

Physical demands of tennis across the different court surfaces, performance levels, and sexes: a systematic review with meta-analysis
Sports Medicine

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Supplementary File 5. Movement characteristics

5.1 Acceleration (ms⁻²)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Junior Men National Hard	Gallé-Ansood (2014)	1.9	0.1	36	Hard	Men	National	>2 m/s ² (14 y)	1st-3rd ranking	No	Only one study for analysis
	Gallé-Ansood (2014)	0.8	0.1	51	Hard	Men	National	>2 m/s ² (14 y)	4th-6th ranking	No	Only one study for analysis
Junior Women National Hard	Gallé-Ansood (2014)	0.9	0.2	36	Hard	Women	National	>2 m/s ² (14 y)	1st-3rd ranking	No	Only one study for analysis
	Gallé-Ansood (2014)	0.8	0.2	51	Hard	Women	National	>2 m/s ² (14 y)	4th-6th ranking	No	Only one study for analysis

5.2 Accelerations per Match (#)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Men International Hard	Whitehead and Reid (2017)	1418.9	360.9	49	Hard	Men	International	>3 m/s ² (cumulative 4 rounds)		No	Data of four matches pooled
Men National Hard	Fernández-Ellas et al. (2020)	18.2	11.1	9	Hard	Men	National	>1.5 m/s ² (24.9 y)		No	Different cut-off points
Men National Clay	Hoppe et al. (2016)	62.0	21.5	20	Clay	Men	National	>2 m/s ² (25 y)		No	Different cut-off points
Men National Clay	Hoppe et al. (2016)	42.0	32.0	20	Clay	Men	National	>4 m/s ² (25 y)		No	Different cut-off points
Junior Men National Hard	Gallo-Salazar et al. (2019)	16.9	6.3	12	Hard	Men	National	>3 m/s ² (14.5 y)	Morning	No	Different cut-off points
Junior Men National Hard	Gallo-Salazar et al. (2019)	21.3	11.5	12	Hard	Men	National	>3 m/s ² (14.5 y)	Afternoon	No	Different cut-off points
Junior Men National Clay	Hoppe et al. (2016)	59.0	33.0	20	Clay	Men	National	>4 m/s ² (13 y)		No	Different cut-off points
Junior Men National Clay	Hoppe et al. (2016)	19.0	18.0	20	Clay	Men	National	>4 m/s ² (13 y)		No	Different cut-off points
Junior Men National Clay	Hoppe et al. (2014)	51.7	19.1	10	Clay	Men	National	>2 m/s ² (13 y)		No	Different cut-off points
Women International Hard	Whitehead and Reid (2017)	649.2	131.6	61	Hard	Women	International	>3 m/s ² (cumulative 4 rounds)		No	Data of four matches pooled

5.3 Accelerations per Minute (#)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Junior Men National Hard	Gallo-Salazar et al. (2019)	0.3	0.1	12	Hard	Men	National	>3 m/s ² (14.5 y)	Morning	No	Only two studies for analysis
Junior Men National Hard	Gallo-Salazar et al. (2019)	0.2	0.1	12	Hard	Men	National	>3 m/s ² (14.5 y)	Afternoon	No	Only two studies for analysis
Junior Men National Clay	Hoppe et al. (2014)	0.6	0.2	10	Clay	Men	National	>2 m/s ² (13 y)		No	Only one study for analysis
Junior Men and Women National Hard	Gallé-Ansood et al. (2018)	0.05	NR	40	Hard	Men	National	1 - 2 m/s ² (13.8 y)		No	Males and females combined
Junior Men and Women National Hard	Gallé-Ansood et al. (2018)	0.05	0.03	40	Hard	Men	National	>2 m/s ² (13.8 y)		No	Males and females combined

5.4 Accelerations per Speed Zone (#)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Junior Men National Hard	Perreira (2016b)	230.6	111.6	4	Hard	Male	National	0 - 1.53 m/s		No	Only one study for analysis
	Perreira (2016b)	251.8	112.8	4	Hard	Male	National	1.53 - 1.94 m/s		No	Only one study for analysis
	Perreira (2016b)	88.4	35.9	4	Hard	Male	National	1.94 - 2.78 m/s		No	Only one study for analysis
	Perreira (2016b)	27.4	10.3	4	Hard	Male	National	2.78 - 4.17 m/s		No	Only one study for analysis
	Perreira (2016b)	5.8	4.7	4	Hard	Male	National	4.17 - 5.0 m/s		No	Only one study for analysis
	Perreira (2016b)	1.9	1.6	4	Hard	Male	National	>5 m/s		No	Only one study for analysis
	Perreira (2016b)	401.5	152.0	4	Clay	Male	National	0 - 1.53 m/s		No	Only one study for analysis
	Perreira (2016b)	459.8	159.6	4	Clay	Male	National	1.53 - 1.94 m/s		No	Only one study for analysis
	Perreira (2016b)	199.9	42.2	4	Clay	Male	National	1.94 - 2.78 m/s		No	Only one study for analysis
	Perreira (2016b)	60.1	15.9	4	Clay	Male	National	2.78 - 4.17 m/s		No	Only one study for analysis
Junior Men National Clay	Perreira (2016b)	10.4	7.6	4	Clay	Male	National	4.17 - 5.0 m/s		No	Only one study for analysis
	Perreira (2016b)	2.5	2.6	4	Clay	Male	National	>5 m/s		No	Only one study for analysis

