

This research on the storytelling process during the integration phase is part of a broader study of learning processes between the firms involved in the merger. Data was collected over a period of more than one year, essentially during the integration period. Our status was dual: we were present both as a researcher and a consultant integrated into the consulting team in charge of facilitating the merger. This dual status enabled us to access a wealth of information and to modulate our approach to different interlocutors. We attended and participated in preparatory works of the merger workshops charged with determining the profile of the new organization. We also integrated the implementation teams. This active participation to the integration process helped us to collect a great amount of various and rich data. In addition, we conducted semi-structured interviews with the members of each company that belonged to the principal departments. These interviews were mainly structured by categories taken from the literature on the implementation of mergers and organizational learning and on narrative theory.

In the course of the study, it quickly became evident that beyond the formal and planned integration processes, storytelling played a significant role in the learning and combination of various elements of knowledge. Stories were presented by many of our interlocutors, especially in the middle management teams, as a way to acquire concrete and situated knowledge. We invited our interlocutors to develop this issue and to tell us which stories they considered particularly useful in their work and how they had access to these stories. We chose to concentrate here on the commercial and R&D services because of their richness of socialization phenomena and because it appeared that the narrative process was a crucial issue in sharing work experience. Of course, in the R&D and Sales Departments, some knowledge was highly formalized and recorded in procedures, directories, guidelines and training documents. But as our respondents noted, this kind of knowledge was not sufficient and often remained too superficial. For most of the people we interviewed, stories constituted an important mode of socialization and were considered as a vehicle for sharing concrete knowledge.

Stories and narration processes were undoubtedly difficult to study. The difficulty inherent in analyzing socialization and storytelling processes lies in their discretion, opaqueness or commonness. The storytelling process was discrete and mainly concerned day-to-day work operations, tips and ordinary know-how. However, through interviews and our presence in the field, we acquired a preferred observation position that enabled us to accumulate a large quantity of information. The study focuses on material gathered while interviewing several times about 20 people belonging to the Commercial and R&D Departments. The questions were first factual (technical data, description of the activity, etc.) or assessed the respondent's judgment (difference between the companies, learning phenomena, etc.). We also asked our interlocutor to give more precise information concerning the socialization processes, how teams were created, and the way knowledge was acquired and shared. When it was relevant to address this issue, we progressively focused the interview on the storytelling processes and

how people in their work could use stories. The interviewees were thus asked to recount their experiences of the storytelling process and to tell us the stories they've heard or they were told and which of them they considered of particular interest.

As we mentioned, our study was also supported by direct observation (Miller and Crabtree 1992). Our presence in the field enabled us to acquire a greater familiarity with the site, to multiply our interactions and to observe the evolution of a community in its usual working context (Bogdewic 1992; Cassel and Symon 1994). This method was particularly appropriate for the study of storytelling phenomena. For example, we gathered many data on stories in some emergent process, just by talking informally with people on the field. We are conscious that such an approach is based on complex relationships between the interviewer and the interviewee. This approach is close to that of Vaara (2002) described as creative interviewing, which involves interaction based on understanding and an empathic approach to optimize cooperation and data gathering.

We recorded the principal stories or those that appeared to be most significant in their content, or in their ability to convey rich experiences and important events. Gradually, several categories emerged and we used these data in the further interviews in order to better understand the content, the structure and the functions of the stories. We also subsequently analyzed the stories we gathered according to several categories that we found in the literature on in the analysis of narration. For this work, we mainly used the works of Bremond (1973), Greimas (1983, 1991) and Genette (1980) to analyze the structure of the stories. Theses authors adopt a structuralist and formalist approach to analyze stories. They propose several categories to better classify stories. We will particularly use here Greimas's actantial model. Moreover, following Boje (2001) and Cunliffe et al (2004), we also paid particular attention to the storytelling process itself. What was important was not only the content of the story but also the relationships with other stories and the way stories were told. For example, we paid attention to the status of the teller or to the vivid expressions, metaphors and images that were used in the storytelling. We used the works of Bakhtin (1981) and Kristeva (1977)to better understand the dynamics and interactive dimensions of the stories, how they change and how they can be combined with other, complementary or even contradictory narratives. These frameworks will be detailed in the course of the study when presenting the storytelling process within the R&D and Sales Departments.

Socialization and integration processes in the merger

Socialization begun with the formation of work groups in charge of preparing the merger. This initial collaboration facilitated the operational combination of the teams. But the real socialization process began with the integration of companies and the combination of people. The merger itself entailed the integration of over 80 people from the Head Office of L'Alsacienne to that of Belin. A large arsenal of socialization measures was deployed to facilitate the integration of newcomers: site visits guided by members of Belin, presentation

of different departments, distribution of welcome booklets and “photo albums.” In addition, the general manager invited groups of newcomers to special breakfast conferences intended to present the reasons for the merger, to reassure the new employees and to introduce the new entity. Moreover, buddies were assigned: The Belin employee was in charge of guiding the newcomer, and providing necessary information to help him or her integrate, i.e. to "acculturate" the newcomer. These buddies enabled the new employees to more quickly grasp the functioning of the organization and better perceive the informal networks. Moreover, each department also strove to create specific events that would bring the teams closer together. Integration also included training sessions during which people were invited to learn the characteristics of the various products they would have to manufacture or to sell, the various tools, procedures and management systems they would have to use.

As we mentioned before, we decided to analyze the storytelling processes in the sales force and R&D departments. Stories and narration processes were indeed considered as an important means to share tacit knowledge, to grasp situated information and to create a common meaning.

Stories and storytelling as a socialization and learning device

In studying the integration process, we had access to numerous narratives recounted by various respondents. We considered it was important to gain a better understanding of the structure of the narratives and to identify several broad categories in order to set up typology. In order to achieve this, we reviewed several theoretical works of narrative analysis (Bremond 1973; Greimas 1983, 1987) which are mainly based on a structuralist perspective consisting in examining the underlying formal structure and coherence of a story (Todorov 1982). We set about classifying the various stories we had heard by using some the categories proposed by Bremond and Greimas.

Structure of the stories : narratological framework

According to Bremond (1973), a narrative consists of a language act by which a succession of events are integrated into the unity of a plot that brings together and organizes these events. A story is regulated by the same rules as those which guide human thought and action. These rules are determined by logical and conventional restriction (effect is brought about by cause, for example) which limit the scope of the story. Moreover, all stories can be decomposed into elementary units and are structured by several categories like, for instance, the fulfillment of a task, the intervention of allies, a negotiation process, an attack and the elimination of the opponent, or the satisfaction of the main character.

In the same vein, but in a more extensive and systematic way, Greimas’s actantial model (1987) which was created on the basis of Propp’s (1968) earlier research underlines the need to study the different categories of actors and to identify certain classes. Taking as a basis the presupposition that human action is directed towards an aim, Greimas’s structuralist approach

has construed a model which represents the different relations to the aim. The actors have an intention: they aspire towards reaching a certain state such as acquiring power, knowledge, wisdom or happiness, overcoming an obstacle, having an increase in salary, becoming a better salesman… The story is constructed according to a sequence of causality that combines a problem, a hero that must solve an intrigue, opponents, enemies or disturbing factors. The narrative sequence culminates in the resolution of the problem. For Greimas, stories convey a transformation from a state of disorder or uncertainty to a new order in which stability is recovered. In this sense, the narration is finalized and is oriented toward a conclusion or a moral. There is therefore some intentionality in the narrative that allows transmission of an experience or of a lesson (Bruner, 1990)

In Greimas's model, the classes of actors are called actants. An actant is a class of actor who shares a certain characteristic quality which is related to the aim of the story. An actant is therefore a class of actor whose members have an identical relation to the organizing plot. It is important to underline that an actant is not necessarily a person but could be a more abstract or less tangible entity (family, social background or even climatic conditions for instance).

In his model, Greimas distinguishes several categories around which stories are organized. The subject could be considered as the main and more active actant. The object is more passive and is the objective of actions. Greimas distinguishes very close categories, those of the sender and of the receiver. Senders and receivers may be embodied in a person but could be a more abstract notions like society, fate, time, ambition or cleverness. And in a complex approach, the sender could be the same person as the receiver if, for example, the subject desires something for him. Thus what is difficult in Greimas's model is that the qualifications of the various actants depend on the level of the story analysis. For example, John, as an actant-subject, wants to marry Mary who is the actant-object. But Mary could also be considered as a subject or sender who is prepared to marry John, who becomes then the receiver. It means that an actor can stand for several classes.

Moreover, for Greimas, many stories are built around a subject who wants something and either gets it or doesn't. But the process is not so simple and the aim is often difficult to achieve. The subject can meet with resistance on the way and may receive help. Thus, Greimas distinguishes another category which determines the circumstances under which the enterprise is brought to an end. According to a logic of opposition which is the basis of the structural analysis, Greimas distinguishes a class of actors consisting of those who support the subject in his task and in the realization of his intention. Greimas calls these actors "helpers". Another important class consists in the "opponents", the adversaries or the opposing forces. Thus the opponent opposes the subject at certain moments of the pursuit of his or her aim whereas the helper facilitates the subject in achieving his aim. Here again, the helper is not necessarily embodied in a person. For example, a self-analysis can be considered as a device helping the main character of the story. And, similarly, economic trend or social conformism could be considered as opponents. In the example of Mary and John, the existing social structure could be considered as an opposite power and as an adversary that makes the

marriage impossible. Mary's father might also be an opponent whereas John's good job or Mary's friends could be considered as helpers (in a very conventional approach). Thus, helpers or opponents could be very concrete but can also remain in the background as a relatively indistinct feature.

These two classes of actants, helpers and opponents, can be regarded as very important because they determine the various adventures of the subject who must often overcome great opposition before he or she can reach his or her goal. It is the presence of helpers and opponents which gives a story suspense. In our study, it was apparent that the role of adversary and the need to overcome obstacles (opponents, hard conditions) was very important in the construction of the plot and in the structure of the story. This explains why many stories we collected, especially in the Sales Department, can be considered as "war stories" in which people had to overcome many obstacles or beat rivals in order to succeed.

Greimas also takes into account in his model the "truth value" of the actants. For instance, helpers and opponents are only in appearance what they seem to be whereas in reality they prove the opposite. A traitor has the appearance of a helper but reveals himself or herself in the course of the story as an opponent. On the other hand, there are secret helpers. According to this distinction, certain categories of actors stand out: liars, master figures, false heroes or truth-tellers, who lead the subject into taking wrong or right decisions. Moreover, some actants or characters in a story are not necessarily helpers or opponents: they can have their own program, independently from the main actants' intentions in the story. However, their presence in a story is often connected with the plot.

Finally, for Greimas, in principal, all actants are represented in stories: without an actant, no relations, without relations, no process or action and without process no story. Moreover, for Greimas, this model has some universal validity and is not limited to invented fictions.

Stories in Sales and R&D departments

We will now describe the storytelling processes within the R&D and sales force. In both departments, storytelling processes played a crucial role and fostered opportunities for discrete learning related to diffuse knowledge and expertise that had been only slightly formalized.

Integration and storytelling processes in the sales force

During the merger, the combination of commercial teams revealed striking differences in the two sales forces. These differences were certainly perceived prior to the merger, but they appeared in starker contrast at meetings in the field. The Belin sales staff had more experience and was older on average. The L'Alsacienne vendors recognized their excellent human relations skills, even though the techniques and sales methods were not always followed to the letter. The L'Alsacienne sales force was younger and relied more on procedures and compliance with guidelines. It followed a more analytical approach during visits. Its behavior

was highly controlled by commercial management by means of countless tables and activity reports. The merger did not bring the cultures into conflict, but rather they proved to complement each other. The Belin sales team discovered more rigor, which had been lacking at times whereas the L'Alsacienne vendors benefited from the expertise and the experience of Belin. L'Alsacienne's salespeople also felt more at ease and liberated from an overly procedural sales approach. They learned to distance themselves from guidelines and appreciated the more casual approach prevailing at Belin.

Because each vendor was assigned a precise sales territory, direct contact between sales people was not very frequent. Contact mainly took place at monthly meetings where vendors reported on their experiences, problems encountered, the competition, customers, product behavior, and market trends. These meetings constituted opportunities for sharing experience and stories. In addition, telephone contact between vendors was frequent. If contact between sales representatives in the field was relatively rare, it was more frequent at the Head Office when vendors reported their results. Lastly, several conventions or important meetings were organized. These events that were attended by the two sales forces enabled the sharing of knowledge and facilitated the integration process. According to most of the sales representatives we encountered, these festive or more formal events reinforced the commitment of all the employees to the new entity, enhanced mutual socialization and could be considered as a stimulating arena for storytelling.

The vendors received training in the products, sales methods and tools (messenger service, laptop computers, reporting charts, statistical statements etc.). Various documents were supplied to vendors concerning products, negotiating techniques and profitability calculations. This learning process was organized by the sales department. Learning was therefore designed to take place through well-controlled and explicit training. But there was a contrast between the numerous procedures and control management systems of the vendors and the behavior of salespeople in the field, which was more based on experience, intuition and need to adapt to each interlocutor. Accordingly, the workers broached a learning content that would have been difficult to treat explicitly during the training phase. Through interviews with sales representatives or simply by joining their informal discussions, we noted the importance of the narration of stories to convey significant experiences and to transfer specific or highly contextual knowledge. Learning arose from a pooling of experience and of sales or negotiation tips.

For instance, one of the vendors reported, during informal conversations with colleagues, an unpleasant experience with representatives of a large supermarket that was not known for its tenderness. From this consequential event, the vendor had learned very specific lessons on the way to negotiate in order to avoid being intimidated or thrown off balance. The tips pertained to behavior and interaction with the purchasers (look, seating arrangement), the pace of the meeting (alternation of aggressiveness or false camaraderie, etc.), rhetoric to adopt and phrases to prepare in response to verbal aggression, gestures to avoid (for example, pouring oneself a glass of water may be interpreted as an attempt to stall and will spark

mockery or wry comments on the vendor's nervousness). These considerations and tips thus appeared to be common to every salesman or woman. To overcome such obstacles, it was not necessary to be a hero or to have a very complex strategy, only to use some stratagems or to understand a very contextualized knowledge.

We also observed conversations between vendors whose subject was, for example, the characteristics of certain buyers of large stores, behavior of certain supermarket managers and department heads or even the layout of negotiating venues. It was important for them to adapt their behavior and their discourse to each interlocutor in order to be well received in the stores and to benefit from the best conditions for their products

Stories and narration also covered the sales process: attitude, way to transmit a message, how to behave toward the store department head or shelf manager. A vendor reported to his new colleagues what type of gift was particularly appreciated by the shelf managers in some hypermarkets he visited frequently; for instance, one commercial store manager preferred a bandanna and baseball cap for his children whereas another preferred a mini-calculator. We assert that these stories were not simply insignificant anecdotes. They gave an opportunity to sales people to find allies who could help them and support them against competitors and rival vendors.

Stories also covered the sales discourse. Each product had its specificity, and experienced vendors were able to underline in a narrative way based on vivid images and anecdotes the kind of characteristics that should be put forward in the product presentation in order to improve sales or to benefit from a better position on the shelves.

In the case we studied, the transfer of knowledge through stories between vendors was undoubtedly asymmetrical in that the Belin sales force had more seniority and more experience. Experienced vendors were explicitly compared to "*living Bibles*" and they were frequently requested to give advice. They knew the customers and the arguments to use to promote products, and had an impressive repertoire of tips adapted to each customer. Their help was requested both by L'Alsacienne vendors and by young newcomers who were hired by Belin.

Integration and storytelling processes in the R&D Department

During the merger, the R&D department of the new entity was grouped at a single site, where Belin had constructed a vast research center equipped with substantial technical facilities. The engineers and technicians were required to master new technologies or products. In addition, new formulas had to be learned. The technicians reported that these tasks were not very difficult. The knowledge was formalized and codified and many technicians or engineers had the same educational and professional background. Moreover, there was a common industrial culture between people, with an implicit understanding of the main issues. This familiarity facilitated the socialization process and the knowledge transfer.

However, our interviews and our discussions revealed that engineers and technicians also had to master new procedures and assimilate new parameters, for example, those of successful

cooking, which proved problematic. For instance, in producing cookies, many parameters were contingent and non-stabilized, and pertained to variables such as the climate, temperature, and specific characters of individual machines. These parameters considerably influenced the quality of the cookie. If some data were coded, a mastery of a technique also called for practice and accumulation of experience. In this sense, the possession of theoretical knowledge alone did not suffice to adequately solve problems and required a practical learning. This learning was contextualized and referred to a kind of knowledge that was neither external to the individual nor inseparable from a context and an agent. We can say that this knowledge was referential and required some experience. A technician could therefore become apparently quickly operational because of the knowledge familiarity, but acquiring skill, perceiving the differences in touch, performing a sensory analysis of texture, color, and consistency of the dough all required more time and experience on the field. The creation of a "pastry grammar" (Pentland, 1995) therefore involved formalization of operating modes but was also based on practical and situated learning.

Thus the learning process was not only built around formal training on products; it also relied on the formation of a buddy system between two technicians coming from each company. R&D people considered that proximity between the transmitter and receiver facilitated the transmission of tacit knowledge. Indeed "knacks," i.e. hints that were difficult to formalize, were transmitted through observation and common interaction. This learning was founded on concrete manipulation, habituation and interaction between people. This practical learning did not preclude symbolization and storytelling. Action-based learning was not mute. The interaction was also verbal and not based on gesture alone. This discourse was situated, referring to a concrete and situated reality. This is why we could speak of a “deictic” learning in which it was necessary to combine practice, words and gesture and to point out concrete examples in order to better understand the main issues of the cooking or product development processes. In this process, technicians and engineers used mimetic descriptions vivid images, metaphors and visual stories. Our observations and interviews revealed for example that technicians and engineers used a new vocabulary based on words specially created to convey the appearance of cookies and their evolution in the cooking process. Some terms were specially coined to convey the texture of cookies and they could be considered as a symbolic and poetic creation or as a product of an innovative fantasy. We noticed that these terms were often different between the teams of the merging teams but these differences didn’t seem to preclude a mutual comprehension and a fruitful adjustment. There was a tacit understanding between people which allowed them to overcome the different vocabularies. This can be explained by their common professional background and by their experience in the field. We can consider that there was an implicit pre-understanding which was based on a familiarity created by belonging to the same communities of practices.

Like in the sales department, R&D people were using stories built up around a plot and with identified and contrasted characters. These stories generally recalled how people solved a technical or financial problem. For instance, a technician reported to his colleagues how he

had succeeded in mastering contingent conditions and had adapted the procedures to the damp climate. Another recounted how he had succeeded in preserving the quality of chocolate biscuits in spite of the lower quality of raw materials used in order to reduce costs

However, many descriptions were also used. One could address the differences between "story" and "description". Studies in narratology (Genette, 1982) make the difference between the "diegetic" and the "mimetic" dimensions. The word "*diegesi*s" is an equivalent for story, unlike to the "*mimesis*" which is a pure representation or description of the events. The description creates something like a reality effect which is very strong for the reader, but there is no plot inside the description. However, we noticed that the descriptions used were built as stories and therefore go beyond a purely mimetic function. This can be explained, as it is mentioned by Genette (1982) and Ricardou's (1978) works on narratives, by the fact that a description often relies on temporality. This temporality is hidden but can be revealed by words like "first", "then", "lastly" even when one describes the production process of a cookies or its appearance. In Ricardou's words which refer to Aristotle, the mimetic dimension should be analyzed through the lens of the diegetic dimension, ie as a temporal sequence, a story, with a beginning and a ending. A description conveys a causal chain, like a series of actions, and introduces a temporal sequence leading to the final denouement of the plot. Thus for Genette (1982), description can not be deprived of any narrative function. This why we can assert that the evaluation of a cookie which was presented at first sight as a description and as a checking of some parameters was "scripted" and staged as a story.

An actancial analysis of stories in Sales and R&D Departments

Drawing on Greimas's (1987, 1991) framework, we suggest now to identify the main actants in stories recounted by the members of the R&D and Sales Departments and to establish a classification.

The plot

Most of the stories were organized around a plot, a problem to solve. It was obvious in the sales department that the vendor was supposed to overcome many obstacles in order to promote products and to increase sales. For instance, the problem could consist in launching a new product, successfully negotiating with difficult customers or outsmarting the competition by founding original ideas to promote the product. In R&D, the plot was more focused on technical problems: the goal could be to develop a new product, to use new raw materials which were difficult to control (like caramel for instance), to reduce the quantity of raw materials or costs, or to solve a cooking problem arising from particular circumstances such as the rate of humidity in the air. In both cases, the riddle was also focused on internal constraints and consisted on the ways to get free from procedures which were too constraining or from the budget limitation. These financial considerations played an important role

because of the huge pressure of generic brands which were viewed as an important threat for Belin and L'Alsacienne.

The hero

Who the hero is in a story is an important question that should be addressed. We noticed that in both departments, stories were highly personified with a hero or with a strong character who was able to learn from painful experience. The resolution of the plot was generally founded on ingenuity and the capacity of a person who was able to overcome the obstacles. However, in many cases, it is important to underline that the hero was not presented as an extraordinary person gifted with exceptional qualities. He or she was generally depicted as a very common person who was able to take advantage of circumstances, to use tricks and stratagems to succeed. The success was not due to the use of formal knowledge or to the power or the help of the Danone Group. The employees were more likely to use micro-strategies than large strategic manoeuvers. Problems were not solved by financial power, procedures or by bargaining power, but instead were resolved by vendors' tips or those of experienced and clever technicians. It refers to the notion of "*metis*" which was defined by Détienne and Vernant (1991) as a form of practical and situated knowledge that enabled Ulysses to thwart the numerous traps and obstacles to which he was confronted in the *Odysseus*.

Moreover, the hero was not necessarily the teller of the story. For example, sometimes the hero was another salesman whose actions were described and probably embellished by the teller. The hero was also not necessarily a person. It struck us that, in R&D, the cookie was frequently described as a living person: metaphors were used to describe its transformation or its aspect and texture. The hero was thus the cookie itself which was described as a living being with its specifications, its way of reacting, growing, resisting. It was the main character brought to life by a technician to be produced. And it was the cookie which was able to bring a real innovation to the market and to satisfy customers. In this case, the story was not focused on the teller who only acted in the story as a helper or as a privileged and clever witness of the "extraordinary" event of a cookie's birth.

The opponents and the helpers

As we mentioned, opponents and helpers were very important to structure stories and to enliven them. As Vaara (2002) mentioned, the adversary is frequently needed for the heroification or glorification of one's actions in success accounts.

The stories, especially in the sales force, included strong external and internal negative characters. The opponents could be the Mass Distribution personnel, the store managers or the competitors who were able to benefit from more advantageous trading conditions because of their lower prices. The opponents were also inside the company. They were embodied in people from other departments, logistics, marketing, industry who followed a different logic and who were submitted to different constraints. An example might be industrial managers

who were not able to satisfy every demand, for, say, specific packaging or for a sharp increase in production of a lot in a very short time. The executive manager of the Sales Department was coming from L'Alsacienne and was considered as a very tough man, putting a lot of pressure on the vendors and controlling each of their movements. He was frequently viewed as an opponent limiting salespeople's autonomy and initiative capacity. We must also highlight that, according to Greimas' model, the opponents were not necessary human beings as many vendors justified their poor performance by invoking the economic slowdown, the hierarchical constraints or the too numerous procedures.

In R&D, the opponents were sometimes people from the financial or from the industry departments following their own logic and constraints. But very often, the opponents were not concretely incarnated. They mostly comprise financial constraints or cost-cutting needs. For example, because of the need to reduce costs, the quality of some raw materials was slightly reduced and it was perceived as a betrayal of the quality values which were particularly strong in Belin's culture. Sometimes opponents consisted in the difficulty to successfully manage the production of a new cookie. We also noticed that climatic variations were considered as contingent parameters which were difficult to monitor and which could dramatically reduce the quality of a cookie.

In Sales, assistants or helpers were represented by other members of the sales team, experienced salesmen (the "living bibles") representatives of the sales development staff who were in charge to support salespeople. As we mentioned, sales people could also find some allies in the stores when they managed to develop friendly relations with store managers who facilitated their work and helped them to improve their performance by having better emplacement on the shelves. In R&D, the helpers were other technicians or engineers. The corporate "centers of expertise" which were developed at the R&D corporate center of the Danone Biscuits Division to help the different brands was also considered as a helper but was in fact rarely consulted. This help was considered as too formal and unable to take into account the numerous contextual variables. Some people in the marketing or industry departments were also considered as valuable interlocutors, facilitating coordination, giving a lot of information and trying to satisfy engineers' requests.

As we mentioned, helpers were frequently colleagues working in the same department. This could refer to the notion of "community of practice" which can be defined as organizational groups that develop a shared understanding among people through the ongoing practices of how to get things done. According to Brown and Duguid (1991), Cook and Brown (1999) or Weick and Roberts (1993), being a member of a community of practice facilitates socialization, access to knowledge and learning. Communities of practice develop some patterns of work based on past habits, norms and routines (Lave and Wenger, 1991). In this sense, they help to coordinate people, they guide their work and encourage knowledge sharing and trust. This is why we can consider "community of practice" as helpers. Communities of practices also enable people to build up a repertoire of stories which could be viewed as a kind of collective memory. But communities of practice could also be understood

as social norms and controlling mechanisms regulating the social interaction between people (Fox, 2000). In this sense, they express the order of a social structure and can generate some inertia reducing knowledge diversity by discarding some stories. In this perspective, community of practice can be paradoxically viewed as an unexpected opponent precluding knowledge diversity and novelty. For instance, several young technicians were disappointed not to be able to implement new projecs in the R&D Department because these projects were not considered as a priority or were introducing some dissonance in the mindset of the R&D team.

Other characters and actants

In many stories, there were many characters who have a minor role in the plot, mainly acting as spectators or as witnesses but not really involved in action. Besides, the actants were not necessarily people. For example, we noticed that space, in stories, functioned in different ways. On the one hand, it was only a frame, a place of action whose role was only to underline the "reality effect" and to give more likelihood to the story. But if the space could remain entirely in the background, it was also sometimes "thematized" and became a true character of the story. It was particularly the case in R&D where climatic conditions or machines and plant equipments were important in the success or failure of the production process of a cookie. In this perspective, space thus became an "acting place" rather than a simple place of action which influenced the course of the events and the story. The fact that the events happened here, in this particularly plant or laboratory was then very important and influenced the events.The following table presents, for R&D and the sales force, the main elements around which the stories analyzed are structured.

	R&D	Sales Force
recipient	Community of practices, service	Community of practices, service
intrigue	Product development Cooking problem, other aspects Mastering raw materials Mastering a machine Dealing with climatic conditions, humidity rate	Implementation of shelf facing Launching of new product Negotiation (price, promotion, place on a shelf…) Cutting production time Satisfying mass distribution clients by personalizing products
heroes	Technician (as a teller or as a witness) Biscuits as a living being	Vendor (as the subject of the story or as a witness)
opponent	Climatic conditions New machine Financial restriction Cost control, management controller Production times Interlocutor at the plant Established mindset and conformist approach	Global distribution representatives, store manager, shelf manager, etc. Competitors Sales people from other divisions of the Danone Group Sales Top Executive manager Production managers and time to product an order Procedures
assistant	Colleagues, expert Central research center, Interlocutor at the plant Experience, history Danone Group	Colleagues, expert, “living bibles” Local ally in store, department head Marketing contact Experience, history Danone Group
destinator/sender	Technician, engineer Community of practices, service	salespeople Community of practices, service
type of story	Learning experience, epic “bildings roman”	War story, learning experience, epic and picaresque stories

Table 1. *Structural elements of stories analyzed*

A typology of stories

As we can see in the table, it’s possible to build a kind of typology of the various stories we collected.

The adventures of sales people throughout the sales territory, as they contended with bizarre situations or characters, could be grouped in the category of picaresque narratives that relate anecdotes and adventures. These stories described people who were first imprisoned in their world but who were able to enlarge their experience by discovering new worlds and by living new and very often surprising experiences. The hero could appear as a “fool” or an

unfortunate victim whose adventures were a source of entertainment. They were common in the sales force and were close to comedy, describing funny misfortunes of people.

There were also epic sagas or “war stories” that described heroes’ responses to adversity. The epic hero transcends the normal experienced world and emerges victorious over various obstacles and enemies. This was the case of the vendors in the "hell" of Mass Distribution. Their victorious stories played the role of a “myth” providing something like a moral and an example for less experienced vendors to follow. The stories of learning were structured as a quest that gradually allowed the construction of the subject reinforcing his personal qualities. This situation was observed in both the sales force and R&D. For example, technicians, to achieve excellence, had to face a multitude of singular situations that they experienced concretely and which helped them to become more mature and experienced.

We noticed that the stories were often but not always success stories (Vaara, 2002). Failure accounts were more rare but were allowed; they could deal with the inability to resolve a technical problem concerning the production of a cookie, the defeat in a commercial negotiation with a manager of an hypermarket. For example, a salesman who was renowned for his commercial qualities and his tenacity reported a tough experience from which he came back in tears, which is especially uncommon in the “virile” sales world. This kind of story could be compared to a tragedy (Gabriel, 2000) which shows a dramatic defeat of the hero and even some kind of sacrifice to the his or her company. But these stories also had also a “heroic” dimension which laid in the ability of the vendor to share this disastrous experience and to build a repertoire of responses and attitudes that should enable him and his or her colleagues to overcome a new trial of this type.

According to Vaara (2002), the narrator was rarely considered as a failure agent and found it difficult to acknowledge responsibility without pointing to other constraining factors. Narrators frequently emphasized their own responsibility in success accounts and the role of others in failure. This analysis points out the central role of the adversary in stories. In these cases, the failure was not attributed to the inability of the vendor or of the technician but to the power of the adversary or to the lack of support from the firm. The hero was therefore a non-deserving victim (Gabriel, 2000) and his or her misfortunes convey some sorrow or pity or even anger and a desire for revenge. We also noticed that in many failure stories, there was a trend to identify a tough opponent or a scapegoat inside the firm itself (a manager who didn’t allocate enough resources, or the firm itself and its top managers unable to understand the situation or to help operational salespeople or technicians). Failure was thus attributed to organizational resistance, incomprehension, environmental change, hierarchical constraints or clients’ and competitors’ behavior.

The functions of stories: socialization and learning by narration

Until now, we have not yet addressed the storytelling process and have focused our research on the content and structure of the stories. In this first perspective, characters had

generally coherent identities and stories' contents a stable meaning. However, such an approach doesn't imply that all stories have a similar concrete content. Moreover, if we follow Boje (2001), we could consider that stories are fragmented, collective and polyphonic. They could be a loose collection of heterogeneous elements. These questions invite us to overcome a static analysis of stories: they require the adoption of a more dynamic stance. The structuralist approach we used until now focuses on the structure and elements common to all stories. In the following part of this paper, we propose to analyze stories through a dynamic lens presenting stories as mosaics integrating various experiences and analyzing them as ongoing discourses and as the result of an inter-subjective process.

Stories as heterogeneous and collective discourses

Many authors in narratology have highlighted the plural dimension of stories. For instance, Bakhtin (1981) and Kristeva (1977) insist on the diverse provenance of stories and Derrida on the ambiguous meanings of any utterance. This calls up the concept of "intertextuality". It means that no story exists independently but is linked to others. For Kristeva (1977), stories are constructed from inextricably intertwined fragments of other stories. They can be viewed as a patchwork of already existing ones and can be analyzed as quotations of other stories even if these quotations are not marked as such. In the same vein, Genette (1982) describes stories as palimpsests to suggest that behind a story there is always another one. The former story serves as a basis for the new one but is in the same time erased by this new story. In a more radical way, referring to Derrida's notion of "differance" (1978), we could suggest that the "first" story referring to an "original" reality loses its meaning and that the reference disappears behind its continuous and unending interpretations. As Boje (2001) underlines, a story is always embedded in a chain of interpretations and there is neither origin nor totalizing story. To describe this plurality, Kristeva (1977) uses the concept of "polyphony". And for Bakhtin (1981), the essential heterogeneity of discourse refers to a "dialogic principle". The narrative thus appears simultaneously as a very individual and idiosyncratic experience and as a mosaic that integrates the different experiences of various narrators coming from different backgrounds (Todorov, 1984).

Polyphonic and dialogic dimensions introduce some plasticity in stories. They could combine differences and opposed points of view. Contrary to a demonstration, guidelines or recipe which are based on the non-contradiction principle, stories convey different types of logic which could be personified, for example, in antagonistic characters. This ambiguity should not be considered as a default. On the contrary, it contributes to the stories' richness. Ricoeur (1992) notes that a story is a forum for tension between a requirement of coherence or and the admission of discord between different understandings or interpretations. A story thus integrates a disparity of logic while manifesting at the same time an internal coherence. This ambiguity implies managerial considerations. As Lewis (2000) contends, the plasticity of a story allows management of paradoxes and accommodation of contradictions within the

organization. Stories may express organizational reality in its richness and complexity. They take into account the singularity of events while being flexible, transformable and generalizable. They are also very helpful to better understand learning phenomena in organizations and can be viewed as a device providing a repertoire of various responses helping to solve problems. As Weick (1995) underlines, a story creates a base of experience and possesses a power of inference that facilitates a diagnosis while reducing the element of surprise. Morover, because of their temporal structure based on the causal chain organized around a plot, stories are easy to memorize (Bruner, 1990) which is not particularly the case for guidelines or standard operating procedures. And contrary to a simple directory, a story is a living learning tool which allows reconstruction of complex situations. It can be interpreted, translated in other contexts and adapted to new and different situations (Brown, 1990). Drawing on the intertextuality framework, the interaction of stories opens to a discursive space in which people share their knowledge and their experience without imposing a single meaning. This is why Gubrium and Holstein (1998) or Weick, (1995) assert that stories preserve some imaginative space and give new possibilities for action.

The storytelling process: narration as a collective performance

Notions such as polyphony and dialogic interaction enable to analyze narration as an interpretation process which gives rise to different meanings. Bakhthin's theory (1981) suggests that stories could be understood as discourse having a social dimension. They can be considered as living organisms which are transformed in the exchange process with other people. The telling process creates an inter-subjective arena which opens the field of meanings, some space in which people have enough freedom to deal with their own working environment. For instance, Orr's study (1990) suggests that stories are not close but are constructed, developed and progressively enriched. Individual stories and anecdotes gradually accumulate to form a repertoire of experiences that each user can draw on and modify as required. This repertoire includes "tips" contributed by some and improved by others. In this perspective, narration is therefore both a result and a collective process consisting in recounting and encapsulating experience. Stories are developed jointly and involve variety and a plurality of viewpoints.

In the case of the merger we studied, one can imagine that all the recipes, "tips" or morals provided by the various stories could have perhaps been written in manuals. But the value of this knowledge did not only consist in the events which were presented or how to solve some problems. The value was also created by the process of narration and in the dialogue between vendors, with the series of questions, observations and comments, along with additions, corrections and confirmations. To quote Nonaka (1994), learning was not only a process of exteriorizing tacit knowledge; its value also lay in the exchanges between vendors. All of the tips acquired some collective value only in the exchange process.

This approach leads to a reception-oriented theory which argues that a story is not really complete before its telling. For example, in organizational studies, Boje (2001) or Cunliffe et al (2004) underline that storytelling is never a single-person-dominated process. Stories are viewed as constructed by the community, by the speaker and also by the listener. Storytelling is therefore a two-way process in which the teller and the audience co-create the story. The meaning of a story is only actualized when the story is told and heard. If stories could have a pre-established internal coherence, in the moment of telling and hearing, this coherence is modified and re-interpreted. In a radical perspective, it is the reader or the listener who "makes" the meaning and the author is not necessary responsible for this meaning. Such an approach implies important methodological issues. For Boje (2001), a story is first an oral act. This is why one must avoid treating stories as abstracted textual content disconnected from the telling process. Consequently, it is necessary to pay attention to the storytelling event and not only to the textual content. In the same vein, Cunliffe et al (2004) underline that it is necessary to differentiate "stories" and "narratives" which refer to the dynamic and inter-subjective dimension of the telling process.

Stories and narration as a meaning creation process ?

As we suggested, organizational life can be viewed as both an interactive and discursive construction which is not frozen but in continual creation (Gioia et al, 2000). Stories are viewed as constructed and developed jointly by the community. This social and relational dimension of storytelling refers to a collective meaning creation process. As Weick (1995) observed, a single story generally does not suffice to provide meaning. Rather, the various stories should be organized to create a useful repertoire of potential "answers" or "models" and this process is generally developed inside the organization. In this case, stories supply identifying models for the members of the group, they convey values and sustain a feeling of belonging. The narration thus participates in the gradual construction of common meaning and is a crucial element of the "*sense making process*" (Weick 1995). Similarly, Lant (1999) reports that the existence of communities of practice fosters the emergence of collective knowledge while reinforcing the identity of the group concerned. For Czarniawska (1997), stories are endowed with social efficiency: they can be considered as a mode of integrating the real in the community and they also facilitate integration into the community. Constant interactions within the organization help to create a community which is reinforced in return by the various stories which are shared, appropriated and transformed by people. Stories and storytelling processes constitute therefore a means of socialization and foster a community of representations. In this sense, according to Brown and Duguid (1991) or Weick and Roberts (1993), one could speak of a "collective intelligence" built through interaction. Individual learning is then inseparable from a collective learning process which is socially constructed. Narration thus appears as an inter-subjective accommodation which transmits shared values

and gradually shapes the culture of a company (Brown 1990; Wilkins, 1984). It can be understood as a means of constructing and furthering the identity of an organization.

However if we consider that the narrative process is open to a continuous re-interpretation and that the meaning of stories is continuously recreated, we can ask if it is really possible to find some unity in the variety of stories. For Boje (1991), narrative theory imposes retrospectively a formal coherence and a single hegemonic understanding on what is a fragmented and multi-voiced phenomena. Suggesting there is a continuous process of interpretation and recreation could entail a radical proliferation of meaning which deprives the organization of a common meaning. In a radical perspective, postmodern analysis assumes that stories are ongoing and dynamic processes which are constructed in an infinite number of ways by readers or listeners. It implies there is no unifying "grand narrative" (Lyotard 1988) but only a multitude of small stories or "petits récits" (Czarniawska 1999) that could be conflicting and antagonistic. In this way, there is no possibility to build up a synthesis or consensus. Then the "dissensus" (Lyotard 1988) is radical and refers to a "stories' war" that exists between "war stories".

It is thus important to explore whether the narrative processes extend beyond simple anecdotes and indeed shape the organization and its identity. It would be then necessary to find some convergent elements in the variety of stories that enable to overcome the simple aggregate of diverse anecdotes. This "grand story" would allow people to build a shared meaning without losing the variety and the singular content of "smaller" stories. In this view, short stories would consequently become concatenated to constitute a larger story that would create meaning and form the basis of a community of interpretation (Smircich 1983).

Of course, it is difficult to empirically determine the creation of common meaning. It requires to construct indicators that allow identification and evaluation of the creation of a "common sense." In our study, owing to the lack of measurement tools, we only questioned whether the sharing and combinations of stories have contributed to reducing antagonism between the teams that were being merged. For many of our interlocutors, by sharing their experience and tips a corpus of useful examples for the employees of the new entity emerged. Moreover, the storytelling process could be compared to "conversations of comprehension" (Ford and Ford, 1995) that facilitated the socialization process and the integration between teams. It helped to set up common references and a shared interpretation of reality. In this sense, we can consider that narration gradually constructed a common "Us". It is difficult to assert that the storytelling process promoted the creation of a new identity of the firm. We only suggest that sharing stories really helped to combine and to put people together. Besides another merger between the "new Belin" (resulting from the merger between L'Alsacienne and Belin) and the Danone biscuit leading brand Lu occurred three years latter. We studied this merger and it was striking that stories about the former merger were frequently evoked to facilitate or to slow down the new merger. Some people used stories to draw lessons from the previous integration and to warn technicians or vendors of possibly difficult problems. This topic should be addressed in further research.

Narratives, power and performance

The collective meaning creation process and the potential emergence of a community of representations through a "grand narrative" (Lyotard 1988) that conveys some unitarian meaning requires to address the authority and the legitimacy of stories. For Lyotard, "grand narratives" are regimes of truth that could subjugate and marginalize alternative meanings. They are hegemonic by privileging one voice which is unquestioned and taken-for-granted. It is thus legitimate to ask whether all stories have the same impact and why some of them could be considered as more valuable ones.

We suggested previously that stories have some plasticity which enable to manage ambiguity and to combine different points of view. This plasticity enables people to incorporate some "poetic license" or "poetic recreation". It means that people can give their own interpretation and preserve their creativity. But at the same time, stories, when they are legitimized and institutionalized, could also act as norms. For instance, we saw with the "living bibles" ie the most experienced vendors or technicians, that some stories may attain some mythical status and have a great influence on people. Then stories are presented as exemplary ones and this could also be viewed as a kind of control which determines in the organization what is true and right, what should be done or not.

This is why we must examine the relations of power between stories and also between the various narrators and hearers. Boje (2001) requires a comparison of the differences between the macro-story and the multiple micro-stories which are sometimes ignored and erased. As we have mentioned, marked differences and contradictions may exist between stories. Peaceful coexistence, adjustment or convergence are possible as is a conflict when contradictory stories correspond for example to diverging interests. The notion of power between stories has been explored by Fox (2000) who identifies in his research on communities of practices various reasons and modes of domination which could guide our research. In the same vein, postmodern analyses underline that shared meaning and common values conveyed by stories often result from a power struggle which excludes some stories and privileges others. As Boje et al (2004) underlined, stories embody power relations. There is a political dimension inside each story which reflects a conflict and that decides which story will be retained in the organization and which will be excluded or forgotten. Therefore it could be of great interest to analyze how some of them become hegemonic and marginalize or suppress other stories.

In our study, the question was first to determine whether one story was pre-eminent over another, whether there were "winning stories" and by which criteria. We noticed that some stories indeed were imposed and relegated others to obscurity. We can distinguish several levels and criteria explaining this domination.

At the macro-level, the imposition of a story was linked to the configuration of the merger itself and to the strengths of each company in the combination. Therefore the domination of a story could be explained by the possible pre-eminence of one company or one department over another. In this framework, the power of a story refers to the story of power between the

merging companies and the company of origin of the "hero" plays an important role. For example, in the case we studied, we can consider that Belin was the winning company because of imposing its brand and many of its management systems and values. Thus stories developed among Belin's employees should prevail. But we also observed that stories originated from Belin were not necessarily the victorious ones. The emergence of winning stories was also dependent on the balance of power in each department. For example in the Sales Department, there was a balance between the formal procedures mainly originating from L'Alsacienne and Belin's "living bibles" which played a great role in maintaining an informal knowledge.

It is also interesting to explain the domination of some stories by studying a more micro-level, referring to the stories' content and to the storytelling process. For instance, the dramatic power of a story was worth noting. The more intense the adventures narrated, the more likely the story was to prevail. We can also retain as a domination criterion the exemplary character of the story and its moral. If the moral was clear and compelling, the story was more likely to endure. Most of the stories that we have studied, be they picaresque or intended as recalling some initiation, involved heroes that first suffered then triumphed. As Vaara (2002) asserted, stories that centered on success are more likely to endure than stories of failure. But this was not necessarily the rule. Some failure stories were also retained as highlighting the pitfalls and the obstacles vendors or technicians had to face. We can explain that failure was not necessarily rejected by the fact that this setback was not attributed to the whole company or to a department but to a single individual who generally was able to draw some valuable lessons from his unfortunate experience. Moreover, we noted that some stories were able, because of their strong evocative power, to facilitate the audience's identification with the main character. Referring to Aristotle (1982), there was a kind of process of "catharsis" that allowed the audience to relive the situations more intensely and also to put the situations at a distance and to learn a lesson.

