Supplemental Materials

Evaluation of Alternative Analysis Choices

There are often many degrees of freedom in an experimental setting that can influence the results and inferences but go above and beyond simply the stimulus features and hypothesis test specifications. Some examples are choice of method for determining values like movement onset/offset, criteria for outliers, etc. We checked the influence of our analysis choices on our results by calculating our results with alternative criteria that were either used by other studies or suggested by reviewers. We found that these alternative criteria, though important, did not change the pattern of our results and lead to the same conclusions.

Comparison of Methods to Determine Movement Onset and Offset

Ganel and Goodale (2003) did not mention details on the methods and criteria used to determine the RT (movement onset in grasping and manual estimation, see Experiment 1) and ManEstTime (movement offset in manual estimation). Ganel and Goodale (2014) did describe these methods (but see Table 4). While we do not expect large differences in the results with their criteria (henceforth GG14 criteria) and our criteria (see Experiment 1), we here compare results using both methods. Ganel and Goodale (2014) determined RT or movement onset as “the time point when the aperture between index finger and thumb increased by more than 0.1 mm for at least 50 ms” (p. 5) and ManEstTime or movement offset as “the time point when the aperture between finger and thumb changed by not more than 0.2 mm for at least 100 ms” (p. 5). Table S1 lists the results of Experiment 1 and 2 with both our criteria and GG14 criteria. The results are quite comparable.

Table S1

Comparison of Results Using Different Criteria

Experiment	DV (unit)	Task	Our criteria	GG14 criteria
1	RT (ms)	CL	-4 ± 4	-3 ± 5
1	RT (ms)	OL	0 ± 7	1 ± 9
1	RT (ms)	ME	5 ± 13	7 ± 12
1	ManEstTime (ms)	ME	42 ± 25	22 ± 18
1	SD_{ManEst} (mm)	ME	0.21 ± 0.15	0.07 ± 0.16
1	Illusion Baseline (mm)	ME	0.51 ± 0.41	0.77 ± 0.43
1	Illusion Filtering (mm)	ME	0.42 ± 0.21	0.47 ± 0.23
2	RT (ms)	ME	8 ± 4	7 ± 4
2	ManEstTime (ms)	ME	17 ± 9	17 ± 7
2	SD_{ManEst} (mm)	ME	0.31 ± 0.09	0.27 ± 0.10
2	Illusion Baseline (mm)	ME	-0.65 ± 0.44	-0.52 ± 0.46
2	Illusion Filtering (mm)	ME	0.76 ± 0.18	0.71 ± 0.18

Note. DV: dependent variable, CL: closed-loop grasping, OL: open-loop grasping, ME: manual estimation, SD_{ManEst}: Variability-based Garner interference in ManEst.

Alternative Velocity Thresholds for RT Calculation

In our experiments, we used a velocity threshold to determine RT (movement onset) as has been done by other studies in the field. However, Brenner and Smeets (2019) suggested that RTs will be longer for a shorter movement when a velocity threshold is used. This has implications for our Experiment 3, where we manipulated the movement amplitude and found an effect on RTs (short amplitude movements were indeed slower). Importantly, the study we followed, that is Hesse and Schenk (2013), used a button release to determine RT — which suffers the same problems as a velocity threshold (Brenner & Smeets, 2019). The question then is, to which degree our results are dependent on our choice of RT criterion / velocity threshold. We calculated RT as the time point when finger or thumb marker first reached a velocity of 0.025 m/s. Here, we determined the RT with higher (double our threshold, i.e., 0.05 m/s) and lower (half our threshold, i.e., 0.0125 m/s) velocity thresholds as

a comparison. The results are listed below in Table S2. Crucially, the results are similar and it is unlikely that the effect of amplitude on RTs was simply an artefact of using a particular velocity threshold.

Table S2

Mean and SEM of RT Differences in Milliseconds with Different Velocity Thresholds

Velocity Threshold		RT Difference (Short – Long)
Standard	0.025 m/s	23 ± 7 ms
Low	0.0125 m/s	20 ± 7 ms
High	0.05 m/s	25 ± 7 ms

Alternative Outlier Removal Criterion

In Experiment 3, an additional criterion to remove outliers was pre-registered: trials with MT or ManEstTime beyond the mean ± 2 SD for that participant in a particular condition were excluded. However, this criterion was not used by other studies on Garner interference in manual estimation and thus might limit the comparability of our results. We therefore reported our results in the main text without this additional criterion. But given that this was a pre-registered analysis, we report the results with this criterion below in Table S3 for transparency. About 5% trials were additionally removed. Importantly, there are only very minor differences in the results (compare Table 5 and Table S3).

Table S3

Results of Experiment 3 in Milliseconds with Different Outlier Criterion

Dependent Variable	Short			Long		
	Baseline	Filtering	Difference	Baseline	Filtering	Difference
RT	313 ± 10	320 ± 11	6 ± 6	290 ± 12	296 ± 12	6 ± 6
MT	652 ± 30	660 ± 29	8 ± 8	805 ± 31	807 ± 33	2 ± 10
ManEstTime	966 ± 37	980 ± 36	14 ± 13	1095 ± 39	1103 ± 40	9 ± 13

Note. Values are reported as mean ± standard error of the mean.

