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**Deutero-Learning in Organizations:
A Review and a Reformulation**

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Deutero-learning in organizations; A review and a reformulation

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The concept of 'deutero-learning' signifies a particular deep or high form of organizational learning. Current conceptualizations, however, are ambiguous and diverse and hide important implications for theory and practice. The purpose of this note is to bring theoretical coherence to this concept by reviewing and analyzing its theoretical antecedents, leading to the reformulation of deutero-learning as a specific form of behavioral-interactional learning, distinct from meta-learning and institutional learning.

Organizations need to learn to master the generally perceived increase in dynamics, complexity and change in the social and economic environment surrounding them. To state it succinctly: "The ability to learn faster than your competitors may be the only sustainable competitive advantage" (De Geus, 1988: 71). In general, the more dynamic, complex and changing environmental contingencies are considered to be, the more deeply probing and comprehensive learning processes in and by organizations should be. In other words, increasing environmental turbulence necessitates higher forms of organizational learning.

The importance of learning in and by organizations has since long been recognized by organization scientists.[1] Especially in the last decade the interest in organizational learning has been blossoming and burgeoning, a fact not only demonstrated by a continuously increasing output in journals and books (recorded in Ang & Joseph, 1996), but also by an increasing number of reviews of the field (e.g., Argyris & Schön, 1996: 180-200; Dodgson, 1993; Easterby-Smith, Snell & Gherardi, 1998; Fiol & Lyles, 1985; Geppert, 2000: 6-54; Huber, 1991; Huysman, 2000; Levitt & March, 1988; Miner & Mezias, 1996; Mirvis, 1996; Shrivastava, 1983; Tsang, 1997).

In theorizing about organizational learning, most scholars have conceptualized it in dichotomous terms. As the most basic form, they consider learning that is action-oriented, routine, and incremental, occurring within existing (mental) frameworks, norms, policies and rules. In the face of profound environmental change, however, they argue that a more incisive form of learning is necessary, which aims at changing the frameworks, norms, policies and routines underlying day-to-day actions and routines. This dichotomy has been expressed in a number of terms: single-loop and double-loop learning (e.g., Argyris & Schön, 1974, 1978, 1996; Argyris, 1976, 1977, 1990, 1991, 1992; 1994, 1996, 1998; Schön, 1975, 1983a,b, 1987); lower-level and higher-level learning (Fiol & Lyles, 1985); first-order and second-order learning (e.g., Arthur & Aiman-Smith, 2001; Lant & Mezias, 1992; Sörenson, 2002; Virany, Tushman & Romanelli, 1992); exploitation and exploration in learning (March, 1991); incremental and radical learning (Miner & Mezias, 1996; Sörenson, 2002); passive and active learning orientation (Sadler-Smith, Spicer & Chaston, 2001). Although these terms stem from different perspectives on organizational learning, a certain consensus seems to have been established that the terms refer to comparable learning processes and outcomes (Argyris, 1996, 2003; Arthur & Aiman-Smith, 2001; Miner & Mezias, 1996).

A number of authors, however, wish to distinguish a deeper or higher level of learning in and by organizations, which they, following Argyris & Schön (1978, 1996), term deutero-learning. In spite of its perceived importance, in this case agreement on termi-

nology is still far from established. Broadly three classes of definitions can be distinguished: (1) deutero-learning as the development of a capability to learn how to learn (Brunsson, 1998; Geppert, 2000; Minnett, 1999; Sinkula, 1994); (2) deutero-learning as an incisive form of cognitive restructuring, stemming from a critical reflection on core assumptions (Cook & Yanow, 1993; Creplet, Dupouet, Kern, Mehmanpazir & Munier, 2001; Dijksterhuis, Van den Bosch & Volberda, 1999; Hedberg, 1981; Koh, 1998, 2000; Sadler-Smith et al., 2001; Snell & Chak, 1998; Thomsen & Hoest, 2001; Wijnhoven, 2001)[2]; (3) deutero-learning as the institutionalization of learning processes, through the establishment of appropriate structures and strategies at the organizational level (Huysman, 2000; McKee, 1992; Romme & Van Witteloostuyn, 1999; Snell & Chak, 1998).

Far from being different sides of the same coin, the classes of definitions reflect considerable differences in underlying conceptualizations. The fact that these conceptualizations are being lumped together under the concept of deutero-learning masks important implications for theory and practice. Underlying the first class of definitions is a view of learning in organizations as a continuous, behavioral - interactional and largely unconscious activity, largely eluding explicit managerial steering and planning and not necessarily directed at the attainment of organizational goals. Underlying the second and third classes of definitions is a quite different view of learning in and by organizations, i.e. as a discontinuous, cognitive and conscious activity, amenable to explicit managerial steering, planning and organizational institutionalization, and directed at improving organizational performance.