The success of some stories also refers to the ability of some narrators to cause emotion. This approach underscores the importance, not of the hero or the main character, but of the teller. It is important to overcome the pure form or structure of a story and to pay attention to how the story is told. This approach is thus more focused on the storytelling process, on who performs the narration and how the story is told. As Cunliffe et al (2004) stress, narration refers more to the "theatrics of story performance" and focuses on how people tell their experience and on what kind of language they use. In the same vein, Boje (2001) argues for an "antenarrative" approach which pays attention to the *in situ* emergence of stories. Storytelling is a process in which meanings mutate over various tellings. It is therefore necessary to take into account the rhetorical devices used by the narrator to retain attention. As living experiential phenomenon, a storytelling performance is more than the words used by the teller to convey the meaning. Through the use of innuendo, irony or gesture, a storyteller can convey many different feelings and meanings. This approach implies a study of how stories are told and by whom. It invites us to analyze the narrative strategies used by

people and their talent to persuade their audience. It also requires an analysis how the audience receives the story and how it could modify or adapt the meaning of that story. Indeed, in our study, some narrators, particularly among the vendors, proved to be highly persuasive. They manifested significant evocative power and talent of persuasion that can elicit fear and admiration. They appeared as very good actors who were able, thanks to their talent and staging of subjectivity, to evoke emotion and identification in their audience. On the contrary, we did not observe such rhetorical ability in the R&D Department where it seems that the force of the example and the moral of the story prevailed over narrative talent.

Conclusion

In this paper, we suggested that learning did not take place solely by training, observation or practice. We have seen that it can also be occurred by narration and the use of stories. Our study of the narration processes in the R&D and Sales Departments highlights how stories facilitate both the dissemination and sharing of difficult to formalize and singular knowledge. In this perspective, narration is both a means of assimilating knowledge and a means of collaboration that enables mutual acculturation. We consider that analyzing organizations from the standpoint of stories and narrative processes may contribute to a better understanding of the variety of learning processes within organizations and may explain some features of the integration process in a merger context.

We paid particular attention both to the content and the structure of stories and to the storytelling process. A formalist approach to stories and an analysis of their content helps to better understand what kind of knowledge is transmitted and how this knowledge is structured. Despite the existence of consequent work, we believe it is worth pursuing the analysis of this content by using different models referring to narratological studies. Stories have a mimetic function but they should not be viewed as a norm. We indeed suggested that stories do not have a fixed meaning in spite of their structure and coherence. The narrative or telling process is an interesting event that considers stories as living and evolving organisms. It could be of great interest to analyze how stories evolve in organizations, how they circulate between people, at which frequency and how they are transformed. We could thus imagine some diagrammatic representation, some mapping describing how stories are linked and are gradually distorted and appropriated in different contexts by different characters.

We contend here that formalist and dynamic approaches dealing with the stories' content and the telling process could be fruitfully combined. We may understand them as complementary perspectives, the first one more focused on a structural analysis, the second privileging the inter-subjective dimension. Stories may thus have a common structure but could also keep their specificity and their openness when they are re-interpreted by listeners and combined with different experiences and stories.

We also suggested that narration can foster the creation of a common meaning that may facilitate integration in a merger. Narration appears to be a collective mode of construction of

identity. By interrelating singular stories, the construction of a common history that each employee can appropriate as he or she wishes may emerge and can contribute to reinforcing or transforming the organizational identity. But how stories and narration processes contribute to the creation of a common and collective meaning deserves rigorous theoretical analysis and in-depth empirical study.

The competition of narrations raises the question of whether a story could be arranged, manipulated to be more uplifting and to serve the cause of a management team. This did not appear to be the case here but a more in-depth study is warranted. From a managerial perspective, stories and narration could be a crucial element as a factor of change that allows, when effectively used, the facilitation of post-merger integration. Nonetheless, controlling this multi-purpose process appears to be a delicate matter. Narration processes are indeed discrete, diffuse and difficult to master, and an overly planned action risks hindering these processes. The solution probably lies in attaining the proper distance between planned or manipulating interventionism and random "laissez-faire". But the question of the use of stories by managers to guide people behavior or to monitor their knowledge is a stimulating avenue of future research.

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Expert Groups as Production Units for Shared Knowledge

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Abstract

This paper is an investigation of the knowledge sharing processes in expert teams working with foresighting, creating knowledge for and about the future in electronic working groups. Building on an understanding of knowledge sharing as cyclic in its orientation, we propose that knowledge creation in expert teams is drawing heavily on latent knowledge embedded in the individual experts. Explicating latent knowledge is seen as occurring during reconstructions that involves questioning, confrontations and debates. Such reconstructions are not fully explicated in the dualistic representation of knowledge often referred to as explicit and tacit. Observations and assessments have been made in two expert workshops conducted on the European level aimed at assessing the true status of plausible hydrogen technologies and their potential.

Keywords: Foresighting, knowledge, expertise elicitation, electronic expert workshops.

Introduction

Foresight studies are intellectual thought processes about the future. Arguably, the only action we can engage in concerning the future, is to think about it. Foresights entail the ability to create and maintain coherent and functional views and use insights in an innovative and guiding fashion. Foresight studies are applied when detecting adverse conditions, guiding policy development, shaping strategy, and exploring new markets, products, and services. Mutual learning, knowledge creation and innovation are all part of assessing and planning for the future. Realising that a significant portion of knowledge about the future is situated in individuals, experts are often put together to achieve foresights about what the future could and/or should hold. Producing and sharing knowledge by experts are commonly organised by expert teams. The episteme underlying this is seen as twofold. Firstly it is assumed that 'two heads think better than one'. Secondly, images of the future can be captured and articulated in oral and written forms, possibly producing new knowledge and technologies. Although foresight studies and expert groups are widely applied, there seems to be an imbalance between the high level of operational use and the relatively low level of research development of its methodology. Through empirical observations from two expert groups producing novel knowledge for the future, we try to cast some light on the knowledge creation process by expert teams producing foresights for the future.

The theoretical puzzle

In creating something new we make use of that which we did not knew we knew. This is because we know more than we can tell, and all knowledge is tacitly rooted (Polanyi 1966). The tacit dimension of knowledge resides within the individual, representing some embodied

know-how inaccessible to conscious articulation. This is practical knowledge that is used to handle that which one is focusing on. Explicit knowledge on the other hand, can be articulated in formal language such as grammar, mathematical statements, specifications, etc. (Nonaka & Takeuchi 1995). Whether knowledge can be dichotomised into explicit and tacit knowledge is at present open for debate. Wilson (2002) claims that Nonaka (1994, 1998) is misunderstanding or misrepresenting the tacit knowledge dimension. Tacit knowledge is in its very nature inexpressible in words and numbers and hence not directly transferable. Knowledge that is expressible on the other hand, becomes information, which is transferable.

If we accept Polanyi's view that knowledge is being inexpressible and rarely externalised, knowledge acquirement may be hard to come by (Hildreth & Kimble 2002). Nevertheless, knowledge creation does occur. Nonaka & Takeuchi claim that although tacit knowledge is hard to articulate, it can be made explicit by some moderating processes. Based on conversion processes knowledge creation is envisaged as a spiralling and sequential process between representations of tacit and explicit knowledge (Nonaka & Takeuchi 1995).

However, the tacit and explicit dichotomy of knowledge may not move in such a straightforward fashion. Mental models, beliefs, and perspectives – often taken for granted – shape how we see the world. Tacit knowledge is thus said to involve an important cognitive dimension (Nonaka 1994, 1998). This pertain tacit knowledge as rooted in past experiences, while thoughts and ideas about the future may be rooted in novel cognitive processes instantly stimulated. Take the situation of acquiring new competences for instance as proposed by Dreyfus & Dreyfus. This happens in five stages; novice, advanced beginner, competence, proficiency and expert. The three first stages pertain to rule-based and explicit knowledge; whilst the last two adhere to implicit knowledge that is based in experience and context specific behaviour. Applying the concept of tacit knowledge to this perspective implies that the most explicit knowledge pertains to the non-expertise levels, and the most implicit knowledge to the expertise levels. Consequently, experts will have more difficulty in revealing and explicating their expertise than explicating their common sense knowledge.

Intuitively this seems rather paradoxical because it refutes the existence of knowledge creation and innovation by experts. Instead we propose that the cyclical process of knowledge sharing from tacit to explicit knowledge fail to take into account reconstruction processes wherein experts question, confront and debate each other. Although some of these processes take the form of information exchange, there seems to be a form of latent knowledge that emerges, which fosters the sharing and creation of new knowledge. Of course, these latent knowledge processes are also present in foresight studies, since all foresight activities depends on the elicitation of opinion and knowledge, be that by experts, novices or laymen.

Contextual setting

So what is actually taking place when a group of experts are gathered together in order to share and create new knowledge that is of high quality and applicable for the future? We aim

to illustrate this by some preliminary observational data collected from a series of expert workshops about both prospect images of the future and of current decisions.

Foresight studies should not be equated with common sense predictions and forecasting. Instead, foresight studies are yielding three integrated themes that determine the quality of the foresight message: creativity, expertise, and interaction (Cameron et al. 1996). These three notions work in combination, and may be depicted as lying at the vertices of a triangle where none of the three are in opposition, but all work through a creative tension. In this particular contextual setting, experts are assembled in a room with an electronic conference tool designed to handle complex problems and issues – the *E-lab*®.[3] This foresight instrument is combining all three elements, yet is placed adjacent on the expertise apex.

The E-lab®

The *E-lab*® expert group method is a process that facilitates consensus building and informed decision-making among experts in a field. It is one of several group techniques developed for situations where individual judgments must be combined to arrive at informed decisions that cannot be made by one person alone and for which there is insufficient scientific information or an overload of often contradictory information. It applies a series of knowledge elicitation techniques; creativity tools, decision tools, assessment instruments, consensus methods like Delphi techniques, expert group tools based on nominal group techniques, etc. It supports brainstorming, developing univocal terminology, categorising of ideas, and evaluation of these, using multiple criteria and techniques.

A facilitator guides the expert teams during brainstorming, categorisation, and decision-making. The *E-lab*® allows for parallel input of data from all participants, anonymity, instant availability of input data, and structures the ideas in a stepwise manner. Participants can simultaneously generate and communicate ideas, comments, oppositions, etc. This eradicates waiting to take turns to "speak" and facilitates electronically storage of all input data. The *E-lab*® methodology is nominal in the sense that it presupposes the input of an expert group in which there is little interpersonal or spoken group interaction.

The expert group itself is composed for the purpose of the problem solving (e.g. technology foresight) and the rankings are provided on an individual basis[7]. Five features characterise the *E-lab*® method as a group decision-making process, as shown in the exhibit below.

Features	Observations
1. Expert input	Experts, masters and innovators participate
2. Anonymity	Avoiding dominance and group think; use of formal assessment formats and private ranking in nominal groups
3. Iteration	Processes occur in iterative steps, allowing experts to change their opinions
4. Controlled feedback/transparency	Own opinion and other experts' responses are reported openly and instantly on the PC monitor
5. Statistical group response	Procedures for voting and ranking against criteria provide judgments by statistical group response

Adapted from Jones & Hunter 1995

Figure 1. *The E-lab® expert group method setup*

Consensus methods are a means of dealing with conflicting scientific evidence. They allow a wider range of study types to be considered than is usual in statistical reviews. In addition they allow a greater role for the qualitative assessment of evidence. The three best-known Consensus methods are the Delphi process, the Consensus development conference and the Nominal group technique. The Nominal group technique is also known as the *Expert panel*. The nominal group technique uses a highly structured meeting to gather information from relevant experts (usually 9-12 in number) about a given issue. A nominal group meeting is facilitated either by an expert on the topic or a credible non-expert and is structured to elicit the expertise in the most productive way and in its most appropriate form. *E-lab®* is modelled according to the basics of the Consensus methodology with 12 laptops in a network, operated by one moderator, careful peer selection of experts, tailoring tools to the issue, and often implying a jury for assessing the primary output from the expert group assignments.

The observational material

Observations and assessments have been made in two expert workshops undertaken by the project HySociety: one in Trondheim, Norway, (August 2003) with inputs from 12 scientifically and technology hydrogen oriented experts, and one in Karlsruhe, Germany, (January 2004) with inputs from 16 experts with a more diverse hydrogen orientation[4]. Common for both workshops are the high concentration of experts put together in one room to communicate via computers, and the extensive use of technical brainstorming in which ideas were organised and ranked according to a consensus-building approach. Although the workshops were specially designed for a collective handling of rather complex issues and problems, the format and focal areas of the two workshops were slightly different. The first workshop was addressing a wide range of technologies related to the utilisation of hydrogen

as a main component in a future energy scenario, whereas the second workshop also dealt with socio-economic measures. Both workshops were conducted on the European level aimed at assessing the true status of plausible technologies and their potential. This includes possible impacts of hydrogen (and hydrogen technologies) for European technology suppliers, vis-à-vis the future global market.

In the workshops candidate hydrogen technologies[5] were reviewed individually responding to a set of underlying criteria such as primary energy demand, cost-benefit and safety aspects. The criteria were partially adopted from the celebrated European energy Delphi. This means that the abilities of the subject technologies to improve sustainability, and to shorten the lead-time for transition to a hydrogen economy in Europe, were imbedded in the subset criteria. And last but not the least, the required level of knowledge, competence and expertise was also addressed, and linked with areas of high societal and commercial potential. The intention is to identify opportunities for Europe to broach leading positions on the future hydrogen-related business arena.

Systematic attempts were made to look into the longer-term future of Europe in view of science, technology, economy and society, and thereby to identify emerging opportunities, technologies and areas of strategic research. This particularly affects areas that are likely to yield the greatest economic, environmental and social benefits. So rather than forecasting a *'future'* that may develop by fate, the endeavour of HySociety is to provide visions about desired *'futures'* that Europe can adapt to - and eventually develop, implement and make revenues to prosper from[6].

Usually the Delphi method is conducted as a multi-round survey. However, subject to the methodology of HySociety each workshop was performed within one day with all experts gathered in one single room. Special efforts were made to facilitate anonymous communication via computers. This means that the transmitted information was orderly recorded onto a database[7]. In the course of the workshop numerous ideas were instantaneously submitted, organised and discussed, and eventually subjected to voting. The participating experts spend substantial time on constant questioning, confronting and debating each other. The individuals' expertise is made public to the others, although anonymously, and both new and old information, opinions, beliefs are put forward. Throughout this constant debating and questioning process, an element of emergent discourse or knowledge(s) occurs, facilitating a solution or decision at the end of the workshop.

Framing knowledge sharing among experts

If we now revert back to our theoretical puzzle: How do we know that experts who are said to hold knowledge that is implicit and tacit actually share and create new knowledge for the future? According to Plato knowledge is seen as «justified true belief». All people hold knowledge, however we differ as to how much and in what field. We also differ as to how we think this knowledge evolves, what its nature is and what the reliability of knowledge would

be. Rationalism assumes there exists a priori knowledge that can be deduced from rational thinking and rules, e.g. formal logic and mathematics. Empiricism holds the opposite view; the only source of knowledge is sensory experience, e.g. perceptions and experimental science. Foresighting tries to bridge both epistemological traditions, applying strict logic in the assessment of present conditions and their possible and probable implications, and using fuzzy logic when anticipating or describing future track changes and chocks. But before we go on to look more closely at how knowledge can be developed and shared in groups, we turn to some general considerations of expertise and the expert.

So who is an expert?

The concept «expertise» is derived from the old French expression experience. A person holds expertise when s/he has demonstrated thorough and extraordinary insight in certain domain, or great skills, or knowledge in a particular field. Moreover, expertness or expertise derives from training or experience. People who hold such expertise are often characterised as experts. Being an expert implies extraordinary proficiency, and often connotes knowledge as well as technical skills. Proficiency refers to thorough competence generated through training and practice, as well as special aptitudes. Expert skills stress that a person masters techniques, and individual dexterity in executing or performing in the expert field (c.f. Merriam-Webster on-line dictionary).

The notion of expertise can refer both to the property of a person, as well as that of a system, which delivers a desired result such as pertinent information or skill. It generally implies useful and large amounts of knowledge and action quickly (fluency). In general terms, there are several synonyms for expertise, such as know-how, skill, knowledge, competence, or excellence.

Expertise is also a form of power; that is, experts have the ability to influence others. Toffler argues in Powershift (1990) that the three main kinds of social power are violence, wealth, and knowledge and, further, that these three kinds of power interact. Expertise is an important expression of the power derived from knowledge. Sometimes, expertise can override the other two forms of power. For example, the expertise of scientists may be deferred to by the military, whose power rests on violence (or threat of violence). On a similar note, corporate executives, whose power rests on wealth, may be able to defer the expertise held by technicians (c.f. Wikipedia, the Free Encyclopaedia). Unique expertise, rather than common, routinised knowledge is what we hope to elicit via the use of expert groups and panels, but is it really what we get?

Back and forth between tacit and explicit

In order to develop an understanding of how knowledge can be created in groups and collectives, we draw on Nonaka's framework of knowledge creating processes. For Nonaka, tacit and explicit knowledge are mutually complementary, rather than separate and opposite

entities. The two forms interact and constitute both a knowledge creation (Nonaka 1994:19), and a knowledge conversion process (Nonaka & Takeuchi 1995:62). The conversion process runs through four stages; *socialisation* which transfers tacit knowledge between individuals making a sort of «sympathised knowledge». *Externalisation* conduces dialogue and collective reflection, resulting in «conceptual knowledge». The step from socialisation to externalisation implies a change from tacit to explicit knowledge. In the next step bodies of explicit knowledge is pieced together by a *combination*, which results in a «systemic knowledge». Finally, *internalisation* converts the (new) explicated knowledge into some sort of new tacit knowledge, resulting in an «operational knowledge». This SECI model is depicted in figure 2:

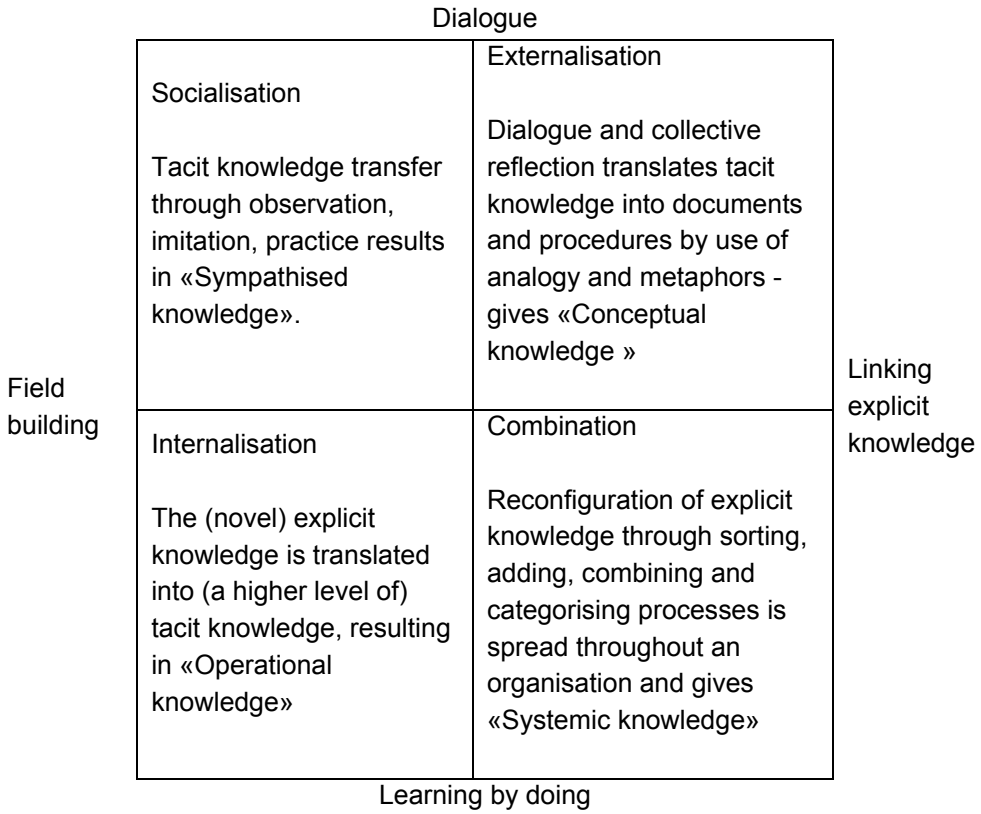

Figure 2. *Nonaka's knowledge conversion process (SECI-model)*

Nonaka and Takeuchi (1995) also present an integrated, five-phased model of the organisational knowledge-creation process. It starts with the sharing of tacit knowledge, roughly corresponding to the socialization process. This is concerted into some form of new concepts, a process similar to externalization, which in turn needs justification, in order to be pursued. Receiving a go-ahead, the concepts are mocked up into a prototype, which in the last phase is disseminated through a cross levelling of knowledge to relevant stakeholders in order to reinforce the new knowledge. The «knowledge spiral» is what Nonaka and Takeuchi (1995:71) calls this process in which knowledge creation and sharing becomes part of or embedded in the organisational culture.

The strengths of the expert groups' knowledge production in the *E-lab*® context obviously lie with the externalisation and the combination stages of the SECI model. However, this is also where the paradoxical situation most obvious reveals itself. Are there any known methods, which can elicit the real tacit expertise or is the only knowledge produced based on the already explicit, rule based stages of the knowledge stairway?

DISCUSSION

Tacit or implicit knowledge?

Polanyi is saying that 'we know more than we can tell', and his concept «tacit knowledge» means hidden and subconscious, i.e. out of reach even from the consciousness of the knower. Thus, in his terms such hidden knowledge cannot be captured and articulated. «Tacit knowledge» involves acts and processes of comprehension, and cannot in itself be expressed (since it is hidden) only demonstrated through expressible knowledge and transferred via imitations of concrete acts. Reassessment of the examples given by Nonaka about this assumed tacit knowledge being made explicit, questions the rationale that he applies (Wilson 2002).

So, if we accept Polanyi's definition, what we can observe from so-called masters and experts is not the hidden, subconscious knowledge itself, rather the physical materialisation of some non-explicable insight. The novice or apprentice in such a situation will not share some kind of articulated and explicit version of the tacit knowledge, but will develop her own tacit knowledge by "becoming immersed in the practice itself, under the guidance of a mentor and whilst situated in a particular environment" (Hildreth & Kimble 2002:8).

Didactically attractive, however both Nonaka's view of the four stages knowledge conversion process and the spiral of knowledge are problematical and refuted in the literature. We agree with the position of both Hildreth and Kimble (2002) and Wilson (2002) on the need for a new understanding of what Nonaka is interpreting as tacit knowledge. More fruitful is the primitive term «implicit knowledge», especially when it is applied to the elicitation of expertise. Hence, we propose the following epistemological taxonomy and description, as;

Dimension	Characteristics
Future oriented	Prospective knowledge; ideas, thoughts about the future in terms of analogies, metaphors etc
Exclusive	Not commonly shared or communicated to the laymen
Expressible	Can be expressed in words and writing
Codifiable	Can be understood in terms of concepts previously developed and applied
Novel	Has not been articulated in this form previously
Incremental	It moves the knowledge frontier (about the future) forward
Instantaneous	Produced simultaneously (here and now) in the expert workshop, not prepossessed; it is the result of the expert dialogue and interaction during the nominal group meeting.

Figure 3. *Taxonomy of implicit knowledge*

We cannot hope to give the ultimate definition of the term expertise here. A vigorous academic debate is raging around the term. For our purposes, however, expertise connotes relative levels of knowledge in people. Relatively few people will claim themselves to be experts, but many people agree they have some measure of expertise in some area. The practical side of *E-lab* deals with how to inculcate, share, and find expertise so that the resources of an organization (and the people within it) increase. What we can observe from the expert workshops is a tremendous amount of apparently novel information, which is produced in a short period of time. Building upon the reactions from the experts themselves and on the validation of data by the disciplinary jury or referees, the output represents expertise on a higher level than before, now shared by a larger group. This would not have been possible if we had to rely on the true meaning of tacit knowledge given by Polanyi. However, it is perfectly conceivable when we apply the term *implicit knowledge* as characterised above.

Replacing the concept tacit with implicit knowledge we can still use Nonaka's SECI model to see how the expertise conversion processes have been conducted to produce foresight knowledge by means of the *E-lab*® methodology. The knowledge elicitation techniques applied by HySociety in the relevant knowledge conversion stages are listed in figure 4.

Knowledge conversion	Knowledge eliciting methods
From implicit to conceptual (explicit)	Externalisation methods Electronic brainstorming simultaneous generation and communication of ideas Technology/policy assessment inventory of possibilities
From explicit to systemic (explicit)	Combination methods Idea organising/structuring/grouping delete redundant ideas merge overlapping ideas categorise recognised ideas Scenarios of possible futures the good, the bad, the ugly Assessment of combinations of technologies and policies voting for best practice Sorting of desired pathways/futures consensus building

Figure 4. *The E-lab® conversion/elicitation techniques*

Following the SECI model, images of our technological futures are a result of a dynamic interaction process where not only facts, but also well-grounded views and opinions, should be treated as important knowledge ingredients. It is not always easy to explicitly express all relevant knowledge, but the *externalisation* of foresight knowledge may be facilitated by group based dialogues and the use of formal creativity tools. In the HySociety Foresight, expert interviews, organised brainstorming, and pre-structured questionnaires and assessment forms have been used for the elicitation and production of *conceptual knowledge*. The various pieces of explicit information must, however, be meaningfully linked and combined to render the resulting information interesting. In the Hysociety case, the *combination* methods have resulted in a number of scenarios, technology visions, maps of potential innovation areas, technology roadmaps and pathways, and a tentative *systemic* model of the future hydrogen energy system in Europe[8].

Expert foresight opinion can be described as the assertion of the future derived from information and logic by an individual who has extraordinary familiarity with the subject. Applying expert opinion has the immanent weakness of being idiosyncratic, there is actually no way to a priori evaluate and compare the various approaches and perspectives of the nominated experts. The *E-lab*® is seemingly effective in terms of resources (time and participants) and quality control over the answers. However ultimately, the relevance and reliability of the *E-lab*® methodology, and of all expert opinion methods, is fundamentally based on the quality, experience, and knowledge of the so-called experts engaged.

So, when do we know that we are dealing with experts sharing the best of their expertise? The answer is that we can never know. Expertise is not connoting a particular and prefixed level of knowledge, insight, wisdom, experience, skill etc., experts are always striving to reach the blue sky of knowledge, but is never supposed to get there. All we can say is that the experts are assumed to be ahead of the laymen in their fields of expertise and this knowledge is the input we use in expert group foresight assignments.

Preliminary implications

Who's sharing what?

In the context of foresight methodology we must deal with such topics as the essential nature of expert knowledge, as well as how «expertise» differs from mere « knowledge», the relation between the individual expert and group conversion processes involved, the social and cultural contexts of expertise, how expertise can be assessed, and the quality of the computer assisted output.

Several disciplines share an interest in understanding the concept of expertise. The questions reach to the very foundations of epistemology and cognitive theory and are the focus of active discussion and controversy among organisation theorists, psychologists, philosophers, computer scientists, and other cognitive scientists.

Some interpret the history, philosophy, and sociology of science as challenging the confidence we have placed in our traditional methods of generating knowledge. History informs us that knowledge is highly fragile, that it is at the mercy of shifts in historical context, and that yesterday's experts are today's museum pieces. So how can we have high confidence in modern expertise? Expertise develops, and is labelled as such, in a social context. Nevertheless, we all act as if we believe that some expert knowledge is more than merely social construction. What is the relation between the development of individual expertise and the development of group expertise, for example, by a firm or industry (Nonaka & Takeuchi 1995)? Some have also noted that expert reasoning seems to differ qualitatively from novice reasoning (Dreyfus and Dreyfus 1986), and claim that this has not only to do with skill level but also with the underlying principles of reasoning.

Fundamental debates in social science and statistics have been concerned with the measurement and assessment of expertise (Cameron et. al 1996). What (if anything) do the present empirical tools of psychology and the observational skills of ethnomethodology tell us about expertise and how it is acquired? What role do social practices concerning culture, deference, respect or authority play? How can expertise be assessed and compared? Can experts be calibrated? What is required for a domain to admit expertise at all?

The observations and assessment from the HySociety expert group exercises reveal some of these paradoxes in knowledge creating and sharing processes, highlighting the cyclical character of knowledge sharing wherein experts constantly question, confront and debate each other over problem definitions and solutions. Although explicit knowledge or information is

put forward from the individual experts to the group, there appear to be an element of emerging knowledge(s) as well. These are elements that are not fully formulated, sometimes contradictory and tentatively understood. Despite their incompletion, in the social context of an expert team working with solutions for the future, additional or new knowledge emerges, which is rendered meaningful by the expert team.

Based on the assumption that expertise used in foresighting is embedded in some sort of implicit knowledge, which is latent, but not necessarily expressed previously, we propose the following hypotheses to be pursued:

H1: Interaction between experts in a nominal group assisted by the electronic tools increases the capabilities of the group to produce novel knowledge about aspects of the future.

H11: Sharing of knowledge between experts increases the possibility of a synergetic group solution

H2: Sharing of supplementary knowledge throughout the group iterative processes, enhances the individuals' scope of domain expertise

H21: Increased domain expertise is conducive to advancement on the knowledge ladder, which as a group effect contribute to producing further, novel insight in the course of the expert meeting

Testing these hypotheses will need a more quasi-experimental setting, in order to improve our understanding of the nature of knowledge creation in expert groups engaging in foresights activities.

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Endnotes

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[3] Although the method has been used in several exercises this paper will just refer to two assignments mentioned in the next section. The E-lab® Is an electronic group system instrument for efficient meetings, developed by RF-Rogaland Research, Norway, c.f. www.rf.no.

[4] The full title of the project is the European Hydrogen (based) Society. The project has 17 partners and 3 subcontractors representing all EU-15 countries – and Norway and Iceland. Under Contract No. NNE5-2001-641 with the European Commission the project is co-ordinated by Instituto Superior Tecnico of Lisbon, Portugal, Research Group on Energy and Sustainable Development. The project was started in February 2003 and finalised in February 2005.

[5] In this context technology is construed as the whole complex of knowledge, skills, routines, expertise, competence, equipment, regulation, engineering practices, guidelines, codes and standards (etc.) that are necessary for designing and realisation of products, processes, cycles and services pertaining to a large-scale transition to hydrogen.

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Communitas and knowledge work: The case of clinical research project work in pharmaceutical industry

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Abstract

This paper employs anthropological theory to explore the long-standing challenge of making project teams become better in sharing know-how and experiences across project borders. Portraying projects teams as what Victor Turner (1969) calls *communitas*, communities of individuals sharing the predicament of operating in domains devoid of structure and meaning, such short-comings in terms of joint learning is appearing in new light. Rather than seeing project team co-workers as being ignorant, an understanding of the everyday life world of the project team co-workers may help rethinking the use of knowledge sharing practices. Rather than expecting project team members to continuously engage in knowledge sharing, project team members may need to be sheltered from such activities during periods of time, while other periods should be more dedicated to feeding back know-how and experiences into the organization. One of the consequences of this perspective is that knowledge sharing in organization is subject to managerial decisions and control rather than being regarded as some self-perpetuating and self-organizing process.

Keywords: Organization learning, New drug development, Liminality, Communitas.

Introduction

Project teams' inability or even reluctance to share know-how with other project teams and similarly to absorb know-how from concomitant project teams is a long-standing concern within the project management literature (see e.g., Tempest and Starkey, 2004). This paper explores some of the mechanisms that inhibit efficient knowledge sharing in clinical research teams in new drug development in the pharmaceutical company PharmaCo. In the analysis, drawing on extensive experiences from working with knowledge sharing seminars in PharmaCo and interviews with participants, knowledge management literature constitute the theoretical framework. Knowledge management has taken a central position in the contemporary discourse of management. Prior to the mid 1990s, there was no literature explicitly examining the notion of knowledge per se, especially not in terms being the single most important resource for the focal organization to control (Easterby-Smith & Lyles, 2003). Ash and Cohendet (2004: 5-6) divides the knowledge work into three different schools, that of (1) the *strategic-management approach*, emphasizing concepts such as core competencies, resources, and assets as the primary drivers for organizational performance, (2). *evolutionary-economics approach,* wherein routines and standard operating procedures are regarded the main vehicles for the deployment of knowledge-based resources and organization learning, and finally (3) the *social-anthropology-of-learning approach* in which the social organization

of knowledge-based communities such as what Fleck (1979) calls a thought-collective and Knorr Cetina (1999) named an epistemic culture are organized into communities of practices with idiosyncratic interests and concerns. While Ash and Cohendet's (2004) first two categories are primarily drawing on literature in economics and management, the third strand of research is integrating a great number of theoretical orientations such as sociology, management studies, anthropology, science and technology studies, organization psychology and so forth. Whereas the two former approaches are dealing with how organizations are creating and exploiting knowledge-based resources, the third approach is more concerned about how knowledge is constituted *qua* knowledge in specific communities and during certain conditions such as for instance among laboratory researchers (Lynch, 1985), technicians (Orr, 1996) or construction workers (Styhre, Josephson & Knauseder, *Forthcoming*). In this approach, knowledge is not, to use Tsoukas and Mylonopoloulos, (2004: S3) formulation, "taken for granted" but is instead explored as an outcome and joint agreement among heterogeneous actors and agents. An "anthropology of knowledge" is therefore of great importance for the advancement of knowledge management theory because it enables for an understanding of how knowledge is constituted as such within its context of application. This paper seeks to discuss the knowledge work in two clinical research projects in a major multinational pharmaceutical company. The analysis draws on the anthropological writing of Victor Turner addressing what van Gennep (1960) calls *liminality* in tribal society. Liminality is the position betwixt and between the instituted orders of a particular society, for instance when a boy or a girl is passing the initiation rite and becomes accepted as adult in the tribe. The initiation rite is in many cases a period of isolation and confinement from the rest of the society, serving to demarcate between periods in life. In modern contemporary societies rites such as a wedding, Bar Mitzvah, or a communion are examples of initiation rites that include some elements of liminality. Rabinow (2003: 88) points out that many doctoral student experience their situation as being one characterized by a certain liminality, that of being in-between the undergraduate student community and that of the world of work wherein they will become the officeholders and functionaries of the future. In one of his books, Turner (1969) is developing his and van Gennep's ideas to include the notion of *communitas*, that is a loosely coupled community of individuals who share the experience of being in a liminal position. For Turner, the *communita* serves a role similar to that of carnival, that of overcoming the instituted order of a particular society for a limited period of time in order to reconstitute the society anew after its end. Communitas are constructed to provide meaning for the individual and to offer some sense of community when the regular social structure is no longer adequate. Drawing on Rabinow's (2003) example, Ph.D. candidates may constitute a communita in order to enable for some social order within their shared position of liminality. Within the communita, Ph.D. candidates jointly constitute social arrangements that mediates the negative consequences of their shared predicament. Speaking in terms of knowledge management, the notion of *communitas* is applicable when seeking to understand how particular communities, in this study project workers, establish a certain shared image of

their work and a joint outlook on the organization and its environment. Communitas create a sense of belonging and establish shared cognitive structures which in turn make clinical research projects efficiently conducted in terms of time and financial resources. On the other hand, the communita of the project workers are less inclined to adapt to external changes and absorb new learnings from concomitant projects in the organizations. In other words, the communita is both enhancing knowledge-based work in some respects but is serving as an impediment for a broader application of experiences and learnings in other areas. This paper suggests that knowledge management researchers need to acknowledge the presence of communitas in organizations but at the same time they need to critically evaluate how the effects of their liminal position, being between what is previously known and what is in the state of "becoming known", can be mediated through for instance knowledge sharing mechanisms and planned organization learning activities (McEvily, Das & McCabe, 2000; Dyer & Nobeoka, 2000).

This paper is structured as follows: First, the knowledge management literature is reviewed, Second, Victor Turner's notions of liminality and communitas is explored. Third, a case study of clinical research in pharmaceutical industry is reported. Finally, some implications are discussed.

Knowledge management in organizations

The knowledge management is quickly growing massive. It is not within the scope of this paper to cover all this literature but following Ash and Cohendet's (2004) separation between on the one hand an economics of knowledge and, on the other, an anthropology of knowledge represents one possible thread of analysis. In the "anthropological" literature on the use of knowledge in organization—in itself a rather heterogeneous body of texts—there are a number of axial principles that are being discussed. For the first, knowledge is here regarded as what is situational, context-bound and agreed upon within social communities. In other words, the "facticity of knowledge" is problematized and instead knowledge is regarded as a form of social accomplishment across a number of actors. The philosopher Alfred North Whitehead (1967: 4) writes, for instance: "In considering the history of ideas, I maintain that the notion of 'mere knowledge' is a high abstraction which we should dismiss of emotion and purpose. Knowledge is always accompanied with accessories of emotion and purpose". Knowledge is always embedded in human faculties such as emotionality, embodiment, and ethical considerations. Secondly, in addition to the strict human qualities, knowledge tend in this perspective to be regarded as what is strongly affected by political decisions and the vested interests of certain groups. For instance, in the book *French DNA*, the American anthropologist Paul Rabinow (1999) examined the field of genomics research in France. In the end of the Twentieth century, genomics became regarded as one of the most important fields of investigation. As a consequence, a rich variety of agents and actors became involved in creating collaborations between different research groups, venture capitalists, and so forth.

Rabinow writes (1999. 4): "French DNA is about a heterogeneous zone where genomics, bioethics, patients groups, venture capital, nations and the state meet. Such a common place, a practical site, eruptive and changing yet strangely slack, is filled with talk of good and evil, illness and health, spirit and flesh. It is full of diverse machines and bodies, parts and wholes, exchanges and relays". Here, knowledge is by no means detached from economic interests, political concerns or other social relevant influences. Knowledge is instead exactly what is emerging from within all those alliances, joint ventures, agreements and collaboration that were created under the banner of genomics. Speaking of a less grand project, that of the day-to-day use of knowledge in organizations, there is still political decisions and routines and standard operating procedures that have strong influence on what qualifies as knowledge and what does not. Nevertheless, being able to exploit the knowledge resources inherent to the organization is put forth as one of the major challenges for organizations in the future. In addition, the knowledge resources may not even be regarded as what is located within the structure of the organization but may be equally regarded as what people bring into the organization. In economist Richard Florida's (2002: 6) formulation: "Access to talented and creative people is to modern business what access to coal and iron ore was to steelmaking. It determines where companies will choose to locate and grow, and this in turn changes the ways cities must compete".

In new drug development work and in the clinical research providing the scientific evidence that the new chemical entity is providing the health care effects postulated while not implying too much undesired side effects, the knowledge employed is on the one hand strictly regulated by standard operating procedures and so-called good clinical practices. On the other hand, there is however always pockets of freedom for individual decisions in the domain of project management practices. The knowledge base is therefore a combination of know-how that have been instituted through many years of clinical trials and new and creative ideas on how to run the projects more efficiently. In other word, there is no strict "facticity of knowledge" that is being adhered to but instead substantial degrees of freedom are given to the clinical research project workers. As a consequence, the anthropology of knowledge work sketched above may be applicable when exploring the practices of clinical research.

The notions of liminality and communitas

Enacting knowledge management as a form of social anthropological investigation into the very constitution of knowledge *qua* knowledge implies that one cannot apply knowledge management theories derived from economics and management offhand. New theoretical frameworks need to be explored in the pursuit for an understanding of how certain groups of individuals regard specific statements and practices as knowledge. Victor Turner (1969, 1982) follows Arnold van Gennep (1960) in seeking to understand how individuals are excluded and re-included into societies through the establishment of liminal positions. *Limen* means threshold in Latin and being in a liminal position implies to be located outside of the threshold

of the regular profane society. The *liminal subject*, the individual temporarily located in a state of liminality, is therefore by definition outside of the social order. The liminal subject is in a position of being "betwixt and between" all instituted orders. This imply a certain amount of ambiguity of the role, status and position of the liminal subject. Turner writes:

> The attributes of liminality or of *liminal personae* ('threshold people') are of necessity ambiguous, since this condition and these persons elude or slip through the network of classifications that normally locates states and positions in cultural space. Liminal entities are neither here nor there; they are betwixt and between the positions assigned and arrayed by law, custom, convention, and ceremonial. (Turner, 1969: 81)

As a consequence, in many tribal societies, the rites of passages establishing liminal positions are confined from the rest of the society. For instance, in tribal society where menstrual blood is regarded of particular religious significance, women enduring their period of menstruation—a liminal period between life and death—may be located in specific huts or shelters. In his 1969 book, *The ritual process*, Turner examines the relationship between a number of individuals sharing the predicament of being liminal subjects. Such communities of liminal subjects are referred to as *communitas* by Turner. Turner (1969: 113) says that "communitas emerges where social structure is not", that is, in the domains of liminality where the institutions of the profane society ceases to play a significant role. Where the social structure does not function, there is little predetermined social content that regulate the relationships and practices within the community. As a consequence, the communita is forged in order to provide some firm ground for liminal subjects. In addition, the communita is playing the role to revitalize the regular profane structure of a particular society. Turner writes (1969: 116): "[I]n *rites de passages*, men are released from structure into communitas only to return to structure revitalized by their experience of communitas". To exemplify, Tuner is accounting for a carnival-like feast in an Indian village wherein the prevailing social order was temporarily overturned: "The masking of the weak in aggressive strength and the concomitant masking of the strong in humility and passivity are devices that cleanse society of its structurally engendered 'sins' and what hippies might call 'hang-ups'. The stage is then set for an ecstatic experience of communitas, followed by a sober return to a now purged and reanimated structure" (Turner, 1969: 174). Turner goes so far to say that the function of communitas is exactly to serve as what is releasing the profane society from its burden of being organized and overturn it for a short period of time in order to revitalize it. This is a very similar to the function that Bakhtin (1968) and Eco (1986) gives the carnival, that of revitalizing society through making the instituted order appear in a new shape. Turner concludes:

> Society (societas) seems to be a process rather than a thing—a dialectical process with successive phases of structure and communitas. There would seem to be—if one can use such a controversial term— a human 'need' to participate in both modalities. Persons starved of one of their functional day-to-day activities seek it in the ritual liminality. The structurally inferior aspire to symbolic structural superiority in ritual; the structurally

> superior aspire to symbolic communitas and undergo penance to achieve it. (Turner, 1969: 193)

Anthropologist such as Pierre Clastres (1994) has argued that war serve a similar function as the communitas to tribal society; war is what is uprooting declining social structures and revitalizes the social organization and helps the social organization avoid petrifying. Both Turner and Clastres and carnival analysts such as Bakhtin (1968) and Eco (1986) adhere to a functionalist view of liminality, communitas and carnivals. Such social institutions serve to mediate social paradoxes and avoid the collapse of social systems since they are at least annually or regularly being put into question.

