



EDITORIAL

Motor learning in Sport. A short stroll into a (un)familiar world [Aprendizaje motor en el deporte: Un corto paseo por un mundo (des)conocido]

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Introduction

It was in 1990 when *Quest* published an issue about “Usefulness of motor learning research for physical educators”. Several scholars tried to give an answer to this question, while motor learning researchers were in favour of this kind of scientific knowledge (Singer, 1990, Magill, 1990) pedagogues were more sceptical (Locke, 1990; Hoffman, 1990). Is it still a question that needs an answer? Does motor learning and expertise research useful for coaches and teachers? To quote J. von Uexkül “perhaps it would be a good idea to give a short stroll into the world of this (un)familiar world”.

Recently the philosophy of mind and philosophy of sport has begun to focus on sport expertise (Breivik, 2007; Moe, 2005). Today we are witnessing a change of the explanatory model of motor skill acquisition. Computational and computer metaphor is rejected and dynamic, sensorimotor, extended and enactive positions are the fashionable approaches (Araujo, 2013; Aviles, Ruiz, Navia, Rioja & Sanz, 2014; Clark and Chalmers, 2011; Davids, 2015; Froese and Di Paolo, 2011; Noë, 2010). In some cases these positions are coincidences but not in others. All of the researchers are agree upon the need to consider the mutuality of human beings and their surroundings. The computer metaphor, which at the time was the paradigm of any explanation, is now beginning to be seen as an overcome idea (Moe, 2005; Varela, Thompson & Rosch, 2005).

When the body met the athletes

If something is characterizing this postcognitive movement is the revitalization of the presence of the body and the sensorimotor competence of the minds development (Klemmer, Hartmann & Takayama, 2006). The mind is not detached from the athlete's body, and it is used on the track, the gym or the field. The mind, as indicated by Clark & Chalmers (2011) extends beyond the boundaries of skin. Cognition can be analysed by the sensorimotor, evolving in time and extending in the environment (Wilson, 2002). For a tennis player, his racket is an extension of himself, expanding his mind in each of his swings of his racket,

is an extension of himself, expanding his mind in each of his swings of his racket, developing what Clark (2001) himself called mind awareness, with a set of resources, a mixture of bodily and extra-bodily content that makes his mind fully prepared.

Ecological approaches based on the principles of Gibson also emphasize the role of the body in extracting the relevant information directly from the environment and decide to act without cognitive mediation (Davids, 2015). The unit of analysis is no longer the isolated athlete or team, but is the system consisting of the athlete/team and their environment in a dynamic interplay with processes of self-organization and emergence (Passos & Davids, 2015). This established view of the skill acquisition and expertise has a long history in oriental tradition. Chinese philosopher Mencius (370 to 289 BC) gives us some light on this issue. For this philosopher, the human mind was an embodiment mind and was expressed in three ways: The first named T'ui or extension, was the ability to act in a complex situation by analogy to other situations in which an action was correct because it was considered that it was valid. The athlete or a team has a repertoire of motor solutions that they know are appropriate for certain situations and that generates a quick response when certain stimulus are presented to them. The second is called Su or attention. It is the ability to see the similarities and correspondences between situations. This circumstance calling attention intensely to know and understand what is happening, to adapt actions to new situations. Mencius took a bit more tactical approach of thinking. The circumstances demanded some attentional resources and the ability to recognize patterns for deciding how to facilitate the adaptation of their own resources to the changing course of events. Finally, the spoke of Chih, called the intelligence of consciousness. At this point the person innovates in his movements, finds ways around; this has not been

used before, and creates procedures that allow you to solve the stated problem. It is freed from the regular and usual procedures, it is a tactic, the highest form of the intelligence that not all athletes use and not all coaches know, or are willing to promote among its athletes (Ruiz, Graupera & García, 2014).

Equipmentalities

Throughout this conceptual and philosophical transformation, the environment context has become more relevant. The information is there for the individual to grasp directly, this information affects their perceptual process and this process affects their actions. Hence here appears the importance of the concept of affordance. The question is whether, athletes or teams are able to directly perceive the usefulness or incitement for action (affordances). Is it necessary for you to have some knowledge about that environment and objects? The question is whether this is a straightforward process with the absence of any kind of cognition. Or otherwise it remains a cognitive mediation, a knowledge gained by experience, whose use is different than the classical cognitive models considered (Clark, 2001).

