Design choices:

Empirical recommendations for designing

two-dimensional finger tracking experiments

COMPLETE RESULTS

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Results of Experiment 1

Data selection.

For the following analyses, we omitted trials in which participants produced commission errors (5.3%) or omissions (7.5%). Error and omission rates were analyzed via linear mixed-effects models using the lme4 package version 1.1-21 of the R software environment. For all analyses we report the outcome of appropriate model comparisons for a model including the effect of interest to the corresponding null model. More errors were committed in the MouseTracker (8.7%) than in the eTracker (3.6%) or in the iTracker (3.7%), $X^2(1) \geq 169.54$, $ps < .001$, with no difference between the latter setups, $X^2(1) = 0.05$, $p = .821$, and more omissions in the iTracker (12.4%) than in the MouseTracker (2.7%) or the eTracker (0.0%), with significant differences between all setups, $X^2(1) \geq 196.44$, $ps < .001$. To provide the most conservative comparison between the setups, the remaining data entered analyses unfiltered. Thereby, strong variations of any measure are not artificially narrowed via outlier elimination but considered within the analyses.

Means and standard deviations of all measures can be found in Table 1.

All dependent measures were then analyzed via $2 \times 2 \times 3$ analysis of variances (ANOVAs) with current compatibility (trial N compatible vs. incompatible), preceding compatibility (trial N-1 compatible vs. incompatible) and setup (MouseTracker vs. eTracker vs. iTracker) as within-subjects factors. We refer to compatibility effects as the difference between currently compatible and incompatible trials (computed as trial N incompatible minus trial N compatible), to aftereffects as the difference between trials after compatible and after incompatible trials (computed as trial N-1 incompatible minus trial N-1 compatible) and to sequential adaptation

effects as the modulation of compatibility effects by preceding compatibility (in the direction of smaller compatibility effects after an incompatible trial relative to after a compatible trial, Gratton, Coles, & Donchin, 1992).

Since we are not interested in the Simon effect or its sequential modulation per se, but how they might be modulated by the setup, we mainly focused on any effect including the factor setup. Main effects of current compatibility, preceding compatibility, or their interaction serve as a manipulation check, and descriptive means for the main effects are provided to give an estimate of the absolute values of the individual DVs. To keep the results frugal and accessible, we only scrutinized effects which include the factor setup in follow-up analyses via planned two-tailed *t*-tests to compare which setup produced the largest Simon effect. Accordingly, in case of differences in sequential modulation, we tested for sequential adaptation within each setup via separate ANOVAs to see which setup produced a significant adaptation pattern.

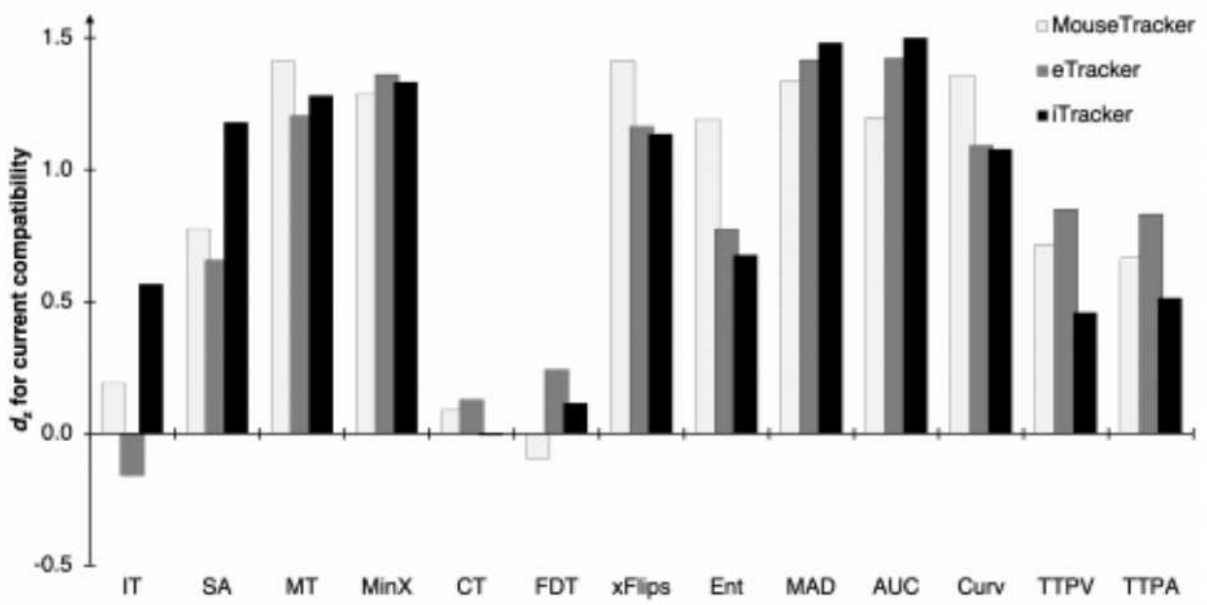

Figure 1. Results for all measures of Experiment 1. Standardized effect sizes d_z for the effect of current compatibility (computed as current incompatible minus current compatible) for each of the computer DV (x-axis) and separate for each setup (columns).

Initiation times. Data showed significantly faster response initiation for current compatible

trials (249 ms) than for incompatible trials (254 ms), $F(1, 35) = 8.36$, $p = .007$, $\eta_p^2 = .19$, as well as faster response initiation after compatible trials (250 ms) than after incompatible trials (254 ms), $F(1, 35) = 9.68$, $p = .004$, $\eta_p^2 = .22$. Response initiation was slower in the iTracker (380 ms) relative to the eTracker (201 ms) and MouseTracker (174 ms), $F(2, 34) = 89.90$, $p < .001$, $\eta_p^2 = .84$, with significant differences between all setups, ts ≥ 4.70, ps $< .001$, ds ≥ 0.78. Compatibility effects differed between setups, $F(2, 34) = 5.93$, $p = .006$, $\eta_p^2 = .26$, with the iTracker producing significantly larger effects ($\Delta = 14$ ms) compared to the eTracker ($\Delta = -1$ ms) or the MouseTracker ($\Delta = 2$ ms), ts ≥ 3.00, ps $\leq .005$, ds ≥ 0.50, but no difference between the latter setups, $t(35) = 1.19$, $p = .241$, $d = 0.20$. Overall, sequential adaptation effects emerged, $F(1, 35) = 7.41$, $p = .010$, $\eta_p^2 = .18$, but these were further modulated by setup, $F(2, 34) = 5.71$, $p = .007$, $\eta_p^2 = .25$, showing that only the iTracker produced the sequential adaptation effect, $F(1, 35) = 9.75$, $p = .004$, $\eta_p^2 = .22$, but not the others, Fs ≤ 2.41, ps $\geq .129$. Aftereffects did not differ between setups, $F < 1$.

Starting angles. Data showed significantly steeper response initiation for current incompatible trials (-1.3°) than for compatible trials (4.8°), $F(1, 35) = 46.77$, $p < .001$, $\eta_p^2 = .57$, as well as steeper response initiation after compatible trials (1.3°) than after incompatible trials (2.2°), $F(1, 35) = 4.78$, $p = .036$, $\eta_p^2 = .12$. Response initiation was most direct in the iTracker (6.8°) relative to the eTracker (-3.2°) and MouseTracker (1.7°), $F(2, 34) = 41.92$, $p < .001$, $\eta_p^2 = .71$, with significant differences between all setups, ts ≥ 3.81, ps $\leq .001$, ds ≥ 0.63. A significant three-way interaction, $F(2, 34) = 8.64$, $p = .001$, $\eta_p^2 = .34$, indicated that only the iTracker produced the expected sequential adaptation effect, $F(1, 35) = 9.16$, $p = .005$, $\eta_p^2 = .21$, whereas the MouseTracker did not, $F < 1$, and the eTracker produced a significant interaction, but in the opposite direction, $F(1, 35) = 8.55$, $p = .006$, $\eta_p^2 = .20$. No other effects were

significant, Fs < 1.

Movement times. Data showed significantly faster response execution for current compatible trials (438 ms) than for incompatible trials (488 ms), $F(1, 35) = 111.27$, $p < .001$, $\eta_p^2 = .76$, as well as faster response execution after incompatible trials (460 ms) than after compatible trials (467 ms), $F(1, 35) = 9.11$, $p = .005$, $\eta_p^2 = .21$. Response execution was fastest in the iTracker (419 ms) relative to the eTracker (481 ms) and MouseTracker (489 ms), $F(2, 34) = 9.92$, $p < .001$, $\eta_p^2 = .37$, with significant differences between the iTracker and both others, ts ≥ 4.15, ps < .001, ds ≥ 0.69, but no difference between eTracker and MouseTracker, $t(35) = 1.14$, $p = .263$, $d = 0.19$. Sequential adaptation effects emerged, $F(1, 35) = 69.15$, $p < .001$, $\eta_p^2 = .66$. No other effects were significant, Fs ≤ 2.96, ps ≥ .066.

Minimum X. Data showed significant differences in deviation towards the opposite side between current incompatible trials (-94 px) and compatible trials (-52 px), $F(1, 35) = 96.45$, $p < .001$, $\eta_p^2 = .73$, as well as between after compatible trials (-78 px) and after incompatible trials (-68 px), $F(1, 35) = 46.81$, $p < .001$, $\eta_p^2 = .57$. Response execution was overall least diverted in the iTracker (-26 px) relative to the eTracker (-101 px) and MouseTracker (-92 px), $F(2, 34) = 128.52$, $p < .001$, $\eta_p^2 = .88$, with significant differences between all setups, ts ≥ 2.25, ps ≤ .031, ds ≥ 0.38. Compatibility effects differed between setups, $F(2, 34) = 17.33$, $p < .001$, $\eta_p^2 = .51$, with the iTracker producing significantly smaller differences (Δ = 17 px) compared to the eTracker (Δ = 58 px) or the MouseTracker (Δ = 51 px), ts ≥ 5.26, ps < .001, ds ≥ .88, and no difference between the latter setups, $t(35) = 1.08$, $p = .287$, $d = 0.18$. Aftereffects also differed between setups, $F(2, 34) = 3.44$, $p = .044$, $\eta_p^2 = .17$, with the iTracker producing significantly smaller differences (Δ = -6 px) compared to the eTracker (Δ = -14 px), $t(35) = 2.65$, $p = .012$, d =

0.44, and the MouseTracker (Δ = -10 px) in between, ts ≤ 1.50, ps ≥ .144, ds ≤ .25. Sequential adaptation effects emerged, $F(1, 35) = 42.83$, $p < .001$, $\eta_p^2 = .55$. The three-way interaction between all factors was not significant, $F(1, 35) = 1.41$, $p = .259$, $\eta_p^2 = .08$.