5.5 Acceleration Distance per Minute (m)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Junior Men National Hard	Gallé-Ansood et al. (2017b)	41.8	5.6	49	Hard	Men	National	Juniors (14 y) 2014-2016		No	Only two studies for analysis
	Gallé-Ansood et al. (2018)	45.4	3.6	22	Hard	Men	National	Juniors (13.9 y) 2015		No	Only two studies for analysis
Junior Women National Hard	Gallé-Ansood et al. (2017b)	40.8	12.6	49	Hard	Women	National	Juniors (14 y) 2014-2016		No	Only two studies for analysis
Junior Men and Women National Hard	Gallé-Ansood et al. (2018)	44.6	2.2	18	Hard	Women	National	Juniors (13.9 y) 2015		No	Only two studies for analysis
Junior Men and Women National Hard	Gallé-Ansood et al. (2016)	42.4	5.7	28	Hard	Men and women	National	Juniors (13.9 y) 2014-2015		No	No separate data for men and women
Junior Men and Women National Hard	Gallé-Ansood et al. (2018)	45.0	3.0	40	Hard	Men and women	National	Juniors (13.9 y) 2015		No	No separate data for men and women
Junior Men and Women National Clay	Gallé-Ansood et al. (2016)	31.6	8.9	28	Clay	Men and women	National	Juniors (13.9 y) 2014-2015		No	No separate data for men and women

5.6 Decelerations per Match (#)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment (all minus)	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Men National Hard	Fernández-Ellas et al. (2020)	19.1	9.9	9	Hard	Men	National	> 1.5 m/s ² (24.9 y)		No	Different cut-off points
Men National Clay	Hoppe et al. (2016)	38.0	14.0	20	Clay	Men	National	2-4 m/s ² (25 y)		No	Different cut-off points
Men National Clay	Hoppe et al. (2016)	40.0	10.0	20	Clay	Men	National	2-4 m/s ² (25 y)		No	Different cut-off points
Junior Men National Clay	Hoppe et al. (2016)	48.0	17.0	20	Clay	Men	National	2-4 m/s ² (13 y)		No	Different cut-off points
Junior Men National Clay	Hoppe et al. (2016)	5.0	2.0	20	Clay	Men	National	>4 m/s ² (13 y)		No	Different cut-off points
Junior Men National Clay	Hoppe et al. (2014)	47.0	18.9	10	Clay	Men	National	>2 m/s ² (13 y)		No	Different cut-off points

5.7 Decelerations per Minute (#)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment (all minus)	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Junior Men National Clay	Hoppe et al. (2014)	0.6	0.2	10	Clay	Men	National	> 2 m/s ² (13 y)		No	Different cut-off points
Junior Men National Hard	Gallé-Ansood et al. (2018)	0.05	NR	40	Hard	Men	National	1 - 2 m/s ² (13.8 y)		No	Males and females combined
Junior Men National Hard	Gallé-Ansood et al. (2018)	0.04	0.02	40	Hard	Men	National	>2 m/s ² (13.8 y)		No	Males and females combined

5.8 Changes of Direction per Match (#)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Men International Hard	Giles et al. (2021)	626	NR	252	Hard	Men	International	Australian Open 2016-2018		No	SD missing, only one study for analysis
Women International Hard	Giles et al. (2021)	411	NR	261	Hard	Women	International	Australian Open 2016-2018		No	SD missing, only one study for analysis

5.9 Changes of Direction per Rally (#)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Men International Hard	Hornsey et al. (2007)	2.5	0.9	17	Hard	Men	International	Australian Tennis Circuit 2003-2004		No	Only two studies for analysis, with one SD missing
Men International Hard	Kovalchik and Reid (2017)	5.0*	NR	21	Hard	Men	International	Australian Open 2012-2017		No	SD missing
Men International Clay	Hornsey et al. (2007)	2.4	1.3	20	Clay	Men	International	Australian Tennis Circuit 2003-2004		No	Only one study for analysis
Junior Men International Hard	Kovalchik and Reid (2017)	6.0*	NR	12	Hard	Men	International	Australian Open 2012-2017 - juniors		No	Only one study for analysis
Women International Hard	Fernandez-Fernandez et al. (2007)	2.4	1.4	7	Hard	Women	International	WTA		No	Only one study for analysis, with one SD missing
Women International Hard	Kovalchik and Reid (2017)	4.5*	NR	21	Hard	Women	International	Australian Open 2012-2017		No	SD missing
Junior Women International Hard	Kovalchik and Reid (2017)	6.0*	NR	21	Hard	Women	International	Australian Open 2012-2017 - juniors		No	Only one study for analysis

Notes: *Median, NR = Not Reported

5.10 Distance Travelled per Match (m)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Sex				
Men International Hard (Best of 5)	Cui et al. (2020a)	2350	916	134.5	Hard	Men	International	Australian Open Seeded 2015-2017		Yes	
	Cui et al. (2020a)	2238	771	111.5	Hard	Men	International	Australian Open Non-Seeded 2015-2017		Yes	
	Cui et al. (2020a)	2252	844	78.5	Hard	Men	International	US Open Seeded 2015-2017		Yes	
	Cui et al. (2020a)	2222	725	52.5	Hard	Men	International	US Open Non-Seeded 2015-2017		Yes	
	Kovalchik and Reid (2017)	1990*	NR*	21	Hard	Men	International	Australian Open 2012-2017		Yes	
	Reid et al. (2020)	2110	898	98	Hard	Men	International	Australian Open 2012-2014		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Cui et al. (2017)	2292	901	NR	Hard	Men	International	AQ 2015-2017 High-experienced Higher RQ		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Cui et al. (2017)	2361	913	NR	Hard	Men	International	AQ 2015-2017 High-experienced Lower RQ		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Cui et al. (2017)	2315	785	NR	Hard	Men	International	AQ 2015-2017 Experienced Higher RQ		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Cui et al. (2017)	2191	771	NR	Hard	Men	International	AQ 2015-2017 Novice Lower RQ		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Cui et al. (2017)	2254	813	NR	Hard	Men	International	US Open 2015-2017 High-experienced Higher RQ		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Cui et al. (2017)	2240	851	NR	Hard	Men	International	US Open 2015-2017 High-experienced Lower RQ		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Cui et al. (2017)	2227	753	NR	Hard	Men	International	US Open 2015-2017 Experienced Higher RQ		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Cui et al. (2017)	2234	771	NR	Hard	Men	International	US Open 2015-2017 Novice Lower RQ		No	Subgroup analysis (Cui et al. 2020a), nr of matches missing
	Whitehead et al. (2015)	3082	1075	40	Hard	Men	International	Top ranked: Australian Open 2012-2014		No	Subgroup analysis (Reid et al. 2016)
Whitehead et al. (2017)	2498	898	40	Hard	Men	International	Lower ranked: Australian Open 2012-2014		No	Subgroup analysis (Reid et al. 2016)	
Men International Clay (Best of 5)	Whitehead and Reid (2017)	9647	2935	49	Hard	Men	International	Australian Open 2012-2014		No	Cumulative 4 rounds
	Cui et al. (2020a)	2549	862	53	Clay	Men	International	Roland Garros Seeded 2015-2017		Yes	
	Cui et al. (2020a)	2203	828	24	Clay	Men	International	Roland Garros Non-Seeded 2015-2017		Yes	
	Cui et al. (2017)	2393	894	NR	Clay	Men	International	RG 2015-2017 High-experienced Higher RQ		No	

