BODY LEARNING: EXAMINING THE PROCESSES OF SKILL LEARNING IN DANCE

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ABSTRACT

This paper focuses on the authors' attempt to understand the process of skill learning in dance. Its stimulus was a period of fieldwork based at the Royal Ballet School in London, and subsequent discussions with the School's teachers and with academic colleagues about how it was that the young dancers developed their characteristic set of skills. Many accounts of skill learning are premised on the presumption that learners come to know about their environment by representing it in the mind and that such representation is a result of a computational process involving information received through the senses. This is the dominant position of researchers in the field, and folk versions were nearly universal among the dance teachers with whom we worked. In this paper, we discuss weaknesses in this information processing theory, and explore the elements of a more satisfactory approach. The account offered here locates dance skills within the context of development, in which skills are incorporated in learners through practice and training in dance environments. Bourdieu's theory of practice offers insights into the practical mastery young dancers carry in their bodies, which cannot be accurately formulated in terms of a system of representations. Dancers, from this perspective, do not passively follow instructions, but actively engage in tasks involving characteristic ways of moving that are situated in the nexus of relations between people and the distinctive contexts of dance. The paper draws on the ecological perspectives of Gibson, the phenomenological stances

of Dreyfus, Heidegger and Merleau-Ponty, and the problem-solving schema of Popper to the extent that all focus on the *perceiver* in the world. Following such theorists, it is suggested that the learning of skills like dance is not a matter of processing information, but is imminent in the active, perceptual engagement of learner and context.

LEARNING AND SKILL

The one-time UK Secretary of State for Education Kenneth Clarke is reported to have once said "having any ideas about how children learn, or develop, or feel, should be seen as subversive activity" (cited by Stones, 1992). Apparently, his statement was out of frustration at educationalists who wilfully refused to accept that the question 'how children learn' is an important and necessarily complex one, and that, moreover, it is a question to which we do not yet have a satisfactory answer. But learning *is* an important and complex question. And it is a topic that deserves much greater attention from educational theorists than it currently attracts.

In part, this is the rationale of this paper: to consider the process by which young people learn. In this case, the learning involved occurs within the context of dance, specifically ballet. Its stimulus is an on-going empirical study into the experiences of a group of young dancers in three of the UK's elite dance schools[1]. In particular, our focus, where relevant, is on the learning of the *skills* of a good dancer. Our method is to reflect critically on some of the main theoretical and philosophical positions adopted to explain their learning.

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[1] cf. Wellard, Pickard and Bailey (2007) and Pickard and Bailey (in press).

To begin with, we would like to suggest three tentative hypotheses about skill learning. These will form the backdrop for the subsequent analyses.

Our first presumption is that skills are learned. That is to say that skills are acquired, and that without this process of acquisition, there would be no skills. Clearly, genetic elements of development influence capacity, but however strongly one might argue for a biological basis for learning (e.g., Bailey, 2003), it is difficult to account for the development of skilled performance in any domain without reference to process of learning, retention and transfer (Newell, 1996). Thus learning is a necessary feature of skill (Moe, 2004).

Our second claim is that skill "can be defined only in terms of success, of achievement, of a goal" (Guthrie, 1952, p. 136). In other words, skills are actions with some outcome in mind, rather than mere physical actions. The distinction between skill and mere technique (or action) is a vitally important one for the argument that follows. Whilst this might seem, on first blush, a somewhat obvious point, we would draw the reader's attention to the countless 'how-to' books on dance and sports which present strings of techniques in isolation from the many other factors that mediate and modify all techniques in the process of them being converted into skills.

Our third and final hypothesis is that skills have a *history* in the sense that they develop in some way over time. Thus, it is usually relatively easy to recognise the differences in the performances of novices and experts in terms of characteristics like technical improvement, consistency, persistence and adaptability (Magill, 2004). In

many cases, this is possible even if the observer has little or no experience of the domain herself. More importantly, perhaps, is the implication that skills also have their autobiographies in the sense that they embody the movement experiences of actors up to the moment of performance of the skills.

