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Teachers' Educational Gestures and Habits of Practical Action: Edusemiotics as a Framework for Teachers' Education

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When trying to help teachers cope with the critical situations they face in classrooms, public policies are mainly concerned with improving initial teacher training. I claim in this article that the role of lifelong learning should no longer be undermined and that the design of teachers' training should be supported by a thorough examination of the cognitive processes involved. A faulty view of cognition may explain both our emphasis on initial training and most of the difficulties faced in designing teachers' training. Searching existing alternative metaphors of cognition and investigating new ones constitutes a way of coping with these problems: first to design new forms of training, second to understand the processes involved in innovative training methods that have already been implemented. My focus in this article is precisely the 'metaphor of cognition' that underlies innovative teacher training methods. This metaphor is based on Peirce's pragmaticism, and it describes teachers' training as a process of taking and changing habits. This article mainly investigates the links between Peirce's later semiotics, Merleau-Ponty's Phenomenology of Perception *and Varela's theory of enaction, in order to propose a threefold definition of 'habit' and define the notion of 'educational gesture', which constitutes a translation of the concept of habit in the field of education and training.*

INTRODUCTION

When trying to help teachers cope with the critical situations they face in classrooms, public policies are mainly concerned with improving initial teacher training. In France, at least, most reforms concerning teachers' training focus on the initial training curriculum (i.e. the type of *knowledge* or the pieces of information that may be useful to teachers), the identification of 'best practices' and the redaction of guidelines (tools that

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professionals may receive during their initial training and throughout their career). One must acknowledge the beneficial efforts that have been made, along these lines, to adjust the methods used in initial training by favouring small group work, using case analysis and practice analysis and optimising the interaction between formal sessions and field experience.

Nevertheless, I claim in this article that without denying the importance of initial training, the role of lifelong learning should no longer be undermined and that the design of teachers' training should be supported by a thorough examination of the cognitive processes involved. A faulty view of cognition may explain both our emphasis on initial training and most of the difficulties faced in designing teachers' training. Searching existing alternative metaphors of cognition and investigating new ones constitutes a way of coping with these problems: first to design new forms of training, second to understand the processes involved in innovative training methods that have already been implemented.

For several years, some colleagues and I experimented with such alternative training methods in the form of 'research-action-based training' sessions whose structure is partly inspired by the dynamics of practice analysis.[1] Some of these methods were conceived in relation to Peirce's pragmaticism (e.g. Denoyel's *GAEP*),[2] and part of my research in this field has attempted to extend the formalisation and use of semiotic models to adjust these alternative training methods. As a result of this formalisation effort, the theoretical analysis I propose here must not be considered a model that precedes practice; the theoretical tools discussed here are used *a posteriori* to describe, analyse and understand the cognitive processes that are made possible during these sessions.

My focus in this article is precisely this 'metaphor of cognition' that underlies these specific teacher-training methods. This metaphor is based on Peirce's pragmaticism, and it describes teachers' training as a process of taking and changing habits. First, I summarise some aspects of Peirce's comments on habits; then I investigate the links between Peirce's later semiotics, Merleau-Ponty's *Phenomenology of Perception* and Varela's theory of enaction. I then propose a threefold definition of 'habit' and define the notion of 'educational gesture', which constitutes a translation of the concept of habit in the field of education and training.

I HABITS, HABITS OF ACTION AND HABITS OF CONDUCT IN PEIRCE

As long as *learning* or *being trained* is equated with acquiring new information, becoming aware of 'good' cognitive models and implementing them based on the 'plans' they suggest, the way we generally train teachers and educators may seem appropriate. But if we abandon this dualist view of learning and reject the representational, computational view of education, we must rethink the actual method of training teachers. 'Edusemiotics' (Danesi, 2010) may be described as an attempt to propose an alternative 'metaphor of education' or to offer an alternative view of cognitive

processes. The first part of this article addresses this question and summarises the main aspects of the semiotic view of cognition that underpin alternative methods for teachers' training. I postulate that learning entails *taking* or *changing habits*.[3] My concern is the ways in which 'habits' and habits of practical action influence professionals' behaviour in educational contexts, and I believe this notion is supported by Peirce's pragmaticism and semiotics, and by Merleau-Ponty's *Phenomenology of Perception*, both of which views are consistent with, in different respects, a more contemporary view of cognition as situated, distributed and embodied.