Click times. Mouse/finger release was fastest in the eTracker (220 ms) relative to the MouseTracker (257 ms) and iTracker (372 ms), $F(2, 34) = 24.55$, $p < .001$, $\eta_p^2 = .59$, with significant differences between the eTracker and both others, ts ≥ 2.32, ps ≤ .026, ds ≥ 0.38, but not between the MouseTracker and the iTracker, $t(35) = 1.77$, $p = .085$, $d = 0.30$. No other effects were significant, Fs ≤ 2.31, ps ≥ .138.

Final distance to target. Residual distance was shortest in the eTracker (13.7 px) relative to the iTracker (14.3 px) and MouseTracker (14.6 px), $F(2, 34) = 7.43$, $p = .002$, $\eta_p^2 = .30$, with significant differences only between the eTracker and the MouseTracker, $t(35) = 3.91$, $p < .001$, $d = 0.65$, and the iTracker in between, ts ≤ 1.69, ps ≥ .100, ds ≤ 0.28. No other effects were significant, Fs ≤ 1.62, ps ≥ .221.

X flips. Data showed significantly more directional changes in current incompatible trials (1.72 per trial) than for compatible trials (1.45 per trial), $F(1, 35) = 110.59$, $p < .001$, $\eta_p^2 = .76$, as well as after compatible trials (1.62 per trial) relative to after incompatible trials (1.55 per trial), $F(1, 35) = 16.45$, $p < .001$, $\eta_p^2 = .32$. X flips occurred least in the iTracker (1.25 per trial) relative to the eTracker (1.56 per trial) and MouseTracker (1.95 per trial), $F(2, 34) = 74.27$, $p < .001$, $\eta_p^2 = .81$, with significant differences between the iTracker and both others, ts ≥ 4.06, ps < .001, ds ≥ 0.68, but no difference between eTracker and MouseTracker, $t(35) = 0.22$, $p = .826$, $d = 0.04$. Overall, sequential adaptation effects emerged, $F(1, 35) = 28.54$, $p < .001$, $\eta_p^2 = .45$, but these were further modulated by setup, $F(2, 34) = 6.75$, $p = .003$, $\eta_p^2 = .28$, showing that only the

iTracker and MouseTracker produced sequential adaptation effects, Fs $\leq$ 17.47, ps $<$ .001, but not the eTracker, $F(1, 35) = 2.47$, $p = .125$, $\eta_p^2 = .07$. No other effects were significant, Fs $\leq$ 1.47, ps $\geq$ .244.

Entropy. Data showed higher movement complexity and fluctuation in current incompatible trials (0.0503) relative to compatible trials (0.0416), $F(1, 35) = 82.30$, $p < .001$, $\eta_p^2 = .70$, as well as after compatible trials (0.0471) relative to after incompatible trials (0.0448), $F(1, 35) = 21.71$, $p < .001$, $\eta_p^2 = .38$. Movement complexity was highest in the iTracker (0.0557) relative to the eTracker (0.0428) and MouseTracker (0.0394), $F(2, 34) = 25.26$, $p < .001$, $\eta_p^2 = .60$, with significant differences between all setups, ts $\geq$ 3.66, ps $<$ .001, ds $\geq$ 0.61. Sequential adaptation effects emerged, $F(1, 35) = 76.54$, $p < .001$, $\eta_p^2 = .69$, and they were further modulated by setup, $F(2, 34) = 7.45$, $p = .002$, $\eta_p^2 = .25$, though sequential adaptation showed up for all setups, Fs $\geq$ 17.66, ps $<$ .001. No other effects were significant, Fs $\leq$ 1.11, ps $\geq$ .341.

Maximum absolute deviation. Movements showed significantly greater spatial deviations for current incompatible trials (192 px) than for compatible trials (112 px), $F(1, 35) = 112.42$, $p < .001$, $\eta_p^2 = .76$, as well as after compatible trials (161 px) relative to after incompatible trials (143 px), $F(1, 35) = 46.45$, $p < .001$, $\eta_p^2 = .57$. Deviation was smallest in the iTracker (68 px) relative to the eTracker (200 px) and MouseTracker (189 px), $F(2, 34) = 90.41$, $p < .001$, $\eta_p^2 = .84$, with significant differences between the iTracker and both others, ts $\geq$ 11.97, ps $<$ .001, ds $\geq$ 1.99, but no difference between eTracker and MouseTracker, $t(35) = 1.41$, $p = .168$, $d = 0.23$. Compatibility effects differed between setups, $F(2, 34) = 14.11$, $p < .001$, $\eta_p^2 = .45$, with the iTracker producing significantly smaller effects (Δ = 38 px) compared to the eTracker (Δ = 108 px) or the MouseTracker (Δ = 95 px), ts $\geq$ 4.76, ps $<$ .001, ds $\geq$ 0.79, but no difference between

the latter setups, $t(35) = 1.15$, $p = .255$, $d = 0.19$. Aftereffects also differed between setups, $F(2, 34) = 4.49$, $p = .019$, $\eta_p^2 = .21$, with the iTracker producing significantly smaller differences (Δ = -11 px) compared to the eTracker (Δ = -26 px), $t(35) = 2.99$, $p = .005$, $d = 0.50$, with the MouseTracker (Δ = -18 px) in between, ts ≤ 1.63, ps $\geq .111$, ds ≤ 0.27. Sequential adaptation effects emerged, $F(1, 35) = 49.63$, $p < .001$, $\eta_p^2 = .59$. The three-way interaction between all factors was not significant, $F(2, 34) = 1.31$, $p = .283$, $\eta_p^2 = .07$.

Area under the curve. Movements showed significantly greater spatial deviations for current incompatible trials (61427 px^2) than for compatible trials (36842 px^2), $F(1, 35) = 103.25$, $p < .001$, $\eta_p^2 = .75$, as well as after compatible trials (51689 px^2) relative to after incompatible trials (46580 px^2), $F(1, 35) = 28.25$, $p < .001$, $\eta_p^2 = .45$. Overall deviation was smallest in the iTracker (23274 px^2) relative to the eTracker (64271 px^2) and MouseTracker (59860 px^2), $F(2, 34) = 77.00$, $p < .001$, $\eta_p^2 = .82$, with significant differences between the iTracker and both others, ts ≥ 11.07, ps $< .001$, ds ≥ 1.84, but no significant difference between the eTracker and MouseTracker, $t(35) = 1.81$, $p = .079$, $d = 0.30$. Compatibility effects differed between setups, $F(2, 34) = 12.00$, $p < .001$, $\eta_p^2 = .41$, with the iTracker producing significantly smaller differences (Δ = 12535 px^2) compared to the eTracker (Δ = 33879 px^2) or the MouseTracker (Δ = 27341 px^2), again with significant differences between the iTracker and both others, ts ≥ 3.86, ps $< .001$, ds ≥ 0.64, but no significant difference between the eTracker and MouseTracker, $t(35) = 1.74$, $p = .091$, $d = 0.29$. Sequential adaptation effects emerged, $F(1, 35) = 32.95$, $p < .001$, $\eta_p^2 = .49$. No other effects were significant, Fs ≤ 3.17, ps $\geq .054$.

Curvature. Movements showed significantly greater curvature for current incompatible trials (ratio of 1.34) than for compatible trials (1.21), $F(1, 35) = 81.02$, $p < .001$, $\eta_p^2 = .70$, as well

as after compatible trials (1.29) relative to after incompatible trials (1.26), $F(1, 35) = 46.70$, $p < .001$, $\eta_p^2 = .57$. Overall curvature was smallest in the iTracker (1.06) relative to the eTracker (1.41) and MouseTracker (1.36), $F(2, 34) = 96.38$, $p < .001$, $\eta_p^2 = .85$, with significant differences between all setups, ts ≥ 3.23, ps $\leq .002$, ds ≥ 0.54. Compatibility effects differed between setups, $F(2, 34) = 16.72$, $p < .001$, $\eta_p^2 = .50$, with the iTracker producing significantly smaller results ($\Delta = 0.05$) compared to the eTracker ($\Delta = 0.17$) or the MouseTracker ($\Delta = 0.17$), ts ≥ 4.06, ps $< .001$, ds ≥ 0.67, but no difference between the latter setups, $|t| < 1$. Aftereffects also differed between setups, $F(2, 34) = 6.44$, $p < .001$, $\eta_p^2 = .28$, with the iTracker producing significantly smaller differences ($\Delta = -0.01$) compared to the eTracker ($\Delta = -0.05$), $t(35) = 3.44$, $p = .002$, $d = 0.57$, and the MouseTracker ($\Delta = -0.03$) in between, ts ≤ 1.79, ps $\geq .083$, ds ≤ 0.30. Sequential adaptation effects emerged, $F(1, 35) = 68.29$, $p < .001$, $\eta_p^2 = .66$. The three-way interaction between all factors was not significant, $F(2, 34) = 2.11$, $p = .137$, $\eta_p^2 = .11$.

Time to peak velocity. Peak speed was reached earlier in current compatible trials (peak velocity at 36.5% of the movement) than in incompatible trials (39.3%), $F(1, 35) = 32.71$, $p < .001$, $\eta_p^2 = .48$. Overall peak velocity was achieved later in the iTracker (48.8%) relative to the eTracker (32.1%) and MouseTracker (33.0%), $F(2, 34) = 90.68$, $p < .001$, $\eta_p^2 = .84$, with significant differences between the iTracker and both others, ts ≥ 12.18, ps $\leq .001$, ds ≥ 2.03, but no difference between the mouse-operated devices, $|t| < 1$. Sequential adaptation effects emerged, $F(1, 35) = 17.57$, $p < .001$, $\eta_p^2 = .33$, but these were further modulated by setup, $F(2, 34) = 3.70$, $p = .035$, $\eta_p^2 = .18$, showing that only the iTracker and MouseTracker produced sequential adaptation effects, Fs ≥ 8.49, ps $\leq .006$, but not the eTracker, $F(1, 35) = 1.14$, $p = .294$, $\eta_p^2 = .03$. No other effects were significant, Fs ≤ 2.51, ps $\geq .096$.

Time to peak acceleration. Movements accelerated earlier for current incompatible trials (peak acceleration at 33.9% of the movement) than for compatible trials (36.8%), $F(1, 35) = 32.05$, $p < .001$, $\eta_p^2 = .48$. Overall peak acceleration was achieved later in the iTracker (47.8%) relative to the eTracker (29.9%) and MouseTracker (28.4%), $F(2, 34) = 148.68$, $p < .001$, $\eta_p^2 = .90$, with significant differences between all setups, ts ≥ 2.08, ps $\leq .045$, ds ≥ 0.35. Sequential adaptation effects emerged, $F(1, 35) = 20.45$, $p < .001$, $\eta_p^2 = .37$, but these were further modulated by setup, $F(2, 34) = 3.59$, $p = .038$, $\eta_p^2 = .17$, showing that only the iTracker and MouseTracker produced sequential adaptation effects, Fs ≥ 11.25, ps $\leq .002$, but not the eTracker, $F(1, 35) = 2.10$, $p = .156$, $\eta_p^2 = .06$. No other effects were significant, Fs ≤ 2.18, ps $\geq .128$.

