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Cognition in Investigation:

The Metaphor of Detectives' Thinking Styles and the Research Process

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ABSTRACT

The literature on research in organizational theory and the social sciences at large is primarily focused on the formal dimensions of the research process and largely ignores the cognitive activities involved in theorizing. We use Dean's (2000) hierarchical typology of the thinking processes of police detectives as an analogical framework to reflect on the cognitive processes of organizational researchers. Graphical depictions of the investigative thinking styles of method, challenge, skill, and risk are presented in a 3-D model. From this we construct a model for the research process that incorporates both the formal dimension related to the management of the research project and the dimension of the cognitive modes activated. We draw implications for theorizing, the conduct of research projects, researchers' self-reflexivity, and the training of research students.

Keywords: Investigative Thinking Styles, Theorizing Process, Research Methods, Metaphor, Analogical Transfer

INTRODUCTION

The figure of the police detective as a rigorous deductive thinker is occasionally invoked in scientific research, especially with reference to difficult to solve situations (Patriotta, 2003; Miyata, Kurokawa, & de Strihou, 2005). However, the reference is usually restricted to a figure of rhetoric, and the analogy between scientific research and police work is seldom substantially developed. One exception is Sanders (1976), who compared the research methods of police detectives and sociologists, and argued that the latter could benefit from adopting some of the former's techniques, in particular with regard to physical evidence and multiple data sources. But Sanders was also careful to highlight some obvious limitations to the comparison, for example that social science research interviews are not conducted in the same context, nor with the same objectives than police interrogations in criminal investigations. Identifying the author(s) of a crime differs from offering an understanding of particular, but diverse, organizational phenomena including, say, patterns of structuration or competitive advantages. These factors may account for the relative lack of interest of social science researchers for police investigations, except of course for those involved in police and justice studies (e.g. Muldoon, 2004; Bennett & Holloway, 2004).

In this paper, we wish to renew and enrich the metaphor of the police detective for organizational research by focusing on the thinking processes of investigators, rather than the objectives and methods involved in the investigative process. We start our discussion with a brief review of contemporary literature on organizational research and show that the field contains an abundance of discussions of and research methods, and discuss in greater detail the few discussions pertaining to the cognitive processes of researchers. In the second section, we present Dean's typology of detectives' thinking styles. In the third section, we use this typology as a source

domain to construct a metaphor for a typology of researchers' cognitive styles. The emergent model is illustrated with a case example. Finally, we discuss the implications of the metaphor for conducting research projects, building theories, researchers' self-reflexivity, and training researchers.

THE ORGANIZATIONAL RESEARCHER AND THE RESEARCH PROCESS

Process and Outcomes of Research

The work of the researcher is often poorly understood. Some popular stereotypes portray the scientist as a (slightly) eccentric individual, beavering away in some obscure corner of the planet, sometimes for years, and then presenting her/his breakthroughs to the world at large to claim fame and fortune (or not). Bryson's (2003) humorous account of the history of knowledge in the natural sciences contains a well populated gallery of such portraits. These popular images of the researcher also often imply that there is some form of magic, or of extra-ordinary thinking, involved in the research process. Such representations may be superficially flattering, implying that researchers possess some abilities beyond the reach of common people. But they are also probably misleading and confusing outsiders (including would-be researchers) about the work that researchers do. Perhaps this is so because the work of the researcher is so rarely discussed in its entirety.

Figure 1 has been extracted from a reputable reference manual for social science research (Black, 1999). The diagram summarizes relationships between concepts that form part of the daily work of the researcher: theory explains events in the world through the description of relationships, and is supported by research (quantitative or qualitative) designed to gather the appropriate data. Alternative versions of such sets of relationships exist, and some readers may well argue that Figure 1 is overly simplistic and reductive. This is not a debate we wish to engage in this paper:

our argument is that Figure 1 does not discuss, explain, or represent what researchers do, but merely refers to the outcomes of the researcher's activity. Indeed, thinking in terms of outcomes seems to be a general tendency of the literature on theory and research in organization studies (Weick, 1995) and possibly the social sciences at large.

Insert Figure 1 about here

The reader wishing to explore Black's Figure in greater detail will find an extensive literature discussing research and theory, including major handbooks (for example: Rogelberg, 2002; Reason & Bradbury, 2001; Denzin & Lincoln, 2005) several specialist journals (including: *International Journal of Social Research Methodology*, *International Journal of Qualitative Methods*, *Organizational Research Methods*, *Qualitative Inquiry*, or *Electronic Journal of Business Research Methods*), occasional publications in generalist journals (for example: Numagami, 1998; Williams, Edwards, & Vandenberg, 2003; Boyd, Gove, & Hitt, 2005) as well as special issues devoted to the topic (Elsbach, Sutton, & Whetten, 1999; Hodgkinson, 2001; Scaringella, 2002). The extensive attention devoted to theory and research methods is warranted: it is what defines how we should conduct our professional activity as researchers, how to make a research claim and present our theories. If one looks in the matter in greater detail, three broad categories of contributions can be found:

a) Contributions focused on research agendas: these papers take stock on research in a particular field or sub-field and identify gaps in our knowledge, or in the language of Figure 1, they identify "world events" that researchers could fruitfully look at. In the field of strategic

management, recent examples include: Chia (2004), Foss (2003), or Ketchen, Snow & Hoover (2004).

b) Articles discussing style and form: these offer descriptions of what a research contribution should contain or look like (e.g. Whetten, 1989; Sutton & Staw, 1995; Van Maanen, 1995) or criteria for conducting the evaluation (Bacharach, 1989).

c) Presentations of research methods: focusing on the project management dimension of the research activity, these describe how to deploy a particular research technique. These articles are by far the most frequent in the literature. Insofar as they are concerned with the processes involved in the research, these are confined to the particular technique or set of techniques they are discussing.

Our brief overview offers a picture of the literature on theory and research that is fragmented and segmented. Sometimes, scholars offer a broader view, usually combining insights about research agendas and methods (e.g. Hoskisson, Hitt, Wan, & Yiu, 1999; Scandura & Williams, 2000) but contributions seeking to embrace the whole process of the researcher's work are found lacking. In particular, the transition from world events to relationships is seldom explored. Theories describe relationships between variables related to world events: but how are these relationships arrived at in the first place? This is a question dogging many researchers, inexperienced or not, and the answer can hardly be found in the literature reviewed above. Arguably, this is the core of the process of theorizing, but it appears to be largely ignored.

Organizational research as craft

Daft (1983) offers a possible explanation for this oversight in the literature when he argues that research is a craft, an activity laden with equivocality, causal ambiguity, and unexpected consequences. As a result, many of the researcher's skills rely on tacit knowledge and can only

be acquired through years of reflexive practice and trial-and-error. His comment that "only the formal side of the research process can be transmitted effectively through textbooks and the classroom" (1983: 540) appears to confirm our brief examination of the literature. If research is a craft, and if many of the skills involved rely on tacit knowledge, there is probably no substitute for the acquisition of such craft skills. We do not believe that such tacit skills could or should be codified (Cowan, David, & Foray, 2000) for such an attempt is arguably impossible (Johnson, Lorenz, & Lundvall, 2002; Nightingale, 2003). However, we believe it possible to construct a more detailed guide of the cognitive processes involved in conducting research and building theories, and such a guide could beneficially aid as a scaffold (Anderson, 2003) to the researchers' reflection about their practice and progress in skill acquisition.