To my knowledge, Peirce does not use the words 'habit of practical action', yet many expressions indicate that Peirce distinguishes habits that are matters of beliefs from habits that concern action or conduct. In *Recreations in Reasoning*,[4] when investigating the question of language, he claims that 'Habits are either habits about ideas of feelings or habits about acts of reaction', the ensemble of habits of the latter type constituting the 'outer world, or universe of existence'. The expression 'habit(s) of action' appears regularly in Peirce,[5] as do the expressions 'habit of deliberate behaviour',[6] 'habit of deliberate action' (CP 5.538), 'habit of really reacting' (CP 5.538), 'habit of acting'[7] and 'habit of conduct'.[8] As early as 1878, in *How to Make our Ideas Clear*, Peirce proposes that 'the whole function of thought is to produce habits of action'; in this context, 'the identity of a habit' (understood here as a general law or principle), 'depends on how it might lead us to act, not merely under such circumstances as are likely to arise, but under such as might possibly occur, no matter how improbable they may be' (CP 5.400).

In another work, Peirce distinguishes between 'practical and theoretical beliefs'.[9] He proposes to use 'habit' not in the narrow sense of 'acquired habit', as opposed to 'natural disposition', but in the wider sense, 'in which it denotes such a specialization, original or acquired, of the nature of a man, or an animal, or a vine, or a crystallizable chemical substance, or anything else, that he or it will behave, or always tend to behave, in a way describable in general terms upon every occasion (or upon a considerable proportion of the occasions) that may present itself of a generally describable character'. An example of a practical belief is the belief that anthracite is a convenient fuel. For Peirce, 'to say that a man believes anthracite to be a convenient fuel is to say no more nor less than that if he needs fuel, and no other seems particularly preferable, then, if he acts deliberately, bearing in mind his experiences, considering what he is doing, and exercising self-control, he will often use anthracite. A practical belief may, therefore, be described as a habit of deliberate behaviour' (CP 5.538). For Peirce, the repetition of the same stimulus increases the likelihood that the same type of action will occur. He presents a noteworthy case, if we consider our present concern, namely, the case in which without a previous stimulus, a reflexive activity allows us to anticipate a possible action in an imagined possible situation:

> But habits are sometimes acquired without any previous reactions that are externally manifest. A mere imagination of reacting in a particular

> way seems to be capable after numerous repetitions of causing the imagined kind of reaction really to take place upon subsequent occurrences of the stimulus. In the formation of habits of deliberate action, we may imagine the occurrence of the stimulus, and think out what the results of different actions will be. One of these will appear particularly satisfactory; and then an action of the soul takes place which is well described by saying that that mode of reaction 'receives a deliberate stamp of approval.' The result will be that when a similar occasion actually arises for the first time it will be found that the habit of really reacting in that way is already established (CP 5.538).

The notion of habit seems to tend increasingly toward the question of action and conduct in Peirce's later writings, notably in his definitions of pragmaticism. If we are aware of the definition of 'habit' as a final interpretant, and if we see 'habits' as theoretical entities, laws and principles in this context, later papers emphasise the fact that the *concept* may not be considered the 'living logical conclusion' of a 'final logical interpretant':

> The real and living logical conclusion ***is*** that habit; the verbal formulation merely expresses it. I do not deny that a concept, proposition, or argument may be a logical interpretant. I only insist that it cannot be the final logical interpretant, for the reason that it is itself a sign of that very kind that has itself a logical interpretant. The habit alone, which though it may be a sign in some other way, is not a sign in that way in which that sign of which it is the logical interpretant is the sign. The habit conjoined with the motive and the conditions has the action for its energetic interpretant; but action cannot be a logical interpretant, because it lacks generality. The concept which is a logical interpretant is only imperfectly so. It somewhat partakes of the nature of a verbal definition, and is as inferior to the habit, and much in the same way, as a verbal definition is inferior to the real definition. The deliberately formed, self-analyzing habit—self-analyzing because formed by the aid of analysis of the exercises that nourished it—is the living definition, the veritable and final logical interpretant. Consequently, the most perfect account of a concept that words can convey will consist in a description of the habit which that concept is calculated to produce. *But how otherwise can a habit be described than by a description of the kind of action to which it gives rise, with the specification of the conditions and of the motive*? (CP 5.491).

Specific actions should not be mistaken for logical interpretants; the description of these specific actions and their conditions and motives constitute an unavoidable way of seizing habits of action. This perspective appears in Peirce's later writings as a key aspect of his definition of pragmaticism. In the *Consequences of Critical Commonsensism*, Peirce states:

> To say that I hold that the import, or adequate ultimate interpretation, of a concept is contained, not in any deed or deeds that will ever be

> done, but in a habit of conduct, or general moral determination of whatever procedure there *may come to be,* is no more than to say that I am a pragmaticist (CP 5.504).

