

S1. Characteristics of the stimuli

Table 1. Lists and comparison of lists (*t*-test for numerical variables, Wilcoxon test for ordinal variables): *: $p < 0.05$, **: $p < 0.01$, ***: $p < .001$.

	List A		List B		Comparison
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
<i>Sentence criteria</i>					
Sentence plausibility	2.9	0.8	2.9	0.9	(<i>ns</i>)
Target verb frequency	72,788	79,898	62,041	74,694	(<i>ns</i>)
Target verb duration (<i>ms</i>)	475	117	480	101	(<i>ns</i>)
<i>Gesture criteria</i>					
Viewpoint: semantically related gestures only (%)	63 character viewpoint (19 items) 37 observer viewpoint (11 items)		63 character viewpoint (19 items) 37 observer viewpoint (11 items)		
Stroke type (%)	67 single (40 items) 33 repeated (20 items)		67 single (40 items) 33 repeated (20 items)		
Stroke duration including post-stroke holds (<i>ms</i>)	596	123	601	149	(<i>ns</i>)
Place of articulation (%)	47 center (28 items) 2 periphery (1 items) 52 periphery-center (31 items)		47 center (28 items) 53 periphery-center (32 items)		
Trajectory (%)	83 simple (50 items) 17 complex (10 items)		83 simple (50 items) 17 complex (10 items)		
<i>Picture criteria</i>					
Concept agreement (%)	93	8	92	10	(<i>ns</i>)
Concept familiarity	3.7	0.7	3.8	0.6	(<i>ns</i>)
Visual complexity	2.7	0.5	2.7	0.4	(<i>ns</i>)

Table 2. Conditions and comparison of conditions (*t*-test for numerical variables): *: $p < 0.05$, **: $p < 0.01$, ***: $p < .001$.

	Semantically unrelated gestures		Semantically related gestures		No gesture		Comparison
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Sentence criteria							
Target verb duration (<i>ms</i>)	496	112	491	98	44	112	* (semantically unrelated vs no gesture & semantically related vs no gesture)
Gesture criteria							
Stroke type (%)	67 single (40 items) 33 repeated (20 items)		67 single (40 items) 33 repeated (20 items)				
Stroke duration including post-stroke holds (<i>ms</i>)	612	152	585	118			(<i>ns</i>)
Place of articulation (%)	35 center (21 items) 0 periphery (0 items) 65 periphery-center (39 items)		58 center (35 items) 2 periphery (1 item) 40 periphery-center (24 items)				
Trajectory (%)	83 simple (50 items) 17 complex (10 items)		83 simple (50 items) 17 complex (10 items)				

S2. Semantically unrelated and related gestures - description

(left and right as from the speaker's perspective)

