

Group	Author (Year)	Study results		Study conditions		Sex	Playing Level	Comment	Meta-analysis	Reason for exclusion from MA	
		Mean	SD	N (Matches)	Surface						
Men International Hard	Carbohn et al. (2018)	1.22	0.03	7	Hard	Men	International	Australian Open 2017	No	Only one study with SD	
	Carbohn et al. (2020)	1.15	0.03	7	Hard	Men	International	Australian Open 2017 New Balls	No	Subgroup analysis (Carbohn et al. 2018)	
	Carbohn et al. (2020)	1.15	0.04	7	Hard	Men	International	Australian Open 2017 Used Balls	No	Subgroup analysis (Carbohn et al. 2018)	
	Morara and Brotherhood (2005)	1.36	NR	12	Hard	Men	International	Australian Open 2005	No	SD missing	
	O'Donoghue and Ingram (2001)	1.23	NR	24	Hard	Men	International	Australian Open 1997-1999	No	SD missing	
	O'Donoghue and Ingram (2001)	1.19	NR	35	Hard	Men	International	US Open 1997-1999	No	SD missing	
	Takahashi et al. (2006)	1.14	NR	16	Hard	Men	International	US Open 2003 and 2004	No	SD missing	
	Takahashi et al. (2006)	0.72	0.25	16	Hard	Men	International	US Open 2003 and 2004 - 1st serve	No	Subgroup analysis	
	Takahashi et al. (2009)	0.94	0.22	16	Hard	Men	International	US Open 2003 and 2004 - 2nd serve	No	Subgroup analysis	
	Takahashi et al. (2009)	1.16	NR	16	Hard	Men	International	US Open 2003 and 2004 - ground stroke	No	Subgroup analysis	
Men International Clay	Carbohn et al. (2019)	1.34	0.04	10	Clay	Men	International	Roland Garros 2017	No	several SDs missing	
	Carbohn et al. (2020)	1.29	0.07	10	Clay	Men	International	Roland Garros 2017 New Balls	No	Subgroup analysis (Carbohn et al. 2019)	
	Carbohn et al. (2020)	1.30	0.06	10	Clay	Men	International	Roland Garros 2017 Used Balls	No	Subgroup analysis (Carbohn et al. 2019)	
	O'Donoghue and Ingram (2001)	1.33	NR	22	Clay	Men	International	Roland Garros 1997-1999	No	several SDs missing	
	Takahashi et al. (2009)	1.14	NR	14	Clay	Men	International	Roland Garros 2003 and 2004	No	several SDs missing	
	Takahashi et al. (2009)	0.90	0.10	16	Clay	Men	International	Roland Garros 2003 and 2004 - 1st serve	No	Subgroup analysis	
	Takahashi et al. (2009)	1.03	0.09	16	Clay	Men	International	Roland Garros 2003 and 2004 - 2nd serve	No	Subgroup analysis	
	Takahashi et al. (2009)	1.36	0.04	16	Clay	Men	International	Roland Garros 2003 and 2004 - ground stroke	No	Subgroup analysis	
	Carbohn et al. (2019)	1.27	0.09	7	Grass	Men	International	Wimbledon 2017	No	several SDs missing	
	Carbohn et al. (2020)	1.20	0.07	7	Grass	Men	International	Wimbledon 2017 New Balls	No	Subgroup analysis (Carbohn et al. 2019)	
Men International Grass	Carbohn et al. (2020)	1.00	0.07	7	Grass	Men	International	Wimbledon 2017 Used Balls	No	Subgroup analysis (Carbohn et al. 2019)	
	Morara and Brotherhood (2005)	1.33	NR	12	Grass	Men	International	Wimbledon 2005	No	several SDs missing	
	O'Donoghue and Ingram (2001)	1.09	NR	26	Grass	Men	International	Wimbledon 1997-1999	No	several SDs missing	
	Takahashi et al. (2006)	0.96	NR	11	Grass	Men	International	Wimbledon	No	several SDs missing	
	Takahashi et al. (2009)	0.21	0.40	16	Grass	Men	International	Wimbledon 2003 and 2004 - 1st serve	No	Subgroup analysis	
	Takahashi et al. (2009)	0.84	0.07	16	Grass	Men	International	Wimbledon 2003 and 2004 - 2nd serve	No	Subgroup analysis	
	Takahashi et al. (2009)	1.38	0.24	16	Grass	Men	International	Wimbledon 2003 and 2004 - ground stroke	No	Subgroup analysis	
	Carbohn et al. (2018)	1.25	0.06	23	Hard	Women	International	Australian Open 2017	No	Subgroup analysis (Carbohn et al. 2018)	
	Carbohn et al. (2020)	1.23	0.05	16	Hard	Women	International	Australian Open 2017 1st - 4th round	No	Subgroup analysis (Carbohn et al. 2018)	
	Carbohn et al. (2020)	1.23	0.05	7	Hard	Women	International	Australian Open 2017 - 1st/2nd - 1st/2nd	No	Subgroup analysis (Carbohn et al. 2018)	
Women International Hard	Carbohn et al. (2018)	1.13	0.08	23	Hard	Women	International	US Open 2017 New Balls	No	Subgroup analysis (Carbohn et al. 2018)	
	Carbohn et al. (2020)	1.10	0.08	23	Hard	Women	International	US Open 2017 Used Balls	No	Subgroup analysis (Carbohn et al. 2018)	
	Morara and Brotherhood (2005)	1.42	NR	9	Hard	Women	International	Australian Open 2005	No	SD missing	
	O'Donoghue and Ingram (2001)	1.32	NR	18	Hard	Women	International	Australian Open 1997-1999	No	SD missing	
	O'Donoghue and Ingram (2001)	1.32	NR	23	Hard	Women	International	US Open 1997-1999	No	SD missing	
	O'Donoghue and Ingram (2001)	1.41	NR	14	Clay	Women	International	Roland Garros 1997-1999	No	several SDs missing	
	Morara and Brotherhood (2005)	1.36	NR	8	Grass	Women	International	Wimbledon 2005	No	several SDs missing	
	O'Donoghue and Ingram (2001)	1.28	NR	26	Grass	Women	International	Wimbledon 1997-1999	No	several SDs missing	
	Notes: NR = Not Reported										

