DEVELOPING A FRAMEWORK OF REFLECTIVE, INTUITIVE KNOWING IN INNOVATION MANAGEMENT

Havard Asvoll, Nord University

ABSTRACT

This paper draws on recent progress in the perspectives of tacit knowing and innovation management to develop a framework of reflective intuitive (R-I) managerial knowing. R-I reflects the on-the-spot way of 'thinking' more profoundly or in ways that open the world and guide managers in it. This means that innovation managers deploy R-I by their intuitive grasp and simultaneous reflection during the course of the situation which guides further action and modifies ongoing practice. As a result, this enables good decisions to be made. It is proposed that the transmutation of 'reflection' and 'intuition' into R-I-K involves the three specific, interwoven and dialogical modes (abductive, deductive and inductive) of innovation management practice. The examples in this paper refer to the practice of being an innovation manager. Such a perspective will contribute to a better theoretical understanding of the complex knowing involved in (innovation) management and an alternative sharper focus is given on how reflection and intuition can sometimes operate simultaneously and intertwined. This is one step in enhancing our theoretical sensitivity towards how the interwoven aspects of R-I can improve managerial practice and knowing. Seeing R-I knowing as an intertwined and complex phenomenon has the potential to more fully reveal its manageability.

"When managers act, their thinking occurs concurrently with action. Thinking is not sandwiched between activities; rather, it exists in the form of circumspection present when activities are executed" (Weick, 1984: 223)

"I am not suggesting that good teachers act without thought. But we have not really examined what the nature is of this "thought" (van Manen, 2008: 11).

Keywords: Reflection, Intuition, Knowing, Abduction, Deduction, Induction.

INTRODUCTION AND PROBLEM

The terms reflection and intuition are conspicuously prominent and dominant in management research. In a variety of ways these concepts occur in numerous contexts including management research on decision-making processes (March & Simon, 1966), sense-making (Weick, 1979), information processing (Simon, 1979), learning cycle (Kolb, 1984), reflective practitioner (Schön, 1983), mindfulness (Weick & Sutcliffe, 2001), experiential learning (Korthagen, 2005), expert intuition management (Dreyfus & Dreyfus, 1986). More specifically, 'reflection' and 'intuition' are ambiguous terms and there is an unclear relationship between them when applied to tacit knowledge and innovation management literature. As 'intuition' is inherently non-verbalizable in expert management decisions (Dreyfus & Dreyfus 1986) and tacit knowing (Baumard, 1999; Boisot, 1995; Davenport & Prusak, 1998) and 'reflection' is almost impossible (i.e. Kroksmark & Johansen, 2003) or very difficult to achieve in instant practice (van

Manen, 2008; Schön, 1983), there seems to be little space left for other perspectives which can link intuition and reflection in a more dialogical and intertwined way.

One of the dominant ways of dealing with ambiguous phenomena in management knowledge/knowing is undertaken by separation and differentiation. For example, the personal, context-bound and dynamic definition of knowledge is often allocated to categories labeled 'implicit', 'tacit and 'intuitive' whereas the impersonal, context-free and static side is allocated to a categories labeled 'explicit', 'analytical' and 'reflective' (Tsoukas, 2003; Stacey, 2001; Nonaka & Takeuchi, 1995). It may be argued that this differentiation is supportive as long as the theoretical and empirical results are not presented in an additive manner. A way to address such a dualistic and dichotomized view is to consider the contradictory meanings simultaneously. This is what Bakhtin (1986) calls loopholes. Loopholes may help to embrace the way reality is perceived in "the form of still latent, unmuttered future work" (Bakhtin, 1984: 90). As a condition and attitude, this unsolvable solution is attractive, and can justify the motivation behind this paper. This motivation challenges the tacit/intuitive-explicit/reflective knowledge dichotomies which tend to leave out all the shades of gray in between.

It is possible that this kind of dichotomized logic, like a colonizing impulse, exercises an excessive influence on our view of what 'good management' ought to be. This dichotomized logic is supported by the fact that our society places considerable emphasis on rationality and efficiency. This means that analytical assessments and (detached) reflection often receive more attention than personal commitment and embodied intuitive skills (Dreyfus & Dreyfus, 1986; MacIntyre, 1985; Toulmin, 2001). There is reason to believe that this colonizing impulse derives some of its legitimacy from a dichotomized view of reflection and intuition.
If this suggestion is correct, there are grounds to find an alternative framework which can stem from the shades of gray and loopholes.

A conceptual framework of 'reflective-intuitive-knowing' (R-I-K) as a knowledge-making process is presented from these shades of gray. This links the distinct reflective and intuitive forms of knowledge. The framework proposes a (radical) challenge with regard to a new (R-I-K) conceptualization of 'here and now' management practice partly based on the two forms of knowledge which traditionally have been dichotomized. In short, either when an (unexpected) problem occurs in the managerial 'here and now' situation or that a situation demands an answer. This means that (expert) managers deploy reflective intuition (R-I) by their intuitive grasp/awareness and simultaneous reflection during the course of the situation which guides further action, or they reframe the problem and modify ongoing practice in such a way that managerial knowing enables good decisions to be made. R-I reflects the on-the-spot way of 'thinking' more profoundly or in ways that open the world and guide managers in it.

Illustrative examples of this R-I-K framework are reviewed and its reliability is tentatively established. Examples of 'reflective-intuitive-knowing' show how the reflective and intuitive processes are interwoven 'here and now'. It is also proposed that the transmutation of 'reflection' and 'intuition' into R-I-K involves the three specific, interwoven and dialogical modes (abductive, deductive and inductive) of management practice. Such a transmutation and synthesis could begin amongst managers themselves, and the examples in this paper refer to the practice of being an innovation manager. Moreover, viewing the manager as a person with tacit knowing/knowledge and innovation practice allows R-I-K to be considered viable for the practice of management.

In this paper I draw on the perspectives of tacit knowing and innovation management to develop a framework of R-I managerial knowing. In addition to tying together elements of the

theory in these areas, this analysis casts new light on and has implications for a variety of issues in management literature, i.e. the importance of open-ended 'here and now' situations; the definition of the (tacit or explicit) knowledge concept; and the managerial innovation process**.** I believe such a perspective will contribute to a better theoretical understanding of the complex knowing involved in (innovation) management and an alternative sharper focus is given on how reflection and intuition can sometimes operate simultaneously and intertwined. This is one step in enhancing our theoretical sensitivity towards how the interwoven aspects of R-I can improve managerial practice and knowing. A greater understanding of the actionable and diverse aspects of R-I knowledge opens up the potential for improved research on the use of knowledge in management. Seeing R-I knowing as an intertwined and complex phenomenon has the potential to more fully reveal its manageability. It can also be helpful to managers as a tool to manage and run their everyday work and projects more efficiently.

First, this paper presents the rationale and features behind the 'theory of reflective-intuitive knowing'. Second, a literature review is presented in order to shed light on and give a framework to the phenomenon of R-I-K. Thereafter illustrations of how R-I-K modes such as abductive, deductive and inductive inferences works are given. Finally, theoretical and practical implications for researching R-I-K management are described.

LITERATURE REVIEW

Since the literature on management research is extensive, I will choose research and theoretical perspectives which could frame the need for a more profound understanding and more studies on reflective-intuitive-knowing in managerial practice. Literature within different areas such as tacit knowledge and innovation management is considered.

Innovation Management

The literature suggests that established firms in the long run need to balance their exploration and exploitation activities in order to achieve superior performance (i.e. March, 1991; Bledow, Frese, Anderson, Erez, and Farr, 2009a, 2009b). How this general insight might unfold in practice is not so evident. However, the exploration-exploitation framework distinguishes two broad patterns of organizational and managerial behaviors. March (1991: 71) broadly defined as:

"Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation. Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution".

Later Levinthal and March (1993: 105) added that exploration involves

"A pursuit of new knowledge,"

Whereas exploitation involves

"The use and development of things already known".

Similarly, Tushman and O'Reilly (1997: 167) argued that

"Organizations can sustain their competitive advantage by operating in multiple modes simultaneously—managing for short-term efficiency by emphasizing stability and control, as well as for long-term innovation by taking risks and learning by doing".