Practice Effects in Manual Estimation

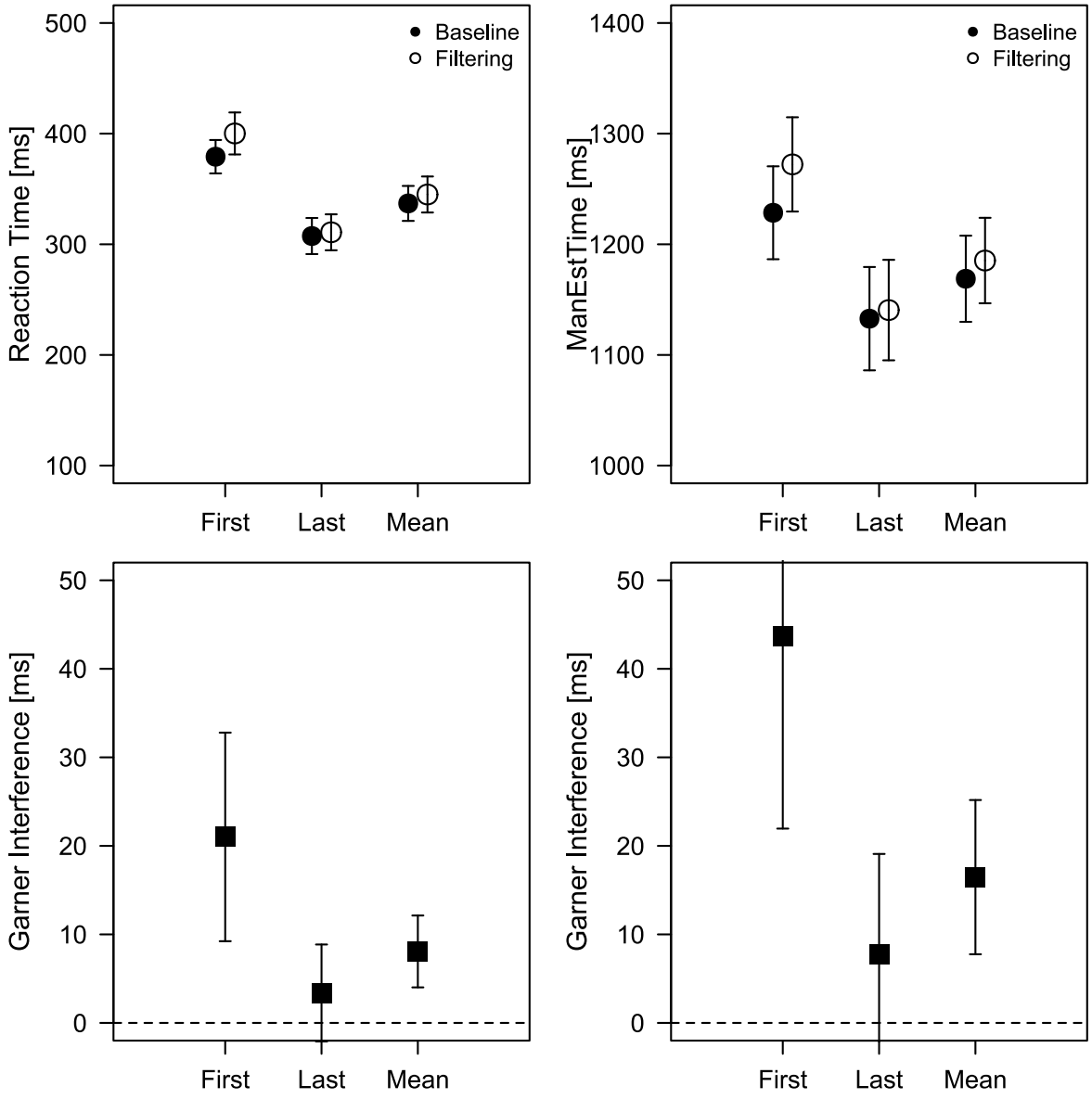
A reviewer suggested that Garner interference might be overall reduced due to practice effects, that is, participants' performance in the task becomes better over the course of the experiment, leading to shorter RTs (and also ManEstTimes). This practice effect should also show up stronger for Experiment 2 than Experiment 1, because we had 256 trials in Experiment 2 and 128 trials in Experiment 1. To check this, we plot the RT and ManEstTime for Experiment 2 in the first block and last block for each condition (32 trials each) and the mean for all eight blocks in Figure S1.

We analysed the results of only Experiment 2 in this way for three reasons: (1) Experiment 1 had the same number of trials as Ganel and Goodale (2003) and the same repeated-block sequence (BBFF, see Method of Experiment 2), (2) Experiment 2 had double the number of trials in Experiment 1, thus making practice effects more likely and (3) participants performed only one task (manual estimation) in Experiment 2 while in Experiment 1 there were other tasks (grasping, speeded-classification), again making practice effects more likely in Experiment 2.

Participants' RT and ManEstTime did indeed decrease over the course of the experiment, likely due to practice (top row of Figure S1). This also led to an overall reduction in the Garner interference effect in the later blocks (bottom row of Figure S1). These practice effects probably also occurred in Ganel and Goodale (2014), who also used 256 trials. Yet, they obtained Garner interference of 22 ± 10 ms, while in our Experiment 2, Garner interference was only 8 ± 4 ms. It is therefore unlikely that these practice effects are the cause of the discrepancy between our results.

Figure S1

Reaction Times and ManEstTimes in Manual Estimation in the First and Last Block of Experiment 2



Note. Change in the Garner interference effect in RT and ManEstTime over the course of Experiment 2. 'First' values are calculated from 32 trials each from the first blocks of baseline and filtering conditions. The 'Last' values are taken from 32 trials of the last / fourth blocks of baseline and filtering conditions. The 'Mean' represents the average value across all eight blocks of baseline and filtering conditions.