Author (Year)	Study results	Study conditions	Meta-analysis							
Author (Year)	Mean	SD	N (Matches)	Surface	Sex	Playing Level	Comment	Included in MA	Reason for exclusion from MA	
Kilit and Arslan (2017)	3289	386	14	Clay	Men	National	Juniors (12.2 y)	Yes		
Kilit and Arslan (2018)	3201	398	13	Clay	Men	National	Juniors (12.2 y)	Yes		
Cui et al. (2018)	1338	572	499	Hard	Women	International	Australian Open 2014-2017	Yes		
Cui et al. (2018)	1423	589	372	Hard	Women	International	US Open 2014-2016	Yes		
Reid et al. (2016)	1232	440	82	Hard	Women	International	Australian Open 2012-2014	Yes		
Kovalchik and Reid (2017)	881*	NR	21	Hard	Women	International	Australian Open 2012-2017	Yes		
Whitehead and Reid (2017)	5654	947	49	Hard	Women	International	Australian Open 2012-2016	No	Cumulative 4 rounds	
Women International Clay	Cui et al. (2018)	1452	600	249	Clay	Women	International	Roland Garros 2015-2016	Yes	
Women International Grass	Cui et al. (2018)	1289	568	249	Grass	Women	International	Wimbledon 2015-2016	Yes	
Junior Women International Hard	Kovalchik and Reid (2017)	798*	NR	6	Hard	Women	International	Australian Open 2012-2017	No	Only one study for analysis, international juniors
Junior Women International Hard	Gali-Ansodi et al. (2017a)	3354	1204	64	Hard	Women	National	Juniors (13.1 y) 2016-2018	Yes	
Junior Women National Hard	Gali-Ansodi et al. (2017b)	3129	1296	49	Hard	Women	National	Juniors (14 y) 2014-2016	Yes	
Perri et al. (2018)	2698	713	12	Hard	Women	National	U12 - Competition	Yes		
Perri et al. (2018)	2424	329	3	Hard	Women	National	U15 - Competition	Yes		