Towards a theory for theorizing

Weick (1989) proposes a model of theorizing as "disciplined imagination" as a starter to fill the gap. In this perspective, theory construction resembles problem-solving: the research starts with puzzling facts, and the work of the researcher is to find an adequate explanation for this puzzle. Weick suggest that this is achieved through an iterative process in three steps: first - the problem is stated, second - hypotheses are generated (imagination), and third –hypotheses are selected through a process of confrontation with criteria (discipline).

Also, Weick discusses two problems associated with the management of the research process. First, managing the three steps independently one of another is difficult because of human cognitive limitations: "the theorist is overloaded by demands to run a miniature evolutionary system in a head that suffers from bounded rationality" (Weick, 1989: 529). And he adds that this is all the more true for organizational researchers because organizations are complex, dynamic and difficult to observe. The second difficulty is Thorngate's (1976) "impostulate of

theoretical simplicity" (Weick, 1979: 35-42; 1999: 800-801) which states that theories of social behavior cannot be simultaneously simple, accurate and general: only two of these attributes can be pursued conjointly, so for example increasing the accuracy and generality of a theory necessarily implies decreasing its simplicity.

In essence, Weick's model provides a template to make sense of the research process, and the insights about the limitations and trade-offs he provides are useful for the researcher to reflect on her/his experience as the research project unfolds. But the discussion of the three stages is only a brief outline of the sense-making process occurring during research.

There is another area of literature where recent work drawing on contemporary advances in cognitive science and psychology provides additional concepts that have the potential to enrich our understanding of the cognitive processes involved in the research process. These are captured in two recent publications which provide up-to-date syntheses.

The first conceptual model is provided by Magee (2005) who argues for a rethinking of 'invention', away from the hitherto dominant view that creativity is triggered by divergent, or lateral thinking (DeBono, 1971). The lateral thinking perspective suggests that creativity is triggered by extraordinary thought and involves the perception of links between previously unconnected domains (Magee, 2005: 34). The alternative to lateral thinking is analogical thinking, which involves ordinary thought, and the transfer of "information and experiences from one known situation [...] retrieved and utilized in the search for the solution to an entirely different situation" (Magee, 2005: 33). Analogical thinking does not require the two contexts involved in the transfer process to be similar, what matters is that the creative individual attempts to transfer insights from one realm to the other. Then, the new ideas are "subjected to vigorous scrutiny, a process that will either reject them as being totally impractical or wrong, throw up

new difficulties that need to be resolved or, occasionally, confirm the validity and viability of the ideas" (Magee, 2005: 34). The rejection of an idea then triggers a new iteration of cognition, involving the revision of the original idea, and/or a new process of analogical transfer, until the problem is solved, or the idea is rejected. Magee notes (2005: 34-35) that this iterative process involving revision and analogical transfer is not linear and can lead to radical leaps in ideas through the critical re-evaluation of one's own ideas and/or the search for knowledge that is new to the individual. Although Magee's discussion is primarily focused on invention, he argues that the process is equally relevant to scientific research and that the history of the development of scientific knowledge is replete with instances of analogical transfer (2005: 37).

The second model we draw from is developed in Cornelissen's (2005) discussion of the role metaphor in organizational research. Although the two concepts are built in different domains (theory of innovation in behavioral economics and theory of metaphor in organizational analysis), they exhibit substantial overlap and provide complementary perspectives. For instance, Cornelissen (2005: 761-762) rejoins Magee (2005) when he suggests that metaphors are catalysts for inquiry and hypothesis generation. According to Cornelissen, the value of metaphor in theory construction is not limited to identifying similarities between two figures, but lies in a more complex interaction: "metaphor invites us to see similarities and differences between two concepts, and to see the one concept in terms of the other, making its meaning inherently more profound and exotic than a rendering of the pre-existing similarities between the conjoined concepts might suggest" (2005: 755).

Hence, metaphorical thinking in Cornelissen's model can be equated to analogical transfer, as defined by Magee. One of the original contributions of Cornelissen's paper that has relevance to the present discussion is that it provides a three-phase model of metaphor development. The first

phase of metaphor development ("generic structure") involves the encoding of the terms of the metaphor between the two different domains, drawing correspondences and parallels. The second phase ("blend") involves the transfer of information from the source to the target domains, and leads to the elaboration of a composite of the original concepts. The third phase ("emergent meaning") links the ideas and conjectures emerging from the composite back to the input target concept: "there is new meaning in the blend that is not simply a composition of meanings that can be found in either the target or source concepts" (Cornelissen, 2005: 758). Relating this new meaning to the original concept leads the observer to see it in a new light.

These two models allow us to propose an enriched version of Weick's original model of disciplined imagination. Cornelissen's notion of metaphorical thinking as a complex interaction between concept domains informs the second stage of 'hypothesis generation' in Weick's model. Moreover, Magee's model of analogical transfer for problem solving elaborates the third stage of 'hypothesis selection' in Weick's model that involves a process of detailed scrutiny which suggests a more varied process of iteration in the cognitive process. Together, the insights of Weick, Cornelissen and Magee offer an expanded view of the theorizing process, portraying researchers as building theory progressively through iterative cycles of considering "puzzling facts", generating hypotheses through metaphors and analogical transfer, and scrutinizing and selecting their theoretical results. Whilst this is helpful, this model does not fully engage with the bounds of rationality invoked by Weick (1989) and the tacit knowledge embedded in the craft skills discussed by Daft (1983). In order to do this, we need to incorporate in the model of theorizing how researchers' cognitive processes unfold during research projects.

In the remainder of this paper, we build an expanded model of the research process that encompasses theorizing, and provides a rich account of the cognitive processes involved. This is

achieved through the use of metaphor: we proceed by applying the theorizing process discussed in this section, in particular Cornelissen's (2005) three-staged process for constructing metaphors. First, in the next section, we present a typology of the thinking styles of police detectives when engaged in the complex activity of conceptualizing how to conduct a serious criminal investigation. In the following section, we then use this typology as the source for a metaphorical model of the cognitive activity of researchers.

TYPOLOGY OF DETECTIVE THINKING STYLES

There is a logical cognitive structure to how experienced detectives think. Empirical research by Dean (2000) uncovered four distinctively different ways of thinking or cognitive styles used by detectives to solve serious and complex crimes. These thinking styles are investigation as Method, as Challenge, as Skill, and as Risk. Recent research by Gottschalk (2005) using Dean's typology confirms the generalizability of this model to other investigative contexts, especially in Singapore and more recently in Norway.

These four 'investigative thinking styles' form a typology in which each cognitive style can be defined in descriptive terms as categorized in Figure 2.

Insert Figure 2 about here

Figure 2 illustrates that all four ways of describing a criminal investigation can be seen as more or less partial understandings of the whole phenomenon of investigation. Each of these ways of understanding emphasize certain essential features and aspects specific to its way of understanding, while dropping other features and aspects that are emphasized by one of the other ways of understanding the investigative process, as the reader passes from thinking style 1 to 4.