	MouseTracker				eTracker				iTracker			
preceding compatibility	compatible		incompatible		compatible		incompatible		compatible		incompatible	
current compatibility	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible
IT	173 (83)	173 (82)	173 (84)	178 (84)	188 (31)	189 (37)	333 (47)	330 (48)	361 (94)	355 (118)	388 (104)	379 (100)
SA	3,5 (5,9)	-1,1 (3,4)	5,2 (5,8)	-0,8 (4,2)	-2,1 (4,4)	-6,4 (6,3)	1,8 (4,6)	-7,1 (7,1)	10,8 (6,8)	1,8 (8,2)	9,4 (8,3)	3,0 (8,2)
MT	453 (80)	534 (98)	472 (87)	498 (79)	447 (80)	522 (86)	490 (47)	486 (72)	384 (98)	461 (120)	417 (100)	415 (112)
MinX	-63 (31)	-132 (38)	-70 (33)	-164 (38)	-75 (38)	-145 (45)	-71 (34)	-117 (48)	-15 (9)	-40 (25)	-21 (12)	-25 (16)
CT	254 (38)	256 (38)	257 (38)	258 (37)	253 (40)	219 (43)	214 (41)	224 (38)	364 (424)	389 (440)	349 (384)	357 (366)
FDT	14,9 (1,0)	14,6 (1,6)	14,6 (1,5)	14,5 (1,5)	13,9 (1,1)	13,7 (1,2)	15,6 (1,7)	15,8 (1,6)	13,8 (2,5)	14,8 (2,3)	14,5 (1,8)	14,0 (3,4)
xFlips	1,80 (0,22)	2,17 (0,28)	1,81 (0,22)	1,59 (0,26)	1,40 (0,30)	1,76 (0,28)	1,36 (0,27)	1,67 (0,54)	1,08 (0,28)	1,48 (0,45)	1,22 (0,28)	1,24 (0,30)
Ent	0,0326 (0,0073)	0,0486 (0,0161)	0,0350 (0,0080)	0,0462 (0,0087)	0,0383 (0,0106)	0,0546 (0,0091)	0,0396 (0,0104)	0,0407 (0,0083)	0,0468 (0,0177)	0,0649 (0,0150)	0,0540 (0,0178)	0,0551 (0,017)
MAD	134 (90)	202 (87)	152 (83)	213 (74)	149 (75)	270 (75)	145 (94)	236 (87)	42 (37)	105 (55)	57 (34)	89 (45)
AUC	43985 (26051)	83600 (25433)	48050 (21631)	86973 (33002)	46385 (25362)	87456 (25367)	45677 (21694)	74865 (30085)	14748 (5452)	35179 (10008)	18286 (11468)	23983 (14103)
Curv	1,25 (0,12)	1,56 (0,15)	1,30 (0,14)	1,59 (0,16)	1,33 (0,17)	1,55 (0,18)	1,30 (0,18)	1,44 (0,19)	1,01 (0,08)	1,12 (0,08)	1,06 (0,04)	1,05 (0,08)
TTPV	30,5 (6,1)	35,2 (6,4)	30,7 (7,2)	30,5 (6,5)	33,3 (7,1)	34,0 (8,2)	30,1 (5,7)	30,3 (6,7)	46,1 (7,0)	53,9 (5,8)	49,6 (6,5)	49,5 (7,4)
TTPA	25,5 (5,5)	31,4 (5,6)	27,7 (5,6)	28,8 (6,2)	27,9 (6,6)	32,2 (4,9)	30,5 (5,0)	31,0 (6,5)	45,2 (6,8)	48,7 (5,7)	48,6 (6,4)	47,5 (7,4)

Table 1. Means (and standard deviations) for all measures and for all combinations of experimental factors of Experiment 1.

Choosing measures

Next to design choices, we set out to give an overview of the parameters that are most frequently used to quantify these movement trajectories. The choice of DVs should reflect whether the experiment is supposed to focus on dynamic changes during the movement. Based

on face validity, X flips and Entropy are likely the DVs that best capture the uncertainty and the directional changes of the movement trajectories. If these changes per se are not of main interest, but how participants' overall movement behavior is affected, both temporally and spatially, by the experimental manipulation, then the other measures should play a more central role.

Next, we want to differentiate between the parameters' theoretical vs. statistical value. For example, initiation time (IT) mirrors the duration for movement planning, as it captures the dwell time in the starting area before movement initiation and is thus of theoretical value. Statistically, however, ITs produced comparably weak effects in the present setup.[1] On the other hand, speed and acceleration measures (TTPV and TTPA) produce stronger statistical effects, but it may not be entirely obvious what this parameter reflects on a theoretical level for many setups.

Finally, Table 2 shows that the DVs that reflect the spatial distortion of the overall movement (MAD, AUC, Curv, and MinX) are highly correlated across trials (see Table 2, $|r|$s $> .83$; correlations including MinX are negative due to its inverse coding: more negative values indicate a stronger spatial deviation from the perfect line). This pattern suggests that they all reflect the same aspect of behavior, so that including all of them would be superfluous.

Based on this reasoning, we report ITs, SAs, MTs, and AUCs in the main text. All these DVs have shown to produce a significant compatibility effect and on a theoretical level, they reflect both temporal and spatial markers of both the early and the later stages of the response movement, which is why we believe they present a short but comprehensive overview of how the

[1] Note that participants were instructed to start their movement as quickly as possible. IT effects were readily found when instructions (and feedback) did not focus as strongly on fast response initiation (e.g., Wirth, Pfister, Janczyk, & Kunde, 2015).

experimental manipulation affects participants' movements.

We could even go one step further in reducing the data, as has been done by Incera (2018). She conducted a factor analysis on all the available DVs of her tracking setup and found that they can be represented by two factors, namely speed and spatial deviation. When we conduct a similar analysis with our data, we also find one factor that might relate to speed (consisting of MT, TTPV, and TTPA) and one factor that represents spatial deviation (consisting of MinX, MAD, AUC, and Curv). However, we report this just for completeness and to mention this possibility, for our experiments, we still prefer to work with measures that can be interpreted more directly.

r	IT	SA	MT	MinX	CT	FDT	xFlips	Ent	MAD	AUC	Curv	TTPV	TTPA
IT	1												
SA	.14	1											
MT	-.22	-.27	1										
MinX	.30	.46	-.60	1									
CT	-.09	-.03	-.11	-.07	1								
FDT	.01	.00	.05	-.03	-.01	1							
xFlips	-.15	-.24	.31	-.39	.08	.02	1						
Ent	.06	-.15	.28	-.32	-.01	.01	.22	1					
MAD	-.33	-.50	.61	-.95	.09	.02	.44	.39	1				
AUC	-.31	-.56	.56	-.92	.10	.02	.40	.35	.96	1			
Curv	-.32	-.33	.65	-.89	.17	.04	.41	.39	.89	.83	1		
TTPV	.15	-.15	.09	-.17	-.07	.02	.12	.31	.20	.19	.12	1	
TTPA	.20	-.12	.10	-.15	-.07	.01	.08	.34	.17	.16	.11	.70	1

Table 2. Correlations between all DVs, averaged over all participants, setups, and experimental conditions.

Results of Experiment 2

Data selection.

Again we only omitted trials in which participants produced commission errors (5.8%) or omissions (15.1%). Errors were committed equally often in both conditions, $X^2(1) = 0.51$, $p = .475$, but there were less omissions in the wide-layout (10.9%) than in the tall-layout (19.3%), $X^2(1) = 153.35$, $p < .001$. The remaining data was left unfiltered, and preprocessing was conducted as in Experiment 1. Means and standard deviations of all measures can be found in Table 3.

All dependent measures were then analyzed via 2 × 2 × 2 ANOVAs with current compatibility (trial N compatible vs. incompatible), preceding compatibility (trial N-1 compatible vs. incompatible) and layout (tall vs. wide) as within-subjects factors (see Figure 2). Again, we only scrutinized interactions with the factor layout in planned two-tailed *t*-tests or separate ANOVAs to keep it frugal.

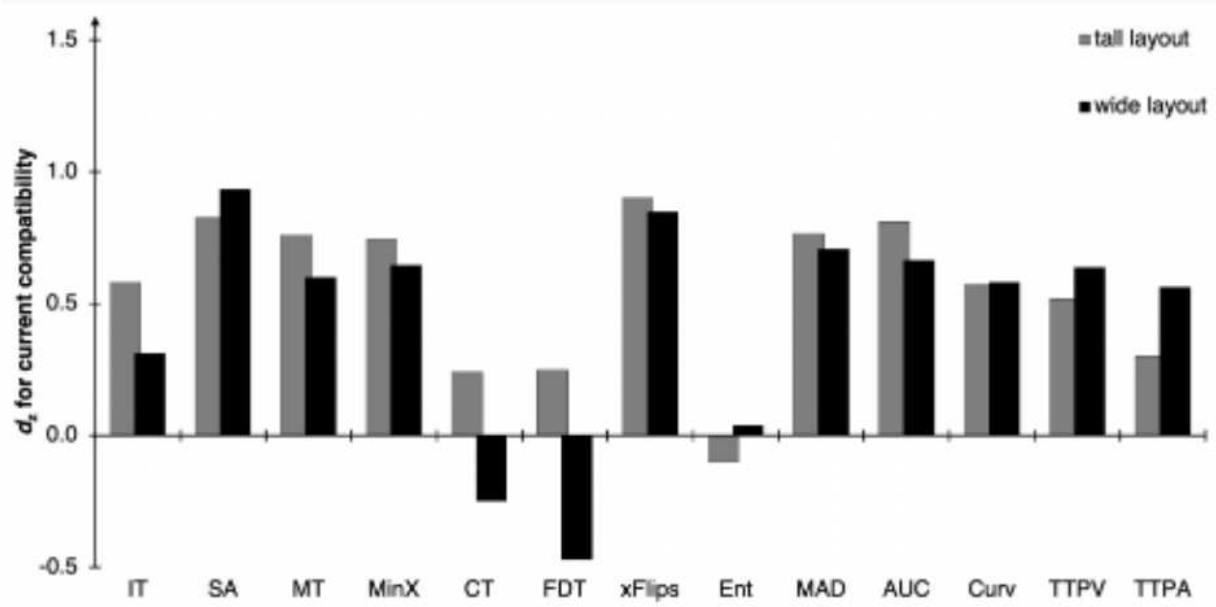

Figure 2. Results for all measures of Experiment 2. Standardized effect sizes d_z for the effect of current compatibility (computed as current incompatible minus current compatible) for each of

the computer DV (x-axis) and separate for each layout (columns).