Notes: *Median, NR = Not Reported

5.11 Distance Travelled per Set (m)

Group	Author (Year)	Study results	Study conditions	Meta-analysis						
Group	Author (Year)	Mean	SD	N (Matches)	Surface	Sex	Playing Level	Comment	Included in MA	Reason for exclusion from MA
Men International Hard (best of 5)	Cui et al. (2020a)	650.0	192.0	134.5	Hard	Men	International	Australian Open Seeded 2015-2017	Yes	
	Cui et al. (2020a)	597.0	151.0	111.5	Hard	Men	International	Australian Open Non-seeded 2015-2017	Yes	
	Cui et al. (2020a)	615.0	164.0	78.5	Hard	Men	International	US Open Seeded 2015-2017 1st set	Yes	
	Cui et al. (2020a)	608.0	152.0	52.5	Hard	Men	International	US Open Non-seeded 2015-2017	Yes	
	Reid et al. (2016)	572.0	152.0	88	Hard	Men	International	Australian Open 2012-2014	Yes	
	Cui et al. (2017)	637.4	182.5	NR	Hard	Men	International	Australian Open 2015-2017 High-experienced Higher RQ	No	Subgroup analysis (Cui et al 2020a), nr of matches missing
	Cui et al. (2017)	647.7	199.0	NR	Hard	Men	International	Australian Open 2015-2017 High-experienced Lower RQ	No	Subgroup analysis (Cui et al 2020a), nr of matches missing
	Cui et al. (2017)	615.8	166.7	NR	Hard	Men	International	Australian Open 2015-2017 Experienced Higher RQ	No	Subgroup analysis (Cui et al 2020a), nr of matches missing
	Cui et al. (2017)	593.9	136.8	NR	Hard	Men	International	Australian Open 2015-2017 Novice Lower RQ	No	Subgroup analysis (Cui et al 2020a), nr of matches missing
	Cui et al. (2017)	643.1	171.2	NR	Hard	Men	International	US Open 2015-2017 High-experienced Higher RQ	No	Subgroup analysis (Cui et al 2020a), nr of matches missing
	Cui et al. (2017)	609.9	172.4	NR	Hard	Men	International	US Open 2015-2017 High-experienced Lower RQ	No	Subgroup analysis (Cui et al 2020a), nr of matches missing
	Cui et al. (2017)	579.6	131.1	NR	Hard	Men	International	US Open 2015-2017 Experienced Higher RQ	No	Subgroup analysis (Cui et al 2020a), nr of matches missing
	Cui et al. (2017)	610.8	149.4	NR	Hard	Men	International	US Open 2015-2017 Novice Lower RQ	No	Subgroup analysis (Cui et al 2020a), nr of matches missing
	Cui et al. (2020b)	64.4	24.4	146	Hard	Men	International	Australian and US Open 2016-2017 1st set	No	Subgroup analysis (Cui et al 2020a)
	Cui et al. (2020b)	658.5	250.0	147	Hard	Men	International	Australian and US Open 2016-2017 2nd set	No	Subgroup analysis (Cui et al 2020a)
Cui et al. (2020b)	630.7	253.4	147	Hard	Men	International	Australian and US Open 2016-2017 3rd set	No	Subgroup analysis (Cui et al 2020a)	
Cui et al. (2020b)	623.2	260.0	75	Hard	Men	International	Australian and US Open 2016-2017 4th set	No	Subgroup analysis (Cui et al 2020a)	
Cui et al. (2020b)	653.3	267.3	28	Hard	Men	International	Australian and US Open 2016-2017 5th set	No	Subgroup analysis (Cui et al 2020a)	
Cui et al. (2020a)	706.0	175.0	33	Clay	Men	International	Roland Garros Seeded 2015-2017	Yes		
Cui et al. (2020a)	627.0	168.0	24	Clay	Men	International	Roland Garros Non-seeded 2015-2017	Yes		
Pereira et al. (2017)	1702	448	4	Clay	Men	International	1st set - Future Tournament	Yes		
Pereira et al. (2017)	1458	378	4	Clay	Men	International	2nd set - Future Tournament	Yes		
Cui et al. (2017)	683.1	386.6	NR	Clay	Men	International	Roland Garros 2015-2017 High-experienced Higher RQ	No	Subgroup analysis, nr of matches missing	
Cui et al. (2017)	684.0	180.2	NR	Clay	Men	International	Roland Garros 2015-2017 High-experienced Lower RQ	No	Subgroup analysis, nr of matches missing	
Cui et al. (2017)	675.3	165.0	NR	Clay	Men	International	Roland Garros 2015-2017 Experienced Higher RQ	No	Subgroup analysis, nr of matches missing	
Cui et al. (2017)	614.6	161.9	NR	Clay	Men	International	Roland Garros 2015-2017 Novice Lower RQ	No	Subgroup analysis, nr of matches missing	
Cui et al. (2020a)	577.0	142.0	81	Grass	Men	International	Wimbledon Seeded 2015-2017	Yes		
Cui et al. (2020a)	549.0	140.0	59	Grass	Men	International	Wimbledon Non-seeded 2015-2017	Yes		
Cui et al. (2017)	588.1	150.8	NR	Grass	Men	International	Wimbledon 2015-2017 High-experienced Higher RQ	No	Subgroup analysis, nr of matches missing	
Cui et al. (2017)	576.1	155.6	NR	Grass	Men	International	Wimbledon 2015-2017 High-experienced Lower RQ	No	Subgroup analysis, nr of matches missing	
Cui et al. (2017)	541.1	131.4	NR	Grass	Men	International	Wimbledon 2015-2017 Experienced Higher RQ	No	Subgroup analysis, nr of matches missing	
Cui et al. (2017)	551.6	122.8	NR	Grass	Men	International	Wimbledon 2015-2017 Novice Lower RQ	No	Subgroup analysis, nr of matches missing	
Cui et al. (2018)	588.8	198	499	Hard	Women	International	Australian Open 2014-2017	Yes		
Cui et al. (2018)	608.8	156.8	372	Hard	Women	International	US Open 2014-2016	Yes		
Reid et al. (2016)	553.0	172.0	82	Hard	Women	International	Australian Open 2012-2014	Yes		
Women International Grass	Cui et al. (2018)	618.7	221.0	249	Grass	Women	International	Roland Garros 2015-2016	Yes	
Women International Grass	Cui et al. (2018)	558.3	188.2	249	Grass	Women	International	Wimbledon 2015-2016	Yes	

Notes: NR = Not Reported

5.12 Distance Travelled per Game (m)

Group	Author (Year)	Study results	Study conditions	Meta-analysis						
Group	Author (Year)	Mean	SD	N (Matches)	Surface	Sex	Playing Level	Comment	Included in MA	Reason for exclusion from MA
Men International Hard	Martinez-Gallego et al. (2013)	84.17*	NR	8	Hard	Men	International	ATP 500 Valencia 2011 - game winners	No	188 games were analysed, SD missing
	Martinez-Gallego et al. (2013)	80.17*	NR	8	Hard	Men	International	ATP 500 Valencia 2011 - game losers	No	188 games were analysed, SD missing
	Whitehead and Reid (2017)	62.19	12.88	13	Hard	Men	International	Australian Open 2012-2016 1st round	No	Only two studies for analysis, SD in other study missing
	Whitehead and Reid (2017)	64.56	15.93	13	Hard	Men	International	Australian Open 2012-2016 2nd round	No	Only two studies for analysis, SD in other study missing
	Whitehead and Reid (2017)	74.72	20.46	13	Hard	Men	International	Australian Open 2012-2016 3rd round	No	Only two studies for analysis, SD in other study missing
Men International Clay	Whitehead and Reid (2017)	79.91	19.19	10	Hard	Men	International	Australian Open 2012-2016 4th round	No	Only two studies for analysis, SD in other study missing
	Pereira et al. (2017)	94.4	94.4	4	Clay	Men	International	Future tournament - 1st set	No	SD missing
	Pereira et al. (2017)	102.9	92.6	4	Clay	Men	International	Future tournament - 2nd set	No	SD missing
Women International Hard	Whitehead and Reid (2017)	64.37	13.25	16	Hard	Women	International	Australian Open 2012-2016 1st round	No	Only one study for analysis
	Whitehead and Reid (2017)	68.63	20.11	16	Hard	Women	International	Australian Open 2012-2016 1-2nd round	No	Only one study for analysis
	Whitehead and Reid (2017)	69.89	16.84	16	Hard	Women	International	Australian Open 2012-2016 3rd round	No	Only one study for analysis
	Whitehead and Reid (2017)	75.30	19.31	13	Hard	Women	International	Australian Open 2012-2016 4th round	No	Only one study for analysis
	Whitehead and Reid (2017)	75.30	19.31	13	Hard	Women	International	Australian Open 2012-2016 4th round	No	Only one study for analysis