Thus, these thinking styles reflect four distinctly different yet interrelated ways of understanding and experiencing the investigative process for detectives.

Furthermore, the structure of this thinking styles typology is hierarchical in the sense of each style from 1 to 4 becomes increasingly sophisticated in terms of its conceptual complexity as illustrated in Figure 3.

Insert Figure 3 about here

As can be seen in Figure 3, the hierarchical structure of how detectives/police investigators think increases in complexity as you go up the typology. Moreover, not all cases will require the use of all four investigation thinking styles to solve them. However, as time marches on in an investigation without a result then other styles of investigative thinking will need to come into play to increase the likelihood of a successful outcome. In essence, as a general principle the more complex the crime the higher the investigative thinking style required to solve it.

As noted previously, all four ways of describing a criminal investigation can be seen as more or less partial understandings of the whole phenomenon of investigation.

To highlight the 'partial' nature of each thinking style as 'one' component of the whole totality of understanding about doing a criminal investigation, the content of the 'investigative thinking style hierarchy' can be written as is shown on Figure 4.

Insert Figure 4 about here

When the qualitatively different 'content' of each way of thinking is added to this hierarchy of investigative thinking styles not only is the partial understandings of each component of the whole more apparent, but the linkages in thinking between each style is also more clearly evident. In that, the content shows how each way of thinking and understanding builds upon the other and is related to the others in various aspects and dimensions.

For example, the 'Investigative Method' is foundational to all the other thinking styles. Also, every serious and/or complex investigation will have some degree of 'Investigative Challenge' to it. Furthermore, no matter what type of investigation detectives get involved with they will always be required to apply their 'Investigative Skill' to it as well, not only to deal with the 'challenges' but also to ensure they conduct the 'investigative method' properly.

Moreover, with some investigations detectives may be required to take an 'Investigative Risk' to increase the likelihood of a good outcome. In so doing, detectives will draw upon their 'skill'; face perhaps new and different 'challenges'; and still have to ensure they do not lose the case by not following the correct procedures in applying the 'method' to the investigation.

Also, as can be seen in Figure 4 the broken-dotted arrows are meant to indicate that the direction of these inter-relationships is one way only. That is, the conceptually rich content of thinking style 4 makes it a more complex way of understanding an investigation and hence is placed above the less complex or simpler ways of understanding. Again, as also noted in Figure 3.

However, it is a relationship of implication only in the sense that a person with a more complex way of understanding something implies that the same person can understand a more simple way of understanding the same thing as well. Hence, the implication cannot necessarily be extended the other way or in the other direction. That is, a person with a simple way of understanding something may not be able to comprehend a more complex way of understanding the same thing.

Given this one-directional nature of the structural relationship between thinking styles, it is clear that this 'investigative thinking style hierarchy' does not mean to imply that a development process is necessarily involved in going from thinking style 1 to 4.

This is an important point to consider as it cannot be assumed that going from a simple way of understanding and thinking about an investigation to a more complex way of understanding and thinking about the investigative process is just a matter of learning about one thinking style after the other in a step-by-step invariant manner of training. Hence, just putting a detective through a course on these thinking styles will not necessarily guarantee the person has actually acquired a particular style of thinking and is competent in applying it.

Such a developmental process may indeed be involved in learning to be an investigator but this cannot be established with any reliability nor taken as proof of such a process on the basis of this 'investigative thinking style hierarchy'. In fact, while these thinking styles can be seen as forming a 'hierarchy' of increasing complexity they can also be seen as 'layers' of experience that the individual has acquired over time and not necessarily in any particular order or sequence.

However, the point is that simpler layers of individual experiences can be assumed to be present in more complex layers, or ways of experiencing, a phenomenon regardless of how or in what sequence they have been learned and internalized.

This is why the arrows that represented the direction of complexity are presented as 'broken lines' to highlight the fact that while a hierarchy of increasing complexity is logically evident from one thinking style to another, it is only a logically 'implied' relationship not necessarily a strong developmental relationship.

Modeling preferences in detectives' thinking styles

These four cognitive styles of thinking by detectives/investigators can be constructed in the form of a physical 3-D structure or model. Such a 3-D structural model captures the 'collective thinking' of police investigators in relation to how they experience, understand and cognitively process the carrying out of a serious and complex criminal investigation. The picture in Figure 5, below, presents this 3-D structural model that captures and integrates the holistic nature of these four investigative thinking styles.

Insert Figure 5 about here

As can be seen, the structure of this 3-D 'ITS' model is symbolic of the brain's neural network with its interconnected web of cognitive pathways. The model incorporates and integrates the relational significance of the key elements associated with each of the four 'investigative thinking styles' that constitute the totality of the model. What is not so obvious from this static photograph is the 3-D dynamics of the model. However, if you visualize the model slowly turning then 3-D features emerge about the 'shape' for each style of investigative thinking. The 3-D dynamics of each investigative thinking style can be explained by the model in the following sequential manner:

- the 'Method' style of investigative thinking is the central rod that links (*blue tubing*) the cone shape of each procedural step of *Collecting-Checking-Considering-Connecting-Constructing* information into evidence to various elements of all the other styles.

- the 'Challenge' style encompasses the surface area of an investigation's outer boundary (the blue circle at the base of the model) by sitting above and being connected into the

investigative circle (*yellow tubing*) through its four key elements - the intensity sources of the *Job, Victim, Crime,* and *Criminal*.

- the 'Skill' style effects an investigation by ballooning out (*green tubing*) in the direction a detective's thinking under the key influential elements of *investigative focus, personal flexibility,* and *level of emotional involvement.*

- the 'Risk' style of investigative thinking caps off an investigation by enhancing the investigating detective or team with a way of thinking that adds (*red tubing*) multiple connections through the application of *creativity, discovery,* and *development* of information into evidence and hence provides skeletal pathways to all the other styles of investigative thinking - Skill, Challenge, Method.

The depicted 'hierarchical structure' of the 'ITS' model should not be taken to imply that investigators always follow a 'temporal sequence' with regard to when, and where, which 'thinking style' is used in an investigation. In some investigations, several of these styles can occur simultaneously. Thus, the process of explaining this model, and the four thinking styles it contains, will of necessity be simpler and different, in some respects, from the complexity of the actual process of operation by investigators in 'how they *prefer* to think about' an investigation.

Although experienced detectives and investigators intuitively use these four levels of thinking in an investigation, it is rare that any one detective will give equal weight to all four styles of investigative thinking in a particular case, because detectives like everyone else, have a preference for maybe one or two particular styles or ways of thinking.

Having examined in detail Dean's typological model of investigative thinking styles used by detectives it is now the task of the next section to analogically relate these four cognitive

processes to the minds of organizational researchers in the quest to better understand how to learn 'how to think' about theory construction.