In the light of these important differences, the purpose of this paper is to bring a degree of theoretical order and coherence to the concept of deutero-learning by analyzing its theoretical antecedents and practical applications in the work of Argyris & Schön and in the works on which they base their thinking. It will be argued that the three classes of definitions reflect two points of ambiguity and diversity in Argyris & Schön's thinking about deutero-learning. To avoid this ambiguity in future research, I propose to distinguish deutero-learning from meta-learning on the one hand (covering the second class of definitions) and from institutional learning on the other (covering the third class of definitions). As a conceptual term, I propose to reserve the term deutero-learning for a specific form of behavioral - interactional learning, following Bateson and more or less in line with the first class of definitions above.

REVIEW AND ANALYSIS

In this section first the work of Argyris & Schön (hereafter abbreviated in references as A&S) is briefly reviewed and analyzed.[3] Then two points of conceptual diversity and ambiguity are identified and discussed: (1) a certain amount of terminological ambiguity is discernible in Argyris & Schön's treatment of organizational double-loop learning and deutero-learning, which may be the result of a conceptual overlap in the theoretical antecedents of these terms; (2) again considered by its theoretical antecedents, the "creative porpoise" experiment is not a correct demonstration of a theory of individual knowing (like Argyris & Schön's), but of a theory of interactive, dyadic behavior.

A brief review

Central to Argyris & Schön's approach is the relationship between knowledge and action. They consider integrating thought with action as the key challenge facing pro-

professionals, philosophers and social scientists: “all human beings – not only professional practitioners – need to become more competent in taking action and simultaneously reflecting on this action to learn from it” (A&S, 1974: 4). Central to this endeavor are theories of action, which have the general form: “in situation S, if you want to achieve consequence C, under assumptions $a_1 \dots a_n$, do A” (A&S, 1974: 6; 1978: 10-11; 1996: 50). Assumptions $a_1 \dots a_n$ constitute a model of the world, in which it is probable that action strategy A will lead to consequence C in situation S. Besides these elements, theories of action contain norms, values or governing variables that make consequence C desirable or worthwhile to achieve. Two kinds of such theories of action are distinguished: espoused theory, to which a person gives allegiance and which he or she communicates to others when requested, and theory-in-use, which actually governs that person’s actions and which can be reconstructed from observations of his or her concrete overt behavior (A&S, 1974: 7; 1978: 11, 15; 1996: 13).

Learning in and by organizations in this perspective starts when the expected consequences of a certain action strategy do not correspond with the actual consequences thereof, i.e. when a discrepancy exists between theory and practice of action. This leads to a problematic situation, in which the discrepancy is considered as an “error” and in which it becomes necessary to turn to reflection and “inquiry” into the causes and circumstances surrounding the problematic situation. Learning, shortly defined as the “detection and correction of error”, then may be accomplished in two ways: (1) single-loop learning, in which the discrepancy between expected and actual consequences is mitigated by adjusting action strategy A and assumptions $a_1 \dots a_n$, without changing the norms and values that make consequence C desirable; (2) double-loop learning, in which the discrepancy between expected and actual consequences is mitigated by adjusting action strategy A, assumptions $a_1 \dots a_n$, and by changing the norms and values that make consequence C desirable (A&S, 1974: 18-19; 1978: 2-3, 18-26; 1996: 20-25).

Argyris & Schön link individual learning processes to organizational learning by pointing out that, by virtue of delegated responsibilities, some organizational members are empowered to speak and act on behalf of the whole organization, not only in top positions, but in every role or function dealing with external relations. Those members learn when they experience the discrepancy between the consequences of an action, expected on the basis of organizational theory-in-use, and the actual consequences of that action. If the organization as a whole is to learn, then the corrective actions these members undertake on the basis of a reflective inquiry into the causes of that discrepancy should become embedded in organizational memory, the whole of individual and shared maps and images of organizational theory of action (A&S, 1978: 12-26; 1996: 15-17).

Terminological ambiguity

In one part of their work, Argyris & Schön distinguish single-loop learning and double-loop learning and introduce deutero-learning as a form of higher learning, relative to these other forms of learning. Organizations are in continuing need to learn how to restructure themselves regularly in order to cope with ongoing change, i.e. they need “to learn how to carry out single- and double-loop learning” (A&S, 1978: 27). To learn to single-loop learn implies learning to improve performance at an increasing rate. To learn to double-loop learn implies learning to carry out the reflection on and inquiry into the governing variables, values and norms underlying organizational action. It also involves an exploration of the ways in which the behavioral world of an organization inhibits or promotes such reflection and inquiry. Organizations may be

more or less open, experimental, confronting, demanding, or defensive with regard to the collaborative inquiry into organizational norms and values (A&S, 1978: 26-28, 86-87; Schön, 1975: 8).