Intro	List A	Semantically related gestures	List B	Semantically related gestures	Semantically unrelated gestures (for both lists)	Single vs repeated stroke	Character viewpoint vs Observer viewpoint
Look at the terrace!	Last Monday, the girl picked the lemon	right hand half closed held at shoulder level palm facing up as if holding something, then coming down right hand closed in a fist held in front of body at shoulder level, back of fist facing up/the right-hand side, then fist moving forward as if hitting something	Last Monday, the girl squeezed the lemon	right hand: hand half open in front of speaker, palm facing down, then fist closing with a rotation of the wrist	Open hand prone ('palm down') - vertical palm. The forearm is vertical so that the palm of the hand faces directly away from the speaker	single	Character
Look at the classroom!	Two weeks ago, the teacher broke the window	right hand closed in a fist, back of hand facing the right-hand side then moving several times to the front and to the back	Two weeks ago, the teacher opened the window	right hand closed in a fist held in front of speaker, back of fist facing up, then moving laterally to the right-hand side	Open hand supine ('palm up') - palm presentation. The open hand supine is presented but is not moved	single	Character
Look at the ship!	Last winter, the woman sawed the mast	right hand held horizontally in front of body at hip level, fingers pointing to the left-hand side, then fingers pointing up with a flick of the wrist and hand moving diagonally up to shoulder level	Last winter, the woman painted the mast	right hand closed in a fist, moving up and down, flexing at wrist, back of fist facing the right-hand side	Open hand supine ('palm up') - repeated palm presentation	repeated	Character
Look at the room!	Last Wednesday, the bird flew from the cage	right hand half-open moving close to the right shoulder, forearm is vertical, fingers are pointing up, as if stopping something	Last Wednesday, the bird hopped into the cage	right hand held half open in front of body at waist level, fingers half-extended pointing to the left-hand side, then hand moving up and to the left-hand side	Open hand supine ('palm up') - palm presentation. The open hand supine is presented but is not moved	single	Observer
Look at the stadium!	Last summer, the girl caught the ball	right hand held in front of body, palm facing up with fingers extended except for thumb, touching the index, doing lateral biphasic movements as if throwing something on the ground	Last summer, the girl threw the ball	right hand moving up close to the shoulder, fingers half extended, then moving forcefully away from the body towards the front	Open hand supine ('palm up') - palm presentation. The open hand supine is presented but is not moved	single	Character
Look at the zoo!	Last year, the girl fed the parrot	right hand in C-shape held in front of body, back of hand facing the body, then repeatedly moving from left to right	Last year, the girl petted the parrot	right hand open, fingers stretched, held in front of the body, palm facing down, then hand moving down and to the right-hand side, then repeating the move	Repeated power grip: the four digits are curled as if in a fist, but the thumb touches the outside of the index finger. The power grip corresponds to the prehensile posture that we give our hands when we hold certain instruments, for example, a club or a hammer	repeated	Character
Look at the hospital!	Last Winter, the doctor shook the medicine	right hand in C-shape, back of the hand facing the right-hand side, then hand quickly jerking upward then falling back in place	Last Winter, the doctor stirred the medicine	right hand closed in a fist in front of body at chest level, back of fist facing up, wrist doing small circular movements on the horizontal plane	Open hand supine ('palm up') - repeated palm presentation with half-closed hand	repeated	Character
Look at the forest!	Yesterday, the man shot the bird	right hand closed in a fist held in front of speaker, back of fist facing up, then moving laterally to the right-hand side	Yesterday, the man released the bird	right hand extended, fingers pointing to the front and the left-hand side, then hand moving slightly up and away from the body	Slice: a rapid downward movement of a flat, open hand held in vertical orientation, with the palm facing to the side	single	Character
Look at the house!	Last Tuesday, the girl opened the door	right hand in a fist held in front of body at chest level, back of fist facing up, then moving twice from left to right	Last Tuesday, the girl locked the door	right hand: hand half open in front of speaker, palm facing down, then fist closing with a rotation of the wrist	Open hand supine ('palm up') - palm addressed - the open hand supine is directed toward the viewer	single	Character
Look at the bedroom!	Three days ago, the boy ironed the jacket	right hand half closed with fingers together as if holding something small, fingers facing the body, then hand moving from right to left twice with wrist rotating clockwise as hand is moving to the left	Three days ago, the boy brushed the jacket	right hand half closed, back of hand facing up and fingers separated, then moving twice from left to right	Slice: a repeated rapid downward movement of a flat, open hand held in vertical orientation, with the palm facing to the side	repeated	Character
Look at the hospital!	Last summer, the nurse stitched the wound	right hand held in front of body in a fist, back of fist facing up, then wrist turning clockwise by 180 degrees	Last summer, the nurse sprayed the wound	right hand held in front of body, fingers bunched together except for index which is extended, palm facing the body, then index flexing and coming back to start position twice	Slice: a repeated rapid downward movement of a flat, open hand held in vertical orientation, with the palm facing to the side	repeated	Character
Look at the school!	Last week, the teacher opened the book	right hand open, fingers stretched, held in front of the body, palm facing down, then hand moving down and to the right-hand side, then repeating the move	Last week, the teacher closed the book	right palm parallel to the ground, facing up, fingers stretched to the front, then wrist rotating at 180 degrees with the hand moving simultaneously in a semi-circle to the left-hand side and palm ending up facing down	Open hand prone ('palm down') - vertical palm - the forearm is vertical so that the palm of the hand faces directly away from the speaker	single	Character
Look at the bedroom!	Two weeks ago, the man petted the cat	right hand almost closed in a fist in front of body, fingers to the front and back of hand facing the right-hand side, then hand moving up and down	Two weeks ago, the man brushed the cat	right hand half closed, back of hand facing up and fingers separated, then moving twice from left to right	Open hand supine ('palm up') - repeated palm presentation	repeated	Character
Look at the kitchen!	Three months ago, the man cut the potato	right hand closed in a fist held in front of body at chest level, back of fist to the right-hand side, wrist then rotating to the left so that fingers face down	Three months ago, the man mashed the potato	right hand closed as if holding something in front of speaker, back of hand facing the right-hand side, then hand moving several times up and down as if crushing something	Open hand supine ('palm up') - repeated palm presentation	repeated	Character
Look at the terrace!	Yesterday, the boy watered the orchid	right hand held in front of body, fingers bunched together except for index which is extended, palm facing the body, then index flexing and coming back to start position	Yesterday, the boy sprayed the orchid	right hand held in front of body, fingers bunched together except for index which is extended, palm facing the body, then index flexing and coming back to start position	Open hand prone ('palm down') - vertical palm - the forearm is vertical so that the palm of the hand faces directly away from the speaker	single	Character

