Supplementary Table 1
Description of included studies on MTr.

Study	Participants	Tasks for training	Group design	Outcome measures	Behavioural comparisons of groups		
					MTr versus active vision pattern	MTr versus passive vision pattern	MTr versus action observation
Nojima et al., 2012	n=20 Mean age: 24.7±4.7 years	10 sets of two-ball rotations for 30 s	(1)MG (2)CG (3)AO	Counting the number of rotations in 30 s	No comparison	Better performance in MTr (F=12.9, p=0.02)	Significant rotation increments compared with baselines, no difference in comparison
Reissig et al.,	n=80 Mean age:	10 sets of fast-as-poss	(1)Active vision (2)Passive vision	Counting the number of rotation	No significance in changes of	No significant rotation difference	No comparison

2015(a)	27.5±8.3 years	ible two ball-rotation task in 10 min	(3)Mirror vision (4)Control group: bilateral static limbs	in 1 min	rotation		
Yarossi et al., 2017	n=10 Mean age: 27.1±6.3 years	4 sets of 2-min index finger-abduction movements	(1)Mirror+target (2)Veridical+target	Analyzing task kinematics (reaction time, movement time, amplitude, peak velocity) and behavioural performance (error	No significance in skill transfer of untrained hand	No comparison	No comparison

				reduction)			
Wang et al., 2013	n=15 Age range: 22-56 years	4 sequences of two finger-opposite movement whose video were showed on goggles	(1)NOR static (2)NOR moved (3)MIR static (4)MIR moved	Counting the number of finger-thumb movement	No significant changes of number of opposition sequence of untrained hand (p=0.41)	No comparison	No significant difference of sequence number of untrained hand (p＞0.1)
Rjosk et	n=35	Complex	(1)MG	Counting the	No comparison	Better	No comparison

al., 2017	Mean age: 26.91±0.61 years	fast-as-possible ball-rotation task	(2)CG	number of rotation/min		improvements of untrained hand in MG ($p < 0.01$)	
Ossmy et al., 2016	n=18 Age range: 23-31 years	4 different sequences of finger-abduction tasks showed on virtual reality conducted by unilateral	(1)RH-RH (2)RH-LH (3)None-LH (4)RH-None	Index of performance gains	RH-LH obtained highest motor gains in untrained hand ($p<0.05$). RH-LH combined with passive	No comparison	No comparison

		hand			movement of untrained hand performed better than RH-LH		
Dohle et al., 2011	n=10 Age range: 19-42 years Mean age: 24.4 years	3 runs of clockwise circular movements	(1)R (right arm, no mirror) (2)Rm (right arm, mirror) (3)L (left arm, no mirror) (4)Lm (left arm, mirror)	Left hand was tested by four-object course using virtual arm	No significant performance gains of circulation	No comparison	No comparison

Bahr et al., 2018	n=60 Age range: 21-27 years Mean age: 3.38±1.58 years	Motor skill test including 5 tasks	(1)MTr group (2)non-mirror group	Evaluation by the same tasks after 4-day training	Significant improved performance of untrained hand in MTr compared with no mirror group (p=0.006)	No comparison	No comparison
Zult et al., 2016	n=24 Mean age: 29±9 years (CG) and	640 muscle contractions of the right wrist flexors	(1)MG (2)CG	Maximal voluntary contraction after training	No comparison	Dynamic maximal voluntary contraction torque of untrained wrist	No comparison

	25±4 years (MG)	at 80% maximal voluntary contraction for 3 weeks			flexors in MG was greater Posttest maximal voluntary contraction torque was 13% higher in MG than that in CG	
Hamzai et al., 2012	n=26 Mean age: 25.5(MG) and 23.9(CG) years	Moving pegs and marbles(20 min/d for 4 days)	(1)MG (2)CG	Counting the number of successful moving	Performance of untrained hand was improved more in MG (p<0.001)	No comparison	No comparison