In other parts of their work Argyris & Schön do not seem to maintain this terminological distinction between single-loop, double-loop and deuterio-learning. For example, in his discussion of learning at the organizational level, Schön (1975) does not clearly differentiate between double-loop learning and deuterio-learning. Instead he refines a twofold distinction between “learning” and “becoming adept at learning” from his earlier book *Beyond the stable state* (1971). The first form of organizational learning involves “learning as experience-based change in theory-in-use in... [the] domains [of] planning & policy, structure, technique, and behavioral world” (1975: 9-10). The second form, called organizational deuterio-learning, involves “learn[ing] to improve the capacity for making experience-based changes in... theories-in-use”, based on “the competence for continuing shared inquiry into the effectiveness of experience-based theories of organizational action...” (1975: 10, 15).

Somewhat confusing is the definition in Argyris & Schön (1996): “A critically important form of organizational double-loop learning... is the second-order learning through which the members of an organization may discover and modify the learning system that conditions prevailing patterns of organizational inquiry. This is the organizational equivalent of what Bateson calls deuterio-learning...” (1996: 29). A learning system, in its turn, “is made up of the structures that channel organizational inquiry and the behavioral world of the organization, draped over these structures, that facilitates or inhibits organizational inquiry” (1996: 28).

The latter definition turns the terminology of Argyris & Schön (1978) subtly on its head. Instead of learning to single-loop learn and/or double-loop learn, it has become theoretically possible to double-loop learn to learn, which is rather difficult to conceive. Also, with deuterio-learning viewed as a form of double-loop learning, the relation between single-loop learning and deuterio-learning has become theoretically ‘empty’.

This terminological ambiguity may be due to a considerable amount of conceptual overlap in the work of the cybernetician W. Ross Ashby and the anthropologist Gregory Bateson, to whom Argyris & Schön refer for the theoretical origins of the terms single-loop, double-loop and deuterio-learning. Regarding Ashby, they specifically note:

We borrow the distinction between single-loop and double-loop learning from W. Ross Ashby’s *Design for a brain* (1960). Ashby formulates his distinction in terms of (a) the adaptive behavior of a stable system, “the region of stability being the region of the phase space in which all the essential variables lie within their normal limits,” and (b) a change in the value of an effective parameter, which changes the field within which the system seeks to maintain its stability. One of Ashby’s examples is the behavior of a heating or cooling system governed by a thermostat. In an analogy to single-loop learning, the system changes the values of certain variables (for example, the opening or closing of an air valve) in order to keep temperature within the limits of a setting. Double-loop learning is analogous to the process by which a change in the setting induces the system to maintain temperature within the range specified by a new setting (A&S, 1996: 21; see also A&S, 1974: 18-19; 1978: 3, 337).

To Bateson, Argyris & Schön make two shorter references with regard to single-loop and double-loop learning (A&S, 1974: 19; 1978: 18, 337), while Bateson is their main reference regarding deuterio-learning. My evidence of the conceptual overlap between these terms comes from Bateson (1958), who discusses the ideas of Ashby in the light of his own thinking.

In the Epilogue to the second edition of *Naven*, Bateson reviews his earlier anthropological research among the Iatmul tribe and supplements it with his more recent idea formation on learning, cybernetics, and the theory of Logical Types. In this context he discusses the concept of schismogenesis, a process of progressive or directional change, stemming from “a process of differentiation in the norms of individual behavior resulting from cumulative interaction between individuals” (1958: 175). This change is assumed to depend on learning, according to Bateson. He notes that in learning experiments, either in classical or instrumental conditioning, two types of learning occur.

In the first type, proto-learning, a subject learns to respond with a higher frequency to the experimental contingencies posed by the experimenter (e.g., Pavlov’s dog learns to salivate in the presence of a ringing bell; Skinner’s doves learn to peck the red button instead of the black one in response to differential reinforcement of the first form of behavior over the second).

In the second, higher-order type of learning, which Bateson calls deutero-learning, the subject improves its ability to deal with the *context* of conditioning; in other words, it learns to (proto-)learn. For example, the subject raised in the context of Pavlovian classical conditioning will increasingly expect a context in which signs of future reinforcements can be detected, but nothing can be done to influence the occurrence of reinforcement. The subject will thus, in terms of “character” formation, develop an attitude of fatalism (1958: 285). This deutero-learning, reflecting experience with earlier patterns of contingencies of reinforcement, leads to a habit of acting as if all new contexts exhibit the same pattern. This habit of expecting a certain punctuation of events tends to become self-validating (and hence self-fulfilling) by promoting certain behaviors and by discouraging others. Schismogenesis, understood as deutero-learning, must be dealt with at the level of context and relationship and cannot be reduced to the individual level. For Bateson, the central unit of analysis is the dyad (or higher), not the monad (Bateson, 1958; 1963; Visser, 2003).