With these tentative conjectures in mind, it is time to move on to consider some of the theories that have attempted to account for skill learning, and which might help explain how young dancers become great dancers.

SKILL AS INFORMATION PROCESSING

> "Roughly the internal states of information-processing machines have become the paradigm for the psychological states of creatures of our kind. If our mental processes once seemed a deficient form of angelic intuition, they have now become an inefficient kind of mechanical calculation. The ghost in the machine has given way to the clockwork in the animal." (Kerr, 1997, pp. 185-6)

Information processing (IP) approaches have dominated academic discussions of skill learning and development for the last 40 years or so (Moe, 2004). IP is based on the findings of certain versions of cognitive science in the 1950s, which in turn is premised on an axiomatic relationship between human learning and mental representations. Simply put, IP posits that an individual learns about her environment by representing it in her mind, and that such representations are the result of a computational process working on information received through the senses. So, just like a digital computer, the mind is understood as an information processor that calculates meaningless bits of information into meaningful movement responses,

which we call skills. This sort of thinking has led to characterisation of the human mind as a type of computer, in which "the mind is the program and the brain the hardware of a computational system" (Searle, 1992, p. 200).

Applied to the physical domain, IP theorists often talk about "motor programs" and "schemas" (Williams, et al, 1999). Essentially, a motor program is "a set of motor commands that is prestructured at the executive level and that defines the essential details of a skilled action" (Schmidt and Wrisberg, 2000, p. 124). Schmidt and Lee (1999) define a motor program as an "abstract representation that, when initiated, results in the production of a coordinated movement sequence" (p. 416). So, motor programs are made up of *mental representations*, which develop into *plans of actions*, *instructions* or *rules* (Magill, 2004) that produce and constrain certain movements that are constitutive of a desired performance of an action. In other words, a motor program is a mental representation, made up of rules, commands and plans, that determine the production of a skill. Language is predictably clumsy here, and it is important not to assume an equation of plans of action and the like with conscious control. In fact, according to the IP perspective, motor programs regulate skill execution "in the absence of a direct conscious control" (Schmidt and Wrisberg, 2000, p. 127). So, skilful performance can be understood within these theories as an expression of a set of trained, habituated, automatic responses in a specific context (Bargh and Chartrand, 1999).

The analogous relationship between a motor program and a computer program is made explicit in a standard textbook account, in which it is written that most motor theorists assume that "a movement is organized in advance by a program that sets up

some kind of neural mechanism, or network, containing time and event information – a movement script, if you will, that specifies certain essential details of the movement as it runs off over time" (Schmidt and Wrisberg, 2000, p. 132). So we hear talk of "running a motor program", a phrase clearly indicative of a view of the performer's mind as analogous to a computer program.

How might this approach relate to the learning of new dance skills? According to IP theories, and most 'common sense' accounts, it is something like this:

> When a novice starts to learn a new skill, she usually presented with fairly detailed rules or instructions related to the successful completion of the movements. Consider as an example a pirouette, which is a turn or a series of turns travelling 360 degrees on one leg. When learning a pirouette the non-supporting leg is usually bent with the foot touching the knee of the turning leg. There are key technical points to note – to execute one pirouette can initially seem very difficult for a developing dancer as the pirouette means the application of a number of technical points including the ability to spot (a means of avoiding giddiness while turning). Once one pirouette becomes easy then the dancers aim to extend the number of pirouettes from a single, to a double to a triple etc. Multiple pirouettes are often executed by ballerinas *en pointe*. So again, a developing dancer may be able to do the movement with ease but needs to adjust again once they have *pointe* shoes on.

According to IP theorists, what has happened is that the dancer has developed increasingly more sophisticated motor programs that store within them "all of the movement commands for controlling the action" (Williams et al, 1999, p. 53). With practice, these programs become "more elaborated, controlling longer and longer

strings of behavior" (Schmidt and Wrisberg, 2000, p. 127), many of which will become automatic, and the dancer becomes more skilful.