March (1991) thought that both exploration and exploitation are essential for long-run adaptation, but the two are fundamentally incompatible. March (1991) provided several arguments in favor of this incompatibility. First, exploration and exploitation compete for scarce organizational resources. Thus, by definition, the more resources devoted to exploration the fewer resources left over for exploitation, and vice versa. Second, both types of actions are iteratively self-reinforcing.

However, some researchers (Uotila, Maula, Keil and Zahra, 2009) used a novel methodology to measure the relative exploration versus exploitation orientation and found an inverted U-shaped relationship between the relative share of explorative orientation and financial performance. That is to say, the relationship between competence exploration and radical innovation is positive, and that the relationship between competence exploration and incremental innovation is inversely U-shaped. Moreover there is a positive relationship between competence exploitation and incremental innovation and an inverse U-shaped relationship between competence exploitation and radical innovation.

The scarcer the resources needed to pursue both exploration and exploitation, the greater the likelihood that the two will be mutually exclusive, that is, high values of one will necessarily imply low values of the other. Logically, within a single domain (i.e., an individual or a subsystem), exploration and exploitation will generally be mutually exclusive.

March's (1991) logic in itself seems difficult to dispute. However, it is possible to question some of the key assumptions. Conflicting demands between exploration and exploration can be addressed by using spatial differentiation, such as creating organizational spinouts to pursue new opportunities (Galunic and Eisenhardt, 2001; Gilbert, 2005). An alternative path to combining exploration and exploitation is by managing them separately within the same (organizational) unit. The use of parallel structures may allow employees to switch back and forth between two or more types of structures, depending on the structure that their specific task requires (Bushe and Shani, 1991; McDonough and Leifer, 1983).

There seems to be consensus in the literature that organizations must learn to excel at both tasks. However, such a consensus seems to be on the organizational level and not on the individual or innovation manager level and contexts. It seems like the interest in analyzing exploration versus exploitation does not deeply consider conflicts over mind-sets and organizational routines (Gupta, Smith and Shalley, 2006) or the individual innovation/entrepreneurial agency, even though substantial research suggest that this might be interesting (Lachman, 1980; Carland, Hoy and Carland, 1988; Herron and Sapienza, 1992; Carland, Carland and Smith, 1996, Åsvoll and Widding, 2011). Based on an R-I-K framework and the individual innovation manager challenges regarding the mutual exclusive relation between exploration and exploitation are addressed in the theoretical remarks section.

Tacit Knowledge

Tacit knowledge is a broad concept of knowledge often referring to the fact that some knowledge is profoundly actionable and harder to externalize than others. There exists many definitions of tacit knowledge which differ with regard to the degree of tacitness and capacity to articulate (Tsoukas, 2003; Gourlay, 2006), it's embodied or cognitive nature and its subjective

(individual) or objective (collective, tradition based) dimensions (see Dreyfus & Dreyfus, 1986, Collins, 2004). In this paper tacit knowledge is thought to have the structure of a syllogism and as such can be reversed and mechanized (cf. Polanyi & Prosch, 1975: 40), and first and foremost it can be displayed and manifested in what we do (Tsoukas, 2003).

In line with this "actionable" approach I agree that research needs to focus more on what it is managers actually *do*, or to be more precise; i.e. to focus on what is the nature of 'thought' in the midst of action (as van Manen, 1998 highlights it in the opening lines of this paper). Maybe no research has as yet taken this argument seriously enough to explore the relationships between managers' actions, their R-I tacit knowing or their ability to develop context sensitive interpretations.

With regard to the (tacit) knowledge management literature one of the most commonly used distinctions is between knowledge that has been made explicit, and the knowledge that remains tacit (Baumard, 1999; Boisot, 1995; Davenport & Prusak, 1998; 1999; Dixon, 2000; Leonard & Sensiper, 1998; von Krogh & Nonaka., 2000; for exceptions see; Cook & Brown, 1999; Kreiner, 1997). We seem to owe it to the initial (misinterpreted) influence of Polanyi's (1962) epistemological project and, following more recently, to the major influence of Japanese authors such as Nonaka and Takeuchi (1995).

The latter investigates why Japanese corporations have a talent for innovation. Nonaka and Takeuchi (1995) distinguish four modes of knowledge conversion: from tacit knowledge to tacit knowledge (socialization); from tacit knowledge to explicit knowledge (externalization); from explicit knowledge to explicit knowledge (combination); and from explicit knowledge to tacit knowledge (internalization). It seems a supported claim that tacit knowledge is most valuable and visible through its externalization and "converted" application and may then be utilized in the innovation process. More specifically, Nonaka & Takeuchi's (1995) work on knowledge creation implies that the main path is from tacit to explicit knowledge and the nurturing of explicit knowledge. An externalization process implies articulating tacit knowledge into an explicit form, allowing it to be shared by others. This is a valuable process in terms of laying the bases for new knowledge, or to cite Nonaka et al. (2000: 9)

> "*When tacit knowledge is made explicit, knowledge is crystallized"*.

Nonaka and Takeuchi (1995) define explicit knowledge as knowledge that can be articulated/externalized in formal language including grammatical statements, mathematical expressions, specifications, and manuals. Such explicit knowledge, they conclude, can be diffused easily and formally between individuals. For example, a manager might invite a seasoned team of frontline workers to design a training manual that describes their own tacitly acquired skills. Metaphors can be highly effective in conveying the feeling of workplace experience. A product team at Matsushita Electric Industrial Company charged with building a high-speed clothes dryer that operated by means of centrifugal force used the image of stir-frying in a Chinese wok to describe the quick, short bursts of movement that would make a rotating drum efficient (Nonaka & Takeuchi, 1995).

Moreover, there seems to be a supported claim that tacit knowledge is made visible through its application and may then be utilized in the innovation process (Leonhard and Sensiper 1998). Howells (1996) emphasizes that learning is particularly crucial in relation to acquire tacit knowledge, which may explain why tacit knowledge is often explained as an intangible asset or hard to imitate dynamic capability. Research shows that tacit knowledge is gained throughout the innovation and production chain of a company. In fact, several authors

assume that tacit knowledge is a unique strategic resource and a source of competitive advantage (Göranzon and Florin, 1990; Gøranzon, 1993; Black and Boal, 1994; Nonaka and Takeuchi, 1995, Howells, 1996; Teece, Pisano, and Shuen, 1997; Choo, 1998; Baumard, 1999; Scharmer, 2000; Ambrosini & Bowman, 2001; Johannessen et al., 2001), even though they have different views on how this should be done.

This paper is concerned with extending what we know about how innovation managers manage practice (beyond crystallized and formalized knowledge) 'here and now' which has parallels to a tacit knowing perspective through viewing the manager partly in terms of what Orlikowski (2002) calls "knowledgeable performance", or "effective action" and partly in terms of what Dreyfus and Dreyfus (1986) names "situational responses" and "intuitive judgment". In addition I will try to show that the argument

"Tacit and explicit knowledge is mutually constituted … inseparable"

(Tsoukas, 1996: 14) may be justified or shown in an R-I-K framework. The challenges regarding inseparable and dichotomized entities are addressed in the theoretical remarks section.

THEORETICAL FRAMEWORK

The theoretical framework tries to answer two central questions; how do managers exercise R and me at the same time? What new concepts do we need to see such a possibility?

Based on aspects from different philosophical texts of Heidegger, Polanyi and Peirce the theoretical framework of R-I-K is presented. More specifically drawing upon Heidegger's texts (1962, 1977, 1993) being and Time, The question concerns Technology and what is Metaphysics? It is possible to show some aspects of how R-I-K can be a condition for knowing and existence in scientific management approaches such as tacit knowledge management and innovation management**.** Moreover, due to this negligence of the meaning of being, man (the 'who' of everyday Dasein is Das Man or man) has lost almost all his connections with being and lives now in a technical and artificial world (Heidegger, 1962, 1977, 1993). That is to say, man has lost his ground and is not at home anymore.

