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## INTRODUCTION

Each year, more than 64 000 people sustain a mild traumatic brain injury (mTBI) in Quebec. Currently, physicians **do not have any objective assessment tools to diagnose mTBI**.

The Neurotracker, initially developed for perceptual-cognitive training (PCT) to enhance sport performance is considered as a **potential tool to identify mTBI**. The PCT seems interesting in this context since it solicits the **cognitive functions needed** in sports and **which may be impaired following a mTBI**.

Studies suggest that athletes' Neurotracker **performances decreased** post-mTBI and it could be used as diagnostic tool to establish preseason baseline values (pre-mTBI). However, **biological sex, history of mTBI** and **type of sports played** are factors that could influence Neurotracker performance at baseline.

## OBJECTIVE

Determine factors that could influence athletes' Neurotracker performance on preseason baseline performance.

- Based on biological sex
- Based on history of mTBI
- Based type of sports played

## METHODS

Université du Québec à Trois-Rivières varsity athletes

- Preseason baseline assessments on the Neurotracker between 2019 and 2022.
- Performance measured in speed threshold.
- Performances compared according to biological sex, history of mTBI (including number of mTBI) and type of sports played.



Table 1; Participants' demographic information

Sports	Female athletes (n=81)	Male athletes (n=87)	Age (Years)	History of mTBI (n=91)
Women's Volleyball	14	0	22,6 ± 3	6
Cheerleading	28	8	23,1 ± 2,4	17
Women's Soccer	39	0	21,7 ± 2,3	21
Men's Soccer	0	36	23,2 ± 2,3	19
Men's Hockey	0	43	23,3 ± 1,8	28