THE PHENOMENOLOGY OF SKILFUL PERFORMANCE

> "Any mechanistic theory runs up against the fact that the learning processes is systematic; the subject dies not weld together individual movements and individual stimuli but acquire the general power to respond with a certain type o solution to situations of a certain general form." (Merleau-Ponty, 1962, p. 142)

The simple ubiquity of IP theories suggests that they offer useful ways of understanding the process of skill learning. Starting from a presumption that learners process information in relation to cognitive structures, and going on to specify the types of information processed, IP seems a plausible account of what happens when someone learns skills. There are, however, a number of reasons to doubt the validity of such approaches. For a start, the IP model, like almost all theories of learning, is a peculiarly disembodied account of motor skill learning. As Kerr (1997) observes at one point of his discussion of 'the new Cartesianism', "You do not have to read far into the writings of some of the new theorists of consciousness to meet strong feelings of dislike for the soft pulpable stuff that human brains are. You feel that some of these thinkers would much prefer bodiless minds: computers that do not run on blood" (p. 186).

Its presupposition is that performance begins with the development and execution of a relatively complex and intellectual plan of action, and that the subsequent action is a relatively simple matter of following that plan. In other words, the mind controls and the body follows. But as Rubin (1988) and others (Ingold, 2001) have pointed out, it

is just as plausible to presuppose precisely the opposite: a simple structure, or even no structure at all, followed by an unfolding of a complex task, in which conjectures, or trials, or theories are regulated by refutations, or error-elimination, or guesses.

Ballet presents a particularly interesting case study in this regard as it places great importance on the 'correct' execution of skills, which are honed over many hours of practice. But even a superficial observation of elite performers reveals that they do not all move in the same way when performing a specific movement or dance; a dancer does not even perform in the same way over a period of time. This is usually explained in terms of variations of height, weight, length of limbs, core control, centre of gravity, depth of bend before a jump, height of jump, timing, musical awareness, use of space, focus, breathing, the next movement, knowledge of technique, knowledge of the piece, knowledge of other dancers, confidence and so on. But such explanations become less persuasive when we are talking about the variation of performance of the same dancer. Of course, we all have 'good' and 'bad' days, but that seems hardly able to account for the evident variation between performances, even with familiar sequences. We suggest that dance involves what Pye (1986, p. 4) calls the 'workmanship of risk', because it is constituted of complex tasks the outcomes of which are not certain. In Campbell's (1974) memorable phrase, the outcomes of these tasks, like all epistemic activities, are 'blind'. No matter how much the dancer prepares, trains and hones her skills, care and judgement will always be needed because there are countless opportunities for things to go wrong, or at least differently.

Pye (1986) argued that, in practical settings, the workmanship of risk is often combined with the 'workmanship of certainty', which offers some degree of control through the use of well-worn techniques and strategies. In dance, these strategies include the development of technical resilience, core stability (the ability to control the central muscular-skeletal section during dynamic action), and the use of cues, of music and space during performance. But this terminology is misleading because there is never certainty in this context. These 'control' strategies are also vulnerable to risk, because they are all the product of a fallible human being, with a fragile body, moving in an ever-changing context.

A more fundamental criticism of the IP account is that learners do not, in fact, experience the world as meaningless, atomistic elements. This is the line of attack taken by Hubert Dreyfus, the philosopher who is probably most closely associated with the philosophical critique of IP theories of skill learning (Moe, 2004; 2005; Selinger and Crease, 2005). His formal interest in the topic began in the 1960s when he and his brother Stuart were hired by the RAND Corporation to evaluate their work on artificial intelligence. Their research culminated in the publication of a paper 'Alchemy and Artificial Intelligence' and a book *What Computers Can't Do*. The titles of these works are indicative of the conclusions the Dreyfus brothers drew from their enquiries.