By taking the question of being as the clue, Heidegger (1962) is concerned about the being behind all beings or entities, which can be grasped by the self-understanding of Dasein (human being). The human being (Dasein) is always already (being-in-the-world) in a process of opening entities into our world involvement. In this way we categorically perceive entities as entities either as themselves or as something they are not, but always for-the-sake of some circumspective activity (Heidegger, 1977). It is being-in-the-world (In-der-Welt-Sein) and this perception 'for-the-sake of' which also may constitute R-I or the experience of R-I**.**

The question that needs to be explored much further is "precisely how do these R-I become available to us?" The explanation proposed is largely as a result of a reading of Heidegger (1962), especially his notion of a horizon of understanding, or significance, which constitutes a pre-cognitive capacity that efficiently, and without conscious effort, is able to generate a context for our being-in-the-world. The interesting point is that Heidegger characterizes this as circumspection, by which he means a casting around for interpretations and meaning. It may be that R-I am one of the most advanced examples of this at work, that is to say we are thrown into the future. In other words, R-I may exemplify that we are always already ahead of ourselves. This may also be a fruitful contribution to Polanyi's (1966: 4) words that we know more than we can tell.

When this notion of R-I circumspection is taken up together with Polanyi's (1962) idea of tacit knowing then a clearer picture starts to emerge. The central idea in Polanyi's philosophy is what he has called the tacit dimension (Polanyi, 1962, 1966). His basic proposal is that all knowledge involves personal knowing, and that knowledge is either tacit or is rooted in the tacit (Polanyi, 1969). He characterizes human knowing as

"Participation through indwelling"

(Polanyi & Prosch, 1975: 44), and that

"Since all understanding is tacit knowing, all understanding is achieved by indwelling" (Polanyi, 1969:160).

The point is that the understanding of managers R-I circumspections or indwelling may be sharper focusing on not only on what is known explicitly, but also on what is known tacitly, i.e. at a pre-cognitive and subsidiary awareness level, sometimes outside of our focal awareness. As Polanyi (1962: 602) says;

"The structure of tacit knowing is then the structure of this integrative process and knowing is tacit to the extent to which it has such a structure. ... Tacit knowing cannot be strictly opposed to focal knowing."

To be more precise, it is the relation between the tacit underpinning (subsidiary awareness) and the explicit focus (focal awareness) of knowing that is important. So, it is this integration or relational character of knowing which is the tacit dimension and is a dimension that is also closed linked to intuition.

Polanyi has written extensively on the nature of imagination and intuition in the context of science. Polanyi (1962) states that if personal participation and imagination are essentially involved in science as well as in the humanities, meanings created in the sciences stand in no more favored relation to reality than meanings created in the arts, in moral judgments, and in religion, and we may add professional management practice. More specifically Polanyi (1962) says there two functions of the mind are jointly at work from the beginning to the end of an inquiry. One is the deliberatively active power of the imagination; the other is a spontaneous process of integration which we may call intuition. Moreover Polanyi (1968: 42) puts it:

"It is intuition that senses the presence of hidden resources for solving a problem and which launches the imagination in its pursuit. And it is intuition that forms there our surmises and which eventually selects from the material mobilized by the imagination the relevant pieces of evidence and integrates them into the solution of problem."

Polanyi seems to define intuition as skillful guessing, that is to say a manager can sense a growing coherence as he/she searches for a solution to a problem. Thus, we can pursue scientific discovery without knowing what we are looking for, because the gradient of deepening coherence tells us where to start and which way to turn, and eventually brings us to the point where we may stop and claim victory (Polanyi, 1962). He focuses on showing how moving from what one knows to what one does not yet know necessarily requires an act of judgment or insight based on incomplete information, an educated guess based on prior information and embodied experience and depending on a new tacit integration that emerges from the particulars.

It seems clear that this intuition of (deepening) coherence cannot be made fully explicit and articulated, Moreover, intuition seems to only reflect the knower's tacit resources more or

less the same way that a skilful performance reflects a performer's skills that also cannot fully be described in words. Here, one central idea is that while attending to focal awareness a person dwells in subsidiary awareness that contains subsidiary elements, or clues, of the focal target. Polanyi (1962: 13) explains:

When we are relying in our awareness of something (A) for attending to something else (B), we are but subsidiarity aware of A. The thing B, which we are thus focally attending, is the meaning of A. The focal object B is always identifiable, while things like A, of which we are subsidiarity aware, may be unidentifiable. The two kinds of awareness are mutually exclusive: when we switch our attention to something of which we have hitherto been subsidiarity aware, it loses its previous meaning.

Here, Polanyi maintains a phenomenological and perceptual stance for tacit knowing, because knowledge is hidden together with the recognition that it is the (personal) intuition that may recognize the tacitness of the knowledge.

So far intuition (together with circumspection and awareness) may be defined as knowledge and awareness without immediate and simultaneously recourse to reflection and interference. But intuition as 'here and now' awareness of the situation, may also be linked to reflective and inferences mode of knowing. Polanyi's (1962) citation says above that subsidiary and focal awareness are exclusive with regard to the focal (reflection) impact on the subsidiary (intuition), but he may at some levels (both ontologically and epistemologically) acknowledge a more dialogical mode between intuition and reflection. However, Polanyi (1962) seems vague and undifferentiated with regard to the exactly how reflection may occur in 'here and now' action and intuitive demanding situations. Even though Polanyi with his emphasis upon indwelling and skillful (intuitive) awareness relies on the relational and actionable character of awareness/knowledge, the relational character seems to cover while not fully exploring some important reflective aspects of 'here and now' professional practice. Being aware of the deepening integration of subsidiary and focal awareness (the Polanyian concept of intuition), intuition may also be understood as perceptual skillfulness. In so doing, intuition is 'moved' from an internal/integration cognitive mode to external perceptual/awareness mode, which may enter the domain of inferences (see below on abduction, deduction and induction). That is to say, intuitions as awareness that sometimes involve conscious deliberation may be crystallized as R-I-K. Thus I propose that intuition as skillful awareness is sometimes connected with a more 'reflective' dwelling and, moreover in a way which can be made quite precise and not just left general and vague. Moreover, what crucially underpins the R-I knowing-making process is circumspective/indwelling (being-in-the-world), intuition as awareness and reflective inferences?

Furthermore, I propose the use of R-I in this respect, as involving a process of abductive, deductive and inductive inferences, described by Peirce (1958).

Peirce (1958) wishes to show how it is possible to make new discoveries and knowledge in a methodologically and logically way. Translated into management practice abduction (firstness) plays the role of generating new ideas or hypotheses; deduction (secondness) functions as evaluating the hypotheses; and induction (thirdness) is justifying of the hypothesis with empirical data.

Abduction, as the first core concept, constitutes, according to Peirce (1958), the first stage of any scientific investigation, and of all interpretative processes (paragraph 6. 469). The very basis for abduction is our examination of a certain number of facts. We attempt to sort out the facts in order to attain an idea of what we find before us. The phase of abduction consists of unexplained or surprising phenomena. According to Peirce (1958), the person at stake or the

manager can reach this abductive hypothesis by genuine doubt. For Peirce (1958: 315), doubt takes arises from surprise or as he says:

"*Genuine doubt always has an external origin, usually from surprise"***.**

In other words, finding an answer to managerial problems requires a certain amount of creativity:

"It is the idea of putting together what we had never before dreamed of putting together which flashes the new suggestion before our contemplation" (Peirce, 1958, paragraph 5. 181).

The possible abductive explanatory hypotheses reveal a path from facts to ideas and theory, or expressed differently: the abductive hypotheses seek theory and deduction.

After the abductive steps have brought us to selected theories that may be fitted to explain the facts, we find ourselves, according to Peirce (1958), on the deductive level. The second core concept, deduction, or the deductive mode, is based on theory and the theory's hypotheses. Deduction involves drawing logical consequences from premises. An inference is endorsed as deductively valid when the truth of all premises guarantees the truth of conclusion. This may correspond to when the manager is introduced to a rule or a theory which aims at gaining understanding of a surprising fact. In this way, deduction, like abduction, contributes to a conceptual understanding of the phenomenon of empirical facts.

Deduction cannot produce new hypotheses or assumptions, because it is fundamentally self-referring. It is important to bear in mind that this kind of reasoning cannot lead to the discovery of knowledge that is not already embedded in the premise (Peirce, 1958). However, Peirce (1958) in line with the inventor of deductive syllogisms, Aristotle, did not isolate formal logic from external reality and they repeatedly admitted the importance of induction. This 'only exclusive deduction' thinking is not endorsed by the Peircean philosophical system, which emphasizes the search for a deeper insight of a surprising fact by the help of the interconnected terms of abduction, deduction and induction.

