

Additional File 1

Supplementary Table 1: Visually Guided Reaching Parameters

Parameter	Description
Posture speed	Median speed of the hand during periods it is supposed to remain stationary within a target. The median of all reaches was calculated.
Reaction time	Duration from when the end target lights up to the onset of movement. The median value of all reaches was calculated.
No reaction time	Number of trials in which it was impossible to determine the movement onset.
Initial direction angle	The angular difference calculated by comparing a straight line from the cursor's position at the onset of movement to its position at the end of the initial movement phase, against a straight line from the onset position of the cursor to the final target. The median value across all trials is calculated.
Initial distance ratio	The ratio of the hand's path length during the initial phase of movement to its total path length from the start to the end of the movement. The median value across all trials was calculated.
Initial speed ratio	The ratio of the maximum speed achieved during the initial phase of movement compared to the maximum speed throughout the entire movement (from movement onset to movement offset; that is, Max Speed). The mean value from all trials was computed.
Speed maxima count	The number of peak speeds identified throughout the entire movement (from movement onset to movement offset). The average number across all trials was calculated.
Min-Max speed	Mean difference between consecutive pairs of maximum and minimum hand speeds, measured from the Max Speed point back to the movement onset. The mean of all trials was calculated.
Movement time	The total duration from the movement onset to movement offset. The median of all trials was calculated.
Path length ratio	The ratio of the total distance covered by the hand during the movement (from movement onset to movement offset) to the direct line distance between the hand's position at the start and end of the movement. The mean value for all trials was computed.

Max speed	The maximum hand speed reached between the movement onset and offset. The median speed across all trials is calculated.
No initial stabilization	Number of trials where the participant was unable to maintain stability at the initial target.
No end movement	Number of trials where the movement offset was not identified prior to the trial end. Trials with false starts are excluded in this count.
End target not reached	Number of trials in which the final target was not reached. Trials with false starts are excluded in this count.

Supplementary Table 2: Object-Hit and Object-Hit-and-Avoid Parameters. Parameters unique to OHA tasks are marked with an asterisk (*). The notation L/R indicates that the parameter is assessed separately for the left and right hands.

Parameter	Description
Target hits L/R	The percentage of balls successfully hit compared to the total number of balls dropped.
Median error	The point, expressed as a percentage, at which the participant committed half of their errors, calculated based on the number of balls, not the elapsed time.
Miss bias	Measures the tendency for misses to occur more frequently on one side of the work area than the other, specifically in the X-direction. This metric is reported in centimeters to indicate the specific location within the workspace where the bias is observed.
Hand speed L/R	The average speed of the participant's hand throughout the duration of the task.
Movement area L/R	The area utilized by the participant's left/right hand over the course of the trial, calculated using a convex hull that includes the entirety of the hand's movement path.
Hand bias hits	A scale ranging from -1 (exclusively left hand) to 1 (exclusively right hand) that measures the predominant hand used for targeting hits.
Hand transition	The location within the workspace where the participant's preference shifts from using one hand to the other.
Hand selection overlap	The total number of hand switches within each bin, normalized by dividing by the total count of targets.
Hand speed bias	A metric ranging from -1 to 1 that quantifies the bias in hand speed between the two hands.
Movement area bias	A scale from -1 (entirely left hand) to 1 (entirely right hand) indicating the bias in the spatial extent of movements between the hands.
*Distractor Hits L/R	The percentage of distractor objects that the participant hit.
*Distractor proportion	The number of distractor objects hit, presented as a percentage of the total number of objects (both targets and distractors) that the participant hit.