TOWARDS A METAPHOR OF THE DETECTIVES THINKING STYLES FOR RESEARCHERS' COGNITIVE ACTIVITIES

In this section we use the typology of detectives' thinking styles as the source for a metaphorical model of the researchers' cognitive activities. Cornelissen (2005) argues that the construction of a metaphor involves 3 stages: the development of a generic structure, the composition of a blend, and the expression of emergent meaning. In this section, we follow these three steps in constructing the metaphor of the thinking styles of police detectives for organizational researchers.

Developing a generic structure for the detective metaphor

The first phase of metaphor involves the encoding of its terms, the identification of parallel structures, and the mapping of correspondences. Dean's (2000) typology comprises four thinking styles, that are inter-related and hierarchized. We start by looking at each style in turn, and then examine their relationships.

Thinking style 1 - "Method": according to Dean, the "method" style of thinking is all about procedure. That is, getting the procedural 'method' right by following a set of five procedural steps of collecting, checking, considering, connecting, and constructing information into evidence. This is analogous with many descriptions of research methods in organization studies. For example: "Organizational survey research typically proceeds through five stages: (1) identification and documentation of the purpose and scope of the survey effort; (2) construction of the instrumentation; (3) survey administration and data collection; (4) the analysis of the information obtained; (5) the reporting of results to key constituents" (Rogelberg, Church,

Waclawski, & Stanton, 2002: 142). The "method" style of thinking is concerned with the foundations and robustness of the detective's investigation, and compliance with legal procedures must be ensured. Two key differences exist between detectives and researchers in this process. First, detectives are given a crime to solve: unlike researchers, they do not have to justify the purpose of their investigation. Second, even if bound by legal process considerations, the detective's "method" appears more flexible and open-ended than some research methods utilized in organization studies, in the sense that detectives do not construct any research instruments *ex-ante*. This is also true of action research, grounded theory and of many forms of case study research, but not of quantitative, survey-based research. There is substantial overlap between detectives and researchers for the other steps, and the statement that theorizing consists of collecting, checking, considering, connecting and constructing data into theory echoes the writing of Weick: "abstracting, generalizing, relating, selecting, explaining, synthesizing and idealizing" (1989: 389).

Thinking style 2 - "Challenge": this "challenge" style of thinking in contrast to the procedural approach of the "method" cognitive style of thinking is all to do with motivation. That is, which "challenges" motivate detectives to do the best investigation they can. Hence, this style describes four sources of the intensity that motivate the detective's efforts. They are driven by the victim(s), criminal(s), and crime(s), and the intrinsic value of the job itself. Detectives are motivated by the desire to do the *best* job they can (we change here the emphasis from Dean's original description -cf. Figure 4) and this implies some level of emotional involvement.

To many, this style may at first appear disconnected from the experience of conducting organizational research: aside from extreme cases (for example: Chikudate, 2002) crimes, criminals or victims do not feature prominently in organizational research. However,

organizational researchers are often motivated by the desire to help the organizations and stakeholders they are studying by proposing solutions to the problems they have identified (Daft, 1983; Mitroff, 1972). So, if detectives find motivation through crimes, criminals, victims, and the job, it appears that organizational researchers are motivated by problems, organizations, and stakeholders as well as research for its own sake as a worthy endeavor for the betterment of society as a whole. Note here that we do not imply a correspondence between the terms: "crimes" may arguably be loosely associated to "problems", but "criminals" or "victims" may not be necessarily linked to "organizations" or "stakeholders". However, doing an 'investigative job' or a 'research job' can both be regarded as worthwhile endeavors to engage in.

Furthermore, whilst the nature and sources of the challenges presented by criminal investigation and organizational research will be different they both will nonetheless contain their own 'challenges' to address and obstacles to overcome. In relation to research, getting funding can certainly be a challenge as well as ensuring ethical consent where interviewing participants is involved in a research study.

Finally, the emotional involvement of researchers in their work is apparent in the sometimes strongly argued exchanges that punctuate the theoretical conversation in organization studies (see for example: Pfeffer, 1993 and Van Maanen, 1995; or Deetz, 2000).

Thinking style 3 - "Skill": where the "method" style is about proper procedure and the "challenge" style is about motivation, this "skill" style is all about relatability. Hence, this style refers to the ability of detectives to relate and communicate effectively with a range of people in order to establish an appropriate investigative focus, and requires both flexibility and the appropriate level of emotional involvement. In this case, the correspondence to the work of organizational researchers will certainly appear manifest to many scholars familiar with forms of

ethnographic and face-to-face research, where listening skills, empathy, and the ability to adjust their language to that of the people they are interacting with, are essential attributes of successful data gathering (Yin, 1994). The detective metaphor also reminds here the organizational researcher that emotional involvement that is too highly charged gets in the way of good practice, and may lead to substitute advocacy and opinion to theory.

Thinking style 4 - "Risk": this cognitive style goes beyond procedure, motivation, and relatability to focus on thinking about being proactively creative. This last thinking style refers to how detectives apply creativity when they gather information and develop it into evidence, within the bounds of sanctioned practice. The analogy with the work of organizational researchers can be split into two distinct terms.

First, the freedom of action of organizational researchers unfolds differently from that of detectives. The ethics of research strictly bound how social science researchers obtain data (Academy of Management, 2002; Aguinis & Henle, 2002), whilst detectives are bound by the ever-present reality in their minds that everything they say, do, and collect can potentially end up in a court of law where they can be cross-examined on it. Furthermore, researchers may have more room for creativity and imagination as to where to look for data, and indeed it is sometimes argued that good organizational research comes out of unusual fields (Weick, 1974). This approach is illustrated, for example, by Feldman's field research on organizational routines conducted in a university student hall (Feldman, 2000; Feldman & Pentland, 2003).

Second, the use of creativity by detectives in this style mirrors Weick's (1989) model of theorizing as disciplined imagination we are building on in this paper, in that the risks must be justified. The need for flexibility and creativity in the approach of the researcher is also argued for by Daft who denies that "hard logic and previous evidence should justify every step" (1983:

540) and suggests that successful research is characterized the search for answers to open-ended questions rather than testing hypotheses.

Relationships between the styles

We now turn to the relationships between the styles. The four styles form a three-dimensional structure (Figure 5), where the core "method" style is surrounded and informed by the three others disposed in successive interrelated layers of experience. At each step of an investigation, all styles may be activated simultaneously, without following a fixed sequence. The four styles form a hierarchy in terms of the complexity of thinking involved (Figure 4), and long and complex investigations usually require the detectives to resort to the higher-ranking style 4 of "risk" (Figure 3), but there is no fixed correspondence between the stages of an investigation and the thinking styles used.

The "detective investigation" metaphor thus suggests five implications for organizational researchers. First, that the four thinking styles cannot be acquired in the classroom but represent layers of accumulated experience fits well with the conceptualization of research as a craft activity. Second, research involves a hierarchy of cognitive activities in terms of their complexity. Third, long and complex research projects require the activation of all styles. Fourth, however it is unlikely that any one researcher will give equal weight to all four styles but rather will have a preference for maybe one or two cognitive styles. Fifth, there is no correspondence between a particular style and particular steps of the research process.

In the next paragraph, we continue to build our metaphor by proposing a "blend": a description of the cognitive activity of researchers informed by the thinking styles of detectives.