I first insisted on a distinction between 'habits' and 'habits of practical action', and I must emphasise that habits of practical action, as defined in this article, must not be confused with 'habits of conduct'. Habits of practical action are ways of acting, doing things, and implementing actions in the real world, as a teacher or an educator might. Peirce never abandons the consideration of logic, and by 'habit of conduct', he often means specific types of conscious cognitive processes.[10] For instance, with respect to understanding the meaning of a concept, Peirce explains:

> [T]he only way to complete our knowledge of its nature is to discover and recognize just what general habits of conduct a belief in the truth of the concept (of any conceivable subject, and under any conceivable circumstances) would reasonably develop; that is to say, what habits would ultimately result from a sufficient consideration of such truth. It is necessary to understand the word 'conduct', here, in the broadest sense. If, for example, the predication of a given concept were to lead to our admitting that a given form of reasoning concerning the subject of which it was affirmed was valid, when it would not otherwise be valid, the recognition of that effect in our reasoning would decidedly be a habit of conduct (CP 6.481).

It is then most likely in this 'broad sense' that one must understand the following famous stance by Peirce: 'I really know no other way of defining a habit than by describing the kind of behaviour in which the habit becomes actualized'.[11] Nevertheless, Peirce considers what may be described as practical actions. For instance, while considering the question of ethics, he states:

> To say that conduct is deliberate implies that each action, or each important action, is reviewed by the actor and that his judgment is passed upon it, as to whether he wishes his future conduct to be like that or not. His ideal is the kind of conduct which attracts him upon review. His self-criticism, followed by a more or less conscious resolution that in its turn excites a determination of his habit, will, with the aid of the sequelæ, ***modify*** a future action; but it will not generally be a moving cause to action. It is an almost purely passive liking for a way of doing whatever he may be moved to do. Although it affects his own conduct, and nobody else's, yet the quality of feeling (for it is merely a quality of feeling) is just the same, whether his own conduct or that of another person, real or imaginary, is the object of the feeling; or whether it be connected with the thought of any action or not. If conduct is to be thoroughly deliberate, the ideal must be a habit of feeling which has grown up under the influence of a course of self-criticisms and of hetero-criticisms [. . .].[12]

II FROM HABIT TO EMBODIED COGNITION: HABITS, SEMIOSIS, AND WAYS OF 'HAVING A WORLD'

Merleau-Ponty: The 'Understanding Body'

If I propose here to consider learning as taking or changing habits based first on Peirce's perspective on habits, Merleau-Ponty's *Phenomenology of Perception* offers a view of habits that is notable when considering the role of experience in the learning process. Merleau-Ponty's non-dualist view of cognition leads him to develop a theory of the 'understanding body'. As de Saint Aubert (2004, p. 105) explains, the issue of the union of soul and body is imperative for understanding Merleau-Ponty's interest in habits: 'Merleau-Ponty is in search for what is inextricably bodily and spiritual, and that he eventually describes by the notion of flesh. To this extent, habits interest him because it is "neither a knowledge, nor an automatic reflex", and "lies neither in thinking nor in the objective body, but in the whole body as mediator of a world" ' (my translation). De Saint Aubert's main interest is Merleau-Ponty's claim that 'it is the body which understands in the acquisition of habit'. These insights constitute a consistent theory of 'practical intelligence' (ibid., p. 106), which proposes notions that would appear particularly relevant in the following half century in the fields of the philosophy of perception, cognitive science and educational science, specifically when considering the role of the autonomous nervous system and the existence of a non-reflexive form of cognition. Thus, 'the body schemata works as a system of equivalents which are not established by a central unit of computation, nor in an ideal subordination, but are directly simulated by an extended neural network systematically soliciting motor areas' (2004, p. 113). Peirce's readers may be struck by Merleau-Ponty's description of the analogical dimension of this practical intelligence: de Saint-Aubert (2004, p. 113) insists on this 'idea of a system of equivalents, this general function of tacit transposition, a principle of understanding (*com*-préhension) without explanation of *the analogical*, synthesis without analysis, made of a rigor which is not developed into reasoning'.

For Merleau-Ponty (1945/1962, p. 10), 'the elementary event is already invested with meaning'. The possibility of attention 'presupposes a transformation of the mental field [. . .]; the first operation of attention is, then, to create for itself a field, either perceptual or mental, which can be "surveyed" [. . .], in which movements of the exploratory organ or elaborations of thought are possible [. . .]' (p. 29); 'the miracle of consciousness consists in its bringing to light, through attention, phenomena which re-establish the unity of the object in a new dimension [. . .]' (p. 30). 'Being-in-the-world' refers to investing in this world by producing a 'phenomenal field' (p. 52), the result of an ongoing cognitive process of interpretation in which the body (not solely the mind) assumes a major role: 'Perception becomes an 'interpretation' of the signs that our senses provide in accordance with the bodily stimuli, a 'hypothesis' that the mind evolves to 'explain its impressions to itself' ' (p. 33). No world exists apart from the world as lived-in: 'The light of a candle changes its appearance for a child

when, after a burn, it stops attracting the child's hand and becomes literally repulsive. Vision is already inhabited by a meaning *(sens)* which gives it a function in the spectacle of the world and in our existence' (p. 52).[13]

