

A guide to the interpretation of the KINE-ADL BE-UJI dataset

March 2019

Biomechanics and Ergonomics Research Group

Universitat Jaume I (Spain)

Contents

0. Key data.....	3
1. Introduction.....	4
2. Experiment.....	4
2.1. Equipment.....	4
2.2. Data acquisition.....	5
2.3. Study participants	5
2.4. Environment	6
2.5. Objects.....	10
2.6. Recorded tasks	10
3. Data processing.....	13
4. Data files	13
4.1. Filenames.....	13
4.2. Data series	14
4.3. Sign criteria	16
5. References.....	16
Appendix I: Objects	17
Appendix II: Tasks	24
Experiment A.....	25
Experiment B.....	28

0. Key data

- **Research group:** BE-UJI
- **Data type:** Motion data, hand postures
- **Hand type:** Human hand
- **Hand recorded:** Right and left
- **Data structure:** Joint angles (deg)
- **Data format:** Matlab structure (.mat)
- **Sampling rate:** 100Hz
- **Action type:** Feeding and cooking activities of daily living
- **Kin. Model #DoF:** 18
- **Equipment:** Motion capture system (CyberGlove)
- **Number of subjects:** 20
- **Number of tasks:** 178
- **Objects type:** Real objects
- **Data filtering:** Low pass 2nd order two-way Butterworth filter, cut-off freq. 10Hz
- **Year:** 2017
- **Additional data:** Age, gender, laterality, weight, height, hand length, hand width and measured AROM of the subjects recruited.

Contact:

Alba Roda-Sales: rodas@uji.es

Margarita Vergara: vergara@uji.es

Joaquín L. Sancho-Bru: sancho@uji.es

1. Introduction

This document is a guide to the interpretation of the KINE-ADL BE-UJI DATASET. This dataset is the result of recording the kinematics of the hands of 20 subjects while performing feeding and cooking activities of daily living, with a total of 58 records per subject (7h, 30min 43s of recordings throughout the whole experiment). These activities were carried out with real objects that are representative of the most commonly used ones, based on those proposed in the YCB Set.

The parameters related to the acquisition, processing and presentation of the data are detailed in the following sections of the document. All the recorded activities are explained in detail, as well as the environment and the objects used to carry them out.

2. Experiment

2.1. Equipment

Data acquisition was performed using two CyberGlove instrumented gloves (CyberGlove II on the right hand and CyberGlove III on the left hand). Each of these gloves has 18 strain gauges that allow the anatomical angles of the underlying joints to be determined.

A 0-255 signal is obtained from each gauge. The angle rotated by each joint with respect to the reference posture (Figure 1) is then calculated from these signals, according to the calibration protocol proposed in [1]. This protocol includes the determination of gains and also some corrections because of cross-coupling effects for specific anatomical angles.



Figure 1: Reference posture (hands resting flat on the table, with the fingers and thumb close together, and with the middle fingers aligned with the forearms).

The anatomical angles obtained according to protocol [1] are those shown in Figure 2:

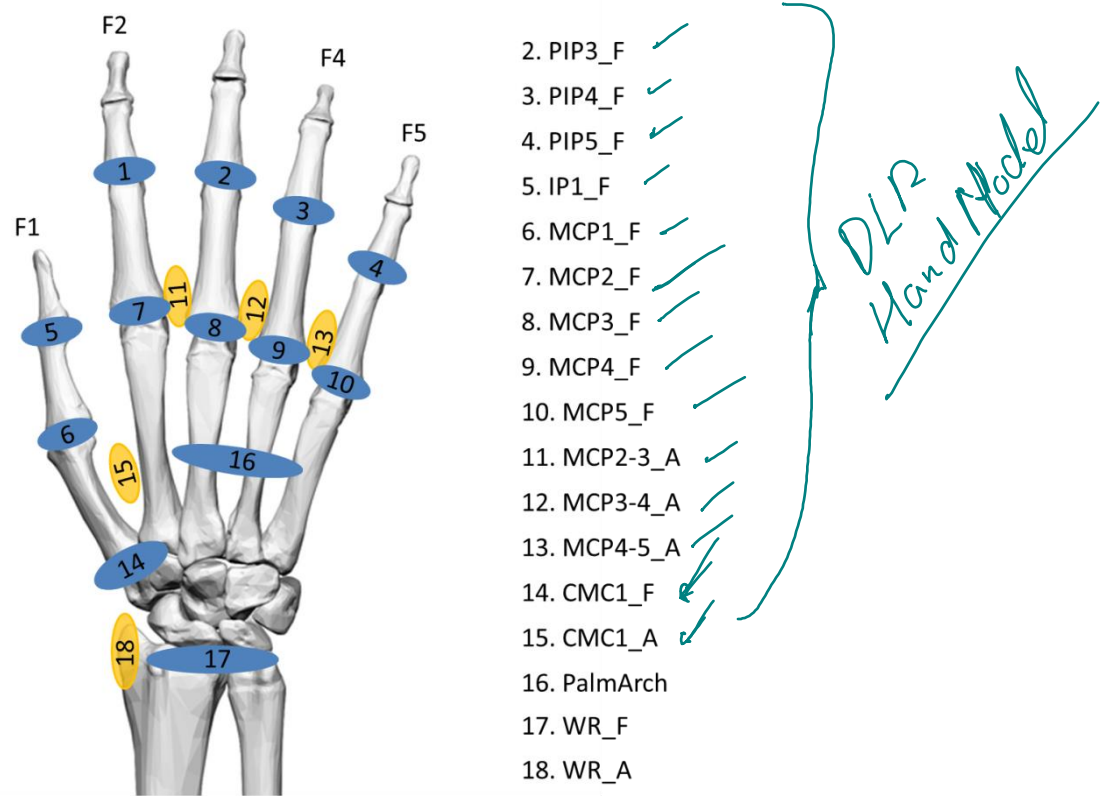


Figure 2: Nomenclature: *_F* for flexion (in blue), *_A* for abduction (in yellow); 1 to 5, digits. Joints: *IP* for interphalangeal joint, *PIP* for proximal interphalangeal joints, *MCP* for metacarpophalangeal joints, *CMC* for carpometacarpal joints, *PalmArch* for palmar arch, *WR* for wrist.

2.2. Data acquisition

CyberGlove data for the reference posture and the movements during the performance of the different tasks were acquired at 100Hz for each subject.

2.3. Study participants

The study consisted of two experiments (A and B), with 20 subjects (10 males, 10 females) participating in each experiment. Only 15 subjects participated in both experiments, so that the total amount of subjects recruited was 25. In both experiments, two of the subjects were left-handed. The mean age of subjects recruited was 35.5 ± 7.67 years in experiment A and 38.05 ± 9.52 years in experiment B. The criteria used to select subjects were gender parity in overall data, age between 20 and 65, no reported upper limb pathologies and laterality representative of the overall population (20% of data from left-handed individuals). Before the experiments, all participants gave their written informed consent. All the experiments were performed in accordance with the Ethics Committee of the Universitat Jaume I.

