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Group Differences and Similarities in Mental Representation Structure of Tennis Serve

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A large number of studies have examined expertise and gender-related differences in the mental representation of motor skills in different sports, like throwing technique in judo, front loop in sailing, and integration of routines in the mental movement representation in volleyball. Also, tactical behavioral studies were conducted in futsal and football. In addition, studies were also carried out to support the motor learning process through mental training in golf. The Structural Dimensional Analysis-Motoric (SDA-M) method was also used in the medical sector for the rehabilitation of stroke patients. So far, few studies have investigated differences in the mental representation of a specific motor skill by experienced athletes of other related sports. The goal of the present study is to examine group differences and similarities in the mental representation of the tennis serve between experienced tennis, badminton, and handball athletes as well as a control group without any sport experience. We want to assess the quality of mental representation of technical-related overhead motion task expertise. For this purpose, we used the SDA-M to measure the mental representation of the tennis serve of four different groups (tennis, badminton, and handball athletes and a group of novices). As expected, badminton and handball athletes showed functionally well-structured representations, which were similar to the structure of the group of tennis athletes. Novices showed an unstructured mental representation. These outcomes confirm the relationship between mental representation and performance in the development of overhead motion. Furthermore, the results emphasize the importance of mental representations as an essential developmental aspect in learning motor skills, especially in learning technical-related motor skills.

Keywords: mental representation, proximal-to-distal-sequence, overhead motion, tennis serve, motor learning

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INTRODUCTION

According to Grosser and Neumaier (1982, p. 8), athletic performances are based on different factors, like tactical skills (sensory-cognitive abilities), conditional abilities, psychological capacity (mental representation), external conditions (environment), and technical skills (coordinative skills). In all kinds of sports, technical skills are highly relevant to solve movement problems.