Inductive logic is often based upon the notion that probability is the relative frequency in the long run and a general law can be concluded based on numerous cases. Peirce (1958) uses the example of an investigator who starts from a hypothesis and tries to test it, elaborating some conditional predictions out of it. To assess the hypothesis, the investigator must judge and estimate the combined value of the evidence. Accordingly, the manager must handle situations and judge if they are reasonable compared to facts such as evaluations. Induction may shed light on important interpretations that in some way reflect what is actually going on in managerial practice. Clearly, a strategy that is faithful to the everyday realities, where surprisingly facts are carefully induced from empirical evidence, can ensure that theory (deduction) is closely related to the daily significant opportunities which may be discovered.

Overall, abduction, deduction and induction are important reflective modalities in the integrated framework which constitutes R-I.

Integrated Framework Based on Different Scholars

One purpose is to move beyond concepts from thinkers such as Polanyi (intuitive skillful guessing), Peirce (reflective aspects of abduction, deduction and induction) and Heidegger (circumspection and being-in-the world**).** The aim is to appreciate a two-fold simultaneous 'here and now' connection; that intuition (perceptual skillful guessing) becomes reflective (when

abductive, deductive and inductive logics are applied) and that reflection relies on intuitive awareness and being-in-the world. It may seem hasty and unjustified to combine and extensively place different thinkers like Polanyi, Peirce and Heidegger under an umbrella called R-I-K. Even though there is not enough space here to elaborate on the issue. However, some remarks can be made. For example, aspects of abduction may appear to be more common sense when seen in connection with Polanyi's account of tacit knowing with its emphasis upon indwelling and two forms of awareness (cf. Mullins, 2002). There seems to be an intersection between Polanyi's concept of indwelling and Heidegger's notion of being-in the-world (Heidegger 1962). Polanyi (1962) argues that all understanding is based on dwelling in the particulars of the object that we comprehend, and such indwelling means our participation in the existence of that object. Polanyi (1962: x) continues:

"*It is Heidegger's being-in-the-world."*

Both of these conceptions seek to overcome the distinction between subject and object. That is to say that R-I is always already consciousness of something, in this sense indwelling and being-in-the-world (circumspection) illustrate aspects of the same idea.

In sum, to further explore the connection between Heidegger's being-in-the-world, Peirce's abduction and Polanyi's tacit knowing may not only suggest some new ways to appreciate the resonant depths of these thinkers, but it may also contribute to a more profound understanding of R-I as a phenomenon.

A tentative framework of R-I circumspection may rest on a (embodied) precognitive/indwelling capacity by which managers may generate abductive-deductive-inductive plausible 'here and now' accounts of their experience**.** R-I therefore can be seen to be the crucial means by which managers simultaneously use reflection and intuition in a threefold manner. These concepts may describe new bearings on internal patterns both on a theoretical level as well as in the reality of management practice. The purpose is not to build ontological models, rather understand real-life practice, i.e. how knowing is abducted or created and inductively or deductively discovered in a variety of here and now situations and for different reasons.

Example of R-I-K in Innovation Management

The Case: The innovation manager needs to check out the poor results from new and explorative business plans for her large company which stem from an external evaluation conducted by a highly rated consultancy. In this case the innovation manager is faced with evaluations which contradict her feeling that the business plans may be successful, i.e. resulting in profitable radical innovations. Previously she had successful experience regarding discovering and recognizing opportunities partly based on the manager's purpose 'to see' every employee's potential for radical innovation. She tries as best she can to give recognition to every employee in the company; not only recognition for an accomplishment, but recognition of the employee's innovative competence/potential, even who he can become (career programs). She keeps her eye on employees and the challenges they have set for themselves. In addition to her own experience, she has also received much positive feedback from both employees and managerial colleagues for her attentive management style. Here there are confusing data at an inductive (empirical) level. The reality perceived by the management does not correspond to the poor evaluation of the plans. Given this contradicting inductive 'evidence' the manager seeks a tentative explanation.

The innovation manager then brings these questions up. While conducting her management of employee' potential for innovation practice she asks herself;

"Is this working out? Do the employees really understand my management? What is the best way of dealing with this right now?"

A syllogism for the above-mentioned manager would look as follows:

Premise: A phenomenon consisting of apparently multiple, positive and promising innovation activities in the company has been observed (from the manager's perspective). In contrast a poor evaluation is presented by external reviewers (x1).

Premise: Among the various explanatory hypotheses are: (a) The manager experiences that her activity makes visible demands, challenges and supports the employees through dialogue and questions, but maybe what you see (management) is not necessarily what is happening (innovation and opportunity creation); (b) the employees' own effort or individual work does not create a decisive basis for positive innovation activities; (c) the employees' dialogue among themselves is not sufficient to develop positive innovation activities. For the manager, (a) is the hypothesis that can best explain x1.

Conclusion: There is reason to pursue (a). The syllogism example demonstrates the innovation manager's creative organization of the empirical facts. According to Peirce (1958: 315), the manager can reach this self-evident hypothesis by the presence of genuine doubt. For Peirce (1958), doubt arises from surprise or as he says*:*

"Genuine doubt always has an external origin, usually from surprise" (Paragraph 5. 443).

Genuine doubt occurred in the light of the paradoxical 'results' of management practice, and now the manager is trying to look at what is going on in front of her, trying to use R-I in the midst of action to make decisions that would allow them to foster as much success as possible out of what is going on. Here, R-I based on Polanyis' (1966) term tacit knowing could stress the quality of perceptually being-there in a way that activates the manager's relation between subsidiary and focal awareness. The guessing in hypothesis (a) (the manager experiences that her activity makes visible demands, challenges and supports the employees through dialogue and questions, but maybe what you see (management) is not necessarily what is happening (innovation and opportunity creation)) requires a perceptual skill guided by R-I. Perceptual skill relies on intuition and a potentiality that is not yet brought into conceptual/theoretical consequences. When the potentiality is sensed, however, it evokes an always already anticipation through which the manager maintains a quest for the discovery of the coherence (reflective abduction).

Deductive-hypothetical conceptualization in the company is necessary (but not sufficient) to deduce systematic, experiential consequences or theoretical working hypotheses. For example the manager was not sure about this woman. She is often is doing incremental innovation practice, and doing other things (D), but the manager assumed that she gets things done anyway (E). This must be checked out. And this young man who is back there is very much into opportunity creation and is often physically elsewhere (F), but he does not miss a trick or any instructions about the assignments the manager assumed (E) . This must be tested. In a syllogism, this can be articulated as follows:

Premise: In theory, all cases of D are interwoven with E.

Premise: In theory, F situations are interwoven with E cases.

Conclusion: In theory, F and D are therefore interwoven cases.

The manager is here carrying out a deductive operation that, based on the premises, draws the logical conclusions. It is important to recall that this does not involve any new applicable knowledge, because the conclusions, that is, being able to apply the concepts together, are implicit in the premises. In other words, the general hypothesis;

"What you see is not necessarily what is happening", is being (theoretically) tested.

This hypothesis and consequences are now integrated in the circumspective activity in 'here and now' situations in the company. Thereafter the manager carries out a systematically testing, relatively long-term and theoretical analysis of the company's empirical facts. For instance:

Premise: D1, D2, D3 … D100 is E.
Premise: D1, D2, D3 … D100 is F.
Conclusion: E is therefore also F.

This syllogism shows that the manager has applied a deductive term in order to categorize the empirical facts. With sufficient field observation time, the manager has thus classified the frequency of 30 (deductively assumed) cases and found a concordance between the deductive theoretical and inductive empirical worlds.

Thus measuring the deductive activity of R-I seems maybe more plausible than specifying the activity of intuition. In the work of deduction, some objects (the general hypotheses; what you see is not necessarily what is happening) of integration become in circumspective practice (as in the example of the manager), less indeterminate. What this amounts to saying is that when the here and now R-I act requires greater effort and integrative knowledge seems most in determinant, the degree of deductive R-I involved is greater.

Moreover, this may indicate that the R-I in some way reflects what is actually going on in the company. An R-I mode that is faithful to the everyday realities, where substantive innovation areas are carefully induced from empirical facts, can ensure that the manager perceived 'innovation reality' (theory) is closely related to (the lack of) employees' daily significant innovation realities. So, the manager is perhaps not mistaken concerning that the employees' innovation perception (based on two cases) is not as poor as the external evaluation might indicate. Clearly, just two inductive occurrences are not sufficient to reject the external evaluation with its poor findings, but the manager may be more tentatively confident that major 'error' is not her style of attentive management.