Group	Author (Year)	Men		Women		Sex	Playing Level	Comment	Meta-analysis	Reason for exclusion from MA		
		Mean	SD	Mean	SD							
International	Carbohn et al. (2018)	1.22	0.03	7	0.23	Clay	23	International	Australian Open 2017	No	Only one study for analysis	
	Carbohn et al. (2020)	1.15	0.03	24	1.13	0.08	23	Hard	International	Australian Open 2017 - New Balls	No	Subgroup analysis
	Carbohn et al. (2020)	1.15	0.04	24	1.13	0.08	23	Hard	International	Australian Open 2017 - Used Balls	No	Subgroup analysis
	Morara and Brotherhood (2005)	1.36	NR	12	1.42	NR	9	Hard	International	Australian Open 2005	No	SD missing
	O'Donoghue & Ingram (2001)	1.23	NR	24	1.32	NR	35	Hard	International	Australian Open 1997-1999	No	SD missing
	O'Donoghue & Ingram (2001)	1.19	NR	35	1.32	NR	35	Hard	International	US Open 1997-1999	No	SD missing
	O'Donoghue & Ingram (2001)	1.33	NR	22	1.41	NR	14	Clay	International	Roland Garros 1997-1999	No	SD missing
	O'Donoghue & Ingram (2001)	1.33	NR	23	1.36	NR	14	Clay	International	US Open 1997-1999	No	SD missing
	O'Donoghue & Ingram (2001)	1.09	NR	26	1.28	NR	26	Grass	International	Wimbledon 1997-1999	No	SD missing
	Notes: NR = Not Reported											