In management studies, the notion of liminality has been employed in several contexts. Garsten (1999) studied how temporary workers, so called "temps", experienced their own work life position as being "betwixt and between" the regular organization and the labour market. Czarniawska and Mazza (2004) explored the role of consultants as being liminal subjects inbetween the organization and the academic knowledge producing community. Tempest and Starkey (2004) invoked the notion of liminality in research on organization learning, arguing that the increased use of project team work poses a challenge for organization learning practices. What is particular of interest in terms of knowledge-based work and work in knowledge-based organization is the thematic connections between the notion of communitas and project work. In communitas, new social relations and shared cognitive structures are developed in order to create some order and meaning where there are no longer any such legitimate instituted order. In project work, a similar situation is created in the face of ambiguities and uncertainty (Newell, Tansley & Huang, 2004; Postrel, 2002). A number of qualified individuals, representing a number of expertise and functional domains such as pharmacology, data management, project leadership, and so forth, is jointly creating a project team (Sole & Edmondson, 2002; Brusoni & Prencipe, 2001; Becker, 2001; Jehn, Northcraft & Neale, 1999). In clinical trials, a project may run for years with a core of individuals staying the entire period being complemented by newcomers and additional personnel. Of course, the project team is not in a liminal position in terms of being isolated and confined from the rest of the organization, but in practice the project team life sphere is developing into something that may be explored and examined in terms of communitas. Moreover, what is of interest in terms of knowledge management is that it is not of necessity easy to make members of different communitas speak to one another or understand one another's perspectives, concerns, or beliefs because of the "stickiness" of knowledge (Szulanski & Cappetta, 2003; Szulanski, 1996; Von Hippel, 1998). In other words, one may say that each project team, each communita, is developing its own idiosyncratic epistemology and *modus operandi*, its own way of perceiving knowledge and its own practices (Huzzard & Östergren, 2002). Recognizing the communitas-like structure of the project team helps understanding and dealing with a variety of knowledge management and organization learning challenges and opportunities. For instance, in how to make concomitant project teams become better in learning from one another, one of the abiding concern in the vast

R&D and innovation management literature. Next, we turn to the study of clinical research in pharmaceutical industry.

Methodology

This study is based on an action research methodology (Coghlan and Brannick, 2001; Ellis and Kiely, 2000; Eden and Huxham, 1996). While traditional business school research is firmly grounded in an academic research agenda, that is, being primarily concerned with the verification or falsification of theoretical models and frameworks, action research is explicitly attempting to contribute with both practical and theoretical insights. This movement beyond a very conventional research agenda has been referred to as Mode 2 research (Harvey et al., 2002; MacLean et al., 2002) bringing together a number of different research projects recognizing the practical implications of research. In more specific terms, the research team was created on the basis of an insider/outsider approach (Bartunek and Louis, 1996). Of the five project team members, two were insiders to the company investigated, the multinational pharmaceutical company AstraZeneca, two were academic researchers at a technical university and one a project management consultant. The composition of the research team ensured a detailed insight and experience from new drug development activities while at the same time enabled what may be called for the lack of a better term "an analytical distance" could be maintained by the three outsiders. By collaborating across three different domains of management (that of conception, distribution, and implementation, represented by the university, consultancy and industry) opened up for new ways of perceiving the knowledge management work in AstraZeneca.

In terms of data collection, an interview methodology (Kvale, 1996; Fontana and Frey, 1994) was selected. 21 interviews with personnel in the clinical research department were conducted. Project leaders, study leaders, data management and project co-workers were represented in the material. These co-workers had university degrees in biomedical sciences, health care professions and systems engineering. Interviewees had tenure in the industry spanning from about a year up to fifteen years. Some of the interviewees were highly experienced in new drug development while others were rather new in the field. 75% of the interviewees were women. Interview median duration time was about one hour but interviews lasted between 45 minutes and two hours. The interviews were recorded and transcribed. The material was jointly coded (Strauss and Corbin, 1990) by the five participating researchers.

Clinical research project teams as communitas

Clinical research represents the last phase in the new drug development process. In the first two phases, a new chemical entity (NCE) with desirable qualities is synthesized in a laboratory setting in the Discovery phase. In the Development phase, the NCE is further refined and tested on animals and voluntary patients in order to specify the pharmacological

qualities of the new drug. In the third phase, large-scale clinical research projects are being organized in order to text the new drug on a population of patients. Clinical research projects are the most time and finance consuming phase of the new drug development project. As a consequence, the ability to manage and run clinical research projects efficiently is one of the key capabilities for pharmaceutical companies. The clinical research projects are in most cases consisting of a number of experts representing different functional domains of the pharmaceutical companies. Projects leaders, data management experts, pharmacologists, medical doctors, and individuals representing other specific competencies are constituting a project team. One of the abiding concerns for pharmaceutical companies is how to make project teams learn from one another, that is, sharing experiences and insights in the course of action. The project management literature provides ample evidence that project teams tend to become self-enclosed, isolated and only modestly interested in adapting to new knowledge during the project period. In PharmaCo the same challenges have been identified in terms of making projects teams collaborate and share their experiences. As a consequence, a knowledge management or organization learning method called the *knowledge facilitation model* was used to make project teams collaborate more closely. The knowledge facilitation model is organized around a series of seminars, first within a specific project in order to orchestrate a joint reflect on what has been learnt in the project to date, and thereafter together with other project teams (for an overview, see Roth, 2003). The response from the project teams in PharmaCo has been positive. In order to further develop the model, a series of interviews were conducted with different project teams that had joined the knowledge facilitation seminars.

The project team is here regarded as what Turner (1969) calls communitas. The project teams developed a sense of belonging, were co-located, regarded themselves as being in a liminal position in-between what is previously known (e.g., registered drugs and justified true belief of the pharmaceutical industry) and what is in a state of becoming known, that is, the new drug being subject to clinical trials. In addition, the project teams operated outside of the regular line organization and were regarded as some kind of satellites operating on its own but still reporting back to the home base in the various therapeutic areas in the line organization. Over time, the project teams tended to become self-enclosed and focused on one single assignment at the time, that of safeguarding the candidate drug through the collection of credible data through the deployment of the predefined and well-structure procedures known as “Good Clinical Practice”. As a consequence of the communitas position, the project teams tended to develop rather poor learning capabilities, that is, they did not pay too much attention to the outside world but were primarily engaging in the focal assignments and tasks. These poor learning capabilities are manifested in at least three different ways: First, in terms of maintaining an instrumental and highly functionalist view of knowledge, leading to a disregard of knowledge and know-how that is failing to address what is immediately present on the project’s agenda. Second, very much a consequence of the first condition, a short-term perspective is being enacted among the project team members, effectively excluding any

attempt to establish a long-term learning experience. Finally, some of the project members demonstrate what can be called a "learning amnesia", that is, the inability to recognize what has been previously learned during the knowledge facilitation seminars. These three qualities of the project team communita will be explored subsequently.

Instrumental view of knowledge and short-term perspectives

Project teams in clinical research work under the burden of time restraints—the faster a new drug can be launched on the market, the higher market share it may entrench—and the awareness of the extraordinary costs for new drug development, especially in the clinical phases. As a consequence, clinical project team members tend to regard their work as being stressful in terms of never being fully assured that the new candidate drug being worked on will ever reach the market in addition to the use of sparse resources. Furthermore, project teams tend to be very focused on their task, that is, to safeguard a new drug and make it become a new registered drug. This work life position implies that project team members are favouring instrumental and highly functional knowledge at the expense of a broader outlook on intellectual resources. In the interviews with project team members who have participated in knowledge sharing activities, several interlocutors argued that they did not learn very much simply because they had specific worries and concerns in mind during that particular event. For instance, one of the interviewees claimed:

> Q: Was there anything specific you learnt at the meeting?
>
> A: No, not that I learnt anything, just that I got confirmation that we were on the right track … mostly it was useful to ventilate, to bring to the surface and as I said to get confirmation … there are of course a lot of valuable tips … I enjoyed very much listening to Study Management [the other skill group] how they are recruiting patients and how the communication with the marketing companies work, I mean… it has implications for both Study Management [them] and Data Management [us].

Here, the interlocutor is arguing that she did not in fact learn very much but at the same time she argues that "she enjoyed" listening to the insights of another skills group dealt with particular problems. What is here perceived as the main learning is formulated as a confirmation of what she supposedly already knew. The idea of confirmation as a form of learning is also invoked by another interlocutor:

> Q: Was there anything specific you learnt at the meeting?
>
> A : No, it was more like … confirming that we had done the right things in the right way and that one recognized many of the questions at issue they had … as we also had … lots of good ideas that they had brought forward, that we did not have time to think about since it [our project] was in such a hurry. In the way we would have liked to have done it but did not have time to do at that time.

Here, the state of being in hurry is recognized as a legitimate explanation for why practices and activities are not reflected upon. A rather typical statement on how clinical project team

workers perceive their day-to-day work; it is a most compressed series of activity devoid of any slack or time for systematic reflection. Short-term thinking is one of the consequences.

Another form of instrumental treatment of knowledge was invoked in terms of the perceived absence of any person in the seminar sharing the same work role and assignment as oneself. Many interlocutors claimed they did not learn very much simply because they wanted to learn from others who are in charge of the same tasks. One interlocutor argued: "…I did not feel that I had a real counterpart there. I did not think that they would get that much out of me actually". The absence of significant others in the knowledge facilitation seminars does not only suspend learning for the interlocutor but also for the other seminar participants who therefore cannot really "get out that much" from some experts. Another interesting aspect was that senior project team members were considered to have more relevant knowledge than the more junior members. This is illustrated in the following quote:

> Q: Was there anything specific you learnt at the meeting?
>
> A: When we all start in a position we are junior and get much less advanced things to do. There is a great distance between us [persons in the same position in different projects] which I know. But I do not understand what I should learn from that [the junior project team members].
>
> A: The questions they had were not at my level. It is not the kind of questions that I deal with so I thought this is not a meeting that I need. I am not the best person to answer since they asked study team questions.

Again, these quotes suggest a narrow and instrumental view of knowledge as a form of distribution of information between individuals. Another problem with joint learning across project teams was that different clinical project may be in different phases. Some clinical research projects are in the early phases, while others have entered full-scale studies comprising thousands of patients in up to 20 countries. These different phases of necessity put different demands on the project teams. One of the interlocutors argued: "It is not always that you can get anything out of another person since they might not be in the phase you are entering, or they are not in the same indication or do not have the contact you need – it is about finding those people that could give you that". "Finding the right person" is here denoting the person that can provide exactly the piece of information you need for dealing with a particular work assignment. A great deal of frustration was expressed at times over the inability to detect the right competencies in the organization in real time. A common concern for most companies being based on the exploitation of know-how and intellectual expertise. The interviews also reveals a Not-Invented-Here attitude to the learning experience. One of the interlocutors who worked in a project that participated at the same knowledge facilitator seminar as a group from a project at another site put it straightforward: "I did not learn anything, but I got a receipt on that we are on the right track…our projects have different prerequisites so what worked for them did not work for us". Taken together, the project team members expressed a view of knowledge that suggest that knowledge is a piece of

information, a tool ready to apply to cases, or a very specific advice aimed at solving some nuts and bolts problem. Knowledge is here what is formulated in instrumental terms.

Learning amnesia

Another finding from the interviews was that the interlocutors in many cases failed to report what they had learning from the knowledge facilitation sessions. Many of the interlocutors argues that they had so many things going on at the time that they either failed to learn anything or that they sacrificed the learning opportunity on purpose in order to release the burden of work. For instance, one of the interlocutors argued: ”I do not remember anything. I do absolutely not remember it. It is a long time ago. I am at meetings all the time. It is totally impossible”. However, when interrogating on the effects of the knowledge facilitation activities, most interlocutors could report some kind of insight or learning gained from the seminars, but these were generally not regarded as instances of learning per se since they were in many cases not directly applicable to the problems and concern facing the interlocutor at the time. Another interlocutor argued in the same vein: “I can not pin-point anything directly, but it is always so that you learn things and that you then have it somewhere in the back of your head. But to say that it was at this specific event I learnt it – no, I can not pin-point anything specific like that”. The following quotation illustrates how one person in the first place fails to recollect what she learnt, while later on during the interview she gives an account on what she has learnt:

> Q: Was there anything specific you learnt at the meeting?
>
> A: No I don’t actually think so. I can’t really remember anything…I just felt that they very doing things that seemed reasonable for me.
>
> [Later on in the interview].
>
> Q: If you would start a new study could you use what you have heard at the knowledge facilitation seminar?
>
> A: Yes it is interesting to see how others do…to meet others that have worked with the same methods [techniques] in different ways in their studies.

The inability to recognize learning when it occurs can be referred to as *learning amnesia*, that is the learning experience is either never recognized as such or is easily forgotten. As a consequence, some of the participants in the knowledge facilitation seminars had a problem to develop a self-reflexive view of their work assignments and their opportunities for developing new skills and capabilities enabling for more efficient ways of working. For some interlocutors the interview seemed to generate reflections about what they learnt.

Discussion

One of the long-standing debates in the project management literature is the relative poor exploitation of joint knowledge creation and sharing in projectified organizations. Since project work is, by definition, organized to deal with one single, yet highly complex undertaking demanding the integration of heterogeneous and specialized competencies, the poor performance in terms of organization learning may be of little wonder. There have been only modest attempts to examine this absence of learning in project teams from new theoretical perspectives and therefore project team co-workers are at times even regarded as displaying opportunistic behaviour in terms of failing to relate to activities external to the focal project. This study suggests that project team co-workers demonstrate an instrumental and short-term view of knowledge sharing and what qualifies as knowledge and that they tend to even fail to recognize learning when it occurred. One consequence from these findings is that knowledge sharing need to be carefully managed and designed to suit the needs of project team co-workers; knowledge sharing is not, which may appear paradoxical, a self-organizing activity in knowledge-intensive organization today. The knowledge-sharing model suggested by Roth (2003) and employed in PharmaCo is therefore one such managerial tool that may help structure and organize knowledge sharing (see Pawlowsky, Forslin & Reinhartd, 2001). Furthermore, it may be that project teams need to be given the prerogative to develop their communitas during periods of time, that is, engaging in their own idiosyncratic concerns and challenges without being forced to relate to the rest of the organization (May, Korczynski & Frenkel, 2002; Alvesson, 2000; Letiche & Van Hattem, 2000). Disrupting the day-to-day project work with additional activities, not of primary interest for the project teams co-workers, may cause stress, frustration and poor performance. However, the need for feeding back know-how, experiences and insights into the organization—that is, what March (1991) refers to as the "exploitation of knowledge" in the organization—should not be abandoned (cf. Contu, Grey & Örtenblad, 2003; Pritchard, 2000) but need to be carefully orchestrated in knowledge-intensive organizations (Alvesson & Sveningsson, 2003). Studies of for instance construction projects (Styhre, Josephson & Knauseder, *Forthcoming*) suggests that learnings from project work are not always being subject to systematic reflections which in turn implies a loss of valuable insights and know-how. Knowledge-intensive organizations need to conceive of their own specific ways of enabling for such systematic knowledge sharing during distinct periods of time in the projects.

In this paper, the anthropological notion of communitas has been used as an analogy for project teams. A project organization is here consisting of a portfolio of communitas, that is, self-enclosed groups of people operating in individual terrains very much detached from concomitant projects. The notion of communitas captures some of the liminality of project work as being outside of the regular line organization and in terms of being focused on one single assignment during a rather significant period of time. Project work in clinical research are rarely lasting just a few months but can extend into years of research and data collection. Therefore, the notion of project team is not simply denoting the same kind of social

organization as in some other industries, operating with shorter project team durations. In clinical research, project teams tend to become exactly such communities operating outside of the regular organization that Turner (1969) names communitas. The concept of communitas is thus applicable in organizational domains wherein the co-workers are constituting a community of practice (Lave and Wenger, 1991; Wenger, McDermott & Snyder, 2002) experiences a certain degree of liminality. It is important to recognize that a communitas is not a synonym to communities of practices. Communities of practice is not emerging on basis of experiences of liminal positions but are based on the shared interests and concerns. Communitas, on the other hand, are developed when there are no adequate social structures determining the relationship between actors. Project work is therefore in some cases but not always dependent on communitas. Managing communitas is therefore different from managing communities of practice. Communities of practice are based on joint expertise and shared concerns. Communitas are composed of a variety of competencies and are easily drifting away from the line organization and is constituting its own conceptual and practical universe. As a consequence, projects teams need to be continuously re-located into the regular organization and not become isolated project islands betwixt and between other projects and organization undertakings. In other words, the project team needs to be able to alter between open and closed positions wherein new ideas and learnings are being adopted and thereafter are applied in the context of the specific project. In the case study of the use of knowledge facilitation model, it is possible to see that some project co-workers are only marginally concerned about what is going on in other projects and raise a number of objections on why they cannot learn from others how to perform better in the project work. Such responses may have perfectly rational explanations deriving from actual differences between clinical trial projects, but they may also be indications of a self-enclosed “project culture” in which are increasingly becoming detached from the line organization and other projects.

Drawing on anthropological writings in organization theory and management studies may appear somewhat unorthodox in the knowledge management and project management literature but there are generic social mechanism that are shared across a broad variety of human communities, from the tribal society to the most advanced research of technoscience (Latour, 1993). Failing to see the continuity between traditional organization forms and contemporary organizations represents a fallacy favouring linear progress over continuity in modernist thinking. This is not to suggest that there is no progress or development but to primarily say that what is a significant social function in a tribal society may appear in a different form in our society. Understanding such elementary forms of social life is one of the key challenges in management studies. As a consequence, anthropological writing provides a vocabulary and a set of theories that may help researchers and practitioners de-familiarize what is largely taken-for-granted and shed some new light on a particular condition or event. For instance, speaking of communitas rather than project teams may help us unconceal some aspects previously unattended to.

Conclusion

In this paper, project teams have been examined as being a specific form of what Turner (1969 calls *communitas*, that is a group in individual creating a sense of community in the face of uncertainty and ambiguities. Clinical project teams are operating in a domain wherein they have to focus on single assignments in order to be successful and consequently teams are not very prone to develop learning capabilities; instead, knowledge is regarded as what is enabling the team do deal with particular short-term problems and what does not qualify in accordance with these criteria is disregarded as being at the best interesting but not very useful. When recognizing that project teams are designed to operate as a *communita,* a greater understanding of the endemic lack of organization learning between project teams may be achieved. Project teams *qua* communitas does not learn from other teams because they do not experience the ontological certainty and organizational stability needed for an engagement with knowledge sharing that is merely loosely coupled with objectives of the team. One of the key merits with examining project teams as communitas is that it enable for an insight into the priorities made among the team members and their propensity to exclude joint learning and knowledge sharing as a key short-term objective. Since project teams are persisting in failing to share know-how and experiences with other teams, there may be a need for rethinking how knowledge sharing is organized in companies today. Project work may for instance be formally structured into periods of isolation and periods of communication with the outside world to enable for a combination of efficient project work and knowledge sharing in knowledge-based organizations. The knowledge sharing model suggested by Roth (2003) may for instance be an applicable tool for organizations pursuing project management work.

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Learning from Errors:
How Emotions Stimulate and Interfere with Learning

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Introduction

Errors occur frequently in the day-to-day life of organizations. Errors are often associated with negative consequences, such as economic costs, damaged reputations, stress, and dissatisfaction. Despite these potential negative consequences, individuals can also benefit from errors when errors stimulate learning (Argyris, 1993; Edmondson, 1999; Sitkin, 1992). Learning occurs when individuals understand the causes of their errors and implement changes that prevent future errors or reduce the negative consequences when errors reoccur (Reason, 1997; Frese et al., 1991).

Research suggests that learning from errors is difficult in part because of the negative emotions that individuals experience when they make errors (Argyris, 1993; Edmondson, 1996; Pearn, Mulrooney, & Payne, 1998). Research on human error has shown that experiencing errors is unpleasant and can cause strong, negative emotions, including fear, guilt and shame (Rybowiak, Garst, Frese, & Batinic, 1999). Research also suggests that errors, which can be seen as a form of negative feedback, can dampen people's self-efficacy (Cannon & Edmondson, 2001; Heimbeck, Frese, Sonnentag & Keith, 2003). Rather than confronting their errors, individuals may rationalize their actions or ignore the experience, thus curtailing the opportunity to learn.

This research is aimed at understanding how emotions stimulate or interfere with individuals' learning from their errors. Although negative emotions have been associated with a tendency towards avoidance or inaction (Anderson, 2003), negative emotions can also stimulate action and learning. Research on emotions suggests, for example, that guilt motivates reparative action in the form of "confession, apologies, and attempts to undo the harm done" (Tangney, Miller, Flicker, & Barlow, 1996: 1257). Recent research on training also suggests that errors, and the negative feelings that errors generate, can contribute to the learning process (Heimbeck et al., 2003). Snell (1988) found that mangers reported that learning from errors played an important role in their learning, despite the emotional costs (see also Paget, 1988). In environments that are high in psychological safety (Edmondson, 1999), individuals may be motivated by the learning opportunities that errors provide, even when they experience negative emotions. Research has not yet explored how and why negative emotions affect learning from errors. Our work is aimed at addressing this gap.

In the following sections we develop a framework for thinking about (a) the emotions that errors generate in individuals and (b) how these emotions hamper or stimulate learning. We begin by reviewing research on errors, focusing on the types of errors that individuals make in organizations. Drawing insights from research on emotions, learning, and human errors, we propose a framework relating negative emotions (shame, embarrassment, fear and guilt) to error-related responses (e.g., ego-defensive emotional regulation or learning activities).

We illustrate this framework with qualitative data that we have collected through semi-structured interviews with restaurant staff. We have conducted extensive observation of

operations at three restaurants and are currently conducting interviews with staff in service roles at other organizations. Here we report some of our observations from interviews with servers and bartenders who worked in a restaurant located in Canada.

Errors

We define errors as individuals' decisions and behaviors that (a) result in an undesirable gap between an expected and real state; and (b) may lead to actual or potential negative consequences for organizational functioning that could have been avoided (Zhao & Olivera, forthcoming). This definition builds on cognitive theories of errors that assume that human behavior is goal-oriented and conceptualize error as the non-attainment of a goal that is potentially avoidable (Norman, 1981; Reason, 1990; Zapf & Reason, 1994).

Consider the following examples of errors that we have observed in our field research in restaurants. A server incorrectly writes down an order from a customer, a cook reads an order incorrectly and prepares the wrong meal, a server takes the bill to the wrong table, or the host gives an incorrect estimate of the waiting time for a table. In each of these examples, individuals' judgment, decisions or behaviors result in a state that is not desired and is likely to have negative consequences. These consequences could have been avoided had the activities been carried out correctly.

As we elaborate below, an important aspect of errors is that they generate emotional responses. Consider the way a server explains the types of errors that she made in her job and some of the emotions associated with these errors:

> "I think most mistakes happen because… okay, maybe one of three things: either the order's rang in wrong, like if I'm taking an order and I decide that I don't need to write it down because I've got a great memory, and then I go to the computer, which is how we do our order into the kitchen, and I press the wrong thing and so in turn the kitchen makes that and then somebody sends it out to your table and it's the wrong thing. So you know, that's a mistake. Sometimes if it's a completely different order then, you know, that thing gets thrown out and then the order has to be [re]made. But at the same time the customer is now upset because they have to wait an extra 10 minutes for their meal and they sometimes… at the same time I feel… I'm sure this is subconscious but that their order wasn't important and they might feel some animosity towards the server.
>
> I've felt that at times. But um… so that's probably the first one. The second one is when the kitchen just does a mistake and then you look bad. Or another really bad one might be if the kitchen runs out of something and you're unaware of it and uh… what we do a lot of the times at [restaurant], we're having a special, we'll pump it up a lot. So like it's Pad Thai Day, I'm going to tell you about it and tell you how much I love it and that it's my favorite thing to eat and you should definitely get it. And there's been times where I've done that and they had run out of Pad Thai a few minutes ago. So then I look kind of silly going back to my table and saying, 'Actually remember that thing I pretty much forced you to get, we don't have that.' So I feel kind of bad and yeah, that's a bad mistake that

happens. I mean, mistakes happen, like you said; like it's inevitable. And I just try to deal with them to the best of my ability at the time and with the resources that we have."

A bartender's explanation also illustrates the types of mistakes she made and how she felt when making mistakes:

"I feel bad... if I make a mistake, like I know that I shouldn't be making. I make a mistake … because I did not pay enough attention. Or … I wasn't thinking about what I was doing. So it is definitely my fault… And I do, like, I feel really bad when I make mistakes, because I want to do my job and I want to do it well. And I don't want to have to get managers to void it off, product, because they lose money when that happens, so I --- I feel bad about it.

Learning from Errors

Building on Duncan and Weiss's (1979) definition of learning, we conceptualize learning from errors as the process through which individuals (a) reflect on errors that they made, (b) locate the root causes of the errors, and (c) develop knowledge about action-outcome relationships and the effect of these relationships on the work environment. From this perspective, learning from errors is an effortful process – it involves purposeful reflection and, potentially, information gathering and feedback seeking. The outcomes of these activities are understanding and insights that may help enhance individuals' error detection and correction skills and abilities, in addition to reducing the probability of the error's recurrence (e.g., Cannon & Edmondson, 2001; Schulz, 2002).

The Role of Negative Emotions in Learning from Errors

Prior research provides some insights about the role that individual differences play in the process of learning from errors. There is evidence, for example, that people differ in their ability to handle negative emotions (e.g., Gross & John, 2003; Salovey & Mayer, 1990). Individuals who can contain their negative emotions well may engage in the learning process without the interference of emotions. Empirical research by Rybowiak and colleagues (1999) provides some evidence of individual differences in coping with and learning from errors.

We take a different approach in that we are interested in investigating the mechanisms through which specific negative emotions affect learning from errors. Particularly, we focus on: (a) which specific negative emotions stimulate or interfere with learning? and (b) what are the mechanisms through which each specific emotion stimulates or interferes with learning from errors?

Recent research on emotions indicates that it is critical to consider the effects of specific emotions rather than treat emotions along a single valence dimension (i.e. positive vs. negative emotions) (e.g., Roseman, Wiest, & Swartz, 1994; Smith & Ellsworth, 1985; Tangney, Wagner, Fletcher, & Gramzow, 1992). This argument suggests that we cannot assume that all negative emotions will discourage learning from errors. Furthermore, we

should not presume that all negative emotions exert their influences on learning through the same mechanisms. Based on findings from the literature on emotions (e.g., Smith, Webster, Parrott, & Eyre, 2002; Tangney et al., 1996), we investigate how specific emotions affect the learning process.

We assume, in line with prior research, that learning requires both motivational forces and cognitive resources (e.g., Kanfer & Ackerman, 1989; Noe & Wilk, 1993; Rybowiak et al., 1999). We conceptualize learning as a controlled and mindful activity (Weick & Ashford, 2001) where attentional resources are necessary for learning to occur. Motivational variables are necessary to initiate and sustain the allocation of cognitive resources to learning (Kanfer & Ackerman, 1989).

Theorists have long suggested that emotions influence motivation and cognition in important ways (e.g., Schwarz, 1990; Lazarus & Launier, 1978). For example, emotions have been found to influence individuals' perceptions of risk (Lerner & Keltner, 2001) and motivation to engage in specific activities (Lazarus, 1991). Recently, researchers have called for studies to examine the role of emotions in learning, arguing that "emotion and learning are vital aspects of individual and organizational functioning" (Antonacopoulou & Gabriel, 2001).

Emotions may stimulate or interfere with learning. Findings from some studies on training suggest that the negative emotions that individuals experience from receiving negative performance feedback interfere with learning (Kuhl, 1984; Kanfer & Ackerman, 1989). Negative emotions are distressful and one way that people cope with this distress is by attempting to regulate the negative emotions directly. According to the literature on emotions and coping, emotion regulation is cognitive resource intensive (e.g., Lazarus, 1991; Lazarus & Launier, 1978; Piaget, 1981). Thus, upon error detection, individuals may allocate attentional resources to defining away or justifying errors as opposed to learning from errors (Weick & Ashford, 2001). Because cognitive resources are limited, negative emotions interfere with learning by drawing from the cognitive effort that would be needed for reflection and analysis of errors (Kuhl, 1984; Kanfer & Ackerman, 1989; Lazarus, 1991).

In our interviews, we also found that individuals can respond to errors in ways that allow them to regulate their emotions but can also potentially curtail the learning process. Consider the following example of *blaming others* for one's own errors as described by one of our interviewees:

> "Usually you blame it on the kitchen. It's just the way it goes. Like in every… everybody that I've spoken to, like I've worked in a couple of bars too and like, you know, they do it too…people like to put the blame somewhere and just naturally they just do. And I think it's better to put the blame on somebody that's faceless … Honestly I do. Those in the kitchen, you never see them. So, 'Oh the kitchen made a mistake. They're really sorry. You'll be getting 15% off or a free dessert, whatever you prefer'. Try to make it better. And yeah, I blame it on the kitchen all the time even if it's fully my fault."

Individuals may also try to *ignore* the mistake, pretending it did not happen. As a bartender explained:

> "--- some people can get away with their mistakes because they just hide it. If they make wrong drinks for a server, then they just immediately throw it out. Then nobody knows that they did it. ------ So, if you, I don't know, if you realize it right away, like our people will just throw it out and pretend it never happened."

There are also instances of people *denying* their mistakes in front of others who is/are aware of the error occurrence:

> "Well some people try to deny it because that's their type of… like that's the way they are: they're very proud and they try to make it look like they didn't make the mistake. And that's horrible, I think. If I've done something wrong I'm going to admit to it and go, 'Yeah, you're right. I did that. I shouldn't have done that.' That's just the way I am. But some people try to cover it up and say, 'No, this is what you told me.' And they just try to bully whoever into thinking that they're right."

These defensive responses, blaming others, ignoring the error, and denying the error, divert the individual's attention away from recognizing and exploring the learning opportunities that errors may offer.

On the other hand, there is also research suggesting that negative emotions may be the driving forces for learning from errors because unpleasant emotional experiences draw awareness to the need to learn and improve performance (Kanfer & Ackerman, 1989; Snell, 1988; Schwarz, 1990). For example, Snell (1988) argued that negative emotions may prompt learning from errors because they "alert managers to a problem and provide the motivation to devote attention to it" (Snell, 1988: 328) or "provide the motivation to set something straight or sort something out" (Snell, 1988: 329). This argument is consistent with findings from research on training, where the perceived need for improvement is a key motivational force for learning (Maurer, Weiss, & Barbeite, 2003; Noe & Wilk, 1993). If individuals know that there is a need for learning, they will be motivated to devote time and effort to learn and improve (Weick & Ashford, 2001).

The following example illustrates an episode where an error seems to have stimulated learning, despite the negative emotions that were experienced. The server describes his understanding of the causes of his mistake and the actions he took to repair the situation. Presumably, this understanding will reduce the likelihood of the error occurring again.

> "Yesterday it was… nothing went smoothly yesterday. It was ridiculous. This is a mistake that doesn't happen very often, but every once in a while you get a customer who wants something wrapped to go, right? Because they haven't finished what they've eaten. And if you're busy and your mind's doing, you know, 100 km an hour, it's very easy for you to get sidetracked with somebody as you're walking to the kitchen saying can I get another ice tea, can I get hot sauce? Okay. So you're thinking that. You've got some dirty dishes from that last table that had something that they want wrapped. So you're going into the kitchen and you're thinking okay, ice tea, diet coke, hot sauce, okay. You put the dishes down and you're still thinking about what's going on and the next thing you know

you're scraping all the plates off. Ooh there goes what somebody wanted wrapped in the garbage. So that happened yesterday. It was a terrible day. And then I went back up to the manager again and I'm like, okay, I uh… 'this is what I did'. Like 'I'm sorry. You've got to do something. These people are not going to be happy with this.' 'Okay, we know what happens, you're really busy right now. And then we 50% the meal to um…' So it happens. But I mean a lot of mistakes happen that cost you… the restaurant some money when you're very busy… So if you're not busy, there's not a lot of reason, there's not a lot of reason why a server should be making mistakes."

One way to reconcile these divergent views about the role of negative emotions in learning is to consider the effects of specific negative emotions on learning from errors, rather than negative emotions in general. In the sections that follow we argue that some negative emotions stimulate learning by alerting people to the need to learn, whereas other negative emotions discourage learning by directing limited cognitive resources away from learning. We elaborate on the role of fear, shame, guilt and embarrassment on learning from errors.

Fear

Fear refers to the feelings of being scared, frightened and afraid (Watson & Clark, 1992). Fear is experienced in situations where individuals perceive obstacles and do not know whether they can escape or avoid an unpleasant or harmful outcome (Ellsworth & Smith, 1988; Smith & Ellsworth, 1985). Errors can induce feelings of fear related to punishment, image or reputation damage, or job loss (e.g., Edmondson, 1996; Paget, 1988; Sexton, Thomas, & Helmreich, 2000; Uribe, Schweikhart, Pathak, & Marsh, 2002). In our interviews, servers talked about the real fears of losing jobs if they made many mistakes

"…[new servers] make a mistake they're like, 'Oh, made another mistake!' And I'm sure at some points they feel like their job might be in jeopardy just due to the fact that they're making all these mistakes."

The following example from one of our interviews with a server illustrates the experience of fear of blame or punishment.

"--- like I just don't like to get into trouble for silly things. You know, like, if you know you have that kind of hard-head manager, and you make like a silly mistake, you of course don't want to go to him because as little as a mistake is, and even if it is not totally your fault, you know that they are not going to be helpful and you know that you are going to get blame for it anyway."

Fear caused by negative performance feedback may motivate both adaptive and maladaptive responses (Lazarus, 1991). When fear directs individuals' focus of attention towards ego-defensive forms of emotional regulation, fear interferes with learning and performance by withdrawing effort from task-relevant activities (Lazarus, 1991). However, fear has also been found to motivate individuals to concentrate effort on task-related activities, which leads to learning and performance improvement (Lazarus, 1991).

Although divergent, both findings can be explained by individuals' tendency to escape or avoid the dangerous or unpleasant situation (Lazarus, 1991; Roseman et al., 1994). In the former case, individuals try to move away from the threatening situation by putting emphasis on short-term benefits of defending the self and by engaging in emotional coping activities (Lazarus, 1991). In the latter case, individuals try to remove the threat by improving their task knowledge and reducing or eliminating chances of error recurrence in the future, thus focusing on long-term benefits of learning.

Therefore, we expect that fear may either interfere with or stimulate learning from errors, depending on individuals' focus on ego-defense or learning and performance improvement. When fear motivates ego-defensive emotional regulation, fear hinders learning by withdrawal of cognitive resources from learning from errors.

Shame

Shame involves negative evaluations of the self and arises from a discrepancy between a desired and a perceived self (Lazarus, 1991). Detecting one's errors may result in shame in situations when the error is interpreted to have significant implications for the individual's sense of self in terms of, for example, competence and professionalism (Bosk, 1979; Paget, 1988). When experiencing shame individuals tend to focus on negative evaluation of their global self rather than specific behaviors or decisions. For this reason, individuals usually adopt maladaptive responses to the emotion-eliciting situation (Tangney et al., 1992; Tangney et al., 1996). Individuals will try to rid themselves of this negative emotion by hiding, or escaping, from the situation (Lazarus, 1991; Lewis, 2000; Tangney et al., 1992, 1996). The following quote from our interviews illustrates that errors can cause individuals to question their self-efficacy and motivate them to withdraw.

> "So I was taking food from the kitchen to a table and I took it to the wrong table and they started eating and then after realizing 'This isn't what I ordered.' And they're about halfway through somebody else's meal and it's my mistake, right? So you'd make mistakes like that and think 'Oh no, maybe they'll get rid of me. Maybe I can't do this. Maybe I'm not cut out for this.'"

Studies have also found that shame is positively associated with the tendency to externalize blame (Tangney, 1990; Tangney et al., 1992). In fact, Bagozzi and colleagues (Bagozzi, Verbeke, & Gavino, 2003) have argued that self-regulation of shame negatively impact individuals' task-related activities by focusing attentional resources on the self and away from the task. Hiding, escaping and blame externalization are all ego-defensive activities (e.g., Lazarus, 1991; Lewis, 2000, Tangney et al., 1992) that consume cognitive resources. We thus expect that shame will interfere with learning from errors by drawing individuals' attention away from learning activities and towards ego-defense activities.

Guilt

Guilt is experienced "when individuals evaluate their behavior as failure but focus on the specific features or actions of the self that led to the failure" (Lewis, 2000: 629). In contrast to shame, "guilt involves a negative evaluation of specific behaviors somewhat apart from the global self" (Tangney et al., 1992: 674). Research has found that guilt motivates adaptive responses and reparative action in the form of "confession, apologies, and attempts to undo the harm done" (Tangney et al., 1996: 1257). In the emotion of guilt, people often report a focus on the specific behavior or decision that make things go awry and a strong wish to avoid the same error (Lewis, 2000; Tangney et al., 1996). Therefore, we expect that guilt will stimulate learning from errors by making salient the perceived need for performance improvement and thus directing attentional resources to learning from errors.

Consider the following example where a server made a potentially life-threatening error when advising a customer that a menu item did not contain peanuts:

> "Sometimes if you don't know the menu well enough, if somebody has an allergy to something and you tell them, 'No, there's no trace of peanut in that,' but there is. And that actually was a problem a couple of years ago. But the person was okay. I actually recommended a dessert to somebody and they [had a] deathly… not deathly, but very allergic [reaction] to peanuts. And there were peanuts… like usually there's peanuts in desserts especially in cheesecake type of you know things with like stuff on top and… I said you've got to try this dessert, it's so great. You know. Like okay. Took a big bite and was just kind of like <makes gagging noise>. And then hives came and it was horrible. But he was alright. But I mean you know if you don't know your job, obviously you're going to make mistakes. You know, personal mistakes."

This episode illustrates the individual focusing on a specific incident and relating it to her knowledge, recognizing that lack of knowledge led to the error.

Another server reflected on his mistake of taking a wrong order from a customer and commented:

> "So you really make an effort to not make those mistakes because it's not pleasant. It's not just a matter of 'Oh we're going to discount it. Everything's going to be fine.' It takes time. You have to find the managers, you have to, you know, explain the situation to them and what have you. And you have to go back to the customers, explain it to them: 'This is what I've done for you. I'm so sorry about that.' Meanwhile you just waited 10 minutes of time that got you behind. So now it's a vicious cycle. And then that increases your intensity and probability of making a mistake. So you're really… there's so much incentive in there to not make those mistakes again and to make sure that you're taking down orders properly and what have you."

Embarrassment

Embarrassment is a less intense and more transient emotion than shame (Smith et al., 2002; Tangney et al., 1996). Compared to shame, embarrassment involves fewer or no

negative evaluations of the self. Rather, public exposure may be the key cause of embarrassment (Lewis, 2000; Tangney et al., 1996).

We anticipate that in many situations individuals will experience embarrassment, rather than shame, when they make errors. Embarrassed people have been found to be less motivated to hide from others than people who experience shame (Tangney et al., 1996). Given that embarrassment tends to be a transient and less intense negative emotion than shame, we expect that embarrassment will not motivate emotional regulation that is cognitive resource intensive and thus will not hinder individuals' learning from errors.

Discussion

We have argued that in order to understand the role of negative emotions in learning from errors, it is necessary to investigate the effects of specific negative emotions. Fear is likely to interfere with learning by drawing away cognitive resources when individuals are preoccupied with short-term benefits of ego-defense. When fear prompts individuals to value long-term benefits of performance improvement, individuals' attention may be focused on analysis of errors and learning. Shame is likely to discourage learning from errors by directing cognitive resources towards self-regulation of shame and away from learning. Guilt is likely to be a stimulant to learning from errors primarily by making salient the perceived need for performance improvement. Finally, embarrassment is likely to be a transient emotion that may not affect learning from errors.

There are three additional considerations in this framework. First, it is important to consider emotional intensity when we study the effects of emotions on cognition and motivation (e.g., Lewis, 2000). We speculate that emotions of weak or moderate intensity may be just enough to alert people to the learning need while emotions of high intensity may prompt emotional regulation. Second, we acknowledge that there is a complex bi-directional link between emotions and cognitions and motivation (Lazarus & Launier, 1978). We chose to focus on the impact of emotions on motivation and cognitions in learning from errors. A discussion about the effects of cognitions on emotions is beyond the scope of this paper. Third, we note that people may experience multiple rather than single emotions in any given emotion-eliciting situation (e.g., Ellsworth & Smith, 1988; Tangney et al., 1996). While it is possible that several emotions may be experienced concurrently upon detection of errors, we assume, in line with Tangney and colleagues (1996), that there will be a dominant emotion and that this emotion will influence learning.

Theoretical Contributions

This paper contributes to the theory on learning from errors in at least two ways. First, we offer a definition of learning from errors based on literature on learning and cognition. To our best knowledge, this is the first attempt at developing a formal conceptualization of learning

from errors at the individual level. Second, we develop arguments about the effects of specific negative emotions on learning from errors. This approach contributes to our understanding of learning from errors and the burgeoning research on specific negative emotions.

Directions for Future Research

We suggest two topics for future research. First, it is important to explore the interactions between the individual/contextual variables and specific emotions in the learning from errors process. Research suggests that both individual and situational factors play a role in learning and development activities in organizations (e.g., Noe, 1986; Maurer et al., 2003). For example, do individual differences moderate (weaken or strengthen) the associations between specific emotions and learning from errors? Research on emotional intelligence suggests that individuals differ in their ability to regulate their emotions. It is conceivable, thus, that individuals who are high in emotional intelligence are more efficient in emotional regulation and thus can concentrate more attentional resources to learning from errors. In terms of situational factors, we know little about how support for learning, a variable that has been consistently found to enhance individuals' learning (e.g., Maurer et al., 2003), affects the allocation of cognitive resources to emotion regulation and learning.

Second, given that work in organizations is often performed by groups, it is important to understand how emotions affect learning from errors at the group level. Recent research has explored the concept of group emotions (e.g., Kelly & Barsade, 2001) and research by Edmondson (1999) on groups' learning from errors has already highlighted the importance of errors as learning opportunities for groups. Although Edmondson (1999) did not directly address the role of group emotions in groups' learning, the important role of the key group level construct---psychological safety---in learning from errors suggests that groups vary in their abilities to learn from errors. If individual team members' specific emotions (e.g., fear, in Edmondson's study) can influence learning from errors at the group level, we would expect that group emotions will also have an impact on groups' learning from errors.

Conclusion

Errors can be valuable experiences if we can learn from them. Individuals and organizations can learn from errors by understanding their causes and implementing changes that will prevent future errors or reduce the negative consequences when errors reoccur (Frese et al., 1991; Reason, 1997; Pearn et al., 1998). However, the negative emotions that people experience when they make errors can interfere with the learning process (e.g., Argyris, 1993; Edmondson, 1996; Paget, 1988). To investigate this important yet understudied area, we integrate insights from a variety of research areas, including individual-level learning, errors and emotions. We argue that negative emotions can both interfere with and stimulate learning.

We see this as a first step towards understanding how fear, guilt, shame and embarrassment affect learning from errors.

