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Letter to editor

The Precocity-Longevity Hypothesis Re-Examined: Does Career Start Age in Canadian National Hockey League Players Influence Length of Lifespan?

Dear Editor-in-chief

Available data on elite athletes suggests they have longer lifespans than the general population (Teramoto and Bungum, 2010); however, this relationship is likely more nuanced than previously considered. For example, the precocity-longevity hypothesis proposed by McCann (2001) asserts that factors related to early career achievement (e.g., debut age) may cultivate early death. Two mechanisms, stress and personality type (e.g., McCann, 2001), have been the predominant explanations because of their purported association with disease states. To date, only Abel and Kruger (2007) have examined this hypothesis in sport, concluding that every year a Major League Baseball player debuted before the mean age of 23.6 years was associated with a decreased lifespan of 0.24 years. Little is known about the extent of this phenomenon among different athlete populations.

This study explored the precocity-longevity hypothesis among Canadian-born National Hockey League (NHL) players. Based on the link between high career achievement and early mortality identified in previous research, we hypothesized that precocious NHL players would have shorter lifespans than those debuting at later ages. There have been 4,583 Canadian-born NHL players who debuted between 1917 and 2010 (Quant Hockey, 2014); however, we only analyzed those who debuted between 1917 and 1986 (n = 2, 971) to limit the influence of players who were still living (i.e., censored cases). Additionally, we restricted our sample to Canadian players to limit the influence of different developmental systems and socio-cultural factors that might affect longevity. Data were collected through the official website of the hockey hall of fame (www.hhof.com), and a random sample (~10%) was cross-referenced within *Total Hockey* (Diamond et al., 1998) and www.hockey-reference.com which confirmed complete agreement.

Kaplan-Meier and Cox regression survival analyses were used. Hazard ratios (HR) considered whether the predictor variable (debut age in the NHL) significantly influenced the event (age at death), while controlling for the potential confounders of position (i.e., Center, Wing, Defense, or Goalie) and years played. To limit the effect of statistical artifacts (see McCann, 2001), we excluded players who died within five years of debut and players whose date of death was unknown (~40 cases). All data were evaluated at the $p \leq .05$ level of significance (95% confidence interval; CI), using SPSS 21 (IBM Corp., 2012).

Overall, 910 out of 2,971 Canadian-born NHL players were deceased as of 1986 (30.62%). The mean age of entry into the NHL by decade were as follows: 25.18 (1917-1926), 22.59 (1927-1936), 22.22 (1937-1946), 21.09 (1947-1956), 21.74 (1957-1966), 22.06 (1967-1976), and 20.84 years (1977-1986). Descriptively, 537 players who debuted *above* the median age, respective to their decade of play, were deceased (median life expectancy estimate: 81 years), compared to 373 players who debuted below the median age of entry (82 years). Kaplan-Meier analysis found no significant difference in survival distribution [x^2 (1) = 2.35, p = 0.12; see Figure 1]. In cox regression models adjusted for player position and years played, no significant relationship between precocity and longevity was found (HR: 0.91, 95% CI: 0.79 – 1.05).

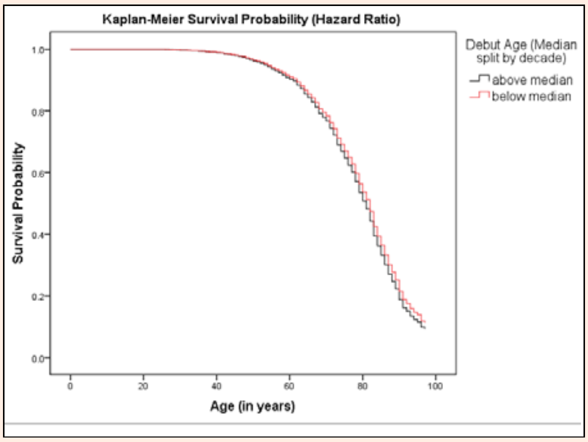

Figure 1. Survival probability of Canadian NHL players.

Our results do not support the precocity-longevity relationship in Canadian-born NHL players, raising the question of its generalizability to sport populations. In addition, our descriptive finding that early high achievers had a lifespan longevity *advantage*, contradicts even the trend of previous precocity-longevity findings. This discrepancy may reflect methodological differences; in particular, our sample contained both deceased and still-living athletes, while the samples of previous studies have only included deceased high achievers. A sample that excludes non-deceased high achievers may result in a greater age differential that artificially supports the precocity-longevity relationship.

Our results may also reflect some of the complications that arise from the heterogeneity and unique demands of sport. For example, ice-hockey is likely more physically demanding than previously studied professions. In addition, sport typically has a narrower entry age range compared to other domains of eminence (e.g., McCann, 2001). As most skills needed for peak athletic performance are age-specific, finding a significant difference in players whose entry ages into professional sport

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are relatively narrow would indicate impressive support for the hypothesis (Abel and Kruger, 2007). Lifespans have tremendous variation and are influenced by many underlying etiological factors (e.g., genetics); therefore, it may be challenging to find widespread support for this phenomenon considering the age restrictions imposed by different domains of eminence.

To more fully understand this phenomena, moderators such as sport-specific energy system demands (i.e., aerobic, anaerobic, mixed) may need to be considered. In addition, an important limitation of this study is that cause-of-death data was not considered. Since age-of-entry is relatively narrow in range, future research in sport may also benefit from examining precocity with respect to different accomplishments, such as age at first all-star selection. To date, analyses of the relationship between early high achievement and premature death are sparse, and largely limited to studies of a theoretical and descriptive nature. Given the limitations inherent to previous methodologies and the complexity of athlete populations, the precocity-longevity hypothesis should be interpreted cautiously.

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References

Abel, E.L. and Kruger, M.L. (2007) Precocity predicts shorter life for major league baseball players: Confirmation of McCann's precocity-longevity hypothesis. *Death Studies* **31,** 933-940.

Diamond, D., Duplacey, J., Dinger, R. and Kuperman, I. (1998) *Total hockey: The official encyclopedia of the National Hockey League*. 1st edition. Total Sports Publishing, Canadian Manda Group.

IBM Corp. (2012) *IBM SPSS Statistics for Windows, Version 21.0.* Armonk, NY: IBM Corp.

McCann, S.J.H. (2001) The precocity-longevity hypothesis: Earlier peaks in career achievement predict shorter lives. *Personality and Social Psychology Bulletin* **27,** 1429-1439.

Quant Hockey. (2014) *NHL totals by nationality - career stats.* Available from URL: http://www.quanthockey.com/nhl/nationality-totals/nhl-players-career-stats.html

Teramoto, M. and Bungum, T.J. (2010) Mortality and longevity of elite athletes. *Journal of Science and Medicine in Sport* **13,** 410-416.

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