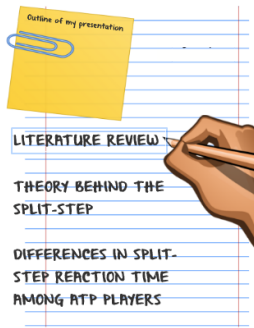




1



2

High-level tennis = very high time and space constraints



O'Donoghue and Liddle, 1998

3

What do we know so far?

High-level tennis players performing a simulated split-step had **shorter reaction and movement times** than beginners, while males were quicker in movement times than females **(Cross & Pollard, 2011)**

High-level tennis players performing a split-step that benefitted from the **split-step shortening phase of reaction** used different ankle joint movement strategies and were able to start the movement faster **(Smekal et al., 2001)**

A few studies have involved an analysis of **split-step timing** **(Filipeic, 2017; Nieminen et al., 2014; Triolet et al., 2013)**

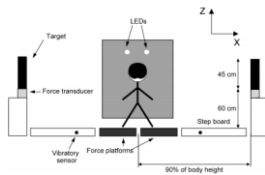
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A split-step shortens the time to perform a choice reaction step-and-reach movement in a simulated tennis task

Ryota Uzu^a, Masahiro Shinya^a & Shingo Oda^a
^a Graduate School of Human and Environmental Studies, Kyoto University, Kyoto, Japan
 Available online: 21 Oct 2009



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Table 1. Temporal and kinetic variables for the split and no-split conditions (mean ± SD).

Variable	No-split condition	Split condition	Significance	Cohen's d
Total reach time (ms)	468 ± 63	746 ± 106	***	1.27
Response time (ms)	181 ± 33	238 ± 73	*	0.33
Step time (ms)	380 ± 39	430 ± 37	***	2.83
Reach time (ms)	107 ± 88	90 ± 27	*	0.33
Peak F _z (N)	461 ± 63	404 ± 63	**	0.56
Time to peak F _z (ms)	646 ± 61	639 ± 113	***	1.68
F _{max} (N/kg)	0.14 ± 0.03	0.36 ± 0.10	***	3.16

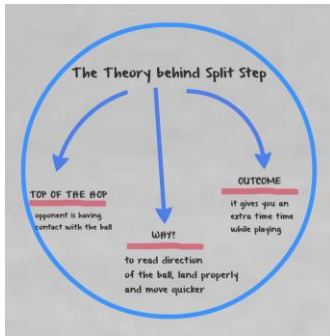
Note: Statistical significance of the difference between the two conditions: *P < 0.05; **P < 0.01; ***P < 0.001.

6

What is the Split-Step?



7



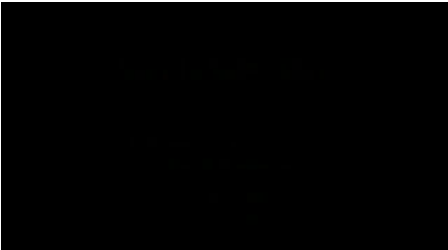
8

An example of a proper split-step



9

Split-step reaction time (Nadal vs Djokovic)



10

Split-step reaction time (World number 1 ITF Junior)



11

Split-step reaction time (Top WTA Player)



12

Garcia's Split Step & Reaction Time Analyses

1. Caroline seems to be locked into beginning her Split Step Hop with the opponent's ball contact instead of starting her Split Step earlier



2. In other words, Caroline needs to start some 5 vf earlier in her loading of her legs so that she can cut 5 vf's off her time

3. The good news is that she is very consistent with her timing (4.42 vf STDEV 1.63 vf), it just needs to occur earlier

13

A sample of professional ATP players

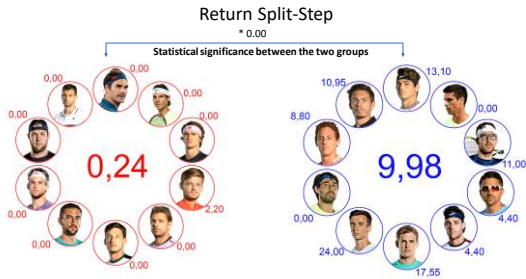


14

1. Return Split-Step



15

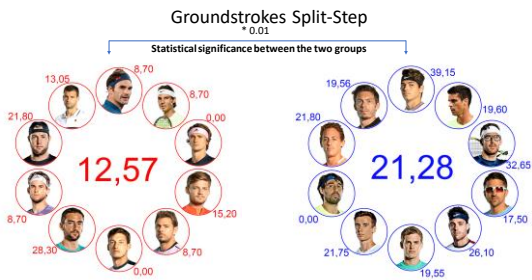


16

2. Groundstrokes Split-Step



17

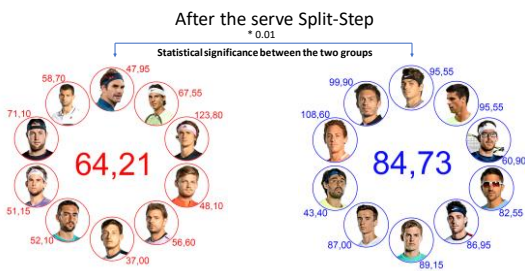


18

3. After the serve Split-Step



19



20

TAKE-HOME MESSAGES!

Split-step in connection with all other tennis-specific elements presents an **important factor in tennis game**.

Rightly executed split-step gives the player an **extra time** to perform an optimal stroke.

Our data show there are **significant differences** in split-step reaction time between higher and lower ranked professional ATP players.

Create a wide range of specific tennis situations to develop a proper reaction time, especially for your player's split step timing.

21



22