Composition of the metaphorical "blend"

The second step in Cornelissen's (2005) model of metaphor construction involves building a "blend", a composite of the source and target domains. From the generic structure discussed above, which established the correspondences and parallels between police investigations and research in organizations, we now propose a new framework for the cognitive styles of researchers, which draws from both domains. To distinguish the "blend" from the metaphor, we refer here to "cognitive modes" rather than "thinking styles", and give each style a different label.

Cognitive mode 1 - "Rational": the first mode is associated with the rigorous and logical application of research methodologies, as instructed to students in classrooms, and presented in reference books and methodological papers. Hence, this cognitive mode echoes with the 'method' style as it too follows a logical, rigorous procedure for conducting a police investigation. This type 1 research mode of cognition is rational, in that it leaves little room for improvisation: research outcomes must satisfy criteria such as validity and reliability to provide adequate support to theory (Guion, 2002). This rational style is at the core of the research process and is (potentially) informed and enriched at all steps by the other styles.

Cognitive mode 2 - "Intentional": in this mode, researchers are stimulated by their passion for their work, and their desire to help the organizations and stakeholders they are studying overcome the problem(s) identified. In other words, in this style, the intentionality of the researchers imbues purpose and drive to the research project in the relation to the organizations, stakeholders and problems of the research context.

Hence, this cognitive mode is related to the "challenge" style because it too is about the intentionality of the research investigation. The driving force that propels the work is what is it

about this research project that motivates this particular researcher or team of researchers. This type 2 research mode of cognition is intentional, as the intent behind the research is sufficient enough to sustain the effort in spite of the difficulties faced or else the research activity collapses, and the researcher loses motivation and purpose.

Cognitive mode 3 - "Relational": researchers in mode 3 seek to establish effective contact with a variety of people to maintain a good investigative focus through flexibility in communication and an appropriate level of emotional involvement towards organizations, stakeholders, and problems. This cognitive mode is related to the 'skill' style as it is all about relating well to a variety of people. This type 3 research mode of cognition relies on the ability of the researcher to switch between different styles of communication depending on who they are talking to as well as simultaneously exhibiting empathy and a professional distance as a way of maintaining as much research objectivity as possible. For example, researchers usually find it useful to use different communication styles during data collection, and presentation of results to academics and managers (Maclean & Macintosh, 2002).

Cognitive mode 4 - "Conjectural": in order to gather useful data and develop it into new and valid theory, researchers must be open to the possibilities of developing or utilizing new approaches, methods and settings, within the bounds of ethics and accepted evaluation criteria. Especially in the case of lengthy and complex research projects, considering a range of conjectures is required to overcome difficulties, or find new directions for the research project. This cognitive mode is linked with the 'risk' style in so far as the need for proactive creativity must always be an open cognitive possibility for research as well. This type 4 research mode of cognition as indicated before is a frequent characteristic of highly successful research projects, in that the conjectures for research are framed around questions to be answered, rather than

hypothesis to be validated, and this usually requires researchers to operate (at least part of time) in a conjectural mode.

Daft (1983) states that achieving significant research requires to go beyond the formal methods of the textbooks. In the terms of the detective metaphor, this implies that researchers may need to activate other cognitive modes in addition to "rational". For example, researchers may be alerted to the existence of problems through contacts with organizations (relational mode), research results may be discussed with stakeholders to check their relevance (balanced mode), and the presentation of research results may involve innovative storytelling (conjectural mode).

Expression of emergent meaning

The final step in metaphor construction links back to the initial domain and extracts the meaning that emerges from constructing the metaphor (Cornelissen, 2005). The metaphor of the detective's thinking styles sheds new light on the cognitive activities of researchers, and on the research process. Our discussion of the research process in the first section of the paper focused on the steps involved in research work, and on the sequence between steps in a research project. The detective metaphor suggests that the dimension of steps offers only a partial view of the research process. The identification of four distinct cognitive modes suggests that there is another dimension to research than that of the steps of the research project. This dimension is sometimes implicitly present in the background to the discussions of the research process: for example, when Daft (1983: 540) advises researchers to "outgrow" the methodological thinking involved in research ("rational" cognitive mode), the other modes of cognition are implicitly assumed. The contribution of the detective metaphor is to provide a structure to express this dimension: researchers activate a variety of cognitive modes during the research process. This

emergent meaning is captured in Figure 6 which represents the steps in the research process along the horizontal axis, and the cognitive modes along the vertical axis.

Insert Figure 6 about here

The traditional "textbook" presentations of the research process ignore the dimension of cognitive modes. Indeed, discussions of research methods and theory usually focus on the "rational" cognitive mode, and do not explicitly acknowledge that it must be complemented by other cognitive modes to lead to successful outcomes. Our two-dimensional model of the research process helps to remedy that situation. As for police detectives, the model does not teach researchers how to activate one or the other of the four cognitive modes, this is an integral part of the skills crafts acquired through experience. But the model provides potentially very useful help in several contexts:

- skill acquisition: researchers can use the model to plot the path of their research projects at each step, and use this as a cognitive scaffold to reflect on their progress and practices. In particular, it can help researchers to identify which cognitive modes they master, and which ones would benefit from further skill acquisition. This may be particularly useful for research students who are at the beginning of the learning curve. In this respect, the model may also provide a useful tool during research supervision. If theorizing is also a process of "disciplined reflexivity" (Weick, 1999), then our two-dimensional framework is a tool to support it.

- project management: the framework can also orient the researcher's self-reflectivity in problem solving. Plotting which cognitive modes have been activated at each step of a

project, may help to suggest new directions if a research project is stalled. And experienced researchers may even plan which modes they will want to activate in future steps of a research project, based on their experience and the project's characteristics.

In the next paragraph, we illustrate the use of the model through a short case study.

Illustration: the case of T.

T. was a PhD student we have supervised. A bright individual, eager to learn, and enthusiastic about the prospects of an academic career, T. was in many respects representative of good PhD candidates. T. also experienced some of the problems research students frequently experience: though understanding existing theory and research methods was no major obstacle for this student, the transition to application was marred by teething problems. A simplified representation of the steps T. went through (1 to 13) during the research project is provided in Figure 7.

Insert Figure 7 about here

T.'s initial formulation of the research problem was entirely driven by a conceptual discussion of the literature (1), leading to logically formulated hypotheses (2), and both steps were firmly grounded in the rational mode. To test this initial formulation of the research project, T. conducted a pilot study. The field research for this pilot study consisted of a qualitative case study. This had been facilitated by personal contacts and involved the activation of the relational mode (3) with which T. was naturally comfortable. The evaluation of the results of the pilot study (4) led back to the activation of the rational mode. However, the outcome of the pilot study was quite disappointing: T. did not obtain sufficiently useful data to confirm or falsify the

hypotheses derived from the theory discussion. This led, to re-visiting (5) the theory and research questions. In effect, T. went through steps 1-5 several times, searching for a solution, and for a way to obtain successful research outcomes. It is only when T. was able to activate the conjectural mode (6) and approach the research project as a series of open questions rather than closed hypotheses needing validation that the research made significant progress. The second round of field research (7) led to the formulation of hypotheses (8) driven this time by the circumstances of the cases (intentional mode) rather than theory alone. The evaluation phase involved feedback from contacts in the case organizations (9), several re-examinations of the original open questions and how they related to the answers constructed from the field data (10), and how the results compared with existing theory (11). Finally, the presentation of the research results was done formally in T.'s dissertation (13) and informally through a series of presentations to sponsors in the case organizations (12).

