

IN FOCUS: THE GESTALT OF HUMAN VOLUNTARY MOVEMENT

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In the following two articles, RIGHI, GALMONTE and AGOSTINI respective BÖGER investigate the organization of human voluntary movements under a not so usual, namely a Gestalt perspective. This means, they put forward and provide evidence for the hypothesis that human movements are planned and controlled as perceptual-conceptual Gestalts.

RIGHI, GALMONTE and AGOSTINI address a complex and sophisticated sports movement, namely hammer throwing and develop a Gestalt approach to such movements. They started with the idea that the rhythmic sound made in the air by the swirling hammer might inform the athlete on the quality of his or her accelerating spins that precede the final throw. The authors recorded that sound with a microphone attached to the hammer and re-played it at another day to the athletes. They found that the athletes threw the hammer the farthest after having listened to the hammer sound preceding their best throws in the recording session. They concluded, first of all, that the hammer sound actually contains relevant information on performance quality and, second, that athletes can strategically use that information to guide and organize their movements. They go on to propose that the Gestalt of the rhythmic sound can be strategically understood as the core of the representation of the movement. Organizing the movement thus implies the key task of organizing the best Gestalt of that sound.

BÖGER addresses the so-called negative asynchrony in periodic metronome-paced finger tapping. Negative asynchrony means that humans tend to perform the tap at about 40 ms prior to the beat without being aware of that systematic error. This intriguing phenomenon has been investigated extensively in the last two decades and has proven exceedingly robust under many experimental conditions. Only in the course of numerous training sessions with continuous feedback on tapping accuracy is it possible to reduce the error. Numerous hypotheses have been proposed to explain this phenomenon. BÖGER now shows that, surprisingly, the error virtually disappears if the experimental subjects are simply instructed to feel one with the movement. This astonishing result provides clear evidence that presence and absence of the negative asynchrony error is dependent on the mental conceptualization of the movement. BÖGER proposes that mental conceptualization might influence and even determine voluntary movement performance and its details to a much higher degree than usually assumed.

Both papers add interesting results and ideas to a rapidly emerging - not generally novel, but newly recognized - approach to understanding human voluntary movement. Traditionally, the muscular and executional part of human movement as well as biomechanics have been the focus of movement and sports science, under the assumption that human movement planning and control mainly means properly organizing the executional apparatus. This new line of research puts forward the hypothesis that human voluntary movements are organized as the perception to move, which means that they are organized in terms of perceptual effects (MECHSNER 2003, 2004; SCHACK & TENENBAUM 2004a, b). Though never widely appreciated, such an

approach to human movement is not at all new. It was, to name a few proponents, already pursued by JAMES (1890), BERNSTEIN (1967) and METZGER (1972). The perceptual-cognitive approach implies, among other things, that difficulty and, in consequence, performance quality, of a movement is crucially dependent on the mental representation of that movement. If so, it is of strong interest to explore what characteristics of the mental movement representation are relevant and how they influence performance. The work of BÖGER as well as of RIGHI, GALMONTE and AGOSTINI give interesting hints in that direction and pave the way for a promising line of research. As their work shows, exploring the role of mental representations for movement performance is not only of theoretical interest but also of practical relevance for sports.

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