Look at the field!	Yesterday, the rabbit hopped into the burrow	right hand held half open in front of body at waist level, fingers together pointing away from the speaker, then wrist rotating so that fingers point to the left-hand side and hand moving up and to the left-hand side	Yesterday, the rabbit darted from the burrow	right hand open held tilted diagonally in front of body at waist level, palm facing down, fingers pointing up and to the left-hand side, then wrist rotating so that palm faces the left-hand side and hand moving away from the body, fingers pointing away from the body	Open hand supine ('palm up') - palm presentation. The open hand supine is presented but is not moved	single	Observer
Look at the garden!	A week ago, the pensioner swatted the bug	right hand closed in a fist, back of hand facing the right-hand side, then fist coming away from the body with an up-and-down movement	A week ago, the pensioner caught the bug	right hand half open held in front of body, back of hand facing up, fingers pointing away from the body, then hand coming up and to the front and closing at the same time	Open hand prone ('palm down') - vertical palm - the forearm is vertical so that the palm of the hand faces directly away from the speaker	single	Character
Look at the garage!	Last Wednesday, the man sanded the plank	right hand half closed, back of hand facing up and fingers separated, then moving twice from left to right	Last Wednesday, the man wiped the plank	right hand open, fingers spread, palm facing away from the body, doing circular motions on the vertical plane	Repeated power grip: the four digits are curled as if in a fist, but the thumb touches the outside of the index finger. The power grip corresponds to the prehensile posture that we give our hands when we hold certain instruments, for example, a club or a hammer	repeated	Character
Look at the orchard!	Last spring, the gardener hammered the post	right hand closed as if holding something in front of speaker, back of hand facing the right-hand side, then hand moving up and down twice	Last Spring, the gardener shook the post	right hand in O-shape, back of hand facing the right-hand side, fingers bunched together except for thumb, then hand moving repeatedly from back to front	Open hand supine ('palm up') - repeated palm presentation	repeated	Character
Look at the kitchen!	Two years ago, the man ground the pepper	right hand closed in a fist in front of body at chest level, back of fist facing up, wrist doing circular anticlockwise movements on the horizontal plane	Two years ago, the man sprinkled the pepper	right hand in C-shape held in front of body, back of hand facing up/the body, then repeatedly moving from left to right	Slice: a repeated rapid downward movement of a flat, open hand held in vertical orientation, with the palm facing to the side	repeated	Character
Look at the water!	Last autumn, the boy dived into the river	right hand at shoulder level, palm facing down, fingers not quite extended, pointing down then hand going down and to the left-hand side	Last autumn, the boy swam across the river	right hand held in front of body, fingers half spread pointing to the left-hand side, palm facing down, then hand moving to the left-hand side	Open hand prone ('palm down') - vertical palm - the forearm is vertical so that the palm of the hand faces directly away from the speaker and fingers are half flexed	single	Observer
Look at the mountain!	Last month, the child climbed up the cliff	right hand held diagonally in front of body at hip level, fingers pointing up, palm facing down, then hand moving up and to the left-hand side	Last month, the child jumped from the cliff	right hand held open at shoulder level, palm facing down, fingers pointing to the left, then hand quickly moving down and to the left	Open hand supine ('palm up') - palm presentation. The open hand supine is presented but is not moved	single	Observer
Look at the water!	Two days ago, the plane flew above the lake	right hand held at shoulder level in front of body, fingers extended and pointing to the left-hand side, palm facing down, then hand moving to the left-hand side	Two days ago, the plane crashed in the lake	right hand at shoulder level, palm facing down, fingers extended, pointing down then hand going down and to the left-hand side	Flick of the hand: hand (horizontal, palm facing down, fingers don't touch) rises short way up and drops back down	single	Observer
Look at the traffic!	Last night, the cyclist swerved on the road	right hand: palm facing the left-hand side, extended fingers pointing away from speaker, hand then moving in a semi-circle to the right-hand side and away from the body	Last night, the cyclist fell on the road	right hand held in front of body, palm facing the left-hand side, extended fingers pointing to the front, then wrist rotating so that palm faces down	Open hand prone ('palm down') - vertical palm - the forearm is vertical so that the palm of the hand faces directly away from the speaker	single	Observer
Look at the building!	Last spring, the aerial swayed on the roof	right hand: fingers extended, palm vertical facing the side, moving to the right then to the left-hand side with a flick of the wrist	Last spring, the aerial broke on the roof	right hand held at shoulder level, fingers extended pointing away from the speaker, palm to the left-hand side, then wrist rotating so that palm faces down	Open hand supine ('palm up') - lateral movement. The movement of the hand is lateral, away from the speaker's mid-line	single	Observer
Look at the gym!	Two weeks ago, the boy swung on the rope	right hand open at chest level, fingers pointing away from the body, then hand moving to the left-hand side in a semi-circle with a twist of the wrist, ending with palm facing up	Two weeks ago, the boy climbed up the rope	right hand held vertically in front of body at hip level, fingers pointing up, then hand moving up to shoulder level	Open hand supine ('palm up') - palm addressed - the open hand supine is directed toward the viewer	single	Observer
Look at the house!	Last Monday, the dog jumped on the sofa	right hand held half open in front of body, fingers together pointing to the left-hand side, then hand moving up and to the left-hand side	Last Monday, the dog climbed down the sofa	right hand held horizontally in front of body at chest level, fingers pointing to the left then hand moving down and to the left-hand side to waist level	Open hand prone ('palm down') - horizontal palm. The palm of the hand is held so that it faces obliquely away (hand is moved is a rapid horizontal lateral movement, away from the midline of the speaker's body).	single	Observer
Look at the garden!	Three weeks ago, the ball rolled across the grass	right hand closed held at chest level with index pointing to the left, back of hand facing up, then hand moving to the left-hand side and away from the speaker	Three weeks ago, the ball bounced on the grass	right hand open with index extended pointing away from the speaker, then hand moving twice in semicircles up then down and to the right-hand side	Open hand supine ('palm up') - palm presentation. The open hand supine is presented but is not moved	single	Observer
Look at the house!	Three days ago, the teenager walked up the staircase	right hand held at waist level, palm facing down, fingers pointing to the left-hand side, then wrist rotating to that fingers point up and hand moving diagonally upwards to shoulder level	Three days ago, the teenager tumbled down the staircase	right hand open held at shoulder level, palm facing down, fingers pointing to the left, then fingers pointing down with a flick of the wrist and hand moving diagonally downwards to hip level	Open hand supine ('palm up') - palm presentation. The open hand supine is presented but is not moved	single	Observer
Look at the kitchen!	Three days ago, the man emptied the bottle	right hand in C-shape, palm facing the left-hand side, fingers pointing to the front, hand and forearm then moving to the left-hand side with a flexion of the elbow so that fingers face down	Three days ago, the man opened the bottle	right hand almost closed in a fist, index and thumb together facing down, then quick clockwise movement of the wrist so that back of fist faces the right-hand side	Open hand supine ('palm up') - palm presentation. The open hand supine is presented but is not moved	single	Character
Practice items							
Look at the road!	Five years ago, the lorry overturned on the bridge	right hand held at waist level, palm up, fingers together pointing away from the body, palm facing the side, then rotation of the wrist so that the palm faces down	Five years ago, the lorry tumbled off the bridge	right hand open held at shoulder level, palm facing down, fingers pointing to the left-hand side, then hand moving downward diagonally to waist level	Open hand prone ('palm down') - vertical palm - the forearm is vertical so that the palm of the hand faces directly away from the speaker	single	Observer