Dreyfus' critique needs to be understood within the phenomenological tradition from whence it sprung. Phenomenology, as opposed to almost every other school of philosophy, is primarily concerned with *description*, rather than the explanation, of the things we experience (Pollio, et al, 1997). According to Kelly (2000, p. 162), "its

goal is completely and accurately to describe the phenomenon of human experience without the interference of metaphysical presuppositions inherited from psychological, scientific, historical, sociological, or other theoretical frameworks". Dreyfus argued that IP is without phenomenological support. He questions the IP account of our experience of the world in terms of "meaningless, atomistic elements ... Nothing is intelligible to us unless it first shows up as already integrated into our world, fitting into our coping practices" (Wrathall, 2000, p. 95). From the perspective of dance, actions of the arms, legs, head and torso only become meaningful after the dancer has processed the different elements that constitute the body in space. Dreyfus argued, then, that if we were to go straight to the actual phenomena we are studying, and undertook a very detailed observation of the activities that they make up, it would be evident that we are not processing bits of information as we deal (or cope) with them. Of course, none of this is to suggest that learners do not try to adhere to hints, cues and rules of thumb that approximate some notion of smooth performance, but the very adherence to these rules presupposes the skills that they are supposed to account for. In other words, the elements of skill do not constitute it; they are only meaningful in light of such skill.

There is an obvious response to the claim that we experience things as immediately meaningful: this is merely the way things seem because the bits of information have already been processed at an unconscious level – we experience things as meaningful because minds have already made them meaningful (Moe, 2005). Against this counter, Dreyfus uses what he calls the 'argument from skills' (Wrathall, 2000) to show how the IP approach ends inevitably in infinite regress. This argument can be paraphrased and reframed thus (adapted from Moe, 2005): if we are to understand

how people learn to dance, and we follow the IP account, we will need not only rules for dancing, but also a specification of the rules that allow the dancer to know when specific skills apply in different contexts. The different skills that make up the different parts of the different dances means that we are talking about a huge number of rules. But still further rules would seem to be needed to direct these rules, and so on for an infinite regress.

People *are* actually capable of dancing, so this potential regress of rules does not seem to immobilise them. So presumably they learn through a different mechanism than IP. Dreyfus stops the regress in typical phenomenological style by situating skills in a practice and coping background that is not and cannot be rule-governed:

> "In explaining our actions we must always sooner or later fall back on our everyday practices and simply say 'this is what we do' or 'that's what it is to be a human being'. Thus, in the last analysis, all intelligibility and all intelligent behavior must be traced back to our sense of what we *are*, which is, according to this argument, necessarily, on pain of regress, something we can never explicitly *know*." (cited in Wrathall, 2000, p. 94)

So, even the simplest dance steps are not susceptible to thorough codification, and when novices do follow rules and hints, these structure the context of learning, rather than make up the content of what is learned.

SKILL AND PRACTICE

In some important respects, Dreyfus' phenomenological approach to skill learning bears a certain resemblance to some other critiques of cognitive-based accounts. Bourdieu's theory of practice (1977) is an illuminating example, because it draws out

some of the central points of Dreyfus' perspective, whilst also highlighting some of its limitations.

According to Bourdieu, thinking and learning do not occur in an interior space of representations, but in people's actual engagement in the context of practical activity. The *habitus* exists only as it is revealed in the activity itself (Ingold, 2000). Bourdieu seems to conceive of skill in terms of a practical mastery that is carried in the body, and that is irreducible to rules and propositions. This mastery is acquired not through formal instruction, but through habitually carrying out activities and actions involving characteristic postures and gestures, that he calls *hexus*:

> "a way of walking, a tilt of the head, facial expressions, ways of sitting, and of using implements – all of these, and more, compromise what it takes to be an accomplished practitioner, and together they furnish a person with his or her bearings in the world." (Bourdieu, 1977, p. 87)

Claire, one of the dancers in our study, explained how her friends often refer to her as being 'such a dancer':

> "*They're always saying to me that I walk with a straight back and a long neck and whatever I do is dance-like and they say Claire 'you're such a dancer." (Claire, 13 years)*

Here Claire is demonstrating, perhaps unconsciously, some identifiable characteristics that those outside the immediate dance culture, her non-dancer friends, see as fitting with the nature of what constitutes the making of a dancer and therefore characterise and identify Claire as a dancer.

