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*A comprehensive analysis of the factors affecting the development of expertise in Para sport athletes*

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Recent studies suggest the nature of impairment plays a role in how athletes advance through their sporting careers (Dehghansai & Baker, 2019; Dehghansai, Lemez, Wattie, & Baker, 2017; Dehghansai, Spedale, Wilson, & Baker, 2020). For example, data from Canadian wheelchair basketball athletes suggest athletes with congenital impairments reach early sporting milestones at a significantly younger age, however; key performance milestones (i.e., debuts at national and international senior level) are attained at a similar age for both groups (Dehghansai et al., 2017). In a subsequent study, both groups were compared to Canadian able-bodied basketball players (Dehghansai et al., 2020), with results indicating early career similarities for athletes with congenital impairment to those of able-bodied athletes. These differences were diminished between the three groups in late-career performance milestones. Until now, the majority of observations have been dichotomous, looking at these groups as congenital versus acquired. However, early research suggested a high variability among the acquired group, posing challenges to generalization within this cohort. In our most recent studies, we have investigated further by grouping athletes based on the onset age of the injury: congenital, pre-adolescent (1 month-11.9 years old), adolescent (12-17.9 years old), early adulthood (18-24.9) and adulthood (25+ years old). Results based on these groupings suggest a lower variability within groups, but also highlighted differences between groups. More specifically, athletes with early-onset impairments resembled a trajectory similar to those with a congenital impairment while athletes in the early adulthood and adulthood group had a similar sporting trajectory (Dehghansai & Baker, 2019).

In the current study we extended these findings with other Paralympic sports. One hundred sixty-nine (53 Canadian and 116 Australian; 115 male and 54 female) athletes with an average age of 33.27 (SD=12.73) filled out the Developmental History of Athletes' Questionnaire. One hundred two athletes reported acquiring their impairments while 64 athletes had a congenital impairment. The most common type of impairment reported was spinal cord injury (n=53), amputation (n=38), and acquired brain injury (n=25). The average age of injury onset was 19.80 (SD=10.55) years old and the injuries were mostly acquired through wide range of accidents (n=75), including sporting, motor-vehicle or falls, while cancer, disease and infection was the second most common cause of impairment (n=21). Athletes from 23 different sports filled out the questionnaire with the most common sports being wheelchair rugby (n=30), table-tennis (n=26), athletics (n=21) and cycling (n=20).

The results suggest similar trends to those from earlier work. More specifically, athletes with a congenital impairment had a similar sporting trajectory to those who acquired their impairment pre-adolescent, and athletes in the late-onset groups (early adulthood and adulthood) had a similar milestone trajectory to one another and reached these milestones at a significantly older age than athletes with a congenital impairment. Athletes who acquired their impairment during adolescence shared similarities with both sides: some trends similar to the early-onset group and others more similar to the late-onset group. Interestingly, groups differed in their training profiles. For instance, investment in different training types and conditions across their careers varied between groups. However, there were no significant differences between groups regarding their experiences in other sports (i.e., number and type of sports, sports settings and conditions, and years played). The results from this study suggest athletes negotiate their sporting careers differently, thus their needs for resources and support will vary. Policymakers and stakeholders should consider these differences to ensure suitable environments are created to support athletes' development and performance.