2.4. Environment

The tasks were performed in the laboratory, within an environment that simulated a kitchen. The scenario was composed of: a refrigerator (Scenario 1) (Figure 3), a high cabinet (Scenario 2) (Figure 4), shelves (Scenario 3) (Figure 5, Figure 6), a small worktop (Scenario 4) (Figure 7), a sink and a rubbish bin (Scenario 5) (Figure 8), a large worktop (Scenario 6) (Figure 9), a low cabinet with a drawer in its upper part (Figure 10) and shelves in the lower part, which has a door (Scenario 7) (Figure 11), a table and a chair (Scenario 8) (Figure 12) and an oven (Scenario 9) (Figure 13).



Figure 3: Fridge (Scenario 1)



Figure 4: High cabinet (Scenario 2)



Figure 5: Shelves (Scenario 3)



Figure 6: Close-up of the shelves (Scenario 3)



Figure 7: Small worktop (Scenario 4)



Figure 8: Sink and rubbish bin (Scenario 5)



Figure 9: Large worktop (Scenario 6)



Figure 10: Cabinet with drawer in its upper part (Scenario 7a)



Figure 11: Cabinet with a door and shelves in its lower part (Scenario 7b).



Figure 12: Table with chair (Scenario 8).

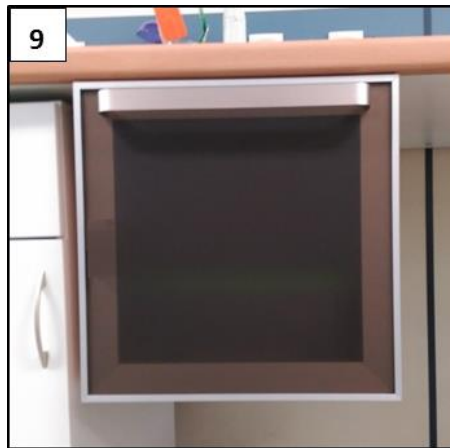


Figure 13: Oven (Scenario 9).

2.5. Objects

The 66 objects used in the recorded tasks, together with their main characteristics, are detailed in Appendix I. Some of the objects were not real, in order to prevent the gloves from getting stained or wet. For example, in the task of breaking eggs, the eggs were previously emptied through a small hole made in the shell. All liquids were replaced by water, and materials such as flour or sugar that could have stained the gloves were replaced by durum wheat semolina. Pieces of polystyrene or cardboard were used to simulate biscuits, bread or crisps. The location of the objects in each scenario was as shown in Figure 3 to Figure 13 with the exceptions detailed in the tables in Appendix II for each task.

2.6. Recorded tasks

Two experiments (A and B) were performed. In experiment A, the activities performed were: having breakfast (preparing and having it), preparing a cake and preparing omelettes. In experiment B, the activities were: setting the table, cleaning the table and washing the dishes, making coffee and preparing a simple

meal. The recording of these activities was divided into 33 recordings (R) in experiment A and 25 in experiment B. These recordings can be seen in the following tables, where a registration number (R) was assigned so that the one-hundred ones (100 onwards) belong to experiment A, while the two-hundred ones belong to experiment B. Some of the records were performed with the subject standing and others while sitting on a chair (specified in the table with an “S” if sitting). Furthermore, the scenario where the tasks were performed is specified (as “SC.”), as well as the objects used (specified as “OBJ.”). All the eating or drinking activities were simulated, by just bringing the food closer to the mouth, and this has been indicated in the task description.

Recordings of experiment A are presented in Table 1.

R	OBJ.	SC.	S	PREPARING AND HAVING BREAKFAST
101	6, 38, 40, 41, 62	2, 3a, 4		Using a toaster.
102	6, 40, 41, 62	4, 8		Setting the table: placing the toast.
103	42, 51, 60	1, 3a, 8		Setting the table: placing a box of biscuits, a carton of milk and an apple.
104	10, 11, 50, 55	1, 2, 8		Setting the table: placing a jar of jam, a tub of butter, a mug and a glass.
105	3, 4	7a, 8		Setting the table: placing a spoon and a knife and sitting on the chair.
106	11, 51	8	x	Pouring and drinking milk.
107	11, 42, 66	8	x	Dipping a biscuit in milk and eating it.
108	10, 57	8	x	Pouring and drinking juice.
109	3, 41, 50	8	x	Spreading butter on toast.
110	4, 41, 55	8	x	Spreading jam on toast and eating it.
111	60	8	x	Eating (simulated) the apple.
R	OBJ.	SC.	S	PREPARING, BAKING AND EATING A CAKE
112	8, 53, 61	1, 2, 6		Carrying utensils and ingredients to the worktop: a bowl, a carton of eggs and a lemon.
113	43, 44, 46	3a, 6		Carrying ingredients to the worktop: a jar with flour in it, a bag of sugar and a box of baking powder.
114	10, 52	1, 2, 6		Carrying utensils and ingredients to the worktop: a carton of milk and a glass.
115	8, 53, 54	5, 6		Breaking an egg into a bowl and throwing the eggshell into the bin.
116	2, 8	6, 7a		Beating the egg with a fork.
117	10, 43	6		Filling a glass with sugar.
118	23, 61	3b, 6		Grating a lemon.
119	1, 10, 44	6, 7a		Filling a glass with flour.
120	8, 10, 19, 52	6, 7a		Opening a carton of milk with scissors and pouring milk.
121	46	6		Pouring baking powder into the bowl.
122	8, 39	6		Using a mixer to mix the ingredients for the cake dough.
123	8, 17, 28	3b, 6		Pouring the cake dough onto the baking tray and using a spatula.
124	28	6, 9		Putting the baking tray into the oven. Taking the baking tray out of the oven.
125	3, 26, 28	6, 7a		Cutting a piece of cake with a knife and eating it (simulated).
126	52, 53, 61	1, 6		Putting the spatula, the knife, the bowl, the glass and the grater in the sink.
127	52, 53, 61	1, 6		Carrying the carton of eggs, the lemon and the carton of milk back to the fridge.

128	43, 44, 46	3a, 6		Carrying the jar of flour, the bag of sugar and the baking powder to the shelves.
129	29	6, 9		Putting the tray with 3kg of food on it into the oven. Taking the tray out of the oven.
R	OBJ.	SC.	S	PREPARING OMELETTES
130	2, 8, 56	6		Beating an egg and salting it.
131	14, 15, 58	3b, 6		Preparing the pan for cooking on the hob.
132	2, 8, 14, 16	6		Cooking and serving a small omelette.
133	3, 6, 14, 15	6		Cooking, serving and cutting a big omelette.

Table 1: Recordings in experiment A.

Recordings in experiment B are presented in Table 2.