Group	Author (Year)	Study results		Study conditions		Sex	Playing Level	Comment	Meta-analysis	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface					
Men International Hard	Filipovic et al. (2021)	12.9	0.4	2	Clay	Men	International	ITF Men's World Tennis Tournament	Yes	Included in MA
	Mackie (2018)	23.0	NR	9	Hard	Men	International	ATP Finals 2012	Yes	Included in MA
	Morara and Brotherhood (2005)	17.5	2.4	12	Hard	Men	International	Australian Open 2005	Yes	Included in MA
	Sare et al. (2015)	18.0	NR	6	Hard	Men	International	ATP (18.3 y)	Yes	Included in MA
	Whitehead and Reid (2017)	14.6	2.5	13	Hard	Men	International	Australian Open 2012-2016 1st round	Yes	Included in MA
	Whitehead and Reid (2017)	14.0	2.7	13	Hard	Men	International	Australian Open 2012-2016 2nd round	Yes	Included in MA
	Whitehead and Reid (2017)	16.0	3.2	13	Hard	Men	International	Australian Open 2012-2016 3rd round	Yes	Included in MA
	Whitehead and Reid (2017)	16.0	3.5	10	Hard	Men	International	Australian Open 2012-2016 4th round	Yes	Included in MA
	Morara and Brotherhood (2005)	21.5	4.9	7	Clay	Men	International	ATP (21 y)	Yes	Included in MA
	Morara and Brotherhood (2005)	19.0	NR	9	Clay	Men	International	Roland Garros 1996	Yes	Included in MA
Men International Clay	Morara and Brotherhood (2005)	20.5	2.1	12	Grass	Men	International	Wimbledon 2005	Yes	Included in MA
	O'Donoghue and Lidgate (1998)	11.5	NR	14	Grass	Men	International	Wimbledon 1996	Yes	Included in MA
	Morara and Brotherhood (2005)	22.0	2.8	9	Grass	Men	International	ITF men's tennis tournaments semi-finals and finals 2004-2007	Yes	Included in MA
	Yusoff & Krishnakumar (2021)	33.4	8.7	7	NR	Men	International	International tennis tournaments semi-finals and finals 2004-2007	No	Only one study for analysis
	Filipovic et al. (2021)	22.5	5.8	6	Hard	Men	National	Juniors (13.9 y) National Championships	Yes	Included in MA
	Gallo-Salazar et al. (2019)	22.0	3.3	12	Hard	Men	National	Juniors (14.5 y) National	Yes	Included in MA
	Gallo-Salazar et al. (2019)	22.8	5.5	12	Hard	Men	National	Juniors (14.5 y) Afternoon	Yes	Included in MA
	Wills and Arvan (2018)	27.6	NR	6	Hard	Men	National	Juniors (13.8 y)	Yes	Included in MA
	Torres-Lopez et al. (2011)	30.1	3.4	8	Hard	Men	National/Regional	Juniors (15.5 y)	Yes	Included in MA
	Kils and Arvan (2017)	26.4	4.4	14	Clay	Men	National	Juniors (12.2 y 9w/10)	Yes	Included in MA
Women International Hard	Kils and Arvan (2018)	26.7	4.3	13	Clay	Women	National	Juniors (13.1 y)	Yes	Included in MA
	Billy and Palmer (1994)	22.0	3.8	7	Hard	Women	International	Clay (22.0-22.4 y)	Yes	Included in MA
	Fernandez-Fernandez et al. (2007)	22.0	3.8	7	Hard	Women	International	WTA (17.3 y)	Yes	Included in MA
	Mackie (2018)	23.0	NR	9	Hard	Women	International	WTA Finals	Yes	Included in MA
	Morara and Brotherhood (2005)	20.2	2.1	9	Hard	Women	International	Australian Open 2005	Yes	Included in MA
	Whitehead and Reid (2017)	14.9	2.7	16	Hard	Women	International	Australian Open 2012-2016 1st round	Yes	Included in MA
	Whitehead and Reid (2017)	15.1	2.9	16	Hard	Women	International	Australian Open 2012-2016 2nd round	Yes	Included in MA
	Whitehead and Reid (2017)	16.3	3.3	16	Hard	Women	International	Australian Open 2012-2016 3rd round	Yes	Included in MA
	Whitehead and Reid (2017)	16.8	2.6	13	Hard	Women	International	Australian Open 2012-2016 4th round	Yes	Included in MA
	Fernandez-Fernandez et al. (2008)	17.1	6.1	7	Clay	Women	International	WTA (17 y)	Yes	Included in MA
Women International Clay	Fernandez-Fernandez et al. (2008)	17.1	6.1	7	Clay	Women	International	WTA (17 y)	Yes	Included in MA
	O'Donoghue and Lidgate (1998)	21.1	NR	10	Clay	Women	International	Roland Garros 1996	Yes	Included in MA
	Morara and Brotherhood (2005)	22.1	2.8	6	Grass	Women	International	Wimbledon 2005	Yes	Included in MA
	O'Donoghue and Lidgate (1998)	16.8	NR	11	Grass	Women	International	Wimbledon 1996	Yes	Included in MA
	Morara and Brotherhood (2005)	22.1	2.8	6	Grass	Women	International	Wimbledon 2005	Yes	Included in MA
	Sare et al. (2015)	23.5	NR	5	Hard	Women	National	Juniors (14.1)	No	Juniors, SD missing
	Torres-Lopez et al. (2011)	31.1	3.2	8	Hard	Women	National/Regional	Juniors (15.5 y)	No	Only one study for analysis
	Notes: NR = Not Reported									