Notes: *Median, NR = Not Reported

5.13 Distance Travelled per Point (Rally) (m)

Group	Author (Year)	Study results	Study conditions	Meta-analysis							
Group	Author (Year)	Mean	SD	N (Matches)	Surface	Sex	Playing Level	Comment	Included in MA	Reason for exclusion from MA	
Men International Hard	Cui et al. (2020a)	10.5	2.4	134.5	Hard	Men	International	Australian Open Seeded 2015-2017	Yes		
	Cui et al. (2020a)	9.8	2.0	111.5	Hard	Men	International	Australian Open Non-seeded 2015-2017	Yes		
	Cui et al. (2020a)	10.2	2.3	78.5	Hard	Men	International	US Open Seeded 2015-2017	Yes		
	Cui et al. (2020a)	10.0	2.2	52.5	Hard	Men	International	US Open Non-seeded 2015-2017	Yes		
	Filipovic et al. (2021)	9.4	0.9	4	Hard	Men	International	ATP (20.1 y) ITF Men's World Tennis Tournament	Yes		
	Kovalchik and Reid (2017)	7.4*	NR	21	Hard	Men	International	Australian Open 2012-2017	Yes		
	Martinez-Gallego et al. (2019)	12.8	NR	8	Hard	Men	International	ATP 500 Valencia 2011 - Point winner	Yes		
	Martinez-Gallego et al. (2019)	13.5	NR	8	Hard	Men	International	ATP 500 Valencia 2011 - Point loser	Yes		
	Reid et al. (2016)	10.2	2.4	88	Hard	Men	International	Australian Open 2012-2014 - Point winner	Yes		
	Reid et al. (2016)	8.1	1.9	88	Hard	Men	International	Australian Open 2012-2014 - Point loser	Yes		
	Cui et al. (2020b)	10.3	2.7	146	Hard	Men	International	Australian and US Open 2016-2017 1st set	No	Subgroup analysis (Cui et al 2020a)	
	Cui et al. (2020b)	10.7	2.9	147	Hard	Men	International	Australian and US Open 2016-2017 2nd set	No	Subgroup analysis (Cui et al 2020a)	
	Cui et al. (2020b)	10.3	2.9	147	Hard	Men	International	Australian and US Open 2016-2017 3rd set	No	Subgroup analysis (Cui et al 2020a)	
	Cui et al. (2020b)	10.2	2.8	75	Hard	Men	International	Australian and US Open 2016-2017 4th set	No	Subgroup analysis (Cui et al 2020a)	
	Cui et al. (2020b)	10.6	3.2	28	Hard	Men	International	Australian and US Open 2016-2017 5th set	No	Subgroup analysis (Cui et al 2020a)	
Whitehead et al. (2015)	9.8	2.8	40	Hard	Men	International	Australian Open 2012-2014 Top-ranked - Serving point	No	Subgroup analysis (Reid et al 2016)		
Whitehead et al. (2015)	8.7	2.1	40	Hard	Men	International	Australian Open 2012-2014 Top-ranked - Receiving point	No	Subgroup analysis (Reid et al 2016)		
Whitehead et al. (2015)	9.5	2.6	40	Hard	Men	International	Australian Open 2012-2014 Lower-ranked - Serving point	No	Subgroup analysis (Reid et al 2016)		
Whitehead et al. (2015)	7.5	2.1	40	Hard	Men	International	Australian Open 2012-2014 Lower-ranked - Receiving point	No	Subgroup analysis (Reid et al 2016)		
Men International Clay	Cui et al. (2020a)	11.9	2.9	53	Clay	Men	International	Roland Garros Seeded 2015-2017	Yes		
	Cui et al. (2020a)	11.0	2.5	24	Clay	Men	International	Roland Garros Non-seeded 2015-2017	Yes		
	Pereira et al. (2017)	5.8	7.2	4	Clay	Men	International	1st set - Future Tournament	Yes		
	Pereira et al. (2017)	6.4	4	4	Clay	Men	International	2nd set - Future Tournament	Yes		
	Cui et al. (2020a)	9.4	2.2	81	Grass	Men	International	Wimbledon Seeded 2015-2017	Yes		
Men International Grass	Cui et al. (2020a)	9.1	2.2	59	Grass	Men	International	Wimbledon Non-seeded 2015-2017	Yes		
	Junior Men International Hard	Kovalchik and Reid (2017)	6.9*	NR	12	Hard	Men	International	Australian Open 2012-2017 - juniors	No	Junior international, only 1 study for analysis
	Junior Men National Hard	Filipovic et al. (2021)	15.0	2.8	6	Hard	Men	International	Juniors (13.9 y) National Championships	Yes	Only one study for analysis
	Cui et al. (2018)	9.7	2.7	499	Hard	Women	International	Australian Open 2014-2017	Yes		
	Cui et al. (2018)	10.2	2.9	372	Hard	Women	International	US Open 2014-2016	Yes		
Women International Hard	Kovalchik and Reid (2017)	5.9	NR	21	Hard	Women	International	Australian Open 2012-2017	Yes		
	Reid et al. (2016)	10.6	3.1	82	Hard	Women	International	Australian Open 2012-2014 - Point winner	Yes		
	Reid et al. (2016)	7.6	2.2	82	Hard	Women	International	Australian Open 2012-2014 - Point loser	Yes		
	Women International Clay	Cui et al. (2018)	10.2	2.6	249	Clay	Women	International	Roland Garros 2015-2016	Yes	SD missing, only one study for meta-analysis
	Women International Grass	Cui et al. (2018)	9.1	2.4	249	Grass	Women	International	Wimbledon 2015-2016	Yes	Only one study for meta-analysis
Junior Women International Hard	Kovalchik and Reid (2017)	6.3*	NR	6	Hard	Women	International	Australian Open 2012-2017 - juniors	No	Junior international, only 1 study for meta-analysis	