Meaning implies secondness, in the form of our encounter with the world; we do not have access to a pure, objective, material world: 'The pure quale would be given to us only if the world were a spectacle and one's own body a mechanism with which some impartial mind made itself acquainted. Sense experience, on the other hand, invests the quality with vital value, grasping it first in its meaning for us, for that heavy mass which is our body, whence it comes about that it always involves a reference to the body' (p. 52). The firstness of the flame requires the secondness of my body's encounter with it for the thirdness of a law or a habit (*fire* means *danger*) to exist; exploring the world, or acting in it, is the source of our 'knowledge' of it in the form of a meaningful phenomenal field.

The world is a lived-in world: it exists depending on the way objects are acted upon, inhabited by our own actions; it is perceived in terms of the possible actions we may perform in it (i.e. *affordances*): 'perception is, by its nature, polarized towards the object' (p. 301). One of Merleau-Ponty's examples demonstrates the essential connection between such a world as acted-in and the question of habit (p. 106): being projected in a specific setting seems to trigger some automaticity, a way of acting being provoked, a habit being called, gestures being convoked, a form of intelligent behaviour that partly escapes conscious thought. In other words, 'the task to be performed elicits the necessary movements from him by a sort of remote attraction, as the phenomenal forces at work in my visual field elicit from me, without any calculation on my part, the motor reactions which establish the most effective balance between them [. . .]' (p. 106). Our capacity to act efficiently in such contexts, underlain by the way we see them as places where certain actions can be implemented, implies a form of synthesis that is not an 'intellectual synthesis'. These actions result from a type of learning through which something becomes inscribed in the body itself: 'the acquisition of habit as a rearrangement and renewal of the corporeal schema presents great difficulties to traditional philosophies, which are always inclined to conceive synthesis as intellectual synthesis [. . .], the learning process is systematic; the subject does not weld together individual movements and individual stimuli but acquires the power to respond with a certain type of solution to situations of a certain general form.' (p. 142).

Thus, 'habit is neither a form of knowledge nor an involuntary action' (p. 144). For the typist, for example, 'to know how to type is not, then, to know the place of each letter among the keys, nor even to have acquired a conditioned reflex for each one [. . .]' (ibid.). Merleau-Ponty proposes an alternative view of cognition: 'we said earlier that it is the body which "understands" in the acquisition of habit. This way of putting it will appear absurd, if understanding is subsuming a sense-datum under an idea, and if the body is an object. But the phenomenon of habit is what prompts us to revise our notion of "understand" and our notion of the body' (p. 144). This

view does not describe 'habits' as by-products of bodily and cognitive activity, but positions them at the core of the process of 'being-in-the-world'. The word 'habit', as many thinkers remind us, refers to a way of 'having' a world. For Merleau-Ponty, 'the body is our general medium for having a world' (p. 146), for making sense of it: 'Habit is merely a form of this fundamental power. We say that the body has understood and habit has been cultivated when it has absorbed a new meaning, and assimilated a fresh core of significance. To sum up, what we have discovered through the study of motility, is a new meaning of the word "meaning" ' (ibid.). Here, Peirce's readers will notice the pragmaticist dimension of Merleau-Ponty's perspective: conceiving meaning implies considering the role of intention, more precisely, the intention of acting upon the world, the semiosic process escaping the sole interplay and computation of representations. The semiotic dimension of habit lies in the fact that its development is based on meanings, and meanings mediate, in the mobilisation of habits, our encounter with the world. Hence, habit allows Merleau-Ponty to define cognition as a semiosic process, a central stance of educational semiotics.

Embodied Cognition and Enaction

Merleau-Ponty's phenomenology of perception invites us to consider habits in a way that, if partly consistent with Peirce's view of the connections between meaning, intention and action, offers a specific view to the extent that cognition appears clearly as a process active in the practice of habit itself. Merleau-Ponty, by describing the meaning of to 'be-in-the-world', as a *knowing* and *interpreting* being, views cognition as embodied, situated and distributed. Many writings in recent decades have investigated such a perspective, sometimes by directly referencing Merleau-Ponty. I consider such a view of cognition particularly relevant when researching the way in which people act in professional (educational, in this case) settings and develop, implement and transform their habits. I also consider that the embodied perspective of cognition is highly consistent with the prospect of edusemiotics.