Perhaps, it is interesting to consider the Heidegger's (1926) concept of equipment and equipmentality. For this philosopher the environment and the objects have a utility to act in the world, writing, playing or working. Some materials are more appropriate than others, and if Gibson focused on surfaces that exist independently of the subject, Heidegger made reference to materials produced by human beings and their usefulness. These materials are provided for a reason, they have a service, to be utilized during favourable conditions. The materials are always conditioned by those who have the need to use them and the athlete learns to perceive how to utilize and use the different materials, spaces and situations of their sport. If they have meaning it is because it is the individual athlete that interprets its utility. This is subjective world that emerges in these situations (Von Uexkül, 1951; Heredia, 2011), a world of interactions and co-determination. As Davids considered affordances are objective and subjective. They need a subject to perceive them. The specific motivations and intentions of athletes that emerge during performance show why affordances are relevant to athletes today. Thus, it is an importance to be identified by coaches and teachers (Davids, 2015).

The subjective universe of athletes, coaches and teams

We are talking about "the circumstance" of the Spanish philosopher Ortega y Gasset. This subjective universe is independent of any outside

observer to analyse it. No external observer can see what the athlete, coach or team can see from their point of view, its biological idiosyncrasies, sensorimotor competences, knowledge, psychological characteristics and their particular experience in their sport. Each person perceives this relationship-coupling according to their personal characteristics, their own goals and their life experience. It is in this realm of this subjectivity where von Uexkül (1951) found that objects and situations may make sense for people. They can acquire a purpose and usefulness, and possess a functional tonality. It is defined by what you can do with them, and how useful they are. This concept of functional tonality has many similarities with the already discussed on Heidegger's equipmentality (1926) or Gibson's affordance (1986). Sounds, movements, gestures, objects, people, weather, etc., mean something, and set something that is perceived and interpreted by athletes, teams, coaches and teachers (Giblin, Farrow, Reid, Ball & Abernethy, 2015).

Another interesting idea that emerges from the postulates of von Uexkül is that you can be in the same team and in the same match, but you perceive the usefulness of situations and objectives from different subjectivities. This idea can be applied to the field of education too. The same situation does not generate the same profits for all components of the team or class, but as not all the requirements to act are the same, the perception and decision depend on their previous experiences. Van der Kamp, Duivendoorn, Kok and Hilvoorde (2015) highlight the problems that education may have when group dynamics are not considered in the process of skill acquisition. Athletes/teams/groups actively create their *umwelts* through training in a personal dialogue with their environment. This fact justifies the importance of analyzing sports performance and expertise only from a third person position to capture this dynamics in a beautiful equation of motion and modelled behaviour, but this is not always the solution for understand this (un)familiar world, because everything in life is greatly unpredictable.

Finishing this short stroll

Philosophers of mind and Sport, and researchers from very different backgrounds are coming to the conclusion that we must change the way we look at reality. This shift means contemplating the body, motor actions and context closely interrelated. Current *zietgeist* considers cognition from another point of view. Cognition and action emerge from interactions between subjects and environment, in a mutually co-determination. Cognition and action are situated and embodied

in the sensorimotor dynamics of the interactions between the athlete and their environment (Stewart, Gapenne & Di Paolo, 2010). These interactions have an implicit tonality in relation with their peers, and then implicit motor learning can be useful for physical educators as was suggested by Van der Kamp et al. (2015).

Enactive approach, extended cognition and sensorimotor approach are presented today as alternative approaches to dynamic and ecological approaches. The concept of athlete as a perceptual-cognitive-motor system is giving a new way to view athletes/teams located in the sporting context. They act like a system and in constant interaction within contexts that involve the objects and the others to solve the problems. A personal and subjective process of problem solving that it is not directly accessible in the same way than we analyse their behaviours. This is the athlete/team/pupil's self-world that captures the possibilities of action and interprets their usefulness for getting their objectives. The consideration of this subjective dimension of movers, coaches and teams, will permit a better understanding of how is the particular way that they have to recognise their reality. Von Uexkül's concept of *Umwelt* permits to go into de specific relationships that athletes maintain with their sport contexts. It is necessary to remember that athletes perceive what they want to perceive. Humans and animals perceive the world from their point of view. In short, to paraphrase Merleau-Ponty (1985), the athletes/pupils/teams are not only bodies, not just a physical structure but also a lived and experiential human being, with an external and internal dimension, closely related to their environment as a complex adaptative system, them, and how useful they are. This concept of functional tonality has many similarities with the already discussed on Heidegger's equipmentality (1926) or Gibson's affordance (1986). Sounds, movements, gestures, objects, people, weather, etc., mean something, and set something that is perceived and interpreted by athletes, teams, coaches and teachers (Giblin, Farrow, Reid, Ball & Abernethy, 2015).

Ultimately, are motor learning and expertise research still useful for coaches and teachers?