In distinguishing types of learning, the use of the word type conforms to Russell’s theory of Logical Types, which Bateson applies to a whole range of biological and social phenomena. Put briefly, this theory asserts three things. First, no class can be a member of itself (e.g., the class of lions does not roar and has no sharp teeth and claws). Second, a class cannot be one of those things correctly classified as its non-members. E.g., we may establish the class of “lions” and note that gorilla’s and antelopes are members of the class of “non-lions”. We cannot, however, formally classify the “class of lions” among the class of “non-lions”. Third, if these two rules are contravened, paradox will occur. While in logic, paradox will totally negate a chain of propositions, in the real world such a negation of events is usually prevented by the passage of time (Bateson, 1958; 1972).[4]

As an illustration of the theory of Logical Types, Bateson discusses Ashby’s example of the household thermostat, and notes:

Following Ashby, I will reserve the word “variables” for those measurable circumstances which change from moment to moment as the house oscillates around some steady temperature, and shall reserve the word “parameters” for those characteristics of the system which are changed for example when the householder intervenes and changes the setting of the thermostat. I shall speak of the latter change as of higher order than changes in the variables. The word “order” is in fact used here in a sense comparable to that in which it was used earlier in this essay to define order of learning. Any two orders of learning are related so that the learning of one order is a learning *about* the other, and similarly in the case of the household thermostat

the message which the householder puts into the system by changing the setting is *about* how the system shall respond to messages of lower order emanating from the thermometer. We are here at a point where both learning theory and the theory of cybernetic systems come within the realm of Russell's Theory of Types (Bateson, 1958: 292-293; italics GB).

At this point the conceptual overlap becomes noticeable. The distinction by Ashby between variable change and parameter change that Argyris & Schön use for their definition of single-loop learning and double-loop learning, also underlies Bateson's distinction between proto-learning and deutero-learning. In other words, taken by their theoretical origins, both concepts of double-loop learning and deutero-learning seem to refer to the same second-order learning phenomenon.

The "creative porpoise"

In their first introduction of the concept of deutero-learning, Schön (1975: 8) and Argyris & Schön (1978: 26-27) refer to Bateson's story of the "creative porpoise" as an example. However, I question the appropriateness of this example as a demonstration of deutero-learning *within* Argyris & Schön's theoretical framework, which, as the reader will recall, is predicated on theories of action. As Argyris & Schön put it, looking back to their first joint book and introducing their second:

When we attributed theories of action to human beings, we argued that all deliberate action had a cognitive basis, that it reflected norms, strategies, and assumptions or models of the world which had claims to general validity. As a consequence, human learning, we said, need not be understood in terms of the "reinforcement" or "extinction" of patterns of behavior but as the construction, testing, and restructuring of a certain kind of knowledge. Human action and human learning could be placed in the large context of knowing (A&S, 1978: 10).

The experiment on the creative porpoise, however, signifies just that, what learning according to Argyris & Schön should not be: "reinforcement or extinction of patterns of behavior."

Bateson studied the behavior and communication of porpoises (circus slang for dolphins) during his stay at the Sea Life Park in Hawaii (1964-1971). The dolphins in the park were trained to perform in public shows, according to the principles of B.F. Skinner's instrumental (or operant) conditioning. The creativity in the porpoise occurred as an unintended result of such conditioning. The dolphin in question was selected as the subject in a public show on "the first steps of dolphin training." To show early conditioning in a number of consecutive shows, the trainers had to select a new item of behavior in every show. After 14 shows in three days, however, the trainers ran out of new behaviors that could be reinforced. In the 15th show and thereafter, the porpoise suddenly and spontaneously began to emit a whole array of novel behaviors, some of which were never observed before in dolphins (Lipset, 1980; Pryor, 1975).

Bateson was fascinated by these events. In the creative performance of the porpoise he saw an instance of deutero-learning. The dolphin not only proto-learns that a certain behavior at the onset of a certain stimulus will be reinforced, it deutero-learns at the same time that proto-learning takes place in an interactive context (or sequence) between herself and the trainer that serves as a model for future proto-learning. The porpoise has escaped a potentially double binding training situation by learning a "rule" or "principle", namely that only new behaviors will be reinforced. Under Bateson's influence (and in spite of his general dislike of behaviorism), the whole sequence was successfully repeated with a second dolphin under experimentally controlled condi-

tions. The results of this experiment first appeared in a Navy report, that explicitly bore the theoretical mark of Bateson (Pryor, Haag & O'Reilly, 1967). An ensuing article in the *Journal of the Experimental Analysis of Behavior*, however, lacked any substantial reference to Bateson and to deutero-learning, which reference presumably had not passed the editor and reviewers of this staunchly Skinnerian journal (Pryor, Haag & O'Reilly, 1969; Pryor, 1975: 248).