R	OBJ.	SC.	S	SETTING THE TABLE
201	32	7b, 8		Putting a tablecloth on the table.
202	2, 3, 6, 10, 31	2, 7a, 8		Placing a dish, a glass, a fork, a knife and a napkin.
203	8, 21, 22, 30	1, 3a, 8		Placing a jug of water, an oil cruet, a salt-shaker and a bowl.
R	OBJ.	SC.	S	CLEARING THE TABLE AND WASHING THE DISHES
204	10, 21, 22, 30	1, 3a, 5, 8		Putting the glass, the jug, the oil cruet and the salt-shaker back in their place.
205	3, 6	5, 8		Throwing the leftovers on the plates into the rubbish bin.
206	2, 8	5, 8		Throwing the leftovers in the bowls into the rubbish bin.
207	32	7b, 8		Removing the tablecloth from the table and folding it.
208	2, 3, 6, 8, 10, 34, 36	4, 5		Washing the glass, the bowl, the dish, the fork and the knife.
209	2, 3, 6, 8, 10, 33	2, 4, 7a		Putting the glass, the bowl, the dish, the fork and the knife back in their place.
210	33, 35	5, 6		Cleaning the worktop.
R	OBJ.	SC.	S	PREPARING AND DRINKING COFFEE
211	45	3a, 4		Taking a jar of ground coffee and opening it.
212	4, 37, 45	4		Filling the filter handle of the coffee machine with coffee.
213	12, 37, 45	2, 3a, 4		Placing a cup under the coffee machine and pressing the power button.
214	12, 20, 24	3a, 3b, 4, 8		Placing the cup of coffee and the sugar pot on a tray. Carrying it to the table.
215	37	4, 5		Throwing the used ground coffee into the rubbish bin.
216	5, 12, 24, 25	8	x	Adding sugar to the coffee, stirring and drinking it (simulated).
R	OBJ.	SC.	S	PREPARING AND EATING A SIMPLE MEAL
217	8, 26, 49	3b, 6		Pouring crisps from a bag into a bowl.
218	49, 63	6, 7a		Closing the bag of crisps with a sealing clip.
219	9, 48	3a, 5, 6		Pouring olives from a tin into a little bowl.
220	47	3a, 6		Pouring salted biscuits from a jar onto a dish.
221	6, 8, 9	6, 8		Setting the table: placing the dish and the bowls.

222	18, 59	3b, 8		Opening a bottle of wine with a corkscrew.
223	13	2, 8		Setting the table: placing a glass of wine. Sitting on the chair.
224	13, 59	8	x	Pouring wine and drinking it (simulated).
225	26, 64, 65	8	x	Eating (simulated) olives, crisps and biscuits.

Table 2: Recordings in experiment B.

Each of these records (R) is composed of different elementary tasks or parts, which are detailed in Appendix II. For example, in the activity of having breakfast (with 11 records, as seen in Table 1) record R=106 is composed of 4 elementary tasks: opening the carton, pouring, closing the carton and drinking (see Table 3). For an unambiguous identification of each of the tasks, a unique ID was assigned for each elementary task, with a total of 99 elementary tasks in experiment A and 79 in B. In Appendix II, the object/s used in each of the tasks are also specified. All the elementary tasks involved grasping or manipulating a product or element with the hands, except for some cases where the subject moved without handling anything, which were labelled as "Displacement without manipulation". For each elementary task, the record considers all time instants since the object was grasped until it was released. In those cases in which the object was released in a specific place or transported to a specific part of the scenario, this place is specified in the description of the elementary task. In all other cases, the release was performed on the closest surface to the subject (table, worktop, etc.).

R	ID	OBJ.	SC.	S	HAVING BREAKFAST
106	16	51	8	x	Opening the cap of the carton of milk
	17	11, 51	8	x	Pouring milk into the mug from the carton
	18	51	8	x	Closing the carton of milk
	19	11	8	x	Drinking from the mug (simulated)

Table 3: Elementary tasks into which task n°106 is divided.

3. Data processing

The raw data collected from the CyberGlove gloves were processed with Matlab to obtain the parameters corresponding to each joint based on the gains and corrections calculated for each of the gauges, according to the protocol presented in [1]. After that, the initial and final instants of each record, in which the hands were static, were removed. The records were then separated into the different elementary tasks as detailed in Appendix II. Finally, the data were filtered with a 2nd order two-way low pass Butterworth filter with a cut-off frequency of 10Hz.

4. Data files

4.1. Filenames

Data is presented as a single Matlab data structure (BE_UJI_DATASET.mat), which is composed of two secondary structures (KINEMATIC_DATA and

SUBJECT_DATA). KINEMATIC_DATA contains all kinematic data recorded, classified by experiment, record, part and subject, while SUBJECT_DATA contains data of the subjects recruited (age, gender, laterality, weight, height, hand length, hand width and measured AROM).

4.2. Data series

The fields contained in both substructures are those detailed in the following schemes:

KINEMATIC DATA

• EXPERIMENT	ID of the experiment.	
• SUBJECT	ID of the subject.	
• RECORD (R)	ID of the recording.	
• ID	ID of the task.	
• ANGLES	• Time	Time stamp
	• R_CMC1_F	Flexion of carpometacarpal 1 (Right hand)
	• R_CMC1_A	Abduction of carpometacarpal 1 (Right hand)
	• R_MCP1_F	Flexion of metacarpophalangeal 1 (Right hand)
	• R_IP1_F	Flexion of interphalangeal 1 (Right hand)
	• R_MCP2_F	Flexion of metacarpophalangeal 2 (Right hand)
	• R_MCP2-3_A	Relative Abduction of metacarpophalangeal 2 and 3 (Right hand)
	• R_PIP2_F	Flexion of proximal interphalangeal 2 (Right hand)
	• R_MCP3_F	Flexion of metacarpophalangeal 3 (Right hand)
	• R_PIP3_F	Flexion of proximal interphalangeal 3 (Right hand)
	• R_MCP4_F	Flexion of metacarpophalangeal 4 (Right hand)
	• R_MCP3-4_A	Relative Abduction of metacarpophalangeal 3 and 4 (Right hand)
	• R_PIP4_F	Flexion of proximal interphalangeal 4 (Right hand)
	• R_PalmArch	Palmar Arch (Right hand)
	• R_MCP5_F	Flexion of metacarpophalangeal 5 (Right hand)
	• R_MCP4-5_A	Relative Abduction of metacarpophalangeal 4 and 5 (Right hand)
	• R_PIP5_F	Flexion of proximal interphalangeal 5 (Right hand)
	• R_WR_F	Flexion of wrist (Right hand)*
	• R_WR_A	Abduction of wrist (Right hand)*
	• L_CMC1_F	Flexion of carpometacarpal 1 (Left hand)
	• L_CMC1_A	Abduction of carpometacarpal 1 (Left hand)
	• L_MCP1_F	Flexion of metacarpophalangeal 1 (Left hand)
	• L_IP1_F	Flexion of interphalangeal 1 (Left hand)
	• L_MCP2_F	Flexion of metacarpophalangeal 2 (Left hand)
	• L_MCP2-3_A	Relative Abduction of metacarpophalangeal 2 and 3 (Left hand)
	• L_PIP2_F	Flexion of proximal interphalangeal 2 (Left hand)
	• L_MCP3_F	Flexion of metacarpophalangeal 3 (Left hand)
	• L_PIP3_F	Flexion of proximal interphalangeal 3 (Left hand)
	• L_MCP4_F	Flexion of metacarpophalangeal 4 (Left hand)
	• L_MCP3-4_A	Relative Abduction of metacarpophalangeal 3 and 4 (Left hand)
	• L_PIP4_F	Flexion of proximal interphalangeal 4 (Left hand)
	• L_PalmArch	Palmar Arch (Left hand)
	• L_MCP5_F	Flexion of metacarpophalangeal 5 (Left hand)
	• L_MCP4-5_A	Relative Abduction of metacarpophalangeal 4 and 5 (Left hand)
	• L_PIP5_F	Flexion of proximal interphalangeal 5 (Left hand)
	• L_WR_F	Flexion of wrist (Left hand)*
	• L_WR_A	Abduction of wrist (Left hand)*

