Exploring the Role of Junior Success in Predicting Senior Success
- A case study in Elite Table Tennis

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Some studies have demonstrated a minor relationship between athletes’ junior success and senior success in different sports.
15% junior top20 ranked players reached senior top 20 professional ranking. (Brouwers et al., 2012)

33% juniors medalists participated in senior major events (Barreiros, 2014)

24% juniors players turn to squad member (Gullinch, 2006)
Literature Gaps

- The relationship between junior and senior success varies from sport to sport. Table tennis is not yet examined.

- These studies mainly focused on successes that athletes achieved at junior competitions. Successes that athletes achieved at international senior competitions but at a junior age is ignored.
Aim

“Junior success → Senior success?”

- To explore the role that junior successes (age <19) at different competitive levels in predicting eventual senior international success.

- To inform a better coach education, specifically in assessing, predicting and monitoring player development.
Research questions

1. How many successful junior players continued to win international senior medals?

2. To what extent can we predict winning senior medals based on competition results at a junior age?
Methods

To what extent they continue to win medals at international competitions at a senior age?

Junior competitions (n=205)
Junior medallists

Senior competitions at junior age (n=197)
Early performers

Early performers
Junior age (U19)
Long-term senior success
International senior competitions
Junior Medallists
Early Performers
Data set

Junior competitions

• Junior Olympic Games
• Junior World championship
• Junior Continental Championships i.e., African, Asian, European, Oceania, Pan American

Timespan: 1990 to 2016

Major senior competitions

• Olympic Games
• Senior World championships
• Senior Continental Championships
Method (statistics): descriptive & discriminant analysis

- Research questions 1, **Descriptive analysis:**
  - To calculate the number of athletes that won medals at a junior age (<19) continued winning medals at a senior age.

- Research question 2, **Discriminant analysis:**
  - To predict whether athletes can win senior medals based on competition results at a junior age.
Table 1. The overview of the independent variables and grouping variables used in DA

<table>
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<tr>
<th>Participant</th>
<th>TG</th>
<th>TS</th>
<th>TB</th>
<th>M. Code</th>
<th>Total M</th>
<th>M/No M</th>
<th>S. M/NoM</th>
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<td>0</td>
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<td>3</td>
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<td>1</td>
<td>0</td>
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<td>Participant 6</td>
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<td>3</td>
<td>1</td>
<td>3</td>
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<td>1</td>
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<tr>
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<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
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</table>
Results: Descriptive Analysis

Figure 2. (a) The transition map from junior competition to competitions at adult age.

Junior competition
205 (♂ 106, ♀ 99)

Early medals?
Yes 51 (24.9%)
♂ 28 (26.4%)
♀ 23 (23.2%)

No 154 (75.1%)
♂ 78 (74.6%)
♀ 76 (76.8%)

Senior medals?
Yes 12 (23.5%)
♂ 6 (21.4%)
♀ 6 (26.1%)

No 39 (76.5%)
♂ 22 (78.6%)
♀ 17 (73.9%)

Yes 18 (11.8%)
♂ 11 (14.1%)
♀ 7 (9.2%)

No 136 (88.2%)
♂ 67 (75.9%)
♀ 69 (90.8%)
Results: Descriptive Analysis

Senior medals?

Yes 32 (16.7%)
♂ 11 (14.1%)
♀ 21 (18.4%)

No 6 (18.8%)
♂ 2 (18.2%)
♀ 4 (19.0%)

Early medals?

Yes 26 (81.2%)
♂ 9 (81.8%)
♀ 17 (81.0%)

No 21 (13.1%)
♂ 14 (20.9%)
♀ 7 (7.5%)

Senior competition at junior age
192 (♂ 78, ♀ 114)

No 160 (83.3%)
♂ 67 (85.9%)
♀ 93 (84.2%)

Yes 21 (13.1%)
♂ 14 (20.9%)
♀ 7 (7.5%)

No 139 (86.9%)
♂ 53 (79.1%)
♀ 86 (92.5%)

Figure 2. (b) The transition map from junior senior competition at junior age to competitions at adult age
Table 1. The % of successful junior players that maintained their success to senior competition by age category

<table>
<thead>
<tr>
<th>Age</th>
<th>Junior medallists (n)</th>
<th>Senior medallists (n)</th>
<th>Success rate</th>
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</thead>
<tbody>
<tr>
<td>U16</td>
<td>23</td>
<td>9</td>
<td>39.1%</td>
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<tr>
<td>U18</td>
<td>29</td>
<td>12</td>
<td>41.4%</td>
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<tr>
<td>U19</td>
<td>31</td>
<td>27</td>
<td>54.8%</td>
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</table>
Table 2. The classification of players in predicting winning senior medals of two groups

<table>
<thead>
<tr>
<th>Player Classification</th>
<th>Predicted to win medals at a senior age (%)</th>
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<tbody>
<tr>
<td>Junior medallists</td>
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<tr>
<td>No medals</td>
<td>17.7</td>
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<tr>
<td>Won medals</td>
<td>36.7</td>
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<tr>
<td>Early performers</td>
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</tr>
<tr>
<td>No medals</td>
<td>4.1</td>
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<tr>
<td>Won medals</td>
<td>55.3</td>
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</table>
Conclusions

• The results of this study suggest that success achieved by junior players at international senior competitions plays a significant role in predicting winning medals at a senior age. Specifically, 37% medallists in junior competitions and 55% of the early achievers in senior competitions could be predicted to win international medals at an adults age.

• With regard to this study’s methodology, the utilization of discriminant analysis appeared to be an efficient way (i.e., classification of group membership) to discriminate medallists from non-medallists in international competitions.
Limitations and future studies

Quantitative studies:
• It mainly provides basic facts, it has limited implication in giving the explanation for the causality.

Qualitative studies: answering “why” question
• High performance managers’ perspectives on how to maintain junior successes to senior level.
Thank you for your attention ☺️ ☺️ ☺️ ☺️ ☺️ ☺️ ☺️

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