

Online Supplementary Table 1: Positional changes of skin length in the thumb, fingers and wrist in women (mean and SD)

A: Thumb and wrist

Sections determined by intervals between skin marks	H' - - - - G' G' - - - - F' F' - - - - E' E' - - - - D' D' - - - - C' C' - - - - B' B' - - - - A'						
Articular Zones (adjacent sections)		Carpometacarpal joint		Metacarpophalangeal joint		Interphalangeal joint	
Region (Combined zones)	Total regional skin						

Changes in hand and wrist position	Changes in skin length						
		6 (4) mm*	11 (5) mm*	6 (3) mm*	6 (2) mm*	3 (2) mm*	3 (2) mm*
From maximal extension to maximal flexion	17 (6) *	17 (6) mm*		9 (3) mm*		3 (2) mm*	
				34 (8) mm*			
	6 (3) mm*	11 (5) mm*	5 (3) mm*	3 (2) mm*	1 (1) mm*	0 (2) mm	-0 (1) mm
From maximal extension to drop hand	17 (6) *	16 (6) mm*		4 (3) mm*		0 (1) mm	
				19 (7) mm*			
	3 (4) mm*	6 (5) mm*	2 (2) mm*	1 (2) mm*	-0 (2) mm	-0 (2) mm	-0 (1) mm
From maximal extension to flat hand	9 (4) mm*	8 (6) mm*		0 (2) mm		0 (2) mm	
				11 (7) mm*			
	1 (4) mm	5 (5) mm*	4 (3) mm*	4 (3) mm*	1 (1) mm*	-1 (1) mm*	-0 (1) mm*
From maximal extension to opposition	6 (6) mm*	9 (7) mm*		5 (3) mm*		-1 (2) mm*	
				14 (8) mm*			

B: Fingers and wrist

Sections determined by intervals between skin marks	I - - - H H - - - G G - - - F F - - - E E - - - D D - - - C C - - - B B - - - A							
Articular Zones (adjacent sections)	Wrist joint		Metacarpophalangeal joint		Proximal interphalangeal joint		Distal interphalangeal joint	
Region (Combined zones)	Total regional skin							

Changes in hand and wrist position	Changes in skin length (index finger)							
		11 (8) mm*	15 (8) mm*	9 (7) mm*	6 (3) mm*	6 (4) mm*	4 (3) mm*	3 (3) mm*
From maximal extension to maximal flexion	26 (15) mm*		15 (8) mm*		11 (4) mm*		3 (3) mm*	
				55 (19) mm*				
	10 (8) mm*	13 (6) mm*	7 (3) mm*	2 (3) mm*	0 (2) mm	0 (2) mm	0 (1) mm*	-1 (1) mm
From maximal extension to drop hand	24 (13) mm*		9 (4) mm*		1 (2) mm		0 (1) mm	
				33 (14) mm*				
	7 (8) mm*	9 (7) mm*	5 (2) mm*	0 (4) mm	-0 (2) mm	-0 (2) mm	0 (1) mm	-0 (1) mm
From maximal extension to flat hand	16 (14) mm*		5 (5) mm*		-1 (2) mm		0 (1) mm	
				20 (16) mm*				
	1 (9) mm	1 (5) mm	4 (6) mm*	4 (4) mm*	2 (3) mm*	1 (2) mm*	0 (2) mm	0 (2) mm
From maximal extension to opposition	2 (11) mm		8 (8) mm*		3 (5) mm*		0 (3) mm	
				12 (14) mm*				