Lappchen et al., 2012	n=20 Mean age: 24.1 years	5 skills conducted for 20 min/d in 4 days	(1)MTr group (2)non-mirror group	Evaluated by completeness of the same 5 skills	Completion and dexterity of untrained hand improved more in MTr ($p<0.02$), no significant improvement of trained hand between groups	No comparison	No comparison
Study	**Participants**	**Tasks for training**	**Experimental design**	**Outcome measures**	**Factors**	**Behavioral results**	

Reissig et al., 2015(b)	n=53 Mean age: 26.1±5.3 (27) (younger adults) and 69.6±5.6 (26) years (older adults)	300 times fast-as-possible and high tone-as-possible ballistic abduction movement	(1)Active vision (2)Mirror vision	Mid- and post-test peak acceleration	Age	No difference in performance of untrained hand between the younger and the older adults. Younger adults acceleration was greater in the trained hand than in the untrained hand (p = 0.001, d = 1.273)
Steinberg et al., 2016	n=80 Mean age: 24.87±4.14 years (39 vetaran+41	4 days of slalom course and stationary ball-dribblin	(1)Novice+mirror (2)Novice-mirror (3)Veteran+mirror (4)Veteran-mirror	Duration of slalom and ball-dribbling tasks; dribbling errors	Skill level	Motor performance increased and motor errors decreased in untrained hand after group (3) most significantly. Performance gains of right hand had no significance in subjects who were novice

	novice)	g tasks				or veteran. More motor improvement in untrained hand and more focused attention in group (2) than that in group (4)
Rjosk et al., 2015	n=32 right-handed volunteers Mean age: 26.78 ± 0.78 years	Complex ball-rotation task	(1)MTr with moving DH (2)MTr with moving NDH	Counting the number of ball rotation in 1 minute	Whether dominant hand moved	No significant difference in performance improvement between group (1) and (2)

Note: Mirror vision/MG: mirror group; participants see the illusion of their moving limb through mirror. Active vision/CG: participants only see their moving limb. Passive vision: participants see their inactive limb through glass rather than their active limb. Action observation/AO: participants see the movements conducted by others without moving their own bilateral limb. NOR static: participants see their dominant hand without conducting movement. NOR moved: participants directly see their moving dominant hand. MIR static: participants don't move limb with a midsagittal mirror. MIR moved: participants watch the illusion of moving hand through a midsagittal mirror. RH-RH: training by right hand with visual feedback of ipsilateral hand. RH-LH: training by right hand with visual feedback of counterlateral hand. None-LH: only observing virtual left

hand movement without moving of each hand. RH-None: training by right hand with no visual feedback. Mirror+target: training with mirror and focusing on the target movement conducted by trained hand. Veridical+target: training without mirror and focusing on the target movement of trained hand. NOR: normal condition. MIR: mirror condition. MTr: mirror training. Non-mirror group: task training without mirror illusion of moving limb. R (right arm, no mirror): participants execute movement by right hand without mirror illusion of moving hand. Rm (right arm, mirror): participants execute movement by right hand with mirror illusion of moving hand. L (left arm, no mirror): participants execute movement by left hand without mirror illusion of moving hand. Lm (left arm, mirror): participants execute movement by left hand without mirror illusion of moving hand. DH: dominant hand. NDH: non-dominant hand. MTr with moving DH: participants move their dominant hand with MTr and assess motor function of non-dominant hand. MTr with moving NDH: participants move their non-dominant hand with MTr and assess motor function of dominant hand. Novice+mirror: participants who are not expert in sports conduct tasks by unilateral limb with mirror illusion. Novice-mirror: participants who are not expert in sports conduct tasks by unilateral limb with direct visual feedback of moving side. Veteran+mirror: participants skilled in sports conduct tasks by unilateral limb with mirror illusion. Veteran-mirror: participants skilled in sports conduct tasks by unilateral limb with direct visual feedback of moving side. MTr with moving DH: dominant hand conducts MTr.