It is important to note that, in Bateson's thinking, references to mental or cognitive states can be redefined in terms of transactions between the organism and its social and physical environment. Characteristics like creativity or, in my earlier example, fatalism do not exist *in vacuo*, but characterize a relation between an organism and some other organism or thing. In such transactions it is well possible to discover contexts of proto-learning that bring about that deutero-learning to which the mental state refers. In relationships, stimuli, responses and reinforcements acquire meaning in contingency patterns of interaction, which patterns are defined as characteristics of the relation (Bateson, 1963; 1972; Bateson & Jackson, 1968).

In line with this reasoning, Bateson would not argue that the porpoise has acquired knowledge of some sort, but only that she has learned a certain pattern of contingencies, inherent in her relationship to the dolphin trainer. Deutero-learning, as evidenced in the creative porpoise experiment and conceived of by Bateson, should therefore not be considered as a form of *cognitive* learning, but as a form of *behavioral - interactional* learning (Visser, 2003). As such it does not fit the overall theoretical framework of Argyris & Schön's work, which is based on individual, cognitive theories of action.

REFORMULATION

The purpose of the reformulation in this section is to avoid terminological ambiguity and to do justice to the terminological diversity, inherent in the use of the term deutero-learning by Argyris & Schön and current scholars. Towards that purpose, I propose (1) to reserve the term deutero-learning, following Bateson and more or less in line with the first class of definitions above, for a specific form of behavioral - interactional learning; (2) to rename the cognitive aspect of deutero-learning, basic to Argyris & Schön's thinking and reflected in the second class of definitions above, as meta-learning; (3) to rename the organizational aspect of deutero-learning, inherent in especially Schön's thinking and in the third class of definitions above, as institutional learning.

Deutero-learning

As a first point in this reformulation, I propose to reserve the term deutero-learning for a specific form of behavioral - interactional learning. In the previous review and analysis, examples have been provided of deutero-learning in connection to schismogenesis and the creative porpoise. However, deutero-learning acquires particular importance in the social contexts of human relations. Bateson emphasizes that such relations have no "thing" quality in themselves. The relationship is immanent in the exchange of messages, "the messages constitute the relationship" (Bateson, 1972: 275).

Context in a relation is introduced in two ways. First, a message, sent by one person, sets the context for a certain class of response by the other person. Second, insofar that such messages are verbal, the non-verbal signs in interaction function as a context marker of the verbal message, therefore as a "context of context" for the other person. This setting of contexts is inevitable in interpersonal exchange, since in interaction the

categories stimulus, response and reinforcement are never 'empty'. All behavior (verbal and non-verbal) occurring between persons who are conscious of each other's presence has behavioral effects, whether intended or not. Such effects have interpersonal message value, and thus are communicative in nature. It follows that in interaction it is impossible not to behave, and therefore impossible not to communicate (Bateson, 1963; Haley, 1963; Watzlawick, Bavelas & Jackson, 1967).

For deutero-learning in organizations the impossibility of not behaving and not communicating acquires special relevance. In social and organizational contexts, all behavior that is emitted in the presence of others has an effect on those others, intended or unintended. Those effects, describable in proto-learning terms as reinforcing or punishing consequences, are mutual and continuous. After some time organization members start to deutero-learn, i.e. they come to discern regularities or patterns in the numerous consequences they experience in the course of their working days.

In this specific Batesonian form, deutero-learning has not been researched very often in organizations. However, instances of deutero-learning have been documented in the literature in at least three forms: (1) the "Pygmalion" effect; (2) the "set-up-to-fail" syndrome and (3) the "unwritten rules of the game":

(1) Following experiments in schools showing evidence of a so-called Pygmalion-effect, it has been researched whether raising manager expectations improves subordinate productivity. A series of field experiments in the Israeli army have tended to answer this question in the affirmative. When superiors are told that their subordinates are especially able and qualified, they will behave more supportively, more task-oriented and more confidently towards their subordinates than superiors not having this 'information', even though the 'able' subordinates are in fact picked at random from the enrollment lists. In their turn, the subordinates receiving the more supportive management approach show higher performance rates and more job satisfaction than the subordinates receiving the standard treatment (Eden, 1984, 1990; Eden & Zuk, 1995; Livingston, 1988; Oz & Eden, 1994).