Changes in hand and wrist position	Changes in skin length (middle finger)							
		13 (8) mm*	16 (7) mm*	11 (7) mm*	7 (3) mm*	7 (5) mm*	4 (3) mm*	4 (3) mm*
From maximal extension to maximal flexion	28 (10) mm*		19 (7) mm*		11 (5) mm*		4 (3) mm*	
				61 (16) mm*				
	10 (16) mm*	14 (6) mm*	6 (3) mm*	3 (3) mm*	6 (2) mm	0 (2) mm	1 (1) mm*	-0 (1) mm
From maximal extension to drop hand	24 (9) mm*		10 (3) mm*		1 (3) mm*		0 (2) mm	
				34 (10) mm*				
	7 (4) mm*	10 (6) mm*	5 (3) mm*	1 (1) mm*	-0 (2) mm	-0 (2) mm	0 (1) mm	-0 (1) mm
From maximal extension to flat hand	17 (7) mm*		6 (3) mm*		-1 (3) mm		0 (2) mm	

	23 (8) mm*							
	1 (4) mm	1 (7) mm	5 (7) mm*	3 (3) mm*	2 (4) mm*	1 (3) mm	0 (3) mm	-0 (2) mm
	3 (7) mm*		9 (8) mm*		3 (5) mm*		0 (3) mm	
From maximal extension to opposition	14 (13) mm*							
Changes in hand and wrist position	Changes in skin length (ring finger)							
	10 (5) mm*	15 (6) mm*	8 (8) mm*	7 (3) mm*	8 (4) mm*	5 (2) mm*	3 (3) mm*	0 (2) mm
	26 (9) mm*		17 (9) mm*		12 (4) mm*		3 (3) mm*	
From maximal extension to maximal flexion	57 (16) mm*							
	9 (5) mm*	12 (8) mm*	6 (5) mm*	3 (3) mm*	2 (2) mm*	0 (2) mm	0 (2) mm	0 (1) mm
	21 (10) mm*		9 (5) mm*		2 (3) mm*		0 (2) mm	
From maximal extension to drop hand	32 (13) *							
	5 (5) mm*	9 (6) mm*	3 (3) mm*	2 (2) mm*	0 (2) mm	-0 (2) mm	0 (1) mm	-0 (1) mm
	14 (7) mm*		5 (3) mm*		0 (3) mm		0 (1) mm	
From maximal extension to flat hand	19 (9) mm*							
	0 (4) mm	1 (7) mm	1 (10) mm	4 (3) mm*	3 (4) mm*	1 (2) mm	0 (3) mm	0 (2) mm
	2 (8) mm		6 (10) mm*		4 (4) mm*		1 (2) mm*	
From maximal extension to opposition	12 (13) mm*							
Changes in hand and wrist position	Changes in skin length (little finger)							
	7 (5) mm*	12 (7) mm *	9 (7) mm*	8 (5) mm*	5 (4) mm*	3 (2) mm*	2 (3) mm*	0 (1) mm
	19 (10) mm*		17 (10) mm*		8 (4) mm*		2 (3) mm*	
From maximal extension to maximal flexion	46 (17) mm*							
	7 (4) mm*	9 (5) mm*	4 (3) mm*	2 (5) mm*	1 (3) mm*	0 (2) mm	0 (3) mm	0 (1) mm
	17 (9) mm*		7 (6) mm*		1 (3) mm		0 (3) mm	
From maximal extension to drop hand	25 (10)mm *							
	3 (4) mm*	7 (6) mm*	3 (2) mm*	1 (4) mm*	0 (2) mm	0 (2) mm	-1 (3) mm	0 (1) mm
	10 (8) mm*		4 (6) mm*		-1 (3) mm		-1 (3) mm	
From maximal extension to flat hand	12 (10) mm*							
	1 (4) mm	1 (7) mm	4 (7) mm*	5 (6) mm*	2 (3) mm*	0 (2) mm	-0 (3) mm	0 (1) mm
	2 (10) mm		9 (9) mm*		3 (3) mm*		0 (3) mm	
From maximal extension to opposition	13 (14) mm*							

*: statistical significant change ($P < 0.05$)

Positive data represent positional lengthening of skin sections and zones, negative data represent positional shortening. Sections are the interval between the skin marks on Figure 1. Zones are combined adjacent sections.

