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Using retrospective analysis of race results to determine success in elite cycling

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Abstract

Background: Achieving success in elite athletic performance is a major research focus for sports scientists. It is now generally accepted that athletes have to undertake many years of training to reach the top levels of endurance sports. However, debate is evident within the literature as to whether athletes have to participate in elite junior competitions to achieve top results as an adult (senior) (Schumacher & Muller, 2001: Journal of Sports Medicine and Physical Fitness, 41, 139-46; Schumacher et al., 2006: Journal of Sports Sciences, 24, 1149-56). Moreover, there has been historical debate as to whether "success breeds success" in sporting competitions (*cf* Bar-Eli et al., 2006, Psychology of Sport and Exercise, 7, 525-53); i.e. if athletes win once, are they then more likely to realize further success during their careers?

Purpose: The aim of this study was to examine the career progression and success of elite cyclists who participated in major junior and senior cycling races by conducting a retrospective analysis of competition results.

Methods: Official results of major junior and senior elite cycling races from 1980 to 2014 were extracted from an online database using a web-spider with permission from the data owner. Altogether, 67,503 results of 5,561 athletes from 75 countries were collected. In addition, we analysed age-related aspects of a sub-set of cyclist's careers by comparing results from three International junior races: U23 and Junior Road Race World Championships, Course de la Paix Juniors, and Paris Roubaix Juniors (2009–2014). Junior race data consisted of 1,024 results of 755 riders from 34 countries. Date of birth, used confirm junior status, was not available for 102 of these riders, reducing the analysed data set to 912 results of 653 riders from 32 countries.

Results: 48 riders appeared in both junior and senior datasets, thus 7.3% (48/653) junior riders progressed to senior elite level. 4.5% of the athletes on the entire database recorded a race win in the first 50 races (254/5561) after appearing on the database for the first time, with 13.1% (727/5561) achieving a top 5 and 19.9% (1106/5561) achieving a top 10 within the same time period. Interestingly, 54% (136/254) of the riders who achieved a win in their careers went on to win at least one more race during their professional careers, with 13.4% (34/254 of those riders going on to win more than 5 races.

Conclusions: The results of this study suggest that less than 10% of participants in elite cycling races progress from being junior to senior athletes. The junior race result database is currently limited to four races and requires expansion before stronger conclusions can be drawn. Our analysis may indicate that if riders are successful early within their career, they are likely to achieve further race wins prior to retirement. The results of this study might highlight the importance of junior athletic development for success in elite senior cycling. However, further analysis of the database is warranted before more definitive conclusions can be drawn.

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