Notes: *Median, NR = Not Reported

5.14 Distance Travelled per Shot (Stroke) (m)

Group	Author (Year)	Study results	Study conditions	Meta-analysis
Group				

	Gallo-Salazar et al. (2019)	11.9	1.4	6	Hard	Men	National	Juniors (14.5 y)	0 - <1 m/s	afternoon	No	Different cut-off points
	Gallo-Salazar et al. (2019)	29.7	5.0	6	Hard	Men	National	Juniors (14.5 y)	1 - <2 m/s	morning	No	Different cut-off points
	Gallo-Salazar et al. (2019)	27.7	4.6	6	Hard	Men	National	Juniors (14.5 y)	1 - <2 m/s	afternoon	No	Different cut-off points
	Gallo-Salazar et al. (2019)	4.6	1.4	6	Hard	Men	National	Juniors (14.5 y)	2 - <3 m/s	morning	No	Different cut-off points
	Gallo-Salazar et al. (2019)	4.2	0.9	6	Hard	Men	National	Juniors (14.5 y)	2 - <3 m/s	afternoon	No	Different cut-off points
	Gallo-Salazar et al. (2019)	1.6	0.6	6	Hard	Men	National	Juniors (14.5 y)	3 - <4 m/s	morning	No	Different cut-off points
	Gallo-Salazar et al. (2019)	1.4	0.6	6	Hard	Men	National	Juniors (14.5 y)	3 - <4 m/s	afternoon	No	Different cut-off points
	Gallo-Salazar et al. (2019)	0.3	0.3	6	Hard	Men	National	Juniors (14.5 y)	4 m/s	morning	No	Different cut-off points
	Gallo-Salazar et al. (2019)	0.4	0.3	6	Hard	Men	National	Juniors (14.5 y)	4 m/s	afternoon	No	Different cut-off points
Junior Women National Hard	Gale-Ansoli et al. (2017)	9.7	5.3	49	Hard	Women	National	Juniors (14.0 y)	2014-2016	0 - 0.5 m/s	No	Only one study for analysis
	Gale-Ansoli et al. (2017)	38.9	22.8	49	Hard	Women	National	Juniors (14.0 y)	2014-2016	0.6 - 1.9 m/s	No	Only one study for analysis
	Gale-Ansoli et al. (2017)	5.9	3.4	49	Hard	Women	National	Juniors (14.0 y)	2014-2016	2.0 - 3.7 m/s	No	Only one study for analysis
	Gale-Ansoli et al. (2017)	0.3	0.2	49	Hard	Women	National	Juniors (14.0 y)	2014-2016	3.8 - 5.0 m/s	No	Only one study for analysis
Junior Men and Women National Hard	Gale-Ansoli et al. (2016)	9.7	5.3	28	Hard	Men and women	National	Juniors (12.9 y)	2014-2015	0 - 0.5 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2016)	55.4	NR	28	Hard	Men and women	National	Juniors (12.9 y)	2014-2015	0.6 - 1.9 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2016)	9.3	5.7	28	Hard	Men and women	National	Juniors (12.9 y)	2014-2015	2.0 - 3.7 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2016)	0.7	0.6	28	Hard	Men and women	National	Juniors (12.9 y)	2014-2015	3.8 - 5.0 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2018)	9.2	5.3	40	Hard	Men and women	National	Juniors (13.9 y)	2015	0 - 0.5 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2018)	52.5	NR	40	Hard	Men and women	National	Juniors (13.9 y)	2015	0.6 - 1.9 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2018)	10.0	6.2	40	Hard	Men and women	National	Juniors (13.9 y)	2015	2.0 - 3.7 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2018)	0.8	NR	40	Hard	Men and women	National	Juniors (13.9 y)	2015	3.8 - 5.0 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2016)	17.5	8.2	28	Clay	Men and women	National	Juniors (12.9 y)	2014-2015	0.6 - 1.9 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2016)	46.4	NR	28	Clay	Men and women	National	Juniors (12.9 y)	2014-2015	0.6 - 1.9 m/s	No	No separate data for men and women
Junior Men and Women National Clay	Gale-Ansoli et al. (2016)	4.7	5.4	28	Clay	Men and women	National	Juniors (12.9 y)	2014-2015	2.0 - 3.7 m/s	No	No separate data for men and women
	Gale-Ansoli et al. (2016)	0.3	0.2	28	Clay	Men and women	National	Juniors (12.9 y)	2014-2015	3.8 - 5.0 m/s	No	No separate data for men and women