Online Supplementary Table 2: Positional changes of skin length in the thumb, fingers and wrist in men (mean and SD)

A: Thumb and wrist

Sections determined by intervals between skin marks		H' - - - - G' G' - - - - F' F' - - - - E' E' - - - - D' D' - - - - C' C' - - - - B' B' - - - - A'						
Articular Zones (adjacent sections)		Carpometacarpal joint		Metacarpophalangeal joint		Interphalangeal joint		
Region (Combined zones)		Total regional skin						
Changes in hand and wrist position		Changes in skin length						
From maximal extension to maximal flexion		4 (4) mm*	10 (4) mm*	6 (3) mm*	6 (3) mm*	4 (2) mm*	5 (3) mm*	1 (1) mm*
		14 (6) mm*		16 (6) mm*	9 (4) mm*		5 (3) mm	
		34 (11) mm*						
From maximal extension to drop hand		6 (4) mm*	11 (4) mm*	5 (3) mm*	3 (2) mm*	1 (2) mm*	1 (2) mm	0 (2) mm
		17 (6) mm*		16 (6) mm*	4 (3) mm*		1 (2) mm*	
		27 (8) mm*						
From maximal extension to flat hand		4 (3) mm*	6 (3) mm*	2 (3) mm*	1 (2) mm*	0 (2) mm	-0 (2) mm	0 (1) mm
		10 (5) mm*		9 (5) mm*	1 (2) mm		-0 (2) mm	
		13 (7) mm*						
From maximal extension to opposition		2 (3) mm*	6 (5) mm*	4 (3) mm*	4 (3) mm*	1 (2) mm*	0 (2) mm	-0 (1) mm
		8 (6) mm*		10 (6) mm*	6 (4) mm*		0 (3) mm	
		18 (8) mm*						

B: Fingers and wrist

Sections determined by intervals between skin marks		I - - - H H - - - G G - - - F F - - - E E - - - D D - - - C C - - - B B - - - A							
Articular Zones (adjacent sections)		Wrist joint		Metacarpophalangeal joint		Proximal interphalangeal joint		Distal interphalangeal joint	
Region (Combined zones)		Total regional skin							
Changes in hand and wrist position		Changes in skin length (index finger)							
From maximal extension to maximal flexion		13 (10) mm*	15 (9) mm*	9 (9) mm*	6 (3) mm*	7 (5) mm*	4 (2) mm*	4 (3) mm*	0 (1) mm
		28 (15) *		15 (11) *		11 (5) *		4 (3) *	
		57 (24) mm*							
From maximal extension to drop hand		14 (12) mm*	14 (4) mm*	6 (3) mm*	2 (2) mm*	1 (3) mm	0 (1) mm	1 (1) mm	0 (1) mm
		28 (13) mm*		8 (3) mm*		1 (3) mm		1 (2) mm	
		38 (13) mm*							
From maximal extension to flat hand		10 (12) mm*	11 (4) mm*	5 (2) mm*	1 (2) mm*	-0 (3) mm	-0 (1) mm	-0 (1) mm	-0 (1) mm
		21 (13) mm*		6 (3) mm*		-0 (3) mm		-0 (2) mm	
		26 (13) mm*							
From maximal extension to opposition		4 (13) mm	3 (7) mm	3 (8) mm*	5 (2) mm*	2 (3) mm*	1 (1) mm*	0 (3) mm*	-0 (2) mm
		6 (11) mm*		7 (8) mm*		3 (3) mm*		-0 (3) mm	
		17 (15) mm*							
Changes in hand and wrist position		Changes in skin length (middle finger)							
From maximal extension to maximal flexion		14 (9) mm*	17 (8) mm*	12 (7) mm*	7 (2) mm*	7 (6) mm*	4 (2) mm*	4 (4) mm*	1 (2) mm
		31 (14) *		19 (7) *		12 (6) *		4 (4) *	
		66 (24) mm*							
From maximal extension to drop hand		12 (11) mm*	15 (6) mm*	7 (5) mm*	3 (2) mm*	0 (3) mm	0 (2) mm	0 (2) mm	0 (1) mm
		26 (13) mm*		10 (5) mm*		1 (3) mm*		0 (2) mm	
		37 (17) mm*							
From maximal extension to flat hand		9 (11) mm*	10 (7) mm*	4 (6) mm*	1 (2) mm*	-1 (3) mm	-0 (2) mm	0 (2) mm	0 (1) mm
		19 (14) mm*		5 (6) mm*		-1 (3) mm*		0 (2) mm	
		19 (14) mm*							