(2) A converse Pygmalion-effect is found in the set-up-to-fail-syndrome, in which negative manager expectations decrease employee performance. The syndrome is typically set in motion by a triggering event, either in the performance of the employee or in the attitude of the manager, which causes the latter to increase and tighten supervision of the former. The subordinate senses the lack of confidence and either starts to distance him or herself from the work situation or strenuously attempts to regain superior confidence by setting unrealistic goals and by overachieving. In both cases the manager interprets these reactions of the employee as a confirmation of earlier suspicions and further increases supervision, including even routine assignments. The manager increasingly will let his or her dissatisfaction and frustration publicly known to which the subordinate reacts with signs of insubordination and further loss of confidence. As a result, the superior now becomes convinced of his or her earlier judgments and openly and intensively controls the employee's performance. The latter in turn irrevocably withdraws him or herself from the work situation emotionally and probably also physically, by reporting sick or by leaving the organization (Manzoni, 2002; Manzoni & Barsoux, 1998, 2002).

Both the Pygmalion-effect and the set-up-to-fail-syndrome become understandable as deutero-learning, i.e. the learning of patterns in mutually shown behavior or interaction. For example, in the set-up-to-fail-syndrome manager and employee gradually become involved in a symmetrical pattern of interaction, in which both persons attempt to determine the definition of their relationship. The manager increasingly regards the subordinate as incompetent and defines the relation in terms of tight control and supervision. The

employee increasingly views the superior as intrusive and overbearing and defines the relation in terms of dependence and distrust. Attempted solutions of the conflict on both sides have the net effect of intensifying the problems. The singular punctuation of events by the contestants operate as self-fulfilling prophecies in the conflict: the manager controls because the employee withdraws, the employee withdraws because the manager controls, and so on.

(3) Finally, deuterio-learning is involved in the learning of the unwritten rules of the game (Scott-Morgan, 1994). The written rules of a corporation (remuneration, job descriptions, organizational charts, reporting lines, performance measures, etc.) specify formal signs of the contingencies of reinforcement that may be expected from top management. In proto-learning terms they constitute discriminative stimuli signaling possible reinforcements and punishments. It depends upon the actual behavior of the top managers (i.e. the reinforcements and punishments they actually apply in practice) in what forms these written rules will be disseminated down the organizational pyramid. If written rules and actual management practices deviate from each other or when the written rules are internally conflicting, then employees will mold from the rules and management behavior a set of parallel unwritten rules that govern their daily behavior on the work floor. This molding constitutes deuterio-learning, since the employee comes to discern patterns (or rules) in the numerous reinforcements and punishments daily meted out by the managers.

Following the previous discussion, I propose a formal definition of deuterio-learning in organizations as:

The learning of characteristic patterns of contingency, or contexts of conditioning, in one or more relationships in organizations. Such learning implies that persons improve their ability to deal with these contexts of conditioning.

Meta-learning

It is noteworthy that, except in Schön (1975) and Argyris & Schön (1978; 1996), the concept of deuterio-learning has largely gone unmentioned in the individual work of Argyris or Schön. Argyris, in his books (e.g., Argyris, 1990; 1992), his major articles (e.g., Argyris, 1976; 1977; 1991; 1994; 1998) and interviews (e.g., Fulmer & Keys, 1998), does not mention deuterio-learning and resorts to single-loop learning and double-loop learning as key concepts. Only recently has Argyris commented on deuterio-learning: "sometimes double-loop learning is equated with Bateson's deuterio-learning. Schön and I have expressed our intellectual indebtedness to Bateson (Argyris & Schön, 1974). However, we also made a distinction between double-loop learning and deuterio-learning. We understood deuterio-learning to mean second-order learning, reflecting on the first-order actions. Deuterio-learning can occur by going meta on single-loop learning or double-loop learning" (Argyris, 2003: 1179). In a recent interview, Argyris further explicates this idea of meta-learning: "you take a look at what you have just done - you reflect on it. Be a 'reflective practitioner', as Don nicely called it... But what does it mean to be good at going meta?... [t]o think about governing values and... about criteria for how to test a claim so that there is no error" (Crossan, 2003: 44).

The term "reflective practitioner", which Argyris mentions, refers to a central theme in Schön's later work, i.e. the relation between knowledge and action in professional practice. Without relating it to deuterio-learning or mentioning the concept, Schön's idea of reflection-on-reflection-in-action seems somewhat reminiscent thereof. Put briefly, when routine procedures yield an unexpected, surprising consequence, we pause, "stop-and-think", and experiment to solve the unexpected puzzle. When we in

turn reflect on this stop-and-think, experimental activity, we reflect on reflection-in-action (Schön, 1983a: 49-69; 1987: 22-40).

Meta-learning thus appears as a concept that denotes the cognitive aspect, predominant in the work of Argyris & Schön and discernible in most current definitions of deuterio-learning. The attentive reader will note, however, that Argyris' recent remarks still leave some ambiguity regarding the distinction between double-loop and deuterio-learning (to "think about governing values" seems to be closer to double-loop learning than to meta- or deuterio-learning). Therefore I propose a formal definition of meta-learning as strictly relative to single-loop and double-loop learning, i.e. as:

The process by which a person or a group of persons reflects on single-loop learning (in which a discrepancy between expected and actual consequences is mitigated by adjusting action strategy A and assumptions $a_1...a_n$, without changing the norms and values that make consequence C desirable) and double-loop learning (in which the discrepancy between expected and actual consequences is mitigated by adjusting action strategy A, assumptions $a_1...a_n$, and by changing the norms and values that make consequence C desirable).