Look at the countryside!	Yesterday, the horse reared on the hill	right hand held flat in front of body at waist level, palm facing down, fingers pointing to the left-hand side, then elbow rotating so that forearm sways to the right-hand side then slightly to the left, fingers pointing up and palm facing the left-hand side	Yesterday, the horse walked down the hill	right hand held half open in front of body at shoulder level, palm facing down, then moving laterally and downwards at the same time, fingers pointing down	Slice: a rapid downward movement of a flat, open hand held in vertical orientation, with the palm facing to the side	single	Observer
Look at the factory!	Last year, the worker turned the handle	right hand half closed in a fist held in front of body at chest level, palm facing down, then wrist twisting and hand moving to the right-hand side so that back of fist faces the left-hand side	Last year, the worker pulled the handle	right hand in a fist in front of body, fingers to the front, back of hand facing up, then fist closing coming closer to the chest	Open hand supine ('palm up') - palm addressed - the open hand supine is directed toward the viewer	single	Character
Look at the kitchen!	Last Spring, the girl ground the meat	right hand closed in a fist in front of body at chest level, back of fist facing up, wrist doing circular anticlockwise movements on the horizontal plane	Last Spring, the girl sliced the meat	right hand almost closed in a fist in front of body, fingers to the front and back of hand facing the right-hand side, then hand moving up and down	Open hand supine ('palm up') - repeated palm presentation	repeated	Character
Look at the savannah!	A year ago, the lion jumped on the rock	right hand held half open in front of body at waist level, fingers together pointing away from the body, then wrist rotating so that fingers face the left-hand side and hand moving up and to the left-hand side	A year ago, the lion crawled around the rock	right hand held at chest level, palm facing the left-hand side, extended fingers pointing away from speaker, hand then moving in a semi-circle to the right-hand side and away from the body	Slice: a rapid downward movement of a flat, open hand held in vertical orientation, with the palm facing to the side	single	Observer