5.18 Distance Travelled per Speed Zone per Match (m)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA	
		Mean	SD	N (Matches)	Surface	Sex	Age					
International Men Hard	Whitehead and Reid (2017)	839.9	218.5	49	Hard	Men	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	0-1 m/s	No	Cumulative 4 rounds	
	Whitehead and Reid (2017)	2751.1	716.4	49	Hard	Men	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	1-2 m/s	No	Cumulative 4 rounds	
	Whitehead and Reid (2017)	2870.3	743.4	49	Hard	Men	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	2-3 m/s	No	Cumulative 4 rounds	
	Whitehead and Reid (2017)	1862.3	474.4	49	Hard	Men	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	3-4 m/s	No	Cumulative 4 rounds	
	Whitehead and Reid (2017)	846.3	240.7	49	Hard	Men	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	4-5 m/s	No	Cumulative 4 rounds	
National Men Clay	Whitehead and Reid (2017)	401.4	161.3	49	Hard	Men	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	> 5 m/s	No	Cumulative 4 rounds	
	Hoppe et al. (2016)	3614.0	671.0	10	Clay	Men	National	(25 y)	0 - <1 m/s	No	Different cut-off points	
	Hoppe et al. (2016)	1307.0	518.0	10	Clay	Men	National	(25 y)	1 - <2 m/s	No	Different cut-off points	
	Hoppe et al. (2016)	86.0	44.0	10	Clay	Men	National	(25 y)	2 - <3 m/s	No	Different cut-off points	
	Hoppe et al. (2016)	19.0	12.0	10	Clay	Men	National	(25 y)	3 - <4 m/s	No	Different cut-off points	
Junior Men National Hard	Hoppe et al. (2016)	8.0	7.0	10	Clay	Men	National	(25 y)	4 m/s	No	Different cut-off points	
	Kilt and Anslan (2018)	2415.0	389.0	13	Hard	Men	National	Juniors (13.0 y)	0-19.4 m/s	No	Different cut-off points	
	Kilt and Anslan (2018)	205.0	60.0	13	Hard	Men	National	Juniors (13.0 y)	1.95-3.33 m/s	No	Different cut-off points	
	Kilt and Anslan (2018)	46.0	20.0	13	Hard	Men	National	Juniors (13.0 y)	3.34 - 5.0 m/s	No	Different cut-off points	
	Kilt and Anslan (2018)	2.7	1.3	13	Hard	Men	National	Juniors (13.0 y)	5.0 m/s	No	Different cut-off points	
	Gallo-Salazar et al. (2019)	718.0	156.0	6	Hard	Men	National	Juniors (14.5 y)	0 - <1 m/s	morning	No	Different cut-off points
	Gallo-Salazar et al. (2019)	1122.0	303.0	6	Hard	Men	National	Juniors (14.5 y)	0 - <1 m/s	afternoon	No	Different cut-off points
	Gallo-Salazar et al. (2019)	1883.0	735.0	6	Hard	Men	National	Juniors (14.5 y)	1 - <2 m/s	morning	No	Different cut-off points
	Gallo-Salazar et al. (2019)	2618.0	721.0	6	Hard	Men	National	Juniors (14.5 y)	1 - <2 m/s	afternoon	No	Different cut-off points
	Gallo-Salazar et al. (2019)	258.0	116.0	6	Hard	Men	National	Juniors (14.5 y)	2 - <3 m/s	morning	No	Different cut-off points
	Gallo-Salazar et al. (2019)	399.0	128.0	6	Hard	Men	National	Juniors (14.5 y)	2 - <3 m/s	afternoon	No	Different cut-off points
	Gallo-Salazar et al. (2019)	102.0	60.0	6	Hard	Men	National	Juniors (14.5 y)	3 - <4 m/s	morning	No	Different cut-off points
	Gallo-Salazar et al. (2019)	131.0	58.0	6	Hard	Men	National	Juniors (14.5 y)	3 - <4 m/s	afternoon	No	Different cut-off points
	Pereira et al. (2016)	1651.3	220.9	4	Hard	Male	National	Juniors (15.5 y)	0 - 1.53 m/s	No	Different cut-off points	
	Pereira et al. (2016)	156.6	68.5	4	Hard	Male	National	Juniors (15.5 y)	1.53 - 1.94 m/s	No	Different cut-off points	
	Pereira et al. (2016)	36.1	18.4	4	Hard	Male	National	Juniors (15.5 y)	1.94 - 2.78 m/s	No	Different cut-off points	
	Pereira et al. (2016)	66.3	18.7	4	Hard	Male	National	Juniors (15.5 y)	2.78 - 4.17 m/s	No	Different cut-off points	
	Pereira et al. (2016)	13.0	7.9	4	Hard	Male	National	Juniors (15.5 y)	4.17 - 5.0 m/s	No	Different cut-off points	
	Pereira et al. (2016)	7.2	9.3	4	Hard	Male	National	Juniors (15.5 y)	> 5.0 m/s	No	Different cut-off points	
	Hoppe et al. (2014)	1218.0	228.0	10	Clay	Men	National	Juniors (13 y)	0 - <1 m/s	No	Different cut-off points	
	Hoppe et al. (2014)	1892.0	578.0	10	Clay	Men	National	Juniors (13 y)	1 - <2 m/s	No	Different cut-off points	
	Hoppe et al. (2014)	268.0	127.0	10	Clay	Men	National	Juniors (13 y)	2 - <3 m/s	No	Different cut-off points	
	Hoppe et al. (2014)	69.0	37.0	10	Clay	Men	National	Juniors (13 y)	3 - <4 m/s	No	Different cut-off points	
	Hoppe et al. (2014)	13.0	13.0	10	Clay	Men	National	Juniors (13 y)	> 4 m/s	No	Different cut-off points	
	Hoppe et al. (2016)	331.0	466.0	10	Clay	Men	National	Juniors (13 y)	0 - <1 m/s	No	Different cut-off points	
	Hoppe et al. (2016)	1404.0	389.0	10	Clay	Men	National	Juniors (13 y)	1 - <2 m/s	No	Different cut-off points	
	Hoppe et al. (2016)	113.0	54.0	10	Clay	Men	National	Juniors (13 y)	2 - <3 m/s	No	Different cut-off points	
	Hoppe et al. (2016)	21.0	11.0	10	Clay	Men	National	Juniors (13 y)	3 - <4 m/s	No	Different cut-off points	
	Hoppe et al. (2016)	3.0	3.0	10	Clay	Men	National	Juniors (13 y)	> 4 m/s	No	Different cut-off points	
	Kilt and Anslan (2017)	2950.0	408.6	7	Clay	Men	National	Juniors (12.2 years)	Winners 0 - 1.94 m/s	No	Different cut-off points	
Kilt and Anslan (2017)	2955.2	376.4	7	Clay	Men	National	Juniors (12.2 years)	Losers 0 - 1.94 m/s	No	Different cut-off points		
Kilt and Anslan (2017)	291.1	84.4	7	Clay	Men	National	Juniors (12.2 years)	Winners 1.95 - 3.33 m/s	No	Different cut-off points		
Kilt and Anslan (2017)	286.6	80.2	7	Clay	Men	National	Juniors (12.2 years)	Losers 1.95 - 3.33 m/s	No	Different cut-off points		
Kilt and Anslan (2017)	70.6	18.8	7	Clay	Men	National	Juniors (12.2 years)	Winners 3.34 - 5.0 m/s	No	Different cut-off points		
Kilt and Anslan (2017)	67.2	25.3	7	Clay	Men	National	Juniors (12.2 years)	Losers 3.34 - 5.0 m/s	No	Different cut-off points		
Kilt and Anslan (2017)	5.9	2.2	7	Clay	Men	National	Juniors (12.2 years)	Winners > 5.0 m/s	No	Different cut-off points		
Kilt and Anslan (2017)	5.8	2.0	7	Clay	Men	National	Juniors (12.2 years)	Losers > 5.0 m/s	No	Different cut-off points		
Kilt and Anslan (2018)	2855.0	384.0	13	Clay	Men	National	Juniors (13.0 y)	0-19.4 m/s	No	Different cut-off points		
Kilt and Anslan (2018)	287.0	61.0	13	Clay	Men	National	Juniors (13.0 y)	1.95-3.33 m/s	No	Different cut-off points		
Kilt and Anslan (2018)	71.0	16.0	13	Clay	Men	National	Juniors (13.0 y)	3.34 - 5.0 m/s	No	Different cut-off points		
Kilt and Anslan (2018)	4.9	1.8	13	Clay	Men	National	Juniors (13.0 y)	> 5.0 m/s	No	Different cut-off points		
Pereira (2016)	2054.5	139.9	4	Clay	Male	National	Juniors (15.5 y)	0 - 1.53 m/s	No	Different cut-off points		
Pereira (2016)	244.6	83.3	4	Clay	Male	National	Juniors (15.5 y)	1.53 - 1.94 m/s	No	Different cut-off points		
Pereira (2016)	211.1	38.9	4	Clay	Male	National	Juniors (15.5 y)	1.94 - 2.78 m/s	No	Different cut-off points		
Pereira (2016)	122.3	32.6	4	Clay	Male	National	Juniors (15.5 y)	2.78 - 4.17 m/s	No	Different cut-off points		
Pereira (2016)	18.6	13.3	4	Clay	Male	National	Juniors (15.5 y)	4.17 - 5.0 m/s	No	Different cut-off points		
Pereira (2016)	5.8	5.8	4	Clay	Male	National	Juniors (15.5 y)	> 5.0 m/s	No	Different cut-off points		
International Women Hard	Whitehead and Reid (2017)	728.8	108.9	52	Hard	Women	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	0-1 m/s	No	Only one study for analysis	
	Whitehead and Reid (2017)	1857.0	320.9	52	Hard	Women	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	1-2 m/s	No	Only one study for analysis	
	Whitehead and Reid (2017)	1683.8	325.3	52	Hard	Women	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	2-3 m/s	No	Only one study for analysis	
	Whitehead and Reid (2017)	915.8	209.3	52	Hard	Women	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	3-4 m/s	No	Only one study for analysis	
	Whitehead and Reid (2017)	327.9	101.5	52	Hard	Women	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	4-5 m/s	No	Only one study for analysis	
Whitehead and Reid (2017)	105.3	55.6	52	Clay	Women	International	Australian Open 2012 - 2016 (cumulative 4 rounds)	> 5 m/s	No	Only one study for analysis		