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Endnotes

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Face-to-face and distant learning as emo-rational microprocesses: understanding change through collective learning from within

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Abstract

Change through collective learning microprocesses was focused in the empirical and conceptual study presented in this paper. Empirical research analyzed three ICT projects initiated by four firms in Brazil, Italy and the UK. The Brazilian telecom firm wanted to develop 120 managers on Entrepreneurship Management through an e-learning project conjointly developed by its own HR staff and a Business School. The Brazilian Business School had no prior experience with e-learning so, for them, it configured an organizational innovation accomplished with its teachers' collective learning capacity. Instead the Italian and the British firms, operating in the IS sector, wanted to build up and enhance processes of organizational change by implementing Intranet technology. The Italian firm Intranet project aimed at developing this technology as main road to familiarize company staff with web technologies. The British company wanted to improve processes of knowledge sharing and transfer to reinforce identity and belonging to the organization by buying and customizing an Intranet-based knowledge management system. The conceptual study about change through learning microprocesses departed from Crossan et al.' organizational learning framework and interactively developed into an in-depth analytical integrative framework. It included emerging concepts as "dispersed communities-of-practice" where "situated learning" developed change constrained by its power dynamics embedded in rationality and emotionality dimensions. The developed integrative framework helped to understand also how in change through learning processes at group level, bounded emotionality and bounded rationality coexisted. Some practical and managerial implications for understanding ICT and learning interrelationships are also presented.

Key Words: Emotionality – rationality – organizational learning and knowing – face-to-face and distant learning microprocesses – change and collective learning.

Study aim and introduction

The aim of this paper is to examine processes of learning and knowing as inextricable intertwining of rationality and emotionality, as well as to inquire the role of Information and Communication Technologies (ICTs) in constituting and affecting such processes.

The study presented here aimed at

- exploring how organizational change originated by learning dynamics was established within specific organizational contexts and their social practices;
- inquiring the relationships between face-to face and technologically mediated processes of learning in organizations, and how technology interweaves emotionality and change through learning processes;

- exploring how knowledge is constructed in the first place, looking at knowledge from within.

The specific focus of this paper is on organizational change occurring through collective distant learning processes as well as on differences and similarities between face-to-face and technologically mediated processes of learning in organizations. These processes, we try to argue, constitute themselves as emo-rational processes. Case studies we draw from concern learning and appropriation of a new technology in four companies, two in Italy and the UK, and two in Brazil. In Brazil, an IT firm and a private Higher Business School implemented conjointly a new e-learning project. In Italy and the UK, two firms implemented intranet sites in order to enable some kind of organizational change. In all the case studies the methodological and theoretical approach was to examine microprocesses of learning with reference to the planned or current mediation of a new technology, to describe and systematize its accomplished or failed collective change through learning processes.

The remainder of the paper is organized as follows. First, learning and knowing as collective microprocesses will be inquired, referring to conceptual frameworks that have emphasized this dimension. Afterwards, categories of emotionality and rationality will be analyzed with reference to organizational processes of learning as increasingly mediated by ICTs in both explicit (e-g. implementation of e-learning processes and intranet technology) and implicit ways (e.g. everyday use of ICTs to communicate and access information). Being technology considered as either the driver/focus of change, or a means through which everyday activities are accomplished, it is our interest to understand how this mediation affects learning and organizational change. Finally, preliminary conclusions will be drawn with reference to the interrelationship between ICTs, learning, emotions and emo-rational microprocesses of change.

Study research methodology

This qualitative study was accomplished through an inductive socio-constructivist methodology that included ethnography, complete participant observation (Crawford, 2003) and insider approach (Evered & Louis, 1981: 392). It was reflexively analyzed through four comprehensive interpretive levels as proposed by Alvesson and Sköldberg (2001):

Complete participant observation was configured because during the research period the researchers worked within the organizations, workers and managers knew that they would be object of this research and accepted the researchers as members of their groups (Crawford, 2003: 88). Qualitative data was generated through informal open-ended, formal semi-structured interviews and field observation. These were interpretively and reflexively analyzed. Reflection was defined as "*the interpretation of interpretation and the launching of critical self-exploration of one´s own interpretations of empirical material (including its construction)"* (Alvesson & Sköldberg, 2001: 6).

In this way field data was systematized to generate insights, their implicit meanings were examined to clarify power and ideological contexts and, finally the language use and text production identified researched participants` interests (Alvesson & Sköldberg, 2001). Conceptual data was systematized considering their epistemological assumptions in order to identify OL studies compatible with relational perspective that would allow us to study the intersubjective and interdependent nature of organizational life (Bradbury; 2000) and with methodological relationalism which recognizes the individual's embeddedness in the social network (Cheng & Sculli, 2001).

Change, learning and knowing as collective microprocesses

Microprocesses were considered here as micro level explanations related to individual and collective practices that might help to explain macro level change (Tolbert & Zucker, 1996).

The conceptual study about change through learning microprocesses departed from Crossan et al. (1999)' organizational learning framework to develop interactively an in-depth analytical integrative framework including field emerging concepts as: dispersed communities of practice (Kan, 1999) where situated learning (Lave & Wenger, 1991) developed change constrained by its power relations (Huzzard, 2003), and emotionality and rationality coexisted in permanent tension.

On organizational change through collective learning

Specifically for studying collective learning processes, we followed a socio-constructivistic approach because it considers knowledge development as physical, biological, cognitive, social, cultural and political phenomenon. It also considers: (a) theory as a dynamic social practice where knowledge is developed; (b) individuals as active actors in knowledge acquisition, apprentices that learn - in different ways- routines and innovations and pedagogical practices to be evaluated on their global results; (c) cognitive processes as social construction of meanings (Easterby-Smith et al., 2000). Differently, collective learning processes have been discussed in an isolated way in organizational theory studies on organizational learning and change.

More systemic and multilevel understandings were developed by researchers such as Crossan et al. (1999), who developed a conceptual framework where learning processes of intuition-interpretation-integration-institutionalization interact with knowledge exploitation and exploration dynamics throughout three analysis levels: individual, group and organizational ones. **Intuition** is defined as a pre-conscious recognition of a pattern or of inherent possibilities among a personal experience flux. **Interpretation** is a personal explanation for one's self and for others about individual's *insight.* This is a learning process that requires verbal manifestations and language development. **Integration** is a process through which shared understandings among individuals occur and coordinated actions

through mutual adjustments result. **Institutionalization** is the process of embedding individual's and group learning within organization including its systems, structures, procedures and strategies (Crossan et al. 1999: 525). Although this framework recognizes cognitive and behavioural elements of change and learning processes as well as its non sequential and non linear nature, nonetheless embedded emotional and power dimensions are not explicated and seem to be considered as factors/variables in a mechanistic way. A rational and managerial perspective prevails, so we continued looking for "process" instead of "factors" in OL studies

Recently, Dutta & Crossan (2003) recognized that in order to accomplish change, organizations necessarily learn, so *change is intimately linked with organizational learning* (p.16) and proposed a dynamic integrative model to explain theoretically how OL may inform change studies. These researchers synthesized their main contributions as that of:

- showing that it exist parallels between the two streams of literature and that learning can be a powerful lens to understand complexities associated with organizational change. Change and learning literatures come together when change is emergent rather than when it is deliberate.
- pointing out that it is important to adopt an organizational perspective to manage change and it is also important to understand change as a process with elements in constant mutual interaction.

But it appears that this model considers interacting "elements" still in a mechanistic way, understanding OL and change processes through its perceived manifestations. In this way, it does not consider embedded organic interdependent interrelations or concomitant power dynamics that pervaded the configured OL processes during our fieldwork.

Differently, although still assuming a unitary view of organizations but departing from organizing and learning as a collective sense making process, Carter & Colville (2003) discussed the tension between organizational leading and learning to link it with change after speculating on two non-considered issues by the predominant change and OL perspectives:

- it exists a tension among organizing and learning because they pull conceptually in different directions; while to learn is to increase variety (disorganize), to organize is to reduce variety.
- it exists a gap among living life forward (present and future) and understanding it backwards (past).

They alerted that organizations tend to simplify and believe too much in past actions as future indicators. Carter and Colville's discussion about the tension between organizing and learning and change as its synthesis led us to reflect on collective change and learning processes´ simultaneity and about learning through action.

On organizational learning through collective knowing

Advancing research on OL as organizational ”knowing”, Nicolini, Sher; Childerstone and Gorli (2003) consider that to reflect on action and in action constitutes an important locus of learning in organizations, where learning at the individual, group and organizational level sustain each other.

They developed a program to promote reflection at the organizational level and examined how personal reflection, group support and organizational change were bridged drawing upon a three-year initiative to introduce critical reflection as a legitimate practice among a group of middle managers. Based on this experience, they described the role of public reflection as a basis for learning and change and suggested that reflection works at individual and organizational levels if it is public, participative and authorized.

In this way Nicolini et al. (2003) understood that the recognition of the centrality of the distribution of power is critical for all organizing processes, especially those of learning and changing. It signalled us a more complex and diffuse nature of OL phenomena, which had showed for example, that manager's job was not so much to get rid of dilemmas, ambiguities and problems, but to accept that these are integral to their work.

On dispersed communities-of-practice and power dynamics within learning

Group learning and types of resulting OL was the focus of Kan´s (1999) research on two organizations where he emphasized the group as locus of OL for considering individual learning different from organizational learning, disagreeing with the accepted reifying assumption that OL would be only the sum of individuals' cognitive rational processes. Based upon empirical findings, Kan (1999):

- pointed to a pluralistic view of organizations' nature as opposed to a unitary view, to better explain OL considered as a product of social construction occurring in a dispersed form.
- suggested to redefine OL recognizing the importance of power relationship within groups.

OL would then be a negotiation process within individuals and groups constituting dispersed communities-of-practice where individuals learn collectively all the time through social processes by enacting power interactions that can affect how they learn. They negotiate to defend their own goals and protect their interests, not necessarily for having common goals (Kan, 1999).

We continued on looking for studies that developed understanding about the complex and relational nature of OL. Amongst them Cook and Seely (1999) based on a three cases study, confronted an "epistemology of practice" - that considers and explains knowledge as action found within individual and collective practice throughout organizations - as opposed to an "epistemology of possession" - that considers knowledge as something that people "have".

Their intention was to demystify priority given to explicit knowledge as superior than tacit knowledge and, consequently,

- to discuss that organizations would be better understood if explicit, tacit, individual and group knowledge were considered complementary forms of knowledge;
- to configure knowing process and knowledge as mutually enabling.

This led us to considerate change through learning as resulting from interactions not as punctual divergence from an ideal stable state, but as a permanent learning flux and, organizational learning process as generated through frequent social interactions within workers.

After drawing a framework of learning in organizations through collective processes and as a collective experience, we point to understand also how learning processes at group level (Gherardi & Nicolini, 2002; Gherardi et al.,1989) emerge from the coexistence, in permanent tension, of bounded emotionality (Mumby & Putnam, 1992) and bounded rationality processes among communities-of-practice.

Communication, technology and emo-rational microprocesses

Considering organizations as socially constructed textures based on tacit knowledge and on knowing-in-practice (Gherardi, 2000), it is possible to see the mobilization of emotions and passion through the analysis of microprocesses of communication as increasingly mediatized. This constitutes what we call emo-rational dimension of the technological mediation. Appropriation of technology itself is also constituted and pervaded by emotionality.

Learning and knowing as tacit dimensions of everyday practice

By adopting a phenomenological stance on learning and knowing, both of them are experiences embedded into practice, therefore learning and knowing emerge from and come through tacit, implicit knowledge (Polanyi, 1967; Gherardi, 2000 and 2001; Schutz, 1964).

As emphasized by Cook and Seely (1999) in their "epistemology of practice", but also by Nonaka and Takeuchi's work on knowledge creation in Japanese companies (Nonaka & Takeuchi, 1995) the process of knowing comprises different types of attitudes and perceptions, both tacit and explicit, formal and informal. Rather than being abstract and disconnected processes occurring through individual biological and cognitive structures, learning and knowing are inextricably intertwined with practice and tacit knowledge, which make them social and situated processes. Learning and knowing, in this respect, occur through an everyday 'work' which allows to accumulate knowledge and to represent and access it as a source of available knowledge (Schutz, 1964). In this respect, the process of learning and knowing is made of progressively taken for granted constituencies, which make it possible to avoid to question reality all the time as well as to critically question what reality is at multiple levels (Berger & Luckmann, 1967).

The tacit dimension of knowledge and its taken-for-granted status is linked with what Brown and Duguid (1996) defined as the "gulf between formal and informal". Going to the core of the gap between formal and informal, it emerges that the situated and social 'nature' of learning accounts for failures and 'knowledge traps' (Levitt & March, 1996; Brown & Duguid, 1996) when focusing only on the most formal (or "canonical") dimensions of the learning process.

Non canonical, tacit and informal dimensions in work and organizations are pervaded by a mutual engagement through which actors and groups are able to act and learn together in communities of practice (Wenger, 1998). Such an engagement is oriented by reciprocity founded on emotional relationships, which seem to trigger and sustain the collective passion for learning when they are constituted as social interactions indeed. Maturana (2002: 24) considers that not all human relations are social, only that founded in other's acceptance as a legitimate other which results in a respectful conduct. If not, without other's acceptance in co-existence, there is neither social phenomena nor language development.

In this respect rationality and emotionality are not as separated as stated by the modernist and positivistic determinist epistemology originating from Cartesian separation between body and mind. Rather rationality and emotionality represent two sides of the same process, or better, they are always evoked and enacted by actors involved in the learning and knowing process.

Emotions and emotional fundaments of social texture: bounded emotionality, bounded rationality and organizing

From a biological viewpoint, Maturana (2002: 92) points out that it is not reason that leads us to action but emotion as "*emotions are corporal dynamics that specify action dominium we move through"*. Emotions are what impede us to fall indifferent and exit without trying and constitute, together with language, our human condition. Maturana considers that when our emotions change, our action dominions we move through change too. Thus every action would be defined by an emotion that makes it possible. Human nature would be constituted among the intertwining of emotionality with rationality. In this way, "*human living occurs among a continuous emotion and language intertwining as a flow of consensual co-ordinations of actions and emotions*" (p. 92). Maturana calls this intertwining "conversation", that means conversations are synonyms of emotional coordination networks. Therefore, he proposes to understand human actions by observing the emotions that make acts possible instead of focusing on acts as particular operations.

Drawing on Maturana's concept of conversation, it follows that language constantly embeds and supports politics of emotion (cf. Lutz & Abu-Lughod, 1990) and that emotion constitutes context and texture in social interaction. Organizing as texture (Cooper and Fox, 1990) has been analyzed by Kallinikos (1989, in Cooper & Fox, 1990). According to Kallinikos, the concept of 'play' is expelled by traditional organizational theory, which tends

to depict action as adhering to rational and instrumental goals. With reference to these goals, free play, unconscious and emotional tendencies represent a corruption of pure instrumental rationality. However, Kallinikos (as well as Cooper & Fox following him) argues that play and emotions are constitutively part of texture of organizing.

Departing from a different standpoint, feminist theorists Mumby and Putnam (1992, cf. Gherardi, 1995) contrast the concept of bounded rationality with that of bounded emotionality. The latter is characterized by care, mutual engagement, connections and individual responsibility in organizing as resources spontaneously emerging from social interactions, whereas the former emphasizes reduction of ambiguities, fragmentation of work and emotional labor as part of organizational rhetoric.

Another point of departure to think of emotions in organizations is proposed by the Japanese theorists of knowledge (Nonaka and Nishiguchi, 2000) who introduced philosophical concepts of "Ba" and "care" as key-words to the successful management and creation of knowledge. The concept of care, with its evoking and meaningful map of feeling, emotion and proximity, means to recover ancestral dimensions of passion to the rational and problem-solving dimensions of organizational work.

All of these theories state that care is what makes social practice situated: therefore, the context is conceived of as emotional territory and situational setting. Emotions of care define and trigger organizations in their processes of learning collectively and creating knowledge. The concept of care was also theorized with reference to alignment and evolution of Information Systems infrastructure as drifting from expected plans (Ciborra, 2001). In this respect, the concept of care may constitute a bridge to link emotions with the process of technological construction, mediation and appropriation.

Emotionality and care in technological appropriation

Instrumentality is often linked with technologies as artefacts aimed at mediating social and cultural action, as well as with technology and technical skills being dominions of masculinity (Wajcman, 1995).

ICTs can be ambivalent in supporting passion of/for learning, but they always trigger some kind of emotion (no matter if this is frustration, disappointment or satisfaction, happiness, involvement and so on). Construction of technology itself, as embodied in social relations and institutions (Bijker, 1995), is led by emotions and passion – sometimes by utopia of possession as in the case of managing knowledge through ICTs – and also by desire of power, which is at its climax embodied in knowledge (Foucault, 1980). How is emotion and passion reconstructed through such a mediation? And how do technologies contribute to enable or constrain emotions and passion, which fuel learning and knowing?

If face-to-face interaction and co-presence represent the main experience of others in everyday life and all the other cases represent deviations from such a 'prototype of social interaction' (Berger and Luckmann, 1967), the importance of physical proximity as based on

rich, multi-layered and dense conversations (cf. Urry, 2002) would not be totally replaceable by other means of communication if collective learning is wanted. However, if we consider Maturana´s concept of emotion and the emotional fundament of rationality and social texture, it would be necessary to pay more attention to ways of developing spaces (physical or virtual) for "conversations" practice and for acceptance development within organizations.

Even if face-to-face encounters keep playing a key-role in establishing and maintaining social interaction and power dynamics, technologies of communication as such can support, foster or constrain processes of learning based on emotions. An example is provided by computer-mediated-communication (CMC) whose performativity also comes from enabling and fostering different ways to support emotional exchange.

Therefore, emo-rational processes are intimately linked with technology construction and alignment of Information Systems infrastructure, as argued by Ciborra through the concepts of care, hospitality and cultivation (Ciborra, 2001: 30-32). Ciborra states that care means familiarity, intimacy and continuous commitment with reference to the process of technology implementation, design and use. Technology as both fragile and ambiguous is in a state of flux in organizations, and its acceptance takes the form of hospitality (which can, in turn, become hostility) as "*one of the oldest arts of mankind: hosting a stranger*" (Ciborra, 2001: 30).

To summarize, communication and social interaction have emotional bases which cannot be deleted and which are constitutive of organizing as texture and learning as process based on knowing-in-practice. Technology plays an ambivalent role in supporting such processes, as it will be illustrated through the case studies presented in the following paragraph.

Case description and empirical findings

The cases illustrated in the paper present some differences and similarities. All of the firms operated in the IT sector (telecommunications; integration and management of Information Systems). Furthermore, each firm took in consideration the opportunity to set up a process of change by implementing and adopting some kind of technology. Therefore, the process of organizational change was meant to be 'driven' (or at least supported) through a technological-based project (e-learning process; Intranet as platform for knowledge management). Empirical research analyzed two perspectives: coordinators' team and users from three ICT projects initiated by four firms in Brazil, Italy and the UK. General data of our four case studies is presented in Table1 below.

Table 1. *Four case studies general data*

General data	**BRAZIL**		**ITALY**	**UK**
Organizations	Firm 1	Firm2	Firm3	Firm4
Firm business sector	Telecom company	Private Business School	IS maintenance and implementation	IS provider, test and integration of
Purpose of technology adoption	Managerial development through corporate university	e-learning education project implementation	- Intranet implementation as "building site" for internal and intraorganizational communication; - staff development and integration on web technologies	- Intranet customization and management of knowledge at distance; - organizational identity development and strengthening
Firm actors	120 students 4 HR members	14 teachers 2 tutors, 2 coordinators	Workers belonging to different company department (e.g. Help-desk, Systems Integration); managers	Consultants working at clients sites, managers, administrative staff

Source: documental and field observation data (during fieldwork 2001-2003)

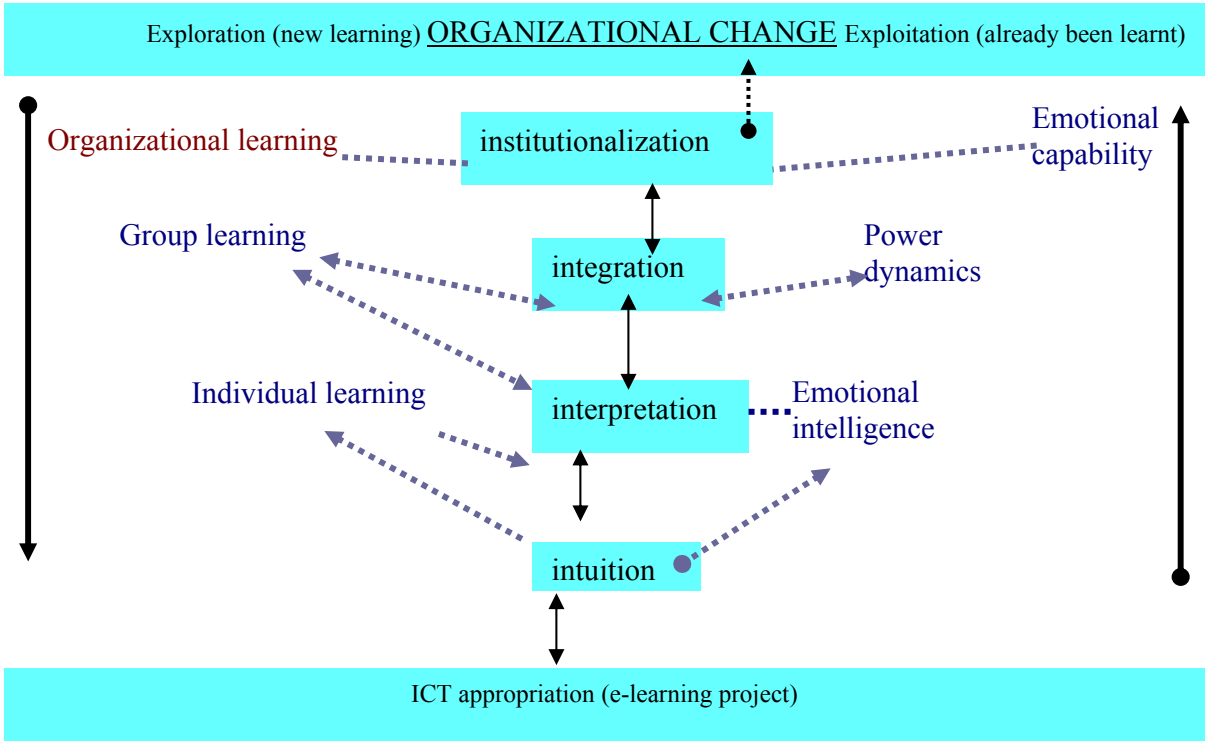
The Brazilian Case

The Brazilian telecom firm wanted to develop its managers through a two years e-learning project conjointly developed by its own HR staff and a Business School that would be responsible of 120 managers' learning on Entrepreneurship Management. This was an organizational innovation for this Business School that propitiated change through collective learning to its four coordinators team -also inexperienced in e-learning technology. First results for both firms´ organizational capabilities development were reflected in new attitude towards e-learning for the 120 participating managers of the IT firm and innovative educational services for the Business school.

Emerging power dynamics and intense emotions within coordination staff revealed interactive relationship between individual cognition and action and generated individual tension when, for example, courses content were analyzed and changes were made to stimulate students e-learning. Tutors realized that the new medium would require updating their face-to-face courses while teachers tried to posit that they were already updated. However, even though during the project the coordination staff experienced such intensity because of the required rapid familiarization with the technological medium, they managed to develop, in different degrees, their emotional intelligence, maybe because this staff had been teacher colleagues for almost three years in that Business School and had recognized and respected mutually their individual competency. So acceptance seemed to prevail within their interactions and permanent discussion as a practice, which allowed negative emotions to change and new conversation to occur recurrently.

Initially this change through learning collective process was understood with Crossan´s et al. (1999) framework but emotional dynamics remained unexplained, so Huy´s (1990) emotional capability contributed. This is schematically presented below in Figure 1.

Figure 1. *Emergent concepts and theoretical framework for analysing organizational learning and change dynamics when implementing e-learning project at the Business School*



Some findings and implications for continuous learning and change at the Business School:

- Coordination staff emotional intelligence as important as intellectual or technical competency.
- Emotional capability and emotional intelligence necessary for sustainable OL and change processes.

Some implications for continuous organizational learning and change:

- The Business School needs to recognize that e-learning project implementation process is not an end in itself but also means to implement and develop organizational learning and change processes.
- Organizational learning process stimulates organizational continuity and change. This is possible if the existing tension between learning exploration (new) and exploitation (routine) dimensions is recognized and stimulated.

5.2 The Italian and the British case

The Italian and the British firms, both operating in the IS sector, wanted to build up and enhance processes of organizational change by implementing Intranet technology. In particular the Italian firm Intranet project aimed at developing this technology as main road ('building site' as stated in the Intranet site homepage) to familiarize company staff with web technologies. Such a project was born, and can be analyzed, in the context of a contradictory intra-organizational relationship with the firm's parent company. In this respect the Intranet was conceived of as a "building site" as well as a promotional and marketing tool towards the parent company. However, less web skilled workgroups perceived negatively the managerial rhetoric dimension of such an attempt of organizational change. Therefore, non-use of the Intranet system and resistance to its inscribed patterns of use (Akrich, 1992) were observed on the field.

On other hand, the British company bought and customized an Intranet-based knowledge management system to improve processes of knowledge sharing and to reinforce identity and belonging to the organization. The system was bought from an external software provider, and a back and forth process of customization and learning emerged. As a tool to reinforce identity and belonging to the organization, the Intranet system (named "the Compass" as tool to orient people towards organizational knowledge) was designed around company consultants working at client sites. However, it failed its objectives due to inter-organizational and socio-technical constraints (e.g. clients preventing consultants from accessing the Compass from their sites, off-line communication, ambiguity in defining search engine mechanisms and knowledge itself and so on).

In the following subsections, a summary of emo-rational dimensions referred to technology as retrieved in the two cases is presented.

Eliciting/erasing emotions through technology

In both the firms the principle of acceptance (Maturana, 2002) was often overlooked in constructing the Intranet as new technology, by thinking of and implementing it as abstracted and detached from the context and the organizational everyday life of company's members. Therefore, technology was used to erase emotions from the organizational texture, through a process of censoring or constraining passion. In particular in the British case, two competing dimensions of knowledge emerged: one of knowledge as linked with belonging, identity, feelings of proximity and integration inside the organizational setting; the other of knowledge as commodity searchable and accessible through the Intranet system despite of time, space and situated practice.

Controlled communities were implemented in both the companies in order to enable knowledge sharing via technology, and failure of such an attempt could be interpreted as due to the marginalization of emotions, passions and relationships of spontaneous mutual engagement on which learning communities are founded (Lave &Wenger, 1991).

The way distance was created and overcome through Intranet-based communities did not enable passion for learning and knowing, instead frustrating it by reducing knowing to a process of typing a question onto a machine, or also to the enforced channeling of communication through artificial and abstract "groups" which had no correspondence in the organizational everyday practice.

On other hand, in both the settings there was an emotional investment onto technology, that means technology was aimed at eliciting or supporting some kind of emotional exchange, e.g. the Italian company was using the Intranet as a self-presentation device and the British company wanted to make consultants feel less alone and isolated at the client site.

Face-to-face vs/and distance

Integration of the Intranet as a new medium and previous, older media on which consolidated communicational routines were based was constantly observed on the field. As it emerged from some of the interviews carried out, some media were felt, perceived and used as more suitable to different circumstances than others, and different degrees of effectiveness and formality were associated with them. For example e-mail was described very frequently as a formal and cold tool erasing emotions or making their communication very difficult, as in the following interview excerpts:

> "E-mails are very cold, black and white… opened to misinterpretation which is quite a big thing since something black and white doesn't' necessarily tell you that what you want to, what you expect because when you come across something you don't know if the person who wrote was in a rush or just nasty with you while generally telephone or conversation get less misinterpreted than e-mail". (Account Manager, British firm)

> "Technology is an aseptic tool. It is very difficult to express emotions if you aren't a very good writer". (Team Coordinator, Italian firm)

Research results and implications

Our four case studies resulted in rich insights to delineate a relational analysis framework of OL phenomena to include its intersubjective nature. Some interactions were revealed and are presented in Figure 2 presented below.

Emo-rational intertwining in collective learning

Emotional dynamics and individual emotional intelligence initiated and sustained collective change through learning, enabling emotional capability development (Huy, 1999) and signaled also an inclusive logic development as proposed by Maturana´s acceptance concept (Maturana, 2002).

Emotionality (Argyris, 1971) and rationality (Shrivastava et al., 1987) dimensions emerged as inextricable to collective learning processes. Also change and learning dynamics were

revealed as concomitant processes every time that reflection was practiced and resulted in enhanced professional consciousness within each workers group/community-of-practice.

Realizing that rationality is embedded in emotional dimensions, that emotions are drivers for action and acceptance emotion is the specific one that configures social texture, led us to reflect on our human condition as stated by Maturana (2002:18),

> "Human condition is constituted within the intertwining among emotionality and rationality (…) Normally we live our rational viewpoints without referring to its founding emotions, because we don't know that our viewpoints and all our actions do have an emotional basis, and we believe that this condition would be a limitation to our rational being. But is the emotional basis of rationality a limitation? No! On the contrary, It [emotion] is the condition that enables rationality…".

If this is reasonable, then why organizational research still emphasizes competition/exclusion and restricts cooperation/acceptance only as means to obtain more... competitiveness?

Specifically, why in OL studies emotion and power consideration as means to obtain desired performance still prevails, instead of conducting more research and studies to deepen bounded emotionality development and implementation within organizations? Why is bounded emotionality not recognized as important as bounded rationality? Why is organizational knowledge predominantly considered a transferable possession instead of thinking of knowledge as result of acceptance interactions and recurring conversation practice? Is it a matter of passion for learning, courage to discover and change what it is instead of what we want it to be?

Emo-rational dimension in face-to-face and distant relationships. Some practical and managerial implications for understanding the role of ICTs in learning processes

Internet/Intranet communication technology projects integrating organizational learning processes:

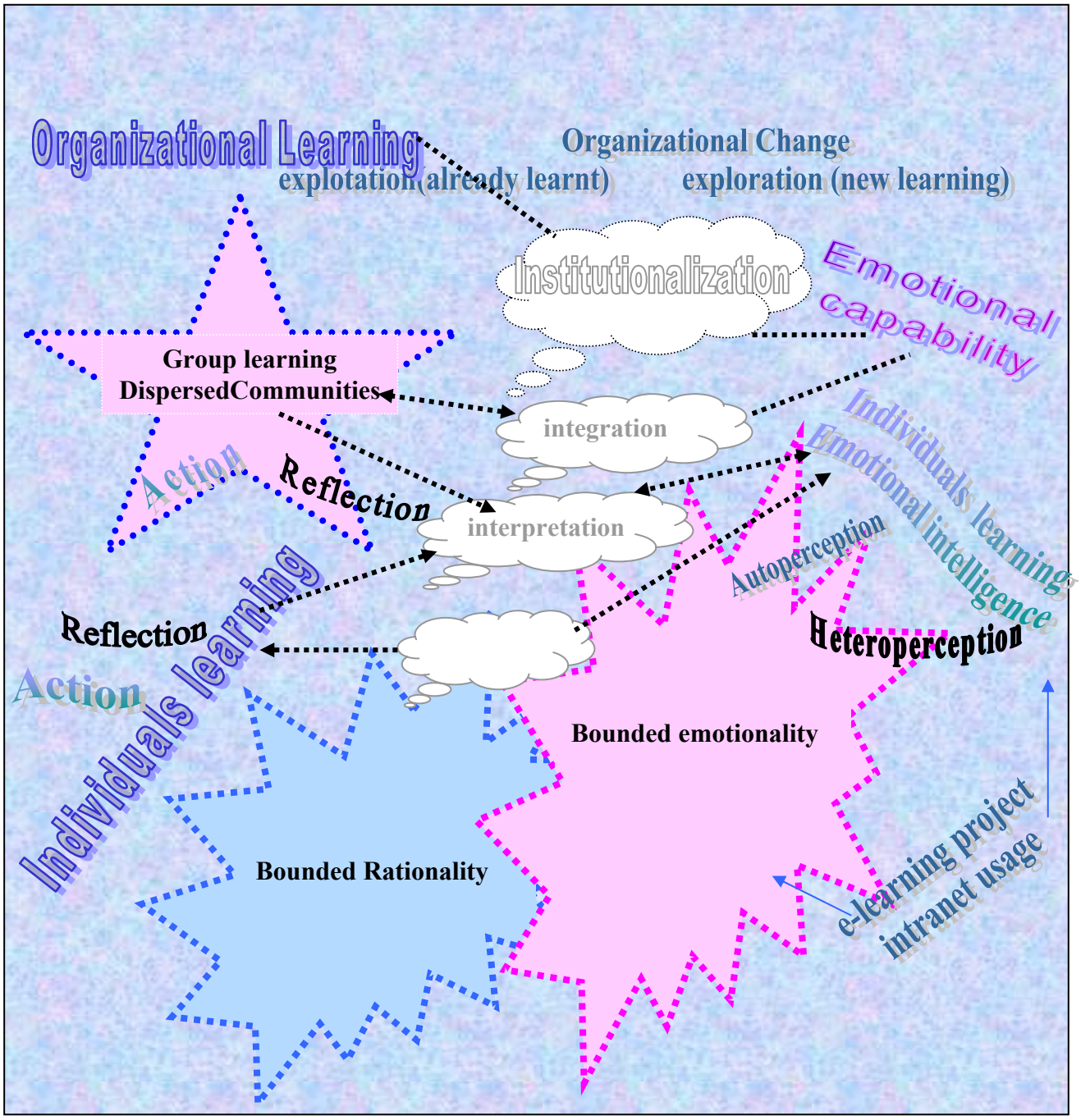
- illuminated a strong emotionality dimension in technology implementation (Zorn, 2002) ranging from feelings of frustration, rage, suspicion and fear to confidence, enthusiasm and collaboration.
- revealed an emotional censorship/ exclusion potential of technology within situated practice as a consequence of its implementation.

With reference to processes of communication and technology appropriation, it emerged that

- face-to-face contact integrates learning process, but organization of the e-learning technology and permanent written communication, characteristic of distant learning, helped to change coordinators' team teaching practice from content teacher focus to a student learning focus that overcame sharing and learning difficulties by stimulating reflection about each user's collective attitudes and working practices.

- ICTs can be ambivalent in supporting learning processes, but they always trigger some kind of emotion and feelings (no matter if this is frustration, disappointment or satisfaction, happiness, and so on).
- the missing or effective link between conversations as based on emotional engagement and construction of technology to support everyday practice and knowing in practice can help to explain failures and change in technology implementation, by looking at collective learning microprocesses.

FIGURE 2. *An integrative framework to delineate and understand emo-rational microprocesses of collective change through learning*



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Re-imaging Information Systems Professionals: From Technicians to Knowledge Network Architects

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Abstract

The knowing organization is a dispersed workplace society—a complex social system involving living knowledge networks and evolving learning communities. Dialogue and conversation are critical dimensions of these networks and communities. In this manner, modern emergent organizations are interactive conversations that foster inquiry, and promote reflective thinking and problem-solving. They are adaptive knowledge generating ecologies rooted in varied information sharing relationships that foster innovative thinking and creative decision-making via human-technological connections. Information systems professionals are knowledge network architects who are challenged to craft technological knowledge management processes and tools that value social ties and interaction, as well as establish information spaces that focus on people interacting with people.

Introduction.

Learning organizations are adaptable intelligent networks. They form a knowledge commons dedicated to the operation, development and success of the organization so that customers are served well. Since computer-based information and communication technology (ICT) has become ubiquitous in the daily operations of the globally dispersed workplace, such complex networks are an intimate and, at times, intricate weaving of people and technology. In such a cyber environment, organizational communication, information sharing and knowledge application requires a technological infrastructure that enables ongoing inquiry, conversation and collaborative workplace relationships among people, as opposed to employees merely accessing and interacting with data. This calls for information systems professionals to perceive themselves not as insignificant behind-the-scenes technicians, but as critical organizational communication professionals fundamental to organizational self-organizing and knowledge creation.

This essay articulates a foundational vision of the information systems (IS) professional as a communication specialist and knowledge network architect who facilitates organizational learning. Taking a socio-technical approach, and rooting itself in current organizational behavior and information systems literature, this interpretive-analytical study draws particularly upon Choo's (2002a, 1998b,) understanding of the knowing information-driven organization, Taylor and Van Every's (2000) notion of the emergent organization, Snowden's (2000) research on knowledge ecologies, and Wenger, McDermott and Snyder's (2002) work on communities of practice.

This introductory study: 1) examines how knowledge is developed in a dispersed cyber-socio work environment, 2) profiles the information systems (IS) professional as a communication and knowledge network architect who facilitators organizational learning, 3) describes directions for future research in these areas.

The Organization.

While information is a key building block of business viability in the twenty-first century, knowledge—valued information that can be applied—is its foundation. Because of this phenomenon, communication strategies are revolutionizing organizational behavior and management practices (Cairncross, 2002). Information and communication technologies are changing how businesses are structured (Tapscott, Ticoll, and Lowy, 2000), making internal and external partnerships central to business strategies and daily operational practices. Business-to-business (B2B) and business-to-customer (B2C) configurations, as well as dispersed work teams, have become commonplace in the business arena. e-business and e-commerce are just how business is now conducted as exemplified by such businesses as eBay, Charles Schwab, and Hewlett-Packard.

Cairncross (2002) points out that critical to a company's survival is collaboration among employees at all levels—senior executives to frontline. Effective management of organizational knowledge, the building and maintaining of communication systems, and the enabling of innovative, decisive decision making are necessary for maintaining competitive advantage. This pivotal role of easily accessible information and continuous knowledge generation requires that information-driven business enterprises envision themselves in a different way from the past.

Organizational Images.

Paradigms aid us in understanding our surroundings (Kuhn, 1996) and surfacing new perspectives. Images or metaphors are lenses that open up the world around us while providing us with a means to construct reality. These perceptions are the foundation for how we act and relate to other people in all areas of life (Lakoff and Johnson, 2003), including how the nature of organizations and work are defined, the workplace is constructed, and employees are communicated with and managed. Mental models (Senge, 1990) and workplace metaphors affect how organizations conduct strategic planning, as well as design and implement information systems (Kendall, J. and Kendall, K, 1993).

Metaphors have given rise to a variety of ways to understand the nature of organizations. Among them are organizations as machines, living organisms, and political systems (Morgan, 1997). Two particular images, though, are critical to understanding the information-driven enterprise: the organization as an information processing brain and the organization as cultures. Morgan states that the core of the former image is information, communication and decision making systems (p. 78), with the organization having the ability to self-organize and to learn through exploration and discovery. The result is evolution grounded in insight and knowledge. The image of the organization as a compilation of cultures is rooted in an organization's ability to construct a common social reality for its members (Morgan, 1997, p. 141). Shared history, beliefs, values, knowledge, stories, and rituals comprise an organization's culture (Schein, 2004, Deal and Kennedy, 1999), giving rise to its accepted

communication methods, operational procedures, leadership styles, types of workplace partnerships, forms of knowledge sharing, learning processes, manner of enabling creativity, etc.

Organizations are socio-technological systems (Mumford, 2003), as are the information and communication systems fundamental to their daily operations (Clarke, Coakes, Hunter and Wenn, 2003). Each blends people and various forms of technology into a consistent, unified system. This notion is particularly significant when understanding organizational knowledge sharing and learning in the modern global information-driven enterprise. Such an organization is highly dependent on ICT and wireless telecommunication devises for day-to-day communication and collaboration.

The Adaptive Intelligent Cyber-Social Network.

The domain of the information-driven enterprise is cyberspace, a virtual world of computer-mediated social relationships, telepresence, digital information and cyber selves (Strate, Jacobson and Stephanie, 2003) where physical location, time and distance are not constraints. With the technological work environment as a backdrop, interpreting the notion of information processing in light of organizational culture results in a dynamic organizational image—the adaptive intelligent cyber-social network.

Chun Wei Choo's (1998b) work on the knowing organization lays the foundation for understanding such an image. In The Knowing Organization, he describes intelligent business enterprises as sense-making communities, knowledge creating entities, and decision-making systems. In Information Management for the Intelligent Organization (2002a) he argues for the value of a well-designed information technology infrastructure and how it enables information to effectively flow throughout a distributed organization. Because of ICT, knowing organizations can strategically leverage information and knowledge, thus having the ability to 1) adapt in a timely and effective way to organizational and marketplace environmental changes, 2) engage in continuous learning, including the unlearning of outdated perceptions, assumptions and practices, 3) mobilize the knowledge and professional expertise of employees to foster creativity and innovation, and 4) focus their understanding and knowledge on clearly thought out, decisive action (Choo, 1998b, pp. 4-5).

By evaluating information and making intelligent choices based upon practical wisdom, managers direct the course of the organization. (Simon, 1997). As does Wieck (1979), Choo envisions organizations as complex, self-organizing systems. Daily, managers and staffs actively search for meaning in corporate decisions and actions so they can comprehend the nature of their business operation, accurately analyze the current conditions, and make strategic plans. The understanding and organizational narratives they fashion enable them to deal with workplace diversity, and respond to business issues as they arise (Weick, 1995). During the sense-making process, organizations interpret information related to the organization's particular condition, while in the knowledge-creation phase they are converting

information into useful, practical knowledge. The decision-making phase which leads to organizational action is characterized by information being processed and applied (Choo, 1998b). In this manner, interpreted organizational experiences result in organizational beliefs, and articulated tacit and explicit knowledge becomes organizational cultural knowledge. Managers' and staffs' preferences become rules and routines. Beliefs and preferences provide shared organizational meaning, purpose and practical wisdom, while shared knowledge leads to new capabilities and innovative behavior that results in goal-directed adaptive behavior (Choo, 1998b, p.241). Thus, the information-driven enterprise is a learning organization that is continuously transforming itself through new insights and informed, thoughtful decisions.

Choo's perception of the information-driven enterprise, though, can be enhanced by emphasizing two key factors: organizations continuously emerge, and are a web of communication networks. Organizations are paradoxical in nature, both being entities that strive to reach stasis, as well as dialogical networks that ebb and flow. They are complex realities that are simultaneously a constantly recognizable entity in time and space, and a phenomenon that continuously emerges through face-to-face and electronic communication connections. In the former, information flows throughout the organization and is stored in data banks, while in the latter, knowledge and practical wisdom is the dynamic interactive social communication network. Organizations are a web of intelligent conversation networks mediated by ICT—a matrix of dynamic relationships comprised of diverse, disparate individuals and work groups. This emergent notion of the organization is fundamental in conceiving the information-driven enterprise, and understanding the strategic role information systems professionals play in communication and knowledge creation.

In The Emergent Organization (2000), Taylor and Van Every state that an organization is "realized in conversation," and is "a vast, sprawling, multileveled universe of talk." Organizational coherence comes from the "emergence of pattern in the interconnectedness of ongoing conversation" (pp. 209-10). Conversation, then, "is the site of organizational emergence," and spoken and written text "its surface" (p. 37). From this vantage point, organizations learn, change and embody their vision statements and business plans when employees reflect upon and dialogue about work situations, marketers respond to customer requests, supervisors write policies and operational manuals, managers make choices and decisions about the critical issues, and executives enacting plans that accomplish their strategic goals.

In this framework, intellectual capital is "an organization's knowledge, information, data, experiences, routines, structures, cultural apparatus and relationships" that can be utilized to advance its position in the marketplace (Wexler, 2002, p. 395). Organizational intelligence is an enterprise's "ability to deal with complexity, that is, its ability to capture, share, and extract meaning" (Choo, 2002, p. 10). Intelligence exists "in the connectedness of the conversing" (Taylor and Van Every, 2000, pp. 209-10) that occurs in the intra and interorganizational networks. Choo's (2002) understanding of key organizational intelligence characteristics as being connecting, accessing, structuring, can be expanded to being an enterprise's ability to 1)

network—link with people and data stores to access knowledge, information and practical wisdom, 2) dialogue about, articulate and convey ideas—interpret, analyze, formulate, and disseminate information and knowledge and 3) discern and act—create meaning and value from information, make decisions and take appropriate action.