Initiation times. Data showed significantly faster response initiation for current compatible trials (460 ms) than for incompatible trials (475 ms), $F(1, 23) = 10.74$, $p = .003$, $\eta_p^2 = .32$. Sequential adaptation effects emerged, $F(1, 23) = 22.51$, $p < .001$, $\eta_p^2 = .50$. The factor layout produced neither main effect nor any interaction, and no other effects were significant, $Fs \leq 1.39$, $ps \geq .250$.

Starting angles. Data showed significantly steeper response initiation for current incompatible trials (18.9°) than for compatible trials (27.7°), $F(1, 23) = 29.27$, $p < .001$, $\eta_p^2 = .56$. Response initiation was steeper in the tall layout (12.3°) relative to the wide layout (34.2°), $F(1, 23) = 111.29$, $p < .001$, $\eta_p^2 = .83$. Compatibility effects differed between layouts, $F(1, 23) = 5.36$, $p = .030$, $\eta_p^2 = .19$, with the tall layout producing smaller differences ($\Delta = 5.6°$) compared to the wide layout ($\Delta = 11.9°$). Sequential adaptation effects emerged, $F(1, 23) = 25.14$, $p < .001$, $\eta_p^2 = .52$. No other effects were significant, $Fs \leq 2.62$, $ps \geq .119$.

Movement times. Data showed significantly faster response execution for current compatible trials (311 ms) than for incompatible trials (331 ms), $F(1, 23) = 17.78$, $p < .001$, $\eta_p^2 = .44$. Sequential adaptation effects emerged, $F(1, 23) = 60.34$, $p < .001$, $\eta_p^2 = .72$. The factor layout produced neither a main effect nor any interaction, and no other effects were significant, $Fs \leq 1.98$, $ps \geq .173$.

Minimum X. Data showed significant differences in deviation towards the opposite side between current incompatible trials (-22 px) and compatible trials (-12 px), $F(1, 23) = 15.06$, $p = .001$, $\eta_p^2 = .40$, as well as between after compatible trials (-19 px) and after incompatible trials (-16 px), $F(1, 23) = 6.29$, $p = .020$, $\eta_p^2 = .22$. Response execution was overall less diverted in the

tall-layout (-11 px) relative to the wide-layout (-23 px), $F(1, 23) = 34.48$, $p < .001$, $\eta_p^2 = .60$. Sequential adaptation effects emerged, $F(1, 23) = 56.50$, $p < .001$, $\eta_p^2 = .71$, and they were further qualified by the three-way interaction between all factors, $F(1, 23) = 4.78$, $p = .039$, $\eta_p^2 = .17$, indicating slightly stronger adaptation effects in the tall layout, $F(1, 23) = 34.31$, $p < .001$, $\eta_p^2 = .60$, relative to the wide layout, $F(1, 23) = 29.85$, $p < .001$, $\eta_p^2 = .57$. No other effects were significant, Fs ≤ 3.34, ps $\geq .081$.

Click times. Finger release was fastest in the tall layout (416 ms) relative to the wide layout (800 ms), $F(1, 23) = 24.11$, $p < .001$, $\eta_p^2 = .51$. No other effects were significant, Fs ≤ 3.21, ps $\geq .086$.

Final distance to target. Compatibility effects differed between layouts, $F(1, 23) = 5.23$, $p = .032$, $\eta_p^2 = .19$, with the tall layout producing smaller differences ($\Delta = 0.2$ px) compared to the wide layout ($\Delta = 0.4$ px). No other effects were significant, Fs ≤ 4.13, ps $\geq .054$.

X flips. Data showed significantly more directional changes in current incompatible trials (1.13 per trial) than for compatible trials (0.95 per trial), $F(1, 23) = 28.91$, $p < .001$, $\eta_p^2 = .56$. Sequential adaptation effects emerged, $F(1, 23) = 23.67$, $p < .001$, $\eta_p^2 = .51$. No other effects were significant, Fs ≤ 2.17, ps $\geq .154$.

Entropy. Movement complexity was higher in the wide layout (0.0867) relative to the tall layout (0.0679), $F(1, 23) = 19.09$, $p < .001$, $\eta_p^2 = .45$. No other effects were significant, Fs < 1.

Maximum absolute deviation. Movements showed significantly greater spatial deviations for current incompatible trials (33 px) than for compatible trials (20 px), $F(1, 23) = 19.33$, $p < .001$, $\eta_p^2 = .46$, as well as after compatible trials (29 px) relative to after incompatible trials (24

px), $F(1, 23) = 8.50$, $p = .008$, $\eta_p^2 = .27$. Sequential adaptation effects emerged, $F(1, 23) = 58.28$, $p < .001$, $\eta_p^2 = .72$. No other effects were significant, Fs < 1.

Area under the curve. Movements showed significantly greater spatial deviations for current incompatible trials (8519 px^2) than for compatible trials (4823 px^2), $F(1, 23) = 17.12$, $p < .001$, $\eta_p^2 = .43$, as well as after compatible trials (7283 px^2) relative to after incompatible trials (6059 px^2), $F(1, 23) = 8.62$, $p = .007$, $\eta_p^2 = .27$. Overall deviation was smaller in the tall layout (5245 px^2) relative to the wide layout (8097 px^2), $F(1, 23) = 10.53$, $p = .004$, $\eta_p^2 = .31$. Sequential adaptation effects emerged, $F(1, 23) = 43.58$, $p < .001$, $\eta_p^2 = .66$. No other effects were significant, Fs ≤ 1.55, ps $\geq .226$.

Curvature. Movements showed significantly greater curvature for current incompatible trials (ratio of 1.07) than for compatible trials (1.03), $F(1, 23) = 13.99$, $p = .001$, $\eta_p^2 = .38$, as well as after compatible trials (1.06) relative to after incompatible trials (1.04), $F(1, 23) = 5.44$, $p = .029$, $\eta_p^2 = .19$. Overall curvature was smaller in the tall layout (1.03) relative to the wide layout (1.07), $F(1, 23) = 10.52$, $p = .004$, $\eta_p^2 = .31$. Sequential adaptation effects emerged, $F(1, 23) = 33.57$, $p < .001$, $\eta_p^2 = .59$. No other effects were significant, Fs ≤ 3.54, ps $\geq .073$.

Time to peak velocity. Peak speed was reached earlier in current compatible trials (peak velocity at 44.4% of the movement) than in incompatible trials (46.5%), $F(1, 23) = 18.93$, $p < .001$, $\eta_p^2 = .45$. Sequential adaptation effects emerged, $F(1, 23) = 34.01$, $p < .001$, $\eta_p^2 = .60$. No other effects were significant, Fs < 1.

Time to peak acceleration. Movements accelerated earlier for current compatible trials (peak acceleration at 43.5% of the movement) than for incompatible trials (45.1%), $F(1, 23) = 7.63$, $p = .011$, $\eta_p^2 = .25$. Sequential adaptation effects emerged, $F(1, 23) = 30.13$, $p < .001$, η_p^2

= .57. No other effects were significant, Fs ≤ 1.09, ps ≥ .308.

	tall layout				wide layout			
preceding compatibility	compatible		incompatible		compatible		incompatible	
current compatibility	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible
IT	442 (100)	486 (124)	467 (102)	464 (125)	455 (110)	490 (125)	476 (122)	461 (127)
SA	15,9 (5,9)	6,4 (10,7)	14,3 (5,7)	12,7 (6,5)	42,9 (11,3)	24,0 (19,8)	37,5 (11,4)	32,5 (16,4)
MT	305 (76)	361 (86)	338 (86)	316 (80)	288 (84)	340 (101)	315 (89)	307 (98)
MinX	-6 (6)	-19 (14)	-10 (8)	-9 (6)	-12 (10)	-38 (29)	-21 (11)	-22 (18)
CT	400 (328)	442 (427)	409 (345)	412 (376)	720 (399)	741 (462)	999 (799)	741 (515)
FDT	13 (2)	14 (2)	13 (2)	13 (3)	13 (3)	13 (3)	13 (3)	13 (3)
xFlips	0,89 (0,17)	1,20 (0,36)	1,04 (0,33)	1,05 (0,24)	0,89 (0,23)	1,26 (0,35)	0,97 (0,24)	1,03 (0,31)
Ent	0,0689 (0,0339)	0,0687 (0,0289)	0,0682 (0,0292)	0,0659 (0,0303)	0,0859 (0,0340)	0,0863 (0,0330)	0,0882 (0,0358)	0,0862 (0,0309)
MAD	14 (13)	42 (32)	24 (17)	21 (15)	16 (13)	42 (32)	25 (17)	27 (24)
AUC	2907 (2659)	8927 (7096)	4732 (3606)	4412 (3481)	4380 (4425)	12915 (11466)	7272 (5759)	7822 (8105)
Curv	1,00 (0,06)	1,07 (0,06)	1,04 (0,04)	1,00 (0,08)	1,02 (0,08)	1,15 (0,13)	1,07 (0,06)	1,04 (0,13)
TTPV	43,4 (8,9)	49,0 (9,4)	46,3 (9,2)	44,6 (8,9)	42,6 (7,5)	47,8 (5,6)	45,3 (6,6)	44,5 (6,4)
TTPA	42,9 (8,8)	47,8 (9,6)	45,5 (8,8)	43,1 (8,6)	41,3 (7,8)	46,4 (5,4)	44,3 (6,9)	43,2 (6,2)

Table 3. Means (and standard deviations) for all measures and for all combinations of experimental factors of Experiment 2.

Results of the between-experiment analysis

After removing all errors and omissions, all dependent measures were analyzed via 2 × 2 × 2 ANOVAs with current compatibility (trial N compatible vs. incompatible) and preceding compatibility (trial N-1 compatible vs. incompatible) as within-subjects factors and distance (near vs. far) as a between-subjects factor (see Figure 3). We only scrutinized interactions with the factor distance in planned two-tailed *t*-tests or separate ANOVAs to keep it frugal.