Varela, Thompson and Rosch (1991, pp. 172–173) claim that 'cognition depends upon the kinds of experience that come from having a body with various sensorimotor capacities, and second, that these individual sensorimotor capacities are themselves embedded in a more encompassing biological, psychological, and cultural context [. . .]; sensory and motor processes, perception and action, are fundamentally inseparable in lived cognition'. More precisely, in reference to phenomenology, they consider the double role of the body in cognition: 'For Merleau-Ponty, as for us, embodiment has this double meaning: it encompasses both the body as a lived, experiential structure and the body as the context or milieu of cognitive mechanisms' (ibid., p. xvi). Varela and his collaborators regard the embodied perspective of cognition as 'resonant with pragmatism' to the extent that 'the body and mind relation is known in terms of what it can do' (ibid., p. 30). Embodied cognition refers to the role of the body and its sensory experience in developing higher cognition and to the idea that the

development of cognition in its forms and structures depends on the way in which one explores the world and sees its parts in terms of affordances.

Emphasising the embodied character of cognition entails rejecting the dualist view of cognition, the idea that cognition may be summed up by the metaphor of computation and that 'computations are operations on symbols' (ibid., p. 41). To the question 'what is cognition?', the 'classical cognitivist research program' answers: 'Information processing as symbolic computation-rule-based manipulation of symbols' (ibid., p. 42). As suggested by Merleau-Ponty in several examples, this metaphor fails to account for many cognitive phenomena. Cognition, while embodied, is situated to the extent that being in the world implies investing it as a 'phenomenal field': this view refers to events that differ considerably from the implementation in the world of an anticipated plan, processed first in an isolated mind; that is true for the typist, for people driving a car, or for the organist playing a new instrument. The cognitive processes considered in this case neither precede nor exist independently of action, but occur in this very setting, specifically, through the 'coupling', as Varela would say, of the body and the environment. Along the same lines, Merleau-Ponty (1945/1962, p. 106) states: 'The bench, scissors, pieces of leather offer themselves to the subject as poles of action; through their combined values they delimit a certain situation, an open situation moreover, which calls for a certain mode of resolution, a certain kind of work' (p. 106). This example is consistent with the situated action perspective: while denouncing the failure of the plan-oriented view of cognition (i.e. a plan of action followed by its implementation) Lucy Suchman (2006) refers to situated action as an expression that 'underscores the view that every course of action depends in essential ways on its material and social circumstances' (p. 70). Suchman, in this analysis, insists on the importance of G. H. Mead's thought when considering action as situated: 'George Herbert Mead has argued for a view of meaningful, directed action as two integrally but problematically related kinds of activity' (Suchman, 2006, p. 71).

Cognition is *situated*, a process happening *somewhere*, with this 'somewhere' being not only the brain but also the autonomous nervous system (my hands *know*) and the entire environment. In fact, most authors proposing a situated view of cognition describe cognition as distributed. However, the distinction allows us to insist on the role of artefacts in cognition, on the part played by the material, social and temporal dimensions of the environment. Hutchins (2001, p. 2068) proposes a broad definition: 'cognitive processes may be distributed in the sense that the operation of the cognitive system involves coordination between internal and external (material or environmental) structure, and processes may be distributed through time in such a way that the products of earlier events can transform the nature of later events'.

Varela, while developing the concept of enaction and insisting on these three dimensions of cognition, proposes a synthesis consistent with Merleau-Ponty's notion of phenomenal field and conception of perception (i.e. an active phenomenon determined by intentional action) as crucial to understanding our 'being-in-the-world': '[. . .] the enactive approach

consists of two points: (1) perception consists in perceptually guided action and (2) cognitive structures emerge from the recurrent sensorimotor patterns that enable action to be perceptually guided' (Varela *et al*., 1991, pp. 172–173). Here, Varela asserts that cognition is related to guided perception in the context of goal-oriented actions and explorations of the world: 'the point of departure for the enactive approach is the study of how the perceiver can guide his actions in his local situation' (ibid., p. 173). In an enactive approach, cognition cannot be reduced to computations based on symbolic representations, but must be defined as a 'history of structural coupling that brings forth a world' (ibid., pp. 206–207).

The enactive approach allows the rethinking of habits in a highly heuristic way. As shown by Merleau-Ponty, habits become a natural 'way of being', a key aspect of human existence. Thus, an embodied, situated and distributed perspective on cognition will help us analyse teachers' habits. From an enactive perspective, questioning teachers' habits of practical action entails understanding (and helping teachers understand) which types of microidentities they developed and may transform when they participate in specific settings, typical situations, or microworlds. Varela (1999) describes how our 'microidentities' develop in a series of 'microworlds' (p. 8):

> Our lived world is so ready-at-hand that we have no deliberateness about what it is and how we inhabit it. When we sit at the table to eat with a relative or friend, the entire complex know-how of how to handle our utensils, how to sit, how to converse, is present without deliberation. We could say that our having lunch-self is transparent [. . .]. I call any such readiness-for-action a *microidentity* and its corresponding lived situation a *microworld* (pp. 9–10).