Group	Author (Year)	Men		Women		Sex	Playing Level	Comment	Meta-analysis	Reason for exclusion from MA		
		Mean	SD	Mean	SD							
International	Mackie (2018)	23.0	NR	9	23	NR	9	Hard	International	ATP/WTA Finals	Yes	Included in MA
	Morara and Brotherhood (2005)	17.5	2.4	12	20.2	2.1	9	Hard	International	Australian Open	Yes	Included in MA
	Whitehead and Reid (2017)	14.55	2.51	13	14.91	2.72	16	Hard	International	AD - 1st round	Yes	Included in MA
	Whitehead and Reid (2017)	15.40	2.6	13	15.40	2.59	16	Hard	International	AD - 2nd round	Yes	Included in MA
	Whitehead and Reid (2017)	15.98	3.17	13	16.27	3.32	16	Hard	International	AD - 3rd round	Yes	Included in MA
	Whitehead and Reid (2017)	16.98	3.52	10	16.84	2.56	13	Hard	International	AD - 4th round	Yes	Included in MA
	O'Donoghue & Lidgate (1998)	14.09	NR	9	14.3	NR	30	Clay	International	Roland Garros	Yes	Included in MA
	Morara and Brotherhood (2005)	20.5	2.1	13	21.1	2.6	6	Grass	International	Wimbledon	Yes	Included in MA
	O'Donoghue & Lidgate (1998)	11.5	NR	14	11.8	NR	14	Grass	International	Wimbledon	Yes	Included in MA
	Torres-Lopez et al. (2011)	30.1	3.43	8	31.06	3.2	8	Hard	National/Regional	15.5 y	No	Juniors
Sare et al. (2015)	27.6	NR	5	23.5	NR	5	Hard	National	13.8 y 14.1 y	No	Juniors, one SD is missing	
Notes: NR = Not Reported												

Group	Author (Year)	Study results		Study conditions		Sex	Playing Level	Comment	Meta-analysis	Reason for exclusion from MA
		Mean	SD	N (Matches)	Surface					
Men International Hard	Carbohn et al. (2019)	1.35	0.4	7	Hard	Men	International	Australian Open 2017	No	Ratio
	Filipovic et al. (2021)	15.6	NR	4	Hard	Men	International	ITF Men's World Tennis Tournament	No	Ratio
	Mackie (2018)	23.0	NR	9	Hard	Men	International	ATP Finals 2012	No	Ratio
	Carbohn et al. (2020)	1.15	0.03	7	Hard	Men	International	Australian Open 2017 - New Balls	No	Ratio, subgroup analysis (Carbohn et al. 2019)
	Carbohn et al. (2020)	1.15	0.04	7	Hard	Men	International	Australian Open 2017 - Used Balls	No	Ratio, subgroup analysis (Carbohn et al. 2019)
	Morara and Brotherhood (2005)	1.33	0.5	10	Clay	Men	International	Roland Garros 2017	No	Ratio
	Morara and Brotherhood (2005)	1.20	0.3	8	Clay	Men	International	Wimbledon ATP	No	Ratio