Institutional learning

The previous definition of meta-learning points at learning at the individual and group levels and leaves open the question of learning as an organizational phenomenon. Still, this is an important second aspect of Argyris & Schön's work and current definitions of deuterio-learning. Especially Schön has called attention to this point. Already in his early influential book *Beyond the stable state* (1971) he argues that since World War II processes of technological and social change have become increasingly pervasive and rapid. Schön notes that public and business organizations are not yet adapted to these processes of change. They exhibit dynamic conservatism, "a tendency to fight to remain the same" (1971: 32). To survive, however, organizations must come to terms with continuing and increasing change, which means that they must learn and at the same time must become adept at learning: "We must become able not only to transform our institutions, in response to changing situations and requirements; we must invent and develop institutions which are 'learning systems',... systems capable of bringing about their own continuing transformation... The need is... to design and bring into being the institutional processes through which new problems can continually be confronted and old structures continually discarded" (1971: 30, 116).

Originally Schön conceives of this process of "becoming adept at learning" in terms of organizational planning, in line with the dominant terminology in public and business administration of the early 1970s. Later Schön (1975) adopts the term organizational deuterio-learning for this process (without clearly differentiating it from double-loop learning, as I noted above). However, Argyris nor Schön are very explicit about the structural and strategic requirements for higher order organizational learning. Their analysis is predominantly social psychological: they concentrate on how at the organizational level individual cognitive models interact with dysfunctional group process to create limited learning systems and which interventions are most appropriate to effect the reflective inquiry, necessary to change organizations into productive learning systems (e.g., A&S, 1978: 109-164; 1996: 73-122).

Following Senge (1990), proponents of the so-called Learning Organization have been more explicit on structure and strategy. For example, De Geus (1988) describes scenario planning as a form of institutional learning. Oil company Shell has established an organization-wide computer-assisted planning system, in which senior decision makers are required to think through different scenarios for the future. The purpose of

this scenario planning is to “to change the microcosm, the mental models that these decision makers carry in their heads” (De Geus, 1988: 71). By imagining and thinking through possible future situations (for example, cases of extreme high or low oil prices), decision makers will be better prepared to deal with these if they really materialize. In Argyris & Schön’s terms, the organization thus creates structures, routines and systems that invite or require meta-learning on a regular basis. Following this and the previous reformulation, I propose a formal definition of institutional learning as:

The creation and maintenance of organizational systems, routines and structures through which organizational members are induced to single-loop learn, double-loop learn or meta-learn on a regular basis.

DISCUSSION AND CONCLUSIONS

In this paper the concept of deutero-learning has been the focal point of discussion. This concept is defined by current scholars alternatively as the development of a capability to learn how to learn, as an incisive form of cognitive restructuring, or as the institutionalization of learning processes. I have argued that these three classes of definitions reflect two points of ambiguity and diversity in Argyris & Schön’s thinking about deutero-learning: (1) a certain amount of terminological ambiguity in their treatment of organizational double-loop learning and deutero-learning, probably the result of a conceptual overlap in the theoretical antecedents of these terms; (2) an incorrect use of the creative porpoise experiment as a demonstration of a theory of individual knowing, instead of a theory of interactive, dyadic behavior. To avoid ambiguity and to bring theoretical coherence, I have distinguished deutero-learning from meta-learning on the one hand and from institutional learning on the other. As a conceptual term, I have reserved the term deutero-learning for a specific form of behavioral - interactional learning and provided an outline and examples thereof.

The implications of this note for theory development are the following. The reformulations and distinctions I proposed may be enlarged into a more general twofold distinction between learning processes in organizations, still on the basis of Argyris & Schön and Bateson: (1) Learning as a *behavioral - interactional* activity at the *dyadic and group level* in organizations. Here the concepts of proto-learning and deutero-learning are proposed, summarily defined as the adjustment of responses to environmental contingencies and the learning of patterns of contingency, respectively. These forms of learning are continuous, behavioral - communicative and largely unconscious. They tend to escape explicit managerial steering and planning, and do not necessarily lead to improvement and progress of the organization and its goals. Therefore, at the *organizational level* no concept is proposed here that is comparable to institutional learning. Learning, thus defined, occurs in organizations, but not by organizations.