*Some wrist angles are missing because of improper fitting of the wrist sensors to some subjects' hands.

SUBJECT DATA

• SUBJECT	ID of the subject.	
• GENDER	(1=male, 2=female)	
• LATERALITY	(1=right handed, 2=left handed)	
• AGE	Age when experiment was performed (2017)	
• WEIGHT	(kg)	
• HEIGHT	(cm)	
• HL_R	Right hand length (mm)	
• HL_L	Left hand length (mm)	
• HW_R	Right hand width (mm)	
• HW_L	Left hand width (mm)	
• AROM	• R_CMC1_F	Max. Flexion of carpometacarpal 1 (Right hand)
	• R_CMC1_E	Min. Flexion (=Extension) of carpometacarpal 1 (Right hand)
	• R_CMC1_A	Max. Abduction of carpometacarpal 1 (Right hand)
	• R_MCP1_F	Max. Flexion of metacarpophalangeal 1 (Right hand)
	• R_MCP1_E	Min. Flexion (=Extension) of metacarpophalangeal 1 (Right hand)
	• R_IP1_F	Max. Flexion of interphalangeal 1 (Right hand)
	• R_IP1_E	Min. Flexion (=Extension) of interphalangeal 1 (Right hand)
	• R_MCP2_F	Max. Flexion of metacarpophalangeal 2 (Right hand)
	• R_MCP2_E	Min. Flexion (=Extension) of metacarpophalangeal 2 (Right hand)
	• R_MCP2-3_A	Max. Relative abduction of metacarpophalangeal 2 and 3 (Right hand)
	• R_PIP2_F	Max. Flexion of proximal interphalangeal 2 (Right hand)
	• R_PIP2_E	Min. Flexion (=Extension) of proximal interphalangeal 2 (Right hand)
	• R_MCP3_F	Max. Flexion of metacarpophalangeal 3 (Right hand)
	• R_MCP3_E	Min. Flexion (=Extension) of metacarpophalangeal 3 (Right hand)
	• R_PIP3_F	Max. Flexion of proximal interphalangeal 3 (Right hand)
	• R_PIP3_E	Min. Flexion (=Extension) of proximal interphalangeal 3 (Right hand)
	• R_MCP4_F	Max. Flexion of metacarpophalangeal 4 (Right hand)
	• R_MCP4_E	Min. Flexion (=Extension) of metacarpophalangeal 4 (Right hand)
	• R_MCP3-4_A	Max. Relative Abduction of metacarpophalangeal 3 and 4 (Right hand)
	• R_PIP4_F	Max. Flexion of proximal interphalangeal 4 (Right hand)
	• R_PIP4_E	Min. Flexion (=Extension) of proximal interphalangeal 4 (Right hand)
	• R_PalmArch	Max. Palmar Arch (Right hand)
	• R_MCP5_F	Max. Flexion of metacarpophalangeal 5 (Right hand)
	• R_MCP5_E	Min. Flexion (=Extension) of metacarpophalangeal 5 (Right hand)
	• R_MCP4-5_A	Max. Relative Abduction of metacarpophalangeal 4 and 5 (Right hand)
	• R_PIP5_F	Max. Flexion of proximal interphalangeal 5 (Right hand)
	• R_PIP5_E	Min. Flexion (=Extension) of proximal interphalangeal 5 (Right hand)
	• R_WR_F	Max. Flexion of wrist (Right hand)*
	• R_WR_E	Min. Flexion (=Extension) of wrist (Right hand)*
	• R_WR_UD	Max. Abduction (=Ulnar deviation) of wrist (Right hand)*
	• R_WR_RD	Min. Abduction (=Radial deviation) of wrist (Right hand)*
	• L_CMC1_F	Max. Flexion of carpometacarpal 1 (Left hand)
	• L_CMC1_E	Min. Flexion (=Extension) of carpometacarpal 1 (Left hand)
	• L_CMC1_A	Max. Abduction of carpometacarpal 1 (Left hand)
	• L_MCP1_F	Max. Flexion of metacarpophalangeal 1 (Left hand)
	• L_MCP1_E	Min. Flexion (=Extension) of metacarpophalangeal 1 (Left hand)
	• L_IP1_F	Max. Flexion of interphalangeal 1 (Left hand)
	• L_IP1_E	Min. Flexion (=Extension) of interphalangeal 1 (Left hand)
	• L_MCP2_F	Max. Flexion of metacarpophalangeal 2 (Left hand)
	• L_MCP2_E	Min. Flexion (=Extension) of metacarpophalangeal 2 (Left hand)
	• L_MCP2-3_A	Max. Relative abduction of metacarpophalangeal 2 and 3 (Left hand)
	• L_PIP2_F	Max. Flexion of proximal interphalangeal 2 (Left hand)
	• L_PIP2_E	Min. Flexion (=Extension) of proximal interphalangeal 2 (Left hand)
	• L_MCP3_F	Max. Flexion of metacarpophalangeal 3 (Left hand)
	• L_MCP3_E	Min. Flexion (=Extension) of metacarpophalangeal 3 (Left hand)
	• L_PIP3_F	Max. Flexion of proximal interphalangeal 3 (Left hand)
	• L_PIP3_E	Min. Flexion (=Extension) of proximal interphalangeal 3 (Left hand)
	• L_MCP4_F	Max. Flexion of metacarpophalangeal 4 (Left hand)
	• L_MCP4_E	Min. Flexion (=Extension) of metacarpophalangeal 4 (Left hand)
	• L_MCP3-4_A	Max. Relative Abduction of metacarpophalangeal 3 and 4 (Left hand)
	• L_PIP4_F	Max. Flexion of proximal interphalangeal 4 (Left hand)
	• L_PIP4_E	Min. Flexion (=Extension) of proximal interphalangeal 4 (Left hand)
• L_PalmArch	Max. Palmar Arch (Left hand)	
• L_MCP5_F	Max. Flexion of metacarpophalangeal 5 (Left hand)	
• L_MCP5_E	Min. Flexion (=Extension) of metacarpophalangeal 5 (Left hand)	
• L_MCP4-5_A	Max. Relative Abduction of metacarpophalangeal 4 and 5 (Left hand)	
• L_PIP5_F	Max. Flexion of proximal interphalangeal 5 (Left hand)	
• L_PIP5_E	Min. Flexion (=Extension) of proximal interphalangeal 5 (Left hand)	
• L_WR_F	Max. Flexion of wrist (Left hand)*	
• L_WR_E	Min. Flexion (=Extension) of wrist (Left hand)*	
• L_WR_UD	Max. Abduction (=Ulnar deviation) of wrist (Left hand)*	
• L_WR_RD	Min. Abduction (=Radial deviation) of wrist (Left hand)*	

*Some wrist angles are missing because of improper fitting of the wrist sensors to some subjects' hands.