References

- Araujo, D. (2013). The study of decision-making behavior in sport. *RICYDE. Revista Internacional de Ciencias del Deporte*, 31, 1-4. <http://dx.doi.org/10.5232/ricyde2013.031>
- Avilés, C.; Ruiz, L. M.; Navia, J. A.; Rioja, N., & Sanz, D. (2014). La pericia perceptivo-motriz y cognición en el deporte: del enfoque dinámico y ecológico a la enacción (Perceptual-motor and cognitive expertise in sport: From a dynamic and ecological approach to enaction). *Anales de Psicología*, 30, 2, 725-737. <http://dx.doi.org/10.6018/analeps.30.2.158611>
- Breivik, G. (2007). Skillful coping in everyday life and in sport: A critical examination of the views of Heidegger and Dreyfus. *Journal of Philosophy of Sport*, 34, 2, 116-134. <http://dx.doi.org/10.1080/00948705.2007.9714716>
- Clark, A., & Chalmers, D. (2011). *La mente extendida*. Oviedo: KRK Ediciones.
- Davis, K. (2015). Athletes and sports teams as complex adaptive system: A review of implications for learning design. *RICYDE. Revista Internacional de Ciencias del Deporte*, 39, 40-61. <http://dx.doi.org/10.5232/ricyde2015.03904>
- Froese, T., & Di Paolo, E.A. (2011). The enactive approach. Theoretical sketches from cell to society. *Pragmatics & Cognition*, 19, 1, 1-36. <http://dx.doi.org/10.1075/pc.19.1.01fro>
- Giblin, G.; Farrow, D.; Reid, M.; Ball, K., & Abernethy, B. (2015). Perceiving movement patterns: Implications for skill evaluation, correction and development. *RICYDE. Revista Internacional de Ciencias del Deporte*, 39, 5-17. <http://dx.doi.org/10.5232/ricyde2015.03901>
- Heidegger, M. (1926). *Ser y Tiempo*. Edición Digital. Disponible en: <http://www.philosophia.cl>
- Hoffman, S.J. (1990). Relevance, application, and the development of an unlikely theory. *Quest*, 42, 2, 143-160.
- Klemmer, S.; Hartmann, B., & Takayama, L. (2006). How bodies matter: Five themes for interaction design. *DIS*, June 26-28.
- Locke, L.F. (1990). Motor learning is ignored: A case of Ducks, Naughty theories, and unrequited love. *Quest*, 42, 2, 134-142.

- Magill, R.A. (1990). Motor learning is Meaningful for physical educators. *Quest*, 42, 2, 126-133.
- Merleau-Ponty, M. (1985). *Fenomenología de la Percepción*. Barcelona: Planeta-Agostini
- Moe, V. F. (2005). A Philosophical Critique of Classical Cognitivism in Sport: From information processing to bodily background knowledge. *Journal of the Philosophy of Sport*, 32, 155-183. <http://dx.doi.org/10.1080/00948705.2005.9714680>
- Noë, A. (2010). *Fuera de la cabeza: Por qué no somos el cerebro: Y otras lecciones de la biología de la consciencia* (Out of our heads: why you are not your brain, and other lessons from the Biology of Consciousness). Barcelona: Kairós.
- Ortega, y Gasset, J. (1950). *Obras Completas*. 2ª ed.. Madrid: Revista de Occidente.
- Passos, P., & Davids, K. (2015). Learning design to facilitate interactive behaviours in Team Sports. *RICYDE. Revista Internacional de Ciencias del Deporte*, 39, 18-32. <http://dx.doi.org/10.5232/ricyde2015.03902>
- Ruiz, L. M.; Graupera, J. L., & García, V. (2014). Inteligencia contextual percibida en el deporte. Desarrollo y validación de un cuestionario. (Self-perceived contextual intelligence in sport. Development and validation of a questionnaire). *Cultura, Ciencia y Deporte*, 9, 27 211-224. <http://dx.doi.org/10.12800/ccd.v9i27.463>
- Singer, R. N. (1990). Motor learning research: Meaningful ways for physical educators or a waste of time? *Quest*, 42, 2, 114-125.
- Stewart, J.; Gapenne, O., & Di Paolo, E. (2010). *Enaction: Towards a new paradigm for cognitive science*. Cambridge, MA: The MIT Press. <http://dx.doi.org/10.7551/mitpress/9780262014601.001.0001>
- Van der Kamp, J.; Duivenvoorden, J.; Kok, M., & Hilvoorde, I. van (2015). Motor Skill Learning in Groups: Some Proposals for Applying Implicit Learning and Self-Controlled Feedback. *RICYDE. Revista Internacional de Ciencias del Deporte*, 39, 33-47. <http://dx.doi.org/10.5232/ricyde2015.03903>
- Varela, F.; Thompson, E., & Rosch, E. (2005). *De cuerpo presente: Las ciencias cognitivas y la experiencia humana*. Barcelona: Gedisa.
- Von Uexkül. J. (1951). *Ideas para una concepción biológica del mundo*. 2ª ed. Buenos Aires: Espasa-Calpe
- Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review*, 9, 625-636. <http://dx.doi.org/10.3758/BF03196322>

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