Conversation and Relationships.

From the discussion so far, it is apparent that the concept of network is recreating the organizational landscape (Monge and Contractor, 2003). Business markets are human conversations among customers (Locke, Searls and Weinberger, 2001). Agile learning organizations are grounded in information systems that enable a matrix of diverse, interactive conversations and relationships among employees, as well as with customers and venders. Dialogue, a two-way process of ongoing conversations where new possibilities are revealed (Barge and Little, 2002), is central to such networking for it fosters shared inquiry which is at the core of organizational learning and innovation. This process is a pivotal means by which divergent individuals and teams consciously reflect and creatively think together in an environment of openness and suspended judgment (Isaacs, 1999). Both dialogue and conversation build organizational community, and augment its intellectual capital which enables other organizational functions to operate more effectively (April, 1999). Through workplace dialogues employees from all parts of the company participate in the life of the organization and its continuous "unfolding and emergence" (Barge and Little, 2002, p. 382). Extending this notion further, planned growth and transformation becomes the intentional altering or replacing of particular conversations in the larger network of organizational conversations with new conversations (Ford, 1999) that advance the organizations objectives and future.

This dialogical workplace is composed of varied partnerships between management personnel, team members, customers, venders, civic community members, etc. Because of the distributed nature of the modern information organization, these working relationships have an electronic or virtual component since most of their interaction is conducted through email, teleconferencing, collaborative virtual environments, and videoconferencing. Information and knowledge management systems weave people and technology into a unified communication, learning and decision-making system, while groupware software platforms create virtual meeting rooms where employees can collaborate on projects. Because of this, an organization's communication and network capital, i.e., its information and communication infrastructure, as well as its capability to link individuals and teams in order to establish and maintain productive working relationships regardless of time or distance, is a critical asset. Similarly, it is important that knowledge management processes, virtual management systems, blended or e-learning systems, data warehousing and management systems, customer relationship management tools, and vendor management systems be aligned with an

organization's culture, mission, operational practices, managerial practices, and workforce skill level.

Information and Knowledge Ecologies.

The information-driven enterprise is a web of information ecologies. Fundamental to their make-up are linked systems "of people, practices, values and technologies" (Nardi and O'Day, 1999, p. 49) that allow information to be accessed, disseminated and applied. These ecologies are part of the social and operational fabric of organizational units, departments, teams, etc., and enable information to flow throughout the enterprise, ultimately being transformed into meaningful knowledge. An organization's information environment has an architecture, culture, behavior, and processes, as well as political issues. An information environment must be monitored and developed by professionals who help ensure that the organization's information is valuable, compatible with business functions, and aligned with the organization's goals and needs (Davenport, 1997).

The nature of the workplace is shifting from information processing to managing knowledge. Some view the knowledge management process as mechanistic—the explicit, systematic management of knowledge-related activities, practices and policies within an enterprise (Wiig, 2000). Others envision it as an organic process—the creation of self-sustaining ecologies in which communities filled with experience and knowledge can synergistically respond to and confidently engage with complex organizational shifts (Snowden, 2000). The latter perspective is the driving force behind the notion that communities of practice are pivotal elements of organizational learning and innovation networks.

To be useful, knowledge needs to be identified, organized, refined, and distributed. Knowledge can be understood as a resource that can be managed, or a people's capability to act that is fostered through sharing experiences and mentoring. Either way, knowledge arises in a communal setting (Snowden, 2000, p.242) by people gathering, interacting and reflecting upon experiences. These gatherings can be face-to-face, through written correspondence or via the Internet or organizational intranets. Knowledge, be it tacit or explicit (Nanaka and Takeuchi, 1995), is a mixture of framed experiences, values, contextual information, and articulated insights that provide a working framework for assessing and incorporating new experiences, information and ideas (Davenport and Prusak, 1998). Self-transcending knowledge refers to the "ability to sense and presence the emerging opportunities, to see the coming-into-being-of the new" (Scharmer, 2001, p. 137).

Knowing, then, is relational, and a social process (Bouwen, 2001). Knowledge creation is a dynamic characterized by socialization, externalization, combination, and internalization (Nanaka and Takeuchi, 1995), for it is a cyclic process involving tacit knowledge being shared and accepted by employees, new explicit knowledge being created and joined with other commonly held ideas to form new organizational knowledge, and culminating in new

tacit knowledge being generated and internalized. Self-transcending knowledge is associated with reflection, imagination, inspiration and intuition (Scharmer, 2001, p. 140).

Like information, then, knowledge thrives and is disseminated in an ecological milieu, i.e., physical or virtual networks of people or communities who have shared language, beliefs, ideas, interests, practices, processes, common boundaries, etc. (Snowden, 2000, Brown and Duguid, 2000). Organizational knowledge exists in adaptive networks composed of various types of distributed repositories of knowledge elements coupled together by knowledge linkages within and between organizations. Knowledge nodes can be either human or technological, such as people, communities of practice, databases, content management systems, avatars, webbots, computer files, etc. (Monge and Contractor, 2003, p. 198).

Communities of Practice.

Effective organizational learning is contingent upon a culture that fosters reflection (van Woerkom, 2004), inquiry (Cavaleri, 2004), openness, trust (O'Keefe, 2002), and commitment, while motivating its employees to share their knowledge. Organizations are an ever-evolving network of diverse communities (Snowden, 2000) that enable growth and development of both the worker and organization as a whole. These numerous forms of work related social networks include formal departments, operational teams, project teams, communities of interest, informal networks, and communities of practice (Wenger, McDermott and Snyder, 2002, p. 42). While some groups are loose "networks of practice" composed of individuals and teams that seldom formally meet (Brown and Duguid, 2000), others are more closely-knit communities of practice who regularly meet to exchange insights, problem-solve, and provide advice (Wenger, McDermott and Snyder, 2002). While some communities are ongoing, many relationships and networks arise when organizational projects and issues emerge, and disband when projects are finished or issues are finally addressed.

Many reasons attract workers to communities of practice. For some it is the sense of belonging to a group (Snowden, 2000) that is willing to share experiences and personal expertise. For others it is professional interest in a particular work-related topic, a willingness to mentor and learn, an interest in joint problem-solving, or a desire to develop a shared practice. It is important to note that it is the relationships and personal interest, not the task, that brings people together and maintains the community over time (Wenger, McDermott and Snyder, 2002, p. 43-44).

Such networking opportunities are vital to the functioning of information-driven enterprises, because "knowledge work is not a solitary occupation, but…involves communication among loosely structured networks and communities" (Thomas, Kellogg and Erickson, p. 886). The development of employees' "expertise recognition, retrieval coordination, directory updating and information allocation" skills (Monge and Contractor, 2003, p.199) is key in maintaining high productivity in a fast-paced distributed workplace, as well as the growth of effective communities of practice.

These communities are also important to the organization's knowledge management and learning process. They arise from and support a knowledge-oriented culture that motivates and provides opportunities for tacit and explicit knowledge sharing (Ipe, 2003). They establish open communication systems and build workplace community spirit, breaking down barriers between functional units and work groups that cause knowledge hoarding. These challenging dialogues and mentoring partnerships allow employees to shift mental models, belief systems and work strategies (Cavaleri, 2004), expand professional understanding and practical wisdom, honing job skills, as well as discover leadership capabilities. Lastly, these in-person and virtual networking opportunities enable employees to refine their perception of the organization, clarify their understanding of their organizational role and responsibilities, deepen their sense of commitment to the organization, and strengthen their trust in colleagues. The outcome is improved performance and a more vital intelligent organization.

Organizational Knowledge Commons.

As the emphasis shifts from informing to knowing, the age old notion of the "commons" is emerging as a metaphor for the type of social interaction-based knowledge sharing forum that promotes organizational learning in a technological work environment. For Lessing (1999), a commons is a component of our everyday world that we may enjoy without having to ask or be granted permission (pg. 2). By extension, an organizational knowledge commons is a networked workplace environment where appropriate knowledge related to the organization's operational and financial health, and its development and well-being, is freely exchanged for the common good of the organization's stakeholders, the desired organization change, and the achievement of the stated strategic goals.

The organization as a knowledge commons is a further development of the notion of the learning organization espoused by Senge (1990) in The Fifth Discipline: The Art and Practice of the Learning Organization and Argryis (1999) in Organizational Learning. In a learning organization, members are in a continuous process of organizing—coming to know themselves as an organization and adjusting work environment errors (Argryis and Schoen, 1978). In doing this they collectively expand the organization's capacity to see and build its own future through feedback exchanges and integration of new ideas into its operational practices (Senge, 1990). Learning organizations are expert at obtaining, refining and converting knowledge, as well as transforming themselves in order to embody the concepts and insights they have discovered or acquired (Garvin, 2000). When such an organization is viewed through the perspective of information flow, the organization becomes a knowledge commons.

A knowledge commons values human capital—individual worker knowledge, capabilities and learning, but centers on fostering social capital (Huysman and Wulf, 2005, p. 5) because "new knowledge grows out of the ongoing social interaction that occurs in collaboration between strategic communities (Kodama, 2005, p. 23). This makes human connections, plus

the “trust”, “mutual understanding” and “shared behaviors” that tie network and community members together and foster “cooperative action” (Cohen and Prusak, 2001, p. 4), important to the knowledge management process. Therefore, the information systems, knowledge repositories and virtual meeting forums deployed in the knowledge commons need to have formats that engage employees in inquiry and dialogical conversation, including dialectical dialogue where individuals or teams with opposing views can engage in conversations and “produce a viewpoint built on the strengths of each other’s idea” (Kodama, 2005, p. 31).

The knowledge common’s democratic form of workplace is characterized by a notion of information freely flowing across functional units (DeTienne, Dyer, Hoopes, and Harris, 2004, p. 29), i.e., open conversations that occur via a combination of face-to-face encounters, electronic correspondence and virtual meetings. Organizational memory and intellectual capital existing in the organization’s overall knowledge commons is accessible to all employees, as well as each department, team, etc. Thus, by structuring and facilitating the social relationships and dialogical opportunities fundamental to transformational learning, the commons actively promotes the development of creative solutions and innovative decision-making.

The Knowledge Network Architect.

IT departments have a strategic role in aiding the management of the information-driven enterprise develop its intellectual capital in order to stay competitive. While IT staffs maintain the information and communication systems’ technical infrastructure, they also are crafters of a knowledge sharing culture by designing and implementing user-friendly tools that establish social networks and support continuous on-the-job learning. Both of these roles are fundamental to the organization’s success, because each serves a specific function in aiding employees to tap into the organization’s knowledge base so informed prudent decisions can be made.

As is evidenced by the previous discussion, the nature of business operations has changed since the initial information systems were implemented. Previous organizations were primarily concerned with information processing. In response to this, IS focused on data collection, storage, and analysis, as well as document and content management. Robust management information systems (MIS), transaction processing systems, (PS), decision support systems (DSS) and executive support systems (ESS) tools were developed for the various business functions—sales and marketing, manufacturing and production, finance and accounting and human resources (Laudon and Laudon, 2006). During this period, the role of these first generation IS professionals were to build the technical infrastructure that under girded these systems and gave the organization competitive advantage.

With the current shift to knowledge sharing in a collaborative work environment, the focus of IT is on establishing social networks that create knowledge, promote learning, and foster innovative decision-making. The role of these second generation IS professionals is to

develop cyber-based processes that tap into and enhance the organization's intelligence. By building upon the original technological systems, IS specialists are striving to design collaborative virtual environments (Churchill, Snowdon and Munro, 2002) and knowledge management systems (Coakes, Willis and Clarke, 2002) that create conversational networks, support teamwork, and foster experiential learning. The challenge is incorporating the social capital element, i.e., creating information spaces that are authentic social meeting places (Hook, Benyon, and Munro, 2003) facilitating human interaction and learning.

Envisioning IS professionals as communication and knowledge network architects emphasizes their institutional role in fashioning the organization into a knowledge commons characterized by reflective thinking and dialogical conversation rooted in interactive relationships. As information systems managers, network administrators and database managers, IS professionals are information gatekeepers who enable information to openly travel through the organization's communication channels. As knowledge management facilitators, they are architects of cyber-social networks and communities that enable dialogue and innovative thinking.

Building the Knowledge Commons.

The first step in shaping a business enterprise into an effective knowledge commons rooted in social networking is to recognize that this task is a joint venture between management, the human resource department and the IT unit. This means that each of these groups need to understand the nature of knowledge acquisition, and value the role of learning in organizational success. All of these groups are responsible for exercising key leadership roles in intentionally managing the organization's processes related to knowledge identification, creation, sharing, analysis and application (Bryant, 2003, p. 38).

The second step is to realize that a knowledge commons for a geographically distributed business enterprise has human and technical elements. Both of these aspects are integral to an organization's ICT infrastructure. As stated earlier, information and decision support systems are people and technology woven into a unified system with technology at the service of the human activity. Table 1 outlines some of these key human and technical elements.

Table 1.

The Knowledge Commons Infrastructure	
Some Essential Human Components	**Some Essential Technological Components**
Learning-innovation oriented organizational culture with active social networking.	IT policy and strategy aligned with the organization's knowledge management/learning vision and objectives.
Loyalty to the organization, and trust in the leadership and co-workers.	Technological infrastructure appropriate for the organization's collaborative, knowledge management and learning efforts.
Leaders that champion and reward knowledge sharing and application (DeTienne, Dyer, Hoopes, and Harris, 2004).	CIO and staff who have an understanding and commitment to organizational learning, and who collaborate with the human resource management department and functional unit leaders.
Motivated collaborative employees committed to learning and willing to share expertise.	IS staff willing and dedicated to designing and supporting human-centric systems and tools that are user-friendly, and matched to user needs.
Technology savvy managers and staffs who are comfortable working and dialoguing in a virtual environment.	Technological systems that enable employees to actively interface with each other, and engage in partnerships and activities marked by inquiry, dialogue and learning.

The third step is to keep as a guiding principle the notion that the ICT infrastructure must promote knowledge sharing through the building of informal networking opportunities and formal communities of practice. This means information systems design focuses less on data storage and access, and more on enabling employees to form work relationships that provide a platform for them to ask questions, identify potential answers, dialogue, analyze, advise, and provide feedback to each other. Issues regarding locale, distance, time zones, gender, language, cultural heritage, job position, professional status, organizational politics, etc. must be addressed so they are not hindrances to the networking process. Also, the communication and information systems implemented must fit the users' work habits, preferred communication styles, learning styles, technology skill level, and particular job needs.

The fourth step is to develop an organizational culture, operational practices and a learning vision that supports structured and spontaneous knowledge generating opportunities. The knowledge management's technical infrastructure emerges from these organizational components. The ideal is to combine face-to-face interaction with virtual networking, knowing that at times the in-person component may not be possible due to time and/or financial cost. Key elements of a knowledge commons' learning process are listed in Table 2.

Table 2.

Components of the Knowledge Commons Learning Process
Communities of Practice (Wenger, 2002)
Mentor Partnerships (Daloz, 1999)
Inquiry
Dialogue (Isaacs, 1999)
Storytelling (Brown,2005)
Critical Reflection (Kolb, 1984, 2002)
Analytical Thinking (Brookfield, 1988)
Learning (Mezirow, 2000)
Articulation of New Knowledge
Innovative Problem-Solving
Decisive Decision-Making
Creative Application

The fifth step is remembering that ICT systems must be evolutionary in order to respond to marketplace shifts, foster organizational growth, adjust to new employee job responsibilities, etc. Their design must be able to adapt to fit various individual and team communication and learning styles.

ICT Tools.

As this essay has discussed, information and communication technologies are instrumental in how today's employees self-organize as a productive business entity (DeSanctis and Fulk, 1999). Authentic dialogue and collaboration can only occur in a trusting environment where members know one another, accept each other as credible experts, and feel safe (Gibson and Cohen, 2003). Therefore, the virtual information spaces created for knowledge management purposes must be characterized by "people meeting people," not just people interacting with data or text. Users need to be aware of others who have visited the site by the "footprints" (Hook, Benyon & Munro, 2003) they leave behind. Tools need to enable users to contact each other, contribute to the site's knowledge base, make comments about their understanding of the material shared, share how they used the material, etc. The goal is to use text, graphics and a variety of interface features so users can feel each others' presence.

More and more ICT tools are becoming available to IS professionals so they can effectively build organizational community, and establish or renew working relationships. Enterprise portals are gateways to both organizational information and the workplace community. They centralize access to information, while making decision-making processes easier (Firestone, 2003). Intranets are another significant tool because they provide

information, enable employees to communicate, work together, and build a sense of community. Groupware platforms afford employees the opportunity to collaborate on tasks and make decisions without concern for distance.

Conversational technologies that enable discussion, collaborative editing, and storytelling are valuable tools. Discussion forums, weblogs and wikis are three examples of tools that are able to harness part of the power of social capital by supporting the natural conversation process and documenting its results (Wagner, 2005).

Table 3 illustrates more examples of ICT tools.

Table 3.

Technological Tools	
Virtual Meetings	Groupware that includes email, chat rooms, asynchronous bulletin boards and document posting, reviewing and editing. Electronic whiteboards, online brainstorming and voting features (Olson and Olson, 2003). Streaming audio and video (Olson and Olson, 2003).
Conversation	Instant messaging. Chat system. Email.
Community Building and Social Networking	Intranets. Group calendars (Olson and Olson, 2003). Enterprise portals. Community forums. Weblogs. Online newsletter.
Knowledge Sharing	Knowledge management systems. Data warehouse and data mining (Taylor, 2002) Shared knowledge repositories with collaborative editing features like wikis. Conversational banks (April, 1999). Directories of subject mater experts, mentors, etc. Web forums with a recommender format.

ICT Applications.

IS professionals are challenged to use ICT in creative ways. Some strategies for effectively deploying ICT to assist in establishing knowledge social networking opportunities include:

- Using intranets and discussion forums to create company-wide dialogue, as well as breaking down barriers.
- Providing the possibility of customizing communication systems for departmental units, special projects, task forces and project teams.

- Deploying enterprise portals to: 1) centralize documents and manage content in order to enhance decision-making, 2) post directories of subject matter experts. This will aid employees in leveraging and reusing the organization's existing resources and discover best practices (Smith, 2001, p. 313).
- Utilizing weblogs to tap organizational memory and intelligence through storytelling, learning libraries (Roth, 2001).
- Establishing online cross departmental mentoring partnerships to build organizational commitment, loyalty and community and foster trust so employees can easily cooperate and willingly share insights gained from experience.
- Establishing work networks and virtual meeting places designed with social navigation features to enable "people-to-people" interactions.
- Devising interactive learning environments that allow managers and staffs to sort, use, store, retrieve data, as well as link information bases that are spread throughout the organization (Smith, 2001, p. 322).
- Teaming with functional units in designing their communication (Benbasat and DeSanctis, 2000), knowledge management and collaborative systems.
- Constructing subject matter expert directory sites with each entry reflecting the employee's personality. Designing directory sites as if two people were meeting each other. Including in the web-based materials pictures, personal antidotes, etc. of the individuals. Having multiple means of contacting subject matter experts in order to meet varied conversational preferences.
- Coupling online collaborative tools with low cost telephony like voice over IP (VoIP) in order to make employees more comfortable working together. Formatting the online processes as if people were actually coming together to meet face-to-face. Using conversational language when communicating in discussion forums, when appropriate. Visualizing the person with whom you are dialoguing. Constructing web tools using features that draw upon multiple sense—pictures for sight, voice for hearing, etc. when possible.

Conclusion.

The information-driven organization is an adaptive intelligent cyber-social network. Computer-based information systems are the means of establishing and maintaining the communications and working relationships that comprise the organization. Through these social networks organizational knowledge is created and intelligence applied through decisions. These views have important implications for both the business and information systems professionals.

Increasingly, employees are becoming knowledge workers (Drucker, 2002). Because of this, the role of the Chief Information Office (CIO) is becoming multifaceted (Sambamurthy, Staub & Watson, 2000). While it is important that the Chief Executive Officer (CEO)

promote an organizational culture that values knowledge and learning, and the Human Resource Management Director develop leaders that enable knowledge sharing and creative thinking, the CIO must envision and implement a human-centric ICT infrastructure—cyber-social system composed of hardware, software, people and processes (Plummer, 2001)—that can be the technological backbone to the organization's communication and knowledge generation processes. All three of these leaders, in conjunction with their staffs, must work as partners in being the architects of a knowledge ecology that flourishes in being an organizational knowledge commons. Together they enable the organization to be an open workplace environment comprised of knowledge sharing processes and networks.

While it is important for managers and staffs to have a passion for knowledge sharing and learning, it is equally important for information systems professionals to be just as passionate. If they are not, it becomes easy for them to just implement systems that are utilitarian in nature, "information-push" in orientation, and nonhuman-centric in design. If they perceive their job as primarily deploying tools that manage documents and provide access to data stores, it is easy to lose sight of the importance of creating virtual interactive meeting rooms where coworkers can gather to generate strategies, dialogue about issues, evaluate marketing demographics and practices, envision new ideas and products, etc. It also becomes difficult to implement email systems that establish reflective conversational networks and mentoring partnerships where practical wisdom can be passed on.

As IS professionals continue to assume the role of communication and knowledge network architect, further research can assist them by:

- Defining the organizational cyber-social knowledge commons, identify its core characteristics, and ICT's role in its operation.
- Identifying practical ways to design information and communication technologies that have more social capital.
- Developing models for organizational IT policy and strategy from the perspective of knowledge management.
- Creating methods for using academic programs and workplace training opportunities to aid IS professionals in further understanding the dynamics of knowledge formation, human communication, social networking and adult learning.

This introductory exploration of the IS professionals as knowledge network architects, concludes with several questions similar to those posed by Shoshana Zuboff almost twenty years ago. Computer-based technology is revolutionizing the workplace. As these technologies are fashioned, will they always be at the service of human activity? Will leaders with integrity surface who are able to recognize this historical moment and the choices it presents? Will they find ways to re-create organizational conditions in which visions, concepts and a new language of work, organization and learning can emerge? If not, will we be left stranded in a new world with old solutions (P. 12)

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The Roles of Trust, Relevance, and Causal Ambiguity in Knowledge Transfer and Enjoyment: Classroom vs. Distance Learning

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Key Words: Organizational Learning, Knowledge Transfer, Distance Learning

Abstract

We investigate two questions in this research: (a) the roles of trust in the instructor and knowledge content relevance and causal ambiguity in enhancing the student's enjoyment of undergraduate university courses and (b) the roles of enjoyment and context (classroom vs. distance learning) in the student's learning performance, as moderated by intellectual ability. We test our hypotheses with a diverse group of students enrolled in an undergraduate business course at a large American university (N= 179) divided into the two contexts with a common instructor, knowledge content, and measurement instruments. We found that student's trust in the instructor ($p < .05$) and perceived relevance of the knowledge content ($p < .05$), but not causal ambiguity of the knowledge content ($p=.17$) were positively related to the student's feeling of having fun in the class. Students in the classroom context had more fun ($p<.001$) and better learning performance ($p<.05$) than students in the internet context. Neither context nor student enjoyment were uniformly related to student performance. Student intellectual ability moderated the relationships between (a) student enjoyment ($p<.05$) and (b) context ($p<.05$) and student learning performance, such that the relationships were stronger at lower levels of intellectual ability.

Introduction

The internet has broken the barriers of distance and time on a global basis, enabling people to communicate, teach, and learn wherever and whenever they wish. Universities are increasing their use of this powerful tool at both the undergraduate and graduate level to reduce costs and to meet student demand for the convenience of whenever/wherever learning (Alavi, Yoo, & Vogel, 1997; Arbaugh, 2000; Davis, Sollecito, Shay, & Williamson, 2004; Webster & Hackley, 1997). The importance of distance learning is illustrated by these data from the U.S. National Center for Education Statistics for the 2000-2001 school year: 56% of all degree-granting post secondary institutions offered distance education courses, 90% of these schools offered internet-based asynchronous courses, and over 3 million students were enrolled (Waits & Lewis, 2003). Research efforts have lagged behind the growth of this phenomenon. For example, management education publications, such as Journal of Management Education, Management Learning, Business Communication Quarterly, and Journal of Education for Business did not begin publishing empirical articles about using the internet for management education until 2000 (Arbaugh, 2005).

Face to face instruction is fundamentally different from distance learning with regard to the instructor's pedagogical role, which person controls the pace of learning, and opportunities for interaction among students (Brower, 2003; Eastman & Swift, 2001; Leidner & Jarvenpaa, 1995). Research has yielded inconsistent results on whether internet-based learning is as

effective as classroom learning in student learning performance (Collins, 2000; Martins & Kellermanns, 2004; McLaren, 2004; Sankaran & Bui, 2001). This inconsistency has led to a call for research with greater depth that incorporates both instructional mode and psychological processes, such as motivation (Alavi & Leidner, 2001). Studies that have incorporated learning motivation often focus on extrinsic motivation within the general framework of valence-instrumentality-expectancy theory, for example better grades lead to higher paying jobs (Covington, 2000; Matthieu, Tannenbaum, & Salas, 1992). In this paper, we shift to an intrinsic motivational focus by studying the role that enjoyment plays in learning performance. Much of the research to date on online learning has focused on the characteristics of the participants, to the neglect of knowledge content issues (Arbaugh, 2005). Our study supplies the greater depth called for by Alavi and Leidner (2001) and the requirements of a comprehensive learning model (Randolph & Posner, 1979; Szulanski, 1996) by incorporating instructional mode, instructor characteristics, knowledge characteristics, student ability, and student enjoyment.

Drawing on the work of Szulanski (1996; 2000) we develop a model of student enjoyment that incorporates the trustworthiness of the instructor and two characteristics of the knowledge content (causal clarity and relevance). We then offer and test hypotheses regarding the influence of enjoyment and context (classroom vs. internet) on learning performance and their interaction with student ability, based on learning and sensemaking theory. This paper contributes to the conference theme and to the learning field by investigating two research questions: (a) *How do a student's trust in the instructor, perceptions of course knowledge content relevance, and understanding of causal relationships in knowledge content contribute to his/her enjoyment of the learning process?* and (b) *How do a student's enjoyment of learning and learning context (distance learning vs. classroom) contribute to learning performance and how are these relationships influenced by student intellectual ability?*

Theory

In a study of best practice transfers in organizations, Szulanski (1996) identified four factors that acted as barriers to knowledge transfer among coworkers: characteristics of the knowledge content, source, recipient, and context. These barriers, or "stickiness" factors make knowledge transfer more difficult, and therefore less enjoyable. In developing a model for learning enjoyment (Figure 1), we control for the ability of the knowledge recipient (student) and context (internet vs. classroom) and focus here on characteristics of the knowledge content and source. These factors are the trustworthiness of the source (instructor), the perceived relevance or usefulness of the knowledge, and the causal clarity of the knowledge. A fourth factor was excluded as not relevant to the classroom situation (source is unwilling to share knowledge). Although Szulanski's (1996) work was based on the corporate environment, these factors map well onto the ARCS theory of learning motivation (Keller, 1983). This theory postulates that arousing interest, presenting relevant

content, and enhancing student confidence are important motivational techniques for instructors. Both frameworks identify the importance of perceived relevance of the knowledge to be transferred. A knowledge source that is perceived as expert should arouse interest. Causal clarity should enhance a student's self-confidence that they can learn the knowledge.

Instructor Trustworthiness

The way students perceive their instructor affects the student's interest in and satisfaction with the course (Arbaugh, 2001; Conaway, Easton, & Schmidt, 2005).When the knowledge source is not considered to be expert and trustworthy, resistance to learning occurs (Szulanski, 1996). Trust increases the amount of information exchanged and reduces the difficulty of the exchange (Tsai & Ghoshal, 1998; Zaheer, McEvily, & Perrone, 1998). Knowledge recipients are more open to the ideas communicated by sources that they consider trustworthy (Szulanski, Cappetta, & Jensen, 2004). Knowledge recipients are more likely to be attentive to sources of knowledge that they view as credible. Arousing and sustaining attention is a key element in learning motivation (Burke & Moore, 2003; Small, 2000). Students' learning processes, therefore, should be more open, more effective, and less difficult when they perceive the instructor as an expert whose knowledge they can trust. Thus, perceptions of instructor trustworthiness should contribute to greater enjoyment of the learning process.

H1a: Trust in the instructor is positively related to student enjoyment of undergraduate classes.

Knowledge Relevance

Characteristics of the knowledge content were also identified by Szulanski (1996) as "stickiness" factors for knowledge transfer. Knowledge that is not viewed as likely to be useful is more difficult to transfer (Szulanski, 1996). Relevant knowledge will be perceived by students as being applicable to their future needs. Applicable knowledge will be more intrinsically interesting to the student (Burke & Moore, 2003; Randolph & Posner, 1979). Thus, students should find it more enjoyable to learn relevant knowledge. Hence,

H1b: Relevance of the course content is positively related to student enjoyment of undergraduate classes.

Knowledge Causal Clarity

Knowledge can be described by a recipient as having causal clarity, if the recipient can understand connections among the elements of knowledge and can visualize cause and effect relationships. Causal ambiguity indicates a lack of "know-why": why things are done and why X leads to Y (Szulanski & Cappetta, 2003). Ambiguity in causal relationships acts as a barrier that makes knowledge transfer more difficult (Szulanski, 1996, 2000). This ambiguity

can arise from knowledge tacitness or from inability to translate known relationships to a new context (Akbar, 2003; Nonaka, 1994; Szulanski, 1996, 2000). Causal clarity makes knowledge transfer easier, because it provides cognitive models against which new information can be compared and stored (Nadkarni, 2003). Easily understood knowledge builds the learner's self confidence, enhancing intrinsic enjoyment of the learning process(Burke & Moore, 2003). Therefore,

H1c: Clear causality in the course content is positively related to student enjoyment of undergraduate classes.

Performance

When students are having fun in a course, they develop a passion for learning based on intrinsic motivation. They are interested in the course content for its own sake. This intrinsic motivation may encourage them to spend more time studying course materials. Students who are enjoying the course are more likely to become fully engaged, participating in discussions and thinking about the material in detail. Intrinsic motivation promotes creative thought and transfer of knowledge in situations in which extrinsic motivation fails (Osterloh & Frey, 2000). Hence,

H2: Student enjoyment is positively related to student learning performance in undergraduate classes.

The context of an internet-based course differs from a classroom context in three major ways: pedagogical assumptions, communication richness, and sensemaking techniques. A course based on transmitting a one-way flow from instructor to student reflects the pedagogical assumptions of the objectivism model (Leidner & Jarvenpaa, 1995). Courses with extensive two-way communication, between instructor and student and among students, reflect collaborativism assumptions(Leidner & Jarvenpaa, 1995). In this model, learning is a social process that emerges during personal interactions, as students enhance, test, and apply mental models (DePhillippi & Ornstein, 2003; Elkjaer, 2003). Although internet-based courses often offer facilities for two-way communication, such as discussion boards and email, the asynchronous nature of the course structure implies that two-way communication is not instantaneous, that is, it does not occur when the ideas are top of mind (Arbaugh, 2000; Brower, 2003; Martins & Kellermanns, 2004). In the classroom, students experience learning benefits when others raise questions that they may not have thought of; distance learning students are not actively exposed to this dialogue. Thus, technology can act as a barrier that restricts information flow to primarily one-way, causing distance learning to operate essentially within the objectivism model, whereas a classroom that incorporates active student engagement operates within the collaborativism model (Leidner & Jarvenpaa, 1995).

Two-way face-to-face communication with access to body language and tone of voice is the richest communication media (Daft & Lengel, 1986). Rich communication media support the transfer of complex or equivocal information and permit rapid feedback to reach common

interpretations (Daft & Lengel, 1986). Thus, a classroom context is a richer communication media than distance learning.

Classroom learning provides superior support for the sensemaking processes that contribute to learning, relative to internet-based distance learning, by allowing students to triangulate and affiliate (Weick, 2001). As an example of triangulation, students in a classroom make sense of new course content by engaging in discussions about how it is applied in practice or asking questions to guide the instructor to explain complex material in different ways. Internet students rely on a single uncontradicted source of information, which can create a feeling of omniscience and difficulty in identifying flaws. Classroom students learn through affiliation when they compare their understanding with that of other students to achieve a shared interpretation. Internet students experience learning in a solitary setting, offering less opportunity to build a social reality (Weick, 2001).

These arguments suggest that the combination of learning in a social environment, communication media richness, triangulation, and affiliation should enhance the learning performance of students in a classroom context relative to students in an internet context. Data comparing internet courses with the classroom context are still scarce and inconsistent. Some researchers have concluded that internet students may perform better (Arbaugh, 2005; Eastman & Swift, 2001) or the same as (McLaren, 2004) classroom students. On the other hand, several recent studies indicate poorer performance in an internet context. For example, in comparing learning performance in web-based, correspondence, and lecture versions of the same class, the web-based group had the poorest performance (Collins, 2000). In another study, students found distance learning to be a less rich media than classroom learning and lower richness led to lower learning outcomes (Webster & Hackley, 1997). In a study that alternated classroom and distance learning, distance learning was associated with reduced effectiveness in mastering the course material (Vamosi, Pierce, & Slotkin, 2004). Based on the theoretical arguments offered, we propose that:

H3: Students in a classroom context have higher learning performance than students in an internet context.

None of the studies indicated above specifically controlled for student ability, indicating that ability may have been an undetected moderator leading to inconsistent performance comparisons. Learning performance is highly dependent upon the intellectual ability of the student to absorb and retain knowledge (Randolph & Posner, 1979; Szulanski, 1996). Students with lower ability benefit from spending additional time studying and thinking about the course material. Intrinsic enjoyment of the course will motivate them to invest extra energy in learning. Higher ability students will experience diminishing returns from extra time investment. Therefore, the relationship between learning enjoyment and learning performance will be stronger for students with lesser abilities. Hence,

H4: Student intellectual ability moderates the relationship between student enjoyment and student learning performance, such that the relationship is stronger at lower levels of intellectual ability.

Similarly, students with less ability will gain greater advantage from the opportunity to question instructors and receive feedback than students who grasp new information more quickly.

Students with less intellectual ability will benefit more from the ability to triangulate on knowledge and to engage their fellow students in discussion. Through these interpretive efforts, cognitive models can be adapted, tested, and compared with others. Students with weaker ability have more to gain from discussions with the stronger students than vice versa. Hence, we expect that the relationship between course context and learning performance will be stronger for students with less intellectual ability. Therefore,

H5: Student intellectual ability moderates the relationship between context and student learning performance in undergraduate classes, such that the relationship is stronger at lower levels of intellectual ability.

Methodology

Sample and Procedure

We tested our hypotheses in an urban university in the southern United States with junior/senior undergraduate students taking a Principles of Management core course in the autumn semester of 2004. The sample group for the main study (N = 200) was comprised of students majoring in management (9%), in other business subjects (77%), and in non-business subjects (14%). The class was very diverse: 56% male, 7% African-American, 43% Asian, 16% Hispanic, 29% Anglo-Caucasian, and 5 % other ethnicity.

A quasi-experimental research design (Shandish, Cook, & Campbell, 2002) was created by offering students the choice of a classroom-based web-enhanced class or taking the same course in a distance learning mode over the internet, using Web/CT software. About half of the students chose each option. The manipulation was monitored by taking attendance in class. Using a design that compared a web-enhanced course to a web-exclusive course allowed us to focus specifically on the role that classroom interaction plays in learning. (Brower, 2003; Eastman & Swift, 2001; Martins & Kellermanns, 2004). Both groups had the same instructor, used the same textbook, received the same lecture notes/case studies/discussion questions, followed the same schedule, and took the same examinations. Both groups had access to the same course website that included lecture notes from the instructor and guest speakers, e-mail connection to classmates and instructor, course syllabus, chat rooms for informal communication, self-tests to drill on basic concepts, and discussion boards to facilitate collaborative analysis (primarily of case studies). The differences between the context conditions were that the classroom group: received the lectures live from the instructor and guest speakers, had the opportunity to ask questions and participate in group discussions, and engaged in live discussions about case studies. An ANOVA analysis showed that the students in the two contexts did not differ significantly on gender, ethnicity, or intellectual ability.

Students had the option of participating in the research study or doing an alternate assignment of equivalent difficulty, however, only one student opted out of the research study. Missing data reduced the sample size to 179 for the enjoyment model and 156 for the learning performance model. The difference in sample size is due to missing SAT scores, as some transfer students did not take that entrance exam.

Another group of students (N=410; response rate 75%) in two separate sections were used as a hold out sample to test and refine the measures used for the study for independent variables. These students were taking the same course on the same days and using the same textbook, but they had a different instructor than the main study research group. This group was offered a trivial amount of extra credit in return for their participation.

The independent variables and demographic data were collected in a single, confidential, on-line survey instrument. Enjoyment data were collected from the main study group about one month later using a separate, confidential, on-line survey instrument. Learning performance data were collected with a paper and pencil instrument in the classroom. Each instrument contained a student identification number, enabling the data to be linked. An independent research assistant who was blind to the hypotheses linked the data and then deleted the identifying codes to preserve student anonymity. For hypotheses testing, the data was analyzed using hierarchical regression.

Measures

Independent variables. Context is dummy coded as 1= classroom environment. Student intellectual ability was measured using self-reported SAT scores divided by 100. Scale items for instructor trustworthiness, knowledge causality, and knowledge relevance were developed using the source unreliability, causal ambiguity, and unproven knowledge measures, respectively, created by Szulanski (1996) as a guidepost and adapting them for the university context. Items are listed in the Appendix. The measures were evaluated using exploratory factor analysis with the holdout sample. A confirmatory factor analysis was performed with the main study data using AMOS 5.0 (Figure 2). The results show a close fit to the hypothesized structure (χ^2 = 65.4/df = 32; CFI = .97; RMSEA = .072; 90% confidence interval for RMSEA is entirely below 0.10). (See Byrne, 2001 for explanation of fit measures.) All factor loadings were significant ($p<.05$) and exceed .65; all but two factor loadings exceed .70. Discriminant validity is evidenced by substantial deterioration in the model fit for two factor and single factor models (χ^2 = 122.0/df = 34 and χ^2 = 339.7/df = 35, respectively). The internal reliability for each construct exceeds the minimum standard of .7 expected for new scales (Nunnally, 1978). Cronbach's alphas for each scale are .86 (trustworthiness), .89 (relevance), and .75 (causality).

Control variables. Since allocation between the classroom context and internet context was not done randomly, we controlled for differences among the students in each group using gender, ethnicity, and intrinsic interest in the course content. Gender is dummy coded as 1 =

male. Ethnicity dummy variables are included, with Anglo-Caucasian as referent category. Intrinsic interest in the course content was measured using the student's choice of major field of study. Interest is dummy coded as 1= majoring in management.

Dependent variables. Enjoyment was measured using a four item scale developed for this study. The measures are listed in the Appendix, along with factor loadings. Cronbach's alpha for the scale is .87. Learning performance was measured using a 43 item examination on knowledge that the students were expected to learn in the course content. The results of this examination were included in the student's course evaluation and weighted as 20% of the total.

Results

The means, standard deviations, and correlations for all study variables are shown in Table 1. Context, knowledge relevance, knowledge causality, and trust in instructor are positively correlated with enjoyment. Context and ability are positively correlated with learning performance.

Table 2 shows the regression results for student enjoyment. Among the control variables in Model 1, only context is significant. Students in the classroom had more fun than students using distance learning technology. Students had more fun when they perceived the instructor as more trustworthy ($\beta = .17$, $p<.05$). Also, students who perceived the content knowledge of the course as relevant to their future needs had more fun ($\beta = .20$, $p<.05$). Model 2 explained 27% of variance in enjoyment. Thus, Hypotheses 1a and 1b were supported. However, Model 2 did not show a significant relationship between causality and enjoyment, providing no support for Hypothesis 1c. Given the strong relationship between causality and enjoyment shown in Table 1 and the lack of a significant relationship in Table 2 Model 2, we performed an ad hoc analysis (Model 3) to test the hypothesis that understanding the causal relationships within knowledge was a necessary precursor to perceiving the knowledge as relevant. We found that knowledge relevance fully mediated the relationship between causal ambiguity and enjoyment.

For the interaction analyses on student learning performance (Table 3), the continuous variables were centered as recommended by Cohen, Cohen, West, and Aiken (2003). Standardized regression coefficients are biased with centered variables (Aiken & West, 1991), so only unstandardized coefficients are shown. Enjoyment did not have a significant relationship with learning performance, so Hypothesis 2 is not supported. Students in a classroom context performed better than students in an internet context ($p<.05$), supporting Hypothesis 3. The interaction between student intellectual ability and enjoyment is significant and negative ($p<.05$), supporting Hypothesis 4. For students with lower intellectual ability, greater enjoyment produced higher learning performance, whereas for higher intellectual ability the effect size of this relationship is significantly lower. The interaction between student intellectual ability and context is significant and negative ($p<.05$), supporting

Hypothesis 5. For students with lower intellectual ability, the classroom environment has a stronger influence on learning performance than for students with higher intellectual ability.

Discussion

This study makes four contributions to the learning literature. First, we translated Szulanski's (1996) work on knowledge transfer stickiness to an academic context and applied it in conjunction with Keller's (1983) model of instructional motivation to offer theoretical and empirical insights into how students become excited about and have fun in undergraduate university courses. We looked inside the black box of the learning process to identify how students' trust in the instructor, understanding of knowledge content causality, and perception of knowledge relevance related to how much fun and enjoyment they experienced in a course. We found that students enjoyed a course more when they perceived the knowledge content as relevant to their future needs and the instructor as a trustworthy source of this knowledge. The student's ability to understand causal relationships in the knowledge they were learning was correlated with learning enjoyment, but this relationship was fully mediated by the perceived relevance of the knowledge.

Second, we relied on learning and sensemaking theory to contrast classroom and internet learning contexts with regard to their pedagogical assumptions, communication richness, and support for the sensemaking processes of triangulation and assimilation. Our data showed the expected relationship that, after controlling for individual differences, students in a classroom environment performed better than students in an online environment. This finding was particularly striking because the internet condition in our quasi-experiment was designed to include the capability for online student collaboration and instructor interaction.

Third, we found that intellectual ability acted as a moderator for both the relationship between context and learning performance and the relationship between enjoyment and learning performance. We postulated that enjoyment would be more important to the learning performance of students with weaker intellectual abilities than for stronger students, because enjoyment could provide the intrinsic motivation to inspire more work and study. We also postulated that students with weaker abilities would perform better in a classroom environment than in an online course, because they would benefit more from collaboration and discussion with other students. Our data supported both of these expected relationships, suggesting that online learning is not the best option for some students, but that students of high ability can achieve nearly equivalent performance online as they do in the classroom. Fourth, we developed a set of measures for instructor trustworthiness, knowledge relevance, knowledge causality, and enjoyment. The measures are brief enough for convenient use in survey research and exhibited strong reliability and good factor structures across two reasonably large groups of respondents.