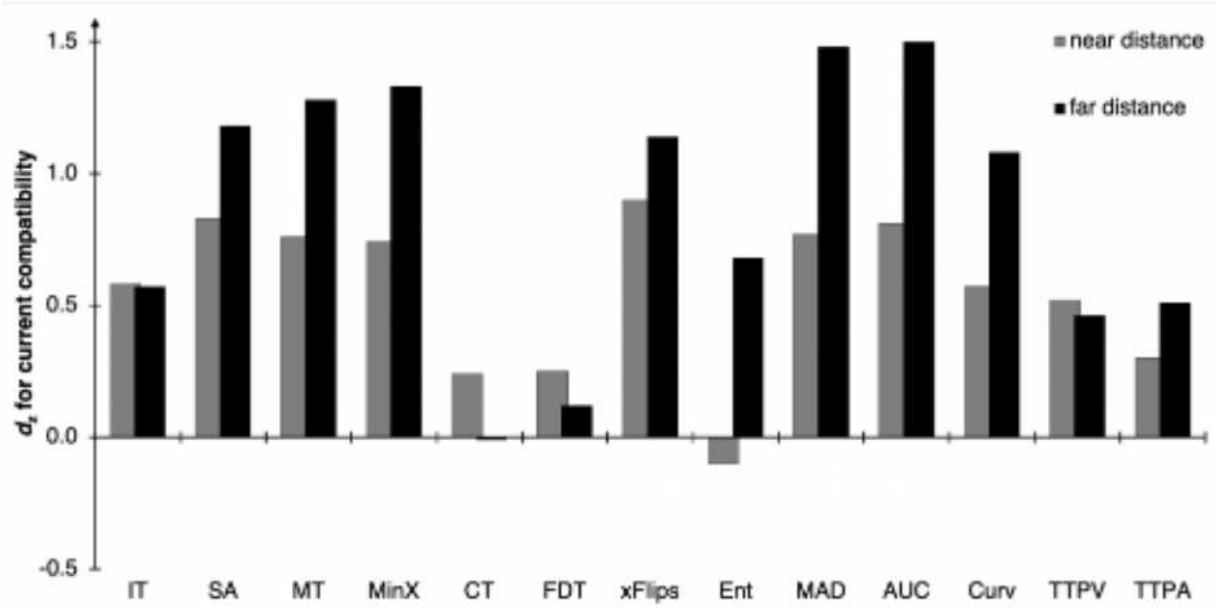

Figure 3. Results for all measures of the Between Experiment analysis. Standardized effect sizes d_z for the effect of current compatibility (computed as current incompatible minus current compatible) for each of the computer DV (x-axis) and separate for each distance (columns).

Initiation times. Data showed significantly faster response initiation for current compatible trials (406 ms) than for incompatible trials (422 ms), $F(1, 58) = 20.38$, $p < .001$, $\eta_p^2 = .26$. A main effect of distance, $F(1, 58) = 9.31$, $p = .003$, $\eta_p^2 = .14$, indicated faster response initiation with the far distance (380 ms) than with the near distance (465 ms). Sequential adaptation effects emerged, $F(1, 58) = 20.20$, $p < .001$, $\eta_p^2 = .26$. No other effects were significant, Fs ≤ 1.37, ps $\geq .247$.

Starting angles. Data showed significantly steeper response initiation for current incompatible trials (5.9°) than for compatible trials (12.2°), $F(1, 58) = 57.01$, $p < .001$, $\eta_p^2 = .50$, as well as after compatible trials (8.3°) compared to after incompatible trials (9.7°), $F(1, 58) = 7.70$, $p = .007$, $\eta_p^2 = .12$. Response initiation was steeper in the far distance (6.8°) relative to the near distance (12.3°), $F(1, 58) = 10.96$, $p < .001$, $\eta_p^2 = .16$. Sequential adaptation effects emerged, $F(1, 58) = 27.78$, $p < .001$, $\eta_p^2 = .32$. No other effects were significant, Fs ≤ 1.70, ps $\geq .197$.

Movement times. Data showed significantly faster response execution for current compatible trials (369 ms) than for incompatible trials (398 ms), $F(1, 58) = 55.53$, $p < .001$, $\eta_p^2 = .49$, as well as after compatible trials (380 ms) compared to after incompatible trials (387 ms), $F(1, 58) = 4.19$, $p = .045$, $\eta_p^2 = .07$. A main effect of distance, $F(1, 58) = 12.53$, $p = .001$, $\eta_p^2 = .18$, indicated faster response execution with the near distance (330 ms) than with the far distance (419 ms). Compatibility effects differed between distances, $F(1, 58) = 8.07$, $p = .006$, $\eta_p^2 = .12$, with the near distance producing significantly smaller differences (Δ = 17 ms) compared to the far distance (Δ = 38 ms). Sequential adaptation effects emerged, $F(1, 58) = 58.39$, $p < .001$, $\eta_p^2 = .50$. No other effects were significant, Fs ≤ 1, ps $\geq .871$.

Minimum X. Data showed significant differences in deviation towards the opposite side between current incompatible trials (-26 px) and compatible trials (-14 px), $F(1, 58) = 60.23$, $p < .001$, $\eta_p^2 = .51$, as well as between after compatible trials (-22 px) and after incompatible trials (-18 px), $F(1, 58) = 19.13$, $p < .001$, $\eta_p^2 = .25$. A main effect of distance, $F(1, 58) = 24.50$, $p < .001$, $\eta_p^2 = .30$, indicated stronger deviation to the opposite side with the far distance (-26 px) than with the near distance (-11 px). Compatibility effects differed between distances, $F(1, 58) =$

13.98, $p < .001$, $\eta_p^2 = .19$, with the near distance producing significantly smaller differences (Δ = 6 px) compared to the far distance (Δ = 17 px). Sequential adaptation effects emerged, $F(1, 58) = 60.94$, $p < .001$, $\eta_p^2 = .51$. No other effects were significant, Fs ≤ 3.42, ps $\geq .069$.

Click times. No effects were significant, Fs ≤ 1.45, ps $\geq .233$.

Final distance to target. Sequential adaptation effects emerged, $F(1, 58) = 10.35$, $p = .002$, $\eta_p^2 = .15$. No other effects were significant, Fs ≤ 3.33, ps $\geq .073$.

X flips. Data showed significantly more directional changes in current incompatible trials (1.27 per trial) than in compatible trials (1.07per trial), $F(1, 58) = 58.27$, $p < .001$, $\eta_p^2 = .50$. A main effect of distance, $F(1, 58) = 9.85$, $p = .003$, $\eta_p^2 = .15$, indicated more X flips with the far distance (1.25 per trial) than with the near distance (1.04 per trial). Sequential adaptation effects emerged, $F(1, 58) = 30.04$, $p < .001$, $\eta_p^2 = .34$. No other effects were significant, Fs ≤ 1.66, ps $\geq .203$.

Entropy. Data showed significantly higher movement complexity in current incompatible trials (0.0629) than for compatible trials (0.0582), $F(1, 58) = 9.03$, $p = .004$, $\eta_p^2 = .14$, as well as after compatible trials (0.0616) relative to after incompatible trials (0.0596), $F(1, 58) = 7.88$, $p = .007$, $\eta_p^2 = .12$. A main effect of distance, $F(1, 58) = 4.29$, $p = .043$, $\eta_p^2 = .07$, indicated higher movement complexity with the near distance (0.0679) than with the far distance (0.0577). Compatibility effects differed between distances, $F(1, 58) = 16.43$, $p < .001$, $\eta_p^2 = .22$, with the near distance producing significantly smaller differences (Δ = -0.0013) compared to the far distance (Δ = 0.0087). Sequential adaptation effects emerged, $F(1, 58) = 19.13$, $p < .001$, $\eta_p^2 = .25$, and they were further modulated by distance, $F(1, 58) = 10.85$, $p = .002$, $\eta_p^2 = .16$, with a significant sequential adaptation only for the far distance, $F(1, 35) = 46.58$, $p < .001$, $\eta_p^2 = .57$,

but not for the near distance, $F < 1$. Aftereffects did not differ between distances, $F < 1$.

Maximum absolute deviation. Movements showed significantly greater spatial deviations for current incompatible trials (65 px) than for compatible trials (37 px), $F(1, 58) = 71.43$, $p < .001$, $\eta_p^2 = .55$, as well as after compatible trials (55 px) relative to after incompatible trials (47 px), $F(1, 58) = 17.10$, $p < .001$, $\eta_p^2 = .23$. A main effect of distance, $F(1, 58) = 29.65$, $p < .001$, $\eta_p^2 = .34$, indicated larger spatial deviations with the far distance (68 px) than with the near distance (25 px). Compatibility effects differed between distances, $F(1, 58) = 17.96$, $p < .001$, $\eta_p^2 = .24$, with the near distance producing significantly smaller differences ($\Delta = 12$ px) compared to the far distance ($\Delta = 38$ px). Sequential adaptation effects emerged, $F(1, 58) = 66.14$, $p < .001$, $\eta_p^2 = .53$. No other effects were significant, Fs ≤ 3.56, ps $\geq .064$.

Area under the curve. Movements showed significantly greater spatial deviations for current incompatible trials (20393 px^2) than for compatible trials (11731 px^2), $F(1, 58) = 69.17$, $p < .001$, $\eta_p^2 = .54$, as well as after compatible trials (17344 px^2) relative to after incompatible trials (14779 px^2), $F(1, 58) = 14.37$, $p < .001$, $\eta_p^2 = .20$. A main effect of distance, $F(1, 58) = 49.99$, $p < .001$, $\eta_p^2 = .46$, indicated larger spatial deviations with the far distance (23274 px^2) than with the near distance (5245 px^2). Compatibility effects differed between distances, $F(1, 58) = 27.41$, $p < .001$, $\eta_p^2 = .45$, with the near distance producing significantly smaller differences ($\Delta = 2850$ px^2) compared to the far distance ($\Delta = 12535$ px^2). Sequential adaptation effects emerged, $F(1, 58) = 48.17$, $p < .001$, $\eta_p^2 = .45$, and they were further modulated by distance, $F(1, 58) = 8.79$, $p = .004$, $\eta_p^2 = .13$, and sequential adaptation showed up for both distances, Fs ≥ 30.24, ps $< .001$. Aftereffects did not differ between distances, $F(1, 58) = 2.66$, $p = .108$, $\eta_p^2 = .04$.

Curvature. Movements showed significantly greater curvature for current incompatible

trials (1.06) than for compatible trials (1.03), $F(1, 58) = 43.69$, $p < .001$, $\eta_p^2 = .43$, as well as after compatible trials (1.05) relative to after incompatible trials (1.04), $F(1, 58) = 8.65$, $p = .005$, $\eta_p^2 = .13$. A main effect of distance, $F(1, 58) = 6.41$, $p = .014$, $\eta_p^2 = .10$, indicated larger curvature with the far distance (1.06) than with the near distance (1.03). Compatibility effects differed between distances, $F(1, 58) = 9.20$, $p = .004$, $\eta_p^2 = .14$, with the near distance producing significantly smaller differences ($\Delta = 0.02$) compared to the far distance ($\Delta = 0.05$). Sequential adaptation effects emerged, $F(1, 58) = 34.36$, $p < .001$, $\eta_p^2 = .37$. No other effects were significant, Fs < 1.

Time to peak velocity. Peak speed was reached earlier in current compatible trials (peak velocity at 46.7% of the movement) than in incompatible trials (48.5%), $F(1, 58) = 13.65$, $p < .001$, $\eta_p^2 = .19$. Sequential adaptation effects emerged, $F(1, 58) = 37.85$, $p < .001$, $\eta_p^2 = .40$. No other effects were significant, Fs ≤ 2.67, ps $\geq .108$.