The case of T. illustrates well how our two-dimensional framework provides a richer account of the research process, compared to traditional representations (cf. Figure 1). In particular, the case shows how our model can account for the "messiness" of the research process and the many iterations through which researchers go through.

The case also illustrates several elements discussed previously:

- T. was a researcher most comfortable with cognitive modes 1 and 3 (rational and relational), but it is only when the conjectural and intentional modes (4 and 2) were also activated that the research project really progressed.

- Most research steps involved the activation of several cognitive modes, thus confirming that there is no correspondence between cognitive modes and stages in research progress.

- Finally, the case illustrates the craft dimension of the skills involved in research, and that researchers need to reflect on their own activities to progress and reach successful research outcomes.

DISCUSSION AND CONCLUSIONS

Discussion: contributions to the literature on research methods and theorizing

This paper offers two main contributions to the literature on theorizing and research methods. The first contribution is an extension of Weick's (1989) model of theorizing as disciplined imagination. We develop Weick's initial model by proposing that the process of "imagination" does not involve any form of extra-ordinary thinking, and can be best captured through the processes of analogical transfer (Magee, 2005) or metaphor construction (Cornelissen, 2005). This first contribution is illustrated through the construction of a new metaphor for the research process, based on Dean's (2000) typology of detectives' cognitive styles. The second contribution is articulated around the detectives' thinking styles, and consists of two parts: first, a typology of researchers' cognitive modes built through metaphor and analogical transfer; second, a two-dimensional framework to represent the research process, that captures both its "technological" and "craft" dimensions (Daft, 1983).

Together, the two contributions provide researchers with a set of tools to guide them through the research and theorizing processes:

- The two-dimensional model of the research process allows researchers to plot the evolution of a research project, and reflect on past stages and the cognitive mode(s) they have activated with a view to solving problems associated with the project, or to guide their learning of research skills through experience. Alternatively, the framework can be used to plan a research project: based on their experience and the characteristic of the project,

researchers can think about the cognitive mode(s) they will need to activate in order to generate successful research outcomes.

- The typology of four cognitive modes (rational, intentional, relational, conjectural) provides researchers with a cognitive scaffold to reflect on their strengths and weaknesses, and help in directing their future experiences in terms of supporting their learning of the research craft skills.

- The extension of Weick's (1989) theorizing model provides researchers with a template to generate hypotheses during the theorizing process through analogical transfer and metaphors.

In this paper, we also provide an illustration for two approaches to theorizing in organization research that have been advocated as relevant for the XXIst century. First, as mentioned above, we have built a metaphor, following the three steps detailed by Cornelissen (2005). This is different from the examples analyzed by Cornelissen in his 2005 paper, which were retrospective analyses of series of related research projects, in that our discussion of the thinking styles of detectives as a metaphor for researchers' cognitive modes is contained within one paper, and thus shows how researchers can develop new theories through metaphors. Second, we have proceeded in what may be called a double-looped theorizing process, where we developed the second theoretical contribution of the paper (typology of cognitive modes and two-dimensional model) by applying the first contribution (extended theorizing model). Such a process exhibits the kind of "second-order complexity", which Tsoukas & Hatch (2001) suggest is necessary to capture the richness of contemporary organizational phenomena. Arguably research about organization theory processes falls in this category.

**Conclusion: implications for further research and for researchers**

Intuitively, the typology of the researchers' cognitive modes looks to have strong currency: researchers can easily relate to the four modes, the two-dimensional model appears to capture appropriately the richness of the research process and it seems a good tool to make sense of the "messiness" of complex and lengthy research projects. However, this model is still at the hypothetical stage, and empirical validation is now warranted: a research project focusing on the cognitive work of researchers appears to be called for. In particular, the model as it stands seems to raise two main interrogations. First, are there other cognitive modes involved in the research process, compared to the four styles involved in detective investigations? Second, it remains to be seen how well the model captures what goes on in teams of researchers: one way to put it would be to ask if the institution of "collective mind" (Weick & Roberts, 1993) leads to different cognitive processes -this time at the collective level?

Finally, this paper has implications for researchers and in particular for research students. If learning about the four cognitive modes does not enable researchers to activate them, it provides a guide on how to capitalize on their experience, and may prompt them to try something new or different. In other words, this framework may not be a substitute for the acquisition of craft skills through experience, but it provides a firm foundation to go beyond the formal methods of the classroom and textbooks, and leads to reflexivity that remains disciplined.