Limitations

The major limitation of this study is representative of the tension between external and internal validity. Using a research design that controlled for instructor style and field of knowledge by focusing on a single course improved internal validity; however, this was accomplished at the cost of limiting generalizability. It was ethically necessary to offer students a choice between the two learning contexts, thus precluding random assignment to conditions. To compensate for this disadvantage we controlled for student differences in gender, race, intrinsic interest in the course content, and intellectual ability.

Implications and Future Research

Although the students in our study found the classroom environment to be more enjoyable than the online learning environment and performed better in the classroom environment, the benefits of lower costs to universities and greater convenience for students will cause the online environment to continue to be an important avenue for university education. Our model for enjoyment provides insights for educators as to what factors to emphasize in course design to increase student enjoyment. Creating perceptions among students that the instructor is an expert in her field and can be trusted to provide accurate knowledge content for the course needs to be emphasized, especially in an online course where the student may not have face-to-face contact to establish that trust. Student perceptions that the knowledge content of the course will be highly relevant to their future needs is very important factor in enjoyment, suggesting the need to emphasize knowledge application, perhaps through case studies, field studies, or guest speakers from fields related to the student's expected career.

The results of this research provide useful insights for academic advisors to guide them in determining whether online learning or classroom learning would be a better fit for an individual student. For example, students of higher intellectual ability are likely to reap the convenience benefits of online learning with minimal loss of learning enjoyment or performance. The demand for solid learning in a foundation course for a student's major might make it an inappropriate choice for online learning, whereas an online non-core elective might meet the student's needs adequately.

A challenge for future research will be to build on these study findings to develop online instructional methods and designs that mimic more closely the enjoyment and performance benefits have from classroom learning. This could be done using a research design that compares the impact of a variety of online course design features. Research could focus on comparing courses that differ in the degree to which they rely on collaborativism vs. objectivism, the richness of the communication media, and the extent to which they provide opportunities for triangulation and affiliation. For example, the effect of pedagogical assumptions might be analyzed by comparing courses that provide opportunities for online collaboration (like this study) versus ones that *require* collaboration and reaching a shared view of reality to complete course assignments. A communication richness comparison might

be made between courses that offer online power point slides of lectures (like this study) and courses that offer broadband access to asynchronous streaming video of lectures. A sensemaking method comparison might be made by comparing a course with an available chat room where students can meet online with the instructor or other students (like this study) versus a course that *requires* participation in periodic online chat room discussions.

Figure 1. *Theoretical Model for Student Enjoyment and Learning Performance*

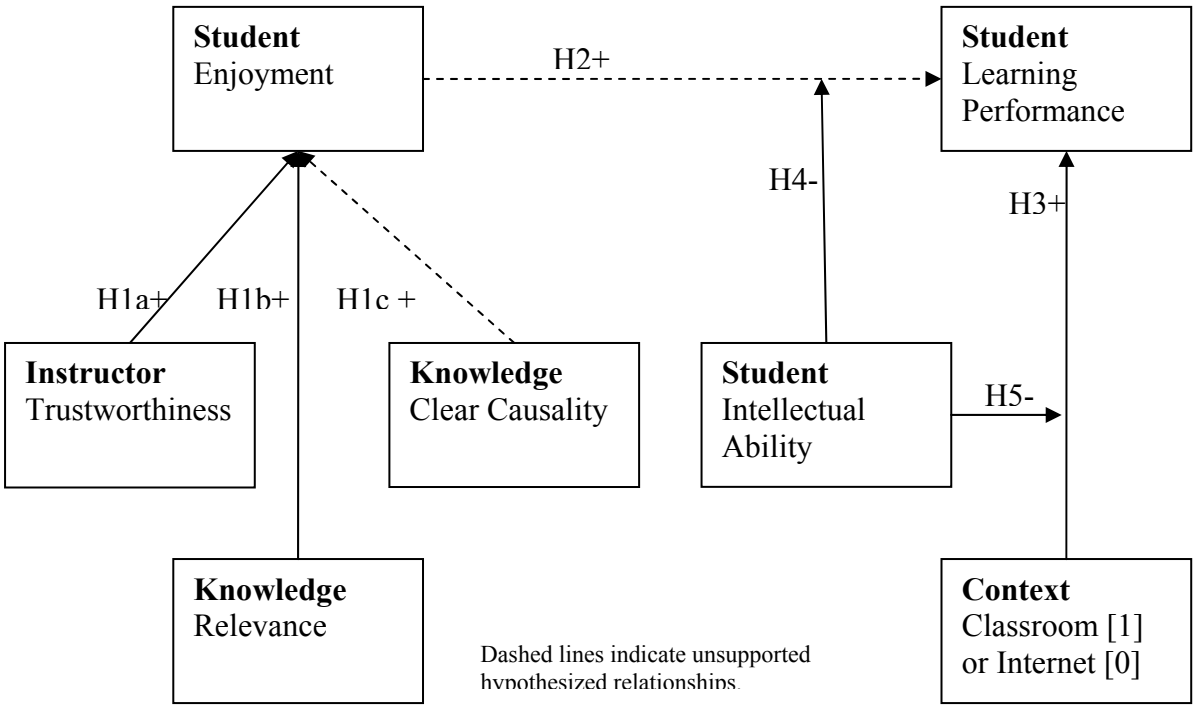
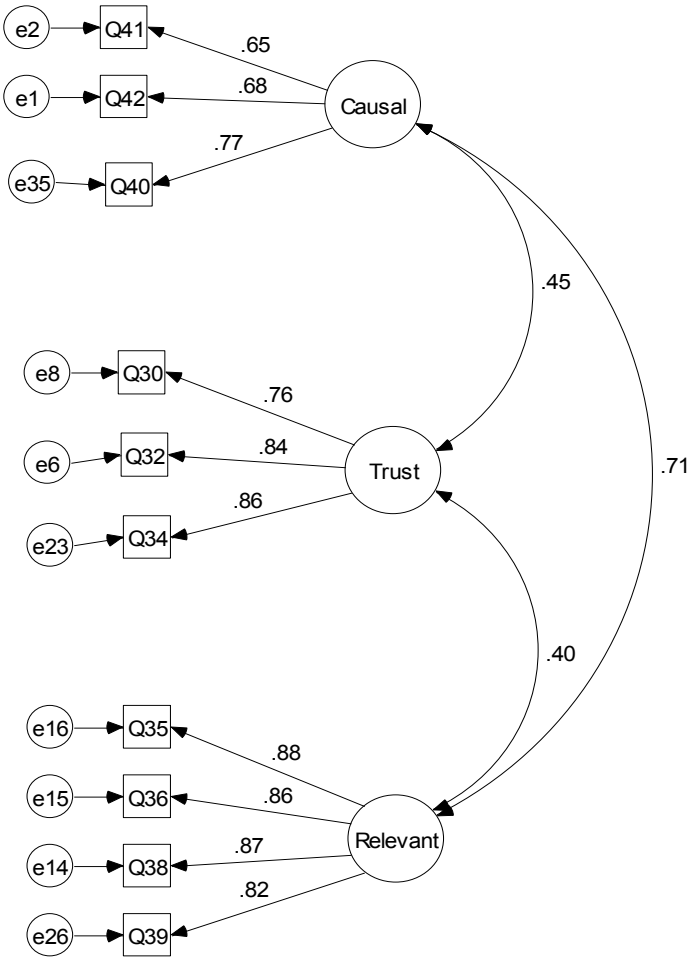


Figure 2. *Enjoyment Measurement Model*



Standardized solution is shown.

Table 1. *Means, standard deviations, and correlations*

Variable	Mean	s.d.	Context	Gender	Afr.	Asian	Hisp.	Other	White	Major	Trust	Relev.	Caus.	Ability	Enjoy
Context	53%														
Male	56%		-.06												
Afr-Am.	7%		-.02	-.03											
Asian	43%		-.03	.02											
Hispanic	16%		.03	.01											
Other	5%		.08	-.03											
White	29%		-.08	.02											
Interest	9%		-.02	.11	-.02	-.05	.01	.09	.05						
Trust	6.54	.52	.13	-.16*	-.02	-.07	.08	-.01	.02	-.13					
Relevant	6.13	.79	.08	-.18*	.18*	-.16*	.17*	.01	-.09*	.05	.43**				
Causality	5.99	.68	.08	-.06	.06	-.02	.18*	-.06	-.16**	.06	.38**	.56**			
Ability [a]	10.9	1.41	-.06	.13	-.27**	.12	-.09	.02	.07	-.17*	-.11	-.16*	-.13		
Enjoy	6.22	.78	.28**	-.08	.06	.04	.07	.01	-.16*	.08	.32**	.41**	.35**	-.04	
Perform	35.55	4.01	.17*	-.05	-.17*	.03	.13	.02	-.03	-.14	-.01	.10	.05	.23*	.13

N = 179 [a] N = 156 - * p<.05 - ** p<.01

Table 2. *Regression results for Student Enjoyment*

	Model 1			**Model 2**			**Model 3**		
Variable	b	s.e.	β	b	s.e.	β	b	s.e.	β
Context	.47**	.12	.30**	.39**	.11	.25**	.40**	.11	.25**
Gender	-.06	.13	-.04	.05	.12	.03	.03	.12	.02
Afr.-Am.	.30	.28	.09	.22	.26	.07	.32	.26	.10
Asian	.16	.15	.10	.18	.14	.11	.16	.14	.10
Hispanic	.23	.19	.11	.11	.18	.05	.15	.18	.07
Other	.01	.28	.00	.05	.26	.01	.06	.26	.02
Interest	.28	.21	.11	.25	.20	.10	.29	.20	.11
Ability	.01	.05	.02	.03	.04	.06	.00	.00	.06
Trust				.25*	.13	.17*	.33**	.12	.22**
Relevant				.20**	.09	.20*			
Causality				.17	.11	.15	.28**	.10	.24**
F			2.38*			4.94**			4.89**
R^2			.11*			.27**			.25**
Adjusted R^2			.06*			.22**			.20**
Δ R^2 vs. M1						.16**			.14**
Δ R^2 vs. M3						.02*			

Unstandardized coefficients, standard errors, and standardized coefficients are shown.
N = 179 - * p< .05 - ** p<.01

Table 3. *Regression Results for Student Learning Performance*

	Model 1		**Model 2**		**Model 3**		**Model 4**	
Variable	b	s.e.	b	s.e.	b	s.e.	b	s.e.
Gender	-.11	.67	-.34	.64	-.51	.64	-.22	.64
Afr.-Am.	-2.21	1.42	-1.36	1.42	-1.49	1.39	-1.22	1.40
Asian	.49	.79	.22	.76	.55	.76	.38	.75
Hispanic	1.42	1.02	1.35	.98	1.60	.97	1.67	.98
Other	.26	1.49	-.18	1.43	.22	1.41	.06	1.41
Interest	-1.87	1.10	-1.46	1.07	-1.29	1.05	-1.22	1.06
Context			1.57*	.66	1.56*	.65	1.59*	.65
Ability			.68**	.24	.65**	.23	1.23**	.34
Enjoyment			.48	.42	.44	.42	.45	.42
Enjoyment x Ability					-.79*	.32		
Context x Ability							-.99*	.45
F	1.57		3.00**		3.41**		3.25**	
R^2	.06		.16**		.19**		.18**	
Adj. R^2	.02		.10**		.13**		.13**	
ΔR^2	.06		.10**		.03*		.03*	

Unstandardized coefficients and standard errors are shown.
N = 156 - * p< .05 - ** p<.01

Appendix

Survey Measures

Independent Variables

	Trust in Instructor
Q30	The instructor for this course is an expert on the topic.
Q31	I can rely on the information in the instructor's lecture notes.*
Q32	I trust this instructor to provide me with accurate information.
Q33	I can rely on this instructor to portray the topic like it really is.*
Q34	I trust this instructor's knowledge about the course content.
	Knowledge Relevance
Q35	The material I am learning in this course will be used often in my future career.
Q36	I can see how the theory I am learning in this class can be applied in 'real life'.
Q37	Most of the material we learn in this class can be applied on the job.*
Q38	I know I will be able to apply what I am learning in the class to future job situations.
Q39	This course is helping me to prepare for my career.
	Knowledge Causal Clarity
Q40	I understand how specific management actions result in specific outcomes for firms.
Q41	I have a precise understanding of what managers do.
Q42	It is well known how particular actions by managers interact to result in firm performance.
Q43	I believe that there is a precise list of the skills, resources, and prerequisites necessary for successful management.*

* Items dropped from scale after analysis of the holdout sample.

Enjoyment/Fun

Item	Factor Loading
This class has been enjoyable.	.87
This was one of my favorite classes.	.85
I had fun in this class.	.92
I enjoyed many aspects of this class.	.85

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The passion for knowledge

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In this paper we discuss the 'passion for knowledge' by unravelling the meaning in which the signifiers 'passion' and 'knowledge' are articulated in different localities (see Laclau and Mouffe, 2001) which, we argue, are important in sustaining and articulating the formation known as knowledge-based economy.

In thinking about knowledge and passion we reflect on the academic arena of Organisational Learning and Knowledge Management, the academic and scientific profession, and then we focus our attention onto other knowledge workers - the new media/digital professionals and entrepreneurs. The new media, digital industry is constructed as inhabited by 'professionals in love' – in love with their practice, with their knowledge, with their way of life. Even the Silicon Valley entrepreneurs are said to be wrapped up in the notion that what it is important is the passion for the thing itself (whatever it is important for the person) and not the drive to making money – 'it is the romance not the finance that makes business worth pursuing' (See Komisar and Lineback, 2000:93).

We specifically address this formation because we believe it offers an interesting illustration but also a promising entry point for discussing and debating the relation between learning, knowledge and passion as much if not more than the academic professionals.

Our reflection was elicited by the consideration that framing the drive towards knowledge as love and passion is not only a theoretical horizon for re-thinking the academic arena of 'organisational learning and knowledge management'. But more specifically, as we have indicated above, this is the way in many locales of knowledge workers practice of how knowledge and is purse is articulated – (often) in/as a discourse of love and passion. In other words, love and passion is associated with knowledge professionals, being them academics, or as in the case of our research, professionals and entrepreneurs of the digital industry; those making possible for us something that has become completely embedded in our daily life - the Internet and mobile phones.

In unravelling and problematising the articulations between passion and knowledge, we consider both the work of academics as well as the (re)production of the knowledge professionals and entrepreneurs designing and making possible the Internet and digital platforms for communication, entertainment and learning, by referring to existing literature as well as the material produced during an ethnographic research in a new media company called Sumary. We propose that there is a dualism sustaining the articulation of knowledge: "either" knowledge is about financial gain and the drive is towards self interest and maximisation of profit "or" it is about passion and love. In addition to this, we consider the different ethical implications that seems to be attached to different articulation. So for example, in academia it is difficult to escape the sensation that somewhat knowledge as passion is somewhat more desirable, even more ethical than the former. While, as we illustrate in this paper, this dualism is often evident in many locales, we are uneasy with it and we are wary of taking it for granted, as mere reflection on the way 'things are'[3].

We discuss passion in its diverse characterizations and chains in which it makes sense. But it is in the work of Lacan and in particular the creative work of Slavoj Zizek, which brings together Lacanian and Marxian notes, that we find inspiration for thinking about passion and knowledge in a way that problematises the acceptance of mere dualist conceptions as well as

the naturalistic notion of knowing the real of practices of knowing. We suggest that the notion of ideological fantasy is an interesting way by which it is possible to consider what love is doing in relation to working practices that are at the fore front of the work of the workplace of the future (Gill, 2003). The fantasy of love in Lacanian and Zizekian terms is not a false representation of an otherwise grim and exploitative reality, but it works as the very support of reality as complete and bearable way of life. This 'way of life' is what we consider to be "ours" - that which is about what we are about. In this case is the free and open world where post-modern subjectivities resides, identities realised in "free" choices in relation to ways of being and a way of working: this sutures the meaning of work in our liberal democratic societies.

Encircling knowledge: OLK and knowledge and learning in the current discursive formation

What is the space of meaning we are tackling and elaborating upon in this paper? The main issue at stake is clearly spelt out in the first conference call for papers, which invited reflection and theoretical elaboration on passion and love. It is to this call for paper that we wish to return – right to the beginning, when this reflection was kick started as an arena of general academic reflection for OL:

> 'We argue that what fuels the debate on knowing and learning has the same origin as what drives people and their organisation to seek out knowledge: love and desire for knowledge for its own sake. While the prevailing functional and economic explanation of the interest for knowledge and learning point to its instrumental value, we contend that knowing and learning are fuelled by passion: they stir passion and make people passionate' (OLK6 First call for paper, 2004)

The space of reflection encircled in these sentences provides us with some coordinates for our discussion. Firstly, we should consider that there is a sense in which this reflection, bringing together and mixing, like in a shaker, love passion and interest and organisational issues - such as knowing, learning - and economic indicators and motivations for seeking and exploiting knowledge is somewhat a new frontier for OL and KM. This might be a new area of investigation that may deepen our understanding of organisational practices and organisational and personal experiences. In other words, there is a reflexive movement, which invites to reflect on our own status as academics and writers and researchers involved (and established) in constructing the field known as organisational learning and knowledge management.

The intriguing and challenging point is that '… *what fuels* the debate on knowing and learning *has the same origin* as what drives people and their organisation to seek out knowledge' (ibid.) This, for us, not only amount, as we said earlier, to a welcomed reflexive gesture, but also makes explicit a "coincidence" between our own work and practice in OLK

and the wider field of work and organised life in the last part of the twentieth and the beginning of new century.

What we would call the current discursive formation, is the one when different discourses repeated over and over again (articulates the need/desire and) reminds us that to pursue knowledge is to survive not only as economies, but much more broadly as societies, if not even as civilisations. Great Britain is certainly committed to it (see Competitiveness Paper 1998); and suffice to say that the European Union, for better or for worse, is committed to it (see Learning Society, 2000). Italy, arguably, is more impermeable to these labels as the political climate is more contradictory and charged then arguably the UK (if not in Europe). Yet, the insisting calls from the right and the left; from ConfIndustria (Association of Industrialists) to CGIL (Biggest Trade Union) is that of more investments in knowledge mainly as research and development. This is the "answer" to what it is suggested are the new challenges for our societies and economies. Arguably Italy, a part from the possible usual exceptions, has very little to say and to offer in terms of knowledge-intensive firms (software, digital content/services/entertainment, new materials, bio-engineering and pharmaceuticals etc.). And what is coagulating the political economic debate in Italy, but this is true in different tones everywhere in the Western world, is the fear of the Red Army of Chinese workers. This is the 'other' who does not belong to us, our tradition, our "good" legislation and is going to rob us of our 'way of life' - unless, that is, drastic measures are taken (See Zizek, 1997).

It is amongst these measures that calls for more knowledge and education and lifelong learning are inserted, together with protectionist moves and furious lobbying for creating 'fairer competition'. In Italy, however, given the actual resources allocated for research and for innovation both in the public and in a private sector and actual policies (see, for example, the situation of University researchers) such a call seems more like a corporatist system masquerading in liberal clothes. In other words, in Italy not hard line neo-liberalism, nor soften third way views seems to take root and be able to mobilise consensus around 'proper administration' of things. By "proper" here it is understood that is post-ideological and it is not biased any more either by ideologies of the left or of the right. This is the case, for example, of Blair's politics in the UK of the 'Third Way'. Populist calls to fight against the fear and the threat of the Chinese labour, arguably "do it better", interestingly suggesting a very passionate, almost tribal, one is tempted to say, political endeavour[4].

We have considered so far a brief excursus in the discursive formation articulating the knowledge and learning societies. These we are told are challenges for the future – unless we become one (a learning/knowledge oriented society) - we are lost. What does it mean we are lost? It means that we shall descend into recession. We worse we shall impoverish at the expenses of China, India, and the other economies that have been deregulated and have addressed the challenges (arguably as in the US). For the American administration some of the attempts of few very "old Europeans" who claim to want to maintain the social regulation of (socio)economic relations is problematic; arguably, many of the contentions on the European constitution are playing up exactly this tension and antagonism on what kind of world "we" (?) want. Just listening to the radio one can consider how much this discourse is

structuring our social order, it is not a domain of the academia. It is spoken in the morning to British citizens listening, for example, to the 'Today' programme. The Americans, arguably, think this concern/tension is a waste of time, if not even worse a dangerous irrationality for the survival of the world.[5] Unless, it is argued, deep re-structuring including, as in the words of the US ambassador to the EU, 'social net, working hours, labour mobility and regulation' a crisis will ultimately precipitate Europe into chaos as competition in a globalised market is fierce, and as the under text suggests, it is ineluctable in its character and dynamics (Radio 4, Today Programme, 2005). The conditions of the knowledge society as globalised productive forces in other words cannot be stopped, hence we must follow the path which is lay out in front of us. The non-alternative trope is very clear here[6].

We have kept this discussion at a very general and somewhat simplistic level, with "carbon box figures" because we aimed to show how the political debate is imbued in economism. As the rules of the globalised economy pushes us all to face up to the challenges of keeping our way of life going. In this light then what appear a straight forward, natural and intuitive thesis is that 'knowledge', which is articulated with learning, continuous improvement and creativity are the ways towards optimisation as well as the innovation required by these challenges. After all as we are told in many mainstream arenas of management knowledge, 'knowledge is the new competitive advantage'. In other words we are to produce in the most efficient/effective way possible as well as innovate what we produce and how we produce it. This is the only strategy that can help us to compete against places where there is abundance of cheap labour and lack of forms of protections (socialised or not) to which we are used to in the West.

Now in this straight forward picture what does passion have to do with it? The insertion of passion we are invited to consider in this conference might seem to point at a novelty in what appears to be a discourse sutured by an hopeless economic determinism. Knowledge and the drive to knowledge, we are invited to consider, is not only a response to the new challenges of globalisation, fierce competition from countries entering the global market etc. There is more to it.

The terms of knowledge: passion and interest

The first consideration is that as suggested in the call for paper there is a coincidence between "ours' and the experiences and needs of companies and organisations in the search for knowledge. Such coincidence for us is not only in that we are participating in and are 'thrown into' the same 'horizon of Being'. This we could also call field of discursivity (Laclau and Mouffe, 2001), which, as we have argued, is hegemonised by totalising signifiers such as 'knowledge/learning society' as the response to unrelenting economic change and market forces. Arguably, as we said the 'search for knowledge' is the answer to the continuous innovation required in/by capitalism to reproduce itself. In this sense, the work of academics in OLK can be simply considered as functional to that hegemony. This not only includes more or less obvious translation (Feyrabend, 1979) of knowledge from the academic arena to that of management consultancy as discussed elsewhere (see Contu and Willmott,

2003). But also it could be argued, it is realised also as academics participate in forwarding views of learning and training in university etc. in which "good" and "proper" 'students' are those individuals that learn to learn, that understand 'employability' and ready themselves to become flexible, life long learners (see Contu et al, 2003).

In this respect then passion seems to be a signifier that sticks out, a remain that does not really fit in what is given as a social that is governed by clear economic forces and when 'individuals' are merely to accept what is "historically" requires to them if they wish to continue to perpetuate this own 'way of life' and avoid the evil that is always around the corner.

> ' While the prevailing *functional and economic explanation* of the *interest* for knowledge and learning point to its *instrumental value*, we contend that knowing and learning *are fuelled by passion*: they stir passion and make people passionate' (OLK6 First call for paper, 2004)'

The space referenced here is rather bringing to the fore the passion that fuelled knowledge. It sustains that knowledge cannot be only accounted for in terms of financial or economic gain. There is something more to knowledge than rational calculation – passion, desire and love are summoned up as some of the terms that one should dwell onto.

What is intriguing of this invitation and this new possible space of investigation is that considering the articulation knowledge/passion rather than mere knowledge/rational interest (or even, without such extremes, as something which is behind or before that interest) has the strength of a truth. In other words it feels truth to many ears. To consider knowledge as something that is pursued for itself - for the passion and love one has for the practice itself might simply be a matter of recognition. Arguably to be a researcher to be a scientists and to work in academia is for reasons that might appear obvious[7] the very expression of a commitment to our work and our practice, which arguably is that of producing more knowledge. This is not only beyond economic gain but also often beyond the call of duty.

So while it is important to consider academics as knowledge workers, as expressed in the introduction, it is important to reflect upon the fact that expressing passion and love for a specific knowledge (and ways of being and way of life, which obviously signifies a very situated and embedded knowledge/ knowing) is also the very way in which much of what we call the knowledge based economy is about. The very structuring narrative matrix of what for many kick started the 'new economy' - the development of the internet and the digital revolution is very often defined in terms of romance versus finance. This narrative is what we present in the next few pages.

The case of the digital matrix: professionals in love

Silicon Valley entrepreneurs as Komisar and Lineback (2000) tells us based on their years of experience in that field of practice are (and should) be driven by passion and not by money

if they want to succeed. Komisar is clear in telling us that passion is about finding out what one is about and pursuing this is what really counts. The Economist certainly participated in making explicit how much individual creativity and passion was the fuel the development of the internet and with it of the new economy and our societies(see Economist, 1995).

Pratt's account of Silicon Alley (ibid.2000), the New York conglomerate of new media agencies, could be considered the matrix that of the way the new media development is forever framed in the social imaginary (see also Golding , 1998; Batt et al, 1999).

As the story goes (see Pratt, 2000) the 'originary point' is that of usually a young couple of college friends, knowledgeable and passionate about their practice, who set up a company financed with an unsecured loan. They manage to get a contract for a website and then start pitching for larger contracts (or have a new idea, which requires expensive hardware, or more people), which need upfront investment. Therefore the young entrepreneurs look for venture capitalists who can pour money into their enterprise. This, as we know, is the classical story of the boom of dotcoms, together with Pratt's description of Silicon Alley of the new media agencies. In this story, then, the famous picture of the young Bill Gates with his 'nerdy' university pals gives way to the image of the parties of young, smart and glamorous dotcom entrepreneurs in New York.

Eventually, according to Pratt, 'the exit strategy' from this investment for the venture capitalists was realised through independent public share offering. In this the role of technology stock analysts such as Mary Meeker of Morgan Stanley Dean Witter acquired almost iconoclastic tones. She was named the 'Queen of the Net' and was one of the most influential voices for the Internet sustaining 'the notion that companies without earnings could transform the world and climb the moon' as it is suggested with a critical tone in a Fortune article (accessed 24.08.2004).

This critical view relates to the wild expectations that were created in the first years of the digital age, when the stock market went wild for technological stock. It signalled a melange of romance, hard financial calculation and pure speculation with, as Thrift (2001) reminds us, commentators who arrived to foresee a complete new economic era with the death of business cycles and virtually unlimited growth. It is because of the passionate youngsters with little money and a lot of passion for everything that had to do with design and software that the internet and everything that made that possible was started. Members of Sumary, the digital communication and marketing agency repeat somewhat this narrative where passion for the practice is one of the driving forces in what they do and how they do it. For example, the production director one of the founding members of Sumary tells us:

> You see I see an entrepreneur as someone who can pick and run with anything while this one has always been a kind of passion which is a different thing from (being) an entrepreneur… if this fails I won't be doing something in a different industry and with the same enthusiasm and drive about achieving things… I do not think I will be able to do that … that is why I do not see myself as an entrepreneur I am passionate about what I want to do…. (Simon, interview Nov. 2001)

It is a widespread narrative in the company to express a sense of passion for what they do and how they do it, many talk about their work as their dream job. [ADD STATEMENT FROM WORKER]

It is this type of statements that we wish to take seriously and unravel as they clearly structure the way people articulate their own experiences as well as the (unreflective) mainstream studies of the subject repeat this meaning. Obviously for us, there is not issue of what comes first as we understand the social as discursive formation.

Unravelling knowledge for passion: the rhetoric of financial calculation

One of the first considerations is that knowledge passion/ knowledge interest can be (too) easily articulated as a duality or a dualism where the two terms are mutually exclusive, or in any case are external to each other and can be found in different degrees, for example, in the same person. The subject at the basis of much of management knowledge is the *homo oeconomicus* . Self interest is what drives his behaviour and if knowledge is what today's brings the best possible chances of enhancing one's value than the *rational* choice of the liberal subject is to invest in knowledge and to participate in its creation, transfer and exploitation. This is true also for firms, as rationalist theories of the firm would propose. Business one could argue require logic and linearity and planning. In other words it is as if passion and self interest belonged to a different set of preoccupations and theorisations. Passion and love do not belong to the field of those who are suppose to help in the prediction and control of managed and organised life, and the undertone seems to be that they should not[8]. In this sense then Simon statement as well as this whole narrative of love and passion is at odd with what is considered to be 'proper' business orientation.

In this view, something like 'passion' sits un-comfortably with the system of rational calculation. Why? Arguably because passion and love are exactly the anti-thesis of rational behaviour, they are what in life is more irrational and uncontrollable, at least as understood in the western rationalistic tradition. Passions are disturbances of what is due and normal, healthy and balanced. As Dixon (2003) informs us passion, for example, has some strong philosophical-religious connotation that had to do with disobedient and morally dangerous movements of the soul (and a variety of lively mental states) (ibid. 18).

Traces of this meaning are still evident in the chains of signifiers we find in the dictionary for the entry 'passion'. Passion, as one reads in the Oxford Dictionary, is, amongst other things about 'suffering', in particular the suffering of Christ and of martyrs. But it is also 'of being affected or acted upon by an external agency' or 'a subjection to a disease'. An expression like a "passionate outburst" give us the sense of the disruption and even violence that accompanies passion.

Now in this sense perhaps we can read those who seemed to find puzzling this presence of passion and romance when matter of political economy are discussed and elaborated as above in relation to the internet and digital industry. They seem to remind us that 'it is the economy stupid!', and arguably traces of disgust are evident in the excessive irrationality that it would require to consider passion and romance significant for making sense of political economy, other then as cultural ideological superstructure that as we see is a "delusion". For example, as far as Golding is concerned the root of the internet lay elsewhere than in the nerds backyards (1998:804). For him the romance is a mythologisation that even if does have

resonance with ‘new age rhetoric, technoshamanism and role playing fantasy world - it is a delusion’ (ibid.803). He reminds us that the military developed the first net as a safety and security technology. This became then an academic network. But it is suggested that the Internet was born when its value, as terrain for commercial exploitation, was decided and the big boys of telecommunication, entertainment and finance joined in. If this is too empiricist as a reading one can consider more theoretically refined discussions such as that of Thrift. Thrift in his article ‘It’s the romance, not the business that makes the business worth pursuing: disclosing a new market culture’ (ibid.2001), tells us how much the romantic notion of a kind of passion for business was an institutional- cum – ideological calculus that was intended to engender continuous asset prize inflation. Finance (venture capital shareholders etc.) was the agency that framed this rhetoric, produced and disciplined it (see ibid.414).

Now the issue we have with this type of reading is that passion and love for the practice (which is also business/commercial practice) is a mere mask on the (harsh) reality of financial exchange which is governed and directed by an all encompassing financial power. This is the ‘real’ reality if you like in which we are supposed to be living in, so it is better that we realise that rather than be fooled by ‘romantic notions’. Passion is then a simple ideological veil, where by ideology is understood in its most traditional sense as something that is false and has a specific scope of manipulation at the service of those who are applying this manipulative false knowledge. In this respect the dualism is evaporated by mean of diminishing passion to a mere cosmetic embellishment that dupe individuals. In the case discussed above in relation to Sumary then the managers would simply be cunningly manipulating and reproducing this rhetoric when talking to a researcher. While the workers are conned into believing that this is the way they feel and want , while in reality, if one gives a radical critical spin to this view - they are exploited and used as mere mean to financial ends. In this case it is the researcher that has a privileged epistemological point and is able to read the truth of historical development of capitalist relation of production.

This is a type of structuralist reading that arguably some would notice returns us to the economism we have discussed at the beginning of this paper and even if talks of agency it is strictly deterministic. This approach it has been argued understand reality as an epiphenomenon, it does not really concerned itself with understanding the experiences as they are realised and understood where they emerge and are enacted. The study in the case of Pratt or, arguably, in the case of Sumary are based on an emic knowledge that attempts to understand the experiences of the other. So in this respect if professionals and workers tells us of their experiences as being about passion and love for what they do and for their way of life, then the reading offered by Thrift is simply reductionist, since it does not consider the richness of human life and its potential.

Passion and love then it could be argued cannot be considered simply a rhetorical appendix but it is a fundamental part of human life. We explore now some of the ways this has been articulated both in psychology and again in the field of MOS. Our position however is critical of this view as it presumes to have freed us from an ideological position and gives us an access to a “naked reality”, where arguably we 'finally' understand that complexity of human

social life where both passion and interest play a role in making possible the pursue of knowledge. We shall consider this chain of signification in the next pages.

Passionate balance

As we have hinted at earlier there is a sense in which the understanding of knowledge as the pursue of passion rather than being (only) about self-interest and rational calculation rings somewhat true and even more, desirable. Arguably psychology has much to say in explaining this distinction as well as in offering the way to compound it in a balanced harmony. Dixon (2003) has even argued that this discipline have much responsibility in having purported the very dualism between rationality/irrationality inscribed in the understanding of knowledge as passion or knowledge as self interest (see Dixon, 2003). Without entering this discussion what is interesting for us is to consider how much the category of "emotions" has become the overarching label, which includes passion and love.

As Dixon (2003) puts it emotions have in themselves an amoral content; they are an autonomous physical and mental state characterised by vivid feelings and physical agitation (ibid.18). It is in psychological knowledge that some re-trace back to Darwinian, evolutionary notion that subsumed emotions as part of the survival strategies made available to successful humans as such it has the same importance as other forms of behaviours and mental states.

In this sense then passion and love are cleansed of negativity as the complex psychology of humans beings requires an healthy emotional development as well as rational/cognitive one. In other words, the category of "emotions" has gentrified "passion" from anything that was somewhat dangerous, ambiguous or unknown. Arguably, even psychoanalysis of the Ego, as it developed in the USA, participates in forwarding and sustaining this understanding. This it might be said does not buy into the evolutionary notion, but it understands the irrational passionate Id of drives as the libidinal content that needs to be healthily channelled and mastered by the Ego and the reality principle. In other words, and this is the critique that Lacan mainly makes to the way psychoanalysis has been distorted into a psychology of the ego, the analysts assume on themselves the discourse of the master, perversely embodying the subject suppose to know, rather than that of the object a, the object of desire that keeps desire going, traversing the fundamental fantasy that structure desire. In this sense then the psychology of the Ego is conservative and reactionary.

Yet the importance of emotions has become wide-spread, a normal way in which education and training is elaborated and designed. So for example, Goleman's book on 'emotional intelligence' was a best seller introducing the average American, as well as the average, British to the notion that emotional intelligence can be more important than IQ. In the field of mainstream American management in the last thirty or so years we have seen how much this discourse has become mainstream in attempting to redefine the very notion of management. For example, Peter and Waterman are interested in re-defining the very concept of what is 'rational' as an important aspect of successful or as they call them, excellent businesses. In their contribution to the book 'how organisations learn ' they tells us that rationality should not only be understood as numerical prediction and planning, as part of the problem may be

missing a perspective; the lack of any *feeling* for the whole on the part of the so-called professional manager. (p.34 emphasis added). For them what it is needed and it is actually happening already is a paradigm shift that can improve on the '*heartless* philosophy of traditional rationality' (38 emphasis added) and include an accent on values which emanates from *love* for the product which is produced (40 emphasis added). Again it should be clear, and it is made explicit also in Peter and Waterman headings that this is a 'question of balance'. Just in case one would take too literally a touchy-feely, love each other, love your customer, be passionate about what you do too literally, they remind us that they are not suggesting that the solution is to move Ford board meetings to the local Zen centre. In other words, passion and love simply enlarges the notion of rationality manages should use in business but without excesses. Again trace of this are evident in the notion that passion has to do with enthusiasm, a kind of healthy charge, of which however you cannot have too much if you want to avoid to be taken as daft or crazy. We shall come back on this point in the last part of the paper.

Now one could not finish an excursion into the articulation of passion and knowledge without considering another eminent discussion on this issue which shares, however, very little with the discourse of love and passion as that which is required for successful businesses and balanced and functional individuals.

Max Weber in 1917, made a significant contribution in his discussion of 'science as vocation'[9] In discussing, what he calls the 'inward calling for science' he talks about passion as the 'sense of intoxication ridiculed by every outsider' which is the substance of the experience of science, that moment in which the result of the actual endeavour depends the fate of his soul. Passion then is enthusiasm and seems to be a positive feature, actually it is so important for Weber that it tells us that 'for nothing is worthy of man as man unless he can pursue it with passionate devotion' (ibid. 11-13). Yet there is this negative aspects as passion is fundamental but it is not all (it needs work and method etc.) and it is somewhat poisonous. This in different way is also spelt out when he discusses the external condition of academic work. He tells us in a rather disarming and somewhat refreshing way how much hazard and even unfairness – 'if he is a Jew, of course, one says *lasciate ogni speranza*'(ibid.1919:4) - there is in the academic organisation. Yet he tells us how much people to the question

> ' do you in all conscience believe that you can stand seeing mediocrity after mediocrity, year after year, climb beyond you, without becoming embittered and without coming to grief? Naturally, one always receives the answer 'Of course I live only for my calling. Yet I have fund that only a few men could endure this situation without coming to grief' (Ibid.4).

In other words there is an point of undecidibility in passion as a call, a drive to persevere, to stick at it. Now the issue is that it would seem to be an intuitive reading that passion is done regardless of what others think – the derision the unfairness and injustice of which Weber talks about. What we would like to suggest is that what we call passion is exactly the name of

what we do because of the derision and the and unfairness and justice. We are pointing at some 'enjoyment' that is caught in the discourse of knowledge as passion. Enjoyment or *jouissance* in Lacanian terms is not pleasure but it is beyond pleasure. This and other aspects of lacanian insights particularly re-elaborated as in Zizek's work we will develop and put to work in the next page in order to offer a reading that goes beyond dualistic and rather conservative reading of social life and work, which articulates passion in the discourse of knowledge production and development both in businesses and universities. After all Weber himself in the last part of this essay tells us that everything is fine and simple if 'each finds and obeys the demon who holds the fibres of his very life'. This introduces an element that irrevocably forecloses and stains some kind of transparent "self presence".

"Love" as (ideological) fantasy and the *enjoyment* of our way of life

We suggest that it is possible to understand 'love' as the ideological fantasy as discussed by Zizek building on the notion of fantasy elaborated by Jacques Lacan, in particular elaborated in the graph of desire.

As we have said earlier understanding a dualism which leans on either of the poles or that preaches an healthy balance between rational self interest and passion engagement is something that we find problematic. As we have seen structuralist readings maintains and perpetuate economism and determinism and consider ideology as the false representation seen from a space that is non-ideological, where by passion and love are seen as part of a 'plot' to sustain what he calls 'conviction capitalism'. What we wish to point out is that ideology i.e. distortion and illusion, in particular of what we understand as sutured, meaningful society, or group or destiny etc. for example is not something we can do without. In this sense we consider those who talks about being beyond ideology as the ideological position par excellence.

The category of (ideological) fantasy is what establishing the screen that sustains reality is not something that is somewhat covering reality and that dupes subjects or reveal to subjects their real inner desires and meanings. The complexity and fascination of Lacan and Zizek work is that exactly refute any kind of dualism in/out, psychic/social etc. For Lacan in fact bodies are always already structurued in a symbolic order, what he calls the big Other for which we are always staging our desire and our way of being or in which desire is structured and played up. It is important to consider that for Lacan desire is always the desire of the Other. This amongts other things indicates that "psychic" reality is always already social. Lacan has elaborated a series of topological figures that are use to approximate this notion he calls extimacy: intimacy...externality.

These considerations are important because for us one can look at this insertion of passion and love in the discourse of knowledge qua self-interest and economic interest as that which does not fit – as a remain that does not really work in the logic of the understanding of the social as simply governed by economic interest. Passion in this respect is the signifier of the lack in the Other who directs us, who governs what we are about – arguably adjusted and productive citizens that participate in keeping our way of life going. Now this signifier is a

signifier of lack that has however a surplus and a possible antagonism. However this is domesticated as 'the answer' no we are more than that – there is more to us than mere rational calculation. The fantasy of love then is the screen where we stage the desire to pursue knowledge that is existence of an inner self or 'something in us' more than money driven person, or mere calculative individual, but an 'inner self ' that can be pursued through the very actions that structure our lives including and not excluding work. It is this extra-ideological kernel that is the very place by which the fantasy of love and the fantasy of a world and a way of life that is more than mere economic logic and personal interest is maintained. Arguably this is so much so that those who are only interested in money are either not going to be really successful, or if they are they are not really developing themselves fully. What we are suggesting is that this is not less ideological then then first . Love, in other words, domesticates the surplus and fills the gap signified in passion. Passion, however, while it is a condition of possibility of love and finally of our way of life, is also dangerous as passion can be excessive and excess should be kept in check. In other words, passion is also exactly that which infects and contaminate the perfect love. As we have said passion has disruptive traces - passion is painful, it is a disease that infect an harmonious love and transforms it into torment.

Conclusions

In this paper we firstly, encircled the space of the reflection which suggest that knowledge is as financial interest and gain. And then we considered how passion is inserted in this discourse. We reflect on the connection between knowledge and passion in relation to the academic arena of organisational learning and knowledge management, also by drawing upon Weber's insights on the notion of passion for scientists and academics. We then consider the iconic figures of the knowledge based economy, the new media/digital professionals and entrepreneurs. We draw upon the way their work has been presented and elaborated in various interventions in sociology, geography and media studies, as well as, referring to the material produced in an ethnographic research.

We considered how passion assumes positive connotation particularly when reflected in the wide spread discourse that subsumed passion as a kind of sub-category of 'emotion'. We explored these connections between knowledge as passion and theorised the declared love of the new media professionals and entrepreneurs as an ideological fantasy (Zizek, 1989) - as the screen in which the politics of production (in its wider sense production of commodities, identities, organisation) is played up. This has enabled us, on the one hand, to consider and explore the symbolic and imaginary dimension of subjects in knowing. More specifically, the meanings of everyday organisational knowing, and how the 'knowing subjects' are established. But we also have considered the antagonism and openness of love and desire of knowledge. This means for us to consider what remains what sticks out - left over, bits that are senseless and that just return: senseless signifiers and objects that return in their speech, etc. Love then is a fantasmatic screen that attempts to domesticate these senseless remains and the negativity which infects the positive way of (organised) life unified by love and passion.

But at the same time, it should be noticed a certain surplus can never be gentrified. From this position then, we argue, love assumes the semblance of an unbearable and consuming passion as it is a drive beyond interest and beyond purpose showing the 'enjoyment' of our way of life in liberal, de-regulated, capitalist organisations.

Playing up these ideas in the contexts and with reference to the organisational vicissitudes of digital media company is a way of re-articulating a dimension and an understanding of knowing that is theoretically much underdeveloped. This offer useful and stimulating categories for understanding organised life in general, and the 'workplace of the future' (Gill, 2002) in particular.

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Endnotes

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[3] This argument is often implied in naturalistic accounts where researcher have actually gone into the field and "talk to the real people" and somewhat touched something real and reached more closely what reality really is like.

[4] Arguably, this is not in the least less problematic or dangerous as it poses the Chinese as the enemy looked at from an ideological free space of bare reality of survival between the democratic, free and progressive world and the technocratic, exploitative Chinese capitalism.

[5] As a strong stable liberal Europe makes possible the perpetuation of the social order.