Time to peak acceleration. Movements accelerated earlier for current compatible trials (peak acceleration at 45.8% of the movement) than for incompatible trials (47.4%), $F(1, 58) = 9.48$, $p = .003$, $\eta_p^2 = .14$. Aftereffects also differed between distances, $F(1, 58) = 4.16$, $p = .046$, $\eta_p^2 = .07$, with the far distance producing post-conflict slowing ($\Delta = 0.6\%$) and the near distance showing signs of post-conflict speeding ($\Delta = -1.1\%$). Sequential adaptation effects emerged, $F(1, 58) = 35.63$, $p < .001$, $\eta_p^2 = .38$. No other effects were significant, Fs ≤ 2.67, ps $\geq .108$.

Results of Experiment 3

Data selection.

Again we only omitted trials in which participants produced commission errors (3.9%) or omissions (11.4%). Fewer errors were committed in the subsequent condition (3.2%) than in the before (4.2%) or simultaneous condition (4.3%), $X^2(1) \geq 5.48$, $ps \leq .020$, whereas the latter did not differ from each other, $X^2(1) = 0.17$, $p = .676$. There were no differences in omission rates, $X^2(1) \leq 0.64$, $ps \geq .426$. The remaining data was left unfiltered, and preprocessing was conducted as in the previous experiments. Means and standard deviations of all measures can be found in Table 4.

All dependent measures were then analyzed via 2 × 2 × 3 ANOVAs with current compatibility (trial N compatible vs. incompatible), preceding compatibility (trial N-1 compatible vs. incompatible) and stimulus onset (before vs. simultaneous to vs. subsequent to movement initiation) as within-subjects factors (see Figure 4). We only scrutinized interactions with the factor stimulus onset in planned two-tailed *t*-tests or separate ANOVAs to keep it frugal.

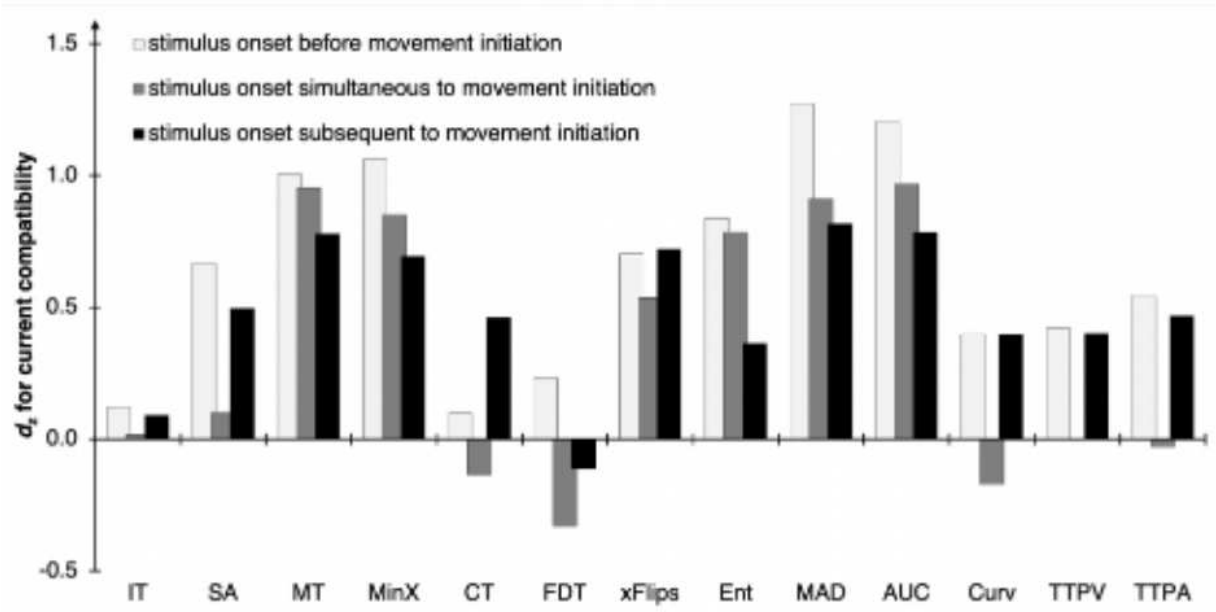

Figure 4. Results for all measures of Experiment 3. Standardized effect sizes d_z for the effect of current compatibility (computed as current incompatible minus current compatible) for each of the computer DV (x-axis) and separate for each onset condition (columns).

Initiation times. Response initiation was slower with stimulus onset before movement initiation (253 ms) relative to the simultaneous (134 ms) and subsequent conditions (118 ms), $F(2, 21) = 9.16$, $p = .001$, $\eta_p^2 = .47$, with significant differences between the before condition and the rest, ts ≥ 3.55, ps $\leq .001$, ds ≥ 0.59, but no significant difference between the simultaneous and subsequent condition, $t(22) = 1.25$, $p = .219$, $d = 0.21$. Sequential adaptation effects emerged, $F(1, 22) = 4.46$, $p = .046$, $\eta_p^2 = .17$. No other effects were significant, Fs ≤ 1.08, ps $\geq .359$.

Starting angles. Data showed significantly steeper response initiation for current incompatible trials (2.4°) than for compatible trials (4.4°), $F(1, 22) = 13.60$, $p = .001$, $\eta_p^2 = .38$. Compatibility effects differed between conditions, $F(2, 21) = 3.58$, $p = .046$, $\eta_p^2 = .25$, with the before condition producing significantly larger results ($\Delta = 3.8°$) compared to stimulus onset simultaneous to movement initiation ($\Delta = 0.2°$), $t(22) = 2.54$, $p = .016$, $d = 0.42$, and the

subsequent condition (Δ = 1.7°) in between, ts ≤ 1.72, ps ≥ .094, ds ≤ 0.29. Sequential adaptation effects emerged, $F(1, 22) = 11.20$, $p = .003$, $\eta_p^2 = .12$. No other effects were significant, Fs ≤ 1.71, ps ≥ .206.

Movement times. Data showed significantly faster response execution for current compatible trials (575 ms) than for incompatible trials (610 ms), $F(1, 22) = 33.22$, $p < .001$, $\eta_p^2 = .60$. Response execution was faster with stimulus onset before movement initiation (486 ms) relative to the simultaneous (621 ms) and subsequent conditions (671 ms), $F(2, 21) = 11.90$, $p < .001$, $\eta_p^2 = .53$, with significant differences between the before condition and the rest, ts ≥ 4.05, ps < .001, ds ≥ 0.68, but no significant difference between the simultaneous and subsequent condition, $t(22) = 1.54$, $p = .132$, $d = 0.26$. Sequential adaptation effects emerged, $F(1, 22) = 49.70$, $p < .001$, $\eta_p^2 = .69$. No other effects were significant, Fs ≤ 2.76, ps ≥ .086.

Minimum X. Data showed significant differences in deviation towards the opposite side between current incompatible trials (-39 px) and compatible trials (-27 px), $F(1, 22) = 26.27$, $p < .001$, $\eta_p^2 = .54$, as well as between after compatible trials (-34 px) and after incompatible trials (-32 px), $F(1, 22) = 4.56$, $p = .044$, $\eta_p^2 = .17$. Sequential adaptation effects emerged, $F(1, 22) = 29.71$, $p < .001$, $\eta_p^2 = .58$, but these were further modulated by stimulus onset, $F(2, 21) = 5.29$, $p = .014$, $\eta_p^2 = .33$, and sequential adaptation showed up for all setups, Fs ≥ 5.68, ps ≤ .026. No other effects were significant, Fs ≤ 2.94, ps ≥ .169.

Click times. No effects were significant, Fs ≤ 2.14, ps ≥ .157.

Final distance to target. No effects were significant, Fs ≤ 2.79, ps ≥ .084.

X flips. Data showed significantly more directional changes in current incompatible trials

(1.58 per trial) than for compatible trials (1.43 per trial), $F(1, 22) = 23.61$, $p < .001$, $\eta_p^2 = .52$. Sequential adaptation effects emerged, $F(1, 22) = 13.27$, $p = .001$, $\eta_p^2 = .38$. No other effects were significant, Fs ≤ 1.82, ps $\geq .187$.

Entropy. Data showed higher movement complexity and fluctuation in current incompatible trials (0.0593) relative to compatible trials (0.0528), $F(1, 22) = 35.39$, $p < .001$, $\eta_p^2 = .62$, as well as after compatible trials (0.0570) relative to after incompatible trials (0.0551), $F(1, 22) = 9.09$, $p = .006$, $\eta_p^2 = .29$. Sequential adaptation effects emerged, $F(1, 22) = 27.33$, $p < .001$, $\eta_p^2 = .55$, and they were further modulated by stimulus onset, $F(2, 21) = 5.06$, $p = .016$, $\eta_p^2 = .33$, and sequential adaptation showed up only for the before and simultaneous conditions, Fs ≥ 19.37, ps $< .001$, but not when targets appeared subsequent to movement initiation, $F(1, 22) = 3.04$, $p = .095$, $\eta_p^2 = .12$. No other effects were significant, Fs ≤ 2.46, ps $\geq .109$.

Maximum absolute deviation. Movements showed significantly greater spatial deviations for current incompatible trials (136 px) than for compatible trials (110 px), $F(1, 22) = 33.20$, $p < .001$, $\eta_p^2 = .60$, as well as after compatible trials (125 px) relative to after incompatible trials (121 px), $F(1, 22) = 8.81$, $p = .007$, $\eta_p^2 = .29$. Compatibility effects differed between conditions, $F(2, 21) = 5.50$, $p = .012$, $\eta_p^2 = .34$, with the before condition producing significantly larger results ($\Delta = 35$ px) compared to stimulus onset simultaneous ($\Delta = 22$ px) or subsequent to movement initiation ($\Delta = 23$ px), ts ≥ 2.53, ps $\leq .016$, ds ≥ 0.42, and no difference between the latter conditions, $|t| < 1$. Sequential adaptation effects emerged, $F(1, 22) = 36.16$, $p < .001$, $\eta_p^2 = .62$, and they were further modulated by stimulus onset, $F(2, 21) = 5.02$, $p = .017$, $\eta_p^2 = .32$, and sequential adaptation showed up for all conditions, Fs ≥ 13.28, ps $\leq .001$. No other effects were significant, Fs ≤ 2.15, ps $\geq .141$.