	23 (17) mm*							
	1 (10) mm	1 (8) mm*	5 (6) mm*	4 (3) mm*	2 (5) mm*	1 (2) mm*	0 (4) mm	0 (2) mm
	2 (15) mm		9 (6) mm*		3 (5) mm*		0 (4) mm	
From maximal extension to opposition	14 (20) mm*							

Changes in hand and wrist position	Changes in skin length (ring finger)							
		12 (5) mm*	15 (8) mm*	9 (5) mm*	6 (3) mm*	7 (5) mm*	4 (3) mm*	3 (3) mm*
	27 (10) mm*		14 (7) mm*		11 (7) mm*		4 (4) mm*	
From maximal extension to maximal flexion	58 (17) mm*							
	10 (5) mm*	12 (9) mm*	6 (4) mm*	1 (2) mm*	2 (2) mm*	1 (2) mm*	0 (1) mm	0 (1) mm
	22 (11) *		7 (4) *		2 (4) *		0 (2)	
From maximal extension to drop hand	31 (14) mm*							
	5 (5) mm*	9 (9) mm*	3 (3) mm*	1 (2) mm	0 (2) mm	0 (1) mm	0 (2) mm	-0 (1) mm
	13 (10) mm*		4 (3) mm*		1 (2) mm		-0 (2) mm	
From maximal extension to flat hand	18 (11) mm*							
	2 (5) mm*	1 (9) mm	2 (6) mm*	3 (4) mm*	3 (4) mm*	1 (2) mm*	1 (3) mm	-0 (2) mm
	2 (11) mm		5 (7) mm*		4 (4) mm*		0 (3) mm	
From maximal extension to opposition	12 (15) mm*							

Changes in hand and wrist position	Changes in skin length (little finger)							
		9 (7) mm*	14 (7) mm*	8 (9) mm*	7 (6) mm*	5 (5) mm*	4 (3) mm*	3 (3) mm*
	23 (8) mm*		15 (11) mm*		8 (5) mm*		4 (4) mm*	
From maximal extension to maximal flexion	50 (15) mm*							
	8 (6) mm*	10 (9) mm*	5 (5) mm*	2 (5) mm*	-0 (3) mm	0 (2) mm*	-0 (2) mm	0 (0) mm
	18 (10) mm*		6 (8) mm*		0 (4) mm		-0 (2) mm	
From maximal extension to drop hand	24 (15) mm*							
	3 (5) mm*	8 (8) mm*	2 (4) mm*	0 (5) mm	-0 (3) mm	-0 (2) mm	-1 (2) mm*	0 (1) mm
	11 (10) mm*		2 (6) mm*		-0 (4) mm		-0 (2) mm	
From maximal extension to flat hand	13 (12) mm*							
	2 (4) mm*	3 (8) mm*	3 (7) mm*	5 (6) mm*	2 (5) mm*	1 (2) mm	0 (4) mm	0 (2) mm
	4 (10) mm*		8 (11) mm*		3 (6) mm*		3 (4) mm	
From maximal extension to opposition	16 (14) mm*							

*: statistical significant change ($P < 0.05$)

Positive data represent positional lengthening of skin sections and zones, negative data represent positional shortening. Sections are the interval between the skin marks on Figure 1. Zones are combined adjacent sections.