[6] It should be said that the Ambassador when asked by the interviewer if old Europe pointed out that there are what he called other approaches

[7] The situation changes however in different countries in relation to the way academic work is constructed. In Italy, for example, is somewhat normal for academics to be also consultant. The system of presence and type of work required is very loose and salaries are lower compared, for example, to England. Yet the status enjoyed by academic in Italy is arguably much higher that in the UK. In the UK also one should consider that the system is much more competitive and managerialised, increasingly similar to that of the corporate world, without, however, providing the same financial benefits but same high expectations and high performance orientation.

[8] This reflection was also suggested to us by the reaction to the conference call of some colleagues.

[9] Interestingly the Italian and English translation have a different accent as in Italian the title is '*Scienza come professione*', which arguably bares always already bares the trace the dimension of relation of production and the exchange and value involved.

Women's Ways of Knowing: It is All about Love!

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The title of my talk is tongue-in-cheek ambivalent: on one hand it is provocative, to the extent that it implies a reference to the stereotype of passive care-giving ascribed to women's "natural" loving attitude; it is a major cultural stereotype, often justifying women's exploitation in the most diverse social situations. Furthermore, it could imply that the domain of women's knowledge is just "emotional", "emphatic", "timic" ("timism" is –roughly- the Greek word for moving passions), while really meaning that women's knowledge is illogical, non-objective, and engrossed.[2]

On the other hand, this title is not provocative at all, inasmuch as it aims at indicating an attitude that feminists have related to "a politics of desire"[3], and in which they have recognized their effort to construct a more balanced, more just society. The tragedy of war in today's world makes the question compelling.

And yet, we should remember that, as the intellectual critic Lea Melandri writes: "Tenderness and violence appear together, inseparable, inextricably linked, and it does not make sense to keep our eyes and arms open wide in relation to one, but to close them in desolation to the other".[4] Desire and desolation, openness and resignation are but corollary feelings composing the complexity of the timic map.

This quote introduces the development of the non-provocative interpretation of my title, which calls for, and deserves, an exploration of the ambivalence inherent in the conceptual definition of the term "love". "Love" is worthy of analysis and attention, because its ambivalence is ineliminable from the relational statute of love itself, and no relation can ever coincide with its representation.

At a semiosic level, the play of signification always undoes the stability of the semantic components implied in a definition of relation (that explains, for example, why the mere repetition of "I love you" does not just produce a tautology)[5].

Given these premises, love's ambivalence calls for an elucidation of the co(n)texts to which it applies.[6] Feminist theory has been dealing with it from multiple perspectives, both theoretical and political (let me specify that this distinction is heuristic, i.e., it is for the use of whomever is concerned about keeping it, though it has very an uncertain epistemological grounding).

In the clarification of the co(n)texts of love, I am using the term "co(n)texts" according to my previous formulation of it as "a figure of thought",[7] which aims at preserving the inextricable continuity of texts, co-texts and contexts.

By texts I mean discursive processes, since, as Roland Barthes cogently put it- the birth of the reader must be at the cost of the death of the author",[8] so texts are never literal, thus no "products", but function in processes of signification, and thus are always re-enacted co-creatively.

Furthermore, Jacques Derrida has very clearly indicated the non totalization of texts, and many feminist philosophers (among them Cixous, Spivak, Minh-ha, Butler, Ziarek, etc.)[9] have made of this awareness an occasion for thinking "difference". As Peggy Kamuf put it: "…The critique of presence does not exhaust the resources of thought. On the contrary, for

deconstruction the impossibility of a fully self-present meaning is that which opens the possibility of any relation to meaning, indeed of any relation whatsoever to and within difference(s)".[10] Thinking difference, as Italian philosophers have repeatedly highlighted (Muraro, Cavarero Violi, and myself)[11] means thinking it as a "differential", not as an oppositional trait, and even less as an essentialist feature of sexuality and/or subjectivity.

Co-texts are previous and co-existing discursive products implied in the process of text production. They are the discursive products which, according to Harold Bloom's phallologocentric genealogy, create an "anxiety of influence" in worthy Oedipal sons, necessarily and unavoidably wrestling with their admirable fathers.[12]

Finally, contexts are the conditions of possibility in which the performance of textuality receives and/or determines social recognition, dissemination, and potential referential transformation.

In short, the notion of co(n)text empowers us to remember that a context separates and thus defines a text, as much as a text textualizes a context.[13]

Arguably, women refer to previous textual productions (co-texts) according to genealogies that differ (at least to some significant and differential extent), from the traditionally canonical ones; feminists have certainly theorized the performance of "ex-centric" textualities, and have emphasized the performativity of contexts, in terms of access to speech and speaking positions (Cixous, Grosz, De Lauretis, etc)[14], and in terms of free dissemination of information, rather than in terms of a purely aesthetic avant-garde.

Feminists have also emphasized the importance of ways of "reading otherwise", starting with the negotiation of interpretants, at the core of sign formation.[15]

Furthermore, women have also aspired at producing texts that will be recognized as authoritative, thus susceptible of becoming co-texts of-for future text production. Part of the failure in the cultural continuity of feminism has to do with the systemic oblivion of texts written by women, or more precisely, written "in the feminine".

In other words, some of the reasons for the cultural "backlash" against feminism can be ascribed to the non-inscription of feminist and women's texts into a co-textual tradition, a tradition of reference socially recognizable and valuable. This "backlash" is not so overt and visibly conflicting today with the hegemonically established desirable agendas, because it derives mostly from social amnesia, but actually it represses the potential social alternatives inherent (perhaps) in the advancement of learning.

The issue of canon formation cannot be exemplified as briefly as one could do here, but I would like to note that in spite of the fact that relatively many are the names of women and feminist circulating today, it is still hard to configure a women's canon, a tradition socially visible as an epistemological domain equally valorized, and thus comparable to THE tradition (which resists a gender qualification, being inscribed in the privileged domain of transcendental masculinity). Emphasis on difference among women thinkers works towards a social silencing of their thought, because there is virtually no culturally accepted site in which they are inscribed.

In this respect, we are not far from the cultural situation described by Virginia Woolf, when she complained about the difficulties a woman encounters when accessing literature: the difficulty of access to a woman's language was due to the unsettling lack of a women's literary tradition.[16]

I think that building a visible and equally praised tradition is essential for the continuity of a women's knowledge, or else women are always "starting from square one", for lack of a genealogy. In relation to this, the issue of memory deserves a much larger debate, but it is certainly central to the problem of a feminist and/or feminine transmission of knowledge.[17]

A successful gynocentric memory can be achieved if transmission of knowledge regards and involves women as women, subjects thought of, and valorized from, an "as a woman" position.

Conflicting cognitive agendas produce a recurrent deplorable fragmentation, and women today still have to work on a form of political and/or cognitive bonding, which would empower them as women. Paradoxically, our investment with difference often dis-empowers us, as soon as a specific difference is highlighted: it often becomes tokenized, or –even worse- it is as if the "passion of knowledge" expressed from an "as woman" position remains an individual's, or a restricted community's goal.

The social valorization of co-texts, which determines the hegemony of reception, and, in turn, the hegemony of certain textual formations, should therefore be investigated critically and from different positions, and resisted wherever it produces discrimination.

Attention to co-texts ultimately means paying attention to the possibilities of symbolic investment, in terms of identification and/or disidentification.

That is why the balance between determining specificity, and the negotiation of translatability is, as I have suggested, one of the most relevant contemporary stakes of feminist epistemology and political practice.

My denunciation of fragmentation should not be confounded with the desire of a feminist monolingualism; on the contrary, I believe that the strength of feminist thinking resides in its capacity to think differentially, starting with sexual difference itself.

My complaint about fragmentation addresses the silencing it produces, and which ultimately represses the irreducible "difference within" of women's ways of knowing. As I said, the balance between a location-valorization of difference, and the negotiation of its translatability is one of the most problematic stakes of contemporary knowledge formation and transmission, and should not be overlooked by those who are concerned about "the passion for learning and knowing".

Factual values of reciprocality do not abolish differences, but, on the contrary, people involved should learn –more and more- how to accommodate them. To this end (i.e., the accommodation of difference in learning and knowing), I have theorized the practice of a simultaneous scientific paradigm of knowledge which would relate, rather than oppose

differences, and would displace the basic conceptual dichotomy of "either/or", towards an "and/or" conceptual frame.[18]

Rather than protecting a consumeristic inclusiveness, the "and/or" economy of thought aims at voicing a "con-disjunctive" practice of thought, the one in which women usually perform, and which can be seen, once we acknowledge the double positioning (by no means a "double standard"), from which women always already start thinking, in relation to the social symbolic (do we still need to say it is patriarchal?).

On a theoretical level, I am thinking of a couple of exemplary references, among many; I am thinking of Raffaella Lamberti's work in Italy, wich I have mentioned already, [19] and of Barbara Johnson's work in the USA. As a feminist deconstructionist critic, Johnson writes: "Instead of a simple 'either/or structure', deconstruction attempts to elaborate a discourse that says neither 'either/or', nor 'both/and' nor even 'neither/nor', while at the same time not totally abandoning these logics either.. The very word deconstruction is meant to undermine the either/or logic of the opposition 'construction/destruction".[20]

The issue of a "woman's knowledge" as a successful translation-formation between the concurrence-disjunction of "claiming" and "being claimed", by personal and social imperatives is expressed by the poet Adrienne Rich as follows: "…and I ask myself and you, which of our visions will claim us/ which will we claim/ how we will go on living…"[21]. I think it is important to notice that this reference is not to some form of a passive "living on", i.e., to an abstact sur-vival (in relation to which the epistemological and/or existential question remains: "where would the 'sur', i.e., the 'supra', the 'elsewhere' be?"). This is a question in which the implication of a full living, i.e., in which a simultaneous acceptance of inspiration, and a determinate agentivity in determining it, aim at giving back to the subject the connected sense of understanding and agency in her own life, as a simultaneous give-and-take, as a coexisting "and/or" possibility.

In relation to the issue of a transmission of passionate knowledge, one must consider the notion of ambivalence in relation to specific co(n)texts in which the term "love" is repeated.

Thinking about "love" has been a hallmark of feminist thought, in spite of the ridicule that jeopardizes the word "love", by references simplistically implying either sexual commodification, and/or oblative sacrifice.

A lucid resistance to the reductive ambiguities of the notion of "love" is part of the feminist agenda, which opposes the silence of obvious reception, with the persistent and yet tentative voicing of a will to protect and increase the desire of a harmonious living for every human being.

The poet and thinker Audre Lorde has expressed it as follows: "There is a timber of voice / that comes from not being heard/ and knowing you 're not being/ heard noticed only/ By others not heard/ for the same reason".[22] Not being heard is a way of not-being; the message is clear and simple, but: who is totally unheard? Isn't representation itself, though distorted

and inaccurate, a form of socially hegemonic listening? Degrees of not-being rather than total "unnoticeableness" are a permanent and recurring feature of our globalized society.

At any rate, the complexities of "love's" ambivalence have de facto determined a current timidity, and/or a cultural cynicism, which prevents people from talking about "love" in empowering ways. Why are some human beings not being heard? Why do they not figure as existing in today's world, the world in which they live?

Who would openly state or admit today that love is on the "national" and "trans-national" agenda, as an asset in imagining the future of a political party, of a Parliament's agenda, of a nation's international relations?

It was perhaps easier to do it in the Seventies, even in the midst of a debate on terrorism (in Italy, for example). These were the words of "Maria and other comrades" as published in a 1991 Reader of Italian Feminist thought: "Only a great love can push you into making decisions which bring into play your whole life, and a great love is needed in order to understand".[23] Do people make loving decisions "which bring into play their whole life"?

The cultural critic bell hooks (alias Gloria Watkins) has recently pointed out in her book All about Love. New Visions (2000)[24] how "love" should be interpreted as an action, rather than a feeling, in order to talk about a practice of love (Chapter One) in which love is not reduced to "care" nor to a cosmetic, sentimental option.

The political functions of inflicted silence, but also the conceptual indecidibility of a definition of love voiced by women, have been co-opted by a hegemonically patriarchal agenda, and the latter has been connoted as a symptom of informational fuzziness, and emotional blurring in concept-formation. Once de-evaluated, this notion of love has even been used to reinforce subjective disappearence in society. (Yet, feminists –both women and men- go on, "and knowing you 're not being/ heard").

The big question remains: "Why is the passion of loving and of knowing blotted out so frequently?".

I believe the reasons are many, and –as I said- not to be attributed solely to patriarchal hegemony, though feminists, both men and women, can easily ascribe this passivity in responding to love to a pervasive, as well as often invisible, ruling-form of institutional violence, all over the world.

The very survival of patriarchal hegemony has to do with the irreducible ambivalence of "love" itself, caught in its intrinsic bio-philic and/or necro-philic structure. As Peggy Kamuf has pointed out: "even if it is essentially preservative, love /…/ is nevertheless no stranger to destruction, to loss and to ruin".[25]

Film director Iciair Bollain well illustrates the tragic ambivalence of a loving relation in her film "I give you my eyes" (Spain, 2002, 106'), in which a woman asks her abusive husband to "take her eyes", accepting to be abused because she cares for their relationship. This is not an unusual attitude, especially among responsive women, because of the "love of relation", which abides in a vast majority of women, from all social classes and ethnic groups,

and who unquestionably believe that a relationship should be preserved for the sake of a greater social harmony, and a presumed "civilization".

As I have suggested, two observations come to mind here: 1) loving does not automatically coincide with protection from destruction; 2) a relation does not coincide with its own representation.

How can we face the potential destructivness of love, and how can we develop this knowledge, and eventually transmit it?

With regard to preservation from annihilation, one has to understand first why even the dramatic evidence of (self)obliteration does not translate into an empowering knowledge, protecting the self from (self)-destructivity.

The acceptance of self-obliteration is paradoxically facilitated by the fact that in general, as we have seen, women are used to a double movement of identification. Barbara Johnson writes: "I think that women are socially led to see more than just one point of view at a time, and certainly more than their own point of view/… / There is always a double message and there is always a double answer. The difficulty for women is that of un-learning self-repression, ambiguation, conciliation, and realize self-affirmation"[26]

This ability to se more than one point of view is what protects women, but simultaneously exposes them. It makes them stronger, but at the same time more vulnerable; it teaches them to recover and to compensate, always at the cost of forgetting the offense.

I believe that women come to deceive themselves into being "really" safe, because they cannot face how pervasively and repeatedly, how really and constantly they are vulnerable, defenseless, open to institutionalized abuse.

Even when the threshold of violence is not high, women are used to being ignored as women (for example, they are taught to read as men, to think as men, to prove themselves equal to men, etc).

Let me ask an exemplary question: how long does it take educated individuals to realize that there are no women in the perfect reproduction of society in Robinson Crusoe? how long does it take for young women to dis-identify with the ideal of the self-made man? how long does it take to read this story as the umpteenth example of a male myth of procreation, together with the many Pygmalion narratives?

And here I am asking again: "Why is the passion of loving and of knowing marginalized so frequently?"

Because the admission of a lack of love, is harder to face than the acceptance of this lack; the recognition of the absence of love, even at the core of the standard institutions socially recognized as love's domain, such as family, school and church, is so difficult and problematic, that it often results in the suspension of reading, understanding, and acting within the non-loving situation. In short, repression of the lack of love is easier and stronger than its denunciation.

As women grow up, learning and dealing with the double front of identifying themselves in relation to both the "outside", i.e., to a hegemonically stable and determined world of patriarchy; and in relation to an "inside", i.e., to themselves as women, they have to know enough to bear insecurity and uncertainty.

Again, this instability is both an asset, and a problem in human development.

It is a problem inasmuch as women respond with more or less blind acceptance: we ultimately accept the cost of being "secondary", for the sake of an acquisition of a successful social visibility. Women might know "down deep" that they count less than man, but they also "know" that by cooperating on the generally accepted silence on this issue, they gain a stable definition as social subjects, and that (i.e., this "gain") becomes an acceptable compensation.

Recent studies in the field of psychology have pointed out how young women progressively lose linguistic creativity (and therefore freedom of self-assertion), as they pass from childhood into adolescence, as they respond to the induced docility of the social system.[27]

Can the educational system take responsibility for this loss? Can schools and Universities intervene in resisting obvious acceptance and irresponsible desolation?

If we do not start from the basic question of "what knowledge" we treasure and "honor", and even if we ignore the question of "what we define as knowledge", we run the risk of being driven by imperatives that are determined away from our identities and our realities.

Yet again, the feminist way of knowing, far from proposing a ready-made answer, and therefore a stereotyped model of success, points to the possibilities of an ever negotiable ground of potential creativity, which obviously cannot do without running great risks, and without hard work, in the acquisition, preservation and transmisison of knowledge.

If we think of knowledge as a component of our own identification (we are what we know, and we "sort of" know who we are); that is, if we think of knowledge as pertaining to our own definition of human beings, we must reject the stereotyped definitions of agents of knowledge production, as determined by masculine transcendence.

Luce Irigaray pointed out that a subject who can say I but without she "remains in a subjectivism without a subjectivity".[28] Can the "I" separated from the "she" count (or even figure), as an agent of knowledge?

The bearing of instability, can –however- be an asset, because feminists have learned to live not knowing "what a woman is", and yet they do not accept being a "non-man". Virginia Woolf herself confessed not knowing "what a woman is", to a group of women she was addressing while talking about "professions for women"[29]

Feminism asserts the "inappropriability of its own subject", and grows with this openness. By doing so, it expresses and brings back the repressed question of the different ways in which the self fails in mastering and/or appropriating its own meaning. This is a topic faced by traditional philosophy only in recent times.

Contemporary philosophy has forcefully indicated that theory itself can include in its progressive agenda a resistance to theory, but a specific question remains, as to the interpretation and valorization of such a resistance. Barbara Johnson discussed this issue in relation to the very influential work of the acknowledged, canonical father-figures which shape the notion of a treasured knowledge in society. Johnson specifically referred to Paul de Man, an acknowledged father of Deconstruction in the USA, but the scope of her questioning invests the value-agenda on which accredited institutions of learning build their authority, and their recognized agency in society: "…the question can be asked why de Man's discourse of self-resistance and uncertainty has achieved such authority and visibility, while the self-resistance and uncertainty of women has been part of what has insured their lack of authority and their invisibility".[30]

The rhetoric of this question makes its logic very compelling: are self-resistance and uncertainty negotiable values determined on the mere basis of gender? Should they be?

As as social subjects, women still receive the stability of the negative: they are non-men. As gendered subjects, however, women aspire to a differential recognition as subjects, and so they have to negotiate a visibility which language denies to them, inasmuch as language marks women as a lack (i.e., the non-man), or grants women the visibility of a variable within mankind. Adriana Cavarero has indicated that: "The mother tongue in which we learned to speak and think is, as a matter of fact, the father's. There is no mother's tongue, since there is no woman's tongue. Our language is for us a foreign language, which we learn, but not as a translation of our own tongue. /…/ What we perceive in this foreign tongue, which we are, and we cannot not be, is thus the distance that separates us from it, the "it" in which we tell about ourselves not telling ourselves; the "it" in which we find ourselves, without finding our selves."[31]

Neither school, nor university do usually help women much on this front, because even feminists are themselves caught into an agenda of solidification of cultural boundaries. And yet: "…differing perceptions of the real are nothing other than perceptions of the boundaries of institutions. /…/ It is as though institutions existed precisely to create boundaries between the unreal and the real, to assure docility, paradoxically, through the assumption of unreality. /…/ Always ideological, they are also, heuristically, if not existentially, inescapable".[32]

Do we really want to assure docility through the assumption of unreality?

As a researcher and teacher, I believe that it is the University's mission to make knowledge visibly open, i.e. irreducibly critical; challengeable in an international arena and by polymorphic subjects. Knowledge should be clearly transformable through dialogue and negotiation, not through deterministic "progress", because it is basically non-epistemologically totalized. This imperative obviously makes knowledge also basically questionable, open to discussion, uncertain, but therefore also open, sharable, and that gives a chance to the possibility of progress, to a fair, indiscriminate "advancement of learning".

The global perspective of today's world puts into play more intensely than any local perspective (*peripheral*, by definition), the differences we encounter on the cultural, social, financial, economic, levels. Thus, the global perspective is the one that allows us to think of the subjects involved in knowing and learning as human beings in charge of the future, i.e., it lets us think of humans as people and peoples ethnically, socially, culturally, and gender determined.

It is then at a global level that we can negotiate the valorization or the obliteration of such differences. Which differences do we want to keep? Which ones do we want to reduce or eradicate?

The "West" is simplististic in asserting that difference is in itself always good. Inequality is a variant of difference that only arguably is good. So the real question becomes: do we want differences to make a difference specifically, or not? And if we do, for whom do we want to make a difference, or do we want a difference made?

As a non totalizing answer, but as an equally inevitable and provisional conclusion, I would like to quote a co-written poem in which two women poets run the risk of perlocution, and in which they indicate that no representation suffices in describing relations. Furthermore, they indicate that there is no mastery of subjectivity, no desire to describe what a woman is, nor what determines her knowledge, but they indicate the movement of signification, and the love of reciprocal knowledge: "All the words have leaped into air like the cards/ in Alice, like birds flying, forming, re-/ forming, swerving and rising, and each word/ says it is love".[33]

Endnotes

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[2] Let me note in passing that, together with "passionate", the English language does not include in its standard dictionary the word "passional" (as in the Italian "passionale"-"appassionato", and even "appassionante"), and that this lack, does not allow a similar representation of the subjective/objective location of passion. I am sure this variance in the representation of "passion" applies to a lot of other cultures.

[3] Seyla Benhabib, Situating the Self: Gender, Community and Postmodernism in Contemporary Ethics, New York: Routledge, 1992; Peg Birmingham, "Feminist Fictions: Discourse, Desire and the Law" Philosophy and Social Criticism, Spring, 1996.

[4] Lea Melandri, "The 'feminine': singular and plural" in Paola Bono and Sandra Kemp, eds., Italian Feminist Thought. A Reader, Oxford: Blackwell, 1991, p. 329.

[5] Roland Barthes, A Lover's Discorse. Fragments, New York: Hill and Wang, 1978.

[6] Carla Locatelli, "Co(n)testi" in Con(n)texts: Implicazioni testuali, C. Locatelli, ed., Trento: Editrice Università degli Studi, 2000, pp. 11-36.

[7] I owe this definition to Teresa De Lauretis in "Constructions in Analysis, or Reading after Freud" in Con(n)texts: Implicazioni testuali, C. Locatelli, ed., pp. 37-56. Quotation p. 37.

[8] Roland Barthes, "The Death of the Autohor" in Image Music Text, London: Fontana Press, 1977, pp. 142-149.

[9] Among many contributions, see: Hélène Cixous, Coming to Writing and Other Essays, Cambridge, Mass.: Harvard University Press, 1991; Gayatry Chakravorty Spivak, In Other Worlds, New York: Routledge, 1988; Judith Butler, Excitable Speech, New York: Routldge, 1997; Ewa Plonowska Ziarek, An Ethics of Dissensus, Stanford: Stanford University Press, 2001.

[10] Peggy Kamuf, "Deconstruction and Feminism. A Repetition" in feminist Interpretations of Jacques Derrida, Nancy J. Holland, ed., University Park, PA: The Pennsylvania State University Press, p. 115. Italics added.

[11] Adriana Cavarero, Nonostante Platone, Roma: Editori Riuniti, 1990; Luisa Muraro, L'ordine simbolico della madre, Roma:Editori Riuniti, 1991; Patrizia Violi, L'infinito singolare. Considerazioni sulla differenza sessuale nel linguaggio, Verona: Essedue, 1988; Carla Locatelli, "Passaggi obbligati: la differenza (auto)biografica come politica co(n)testuale" in Co(n)texts: implicazioni testuali, op.cit., pp.151-196.

[12] Harold Bloom, The Anxiety of Influence. A Theoryof Poetry, New York: Oxford University Press, 1973.

[13] Carla Locatelli, "In(de)scrizioni" in Descrizioni e iscrizioni: politiche del discorso, Trento: Editrice Universita' degli Studi di Trento, 1998, pp.13-65.

[14] Hélène Cixous, Coming to Writing and Other Essays, op.cit.; Carla Locatelli, "Questo lavoro d'analisi e illuminazione" in Scritture del corpo. Hélène Cixous. Variazioni su un tema, Paola Bono, ed., Roma: Luca Sassella, 2000, pp. 21-45; Teresa De Lauretis, Technologies of Gender, Bloomington: Indiana University Press, 1987.

[15] Anna Santoro, "Creatività ed etica della lettura di genere" ("Cretivity and Ethics of a Gendered Reading"), in Quaderns d'Italià, 6, 2001, Universitat Autònoma de Barcelona, 2001, pp. 37-52. Carla Locatelli, "e/O: S/Oggetti immmaginari: letterature comparate al femminile:" in S/Oggetti immmaginari: letterature comparate al femminile, Liana Borghi and Rita Svanderlik, eds., Urbino: Quattroventi, 1996, pp. 41-62.

[16] Virginia Woolf, The Crowded Dance of Modern Life, London: Penguin Books, 1993. See in particular "Professions for Women", pp. 101-106

[17] Among many possibile references, see the recently published: Vita Fortunati, Gilberta Golinelli and Rita Monticelli, eds., Studi di genere e memoria culturale. Women and Cultural Memory, Bologna: CLUEB, 2004.

[18] Carla Locatelli, "e/o: la parola chiave" in Anterem 50, 1st Semester, 1995, pp.30-32.

[19] Raffaella Lamberti, "Individualità e pluralità: il 'pensiero della nascita'" in Questioni di teoria femminista, Paola Bono, ed., Milano: La Tartaruga Edizioni, 1993, pp. 79-87.

[20] Barbara Johnson, , A World of Difference. Baltimore and London: The Johns Hopkins University Press, 1987. Quotation p. 12.

[21] Adrienne Rich, "Nights and Days" in The Dream of a Common Language, New York: W.W. Norton & Company, 1978, p. 45.

[22] Audre Lorde, "Echoes" in The Marvelous Arithmetics of Distance, New York: W.W. Norton & Company, 1993, p. 7.

[23] Paola Bono and Sandra Kemp, Italian Feminist Thought. A Reader, Oxford: Blackwell, 1991, p. 300.
[24] bell hooks, All about Love. New Visions, New York: William Morrow, 2000.
[25] Peggy Kamuf, "Deconstruction and Love" in Nicholas Royle, ed., Deconstructions. A User's Guide, Houndsmills, Basingstoke, Hampshire, and New York: Palgrave, 2000, pp. 151-170. Quotation p.152.
[26] Barbara Johnson, "An Intervew" in Criticism in Society, Imre Salusinszky ed., New York: Methuen, 1987, pp. 150-175.Quotation pp. 169-70.
[27] Carla Weber, Inventare se stesse. Adolescenti sulla soglia della civiltà planetaria, Roma: Meltemi, 2004.
[28] Luce Irigaray, "The Other: Woman" in I Love to You: Sketch for a Felicità Within History, London: Routledge, 1996.
[29] Virginia Woolf, "Professions for Women" in op. cit..
[30] Barbara Johnson, "Deconstruction, Feminism, and Pedagogy" in A World of Difference , op. cit., p. 45.
[31] Adriana Cavarero, "Per una teoria della differenza sessuale" in Diotima. Il pensiero della differenza sessuale, Milan: La Tartaruga, 1987, p. 52. Translation mine.
[32] Barbara Johnson, A World of Difference, op.cit., p.3.
[33] Gillian Hanscombe and Suniti Namijoshi, "All the Words" in Dancing the Tightrope, B: Burford, L. Macrae, and S: Paskin, London: The Women's Press, 1987, p.30.

Dismantling Leadership or Leading Knowledge? Suggestions from a regional welfare system

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Leadership in practice.

In the field of the organizational studies, the so-called “practice turn” and the related different approaches have implied a progressive shifting from nouns to verbs (organizing vs. organization, knowing vs. knowledge, ecc.), aligned with processual paradigms (Schatzki, Knorr Cetina, von Savigny, 2001; Nicolini, Gherardi, Yanow, 2003). At the same time, affirmed ontologies such as the actor, or the structure are disappearing, while the net, or the practice itself are emerging. These newness of cognitive styles, epistemic culture and so on, have permitted some revenges: the meso “syren” of the context vs. the macro-micro dualism; the objectivity vs. the subjectivity; the materiality vs. the idealized (meanings, representations, ecc.), and so on.

Within these transitions (or translations?) some classical issues seem to have been lost or renewed or dismantled, e.g., as the question of power in the assumed machiavellism of the *Actor Network Theory*, or as the presumed functionalism of the *communities of practice*. Another classic, although controversial, theme, that of leadership, seems to be disappearing when confronted with the approaches founded on the ontology of practice. After all, this concept and the innumerable theories linked with it evoke old fashioned ideas: the individual actor, the influence styles, ecc., too much psychosocial tasting.

In this paper, anyhow, will be addressed the hypothesis that talking of passions for knowledge in the organizations or, more “politically correct”, *for passioning, knowing, organizing, practising and so on* could perhaps gain some interesting stimulus through an appropriate conception of leadership or, better, of *leading*. We shall also try to consider this issue as a matter of networks (or interactions) more than (only) actors, in terms of contexts instead of (only) styles (of/or personalities), as micropolitics and not as (only) charismatic powers, and then our comprehension of passions for knowledge could probably become enriched.

The empirical case we’re going to discuss will probably offer us an overview of such a direction, getting help from the interesting discussion of Amin and Cohendet’s (2004) "four architectures" (or achitecturing?) of organizational knowledge. It is a story of mixing, (re)creating, consolidating communities of practice in and out the boundaries of a regional southern administration involved in the reform of the italian welfare system. Our question could be then formulated in such a way: is it leadership that acts for displacement/replacement of knowledges among political, bureaucratic, professional, “third sectorial” and so on, communities and organizations? Or IT is such a contextual net that is acting for (some kind) of emerging leadership? Are we sure that it is fruitful, in praise of the ontology of practice, to dismantle this kind of phenomena and the related questions, when we are actually trying to understand passions for knowledge?

Reforming the italian welfare system at the regional level.

Since the seventies of the last century the western welfare systems have been invested by a profound and irreversible crisis; here is not possible to follow the multiple paths through which the national systems have tried to invent new solutions to face different kind of problems, the first of all being the progressive restraining role of the "public". In any case it is worthwhile to observe that, notwithstanding the national legacies, a consistent isomorphic process has been going on, at least in Europe, producing a new model of hybridation: the birth of a welfare mix system. New relations have been discovered and experimented below the traditional diades: the public and the private, the centre and the local, the state and the market, the individual and the collective, the commodification and the reciprocity, and so on. Furthermore new actors have also claimed for their dignity, with a particular evidence to the role of the quasi-organizations of the no-profit third sector, and to the growing emergence of "governance-nets" composed of assembling patchworks of actors.

Following this more general trend, at the turn of the century, the italian welfare system has established an innovative pattern, the Integrated Social Services System (ISSS) with the enactment of the Statutory Law n. 328 in 2000, of which main principles are:

1. an universalistic supply of social services to all citizens, with a certain regard to a direct contribution in relating to their income level;
2. an overcoming subsidiarity (i.e., integration and cooperation) between public institutions at different stages of decentralization and private organizations, especially the no-profit ones;
3. an overwhelming emphasis on assessment criterias for the quality of social services and the professionalization of the field.

After the establishing of this national reforming law, each regional government has been called to promote another law of its own, with the aim of redefining those principles and tuning them with the particular features of the regional socio-economic context. In such a way, in our case represented by the "Region Campania"[2], the process of translation – in accordance with the *Actor Network Theory* – has been starting firstly with the regional translation of the national law and after that has been translated twice at the local government level, as it has been noted by Staibano (2004, cfr. fig. 1). The Government of the regional Parliament, in fact, promulgated during the years 2002-04 a set of guidelines for the implementation of the national welfare system reform, mainly with the scope of pursuing a relevant and innovative aggregation of different sets of municipalities, for the managing of social policies at the local level. This strategy was considerably consistent with the drawing of *governance networks*, forcing the traditionally disgregated enatcment of social services by each one of the many municipalities, into coordinated and integrated plans, elaborated at a more aggregated level of elaboration and planning.

This integrating level has been individuated for less than 50 "Districts", each of those in charge of constituting a District Office Plan as a counterpart of the new Regional Office Plan. The latest structure being established as an innovative, even if at the beginning informal,

organizational structure, by the higher civil servant of the regional bureaucracy Department dedicated to the social policies: a rather young (about fourteen aged) woman with a noticeable professional currriculum in the field, and recruited fron the external of the Region. Most of the institutional, organizational and policy changes, not to mention the very concerned vision and sense making in the regional welfare, have certainly seen her role as a key leader in promoting innovative processes for the creation, experimentation and diffusion of practices, knowledge and competences in the field. However here it is intended to suggest that her leading action could be interpreted not only as a charismatic-trasformational (Bryman, 1992; Burns, 1987; Leithwood, Jantzi, Steinbach, 1999) style or at least as a democratic-empowering micropolitic (Bacharach, Mundell, 1993; Ball, 1987; Blase, Anderson, 1995), but only as a symptom of an enactment process, a sort of committing spark of a distributive, or collaborative leadership widely spread among many actors.

One of the clearest empirical evidences in this sense could be discovered by tracing the complex process of reciprocal adaptation and negotiating arrangements besides the emergence of the political, professional and bureacratic networks coming out of the relations founded on the designing of the District Offices Plan. Each of these ones has provoked the creation of a narrower coupling of political, professional and social actors involved in programming and implementing social policies for the municipilaties linked by every District Office.

Fig. 1 *Two "translation" processes of the Reform of Social Services' in the Campania Region (adapted from Staibano, 2004)*

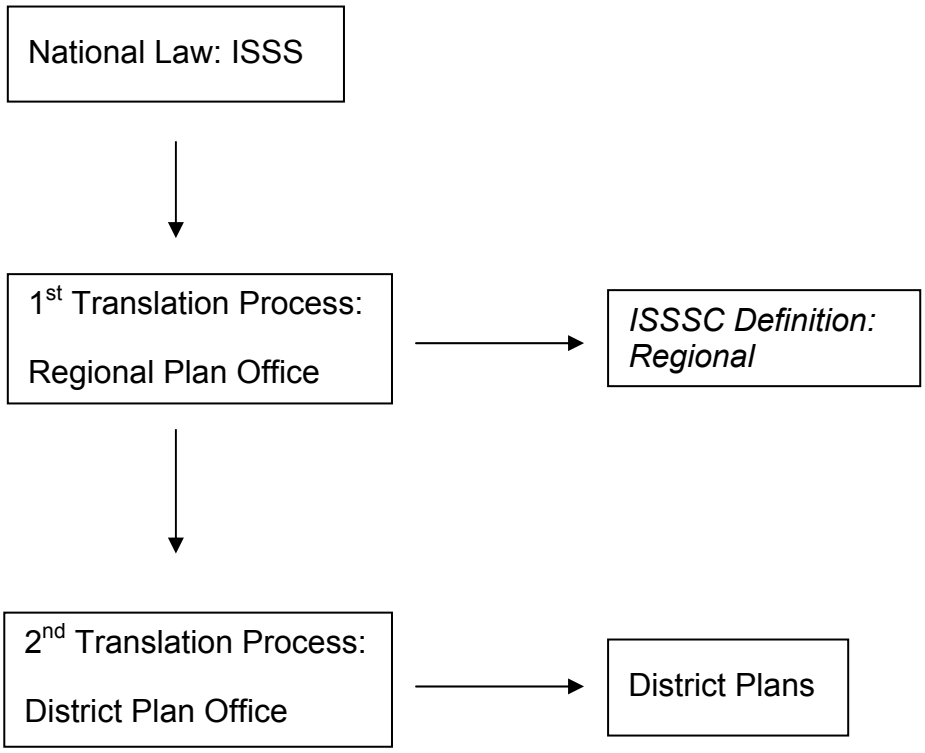
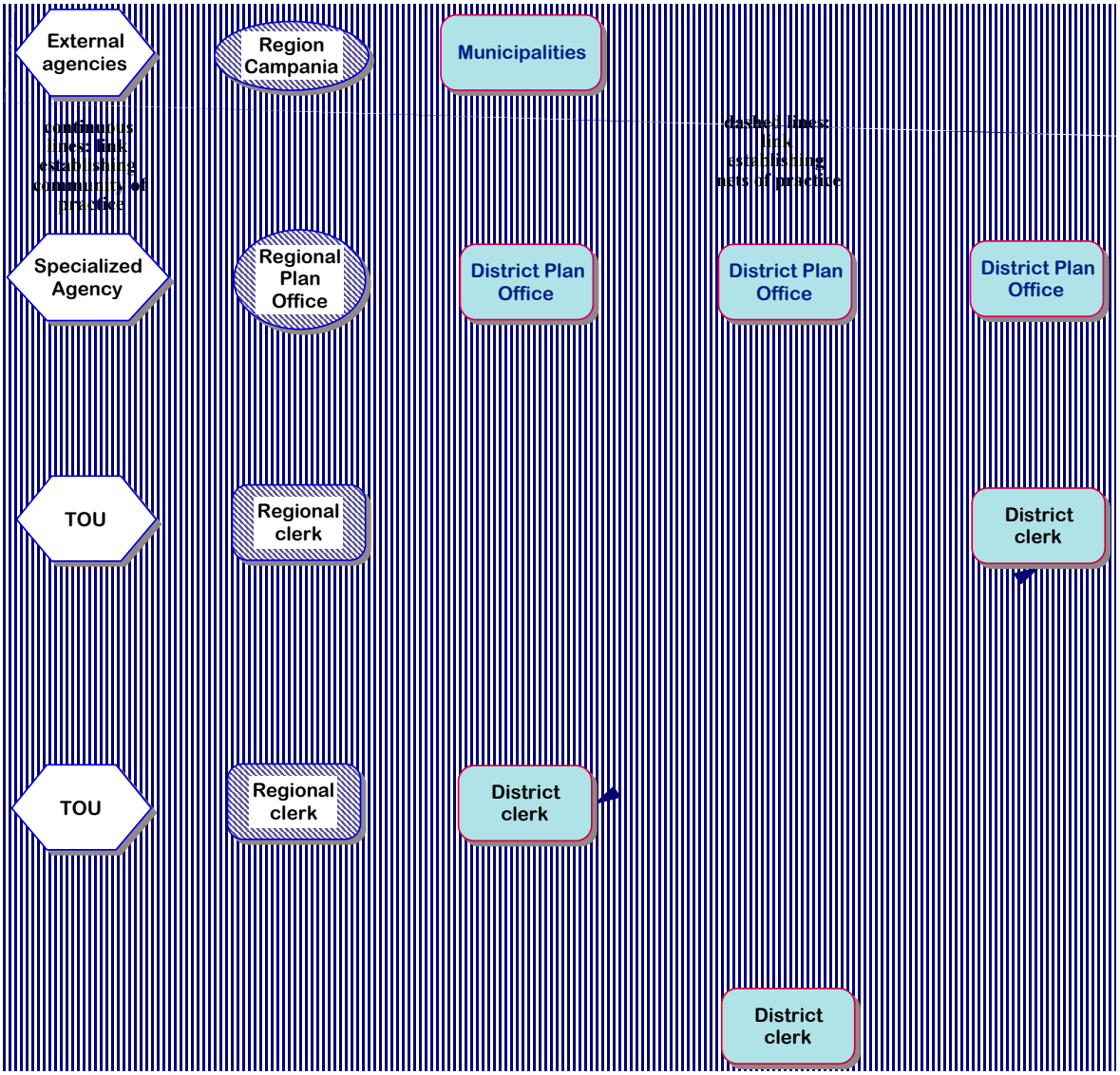


Fig. 2. *Exemplified drawings of the communities and nets of practice established in the welfare regional system (cfr., Brown, Duguid, 2000)*



Another relevant dimension was represented by the Regional Office Plan and its role: looking for less bureacratic and more professional ways of working, this structure was intended to interpret a technical supporting level for the functioning of the District Offices. And at the same time a professional and technical support was needed for the regional servants, being committed to discover and experiment new practices, new knowledge just as new tools for confronting with a completely new ways of deciding, planning, monitoring and evaluating the regional welfare system. For this reason the Regional Office Plan was supported by well trained professionals of external organizations, such as specialised Agencies and Universities. These professional supporting actors, the so-called TOU (Technical Operational Units), were intended to work in such a manner in the Regional Office

Plan: the creation of mixed couples of professionals, one regional servant and one external TOU, each of the couple confronting and supporting one or more of the District Offices Plan referring to the aggregated municipalities.

As the fig. 2 shows, during the years a creation of a new community of practice has come up from the Regional Office, but it is also possible to discover different communities of practice for every team-work (regional servant, TOU and District servants-professionals and othes less invisible actors) related to each one of the Districts. And, as a matter of fact, following the suggestions of the "travelling practices" (Brown, Duguid, 2000) it is possible to distinguish practice-networks via the connections performed by the actors belonging to different communities of practice, able to indirectly link actors not directly communicating with each other. Another noticeable issue is the fact that together with the networking of professionals, bureaucrats, and experts from the field, the Region has set up many Tables for the Participated Planning of the municipalities, reinforcing both the political and the professional networks for the decisioning and the implementing of the social policies.

This brief presentation shows that the reforming of the regional welfare system has been straightforwardly directed towards a model of *networks-governance*, at the same time *hybrid and emergent* in referring to:

1. the nature of the decisional processes within the Participating Planning and of the implementing ones, i.e., the practices discovered and experimented for the functioning of the District Offices Plan;
2. the features of the financial, regulative and expertising resources;
3. the non-human actors involved (quality methodologies, guidelines, information systems, etc.);
4. and above all the constitutions of new (nets of) actors, either formal or not, such as the Districts, the Tables, the regional Plan Office, the mixed couple of experts (the external TOU together with the regional bureaucrats), and so on.

Institutional leadership and knowledge leading.

The question of the leadership considered as something more than the traditional psychosocial vision of a super-actor and his followers, but as a social process in which institutional pressures and intentional agencies are comprised together, not to mention the unexpected consequences of this interaction, could be interpreted by these main side views:

the institutional sets of the welfare system as it has been evolved in the Campania Region:

the knowledge creating, transforming and circulating actually sustained for the changing social policies.

Towards an institutional leadership.

Individuating particular variables as conditions for the analysis of the public policies' management, the network management comes up as an equilibrated type between other two

regulation models, the bureaucratic management and the new public management. The network regulatory type is a solution that doesn't imply the vanishing of the bureaucracy and the quasi-market, but in a certain way let grow up mixed models of regulation, along the path-dependencies and the legacies of the policies and both the institutional systems (e.g., national states, regional governments, etc.). Considering five variables (cfr. tab. 1), actors, processes /relations, resources /instruments, objectives and agency logic, it is reasonable to interpret our empirical case as a regional welfare system exhibiting a strong tension towards:

1. new forms of «public/private partnership»;
2. «cooperative processes and relations»;
3. the disposal of «communication and knowledge resources/instruments»;
4. an «integration of objectives»;
5. the enacting of a «logic of trust».

It should be clear, by the way, that the term "tension" wants to represent the processual nature, never ended, of the change. The regional welfare system, in other words, seems to witness the progressive taking shape of a hybrid and emergent network governance, also beyond the intentionality of the agencies. The question about both the logic of trust and the communicative/cognitive instrumentalities is, furthermore, really in keeping with the weakness of the "technical" environment (Meyer, Rowan, 1977) in regard to the professional resources, as it has been showed for the planning and evaluating competencies. The regional institutions, in fact, are consistently trying to develop a more sophisticated and complex architecture of knowledge, as it will be discussed later.