FIGURES

FIGURE 1

A traditional representation of the research process
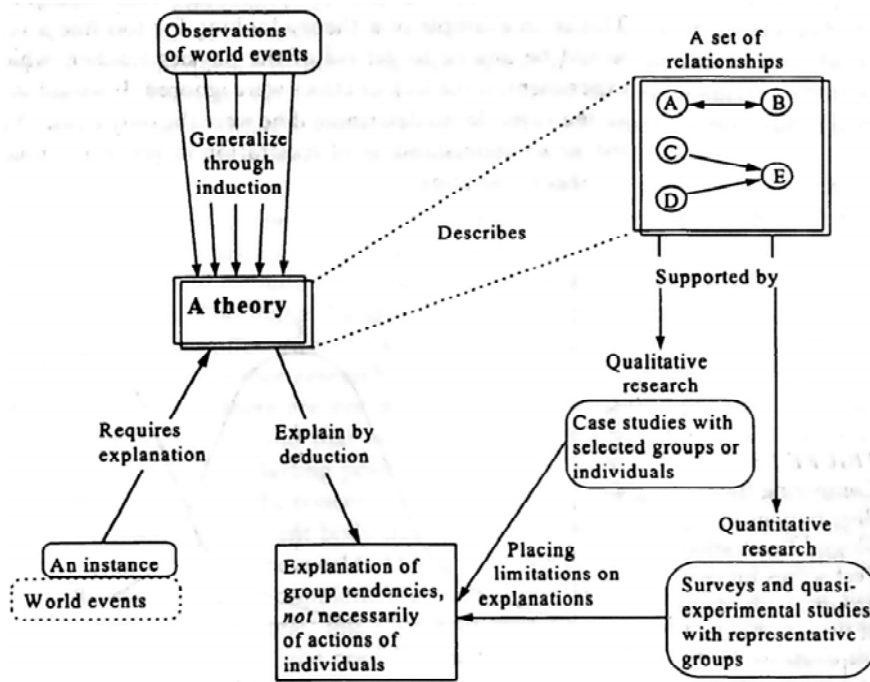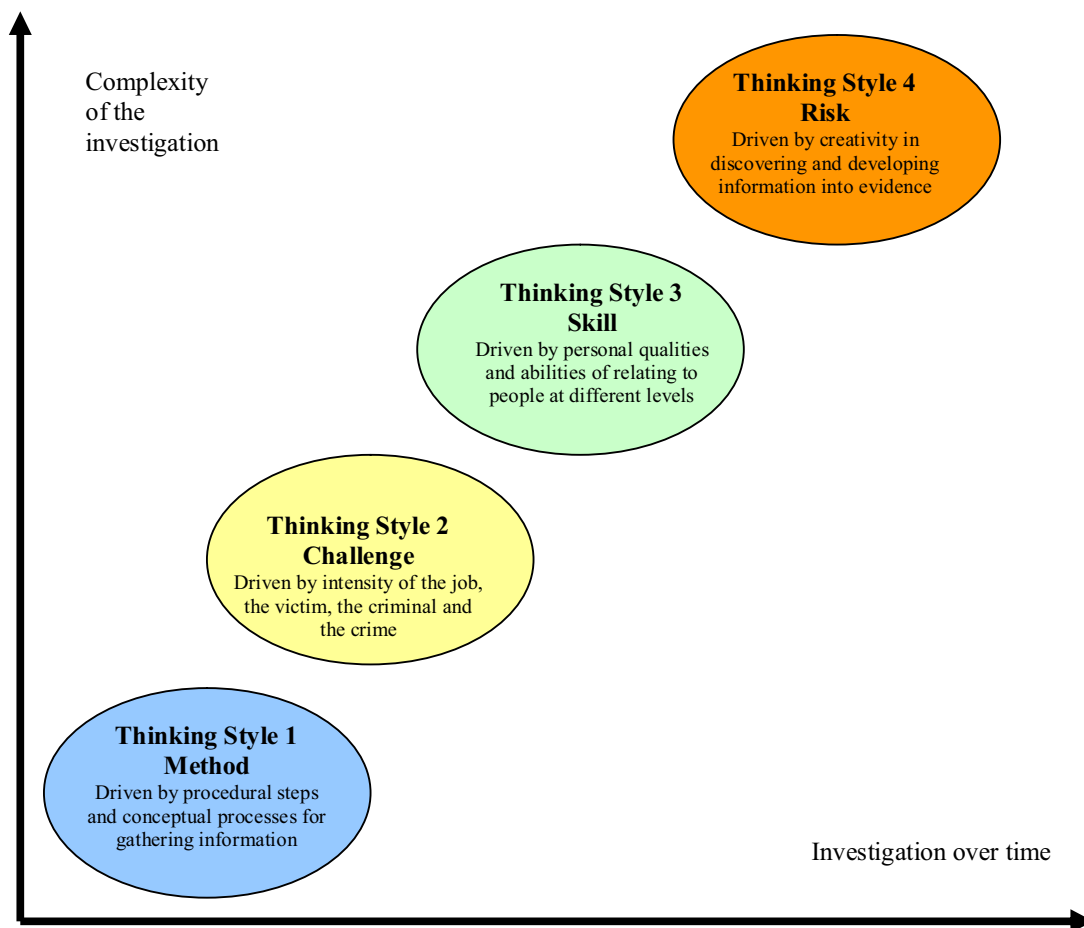

Source: Black (1999: 9)

FIGURE 2

Typology of thinking styles about the investigative process by detectives

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THINKING STYLE 1: INVESTIGATION AS METHOD
Detectives describe this way of thinking as following a 'method' that is driven by a set of basic procedural steps and conceptual processes for legally gathering information and building evidence.

THINKING STYLE 2: INVESTIGATION AS CHALLENGE
Detectives describe this way of thinking as a 'challenge' driven by the intensity that is generated by the four key processes of the job, the victim, the criminal and the crime.

THINKING STYLE 3: INVESTIGATION AS SKILL
Detectives describe this way of thinking as a 'skill' that requires a set of personal qualities and abilities that revolve around the central skill of relating effectively to a diversity of people at a number of different levels throughout an investigation.

THINKING STYLE 4: INVESTIGATION AS RISK
Detectives describe this way of thinking as taking a 'risk', that must be legally justifiable, in order to be proactive through the use of creativity in discovering and developing information into evidence.

Source: Dean (2000)

FIGURE 3

Hierarchical complexity of detective thinking styles typology

Complexity
of the
investigation

Thinking Style 4
Risk
Driven by creativity in
discovering and developing
information into evidence

Thinking Style 3
Skill
Driven by personal qualities
and abilities of relating to
people at different levels

Thinking Style 2
Challenge
Driven by intensity of the job,
the victim, the criminal and
the crime

Thinking Style 1
Method
Driven by procedural steps
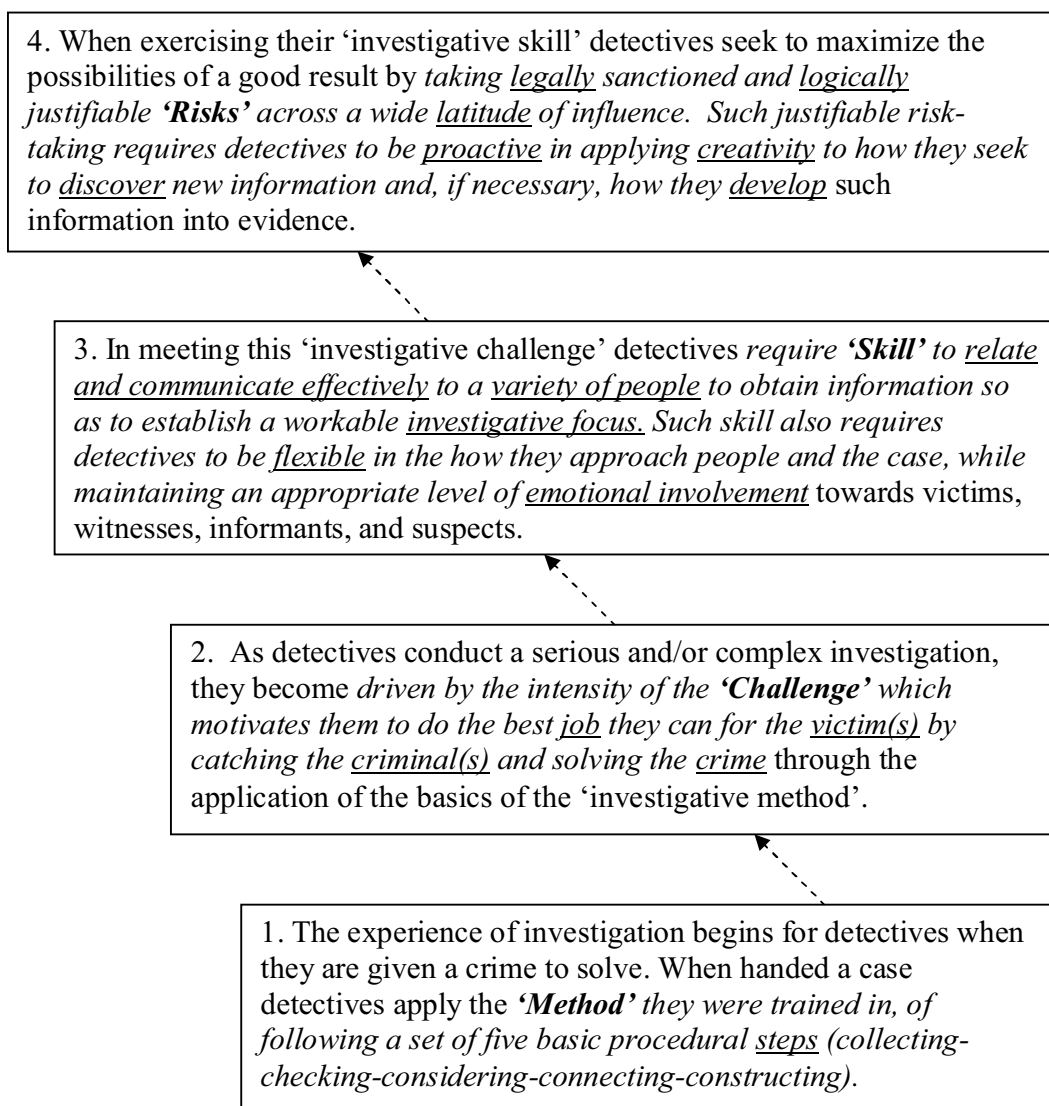and conceptual processes for
gathering information