4.3. Sign criteria

- **PIP(2-5)_F, IP1_F, CMC1_F, MCP(1-5)_F, WR_F:** Flexion + / Extension -
- **MCP(2-3, 3-4, 4-5)_A:** Fingers separated + / Fingers together -
- **PalmArch:** Flexion +/Extension -
- **CMC1_F:** Flexion +/Extension - (See Figure 14)
- **CMC1_A:** Abduction +/Adduction - (See Figure 14)
- **WR_A:** Ulnar deviation +/Radial deviation -

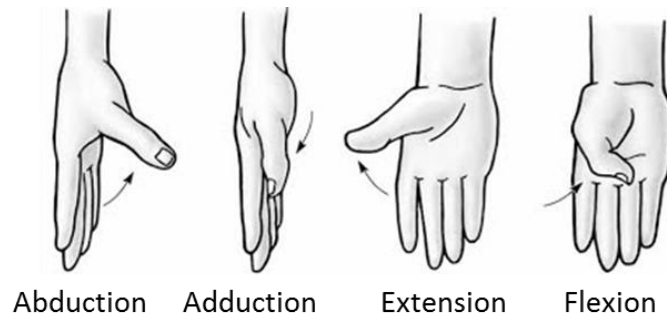










Figure 14: Movements of the carpometacarpal joint.

5. References

- [1] V. Gracia-Ibáñez, M. Vergara, J. H. Buffi, W. M. Murray, and J. L. Sancho-Bru, “Across-subject calibration of an instrumented glove to measure hand movement for clinical purposes,” *CMBBE. Computer Methods in Biomechanics and Biomedical Engineering*, vol. 20, no. 6, pp. 587–597, 2017.

Appendix I: Objects

<p>1. Soup spoon</p>  <p>Weight: 50g Material: Stainless steel and plastic.</p>	<p>2. Fork</p>  <p>Weight: 40g Material: Stainless steel and plastic.</p>	<p>3. Knife</p>  <p>Weight: 40g Material: Stainless steel and plastic.</p>
<p>4. Dessertspoon</p>  <p>Weight: 20g Material: Stainless steel.</p>	<p>5. Coffee spoon</p>  <p>Weight: 15g Material: Stainless steel.</p>	<p>6. Plate</p>  <p>Weight: 740g Material: Ceramic. Dimensions: Ø280mm</p>
<p>7. Dish</p>  <p>Weight: 580g Material: Ceramic. Dimensions: Ø245mm</p>	<p>8. Medium-sized bowl</p>  <p>Weight: 600g Material: Glass. Dimensions: Ø280mm</p>	<p>9. Small bowl</p>  <p>Weight: 210g Material: Glass. Dimensions: Ø220mm</p>
<p>10. Glass</p>  <p>Weight: 210g Material: Glass. Dimensions: Ø76mm</p>	<p>11. Mug</p>  <p>Weight: 320g Material: Ceramic. Dimensions: Ø80mm Handle width=15mm</p>	<p>12. Coffee cup</p>  <p>Weight: 135g Material: Ceramic. Dimensions: Ø62-45mm Handle width=10mm</p>

<p>13. Wine glass</p>  <p>Weight: 180g Material: Glass. Dimensions: Ø80mm Handle Ø=8mm</p>	<p>14. Frying pan</p>  <p>Weight: 480g Material: Steel and plastic. Dimensions: Handle thickness=35×15mm</p>	<p>15. Pan lid</p>  <p>Weight: 90g Material: Aluminium and plastic. Dimensions: Handle Ø=28mm</p>
<p>16. Slotted spoon</p>  <p>Weight: 60g Material: Plastic. Dimensions: Handle thickness=20×10mm</p>	<p>17. Spatula</p>  <p>Weight: 100g Material: Steel, aluminium and silicone. Dimensions: Handle thickness=30×20mm</p>	<p>18. Corkscrew</p>  <p>Weight: 70g Material: Stainless steel.</p>
<p>19. Scissors</p>  <p>Weight: 150g Material: Stainless steel and plastic.</p>	<p>20. Tray</p>  <p>Weight: 200g Material: Plastic.</p>	<p>21. Oil cruet</p>  <p>Weight: 260g Material: Plastic (with water as oil). Dimensions: Ø60mm</p>
<p>22. Jug of water</p>  <p>Weight: 1440g Material: Glass (with water). Dimensions: Handle thickness=10×10mm</p>	<p>23. Grater</p>  <p>Weight: 175g Material: Stainless steel and elastomeric plastic.</p>	<p>24. Sugar pot</p>  <p>Weight: 200g Material: Plastic (with durum wheat semolina as sugar). Dimensions: Ø85mm.</p>

<p>25. Sugar pot spoon</p>  <p>Weight: <10g Material: Plastic.</p>	<p>26. Crisps</p>  <p>Weight: <10g Material: Extruded polystyrene.</p>	<p>27. Piece of cake</p>  <p>Weight: <10g Material: Extruded polystyrene.</p>
<p>28. Baking tray</p>  <p>Weight: 530g Material: Stainless steel. Extruded polystyrene as cake.</p>	<p>29. Tray with 3 kg</p>  <p>Weight: 3030g Material: Stainless steel and packet of paper.</p>	<p>30. Salt-shaker</p>  <p>Weight: 250g Material: Glass and stainless steel (with durum wheat semolina as salt). Dimensions: Handle Ø=53mm.</p>
<p>31. Napkin</p>  <p>Material: Paper.</p>	<p>32. Tablecloth</p>  <p>Weight: 690g Material: Cloth.</p>	<p>33. Dishcloth</p>  <p>Material: Cloth.</p>
<p>34. Dish sponge</p>  <p>Weight: <10g Material: Sponge.</p>	<p>35. Spray bottle</p>  <p>Weight: 80g Material: Plastic (empty bottle).</p>	<p>36. Bottle of washing-up liquid</p>  <p>Weight: 100g Material: Plastic (empty bottle).</p>

