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Technical proficiency among table tennis players with and without intellectual disabilities

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ABSTRACT

A relatively small body of research addresses the effect of intellectual impairment on proficiency in sport. The aim in the present study was to determine whether the technical proficiency of table tennis players (TTP) with and without intellectual disability (ID), matched for years of training experience, are different. The sample consisted of 71 elite TTP with ID (41 males, age = 27 ± 8 years, IQ = 61 ± 9 ; and 30 females, age = 28 ± 8 years, IQ = 57 ± 10 ; $M \pm SD$) and a comparison group of 17 players (12 males; age = 24 ± 12 years; and 5 females, age = 20 ± 9 years) without ID. All were assessed using a test-battery that included 10 sets of five basic and five advanced technical skills. Statistical analysis (ANOVA) revealed no gender differences in proficiency. The total score on technical proficiency for ID players ($63.7\% \pm 12.5$) ranged between 53% (advanced strokes) and 76% (basic strokes). Table tennis players without ID scored significantly better: $87.6\% \pm 6.2$ (range: 80–94%). The significance of these differences in technical proficiency held even when delimiting the comparison to the top 8 players (age = 25.9 ± 7.0 , IQ = 61.8 ± 9.8) with ID and counter-parts without ID who competed at regional levels in their country. The top eight players scored $73.1\% \pm 7.4$ (range: 65–81.6%). These results suggest that impaired cognitive functioning may have a direct bearing on technical proficiency in sport.

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1. Introduction

Elite sporting events attract considerable attention in today's world, with high performance athletes increasingly recognized as cultural icons and role models (Starkes & Ericsson, 2003). The Paralympic Games, the second largest multi-sport event on earth (Brittain, 2010) is no exception with escalating media attention over the past 20 years. Partly as an artifact of this attention, the Games have become an important mechanism for advancing awareness of the strengths and talents of athletes with disability and, in turn, enhancing positive attitudes towards people with disability and diversity in general (Brittain, 2008).

The International Paralympic Committee (IPC) recently endorsed a new classification system to be adopted and customized for application in all sports throughout the movement (Tweedy & Vanlandewijck, 2009)¹. The key tenet of this system is to ensure equity by minimizing the role that impairment plays in determining the outcome of competition (e.g., domination by athletes with the less significant impairments). Paralympic athletes must have a verifiable impairment (establishes eligibility), which affects sport specific proficiency. Sport proficiency is about aptitude and innate ability in relation to the demands of the sport and to the fullest extent possible should not be influenced by level of training or technological innovations.

Developing such a system for athletes with ID, represented by the International Federation for Sports for Para-athletes with Intellectual Disabilities (INAS) has been the focus of a six-year long joint INAS-IPC, multi-disciplinary, international classification research project. The present paper includes the latest developments from one component of this work that examined the interconnection between cognitive functioning and technical proficiency of table tennis players (TTP) with intellectual disability in an effort to better understand this relationship.

For in-depth study of this relationship, both concepts – sport proficiency and intellectual functioning – were broken down into measurable sub-components. To account for the breakdown of sport proficiency, the theoretical model of Williams and Reilly (2000) was used. This model attributes sport proficiency to four core determinants: tactical skill, technical skill, physical/physiological factors, and psychological factors. In applying this model a process of logical deduction based on extensive knowledge of ID, a hierarchy of the determinants of proficiency most likely to be affected by the underlying impairment suggests tactical skills and psychological factors being the most susceptible, with technical skill and physical/physiological factors being the least. Other factors also may indirectly influence sport proficiency among athletes with ID. In a recent study by Vuijk, Hartman, Scherder, and Visscher (2010), an association was found between the degree of ID and motor skill development. Access to top quality coaches, training programs and facilities, and motivational issues (also an inherent aspect of ID) are other factors that could have substantive bearing on sport proficiency. In the IPC Classification Code, however, indirect influences on sport proficiency are acknowledged as important, but secondary to the central aim of classification – which account for the impact of the underlying impairment on proficiency within a specific sport or discipline (e.g., event).

Cognitive functioning is imperative to learning, controlling and performing motor and sport skills (Thomas, Gallagher, & Thomas, 2001). In studying cognitive functioning and cognitive-related limitations in adults with ID, Switzky and Greenspan (2003) identified functional and performance limitations as inherent to intellectual impairment and directly associated with difficulties in learning and adapting to environmental demands. As a consequence, having ID reduces the capacity to learn tactical concepts in sport and limits the ability to take the correct tactical decisions in a rapidly and constantly changing sport context.

Based on this and other studies (Hemayattalab & Movahedi, 2010; Van Biesen et al., 2010), as well as experience with ID athletes, it was hypothesized that the most direct and influential effects of intellectual impairment in sport proficiency were likely found in the tactical domain, with relatively fewer implications for the other core determinants. To fully assess sport proficiency, however, requires a clear understanding of technical skills, as limited capacity in this area may be interpreted as tactical

¹ Paralympic classification uses terminology from the International Classification of Functioning, Disability and Health (ICF) (Tweedy & Vanlandewijck, 2009). To be consistent, the remainder of this manuscript uses terms as defined by the ICF. "Intellectual impairment" is systematically used to refer to the impairment, whereas the term "Intellectual Disability" (ID) is used to refer to the group of athletes under investigation.

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