5.19 Running speed - Average (m/s²)

Group	Author (Year)	Study results		Study conditions				Playing Level	Comment	Meta-analysis included in MA	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface	Sex	Age				
Men International Hard	Filipic et al. (2021)	1.26	0.14	4	Hard	Men	International	ITF Men's World Tennis Tournament	Yes		
	Martinez-Gallego et al. (2019)	1.66	NR	8	Hard	Men	International	ATP (24.8 y) point winner	Yes		
	Martinez-Gallego et al. (2019)	1.73	NR	8	Hard	Men	International	ATP (24.8 y) point loser	Yes		
	Reid et al. (2016)	3.68	0.41	88	Hard	Men	International	Australian Open 2012-2014	Yes		
	Martinez-Gallego et al. (2013)	1.33*	NR	8	Hard	Men	International	ATP - Game winner	No	Subgroup analysis (Martinez-Gallego et al 2019)	
	Martinez-Gallego et al. (2013)	1.38*	NR	8	Hard	Men	International	ATP - Game loser	No	Subgroup analysis (Martinez-Gallego et al 2019)	
	Whitehead et al. (2015)	1.30	0.20	40	Hard	Men	International	Australian Open 2012 - 2014 Top-ranked	No	Subgroup analysis (Reid et al 2016)	
Whitehead et al. (2015)	1.20	0.20	40	Hard	Men	International	Australian Open 2012 - 2014 Lower-ranked	No	Subgroup analysis (Reid et al 2016)		
Junior Men National Hard	Filipic et al. (2021)	1.25	0.08	6	Hard	Men	International	Juniors (13.9 y) National Championships	Yes		
	Gale-Ansoli et al. (2017)	3.20	0.46	49	Hard	Men	National	Juniors (14 y) 2014-2016	Yes		
	Gale-Ansoli et al. (2018)	3.40	0.40	22	Hard	Men	National	Juniors (13.9 y) 2015	Yes		
	Gallo-Salazar et al. (2019)	0.80	0.10	12	Hard	Men	National	Juniors (14.5 y) Morning	Yes		
	Gallo-Salazar et al. (2019)	0.80	0.10	12	Hard	Men	National	Juniors (14.5 y) Afternoon	Yes		
Junior Men National Clay	Kilt and Anslan (2018)	0.63	0.53	13	Hard	Men	National	Juniors (13 y)	Yes		
	Hoppe et al. (2014)	0.70	0.10	10	Clay	Men	National	Juniors (13 y)	Yes		
	Hoppe et al. (2016)	0.70	0.10	10	Clay	Men	National	Juniors (13 y)	Yes		
Men Regional Clay	Kilt and Anslan (2017)	0.69	0.56	14	Clay	Men	National	Juniors (12.2 y)	Yes		
	Kilt and Anslan (2018)	0.72	0.58	13	Clay	Men	National	Juniors (13 y)	Yes		
Women International Hard	Hoppe et al. (2016)	0.60	0.10	10	Clay	Men	Regional	Adults (25 y)	Yes	Regional; adult men	
	Reid et al. (2016)	3.45	0.48	82	Hard	Women	International	Grand Slam	No	Only one study for analysis	
Junior Women National Hard	Gale-Ansoli et al. (2017)	2.83	0.4	62	Hard	Women	National	Juniors (13.1 y) 2014-2018	Yes		
	Gale-Ansoli et al. (2017)	2.91	0.40	49	Hard	Women</					