	Takahashi et al. (2009)	183	NR	14	Clay	Men	International	Roland Garros 2003-2006	No	SD missing
	Klavans and Magnus (1998)	230	NR	258	Grass	Men	International	Wimbledon 1992-1995	No	SD missing
	Kovachik and Reid (2017)	221*	NR	NR	Grass	Men	International	Wimbledon 2016	No	SD missing
Men International Grass (best-of-5-sets)	Takahashi et al. (2009)	191	NR	11	Clay	Men	International	Wimbledon 2001-2006	No	SD missing
Men International Hard (best-of-5-sets)	Filipovic et al. (2012)	105	12	4	Hard	Men	International	ITF Men's World Tennis Tournament	No	Only two studies for analysis
Junior Men International Hard (best-of-3-sets)	Skuse et al. (2014)	183	NR	5	Hard	Men	International	Australian Open 2016, 2017, US Open 2016 (junior)	No	SD missing, only two studies for analysis
Junior Men International Clay (best-of-3-sets)	Skuse et al. (2015)	145	NR	6	Hard	Men	International	ITF J (13-18 yr)	No	SD missing
Junior Men International Grass (best-of-3-sets)	Kovachik and Reid (2017)	113*	NR	NR	Clay	Men	International	Roland Garros 2016 (junior)	No	SD missing
Junior Men National Hard (best-of-3-sets)	Kovachik and Reid (2017)	117*	NR	NR	Grass	Men	International	Wimbledon 2016 (junior)	No	SD missing
Junior Men National Clay (best-of-3-sets)	Filipovic et al. (2012)	144.2	22.7	6	Hard	Men	National	National Championships (13-19 yr)	No	Only two studies for analysis
Junior Men National Grass (best-of-3-sets)	Trey-Lopez et al. (2011)	261	22	8	Hard	Men	National	Junior (15-18)	No	Only two studies for analysis
Junior Men National Clay (best-of-3-sets)	Kovachik and Reid (2017)	121	14	14	Clay	Men	National	Junior (12-20)	No	SD missing, only one study for analysis
Women International Hard	Kovachik and Reid (2017)	120*	NR	NR	Hard	Women	International	Australian Open 2016, US Open 2016	No	SD missing
Women International Clay	Kovachik and Reid (2017)	119*	NR	NR	Clay	Women	International	Roland Garros 2016	No	SD missing
Women International Grass	Kovachik and Reid (2017)	119*	NR	NR	Grass	Women	International	Wimbledon 2016	No	SD missing
Junior Women International Hard	Kovachik and Reid (2017)	127*	NR	NR	Grass	Women	National	Australian Open 2016, 2017, US Open 2016 (junior)	No	SD missing
Junior Women International Clay	Kovachik and Reid (2017)	112*	NR	NR	Clay	Women	National	Roland Garros 2016 (junior)	No	SD missing
Junior Women International Grass	Kovachik and Reid (2017)	115*	NR	NR	Grass	Women	National	Wimbledon 2016 (junior)	No	SD missing
Junior Women National Hard	Skuse et al. (2015)	141	NR	5	Hard	Women	National	Junior (14-18)	No	SD missing
Junior Women National Clay	Trey-Lopez et al. (2011)	158	19	8	Hard	Women	National	Junior (15-18)	No	Only one study for analysis

Notes: *Median, NR = Not Reported

4.15 Points (Rallies) per Set (8)

Group	Author (Year)	Study results	N (Matches)	Surface	Sex	Playing Level	Comment	Meta-analysis	Reason for exclusion from MA	
Men International - Court surface NR	Yusoff & Kravtchikov (2021)	48.6	18.7	7	NR	Men	International	International tennis tournaments (semi-finals and finals) 2014 - 2017	No	Only one study for analysis
Junior Men International - Court surface NR	Yusoff & Kravtchikov (2021)	51.0	18.0	7	NR	Men	International	International tennis tournaments (semi-finals and finals) 2014 - 2017	No	Only one study for analysis

4.16 Points (Rallies) per Game (9)

Group	Author (Year)	Study results	N (Matches)	Surface	Sex	Playing Level	Comment	Meta-analysis	Reason for exclusion from MA	
Men International All Surfaces	Carboth (2017)	6.29	6.12	487	All surfaces	Men	International	All 4 Grand Slams 2016	No	Only one study for analysis
Men International Hard	Carboth (2017)	6.28	NR	121	Hard	Men	International	Australian Open 2016	No	SD missing, subgroup analysis
Men International Clay	Carboth (2017)	6.35	NR	116	Hard	Men	International	US Open 2016	No	SD missing, subgroup analysis
Men International Grass	Carboth (2017)	6.40	NR	133	Clay	Men	International	Roland Garros 2016	No	SD missing, subgroup analysis
Men International Grass	Carboth (2017)	6.24	NR	125	Grass	Men	International	Wimbledon 2016	No	SD missing, subgroup analysis
Men International All Surfaces	Klavans and Magnus (1998)	6.12	NR	258	Grass	Men	International	Wimbledon 1992-1995	No	SD missing
Women International All Surfaces	Carboth (2017)	6.54	6.28	487	All surfaces	Women	International	All 4 Grand Slams 2016	No	Only one study for analysis
Women International Hard	Carboth (2017)	6.55	NR	121	Hard	Women	International	Australian Open 2016	No	SD missing, subgroup analysis
Women International Clay	Carboth (2017)	6.54	NR	125	Hard	Women	International	US Open 2016	No	SD missing, subgroup analysis
Women International Grass	Carboth (2017)	6.43	NR	125	Clay	Women	International	Roland Garros 2016	No	SD missing, subgroup analysis
Women International Grass	Carboth (2017)	6.43	NR	134	Grass	Women	International	Wimbledon 2016	No	SD missing, subgroup analysis
Women International Grass	Klavans and Magnus (1998)	6.46	NR	229	Grass	Women	International	Wimbledon 1992-1995	No	SD missing

Notes: NR = Not Reported