This 'microworld' cannot be defined simply as an objective, 'real world' that would be *seen* (passively) through filters: 'These interactions (between body and environment) [. . .], this coupling is possible only if the encounters are embraced *from the perspective* of the system itself. This embrace requires the elaboration of a *surplus signification* based on this perspective; it is the origin of the cognitive agent's world' (Varela *et al*., 1991, pp. 55–56). The intervention of perceptual and motor (not merely perceptual) events and the intentions are critical to this coupling: 'this basic assessment of surplus signification cannot be divorced from the way in which the coupling event encounters a functioning perceptuo-motor unit; indeed, such encounters give rise to *intentions* (I am tempted to say "desires"), and intentions are unique to living cognition. To put this in another way, the nature of the environment for a cognitive self acquires a curious status: it is that which *lends itself* to a surplus of signification' (p. 56). For Varela, this process is critical to our 'having a world' (p. 150), a notion present in Merleau-Ponty's thought about habits. Varela summarises:

> [T]he challenge posed to cognitive science is to question one of the more entrenched assumptions of our scientific heritage—that the world is independent of the knower. If we are forced to admit that

> cognition cannot be properly understood without common sense, and that common sense is none other than our bodily and social history, then the inevitable conclusion is that knower and known, mind and world, stand in relation to each other through mutual specification or dependent coorigination (ibid., p. 150).

III THE THREEFOLD DIMENSION OF HABIT AND THE QUESTION OF EDUCATIONAL GESTURES

Habit: A Residue of Spiritual Activity or a Matter of Embodied Cognition?

I have discussed three main perspectives on habits: Peirce's pragmaticism, Merleau-Ponty's *Phenomenology of Perception*, and Varela's theory of enaction. My aim, by describing these theories, was not to suggest perfect consistency among these three views of habits. A key difference, constituting apparently a strong contradiction, is the way in which cognitive processes (in this case, processes of semiosis, or the production of meaning) and habits, more precisely, habits of conduct, become active. When we proposed with Denoyel (Denoyel and Pesce, 2009) to describe adults' training as a matter of unfolding habits of practical action, we adopted a Peircean perspective. We considered that semiosis produced habits (final interpretants) that underlay habits of practical action, thus proposing that habits of practical action should be regarded as constituting intelligent behaviour, in the sense that meanings mediate the relationship between a subject and the world through habits of practical action that retained *tracks* of past semiosis. Such a description seems to echo Bergson's definition of habit (the 'fossilized residue of a spiritual activity'), a definition that Merleau-Ponty (1945, p. 142) rejects when rhetorically asking his readers: 'Must we then see the origin of habit in an act of understanding which organizes the elements only to withdraw subsequently?'

Thus, an apparently important difference between Peirce's and Merleau-Ponty's analyses of habit is that for the latter, cognition is embodied in the strongest sense of the term: cognition occurs when exercising habit, specifically, when a form of non-intellectual, yet intelligent, synthesis occurs. Claiming that cognition is embodied does not mean, for Merleau-Ponty and Varela, that cognition sustains or structures future action, but that action and situations are places where cognition occurs. This view strongly differs from Peirce's view of habits, though the dimension of embodiment is far from inexistent in his writings. For instance, the embodied dimension, if not of cognition, then of habit-taking, is present in Peirce's reflection on the materiality of habit formation, or the 'physiology of habit' (CP 6.259). Such things as 'habits of the nerve' must be considered: 'for the analogue of belief, in the nervous system, we must look to what are called nervous associations—for example, to that habit of the nerves in consequence of which the smell of a peach will make the mouth water' (CP 5.373). This instance demonstrates how our environment becomes meaningful for us,