(2) Learning as a *cognitive* activity at the *individual and group level* in organizations. Here the concepts of single-loop learning, double-loop learning and meta-learning are proposed, summarily defined as less incisive and more incisive forms of learning and reflection on these two forms, respectively. These forms of learning are discontinuous, cognitive and conscious. They are to a large extent amenable to managerial steering and planning, and are directed at improving organizational performance. Therefore, at the *organizational level* the concept of institutional learning is proposed, signifying the creation of structures and strategies conducive to the three forms of learning mentioned. Learning, thus defined, occurs in organizations and by organizations.

The implication of this note for empirical research are also twofold: (1) researchers of deuterio-learning in organizations should be aware of specific demands imposed by the Batesonian framework. An important, but sometimes neglected aspect of performing empirical research is the fact that the researchers enter into a *relationship* with the subjects under research. The same rules of interaction that govern proto- and deuterio-learning within organizations also are applicable to the learning that occurs in the relation between researchers and subjects. This implies that research methods in the neutral, positivist tradition may not be the only (or the most appropriate) ones for researching deuterio-learning. They should be augmented by more anthropologically oriented research methods, like participant observation. Here researchers may use their own deuterio-learning experiences in interacting with subjects as research data, in addition to data collected by more traditional, positivist means. The importance of such an approach has been acknowledged by Schön: "In the organizational context, the quest for objectivity, in the sense of freedom from influence by the research process, is probably hopeless. A more appropriate kind of objectivity has to do with the researcher's awareness of his or her effect on others" (Schön, 1983b: 127).

(2) Researchers of cognitive and institutional forms of learning do not face these specific Batesonian requirements and may resort to more traditional positivist research methods to measure the variables connected to single-loop, double-loop, meta- and institutional learning. Still, it remains a point of contention whether the organizational scientist should be content with a mere description of factual learning processes or whether the knowledge of imperfect learning carries an obligation for the scientist to intervene in an organization and help improve its learning processes (on the latter position see Argyris, 1996, 2003, on the former Miner & Mezias, 1996; Easterby-Smith & Lyles, 2002).

Finally, this note has two sorts of implications for practitioners, especially managers: (1) As evidenced in the Pygmalion-effect and the set-up-to-fail-syndrome, the concept of deuterio-learning points at the importance of managers' communicative attitudes in dealing with employees. Often an employee is considered lazy or uncommitted, when in fact these attributions are a function of the way in which the manager deals with that employee. Instead of blaming the other, managers and employees might more productively look at their own role in maintaining mutual communicational patterns.

(2) The concept of deuterio-learning draws attention to the importance of congruency in day-to-day communications in organizations. Since it is impossible not to communicate, in personal interaction verbal and non-verbal behaviors are continually and often unconsciously exchanged. Problems are bound to rise when a person habitually communicates inconsistently at the verbal and non-verbal levels. For example, consider a manager who habitually goes around his or her department verbally promoting the use of new management systems or methods, but at the same non-verbally displays a blatant lack of knowledge or interest about their specific workings. His or her employees will quickly come to sense the lack of veracity in the manager's attempt to influence their behavior and react accordingly. They are likely to comply only superficially to his or her wishes and demands, taking up their own business the moment the manager walks out the door. Incongruent communication tends to breed indifferent or even frustrated workers.

NOTES

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[1] The study of organizational learning dates back as far as the 1930s, when the first work on organizational learning curves appeared (reviewed in Argote, 1999). Research on organizational learning proper started with the System Research Laboratory's air defense experiments in the mid 1950s (Chapman, Kennedy, Newell & Biel, 1959), while Cyert & March (1963) included organizational learning in their behavioral theory of the firm. The year 1965 marked the first appearance of the term 'organizational learning' in the title of a journal article (Cangelosi & Dill, 1965).

[2] Within this class of definitions, deutero-learning is sometimes regarded as a particular form of double-loop learning (e.g., Argyris & Schön, 1996; Hedberg, 1981; Thomsen & Hoest, 2001) or equated with still another term, triple-loop learning (e.g., Romme & Van Witteloostuyn, 1999; Sadler-Smith et al., 2001; Snell & Chak, 1998).

[3] Since the reader is probably familiar with Argyris & Schön's ideas, this brief review only concentrates on the concepts most pertinent to the present discussion, i.e. theory of action, single-loop and double-loop learning. For a more extended review of Argyris & Schön's other concepts and their impact on organization science I refer to Easterby-Smith & Lyles (2002) and Fulmer & Keys (1998).

[4] With regard to types of learning, paradox will occur when negative proto-learning is combined with negative deutero-learning, as when a child is being punished for a certain behavior and at the same time, under the threat of punishment, learns that it must not learn that punishment follows that particular behavior. This idea has become the leading thought in Bateson's concept of double bind, to which Argyris & Schön occasionally refer without noting its close relationship to deutero-learning (e.g., A&S, 1978: 118-119; Argyris, 1977, 1992: 433-434; see further Visser, 2003).

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