Jon also noted how he, seemingly habitually, carried out activities that involved characteristic postures and gestures, some of which do not fit with his friends expectations of what it is to be a man or man-like:

> *"I get really fed up with the way people sometimes say that I don't walk or sit like a man. They say I stand too tall and straight and that I use my hands and body too much when I'm trying to explain things. They say I need to look cooler. I'm not sure if it's because I'm a dancer that I do these things, I don't even know I'm doing them. I'm just being comfortable. Funny thing is they say I'm really different when I'm playing football. I don't know why." (Jon, 13 years)*

Interestingly, Jon appeared to be able to switch his behaviour and apply appropriate male-like, behaviour when engaged in playing football. And perhaps this is not surprising: Prain (1998) claims that gender is not something that exists 'in the head' but rather, gender is felt, enjoyed and suffered through a literate body which learns the postures, movements and social 'scripts' of masculine and feminine bodies.

These respondents and their peers are not merely referring to the 'technical' aspects of walking and standing that they might have picked up from their training. They are talking of the much more subtle movements of the sort described vividly by Proust (1992), which we will return to later. Many of these are not explicitly taught at all; they are presumably acquired by being around dancers, because that is how dancers move, or look, or drink, or whatever. These actions have become embodied – they have become parts of the dancer's body, carried with them after they leave the studio. And this account explains why it is that people from different backgrounds often

move and perform in different ways: habitual action, of whatever sort and in whatever context, becomes part of our bodies. They cannot but leave indelible marks.

We will draw out just two implications of this view for the phenomenological theory of Dreyfus. First, unlike Bourdieu, for Dreyfus the body that acquires skill seems to have no relevant biography, gender, ethnicity or age. But the body of the learner is the outcome of an 'apprenticeship' beginning and continuing from infancy (Sheets-Johnstone, 2000). This apprenticeship leaves the learner's body full of meanings and experiences that will influence all subsequent learning: "whatever the particular adult skill-learning situation - playing the piano, driving a car, playing chess, making trousers – it is a compound of experiences sedimented with skills and concepts accruing from our history" (Sheets-Johnstone, 2000, p. 359). This leads to the second, related point. Despite Dreyfus' critique of the IP theorist's reliance on the acquisition of information in the form of rules as the basis of skill learning, he does not seem able to completely free himself from the traditional cognitive-based, disembodied, rule-governed approaches to skill learning. He wrote:

> "Generally, in acquiring a skill – in learning to drive, dance, or pronounce a foreign language, for example – at first we must slowly, awkwardly, and consciously follow the rules. But there comes a moment when we finally can perform automatically. At this point we do not seem to be simply dropping these same rigid rules into unconsciousness; rather we seem to have picked up the muscular gestalt, which gives our behavior a new flexibility and smoothness." (Dreyfus, 1992, pp. 248-249)

Dreyfus suggested that novices, because they have no existing skills, need to acquire them at first through following rules. Over time, they learn to make exceptions to

those rules, and the rules progressively disappear as the learner moves towards expertise. But Dreyfus' presupposition is surely incorrect: the learner is already skilled in numerous ways. She does not unlearn these skills when presented with a new challenge. A young child joining a dance class can already move in countless ways, and these ways have a biography that expresses itself in every action. She always brings her bodies with her when she approaches a new context. She cannot help but do so. This is why a teacher or coach is important: not to pass down rules (they can flow from, rather than precede, practice), but to help learners negotiate the difficult path towards so-called 'ideal' forms with their unique and history-laden bodies. There is no such thing as a generic way of moving, and it is a poor teacher who acts as if there is. The skilled teacher is one who responds sensitively to the inherent differences among learners, leads them to attend to certain features of the learning context, so that they can get a sense of them for themselves. This model of teaching is essentially that of an 'education of the attention', in Gibson's (1979) phrasing. So, *contra* Dreyfus and many other theorists, a teacher does not become progressively redundant as the student becomes more skilled. This is because the dancer brings her own biography to bear when she moves, and therefore she is not well positioned to judge it impartially. This is not, however, because the teacher is somehow impartial herself, but simply because she comes from a different situation.