Summarized the case starts with the manager's intuitive awareness when hard data (poor result in an external evaluation) does not feel quite right (inductive mode). 'Here and now' R-I allows the manager to doubt (abductive mode), elaborate working hypotheses (deductive mode) and seek more information or look at what data we have from a different angle in the midst of action (inductive mode). During the short period of management practice she has undergone in the following order: inductive, abductive, deductive and inductive processes on the spot while conducting management. This can be conceptualized as R-I shown as a dialogical A-D-I mode.

Moreover, this may indicate that the R-I in some way reflects what is actually going on in the company. An R-I mode that is faithful to the everyday realities, where substantive innovation areas are carefully induced from empirical facts, can ensure that the manager perceived

'innovation reality' (theory) is closely related to (the lack of) employees' daily significant innovation realities. So, the manager is perhaps not mistaken concerning that the employees' innovation perception (based on two cases) is not as poor as the external evaluation might indicate. Clearly, just two inductive occurrences are not sufficient to reject the external evaluation with its poor findings, but the manager may be more tentatively confident that major 'error' is not her style of attentive management.

Summarized the case starts with the manager's intuitive awareness when hard data (poor result in an external evaluation) does not feel quite right (inductive mode). 'Here and now' R-I allows the manager to doubt (abductive mode), elaborate working hypotheses (deductive mode) and seek more information or look at what data we have from a different angle in the midst of action (inductive mode). During the short period of management practice she has undergone in the following order: inductive, abductive, deductive and inductive processes on the spot while conducting management. This can be conceptualized as R-I shown as a dialogical A-D-I mode.

For Peirce (1958), abduction, deduction and induction do not constitute a static order, but follow in a transformative and dialogical order during the interpretative process. Introduction of the concepts into an interpretative R-I process helps to raise awareness in management practice. More specifically, the use of theory (manager's perception of her own practice), subsequent to the analysis of inductive empirical facts, can be corrected by abductive processes. Abduction can thus not only directly influence the selection of (theory) deductive consequences, but also ensure that the theoretical world (the manager's hypotheses of her own innovation practice) is developed further in accordance with the empirical one (evaluation of the employees' innovation practice and potential).

Hypothetically, at this point, the manager is faced with three choices. She: (a) can ignore this type of abductive process and allow the external evaluation to emerge as the dominant constructive factor; (b) reject her theory because of possible biased focus; or (c) she can modify the theory such that both the external evaluation and her management can direct the analysis of the employees' innovation process. In this case, the manager selects the latter alternative, (c).

One important premise of the framework of R-I-K emphasizes the managers' spatial 'here and now' location, or what may be called a form of circumspection (Heidegger, 1962). On the basis of the example, the manager must rely on periodical and systematic observations of innovation activities in the company. In accordance with the issue to be examined, the company is the physical point of departure for an interpretative activity. The quality of the abductive, deductive and inductive hypotheses is in other words based on the manager's physical presence and observation in the company. This physical presence enables the manager's horizon of understanding or a circumspective activity involving casting around for interpretations and meaning.

THEORETICAL REMARKS AND PRACTICAL IMPLICATIONS

There are theoretical remarks and insights as well as practical or managerial implications which can be drawn from the R-I-K framework. First, the theoretical remarks concentrate on general attributes to the framework of R-I-K. Second, these attributes are considered in how they can add new insight in research areas such as innovation management and tacit knowledge. Practical implications focus on what can be gained by emphasizing reflective intuitive knowing in innovation management practice.

Theoretical Remarks

It is important to stress that

"Only reflective intuitions, in other words, intuitions that are informed in situ by a cautious examination of the reflective significance of intuitive aspects, are to be taken into consideration" (Åsvoll, 2012: 13).

Although many innovation managers can become reflective-intuitive, some do not. This might be due to many factors, i.e. barriers concerning local culture not encouraging reflection (Russel, 1993) and the experienced lack of reflection time in situations demanding action (van Manen, 2008).

It is important to clarify that the reflective-intuitive mode of knowing is not characteristic of all thinking, but only of specific situations/actors. When some managers can become reflective-intuitive and some do not, it is about the quality of R-I being-there (Dasein) in the midst of action. To activate both reflection and intuition simultaneously may require experience, tolerance for ambiguity, capacity for multiple possible reactions/decisions, awareness of unfolding situations etc. What are the alternatives? Only intuition without reflection (the ultimate expert according to Dreyfus and Dreyfus). Only detached reflection (that is not possible according to Polanyi). It seems that there are many alternatives and perhaps they often interact with the R-I phenomenon. The issue of becoming reflective-intuitive offers opportunities for further theorizing. It may be important to follow Miller and Tsang (2011) words that by focusing on diverse phenomena, researchers tend to and perhaps should position their theories as complementary rather than competing. In other words, theorizing about R-I do not compete with other theories, but may offer a complementary focus. So, could the R-I phenomenon be tested and then compared to other theories with regard to different forms of validity? One major obstacle to testing management theories in a rigorous manner has to do with the nature of the social phenomena that management researchers investigate (Miller and Tsang 2011). Also from a critical realist philosophy (cf. Miller and Tsang) one realizes major challenges with regard to identify and measure the relevant mechanisms in play in a situation and (2) test for conjunctions of mechanisms as explanations for empirical outcomes (p.147), hence finding and testing the temporary and interpretive mechanisms behind R-I phenomenon is not an easy task.

There seem to be more factors (practical, methodological) contra reflection and especially R-I than against it. It is important to note that such reflection is not an aim in itself. Molander (2008: 20) sheds light on this saying that;

"Because reflection is as fallible as other ways of gaining knowledge, it is not at all certain that a reflective or reflected practice is better than a non-reflective one. It depends on how well the reflection processes have managed to improve the overall knowledge (in action) of the agent(s) in question."

Translated to R-I, that is to say, R-I is not an aim in itself. R-I is not self-validating or self-justifying. As stated by Molander (2008: 21)

"No type of reflection can claim infallibility."

In my view R-I must sometimes rest on an unpredictable and 'not-at-home' way of being-in-the-world. That is to say, R-I is not a stable and constant phenomenon for the individual manager. However, management practice that does not allow time for R-I could end up as non-learning practice. My thesis is that innovation management practice needs managers who can adopt R-I at the right time, and at best, only at the right time.

Innovation management and R-I

The complex link and threads between exploration and exploitation are often not considered, maybe because a key feature in the research emphasizes the advantages of the analytical separation between invention and commercialization (Teece, 1988) or between exploration and exploitation (March, 1991), even though it is realized that the two functions cannot be empirically separated (Teece, 2006: 1137). In the light of the three concepts of abduction, deduction and induction, the R-I example has documented or indicated *some of the complementary and non-competitive* existence between opportunity creation/exploration (i.e. abductive problem identification) and possible opportunity exploitation strategies (i.e. possible deductive consequences and inductive experience-based analyses). From the example it is possible to question if a dominant use of either abductive exploration, or deductive-inductive exploitation strategies would be more beneficial. It is possible to see the relevance and inter connectedness between abductive (exploration), deductive and inductive (exploitation) processes from the innovation manager's perspective. The example supports the assumption is that entrepreneurial actions (exploration) and strategic actions (exploitation) can contribute to value creation even more when they are integrated. Theoretically, entrepreneurial opportunity-seeking is at the same time also strategic behavior with the aim of value creation (Ireland, Hitt, & Simon, 2003; Ramachandran, Mukherji, & Sud, 2006). That is to say, that the two fields are interdependent, since the research results of the one cannot fully be understood without the other (Barney & Arikan, 2001). The innovation management example support this interdependency. Theoretically, R-I and the sub processes abduction, deduction and induction are interconnected, recursive and non-sequential in nature, which may add more nuanced approaches to how innovation can be understood. Hence, entrepreneurially orientation is not just about sporadic periods of action; rather it needs to be a regular and systematic part of a firm's behavior (Smith & Gregorio, 2000; Ireland, Covin, & Kuratko, 2009). But it is also possible to question the female manager's 'here and now' R-I abductive, deductive and inductive skills, because as we saw from the example, the company may have received valuable deductive analytical help from external consultants which were not perceived as trustworthy in the initial phase of innovation.

Tacit Knowledge and R-I

The objective in this section is to focus on how the perspectives of Polanyi (1962, 1966) and Nonaka and Takeuchi (1995) on tacit knowledge relate to the R-I framework.