Figure 1; Neurotracker performance based on biological sex

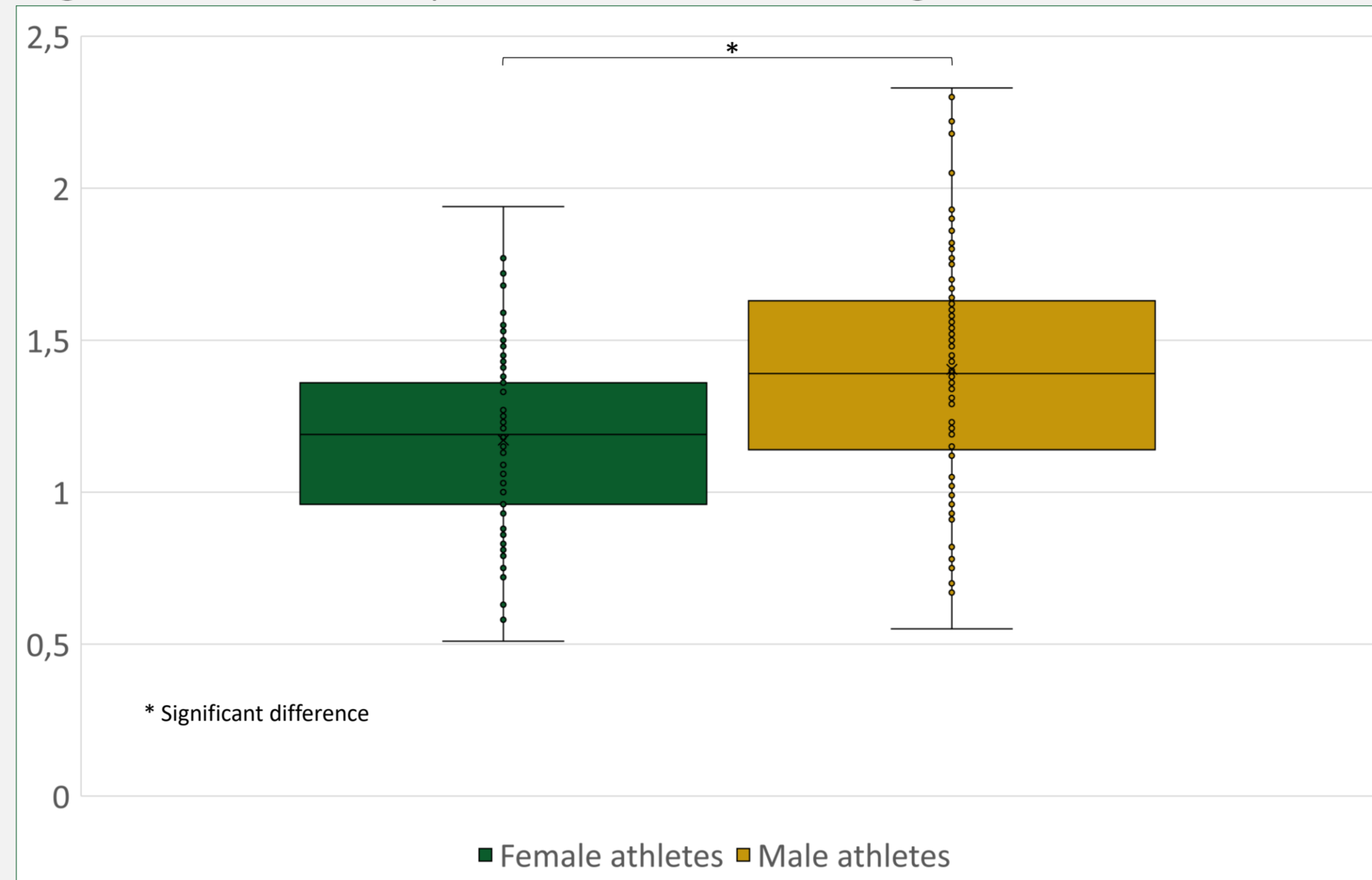


Figure 2; Neurotracker performance based on history of mTBI

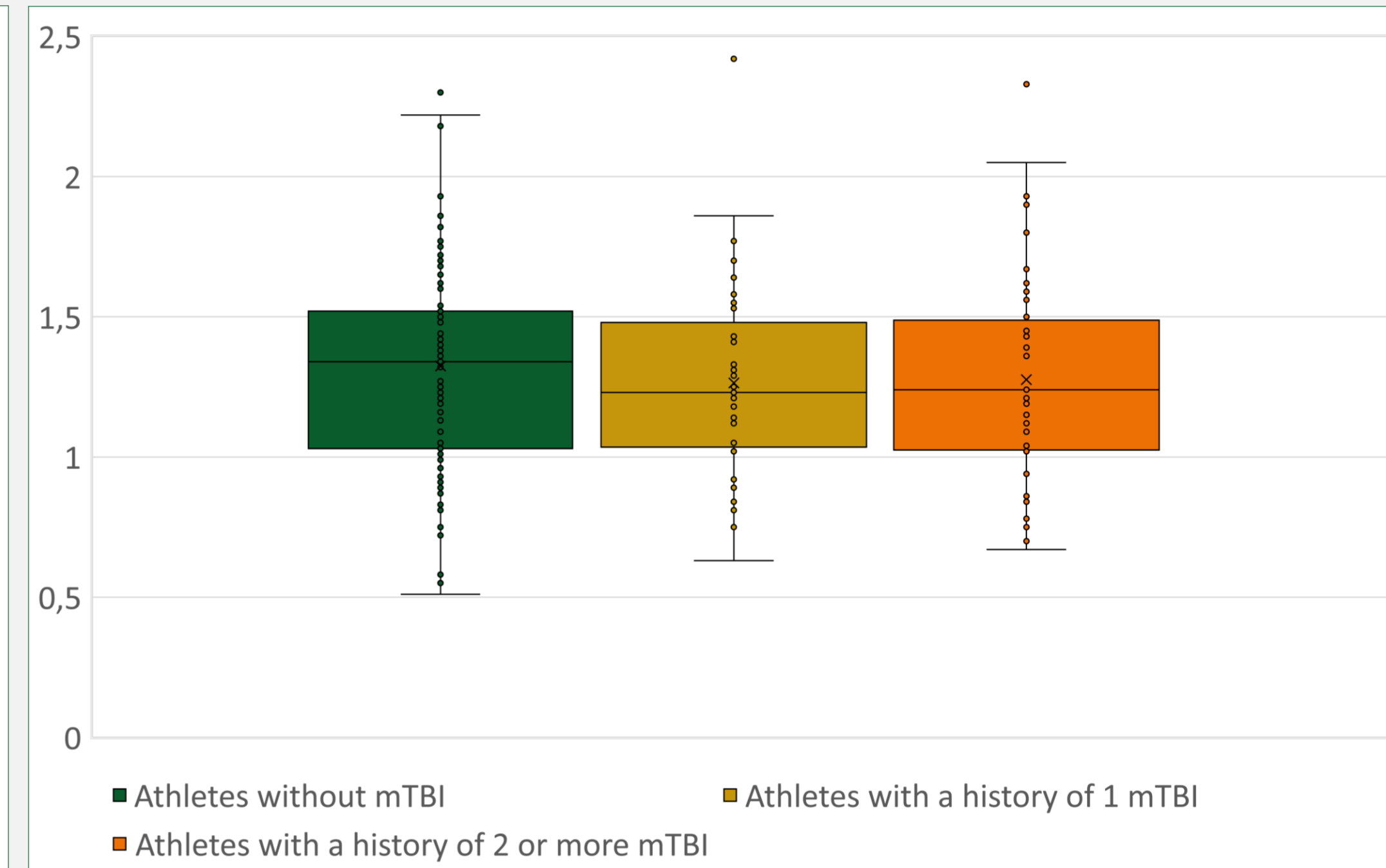
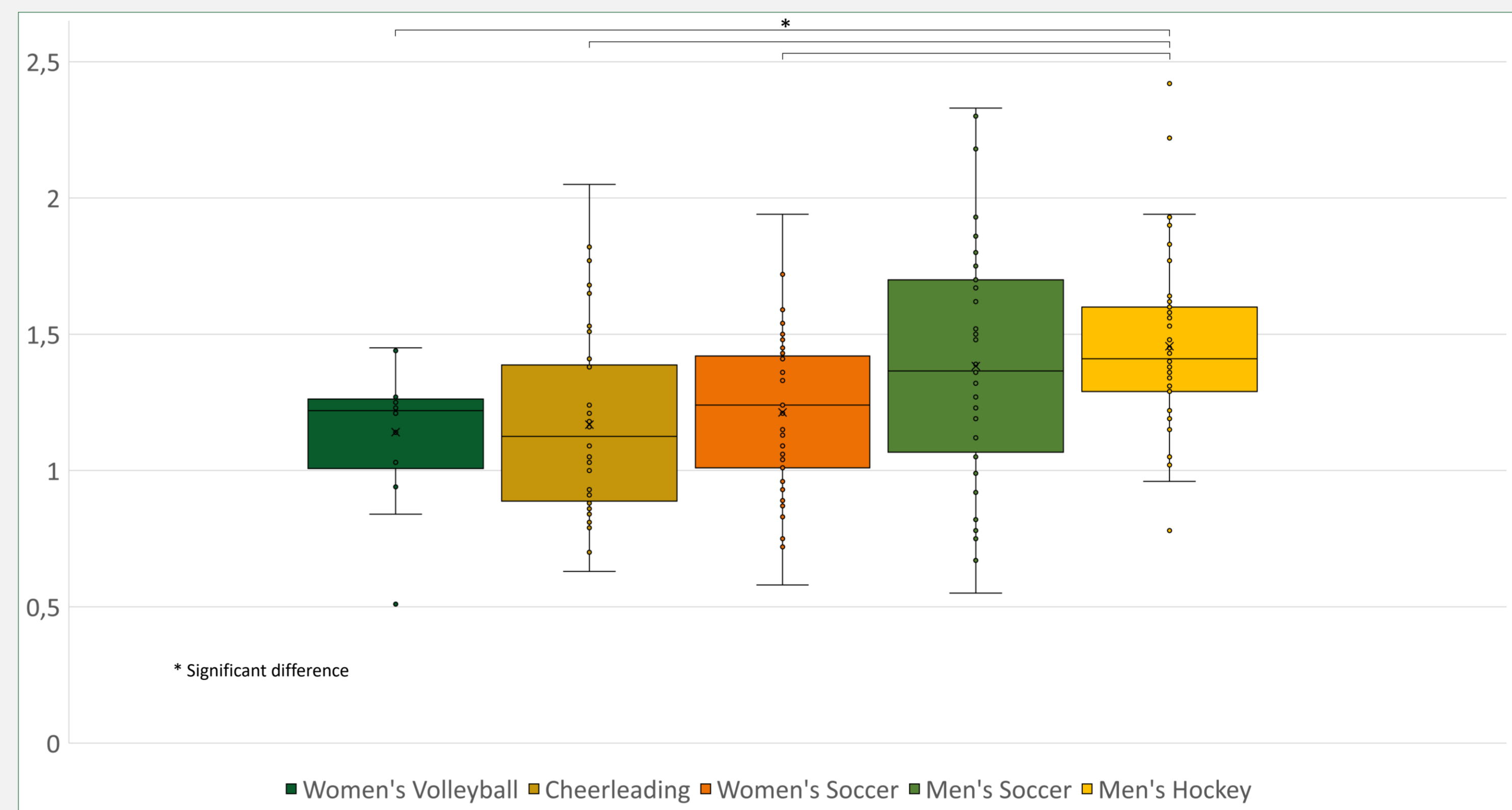


Figure 3; Neurotracker performance based on type of sports played



## RESULTS + DISCUSSION

168 participants  
Age: 22,7 ± 2,3  
48,21% are women  
53,53 % of participants have a history of mTBI

### Neurotracker performance Men / Women

Male athletes achieve a mean speed threshold of 1,40 at the Neurotracker test and Female athletes' mean Neurotracker performance is 1,17. This is a significant difference.

### Neurotracker performance based on history of mTBI

There is no significant difference in Neurotracker performance.

### Neurotracker performance based on type of sports played

Sports	Average speed threshold
Cheerleading	1,17
Men's Hockey	1,46
Women's Soccer	1,21
Men's Soccer	1,38
Women's Volleyball	1,14

\* Significant difference

## CONCLUSIONS

The results of the study indicate that **the type of sports played influences the Neurotracker performance**. Hockey seems to develop further perceptual-cognitive capacities.

In regards to history of mTBI, **the number of mTBI does not seem to influence** Neurotracker performance.

The study shows that **male athletes' performance were significantly better than female athletes' performance**. This may be the first study to find a significant difference between men and women Neurotracker performance.

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