RETHINKING SKILLS

> "For in psychology there are experimental methods and conceptual confusion … The existence of the experimental method makes us think we have the means of solving the problems which trouble us; though problem and method pass one another by." (Wittgenstein, 1953, p. 232)

As we stated at the on-set, our aim here is not to solve any problems associated with skill learning, but rather to reflect on some of the main theoretical positions adopted over recent years to explain the learning of skills. However, certain themes do emerge from such reflection. An almost universal aspect of accounts of skill learning is, in Bernstein's words (1996, p. 181), that skills have a *history* in the sense that they are first learned and later end. We would suggest that this is an inaccurate characterisation. It is very difficult to imagine *any* skill that does not have a precursor. This is especially evident when one observes the development of physical skills. The learner, even the youngest or most inexperienced, does not write her skill on a blank slate. Even less is the skill written on her by a teacher or coach. On the contrary, skill learning can usefully be characterised as an active process of adaptation to specific contexts, based upon a pre-existing repertoire of skills. This is why an essential feature of skill learning is articulating and working with existing skills, and this is no mean feat, as most models of skill learning actually aim to produce an individual who is *unconscious* of her actions in certain contexts. And, as Dewey (1922) pointed out many years ago, if we wish to appreciate the peculiar place and force of habit in our activities, we should consider *bad habits*, like addictions. Clearly desire plays a role: it exerts a hold over us, and compels us towards certain courses of action.

Even if we do not seek to make our skills habitual, time alone will lead us to lay down a compendium of capacities and actions through the frequent repetition of acts, and these become a fundamental and intimate part of ourselves. These acts – how we

walk, hold ourselves as we talk, gesture, and sit – leave their mark on our bodies. A beautiful account of behaviour is offered by Proust's character Saint-Loup:

> "There were moments when my mind distinguished in Saint-Loup a personality more generalised than his own, that of 'nobleman', which like an indwelling spirit moved his limbs, ordered his gestures and his actions; then, at such moments, although in his company, I was alone, as I should have been in front of a landscape the harmony of which I could understand. He was no more than an object the properties of which, in my musing, I sought to explore…In the moral and physical agility which gave so much grace to his kindness, in the ease with which he offered my grandmother his carriage and helped her into it, in the alacrity with which he sprang from the box when he was afraid that I might be cold…I sensed in it above all the certainty or the illusion in the minds of those great lords of being 'better than other people', thanks to which they had not been able to hand down to Saint-Loup that anxiety to show that one is 'just as good as the next man', the dread of seeming too assiduous of which he was indeed wholly innocent and which mars with so much stiffness and awkwardness the most sincere plebeian civility." (II, p.96)

Following on from this first point, we are also led to question the familiar reduction of dance skill to a "technique of the body". This phrase originates from a now classic essay by the French sociologist Marcel Mauss (1979, p. 104), who wrote that the dancer uses her body as an instrument. So do we all, in fact, as the body is the "first and most natural technical object, and at the same time technical means". This reduction of skills to mechanics is an inevitable consequence of the separation of the body from the thinking agent that puts it to work, and the environment in which it

operates. But to understand skill, we need to locate the learner in a process of active engagement with the constituents of her environment (Ingold, 2000), and "awareness of body parts, their interrelationship and function in movement, the dancer's ability to coordinate and make choices and her understanding of principles and qualities of movement" (Jackson, 2005, p.31).

A similar point was made more than fifty years ago by the great, if until recently barely known, neuroscientist Nicholai Bernstein (1996). From a detailed study of a skilled blacksmith, he found that while the trajectory of the tip of the hammer was highly reproducible, the trajectories of the arm joints varied from stroke to stroke. This is hardly surprising given the freedom of movement of the joints and muscles in the arm. However, the acceptance of such flexibility immediately raises the central problem for Bernstein: how can it be that the motion of the hammer is reproducible, not the action of the arm, when it is through the arm that the hammer is made to move (Latash, 1996). Bernstein's solution was that the essence of the blacksmith's skill, his dexterity, can be found not in the movements themselves but in his responsiveness of his movements to the changing environment conditions, which are never the same from one moment to the next (Bernstein, 1996).