Polanyi argued that you cannot view subsidiary particulars as they allegedly only exist in conjunction with the focus to which you give them, and that makes them unspecifiable. The question is; in light of the innovation manager example, can she have the necessary articulation potential (theoretically) to justify R-I, simply because, following Polanyi's understanding of tacit knowledge, skillful knowing and guessing (intuition) contains an ineffable element; it is based on an act of personal insight that is essentially inarticulable. According to Polanyi (1966) analysis and reflection may bring subsidiary knowledge into focus and formulate it as a maxim, but such

specification is in principle not exhaustive. Although they emulate their maxims, they know many more things than they can tell, knowing them only in practice, as particulars, and not explicitly, as objects. The knowledge of such particulars is therefore ineffable, and

"The pondering of a judgement in terms of such particulars is an ineffable process of thought" (Polanyi, 1962:88).

Polanyi's (1962) citation says above that subsidiary and focal awareness are exclusive with regard to the focal (reflection) impact on the subsidiary (intuition), but at some levels (both ontologically and epistemologically) he acknowledges a more dialogical mode between intuition and reflection. However, as stated in the theoretical framework, Polanyi (1962, 1966) seems vague and undifferentiated with regard to the exactly how reflection may occur in 'here and now' action and intuitive demanding situations. This may lead some scholars (with different Wittgensteinian and Heideggerian arguments and philosophical underpinnings) to conclude that while we can certainly focus on particulars, we cannot do so in the context of action in which we only have a subsidiary awareness (Tsoukas, 2003; Oakeshott, 1991; Dreyfus & Dreyfus, 1986). The 'here and now' R-I phenomena and framework, if it is justified, challenges such a conclusion. Because R-I requires that subsidiary awareness/elements are made visible and mediated by (abductive, deductive and inductive) reflection in the midst of action or while focal awareness are functioning, we maybe can focus on both particulars and subsidiary awareness simultaneously.

Also the tacit-explicit knowledge dichotomy may make it harder to see dynamic and intertwined connections between reflection and explicit and intuitive/tacit knowledge as tentatively stated in the R-I framework.

The tacit-explicit dimension of knowledge is one of major topics discussed in knowledge management. The pivotal work could be Nonaka and Takeuchi (1995), which presents a new description of knowledge in an organizational context. Its essence is that successful innovation comes from the mobilization and conversion of tacit knowledge through four modes of knowledge conversion (socialization, externalization, combination and internalization (the "SECI" model). It is possible to interpret Nonaka and Takeuchi's (1995) work about knowledge creation so that it implies that the main path is from tacit to explicit knowledge and the nurturing of explicit knowledge. This creates a gap between explicit and tacit knowledge. To simplify, Nonaka and Takeuchi (1995) have come to mistrust intuition, preferring convertible tacit knowledge and explicitly articulated knowledge, indicating being uncomfortable with here and now actionable knowledge (as the R-I main feature), opting for systematic crystallized knowledge; in reality they substitute theoretical converted knowledge for how reflection and intuition sometimes can be more dialogical, interdependent and simultaneously.

Meeting Polanyi (1962, 1966) the halfway position acknowledges the 'intuitive' relation between focal and subsidiary awareness but lacks more emphasis on (reflective) intuition as some form of awareness and perception. As stated in the theoretical framework, the term intuition in R-I means perceptual awareness or some form of observational (guessing) skills. In strong contrast to Nonaka and Takeuchi's (1995) converted view of tacit knowledge (the prime value of tacit knowledge is its potential for conversion, not its actionable here and now character), the R-I concept suggests that all our knowledge (tacit/intuition and explicit/reflection) can be exercised simultaneously in practice. Hence, R-I aims at questioning the dominant and dichotomized (tacit-explicit) view of knowledge in management literature. This is not a new critical question regarding the tacit-explicit dichotomy, but R-I suggests a new solution to those

who consider this dichotomy to be insufficient and perhaps misconceived. This can be done by looking at how the different aspects (abductive, deductive, inductive) of knowing are (not) used by the innovation manager. Thus here the term "tacit knowing" may be used to capture the notion of R-I knowing as something intimately linked to and wrapped up in doing and actionable 'here and now' knowledge. This may help to emphasize the nature of the tacit knowing seen in managers' R-I interpretative actions and castings, but rarely examined in detail.

Practical Implications and Further Research

What can be gained by emphasizing reflective intuition in innovation management practice? Although this paper does not touch on management practice in depth, it seeks to offer another conceptual system by which to consider management and research (some of the implications were tentatively described in Asvoll, 2012). Moreover, it seems that the tacit-explicit dichotomy puts too much weight on the process of externalization or codification although more attention should be paid on the question concerning what kind of knowledge is valuable in the first place. The manager's dialogical and 'unsecure' use of abductive, deductive and inductive R-I modes may help to decide what kind of knowledge may be considered tentatively trustworthy (i.e. objective evaluative or personal phenomenological knowledge) in the first place.

Obviously, when the manager exposes her actions based on R-I mode she can put herself at risk. An awareness that the risk element in R-I involves different aspects of knowledge better equips a manager to identify and measure the risks inherent in the situation and to explain the grounds and the R-I aspects on the basis of which decisions were taken. A sharper awareness of the role that R-I plays in evaluating 'here-and-now' actions and decisions can contribute to an improved understanding of the limitations of both isolated reflective/explicit and intuitive/implicit dimensions of knowledge. One practical implication is that R-I can be used to remedy shortcomings in business plans based on a priori reflection and explicit knowledge alone, and it can help to create and resolve unpredictable issues. An implication of this is that the execution of actions based on R-I is often not predictable in advance. For the innovation manager the implication also might be greater awareness of the need for simultaneously and constantly searching for 'here and now' abductive, deductive and inductive inferences and answers to their entrepreneurial challenges. This suggest that the innovation manager's use of analysis (deduction and induction) may actually not disrupt processing and qualified guessing (abduction) because their 'here and now' knowing always has the potential for articulation and reflection in the midst of action.

Such reflective intuition is a fairly short-term feature, which can be viewed as an approach to enable managers to feel some degree of 'controlled uncontrollability' over their employees and the innovation processes – an aspect which novice managers may lack. This 'controlled uncontrollability' as an expression of a sharper awareness of the importance of R-I may help managers to take (unpredictable) responsibility for their actions, as there may be no explicit knowledge or a priori reflections to support 'here-and-now' decisions. The importance of hands-on processes such as timing and budget may be central. For example involving top-management too early may slow down or disrupt promising innovation processes.

Such examples stress the need for further research on the perspective of R-I tacit knowing. There are different ways of pursuing such research. One approach (which I personally prefer) is phenomenological. I think a phenomenology of reflective intuition must proceed essentially by examples. Is there anything that may be called "phenomenological reflective

intuition"? Yes, I think. Maybe a precondition for an R-I phenomenology is that there should be a necessity of immediate action based on an interwoven reflective (abduction, deduction and induction) intuition (relation between subsidiary and focal awareness). Even though what is immediate or not depends very much on the practice in question, and there is never only one true description, R-I may be relevant to show some of the varieties and complexities of management practice. Here, phenomenology may rest on a hermeneutical perspective in order to emphasize how R-I may emerge as a phenomenon.

It is important as Freeman and Chung (2014) states that hermeneutic inquiry into a subject or area involves the intent to understand rather than explain. The purpose of such a research may focus on the whole-ism of society and the hermeneutical circle as a basis for R-I interpretation. This whole-ism includes the current and historical socio-political culture, both of which are essential to understanding the self (Freeman and Chung 2104) and we may add, to understand and interpret the R-I phenomenon. The tentative whole depending on its dynamic parts is important within hermeneutics, particularly as interpreted by Gadamer (1989). The tentative whole may depend on parts or challenging action demanding contextual factors. Among a number of barriers to becoming R-I may be that the practice of R-I is highly context-specific and that the social and cultural context in which R-I takes place has a powerful influence over what types of R-I (abductive, deductive and inductive) it is possible to foster. For example, local innovation culture may tend to persuade innovation managers that improved knowledge is gained from external resources (i.e. open innovation alliances, buying immaterial property rights) rather than from personal and first hand experiences, and hence R-I may not be encouraged.