Investigation over time

Source: Dean (2000)

FIGURE 4

The four 'investigative thinking styles' expressed

As components of a whole investigative process

4. When exercising their 'investigative skill' detectives seek to maximize the possibilities of a good result by *taking legally sanctioned and logically justifiable 'Risks' across a wide latitude of influence. Such justifiable risk-taking requires detectives to be proactive in applying creativity to how they seek to discover new information and, if necessary, how they develop such* information into evidence.

3. In meeting this 'investigative challenge' detectives *require 'Skill' to relate and communicate effectively to a variety of people to obtain information so as to establish a workable investigative focus. Such skill also requires detectives to be flexible in the how they approach people and the case, while maintaining an appropriate level of emotional involvement* towards victims, witnesses, informants, and suspects.

2. As detectives conduct a serious and/or complex investigation, they become *driven by the intensity of the 'Challenge' which motivates them to do the best job they can for the victim(s) by catching the criminal(s) and solving the crime* through the application of the basics of the 'investigative method'.

1. The experience of investigation begins for detectives when they are given a crime to solve. When handed a case detectives apply the *'Method' they were trained in, of following a set of five basic procedural steps (collecting-checking-considering-connecting-constructing).*

Source: Dean (2000)

34

FIGURE 5
3-d model of the hierarchical structure of 'investigative thinking styles' typology

Source: Dean (2000)

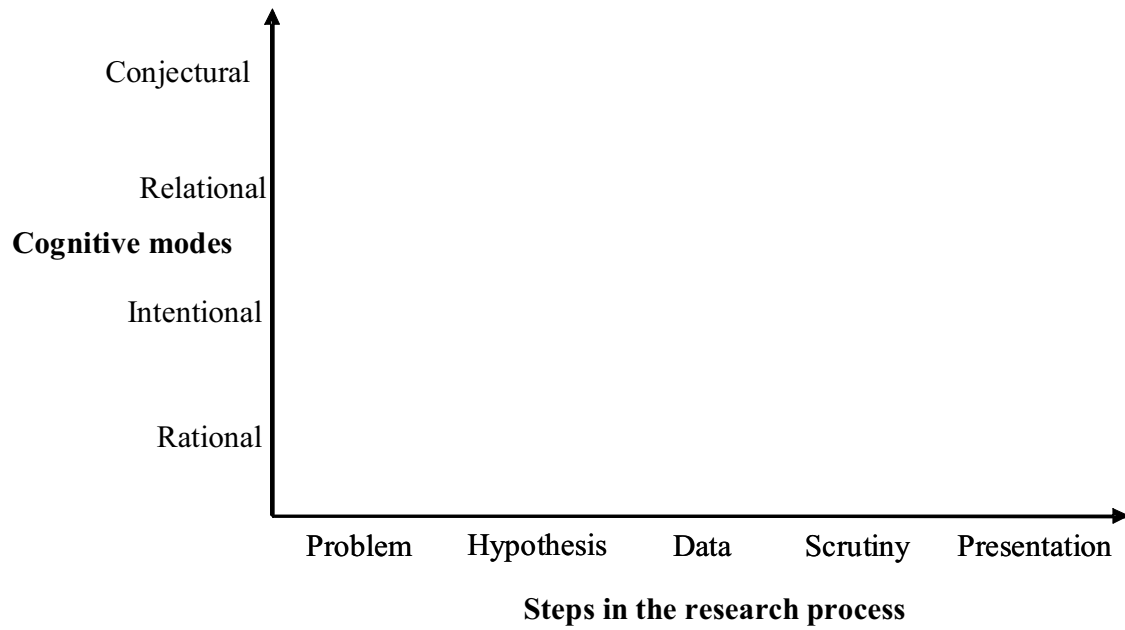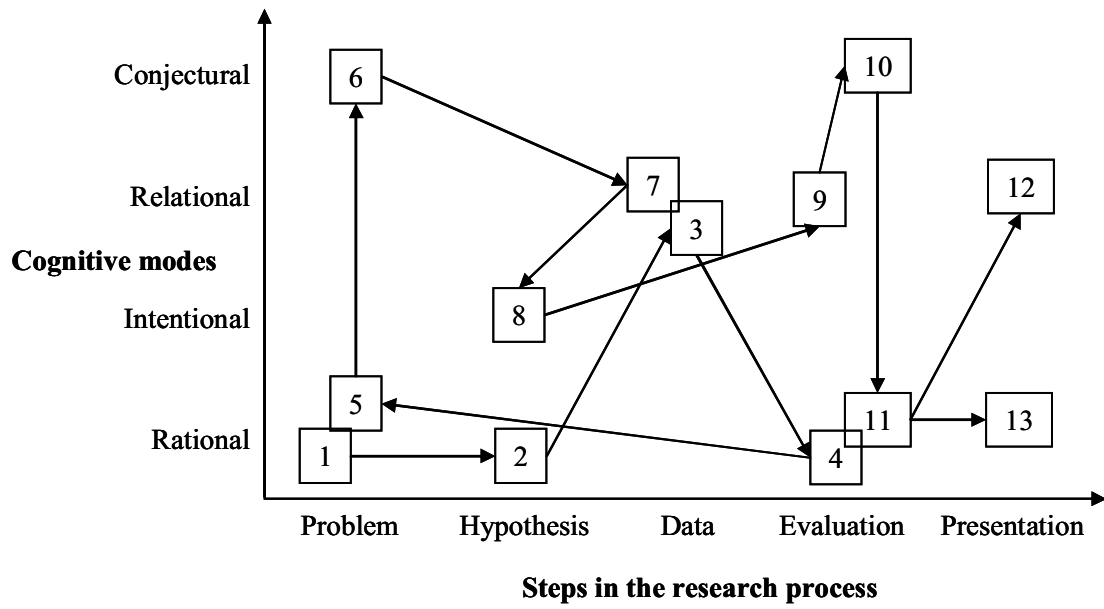**FIGURE 6**

Dimensions of the research process

FIGURE 7

A simplified representation of T.'s research project

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