Bernstein's observation raises doubts about one aspect of skill learning that seems to be simply assumed by many theorists, namely that the repetitive practice of expert results in unthinking automaticity (Bargh and Chartrand, 1999). Thus, Connerton (1989, p. 94) writes that the repetition of certain actions leads to their bodily execution becoming increasingly automatic, to the point that "awareness retreats [and] the movement flows involuntarily". But this cannot be correct if it is the case that the

skilled dancer operates within the workmanship of risk, where the outcome of an action is not predetermined. It has been argued earlier that far from losing conscious control over her actions, the skilled dancer becomes more responsive and intensely aware of her performance. In the language of the psychologist Ellen Langer (1997), genuine skilled performance is 'mindful', not 'mindless'. This attentiveness need not extend to all movements that the dancer makes, and it is likely that all of us require a foundation of automatised competences that disappear from our awareness for the purposes of self-regulation (Bargh and Chartrand, 1999). But our concern here is with the skills that separate the highly skilled performer from the rest of us, and we maintain that these skills are not best left to autopilot. More skilled dancers have greater, not less, concentration. Such awareness of the body combined with understanding of how a particular technique works leads to success, but concentration is necessary to know which parts of the body to tune as appropriate and how to apply particular rules to the individual body. This is a quick and almost habitual process each time the skilled dancer executes movement. Of course dancers must train for hours to teach their bodies and minds to do things that then appear natural. Dancers may also have to contend with the pain of injuries as they may try to adjust or push their bodies in an ‘unnatural’ way (Pickard, 2007).

TEACHING SKILLS

If the above points are accepted, then certain pedagogical principles seem to follow. For a start, it is impossible to uphold the transmissionist view of learning by which an individual learns when skills (or rules that constitute skills) are passed down to them by a knowledgeable teacher. In fact, implicit within the transmissionist position is a view of the teacher as not just knowledgeable, but also skilful. And here is a clue to

the problem with that approach, as it is simply not the case that a teacher or choreographer always needs to be 'better' than the student, as is evident by the numerous highly regarded teachers who are not and may never have been outstanding performers themselves. A quality that the teacher really needs to bring to the situation is sensitivity to the different histories of the learners before her.

There is little doubt, though, that a teacher continues to be necessary throughout a dancer's professional life. However, the character of the teacher's role will change over time. Observation is of paramount importance here. As the dancer becomes more expert the teacher is looking closely for the fine-tuning of movement, aiding the prevention of injury and the style, grace and communication of the movement or choreography. The dancer may feel and be able to apply the movement in her body and be technically sound but may not always be aware of aspects of the aesthetics and qualities of performance. Again, the articulation of skill happens through an interactive process, involving both the dancer and her context, of which the teacher is a part. So, Dreyfus is mistaken to believe that a teacher becomes progressively unnecessary as the learner moves towards expertise. Perhaps the very opposite is the case: it is possible to imagine someone developing a rudimentary level of dance skills alone, using books, videos, or simply observation; but it is inconceivable that this approach could be take the dancer to the sort of standard necessary entry to an elite dance school (even Billy Elliot needed a teacher!).

Dreyfus and Dreyfus (1986, pp. 30-31) are mistaken, too, in suggesting that “when things are progressing normally, experts do not solve problems or make decisions; they do what normally works. In saying this, they are seeking to distance their

approach from that of the IP theorists, who suppose that intelligent action is always based on a plan, which is formulated by bringing to bear a given set of rules on a representation of the existing situation (Ingold, 2001). And they are surely right to criticise this approach for treating motor performance, such as that of a dancer, as nothing more than the bodily execution of a set of commands generated and directed by the intellect. But it is a great and unhelpful leap from denying the centrality of rules and plans of action to abandoning a role of cognition and problem-solving in skilled performers, at all. Skill is not a property of the mind. Nor is it a property of the body. If we are going to understand how people learn skills, we need to widen our focus to take in the total field of relations made up of the whole learner and the whole space for learning.

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