the peach being 'seen-as' (something tasty), its spectacle generating a dynamic interpretant. Other writings describe forms of habitual behaviour that may further clarify the relationship between the question of learning and bodily activity: 'A judgment is an act of consciousness in which we recognize a belief, and a belief is an intelligent habit upon which we shall act when occasion presents itself. Of what nature is that recognition? It may come very near action. The muscles may twitch and we may restrain ourselves only by considering that the proper occasion has not arisen' (CP 2.435). Similarly, Peirce insists that 'habit', in a broad sense, 'is by no means exclusively a mental fact' (CP 5.492). The formation of certain habits requires a 'muscular effort', a form of *practice*: 'In the second place, the event that causes a habit-change may be a muscular effort, apparently. If I wish to acquire the habit of speaking of "speaking, writing, thinking," etc., instead of "speakin', writin', thinkin'," as I suspect I now do (though I am not sure)—all I have to do is to make the desired enunciations a good many times; and to do this as thoughtlessly as possible, since it is an *inattentive* habit that I am trying to create' (CP 5.479; my emphasis). The repetition of an action seems to allow the progressive embodiment of a habit: 'Habits differ from dispositions in having been acquired as consequences of the principle, virtually well-known even to those whose powers of reflexion are insufficient to its formulation, that multiple reiterated behaviour of the same kind, under similar combinations of percepts and fancies, produces a tendency—the habit—actually to behave in a similar way under similar circumstances in the future' (CP 5.487). In this sense, an embodied dimension is present in forming habits, but what is then considered is a specific form of habit, i.e. habits of action, not 'habits' as final interpretants: 'Everybody knows the facility with which habits may thus be acquired, even quite unintentionally. But I am persuaded that nothing like a concept can be acquired by muscular practice alone. When we seem to do that, it is not the muscular action but the accompanying inward efforts, the acts of imagination, that produce the habit' (CP 5.479). Here, Peirce distinguishes between 'habits' and 'habits of practical action' as I had introduced previously. Even if a form of embodiment appears in Peirce's writings, habits cannot be understood, when considering all his writings, as 'things we usually do' or gestures we often repeat, notwithstanding that such a definition sometimes appears.

Based on this distinction among different forms of habits, I consider that while attempting to understand teachers' and educators' ways of acting in the classroom, Peirce's and Merleau-Ponty's views may be consistent and may each clarify, though distinctly, the situations that we are willing to analyse. If a 'spiritual', or reflexive activity precedes the formation of habit (it is a track of semiosis for Peirce), all intelligent behaviour and cognition do not necessarily disappear when habits are formed and unconsciously implemented. Acting from habit is acting in an intelligent manner; habit implies a fundamental mode of cognition. Acting based on habit does not mean implementing unintelligently actions that have previously been intelligently elaborated. Habit implies repetitions, not mere repetitions, but creative repetitions, what Yves Clot (2002) has called 'repetition beyond

repetition', gestures and ways of being that change slightly, expressing a style, not accidentally, but as our body invests in the world, inhabits it, fits into it, adjusts itself to it, or more precisely, referring to Varela's analysis, experiences the ongoing evolution of the *couplings* that organise the world-body system.

Habits, Habits of Practical Action, and Educational Gestures

I consider here at least three dimensions of 'habit': 'habits' in the sense of general laws or principles (final interpretants); 'habits of conduct', present in general manners of addressing specific situations (final logical interpretants, similar to Piaget's and professional didactics' 'schemata'); and 'habits of practical action', a notion that does not exist in Peirce's work, but that I propose to use for describing the actions that our 'microidentities' allow us to implement in specific 'microworlds', or the finely tuned, precise gestures people perform in professional contexts, a form of habit that evokes many of Merleau-Ponty's examples.

I thus consider that understanding the normal 'way of being' of professionals in educational contexts requires considering these three forms of habits. I would like to add to this threefold description of habits the notion of 'educational gesture', which I have proposed elsewhere (Pesce, 2014) and which must be defined relatively to these three dimensions of habits. My use of 'educational gesture' results from a 'translation' of Mead's concept of 'significant gesture' (Mead, 1934) and refers to a specific way in which teachers and educators respond to specific situations (in Mead's social behaviourist terms, the way in which responses are given to specific stimuli) through the mediation of meanings. While Brassac (2008, p. 12) analyses, in the field of *professional didactics*, Mead's notion of *action* to understand professional gestures, he insists on something referring to the notion of coevolving world and subject and on the fact that the meaningfulness of answers is present when perceiving the world: 'the *action* is in some way the category allowing G. H. Mead to theorise this micro-narrative of the alteration of an organism and of its environment. The impulse, first stage of the act, is in some way a "selective attention" of the organism in regard with its environment' (my translation.).

In my view, a particular action, a gesture, specifically, an *educational gesture*, develops based on a set of couplings of the subject and its environment and thus is a way of acting vis-à-vis educational situations based on previous semiosis. It is not a habit in the general sense of 'final interpretant', but constitutes a way of being based on a structure or schema underlain by previous semiosis through a self-conscious act during an epistemological activity, or an inquiry. Educational gestures imply some 'habits of conduct', a general way of acting whose meaning has been previously elucidated, then strengthened through experience, in other words, progressively embodied. An educational gesture implies particular forms of 'habits of practical action': particular in the sense that whereas habits of practical action may result from trials and errors and thus may resolve to 'habitual behaviour' or 'habitual practice', educational gestures

result from a wilful reflexive activity. Therefore, an educational gesture (that ideally is efficient) may replace an old habit of practical action of which one became aware and decided to change (it does not mean that any habit of practical action should be considered inefficient). An educational gesture results from previous events of semiosis, yet its implementation is conditioned by situated cognitive phenomena in the form of analogical, transductive operations. It is considered to be not the *fossilized residue*, but the result, as an ongoing cognitive, social and motor process, of a past reflexive cognitive activity.