<p>37. Coffee machine</p>  <p>Weight: 240g (handle). Material: Steel and plastic (handle). Dimensions: Handle $\varnothing=35\text{mm}$</p>	<p>38. Toaster</p>  <p>Material: Steel and plastic.</p>	<p>39. Mixer</p>  <p>Weight: 600g Material: Steel and plastic. Dimensions: Handle $\varnothing=53\text{mm}$</p>
<p>40. Bag of sliced bread</p>  <p>Weight: 40g (6 slices of toast + sealing clip for bags) Material: Plastic.</p>	<p>41. Sliced bread for toast</p>  <p>Weight: 5g per slice of toast. Material: Extruded polystyrene.</p>	<p>42. Box of biscuits with tray inside</p>  <p>Weight 90g Material: Cardboard (box and biscuits) and plastic (tray).</p>
<p>43. Bag of sugar and sealing clip</p>  <p>Weight: 200g Material: Paper and wooden sealing clip (with durum wheat semolina as sugar).</p>	<p>44. Jar with flour</p>  <p>Weight: 1000g Material: Plastic (with durum wheat semolina as flour). Dimensions: $\varnothing120\text{mm}$</p>	<p>45. Jar of ground coffee</p>  <p>Weight: 300g Material: Glass and plastic. Durum wheat semolina as café. Dimensions: Lid $\varnothing=67\text{mm}$.</p>

<p>46. Box with baking powder</p>  <p>Weight: 20g (with 1 bag) Material: Paper and cardboard. Durum wheat semolina as baking powder.</p>	<p>47. Jar of salted biscuits</p>  <p>Weight: 340g Material: Plastic, cardboard (biscuits) and sand (to add weight). Dimensions: 95×95mm</p>	<p>48. Tin of olives</p>  <p>Weight: 180g Material: Tin and dried chickpeas as olives. Dimensions: Ø60mm-Ø75mm (several tin models)</p>
<p>49. Bag of crisps</p>  <p>Weight: 55g Material: Plastic. Extruded polystyrene as crisps.</p>	<p>50. Tub of butter</p>  <p>Weight: 140g Material: Plastic. Clay as butter.</p>	<p>51. Carton of milk (with cap)</p>  <p>Weight: 700g Material: Cardboard and plastic. Water as milk. Dimensions: 230×70×70mm Cap Ø=30mm</p>
<p>52. Carton of milk (without cap)</p>  <p>Weight: 700g Material: Cardboard and plastic. Water as milk. Dimensions: 195×90×55mm</p>	<p>53. Carton of eggs</p>  <p>Weight: 100g (10g each egg) Material: Cardboard and empty eggs.</p>	<p>54. Egg</p>  <p>Weight: 10g Material: Empty egg.</p>

<p>55. Jar of jam 56. Salt container</p>  <p>Weight: 440g. Material: Glass and steel. Dimensions: Ø75mm</p>	<p>57. Bottle of juice</p>  <p>Weight 660g Material: Glass and steel. Water as juice. Dimensions: Ø70mm Cap Ø=50mm</p>	<p>58. Oil bottle</p>  <p>Weight: 40g Material: Plastic. Dimensions: 68×68mm Cap Ø=28mm</p>
<p>59. Bottle of wine</p>  <p>Weight: 1120g Material: Glass and cork. Water as wine. Dimensions: Ø75mm</p>	<p>60. Apple</p>  <p>Weight: 20g Material: Plastic.</p>	<p>61. Lemon</p>  <p>Weight: 20g Material: Plastic.</p>
<p>62. Sealing clip for bags</p>  <p>Weight: 20g Material: Plastic.</p>	<p>63. Sealing clip</p>  <p>Weight: 20g Material: Plastic and steel.</p>	<p>64. Olives</p>  <p>Weight: <10g Material: Clay.</p>
<p>65. Salted biscuits</p>  <p>Weight: <10g Material: Cardboard.</p>	<p>66. Biscuits</p>  <p>Weight: <10g Material: Cardboard.</p>	

Appendix II: Tasks

Experiment A

R	ID	OBJ.	SC.	S	PREPARING AND HAVING BREAKFAST
Additional objects in scenarios:					
Scenario 8 (Table): 57 (Bottle of juice).					
101	1	6	2, 4		Opening the cabinet to take out the plate and leaving it on the worktop. Closing the cabinet.
	2	40	3a, 4		Taking the bag of sliced bread from the shelf and leaving it on the worktop.
	3	40, 62	4		Opening the bag (initially closed with a sealing clip).
	4	38, 40, 41	4		Taking out a slice of bread, putting it into the toaster and pushing down the toaster lever.
102	5	41	4		Taking the slice of bread out of the toaster and putting it on the plate.
	6	40, 62	4		Closing the bag of bread with the clip.
	7	6	4, 8		Carrying the plate from the worktop to the table.
103	8	42	3a, 8		Taking the box of biscuits from the shelf and carrying it to the table.
	9	-	-		*****Displacement without manipulation.
	10	51,60	1, 8		Opening the fridge, taking out a carton of milk and the apple, closing the fridge and carrying the objects to the table.
104	11	55, 50	1, 8		Opening the fridge, taking out the jar of jam and the tub of butter, closing the fridge and carrying the objects to the table.
	12	10, 11	2, 8		Opening the cabinet, taking out the mug and the glass. Closing the cabinet and carrying the objects to the table.
105	13	-	7a		Opening the drawer.
	14	3, 4	7a, 8		Taking a dessertspoon and a knife from the drawer. Closing the drawer. Carrying the objects to the table.
	15	-	8		Pulling the chair from under the table and sitting on the chair
106	16	51	8	x	Opening the cap of the carton of milk.
	17	11, 51	8	x	Pouring milk from the carton into the mug.
	18	51	8	x	Closing the carton of milk.
	19	11	8	x	Drinking from the mug (simulated).
107	20	42	8	x	Opening a box of biscuits and taking out the plastic tray.
	21	11, 42, 66	8	x	Taking out a biscuit, dipping it in the milk and eating the biscuit (simulated).
	22	42	8	x	Pushing the tray back inside the box and closing the box.
108	23	57	8	x	Opening the bottle of juice.
	24	10, 57	8	x	Pouring juice from the bottle into the glass.
	25	57	8	x	Closing the bottle.
	26	10	8	x	Drinking from the glass (simulated).
109	27	50	8	x	Opening the tub of butter.
	28	3, 41, 50	8	x	Taking the knife and spreading butter on the slice of bread. Leaving the slice on the plate.
	29	50	8	x	Closing the butter container.
110	30	55	8	x	Opening the jar of jam.
	31	4, 41, 55	8	x	Taking the dessertspoon and spreading jam on the slice of bread. Leaving the slice on the plate.
	32	55	8	x	Closing the jar of jam.
	33	41	8	x	Taking the slice of bread from the plate and biting it (simulated). Leaving it on the plate.