Literature on how the aspect of (personal/subjective) time affects innovations and strategic decisions in corporations are scarce, even though the importance of this interlink has been demonstrated in multiple studies (see Hernes, Simpson and Soderlund 2013; Svensrud and Åsvoll 2012; Harryson, 2005; Stalk Jr, 1988). I suggest that in innovation and strategic management, time should be managed in a more subjective manner than when operating production to ensure optimized growth conditions for the opportunities. That is to say, R-I may be investigated as an understanding of temporality (experiencing time). As suggested by Drakopoulou Dodd, Anderson and Jack (2013), Heidegger's ideas about time are considered as an explanation of how temporal strategic practices and processes use time which is not only, always, sequential. More concrete it is possible to re-search R-I on how the past, the future of a situation are rolled together into the ongoing experience of the present (strategic) R-I moment.

It seems possible to pursue research in line with a critical realism which focuses on the unobservable generative mechanisms (social, cultural and biological) necessary for a particular turn of events to occur, which are themselves a complex outcome of structure and agency (Healey and Hodgkinson 2014). In similar vein as Healey and Hodginkson (2014) state from a critical realist view;

"We are arguing that neuropsychological processes are a constitutive mechanism of social processes in general" (p. 778).

I will not debate this approach in detail with regard to potential biases and reductionism etc.(see Healey and Hodginkson 2014), but I agree with Healey and Hodginkson (2014) that we may ask which neuropsychological features higher-level individual and socio-organizational processes draw upon or harness in the execution of particular significant (organizational) activities. Here one main issue could be to avoid both the neurocentric and (radical) social

constructivistic view, that R-I capability resides only in the brain or just in social processes. Maybe Polanyi (1968, p. 1312) words are relevant (remember he was also a natural scientist);

"The mind harnesses neurophysiological mechanisms and is not determined by them … we can see then that, though rooted in the body, the mind is free in its actions".

One way to use neuroscience in this context is to examine the extent to which, and in what ways, neuropsychological mechanism of reflection and intuition correlate or may be analogues from those of (innovation) managers' actions. It would be very interesting and certainly a strong evidence of the R-I-K framework if such correlations or analogues exist. However, an R-I-K framework could serve as an overarching theoretical framework that will in the longer term allow for closer integration of concepts describing higher-level (i.e. strategic management and organization) phenomena with those describing lower-level (i.e. neuropsychological) mechanisms.

May be such a critical realist approach (linking biophysical and social mechanisms) also could answer some open questions about the dynamic capabilities view (DCV); i.e. what conditions bound the DCV (Eisenhardt and Martin (2000), and is there a relationship between DCV and entrepreneurship (Teece, 2007) or innovation management? The aim of dynamic capabilities research is ambitious: to understand how firms can sustain a competitive advantage by responding to and creating environmental change (Teece, 2007). Theoretically, maybe such theoretical linking and comparison could help with regard that DCV lacks underlying theory at micro-level Salvato (2003); could help to solve issues about inconsistencies of usage of the DCV concept (Zahra et al. 2006); and infinite regress challenges, i.e. capabilities come from capabilities (Collis 1994). Perhaps R-I at the empirical innovation management level sometimes can explain that there are more and less effective ways to 'here and now' execute particular dynamic capabilities such as alliancing, strategic decision making, and knowledge brokering.

It appears that there is much room to explore R-I in corporate life. Moreover, researchers have hunkered down both intuition and reflection, trying to elicit more answers as to use it appropriately (see Dane and Pratt, 2004; Sonenshein, 2007; Schön, 1987). Thus, given that R-I-K represents a salient issue in organizational contexts, I think that one could probe how R-I permeates other organizational members' perceptions related to this subject (not only innovation managers). In other words, are people able to use R-I to anticipate new opportunities regarding market/technology, internal strategic disagreements between colleagues and management levels? It could be interesting to investigate more systematically how workers are able to reflectively intuit certain choices, for example supporters (or not) for their ideas and innovation projects. One could also examine whether workers can reflectively intuit the impact of the replacement of bosses in their careers, the upshots of organizational change, and operational problems. In other words, do they perform R-I before major changes take place? Thus, one can surmise that workers/managers could use R-I on a daily basis, hoping to solve their job issues. Hence, one would welcome studies aiming to find how often managers and executives use R-I before and during making important decisions in their organizations. Accordingly, one could also examine afterward if they were satisfied with the accuracy of their decisions. One could verify whether people rely on the thoughts and ideas that come up (based on R-I), especially when they are assigned to carry out complex tasks and innovation projects.

REFERENCES

Ambrosini, V. & Bowman, C. (2001). Tacit knowledge: Some suggestions for operationalization. *Journal of Management Studies*, *38*, 811-829.

Bakhtin, M. M. (1984). *Problems of Dostoevsky's Poetics*. Minneapolis: University of Minnesota Press.

Bakhtin, M. (1986). *Speech genre and other late essays*. Austin: University of Texas Press.

Baumard, P. (1999). *Tacit Knowledge in Organizations*. Thousand Oaks: Sage.

Black, J. A. and Boal, K. B. (1994). "Strategic Resources: Traits, Configurations and Paths to Sustainable Competitive Advantage". *Strategic Management Journal*, *15*, 131-148.

Bledow, R., Frese, M., Anderson, N., Erez, M. & Farr, J. (2009). A Dialectic perspective on innovation: Conflicting demands, multiple pathways, and ambidexterity. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, *2*, 305-337.

Bledow, R., Frese, M., Anderson, N., Erez, M. & Farr, J. (2009). Extending and refining the dialectic perspective on innovation: There is nothing as practical as a good theory; nothing as theoretical as a good practice. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, *2*, 363-373.

Boisot M. (1995). *Information Space: A Framework for Learning in Organizations, Institutions and Culture*. London: Routledge.

Barney, J. & Arikan, A. (2001). The Resource-based view: Origins and implications. In Hitt, M. A., Freeman, R. E. & Harrison, J. S., (eds.), *Handbook of Strategic Management* (124-188). Blackwell Publishers Ltd: Oxford, UK.

Bushe, G. R. & Shani, A. B. (1991). *Parallel Learning Structures: Increasing Innovation in Bureaucracies*. Reading, MA: Addison-Wesley.

Carland, J. W., Hoy, F. & Carland, J. A. (1988). Who is an Emrepreneur? Is a Question Worth Asking. *American Journal of Small Business*, *12*(4), 33-39.

Choo, C. W. (1998). *The knowing organization: How organizations use information to construct meaning, create knowledge, and make decisions.* New York: Oxford University Press.

Cook, S. N. & Brown J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organizational Science*, *10* (4), 382–400.

Collis, D. J. (1994). Research note: how valuable are organizational capabilities?. *Strategic Management Journal*, *15*, 143-152.

Davenport, T. H. & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Boston: Harvard Business School Press.

Dane, E. & Pratt, M. G. (2004). *Intuition: Its boundaries and role in organizational decision-making*. Academy of Management Best Paper Proceedings.

Dixon, N. (2000). *Common Knowledge: How Companies Thrive by Sharing What They Know*. Boston: Harvard Business School Press.

Drakopoulou Dodd, S., Anderson, A. & Jack, S. (2013). Being in time and the faily owned firm. *In Scandinavinan Journal of Management*, *29*(1), 432-454.

Dreyfus, H. L., & Dreyfus, S. E. (1986). *Mind over machine:The power of human intuition*. New York: Free Press.

Eisenhardt, K. M. & Martin, J. A. (2000). Dynamic capabilities: what are they?. *Strategic Management Journal*, *21*, 1105-1121.

Freeman, I., & Chung, R. (2014). *The Logic of Hermeneutics A Methodology for Research Today and expertise in the era of the computer*. New York: The Free Press.

Gadamer, H. G. (1989). Truth and Method. In J. Weinsheimer and D. G. Marshall. New York: Continuum.

Gourlay, S. (2006). Conceptualizing Knowledge Creation: A Critique of Nonaka's Theory. *Journal of Management Studies*, *43*(7), 1415-1436.

Goranzon, B. (1993). *The Practical Intellect: Computers and Skills*. Springer: Verlag London.

Berlin Gupta, A. K., K. G. Smith. & C. E. Shalley. (2006). The Interplay between exploration and exploitation. *Acad. Management Journal*, *49*, 693–706.

Heidegger, M. (1962). *Being and Time*. New York: Harper & Row.