Tab. 1. *Models of regulatory management (adapted from Fedele, 2002, and D'Albergo, 2002)*

	Actors	**Processes /relations**	**Resources /instruments**	**Objectives**	**Agency logic**
Bureaucratic Management	public	hierarchical	normative	sectorial	authority
Network management	public/private partnership	cooperative	communicative /knowing	integrated	trust
New public management	private	competitive	economic	aggregated	self-interest

It is worthwhile, then, to note that the considerable level of the efforts, implicated by the innovative tension for establishing the basis of a welfare system *enabling* the cooperation of a wide network of actors, has required a great amount of displacement of symbolic, professional, knowing, financial and trustee resources. The enacting/regulating frame of the interorganisational and intraorganisational governance relations seems then the resulting of an institutional and distributed leadership, founded on the close coupling of professional and

political actors, first of all at the regional level, but also empowered at the level of municipalities and social expertises.

It is, in fact, possible to recognize some moves of enactment and sense-making according to March, Olsen and Weick, scholars certainly very little prone to leaderistic shiftments, in studying the institutional and organisational change. The first two of them, as well known, when proposed to reject the instrumental rationality, recalling the March's famous articles about "footnotes" on organisational change (1981), were also suggesting to consider the latter as a normal phenomenon, except for three intentional forms of control (March, Olsen 1989, p. 102). These kinds of intentional control over the direction of the organisational change require:

1. a particular caring of the "attention" processes;
2. the monitoring of the "unexpected consequences";
3. and the elaboration of wider "meanings systems".

At the same time, in his studies referred to the loosely coupled organisations and the sense making, Weick (1995), has underlined three processes to contrast the loosely-coupling of different parts of a system (an organisation, a net, a policy, etc.). These processes, with a clear analogy with the above cited March and Olsen's conceptualization, are individuated as follows (Orton, Weick, 1990):

1. a "leadership intensification";
2. the "focusing of attention";
3. the "sharing of values".

With recurring at these *leading devices* it has then reached a very institutional leadership, especially by means of a close relation among the higher public manager and some of the regional councillors following the destiny of the regional social policies. This relation has in fact set up a relevant system of meanings oriented towards an innovative, almost *left-wing*, vision of a welfare regional governance where the "public" has the function of leading and empowering the other actors, institutions and organizations. A great impact of the changing social values, attitudes and behaviours has requested an enduring focusing of the attention and a relevant work for the sharing of values, but also of the cognitive and pragmatic frames. This kind of enactment has then not worked out as a result of the voluntaristic and heroic agency of a single leader, but as a process of distributing leadership in and out the boundaries of the regional organization. Such a process has enlarged the trustee resources and the sharing of values, knowledge and practices, and it seems reasonable to actually recognize a true intensification of an institutional leadership. As a result, this empowering regional welfare system has therefore implicated an increasing level in the commitment both of the municipalities' mayors and councillors and of the third sectorial organizations and associations, in participating to the decision-making and implementing of the social policies.

Leading knowledge.

The described model of regional welfare, in order to challenge the change and to enforce the chances of success, as it is understandable, should look for actors able to grant solidity during the time. After the discussion of the political and institutional conditions, we could argue about the role of the changing processes of knowing and establishing communities and nets of practice. One more traditional way of looking at issues like these is to consider the complex facets of the "normal" change (March, 1981), well beyond the explicit designing of organizational structures, rather than turning the eye towards the question of professional identities, established competences and daily practices.

1. following March the first paths of the normal change are the *problem solving* and/or *trial and error* processes, i.e. adaptative organizational routines; the ways of functioning of the new Regional Office Plan seem to fit this manner of changing when confronting with the problems arising from the newly established Discrict Offices Plan;
2. the *epidemic* diffusion, instead, appears to occur when the regional welfare system has begun to be more tightly linked to external expertises (as in the case of the TOU linked to specialised Agencies, or of the Social Information System committed to Universities) with the internal ones; in this case methodologies, techniques, languages and codes were trasmigrating from organizations to others and vice versa;
3. changing by *negotiation* has been neatly pursued when new places and times have been set up such as the Participating Planning Tables or as the Regional Direction Cabinet;
4. non conventional bureaucratic practices witness another type of normal changing, the *selections and variations* one, when new rules and procedures have been discovered by means of non-human, immaterial actors too (e.g., the enrolment of the regional Guidelines, or the District Plans, etc.);
5. last, but very important in our case, the *regeneration* model, via the turnover or the training of the human resources, has implied a considerable shifting of the "intentions and competences" of the actors, both the regional and the other ones; recruiting of high servants (the same higher manager of the Regional Department of Social Policy was coming from the outside) and clerks from the external of the Regional organization; new step of careers for the internal ones; contracting with professionals of specialized Agencies and academic professors and researchers; programs of training both about technical matters and the psycho-social climate; all of these are different experiences of a huge regeneration pursued by the leading network.

Most of the so-called normal change could be interpreted as the consequences of the privileged cognitive lens typical of a neo-institutionalist matrix (March, Olsen 1989); but in accordance with the practice turn, other interpretations let emerge less and less "normal" lectures of the change, for example referring to the "translation" or the "community of practice" approaches. Here we would like to offer a reading of the empirical case as an overview of such a change in terms of leading knowledge among communities of pratice,

seeking help from the interesting discussion of Amin and Cohendet's (2004) "four architectures" of organizational knowledge (see following tab.)

Tab. 2 *Architectures of Knowledge in the regional welfare system (readapted from Amin e Cohendet, 2004)*

continuous arrow: track already pursued by the Region welfare *dashed arrows: possible trends of evolution for the Regional welfare*	weak repetitiveness of interactions between communities	strong repetitiveness of interactions between communities
poor quality of communication between communities (lack of common codes, jargon, languages)	*weak communicative cultures* role of hierarchy in designing and imposing controlling an unified knowledge by prescripting procedures and techniques (technology as deterministic)	*strong tacit culture* coordination by leadership creating common knowledge and/or searching for knowledge aligning (technology as flexible or "mission impossible")
rich quality of communication between communities (existence of common codes, jargon, languages)	*strong codified culture* role of hierarchy in critical moments redefine the common platform of knowledge if radical innovations needed (technology as appropriated or "empty can")	*strong communicative culture* coordination by governance (distributing ledadership) enact the organizational form of the emerging platform of knowledge (technology as enacted)

These four types are created by means of a matrix derived from two analytic dimensions: the weak/strong frequence of interactions and the poor/rich quality of communication between communities (of practice).

In the first type (weak interaction/poor communication), a weak communicative culture is presented whereas knowledge is prescriptive: the hierarchy designs, imposes and controls ways of doing things and ways of knowing; the technology itself, even for mastering knowledge, is imbued of determinism.

In the second architecture (strong interaction/poor communication), a prevailing tacit culture asks for a (classical) conscious and intentional action of leadership, in order to create a common knowledge or aligning different knowledges; technologies are assumed as flexible, configuring a "mission impossible" when pretending to capture an intrisically tacit knowledge.

A strongly codified culture, where the role of hierarchy is needed when crisis is due to lack of innovations, represents the third type (weak interaction/rich communication); in such a

case, actors appropriate technology just to fill it, with their explicit knowledge, as an empty (garbage?) can.

The last one is featuring strong interaction/rich communication and, then, appears as a strong communicative culture; leadership should distribute between communities almost able to engage themselves in a process of governance and of enacting technologies for knowing.

The lecture of the empirical case here presented draws ispiration from this typology, narrating of leading (passions) for (innovative) knowledge from the first architecture to the second one, with open endings towards the third or the last types. The features of the second type, in fact, almost fit the transitional state of the regional governance of social policies: whereas a thick interaction among different communities of practice (cfr. fig. 2) goes together with a not yet sufficiently rich quality of communication, because of a persistent fragmentation of techno-specialistic codes and disalignments of langauges (even the political-institutional ones). The enactement of an insitutional leadership – in some ways recalled by the same designing mode of knowledge transactions among communities – has let the regional organization become the central knot for granting the empowering, not only quantitative but rather qualitative, of the network governance. The change till now realized, in other words, has been over the "dialogue among the deaf" characterized by the scarcity and the poorness of communication among loosely coupled actors, whereas the only way of leading must be interpreted as a hierarchical government, as in the bureaucratic model of organizing (and of knowing). The moves of leading by focusing attention, enabling trust, empowering competences and expertises, in order to favour richer communications and interactions among communities and the nets of practice, are anyhow recalling for further developments in order to obtain a more consistent solidity of the networks.

According to the architecture of knowledge is needed encouragement of traductions-translations of explicit and tacit knowledges accumulated thanks to the interactions among communities; a richer quality of communication could then be addressed also by means of knowledge codification such as the coordination of social information systems, via the adoption of ICT. The future configurations of the architectures of knowledge, as it is sustained by such an approach, can nevertheless assume two distinct states:

a. the first one is founded on a knowledge governance of the communities of practice actually selfmanaged and directed towards the enrichment of communications; the regional organization should play a role of distributing leadership and enacting an increasing quality of the sharing of knowledge – by this way the same ICT should be seen not only as "appropriated" but as creatively "enacted" (Orlikowski, 2000);
b. the other configuration sees the same rich quality of communication as above, but at the price of such a codification of knowledge that the interactions among communities will become less and less frequent – in this case the technologies, designed as repositories in order to pick up the codified knowledge, should risk to be the privileged intemediaries among communities; the leading role of the Region should then intervene only for surrendering innovations during crisis periods (e.g., for the duration of experimentations), where after codified knowledge couldn't be helpful.

We don't know how the welfare system of the Campania Region will evolve, because too many intervening variables, the political, the professional, the social ones and even the unexpected consequences render any kinds of forecasting at least very risky. It is possible to argue, anyway, that the season of building up a process of leading for the enabling and empowering of a network of actors, where the latter have tried to commit themselves in the exploration of new ways of sharing values, knowledge and practices will probably last until some "passion" will come up for some kind of "distributed leadership" (Gronn, 2000) or even for *leading without hierarchies* (Serpieri, 2002).

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Endnotes

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[2] ampania is a southern italian region, with a population of about 5 millions inhabitants and subdivided in more than 500 municipalities, the biggest being the town of Naples.

The Passion for Mathematics
Emotions, knowledge and mathematics in and out the university

Paolo Landri[1]

Introduction

"I have not certainties, at most probabilities"

"If you are afraid of something, measure it,
and you will realize it is a mere trifle"

(Caccioppoli)

This paper is intended to address the question of the emergence of the passion for knowing and learning in communities of mathematics in and out the university. In that respect, we will try to show how this coming up is accompanied by a *semiotics of passion for knowledge* that represents a situated theory of a particular culture of proving. The passion implies a process of abandonment to the objects of knowledge of a given community. The attachment to the objects develops within the ordinary practices of a community of knowing as a particular characteristic of that social world. However, the acknowledgement of the passion seems to require a semiotics which helps to make the feelings culturally accountable.

We will focus on these dynamics, drawing on a research on the practice of mathematics. The study started with a focus on a famous mathematician, Caccioppoli an innovator in his field who live from ´20 to ´60 in Italy and developing a community of practice within the social world of mathematics. His works and the "products" of his community secured a connection with the innovative developments in that discipline during difficult years (he worked during the fascist regime and at the end of Second World War). In that case, the passion did not regard the mathematical object per se, rather implied a widespread recognition of that objects as cultural entity.

The practices of mathematicians has not been the focus of many social studies of science (Bloor, 1976; Pickering and Stephanides, 1992; Livingston, 1986, 1999; Mc Closkey, 1999; see also the organizational ethnography of Strati e Gherardi, 1990). In addition, a prevailing prejudice on that knowledge tends to describe that discipline and their interpreters as not so "passionate", while a more internal view is able to highlight how the passion is relevant for sustaining the process of learning and knowing for mathematicians in and out the organizations they inhabit.

At the theoretical level, the point of departure are different contributions in the theory of situated learning (the COPT, Lave and Wenger, 1991, ANT, Latour, 1987), i.e. the recognition of the embeddedness of the mathematics in a socio-cultural context that actively contributes to the making of the mathematical objects. Accordingly, mathematicians work in epistemic communities orientating the everyday activities. The research program draws on qualitative methodology and reflects on in depth interviews, documents (letters, books,

movies analysis, newspaper's article) as well on the studies of contemporary and "historical" mathematical practices. In the following, we will briefly focus on the theoretical framework of the research; then we will draw attention on a profile of a semiotics for passion in mathematics emerging from our research program; finally, we will discuss this first findings, by trying to develop future directions for the not completed yet fieldwork.

Situated knowledge and learning

The *theory of situated knowledge* represents the framework we assumed in order to devise and try to interpret our historical data as well as the contemporary data we collected. The *situated theory of knowledge* is an "overlapping zone" of diverse theoretical approaches (activity theory, phenomenology, symbolic interactionism etc.) emphasizing the link between knowledge and practice, revealing the embeddedness of learning and knowledge within a social dimension (the concepts of community of practice and network based practice) and agreeing with a mediated approach to agency. In that view, the practice is considered both the generative side for knowledge (and learning) and the pathway by means of which the knowledge can move and translate. The classical distinctions between "knowing that" and "knowing how" (Ryle, 1949) and the reference to the tacit dimension (Polanyi, 1966) can supplement that point. *Knowing that* is what is explicit, regards rules and information that can be transferred by means of the ordinary channel of learning; *knowing how* is knowing-in practice with an inescapable tacit dimension, not completely addressed or referred to in an analytical mode ("we know more that we can tell" as Polanyi observed[2]) that can be extended only as long as the practice is extended, or to say in other terms, participating to a community of practice (Lave and Wenger, 1991). In that sense, "knowledge of that" implies knowledge of how" in order to translate the rule of appropriateness without which information and rules seems to "resist" to be transferred and, in some cases, cannot be applied properly. An useful distinction for the purpose of our work has been to consider beside the alternative and complementary *situated knowledge* and *tacit knowledge*, the *disciplinary knowledge*, i.e. to address more explicitly the question of codification of knowledge (Guile and Young, 2003) that can develop for research objectives as well for educational goals, but still for defensive strategies. As we will see this categorization allows a more dynamic view of knowledge making letting emerge the politics of mathematics in a more direct way.

The issue of the difficulties of the *circulation of knowledge* (knowledge can be "sticky") draws attention on the *problem of the context*, i.e. on the social contexts where knowing, learning and working develop in practice. In that respect, the empirical and theoretical debate around the notion of *community of practice* leads to identify new units of analysis not completely aligned with the traditional places of educational and research (*network of practice*, see Brown e Duguid, 2000, and *social system of learning*, Wenger, 2000). The reference to the "social character" of the process of producing knowledge and learning can be found in other similar concepts, like those of *epistemic cultures* or the *community of knowing*

(Knorr Cetina, 1999) and problematizes the traditional theory of knowledge which tends to consider knowledge and learning, in a separate way and to detach the process of learning and knowing from the social contexts, the nets of subjects-and-objects where they are significantly embedded.

The reflection on the sociality involved in the circulation of knowledge leads to consider with attention the *materiality of learning and knowing*. A situated theory of knowledge is, in particular, a theory of the "distributed cognition" since it underlines how the process of knowing is social process involving a non human side which is not irrelevant for the results in terms of knowledge and learning. The relevance of materiality draws attention to the techniques, the artefacts, the objects, and the tools that represents the embodiments of knowledge and, partly, the carrier for the process of knowing in a particular social setting. The social bonds are mediated linguistically, but even by means of heterogeneous networks of objects, artefacts and activities. Objects and tools, in turn, are itself the relational effects of an action nets and represent the translation of knowledge and competencies in a set of materials. Of course the acknowledgement of materiality develops as a consequence of a theory of agency where the process as well as the concept of mediation are an important question at the theoretical level since it is intended to point out a way out for confronting with the objectivity of the social without embracing a deterministic view about the role of the objects in human agency and escaping from the dominant perspective of knowledge and learning as disembodied practices.

In taking this theoretical position, we will have a *heterarchic view of the social* (Latour, 2004) by paying attention to the many subject and object networks that constitute the society. Consequently, we will make a tentative to conceptualize in a different way the link between mathematics and society, by looking at the socio-logics of our actors, i.e. following our mathematicians and describing how they construct their associations. Here, the tentative is to reverse the external view of a "social" that affect mathematics, by trying to understand from inside the attachments, the subject-networks where mathematicians are involved in and contribute to shape. In this way, we will treat mathematicians as sociologists who write their sociologies for us.[3]

A semiotic of passion for mathematics

The essay draws on a preliminary report of a research on Caccioppoli, a mathematician well known for his genius who lived in Neaples (Italy) in a difficult historical period which comprehends the fascist regime, the Second World War and the first post war reconstruction. Our reflections have been based on historical sources as well as on contemporary data collected during the periodical meeting for the collective remembering of Caccioppoli's work regularly organized by the mathematicians and those who knew him as an *engaged researcher* since the end of '80.

The richness of the materials collected about his work and on the works of his contemporaries' colleagues is really important and, at the moment, is not easy to frame a unique pathway of analysis since it can offer some insights for a variety of interests. Talking about "Caccioppoli" means analysing the work of a mathematician, and in particular, the work of a emergent community of mathematicians as well as to dealing with the link between his work as academic and story of a city within Caccioppoli plays the role of a contemporary myth. Many people, from the elites of the city to the "ordinary" citizens, knew him and are ready to tell a story about him, even if as it usual in that case, not all the stories are completely relevant or convincing enough to draw some conclusions about. The difficulty of the study is even higher since the work of mathematicians are really technical and obscure from the point of view of a sociologist, like me, who can be considered as "outsiders" i.e. a reseacher from another discipline without the appropriate set of competencies for translating the technicalities and the subtleties of the practices of a community of mathematics. Usually, this "resistance" emerges as a refusal in giving description of work and of the everyday practices and with a dominant attention not on making discourses on mathematics, but on *doing mathematics* (see for example, the known Hardy's book, 2002). In our research the tentative has been to find an approach for decentring from the subject and describing instead, the mutual constitution of subjects and objects of a community of mathematicians. In following this way, we have tried to redistribute Caccioppoli to the *subject and object networks* where he was involved in and he contributed to set up at the local level. This work offers a behind-the-scene view on mathematics; it gives a description of the making of mathematics and starts to find a way for approaching the *making of* mathematics. Most scholars have noted a notable difference between the *formal mathematics* as it is presented according the codified learning process of mathematical knowledge inside the formal organization of education and training (schools, universities and higher educational establishments) and *informal mathematics* from the point of view of those who produces this objects of knowledge. The formal mathematics tends to present itself as an abstract and decontestualized knowledge, and, from the emotional side, as "cold" and "not passionate", while producing negative feelings, like frustration, anger, and disappointment for those who learn it.

The *embodied mathematics* in the making looks completely different; it can highlight levels of tacit knowledge, not completely formalized; situatedness in the context of practice; a mix of feelings and emotions to be contained in organized tracks of materialization and formalization; similarity to artistic endeavour than to a technical plan; a history, a set of trasformation and change during time (it is very important to remember that the proving of theory is usually a paper-and-pencil work, so the proving of a theory by means of computers, for example in the history of the four colours theorem in McCloskey, 1999 raised the question of "what is actually an admittable proof"). Here, it can be interesting to take an anthropological theme, and considering, as for example Livingston does, the work of mathematicians as a *culture of proving* that is possible to describe and analyse from the perspective of its production/reproduction. The research materials we have at the moment

allow comprehending what are the characteristics of the *culture of proving* within which the epistemic communities Caccioppoli, his colleagues and his students were embedded. We have focused on the *social texture* of that culture and, in particular, on the emotional side of this texture, how it emerges, stabilizes and reproduces through process of collective remembering. We will address, in particular, on the *semiotics of the passion for knowledge* in that culture, i.e. on how it is recognized from the point of view of the community of mathematicians. This situated theory seems to be characterized by five features: the *policontextuality*, the *ability to engage in controversies*, the *organization of emotions*, the *beauty of mathematical objects*, the *fictionalization of the knowledge-maker*. We defined this pattern, by a careful reading of historical data and accounts as well on the observation of practices of collective remembering and supplemented the emerging features with more general reflections from the relevant literature.

Policontextuality

A first feature of that semiotics is given by the practice of policontextuality of Caccioppoli's work and later on of the mathematicians in some way to be acknowledged within the Neapolitan mathematical school. This implies a multiple engagement in different field of activities within mathematics as well as beyond mathematics. Caccioppoli's style as a starting point of this way of working tends to be distributed within the epistemic culture developing along the time. While it is somewhat difficult to point out a starting point for that practicing, the narratives of the field suggest that the choice of doing mathematics for Caccioppoli depended on a feeling of challenge. Doing mathematics is not easy and it is not frequent to practice is an excellent way. Here, the passion for mathematics is accompanied by an expertise in music's, a sensibility towards poems and literature and more in general towards the arts as well as for the emerging movies industries. Caccioppoli became very well known for his passion for politics; he was anti-fascist and his political position leaded him next to the Italian Communist Party during the period of the Cold War. This was very costly because he was first temporary imprisoned in a mental home before the war for a demonstration against fascism[4] and then he suffered after the war from the ongoing control of his activities and travelling (for example he was prevented from participating at an international meeting of mathematics outside Italy). The passion for mathematics was favoured for the influence of two convergent movements: a pressure, in some way, forcing him and an event that enrolled him. The former is that of his family which was worried about the vocation of Caccioppoli for music and tried as far as possible to orientate his decision for a professional practice they considered more appropriate for his social position and familiar choices usually moving in traditional social circles and towards liberal profession or academic position (an aunt was a professor of chemistry at the University of Naples). The latter, the enabling event, was the passage to mathematics after the degree in engineering when he met Picone, a mathematician who acknowledged his talent. Picone guaranteed him the access to

the "academic tribes" as well as secured him to participate at the wider epistemic communities of mathematicians. Similarly, when he became a full professor, he repeated with his students this kind of enrolment practice where the access to the knowing practices of the field was accompanied by the recognition of an appropriate performance in mathematics and with the participation to a community of practice. Those who were chosen for mathematics in most of the cases shared similar interests for policontestuality and passion for knowledge. At that time (we are during the '20 of 1900), Caccioppoli shared his interests in mathematics within a team of other four young mathematicians being in contact with Picone. Here, Picone played the role of an academic entrepreneur *avant lettre*. Later on this passion transformed into a local network of practice where different community of knowing developed around his charismatic and scientific leadership. The embedded socio-logics of this passion established unexpected associations with the social worlds of mathematicians and the political as well as the intellectual arenas of the Naples.

Engaging in Controversies

Two mathematical schools characterized the mathematical landscape for this emergent community of practice in functional analysis. These two school were commonly referred to the work of two actor-networks, respectively Tonelli and Picone. To some extent, these schools represented the most relevant in that field in Italy between the First and the Second World War (Guerraggio, 1998). Yet they followed different research programmes. The contrasts, and in some cases, the open conflicts between the two schools produced notable frictions and reciprocal charges of unusefulness of the respective production. Tonelli's position was, in some way, a traditional one, since he was quite critical about the processes of abstraction developing as a consequence of the emergence of the functional analysis as a further area of investigation of mathematical knowledge. Furthermore, Tonelli's work and of his common colleagues were quite distant from the application side of mathematics. Picone's attitude, on the contrary, was more flexible; he was able to work as institutional entrepreneur in applying mathematics while securing room for the development of functional analysis at the level of more fundamental research. This opening allowed to remaining aligned with the most relevant emergent knowing processes in mathematics at the international level. In addition, the attention paid for applying mathematics leaded to the foundation of the first institute for mathematical application (INAC) and to extend a wider and longer network of practices with the respect to Tonelli's school.

The political views were different too. The former was explicitly against fascism, with the effect of being marginal of the academicals life in order to preserve his doing mathematics; the latter, instead, showed clearly his liking with the fascist regime up to point to consider his work as a notable expression of mathematical fascism, even if he was very able to regain its position after the demise of the fascism and at the end of second world war, escaping from the political initiatives aimed at the substitution of those who have been profoundly engaged with

the fascism inside the academicals environment. Many episodes witness the conflicts between the two schools; this implied the confrontation between the leaders as well as between mathematicians of the different schools by means of polemic writings. The frictions regarded proving and mathematical objects. The focus of those frictions was on errors or on oversights during proving as well as on proposal for alternative proofs that called for attention because more "elegant" and "simple" for getting to general and more abstract solution. These controversies delayed on time and allowed the visualization of reasoning already presented, but probably written in a not sufficiently clear way. This produced the publications of addenda and new mathematical notes. Here, the issue at the stake was the mathematical rigour and the consequences in terms of scientific credit. The effect of the critics could have determined the stop of circulation of ideas contained within publication, i.e. the production of obstacle for the network extension of the schools with consequences for acknowledging the originality of the works and negative influences for the search for simplicity in proving.

Caccioppoli will receive critical reviews by Radò and L.C. Young on *Mathematical Reviews*. Caccioppoli (1952) noted after some time after the controversies was settled: "… some ideas (not all the ideas) inspiring my works are quite diffuse since now, yet some errors they brought with them have provided either a reason for ignored them or the only theme for the quotations". This seemed to be not really important (*felix culpa*) for him, since this did not prevent him to point out "fundamental facts and more appropriate methods". The temporary effect, however, was an obstacle to their circulation, which was removed only when the "value" of their proving was made more explicit and accountable. Here, this occurred when another mathematician, De Giorgi who worked during the post-war with Caccioppoli for a long time, was able to make more explicit the meaning of the already mathematical procedures undertaken and was able to overcome the controversy. Here, it can suggest that the *situated knowledge* can be sticky, i.e. difficult to detach from the production site. This creates dialectic with the *disciplinary knowledge* that tends to circumscribe the objects that can consider an appropriate knowledge in a particular scientific field. In an interesting and complementary model, Rotman suggests that the "mathematician" is embedded in three codes (*Code*, *Metacode*, *Virtual Code*) that can be considered as repositories he/she take into account during the waking dream or the thought experiments that leads him/her towards the making of mathematical objects. In particular, the *Metacode* is given by the set of non rigorous mathematical procedures that are significantly are embedded in a given culture of a particular sociocultural context and are expressed in natural language; the *Code* represents, instead, the set of formalized mathematical procedures to be considered as rigorous; the *Virtual Code*, finally, is the domain of all the legitimated signifying operations. Each code has its spokesperson: for Metacode, the "Person"; for the Code, the "Subject" and when it comes to the Virtual code, the "Agent". "Everyday mathematics can be described as thought experiment or waking dreams where an idealized imago has been propelled in a landscape of signs and in particular, the Person (Dreamer Awake) observes the Subject (Dreamer) imagining a proxy of himself (Agent) carrying out a set of available mathematical operations

and come to be to persuaded of the appropriateness of these practices, i.e. of the likeness between the Subject and the Agent" (Rotman, 1999). From this semiotic model, the Code, what before we have addressed as disciplinary knowledge or the formalized mathematics is the end result of a complex negotiation within persons where different codes are mobilized in processes of defining, proving and persuading. Our examples suggest in addition that this negotiation can develop among epistemic communities and can be presented as an *intersubjective thought experiments* fuelled by controversies and pathos for knowledge.

Organising Emotions

The passion as abandonment to the object of activity, as enabling and supporting factor for mathematical practices can have some disruptive effects: a semiotics of passion for mathematics suggests, accordingly, to "containing" it in some way or another. Here, communities of practice can be considered as container of passions. Picone's school is not only an epistemic community, but it even presents a specific combination of cognition and emotions. At the beginning, it comprehended four young mathematicians: Caccioppoli, Cimmino, Scorza Dragoni, Miranda that worked in Naples since '20 and then chose their own way, but that remained commonly bound by common interests and objects, even if most of them starting to go away from Naples to working in another Italian cities. Here, it is possible to refer to their work together as "heedful and related activities". This team had a good mixture of competencies that will allow the development and the stabilization of their activities and that will lead to an internal differentiation of their respective identities as a process of mutual constitution of subjects and objects. Caccioppoli played the role of "genius", but presented, sometimes, a language for initiated; Scorza Dragoni, on the contrary, was able to visualize and to formalize what in the making of mathematics could have been tacit, or situated, but possibly to make more explicit. Miranda, however, was the *organizational alter* of the group and was able to establish a fruitful link with Caccioppoli at the local level. He set up an infrastructure for this fabrication of knowledge, by guaranteeing it stability over time. The link Miranda-Caccioppoli developed both at scientific and at the academic level and during the everyday life. At the academic level, they were engaged in the difficult work of reconstruction (we are just after the end of the second world war) of universities, so that they were able to set up again the Library and the Institute for Mathematics in Naples. In addition, they cultivated a local scientific communities (they will be the mentors of a new generation of mathematicians, like Cafiero, Stampacchia, Greco, Ciliberto, Stoppelli etc.) and disseminated the results within the scientific community. In this respect, particularly important is Miranda's work that started a process of transferring knowledge towards wider epistemic communities. The work of Miranda suggests he was a sort of container of the less regulated colleague. A contemporary like De Lucia noted "… the two men were complementary, a situation of competition and rivalry should have been a disaster; Miranda's skill and kindness in using his talents in organising and his ability for the

systematic work even at disposal of his brilliant, but untidy colleague that suffering bureaucratic and administrative trammels, is without doubt the basis on which it developed a relevant mathematical school". Similarly others, like Zappa for example observed how Caccioppoli talked not so much during the faculty meeting, leaving Miranda expressing his position (Sbordone, 2004).

Here, the "organization" is associated with different feelings. On one hand, there are negative feelings, while the passion with the joyful abandonment to the mathematical object is referred to the practice of the making mathematics. On the other hand, there is the recognition of the limits of the passion and the importance of reaching a temporary balance between outside and inside community of practice, between situated and disciplinary knowledge, between the passion for mathematics and the practice of boundary crossing towards other cultural practices. As a result, organising practice implies an ongoing work for establishing boundaries and containing emotions and passions. In some way, these alternatives suggest different socio-logics and politics of involvement into the "social" of the mathematical epistemic communities.

The beauty of mathematical objects

An important feature in this practicing mathematics seems to be the *aesthetic judgement*. Here, the mutual constitution of subject and object which represents the social texture of the epistemic community come to be stabilized unexpectedly (in an view that consider mathematics exclusively from the analytical-rational mode of reasoning) by means of sharing metaphors and the beauty of mathematical objects, i.e. through the appropriate performance of an aesthetic judgement. The quotations from the materials we collected about Caccioppoli and the epistemic communities we have considered are abundant about.

In an transcripted conference (see Carbone, Cardone, Palladino, 1997), Caccioppoli talked a lot about the new development of the functional analysis, yet he did not use formulas and he decided not to writing at the blackboard. Here, the discourse has been developed through hints about the reasoning in their making and by using metaphorical concepts. At the end of the conference, he says he had presented:

> "…Not a method, but a general direction. A point of view if you like, a taste a sceptical will be able to call it, a plan probably a politician and, why not? A state of mind a poet can call it, so as Anouil used to refer to the landscape as a state of mind, at the end a set of theories could be a state of mind"

Cimmino, one of the first four mathematicians of the Neapolitan school, remembers how Caccioppoli explained him the difference between *esprit de geometrie* and *esprit de finesse*:

> "…I recall only a detail: one of first times we met at the beginning, he explained the intriguing difference Pascal proposed between *esprit de geometrie* and *esprit de finesse*. And he

> complained because in his view I preferred to refer too much to the former and lesser to the latter"

Again, De Giorgi noted how looking at the Caccioppoli's mathematics we can easily address:

> "…The idea of pytagoric harmony, i.e. the idea that at the end the mathematical construction should be a beautiful and harmonic construction, not a disordered decoupled construction, without beauty"

The relevance of beauty for mathematical objects is confirmed by other autobiographical accounts made by other famous mathematicians, like Hardy's and Toth's. Hardy for example stated an important argument about the question of usefulness and the mathematics. In particular, he argued that there is no place for "ugly" mathematics; the important mathematics should always be beautiful. As a consequence, the ugly mathematics is applied mathematics, the useful mathematics. Similarly other sociological research, like that of Gherardi e Strati (1990), addresses the question of aesthetics judgement by highlighting the relevance of beauty and the trivial for the texture of organising of a mathematical department. It is important to note that the aesthetic judgement is neither individual nor solely a retrospective account, rather it is an ability a mathematician have to display in order to be considered a competent subject of a given community of practice. Furthermore, it seems to be internal to the making of mathematics since it helps in choosing between alternative modes of reasoning. Here, the beauty, the stylish can help in selecting among many equally correct proofs. By taking the classification we considered in previous paragraph, we could point out it belongs to the tacit and situated knowledge of a definite community or network of knowing.

Fictionalization of Knowledge-Makers

The semiotics of the passion for knowledge and for the originality of the scientific production can lead to the *fictionalization of knowledge-makers*. The knowledge-maker can become object/subject of storytelling with the effect of producing a mythology. These stories and their materialization contribute to the processes of (re) production of the passion for knowledge in a particular discipline as well as for the intellectual work as such. However, not all the stories seems to present the quality for being mythical and/or for be translated into artistic productions. Some elements of "extraordinariness" look relevant, but unresolved conflict and open dilemma can offer an added appealing value. An important theme can be the imbalance between emotions and rationality, between passion and mind. In mathematical field some examples are given by Evariste Galois a young mathematician who died during a duel; or recently, by Nash, a Nobel awarded researcher, who suffered mentally. Caccioppoli's life contained many ingredients for becoming mythical. First of all, the tragedy of the death:

Caccioppoli decided to kill himself in 1959. The event had a notable dismay both in those who knews him directly and in public opinion, coming up to the attention of media. Regardless the wide participation to the funerals, mainly for political reason the comments appeared on newspapers were not so friendly with the dead. The suicide was a shock for his students and friends and the emerged outcry produced a defensive reaction within the networks of practice where he was involved in. As a result, the mathematicians preferred to keep the memories in a secret way refusing to talk about him for several years after the death. However, the policontestuality, his ability in moving in different arenas of cultural production favoured many contacts with other social worlds and strengthened already when he was alive the recognition of his exceptional way of embodying intellectual activities and the mathematical practices. His passion for politics, his being communist, even if not officially registered as a member of the Party, but his political demonstrations during hard time both during the fascism regime as well as during the cold war were ingredients of the uniqueness of life. The life apparently without rules, and characterized by a multiplicity of abandonment and lost of self in many cultural activities was another point that triggered the development of many memories and stories, even if it is not easy comprehend if invented or not. This way of life living similar to a work of art has nourished a process of collective remembering that regarded the community of mathematicians at the beginning, but later on, since the end of ’80, involved the other social worlds within the mathematician was in contact. The mobilization of other social worlds has produced: a documentary which contained many interviews and testimonies of colleagues and students (the director was Marussa Gravagnuolo); a movie, called “The Death of Neapolitan Mathematician” (the director was Mario Martone); many books that represent the documents of the respective commemorations, but even some books on the edge between the historical description and the literature, where Caccioppoli is an essential character of the Naples of the ’50 (playing a central or a peripheral role, see for example Toma, Rea etc.); the naming of an asteroid to Caccioppoli; a theatrical play drawn on a set of letters among Caccioppoli, other mathematicians and Picone, the academic entrepreneur we talked before (called “Il Gallo al Guinzaglio”, i.e. “The Cock on the Lead”).

Here, the research on the mathematician’s life and work produces materials to be organized in different ways for different audiences during the events of memories. In this way mathematicians contents come to be discussed with many other social worlds; the community of mathematicians enacts meeting points and produce attention towards mathematics exhibiting his fascinating and passionate side, let emerge again the emotions by means of a multiplicity of cultural practices (the public discussion, the movie, the theatre etc.).

However, the practice of collective remembering can lead to conflict on the memory while at the same time activating a process of learning and cultural (re) appropriation. This seems to be a side effect of applying dominant institutionalized classifications. To classify can create “sufferings” while it creates inclusions and joy for remember (see the interesting Bowker an Star’s on classification on that). And the memory becomes a contested memory. Here, the cultural (re) appropriation can hide the mathematical practice that represents the main activity

of our mathematician for the limited possession of mathematics inside the networks of society. The visualization of knowledge maker's life can be more transferable with respect to the description of working practices where the knowledge of the field is needed in order to understand the fine distinctions of practice and appreciate their individuality.

These tensions were particularly visible after the carried out of Martone's movie. The comments and the debates following that work (Risma, 1993) showed a clear division between a *realist* position that confronted the product of collective remembering with the direct experience of the knowledge-maker and try to defend his memory as a "mathematician" and a *constructivist view* more willing to work on the myth so that to select some elements useful for the purpose of the artistic performance, with an emphasis on a likelihood criterion instead of a validity claim to a scientific level (see for example Toma's and Rea's books), even at the cost of forgetting in some way the mathematical background. This division is still now in place, creating objects and opportunities to remember that mobilize networks of practice that can be different depending on the dominant focus either on the political or scientific side.

It can be noted how this opportunity can be considered as *hybrid forums* (Rip, 2003) where participants of different social worlds meet together and activate processes of collective learning with a high emotional intensity. There, the emotions are provoked by human witnesses and/or media representation (exhibits, movie, theatrical representation etc.). Furthermore, in that case we have an improvement of the materialization of the memory that can ease the agreement (as in the case of theatrical representation "The Cock on the Lead"), at least temporarily, between the different memories. The searching for agreement is supported by the emergence of new materials of research (a set of letters within and between Picone's school and the other mathematical communities) and by the development of competence as an effect of the learning processes of those called for translating mathematical practice in a way perceived more and more appropriate for those internal to the world of mathematics. The possibility of these forums, however, is far from recognized in terms of exchange between the world of mathematics and the other social worlds and is not completely acknowledged for producing a more comprehensive view of mathematics and for assuring sustainable exchanges between social worlds.

Discussion

In this working paper we have presented some research materials in order to draw attention to a semiotic of passion for knowledge embedded in a culture of proving. This furnishes descriptions of mathematics "behind the scenes" by highlighting some stories of the making of mathematical knowledge of some years ago. The work we have done is not completed yet and we need additional information and, probably, of pointing out an appropriate strategy of research that can overcome the defensive strategies of the mathematical communities still suspicious about the possible misunderstanding of one of its leading figure. We will focus in this last paragraph on several concluding points in order to point out some initial reflections

about the social processes we presented and the future challenges of this research project. We grouped these themes in three threads: the question of *organizing and knowing*, the *politics within mathematics* and the *body of mathematics*.

Organizing and knowing

The universities and the establishments of the higher research play a subordinate role into the narrative we took into account. Mostly important are the epistemic communities that work outside the organizations or on the organizational boundaries. This probably depends on the difficult environment they were dealt with because of the excessive political pressures as well as of the war effects. As matter of fact, after the war the universities had to be build again, therefore it can be concluded that the workplace for the mathematicians were wider than the academic infrastructure. The place for the emergence of the passion for knowledge is the community of knowing that live in an interorganizational field; the single universities are a channel for making the accessing/recruiting process more stable. The access to the coomunity of knowing was generally granted by the acknowledgement of the senior researcher who chose those with the quality for making mathematics. However, if the passion for knowledge is the drive for the making of mathematics, the passage to the ordinary practices of organising implies a delicate mixture of expertise. Here, it seems to be relevant the learning of organizational competencies (see what we observed with the respect to the relationship between Caccioppoli and Miranda for example) that allow an infrastructure for the processes of knowing as well as the expansion and the reproduction of the epistemic community.

Politics and Mathematics

The trajectory of growth of this community gives some information about the links between politics and mathematics. Again the epistemic community and the internal equilibrium are relevant for the making of knowledge as well as for the confrontation with other communities of knowing. The frictions between the schools suggest the clash between different paradigms. The paradigms orientate the respective culture of proving, recommend different style of analysis and conclude with different results. The controversies highlight different way of reasoning that required an ongoing interplay between the tacit, the situated and the disciplinary knowledge. The issue at the stake is the mutual recognition of the scientific credit and of the competence as a member of the academic mathematics. Here, the brief accounts we have told represent a further display of the role of the politics within an esoteric science, like mathematics that is visible if we look at the overlapping of the *core-sets* and the *core-groups* within the research networks that confronted each other (see Collins and Evans for these concepts, 2003).

Politics is clearly emergent looking at the *work of controlling the boundaries* from the external interferences within the mathematical practices. Again, that practice is relevant for securing the development of mathematical knowledge as well as for promoting their

knowledge-makers especially when dealing with other scientific disciplines. Further, the role of leaders of actor-networks we have talked about was obviously political in defending the boundaries of the community as well as for expanding his relevance for knowledge making in mathematics.

Finally, the episode of the contested memory suggests that the networks of practicing mathematics pay particular attention to reinterpretation of the memory of the former mathematicians by the possible appropriation of the memories from other disciplines as well as from other social worlds. The strategy of silence after Caccioppoli's tragic death can be interpreted as an extreme alternative for standing at the boundaries and defending from a possible reconfiguration of identity *post-mortem*.

Embodying Mathematics

The stories of our mathematicians suggest that mathematics is not a cognitively abstract discipline, but operates in a *social texture* far from being "cold" with respect to emotions and passions. Therefore, it is possible to conclude that mathematics is embedded like any other fabrication of knowledge to its socio-cultural context. Further research is required to clarify this connection and revealing the implications for making mathematics as well for the links with other communities of knowing. Probably, this would imply a more internal view; several studies tend to favour such approach and prepare the way for a more comprehensive understanding of the field. The semiotic model of mathematics (Rotman, 1999), the study of conceptual practice in mathematics (Pickering et Stephanides, 1992), the ethnometodological analysis (Livingston, 1999), as well as the recent sociological analysis and the historical accounts of mathematics seems to convergence in considering with more attention the social aspect of mathematics. Not to mention recent works in anthropology that suggest the embeddedness of mathematics in all the human cultures. An interesting perspective could be to analyse, reinterpreting Latour's famous statement (1994), the body of mathematics, i.e. conceptual practices and the materializations as they emerge within an epistemic culture and reproduce during the everyday practice of mathematics. That approach could permit to produce an appropriate account of making mathematics in order to shed light on the intertwining of emotions and cognition (Fineman, 1996). At the moment, this line of research would imply a competence of translation not so widespread within the social studies of sciences. The thick description of mathematical practice could reverse the diffuse prejudices about that discipline, help in devising educational curricula more appropriate for improving the teaching of mathematical knowledge and mobilizing an ongoing attention towards the discipline. Studying the situated character of making mathematics neither affect the belief of the objectivity in mathematical knowledge nor necessarily lead to radically post-modern position with the respect to knowledge (Lakoff and Nunez, 1999; Pickering and Stephanides, 1992). It can open, on the contrary, some additional "glances" on scientific practices attributing a higher value to aesthetics (see on that Strati, 1999), while problematizing the

question of the utility of knowledge and of their application in practice easily transformed in an unreflexive rhetoric.

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Endnotes

[1] CNR – IRPPS, p.landri@irpps.cnr.it

[2] Polanyi here develops a Plato's issue.

[3] This is partly similar with the Gomart and Hennion' research on drugs and music amateur (Law, Hassard 1999)

[4] Apparently, he sang "La Marsillese" in a bar at the end of the day Hitler was in Naples. Here, the episode became a source for narrative accounts retold as a legend from time to time. However, this contrasted with the police's account that underestimated and reduced the event as generic demonstration against fascism and nazism. It can be noted how the police's pratice of accountability helped Caccioppoli in having a "less" important sentence so to speak. Probably, this underestimation was supported by some influential member of his family which was well known in the academic environment.