111	34	60	8	x	Taking the apple, biting it twice (simulated), leaving it on the plate.
R	ID	OBJ.	SC.	S	PREPARING, BAKING AND EATING A CAKE
112	35	8	2, 6		Opening the kitchen cabinet, taking a bowl out, closing the cabinet and leaving the bowl on the worktop.
	36	-	-		*****Displacement without manipulation.
	37	53, 61	1, 6		Opening the fridge. Taking out a carton of eggs and a lemon. Closing the fridge. Carrying the objects to the worktop.
113	38	44	3a, 6		Taking a jar of flour from a shelf and carrying it to the worktop.
	39	-	-		*****Displacement without manipulation.
	40	43, 46	3a, 6		Taking a bag of sugar and a box of baking powder from a shelf, and carrying them to the worktop.
114	41	52	1, 6		Opening the fridge. Taking out a carton of milk, closing the fridge and carrying the milk to the worktop.
	42	-	-		*****Displacement without manipulation.
	43	10	2, 6		Opening the kitchen cabinet, taking out a glass, closing the cabinet and carrying the glass to the worktop.
115	44	53	6		Opening the carton of eggs.
	45	8, 54	6		Breaking an egg into the bowl.
	46	54	5, 6		Throwing the eggshell into the rubbish bin.
	47	53	6		Closing the carton of eggs.
116	48	2	7a		Opening a drawer, taking out a fork and closing the drawer.
	49	2, 8	6		Beating the egg with the fork.
117	50	43	6		Opening the bag of sugar (initially closed with a peg).
	51	10, 43	6		Taking the bag of sugar and filling the glass with sugar.
	52	43	6		Closing the bag of sugar with the peg.
118	53	23	3b, 6		Taking a grater from a shelf and carrying it to the worktop.
	54	23, 61	6		Taking the lemon and the grater and grating the lemon into the bowl.
119	55	44	6		Opening the jar of flour.
	56	10, 44	6		Taking the jar of flour and filling the glass with flour.
	57	1, 10, 44	7a, 6		Opening the drawer, taking out a spoon, closing the drawer. Taking two or three tablespoons of flour from the jar and pouring them into the glass.
	58	44	6		Closing the jar of flour.
120	59	19	7a, 6		Opening the drawer and taking out a pair of scissors. Leaving them on the worktop. Closing the drawer.
	60	19, 52	6		Taking the scissors to open the carton of milk and leaving them on the worktop.
	61	10, 52	6		Taking the carton of milk and pouring milk into the glass.
	62	8, 10	6		Taking the glass of milk and pouring it into the bowl.
121	63	46	6		Opening the box of baking powder, taking out one sachet and opening it. Pouring the powder into the bowl. Closing the box.
122	64	39	6		Taking the mixer from the worktop. Plugging it into a socket (with just one hand).
	65	8, 39	6		Using the mixer to mix the ingredients in the bowl.
	66	8, 39	6		Taking the mixer out of the bowl and leaving it on the worktop.
	67	39	6		Disconnecting the mixer from the socket (with just one hand).
123	68	28	3b, 6		Taking a baking tray from the shelf and carrying it to the worktop.

	69	17	6		Picking up a spatula from a pot placed on the worktop.
	70	8, 17	6		Pouring the cake dough onto the tray from the bowl using a spatula to scrape out all the dough.
	71	17, 28	6		Spreading the cake dough on the tray with the spatula and leaving the spatula inside the bowl.
124	72	28	6, 9		Opening the oven, taking the tray from the worktop, putting it into the oven and closing it.
	73	28	6, 9		Opening the oven, taking the tray out, leaving the tray on the kitchen worktop and closing the oven.
125	74	3	7a		Opening the drawer, taking out a knife and closing the drawer.
	75	3, 28	6		Cutting a piece of cake with the knife. Leaving the knife on the worktop.
	76	28, 26	6		Taking a piece of cake and biting it. Leaving the piece of cake on the worktop.
126	77	3, 8, 17	5, 6		Taking the spatula, the knife and the bowl from the worktop and putting them in the sink.
	78	-	-		*****Displacement without manipulation.
	79	10, 23	5, 6		Taking the glass and the grater from the worktop, putting them in the sink.
127	80	53, 61	1, 6		Taking the carton of eggs and the lemon from the worktop, carrying them to the fridge, opening the fridge and putting the objects inside it. Closing the fridge.
	81	-	-		*****Displacement without manipulation.
	82	52	1, 6		Taking the carton of milk from the worktop, carrying it to the fridge, opening the fridge and putting the carton inside it. Closing the fridge.
128	83	44	3a, 6		Taking the jar of flour from the worktop, carrying it to the shelf. Leaving the jar on the shelf.
	84	-	-		*****Displacement without manipulation.
	85	43, 46	3a, 6		Taking the bag of sugar and the box of baking powder from the worktop, carrying them to the shelf. Leaving the objects on the shelf.
129	86	29	6, 9		Opening the oven, taking the tray with a 3kg weight on it from the worktop, putting it into the oven and closing it.
	87	29	6, 9		Opening the oven, taking out a tray with a 3kg weight on it, leaving the tray on the worktop, closing the oven.
R	ID	OBJ.	SC.	S	PREPARING OMELETTES
Additional objects in scenarios:					
Scenario 6 (Worktop): 2 (Fork), 3 (Knife), 6 (Plate), 8 (Medium-sized bowl).					
130	88	2, 8	6		Taking a fork from the worktop and beating eggs (simulated) in a bowl. Leaving the fork in the bowl.
	89	8, 56	6		Opening the salt container (placed on the worktop), taking salt with the tips of the fingers and pouring it into the bowl.
131	90	14, 15	3b, 6		Taking the frying pan and its lid from a shelf and carrying them to the hob.
	91	58	6		Taking a bottle of oil from the worktop, opening the cap, pouring oil into the pan, closing the bottle and leaving the bottle on the worktop.
	92	-	6		Switching the hob on.
132	93	2, 8	6		Pouring the beaten eggs from the bowl into the pan, with the help of the fork.
	94	14, 16	6		Picking a slotted spoon from a pot on the worktop and stirring the contents of the pan.
	95	14, 16	6		Taking the omelette out of the pan with the slotted spoon and placing it on a plate. Leaving the spoon on the worktop.
133	96	14, 15	6		Taking the pan lid from the worktop, putting it over the pan and turning the omelette over with the lid.

	97	14	6		Grasping the handle of the pan and shaking it.
	98	14, 6	6		Taking the pan by the handle and putting the omelette on the plate.
	99	3, 6	6		Taking the knife from the worktop. Cutting the omelette in four pieces. Leaving the knife on the worktop.