Heidegger, H. (1977). The Question Concerning Technology. In W. Lovitt (Eds.), The Question Concernin Technology and Other Essays. New York: Harper & Row Publishers.

Heidegger, M. (1993). What is Metaphysics?. In D. F. Krell (Eds.), *Basic Writings*. London: Routledge.

Healey, M. P., & Hodgkinson, G. P. (2014). Rethinking the philosophical and theoretical foundations of organizational neuroscience: A critical realist alternative. *Human Relations*, 1-28.

Hernes, T., Simpson, B. & Soderlund, J. (2013). 'Managing and temporality'. *Scandinavian Journal of Management*, *29*(1), 1-6.,

Herron, C. & Sapienza, H. J. (1992). The entrepreneur and the initiation of new venture launch activities. *Entrepreneurship Theory & Practice*, *17*(1), 49-55.

Howells, J. (1996), ''Tacit knowledge, innovation and technology transfer''. *Technology Analysis & Strategic Management*, *8*(2), 91-106.

Ireland, R. D., M. A. Hitt, & D. G. Sirmon. (2003). A model of Strategic Entrepreneurship: The Construct and its Dimensions. *Journal of Management*, *29*(6), 963-89.

Ireland, R. D., Covin, J. G., & Kuratko, D. F. (2009). Conceptualizing Corporate Entrepreneurship Strategy. *Entrepreneurship Theory and Practice*, *33*(1), 19-46.

Johannessen, J. A., Olaisen, J. & Olsen, B. (2001). Mismanagement of tacit knowledge: the importance of tacit knowledge, the danger of information technology, and what to do about it. *International Journal of Information Management*, *21*, 3-20.

Johansson, T. & Kroksmark, T. (2004). Teachers' intuition-in-action: How teachers experience action. *Reflective Practice*, *5* (3), 357-381.

Kolb, D. A. (1984). *Experiential learning: experience as the source of learning and Development*. Englewood Cliffs, NJ: Prentice Hall.

Korthagen, F. A. J. (2005). The Organization in Balance: Reflection and Intuition as Complementary Processes. *Management Learning*, *36* (3), 371-87.

Kreiner, K. (1997). Knowledge and Mind. In Cognition, Knowledge and Organizations. Porac, J. and Garud, R. (Eds.), *Advances in Managerial Cognition and Organizational Information Processing*, *6*,(1-29).

Lachman, R. (1980). Toward measurement of entrepreneurial tendencies. *Management International Review*, *20*(2), 108-116.

Leonard, D. & Sensiper, S. (1998). "The Role of Tacit Knowledge in Group Innovation". *California Management Review*, *40*(3), 112-132.

Levinthal, D. & March, J. G. (1993). The myopia of learning. *Strategic Management Journal*, *14*(2), 95-112.

MacIntyre, A. (1985). *After Virtue*. London: Duckworth.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, *2*.

March, J. G. & Simon, H. A. (1966). *Organizations*. John Wiley and Sons.

McDonough, E. F. & R. Leifer. (1983). Using simultaneous structures to cope with uncertainty. *Acad. Management Journal*, *26*, 727-735.

Miller, K. D. & Tsang, E. W. K. (2011). Testing management theories: critical realist philosophy and research methods. *Strategic Management Journal*, *32*, 139-158.

Molander, B. A. (2008). "Have I kept inquiry moving?" On the Epistemology of Reflection. *Phenomenology & Practice*, *2*(1), 4-23.

Mullins, P. (2002). Peirce's Abduction and Polanyi's Tacit Knowing. *Journal of speculative philosophy*, *16*(2), 198-224.

Nonaka, I. & Takeuchi, H. (1995). *The Knowledge-Creating Company*. New York: Oxford University Press.

Oakeshott, M. (1991). *Rationalism in Politics and Other Essays*. Indianapolis: Liberty Press.

Orlikowski, W. J. (2002). Knowing in practice: enacting a collective capability in distributed organizing. *Organization Science*, *13*(3), 249-273.

Peirce, C. S. (1958). *The Collected Papers of Charles Sanders Peirce*. Cambridge: Harvard University Press.

Polanyi, M. (1962). *Personal Knowledge*. Chicago: The University of Chicago Press.

Polanyi, M. (1966). *The Tacit Dimension*. London: Routledge & Kegan Paul.

Polanyi, M. (1968). *Logic and Psychology*. American Psychologist, 27-43.

Polanyi, M. (1969). *Knowing and Being*. Chicago: The University of Chicago Press.

Polanyi, M. & Prosch, H. (1975). Meaning. Chicago: The University Of Chicago Press.

Van Manen. M. (2008). Pedagogical Sensitivity and Teachers Practical Knowing-in-Action. *Peking Educational Review*, 1-23.

Ramachandran, J., Mukherji, S. & Sud, M. (2006). "Strategic Entrepreneurship in a Globalizing Economy: Evidence from Emerging Economies". *IIMB Management Review*, *8*(3), 291-302

Russel, T. (1993). Critical attributes of a reflective teacher: Is agreement possible?. In J. Calderhead & P. Gates (Eds.), *Conceptualising Reflection in Teacher Development*. London: Falmer Press.

Salvato, C. (2003). The role of micro-strategies in the engineering of firm evolution. *Journal of Management Studies*, *40*(1), 83-108.

Scharmer, C. O. (1999). Organizing Around Not-Yet-Embodied Knowledge. In Krogh, G.V., I. Nonaka and T. Nishiguchi (eds.), *Knowledge Creation: A New Source of Value*. Macmillan.

Schon, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.

Schon, D. A. (1987). *Educating the reflective practitioner*. Toward a new design for teaching and learning in the professions. San Francisco and London: Jossey-Bass.

Simon, H. (1979). Information Processing Models of Cognition. *Annual Review of Psychology*, 363-396.

Sonenshein, S. (2007). The role of construction, intuition, and justification in responding to ethical issues at work: The sensemaking-intuition model. *Academy of Management Review, 32*(4), 1022-1040.

Stacey, R. (2001). *Complex Responsive Process in Organizations: Learning and Knowledge Creation*. London: Routledge.

Stalk, Jr., G. (1988). Time-The next source of competitive advantage. *Harvard Business Review*, *66*, 41-51.

Svensrud, E. & Asvoll, H. (2012). Innovation in Large Corporations: A Development of the Rudimentary Theory of Effectuation. *Academy of Strategic Management Journal, 11*(1), 59.

Teece, D. J. (1988). 'Technological change and the nature of the firm'. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg & L. Soete (eds.), *Technical Change and Economic Theory* (256-281). Pinter Publishers: New York.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509-533.

Toulmin, S. (2001). *Return to Reason*. Cambridge, Mass: Harvard University Press.

Tsoukas, H. (1996). The firm as a distributed knowledge system: A constructionist approach. *Strategic Management Journal, 17*(Winter Special Issue), 11-25.

Tsoukas, H. (2003). Do We Really Understand Tacit Knowledge?. In Easterby-Smith, M., Lyles, M. (Eds.), *Handbook of Organizational Learning and Knowledge* (410-427). Oxford: Blackwell.

O'Reilly, C. A., M. L. Tushman. (2004). The ambidextrous organization. *Harvard Bus. Rev*., *82*(4) 74–81.

Von Krogh, G. K. & Nonaka. I. (2000). *Enabling Knowledge Creation How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*. New York: Oxford University Press.

Uotila, J., Maula, M., Keil, T., & Zahra, S. (2009). Exploration, exploitation, and financial performance: analysis of S&P 500 corporations. *Strategic Management Journal*, *30*(2), 221-331

Weick, K. E. (1979). *The Social Psychology of Organizing. Reading*. MA: Addison-Wesley

Weick, K. E. (1984). Managerial thought in the context of action. In Srivastva S and Associates (Eds), The Executive Mind (221-242). San Francisco: Jossey-Bass.

Weick, K. E. & Sutcliffe, K. M. (2001). *Managing the unexpected: assuring high performance in an age of complexity*. San Francisco: Jossey-Bass.

Asvoll, H. (2012). Perspectives on reflection and intuition in teacher practice: a comparison and possible integration of the cognitive constructivist and the Drey fusian intuitive perspectives. *Reflective Practice*, 1-16.

Asvoll, H. & Widding, L. (2011). Perspectives on knowledge in innovation management-Some steps toward developing a framework for tacit knowing. *International Journal of Management Concepts and Philosophy*, *5*(4), 389-402.