Area under the curve. Movements showed significantly greater spatial deviations for current incompatible trials (43197 px^2) than for compatible trials (36139 px^2), $F(1, 22) = 32.80$, $p < .001$, $\eta_p^2 = .60$, as well as after compatible trials (40282 px^2) relative to after incompatible trials (39054 px^2), $F(1, 22) = 5.47$, $p = .029$, $\eta_p^2 = .20$. Compatibility effects differed between conditions, $F(2, 21) = 7.30$, $p = .004$, $\eta_p^2 = .41$, with the before condition producing significantly larger results (Δ = 10006 px^2) compared to stimulus onset simultaneous to (Δ = 5840 px^2) or subsequent to movement initiation (Δ = 5329 px^2), ts $\geq$ 2.84, ps $\leq$ .008, ds $\geq$ 0.47, but no significant difference between the simultaneous and subsequent condition, $|t| < 1$. Sequential adaptation effects emerged, $F(1, 22) = 31.19$, $p < .001$, $\eta_p^2 = .59$, and they were further modulated by stimulus onset, $F(2, 21) = 4.36$, $p = .026$, $\eta_p^2 = .29$, and sequential adaptation showed up for all conditions, Fs $\geq$ 9.29, ps $\leq$ .006. No other effects were significant, Fs $\leq$ 1.70, ps $\geq$ .207.

Curvature. No effects were significant, Fs $\leq$ 3.36, ps $\geq$ .054.

Time to peak velocity. Overall peak velocity was achieved earlier with stimulus onset before (54.7%) relative to the simultaneous (62.6%) and subsequent conditions (62.0%), $F(2, 21) = 5.19$, $p = .015$, $\eta_p^2 = .33$, with significant differences between the before condition and the rest, ts $\geq$ 2.76, ps $\leq$ .009, ds $\geq$ 0.46, but no significant difference between the simultaneous and subsequent condition, $|t| < 1$. Sequential adaptation effects emerged, $F(1, 22) = 6.78$, $p = .016$, $\eta_p^2 = .24$, and they were further modulated by stimulus onset, $F(2, 21) = 4.10$, $p = .031$, $\eta_p^2 = .28$, with sequential adaptation only showing up for the before condition, $F(1, 22) = 15.21$, $p = .001$, $\eta_p^2 = .41$, but not for the others, Fs < 1. No other effects were significant, Fs $\leq$ 3.68, ps $\geq$ .068.

Time to peak acceleration. Movements accelerated earlier for current compatible trials

(peak acceleration at 58.1% of the movement) than for compatible trials (59.3%), $F(1, 22) = 4.80$, $p = .039$, $\eta_p^2 = .18$. Overall peak acceleration was achieved earlier with stimulus onset before (53.8%) relative to the simultaneous (61.6%) and subsequent conditions (60.7%), $F(2, 21) = 4.70$, $p = .021$, $\eta_p^2 = .31$, with significant differences between the before condition and the rest, ts ≥ 2.58, ps $\leq .014$, ds ≥ 0.43, but no significant difference between the simultaneous and subsequent condition, $|t| < 1$. Compatibility effects differed between conditions, $F(2, 21) = 4.32$, $p = .027$, $\eta_p^2 = .29$, with the simultaneous condition producing significantly smaller results (Δ = -0.1%) compared to the before (Δ = 1.7%) or subsequent condition (Δ = 2.0%), ts ≥ 2.05, ps $\leq .048$, ds ≥ 0.34, and no difference between the latter conditions, $|t| < 1$. Sequential adaptation effects emerged, $F(1, 22) = 6.77$, $p = .016$, $\eta_p^2 = .24$. No other effects were significant, Fs ≤ 1.27, ps $\geq .301$.

	before movement initiation				simultaneous to movement initiation				subsequent to movement initiation			
preceding compatibility	compatible		incompatible		compatible		incompatible		compatible		incompatible	
current compatibility	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible
IT	245 (135)	258 (162)	285 (166)	280 (152)	133 (63)	134 (58)	134 (60)	135 (55)	113 (44)	119 (47)	120 (48)	116 (48)
RA	6,5 (6,8)	-0,2 (6,8)	3,7 (7,3)	2,6 (5,1)	3,5 (7,7)	2,9 (6,5)	3,8 (7,2)	4,1 (7,3)	5,1 (7,8)	2,6 (5,8)	4,5 (7,5)	3,5 (6,6)
MT	440 (105)	525 (126)	484 (111)	481 (121)	594 (168)	651 (195)	615 (184)	623 (153)	645 (248)	700 (265)	668 (250)	671 (250)
MinX	-20 (10)	-40 (20)	-38 (20)	-33 (21)	-26 (21)	-40 (27)	-30 (21)	-34 (25)	-25 (20)	-41 (20)	-27 (16)	-35 (25)
CT	510 (405)	432 (370)	432 (374)	540 (505)	410 (413)	408 (380)	394 (343)	417 (427)	470 (403)	514 (526)	405 (479)	595 (662)
FDT	30 (32)	23 (12)	22 (18)	30 (32)	20 (21)	17 (12)	23 (12)	19 (10)	17 (5)	16 (4)	15 (3)	15 (4)
xFlips	1,37 (0,30)	1,33 (0,28)	1,38 (0,48)	1,44 (0,41)	1,43 (0,40)	1,47 (0,46)	1,38 (0,33)	1,50 (0,53)	1,41 (0,37)	1,47 (0,44)	1,53 (0,60)	1,66 (0,71)
Err	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAD	93 (60)	104 (76)	103 (82)	112 (84)	107 (60)	116 (77)	118 (67)	120 (72)	120 (70)	133 (82)	126 (70)	139 (77)
AUC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Curv	1,32 (0,83)	1,28 (0,29)	1,24 (0,34)	1,41 (1,03)	1,18 (0,30)	1,32 (0,73)	1,28 (0,62)	1,14 (0,11)	1,15 (0,12)	1,22 (0,19)	1,14 (0,08)	1,18 (0,11)
TTPV	62,8 (9,2)	56,3 (8,8)	55,3 (7,0)	54,5 (8,8)	62,0 (12,3)	62,7 (13,6)	63,2 (12,5)	62,6 (13,4)	61,1 (14,6)	63,3 (14,2)	61,1 (15,3)	62,6 (15,5)
TTPA	62,1 (9,2)	55,5 (9,5)	53,6 (8,1)	53,0 (8,3)	61,3 (12,2)	61,8 (13,2)	61,3 (12,8)	61,2 (13,1)	59,7 (14,2)	62,4 (14,1)	58,7 (15,2)	61,0 (14,4)

Table 4. Means (and standard deviations) for all measures and for all combinations of experimental factors of Experiment 3.

Results of Experiment 4

Data selection. Again we only omitted trials in which participants produced commission errors (5.6%) or omissions (6.3%). More errors were committed in the large target condition (6.8%) than in the small (4.9%) or medium condition (5.1%), $X^2(1) \geq 16.07$, $ps < .001$, whereas the latter did not differ from each other, $X^2(1) = 0.17$, $p = .676$. Omissions were committed more often in the small target condition (11.0%) than in the large (3.8%) or medium condition (4.2%), $X^2(1) \geq 172.18$, $ps < .001$, whereas the latter did not differ from each other, $X^2(1) = 1.43$, $p = .232$. The remaining data was left unfiltered, and preprocessing was conducted as in the previous experiments. Means and standard deviations of all measures can be found in Table 5.

All dependent measures were then analyzed via 2 × 2 × 3 ANOVAs with current compatibility (trial N compatible vs. incompatible), preceding compatibility (trial N-1 compatible vs. incompatible), and target size (small vs. medium vs. large) as within-subjects factors (see Figure 5). We only scrutinized interactions with the factor target size in planned two-tailed *t*-tests or separate ANOVAs to keep it frugal.

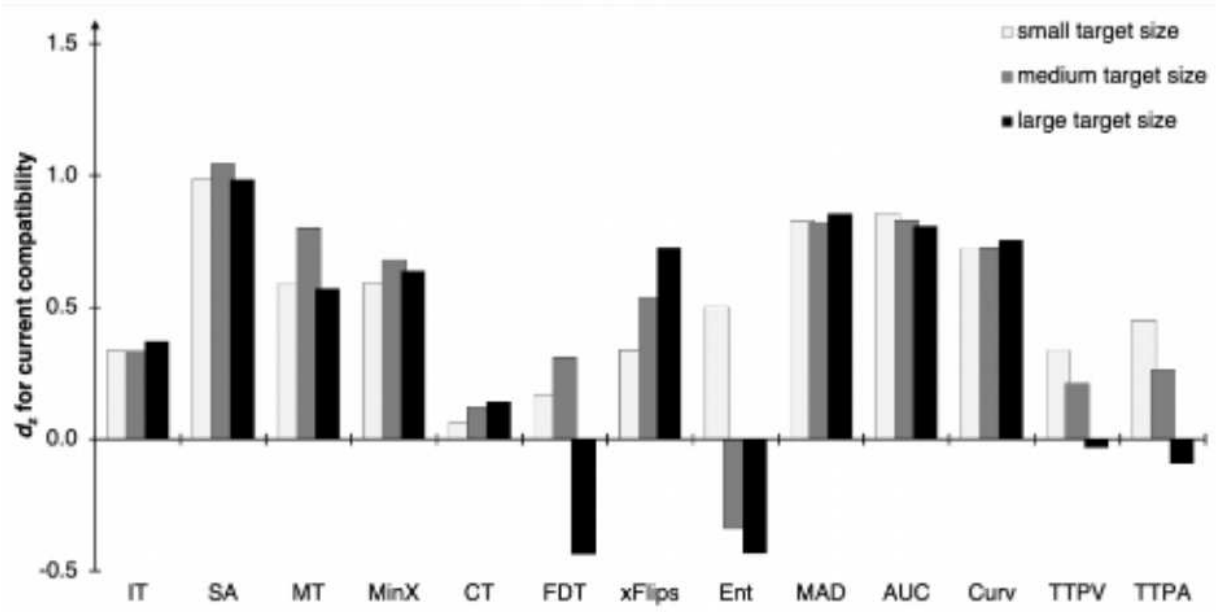

Figure 5. Results for all measures of Experiment 4. Standardized effect sizes d_z for the effect of current compatibility (computed as current incompatible minus current compatible) for each of the computer DV (x-axis) and separate for each target size (columns).

Initiation times. Response initiation was faster after compatible trials (396 ms) than after incompatible trials (407 ms), $F(1, 23) = 14.47$, $p = .012$, $\eta_p^2 = .25$. Sequential adaptation effects emerged, $F(1, 23) = 17.43$, $p < .001$, $\eta_p^2 = .43$, and they were further modulated by target size, $F(2, 22) = 5.32$, $p = .013$, $\eta_p^2 = .33$, and sequential adaptation showed up only for the small and large targets, Fs ≥ 8.37, ps $< .008$, but not with medium sized targets, $F(1, 23) = 1.60$, $p = .219$, $\eta_p^2 = .07$. No other effects were significant, Fs ≤ 3.38, ps $\geq .079$.