Experiment B

R	ID	OBJ.	SC.	S	SETTING THE TABLE
Additional objects in scenarios:					
Scenario 1 (Fridge): 8 (Medium-sized bowl).					
201	1	32	7b		Opening the kitchen cabinet to take out the tablecloth. Closing the cabinet.
	2	32	8		Placing the tablecloth on the table.
202	3	-	2		Opening the kitchen cabinet.
	4	6, 10	2, 8		Taking a plate and a glass from the kitchen cabinet, and leaving them on the table.
	5	-	2		Closing the kitchen cabinet.
	6	2, 3, 31	7a, 8		Opening the drawer to take out a fork, a knife and a napkin, and leaving them on the table.
203	7	21, 30	3a, 8		Picking up an oil cruet and a salt-shaker from the shelf and leaving them on the worktop.
	8	22	1, 8		Opening the fridge to take out a jug of water. Closing the fridge and leaving the jug on the table.
	9	8	1, 8		Opening the fridge to take out a bowl. Closing the fridge and leaving the bowl on the table.
R	ID	OBJ.	SC.	S	CLEARING THE TABLE AND WASHING THE DISHES
204	10	10	5, 8		Taking the glass from the table to leave it in the sink.
	11	22	1, 5, 8		Taking the jug of water from the table to fill it with water from the tap. Carrying the jug to the fridge, opening the fridge to leave it inside. Closing the fridge door.
	12	21, 30	3a, 8		Taking the oil cruet and the salt-shaker from the table to leave them on the shelf.
205	13	3, 6	8		Taking the plate and the knife from the table.
	14	3, 6	5, 8		Throwing the leftovers on the plate (simulated) into the rubbish bin, with the help of the knife.
	15	3, 6	5		Leaving the plate and the knife in the sink.
206	16	2, 8	8		Taking the bowl and the fork from the table.
	17	2, 8	5, 8		Throwing the leftovers (simulated) into the rubbish bin, with the help of the fork.
	18	2, 8	5		Leaving the bowl and the fork in the sink.
207	19	32	8		Removing the tablecloth from the table, carrying it to one side of the room and shaking it.
	20	32	-		Folding the tablecloth.
	21	32	7b		Opening the kitchen cabinet to put the tablecloth away, and closing the cabinet.
208	22	36	5		Opening a bottle of washing-up liquid.
	23	34, 36	5		Taking the bottle of washing-up liquid and a dish sponge, and pouring (simulated) liquid onto the dish sponge.
	24	2, 3, 6, 8, 10, 34	5		Washing (simulated) the glass, the bowl, the plate, the fork and the knife with the dish sponge.
	25	2, 3, 6, 8, 10	4, 5		Rinsing (simulated) the plate, the bowl, the glass, the fork and the knife (in that order) with water, and leaving them on the

					small worktop.
209	26	8	2, 4		Taking the bowl, opening the kitchen cabinet and putting the bowl away inside it.
	27	10	2, 4		Taking the glass to put it away inside the kitchen cabinet.
	28	6, 33	2, 4		Taking the plate to dry it with a tea-towel.
	29	6	2, 4		Taking the dish to put it away inside the kitchen cabinet. Closing the kitchen cabinet.
	30	2, 3, 33	4		Taking the fork and the knife to dry them with the tea-towel.
	31	2, 3	4, 7a		Taking the fork and a knife and opening the drawer to put them away inside it. Closing the drawer.
210	32	35	5, 6		Taking a spray bottle to spray the worktop.
	33	33	5, 6		Taking the dishcloth to wipe the worktop.
	34	33	5		Cleaning the dishcloth under simulated water and wringing it out in the sink.
R	ID	OBJ.	SC.	S	PREPARING AND DRINKING COFFEE
Additional objects in scenarios:					
Scenario 4 (Small worktop): 4 (Dessertspoon).					
Scenario 8 (Table): 5 (Coffee spoon).					
211	35	45	3a		Taking a jar of ground coffee from a shelf and carrying it to the small worktop.
	36	45	4		Opening the jar of ground coffee.
212	37	37	4		Removing the handle of the coffee machine.
	38	4, 37, 45	4		Taking a dessertspoon and filling the handle of the coffee machine with coffee.
	39	37	4		Putting the handle of the coffee machine back in its place.
213	40	45	4, 3a		Closing the jar of ground coffee and placing it on the shelf.
	41	12	2, 4		Opening the kitchen cabinet and taking out a coffee cup. Closing the cabinet and putting the cup on the coffee machine.
	42	37	4		Switching on the coffee machine (Pressing a button).
214	43	20	3b, 4		Taking a tray from the shelf and leaving it on the worktop.
	44	12	4		Placing the coffee cup on the tray.
	45	24	3a, 4		Taking a sugar pot from the shelf and placing it on the tray.
	46	20	4, 8		Carrying the tray from the worktop to the table.
215	47	37	4		Removing the filter handle of the coffee machine.
	48	37	5		Throwing the used ground coffee into the rubbish bin.
	49	37	5		Leaving the filter handle of the coffee machine in the sink.
216	50	12, 24, 25	8	x	Opening the sugar pot, and putting a spoonful of sugar into the cup of coffee.
	51	5, 12	8	x	Picking up the spoon and stirring the coffee.
	52	12	8	x	Drinking (simulated) from the cup of coffee.
R	ID	OBJ.	SC.	S	PREPARING A SIMPLE MEAL
Additional objects in scenarios:					
Scenario 6 (Worktop): 6 (Dish), 8 (Medium-sized bowl), 9 (Small bowl).					
Scenario 8 (Table): 18 (Corkscrew).					
217	53	49	3b, 6		Picking up a bag of crisps from the shelf and carrying it to the worktop.
	54	49	6		Opening the bag of crisps.
	55	8, 49, 26	6		Putting the crisps into a bowl.
218	56	63	7a		Opening the drawer and taking out a sealing clip. Closing the

					drawer.
	57	49, 63	6		Closing the bag of crisps with the sealing clip.
219	58	48	3a, 6		Picking up a tin of olives from the shelf. Carrying it to the worktop.
	59	48	6		Opening the tin of olives.
	60	9, 48	6		Putting the olives into a little bowl.
	61	48	6, 5		Throwing the tin into the rubbish bin.
220	62	47	3a, 6		Picking up a jar of salted biscuits from the shelf. Carrying it to the worktop.
	63	47	6		Opening the jar of biscuits.
	64	6, 47	6		Putting biscuits on a plate.
	65	47	6		Closing the jar.
221	66	6	6, 8		Carrying the plate of biscuits from the worktop to the table.
	67	-	-		---- Displacement without manipulation ----
	68	8, 9	6, 8		Carrying the bowls from the worktop to the table.
222	69	59	3b, 8		Picking up a bottle of wine from the shelf and carrying it to the table.
	70	18, 59	8		Opening the bottle of wine with the corkscrew.
	71	18	8		Unscrewing the cork from the corkscrew.
	72	18	8		Folding the corkscrew.
223	73	13	2, 8		Opening the kitchen cabinet to pick up a wine glass, and carrying it to the table.
	74	-	8		Sitting in the chair at the table.
224	75	13, 59	8	x	Pouring wine from the bottle into the glass.
	76	13	8	x	Drinking (simulated) from the glass of wine.
225	77	64	8	x	Picking up one olive from the little bowl and eating (simulated) it, twice.
	78	26	8	x	Picking up a crisp from the bowl and eating (simulated) it.
	79	65	8	x	Picking up a biscuit from the dish and eating (simulated) it.