CONCLUSION

Habit is a 'normal', fundamental way of being: one cannot ask typists to 'compute' reflexively before striking a key, drivers to stop their cars and measure their length before each obstacle, or teachers to think carefully for hours when two students start fighting in the classroom. Expert professionals, by definition, implement gestures without thinking: 'Every expert knows this sensation of emptiness well; in the West, for example, athletes, artists, and craftsmen have always insisted that self-consciousness interferes with optimal performance' (Varela *et al*., 1991, p. 35). I do not only consider habits as part of professional life, but I propose that becoming an expert professional requires teachers and educators to develop habits and act through them. In contrast to the fully conscious implementation of a cognitive model, new educational gestures require time to become structured by habits of practical action. Most likely, by focusing mainly on initial training and by rarely considering the importance of this process and its social dimension, our traditional forms of training fail to give teachers efficient tools. For this reason, we must not only explore alternative forms of lifelong teachers' training but also rethink initial training to transform training in a place where lively semiosic processes aimed at habit-taking and changing may occur.

Guiding teachers' activity and designing public policies require new perspectives on educational processes. If comparative research in education is useful for designing new methods and practices, this approach is not necessarily sufficient. Indeed, public educational policies tend to assume the form of evidence-based policies, aiming to understand what 'works' in neighbouring countries to import the 'best practices'. However, the risk of this approach is to focus on certain causes (e.g. no marks, small class groups, well-paid teachers) and their effects (e.g. effective learning, happy kids, scarce bullying), without 'getting into the black box', without trying to understand which processes are invoked when specific causes provoke particular effects. By remaining outside the black box, this comparative approach fails to explore thoroughly the cognitive, social, and semiosic processes that produce such effects. If one accepts, with Blumer, that people act toward things based on the meanings these things have for them, then these processes are essential to understanding what *constitutes* and makes effective the procedures we come to observe and seek to import:

such an import may fail if we ignore the semiosic processes that structure their dynamics in particular settings. Understanding education does not mean knowing *which methods* work, but discovering *which cognitive processes* these methods enable: this allows us to redesign and experiment, *hic et nunc*, the particular and situated methods that may give rise to similar cognitive and semiosic events. These methods become relevant in the contexts in which people perform their everyday activity, because of the *symbolic investment* their situatedness permits. It is to this process that research-action-based training methods attempt to contribute.

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NOTES

1. I have experimented with alternative training methods with several people, some of whom trained me on the tools they had created, prior to engaging in further experiments, adjustments and improvements. I wish to emphasise the role played in the design of such sessions by Noël Denoyel (Université de Tours), Rémi Casanova (Université Lille III) and Cécile Perrot (Fondation des Apprentis d'Auteuil).
2. GAEP = *Groupe d'Analyse de l'Expérience Pragmatique*.
3. This article was first presented in May 2012 at the *Semiotics and Education* Network Seminar held in Bath, where several speakers proposed such a definition of learning as habit-change.
4. CP 4.157, c. 1897; for the *Collected Papers* (CP), see Peirce, 1931–1958.
5. CP 5.400, *How to Make our Ideas Clear*, 1878; CP 4.159; *Recreations in Reasoning*, c. 1897.
6. CP 5.538, *Minute Logic*, c. 1902.
7. CP 5.491, 'A Survey of Pragmaticism', c. 1907.
8. CP 5.430, 'What Pragmaticism Is', *The Monist*, 1905; CP 5.504, *Pragmaticism*, 1905; CP 6.481, 'A Neglected Argument for the reality of God', *The Hibbert Journal*, 1908.
9. CP 5.538, *Minute Logic*, c. 1902.
10. See, for instance, 'On the Algebra of Logic', particularly CP 3.157-CP 3.163.
11. CP 2.666, Note added in 1910 to 'The Doctrine of Chance'.
12. CP 1.574, 'Basis of Pragmaticism', 1906.
13. Peirce (CP 6.454) analyses the same example to clarify the notion of habit: 'Take for illustration the sensation undergone by a child that puts its forefinger into a flame with the acquisition of a habit of keeping all its members out of all flames. A compulsion is "Brute", whose immediate efficacy nowise consists in conformity to rule or reason'. For Peirce, this kind of experience typically 'contributes to a habit'.

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