Starting angles. Data showed significantly steeper response initiation for current incompatible trials (6.9°) than for compatible trials (12.0°), $F(1, 23) = 42.29$, $p < .001$, $\eta_p^2 = .65$, as well as between after compatible trials (9.9°) and after incompatible trials (9.0°), $F(1, 23) = 5.00$, $p = .035$, $\eta_p^2 = .18$. Sequential adaptation effects emerged, $F(1, 23) = 35.88$, $p < .001$, $\eta_p^2 = .61$. No other effects were significant, Fs ≤ 2.29, ps $\geq .125$.

Movement times. Data showed significantly faster response execution for current

compatible trials (339 ms) than for incompatible trials (359 ms), $F(1, 23) = 19.05$, $p < .001$, $\eta_p^2 = .45$. Response execution was slower with small targets (412 ms) relative to with medium (332 ms) and large targets (303 ms), $F(2, 22) = 38.26$, $p < .001$, $\eta_p^2 = .78$, with significant differences between all conditions, ts ≥ 3.12, ps $< .001$, ds ≥ 0.52. Sequential adaptation effects emerged, $F(1, 23) = 49.04$, $p < .001$, $\eta_p^2 = .68$. No other effects were significant, Fs ≤ 1.18, ps $\geq .289$.

Minimum X. Data showed significant differences in deviation towards the opposite side between current incompatible trials (-25 px) and compatible trials (-17 px), $F(1, 23) = 15.40$, $p = .001$, $\eta_p^2 = .40$. Sequential adaptation effects emerged, $F(1, 23) = 38.69$, $p < .001$, $\eta_p^2 = .63$. No other effects were significant, Fs ≤ 2.75, ps $\geq .111$.

Click times. Finger release was slower with small targets (733 ms) relative to with medium (567 ms) and large targets (493 ms), $F(2, 22) = 7.24$, $p = .004$, $\eta_p^2 = .40$, with significant differences between the small and the large target conditions, $t(23) = 3.61$, $p < .001$, $d = 0.60$, but no significant differences between the medium and both other targets, ts ≤ 1.76, ps $\geq .088$, ds ≤ 0.29. No other effects were significant, Fs < 1.

Final distance to target. Residual target distance was smallest for the small targets (14 px) relative to medium (22 px) and large targets (29 px), $F(2, 22) = 89.40$, $p < .001$, $\eta_p^2 = .89$, with significant differences between all conditions, ts ≥ 5.93, ps $< .001$, ds ≥ 0.99. Compatibility effects differed between conditions, $F(2, 22) = 4.59$, $p = .022$, $\eta_p^2 = .29$, with the large targets producing reverse results (Δ = -1.1 px) compared to medium (Δ = 0.8 px) and small targets (Δ = 0.2 px), ts ≥ 2.42, ps $\leq .020$, ds ≥ 0.40. Sequential adaptation effects emerged, $F(1, 23) = 12.61$, $p = .002$, $\eta_p^2 = .35$. No other effects were significant, Fs ≤ 2.05, ps $\geq .153$.

X flips. Data showed significantly more directional changes in current incompatible trials

(1.21 per trial) than for compatible trials (1.09 per trial), $F(1, 23) = 10.73$, $p = .003$, $\eta_p^2 = .32$, as well as after compatible trials (1.17 per trial) relative to after incompatible trials (1.13 per trial), $F(1, 23) = 6.36$, $p = .019$, $\eta_p^2 = .22$. Sequential adaptation effects emerged, $F(1, 23) = 37.74$, $p < .001$, $\eta_p^2 = .62$. No other effects were significant, Fs < 1.30, ps > .294.

Entropy. Movement complexity was smallest for the small targets (0.0515) relative to medium (0.0803) and large targets (0.0999), $F(2, 22) = 45.39$, $p < .001$, $\eta_p^2 = .81$, with significant differences between all conditions, ts ≥ 4.02, ps < .001, ds ≥ 0.67. Compatibility effects differed between conditions, $F(2, 22) = 4.59$, $p = .022$, $\eta_p^2 = .29$, with the small targets producing larger results (Δ = 0.0040) compared to medium (Δ = -0.0026) and large targets (Δ = -0.0069), ts ≥ 3.15, ps ≤ .003, ds ≥ 0.53, but no significant difference between medium and large targets, $t(23) = 2.01$, $p = .052$, $d = 0.33$. No other effects were significant, Fs ≤ 2.45, ps ≥ .131.

Maximum absolute deviation. Movements showed significantly greater spatial deviations for current incompatible trials (66 px) than for compatible trials (47 px), $F(1, 23) = 28.27$, $p < .001$, $\eta_p^2 = .55$. Sequential adaptation effects emerged, $F(1, 23) = 42.72$, $p < .001$, $\eta_p^2 = .65$. No other effects were significant, Fs ≤ 2.00, ps ≥ .171.

Area under the curve. Movements showed significantly greater spatial deviations for current incompatible trials (21042 px^2) than for compatible trials (15089 px^2), $F(1, 23) = 28.87$, $p < .001$, $\eta_p^2 = .56$. Sequential adaptation effects emerged, $F(1, 23) = 51.81$, $p < .001$, $\eta_p^2 = .69$. No other effects were significant, Fs ≤ 1.98, ps ≥ .173.

Curvature. Movements showed significantly greater curvature for current incompatible trials (ratio of 1.07) than for compatible trials (1.04), $F(1, 23) = 24.67$, $p < .001$, $\eta_p^2 = .52$. Sequential adaptation effects emerged, $F(1, 23) = 30.80$, $p < .001$, $\eta_p^2 = .57$. No other effects

were significant, Fs < 1.

Time to peak velocity. Peak speed was achieved earlier with small targets (48.8%) relative to medium (60.0%) and large targets (66.2%), $F(2, 22) = 108.66$, $p < .001$, $\eta_p^2 = .91$, with significant differences between all conditions, ts ≥ 5.54, ps < .001, ds ≥ 0.92. Sequential adaptation effects emerged, $F(1, 23) = 13.61$, $p = .001$, $\eta_p^2 = .37$. No other effects were significant, Fs ≤ 1.81, ps ≥ .192.

Time to peak acceleration. Overall peak acceleration was achieved earlier with small targets (47.6%) relative to medium (58.5%) and large targets (64.6%), $F(2, 22) = 105.54$, $p < .001$, $\eta_p^2 = .91$, with significant differences between all conditions, ts ≥ 5.50, ps < .001, ds ≥ 0.92. Sequential adaptation effects emerged, $F(1, 23) = 22.79$, $p < .001$, $\eta_p^2 = .11$. No other effects were significant, Fs ≤ 2.56, ps ≥ .100.

	small target size				medium target size				large target size			
preceding compatibility	compatible		incompatible		compatible		incompatible		compatible		incompatible	
current compatibility	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible
IT	393 (102)	409 (107)	409 (102)	418 (109)	372 (104)	387 (103)	388 (113)	386 (108)	380 (102)	419 (101)	408 (106)	408 (113)
RA	14.0 (7.8)	4.9 (7.4)	11.4 (8.6)	8.1 (7.5)	12.1 (8.7)	6.3 (6.6)	11.6 (7.3)	9.2 (7.5)	11.7 (8.2)	6.4 (7.5)	10.8 (7.8)	7.7 (7.8)
MT	395 (88)	405 (93)	413 (93)	409 (95)	310 (97)	387 (79)	392 (86)	396 (87)	391 (70)	326 (70)	308 (64)	300 (70)
MinE	14 (14)	37 (26)	21 (21)	21 (20)	13 (13)	23 (21)	21 (20)	15 (14)	13 (5)	31 (15)	22 (17)	20 (15)
CT	735 (548)	709 (535)	718 (445)	757 (552)	554 (550)	536 (527)	537 (435)	552 (447)	481 (378)	471 (300)	508 (457)	533 (486)
PDT	13 (2)	14 (2)	14 (2)	13 (2)	21 (5)	20 (5)	22 (5)	21 (4)	23 (6)	23 (7)	31 (7)	28 (6)
nFlips	1.10 (1.20)	1.28 (1.37)	1.13 (0.27)	1.12 (0.24)	1.06 (0.22)	1.26 (0.41)	1.10 (0.42)	1.50 (1.20)	1.06 (0.30)	1.22 (0.35)	1.15 (0.23)	1.18 (0.39)
Ent	0.0480 (0.0180)	0.0544 (0.0180)	0.0509 (0.0167)	0.0525 (0.0163)	0.0607 (0.0222)	0.0726 (0.0212)	0.0624 (0.0217)	0.0784 (0.0215)	0.1041 (0.0237)	0.0947 (0.0230)	0.1025 (0.0252)	0.0991 (0.0252)
MAD	40 (29)	61 (54)	57 (51)	66 (45)	36 (26)	75 (46)	54 (47)	54 (37)	37 (26)	72 (45)	52 (40)	52 (35)
AUC	13060 (12706)	20225 (15231)	16717 (15436)	20431 (14651)	12631 (11000)	23422 (12961)	17036 (14302)	17477 (11871)	11825 (8259)	22067 (14662)	16115 (11536)	16618 (11227)
Curv	1.02 (0.00)	1.09 (0.09)	1.06 (0.07)	1.05 (0.03)	1.00 (0.02)	1.26 (0.07)	1.06 (0.07)	1.04 (0.05)	1.03 (0.03)	1.09 (0.06)	1.06 (0.06)	1.05 (0.05)
TTPV	48.8 (5.0)	56.5 (6.8)	48.4 (5.0)	48.2 (5.0)	59.6 (6.0)	61.7 (6.3)	59.7 (6.6)	59.0 (6.3)	65.8 (5.8)	66.9 (7.7)	66.7 (7.0)	66.3 (7.5)
TTPA	48.7 (5.2)	48.8 (5.2)	47.8 (5.2)	48.8 (5.0)	58.2 (7.0)	60.2 (6.1)	57.0 (6.3)	57.0 (6.4)	63.7 (5.8)	66.3 (7.4)	65.8 (7.0)	65.5 (7.5)

Table 5. Means (and standard deviations) for all measures and for all combinations of experimental factors of Experiment 4.

Results of Experiment 5

Data selection.

Again we only omitted trials in which participants produced commission errors (3.4%) or omissions (7.1%). Errors were more prominent in the lift condition (4.3%) compared to the touch condition (2.5%), $X^2(1) = 26.24$, $p < .001$, and there were more omissions in the lift condition (8.5%) than in the touch condition (5.6%), $X^2(1) = 30.13$, $p < .001$. The remaining data was left unfiltered, and preprocessing was conducted as in the previous experiments. Means and standard deviations of all measures can be found in Table 6.

All dependent measures were then analyzed via 2 × 2 × 2 ANOVAs with current compatibility (trial N compatible vs. incompatible), preceding compatibility (trial N-1 compatible vs. incompatible) and hit condition (lift vs. touch) as within-subjects factors (see Figure 6). Again, we only scrutinized interactions with the factor hit condition in planned two-tailed *t*-tests or separate ANOVAs to keep it frugal.

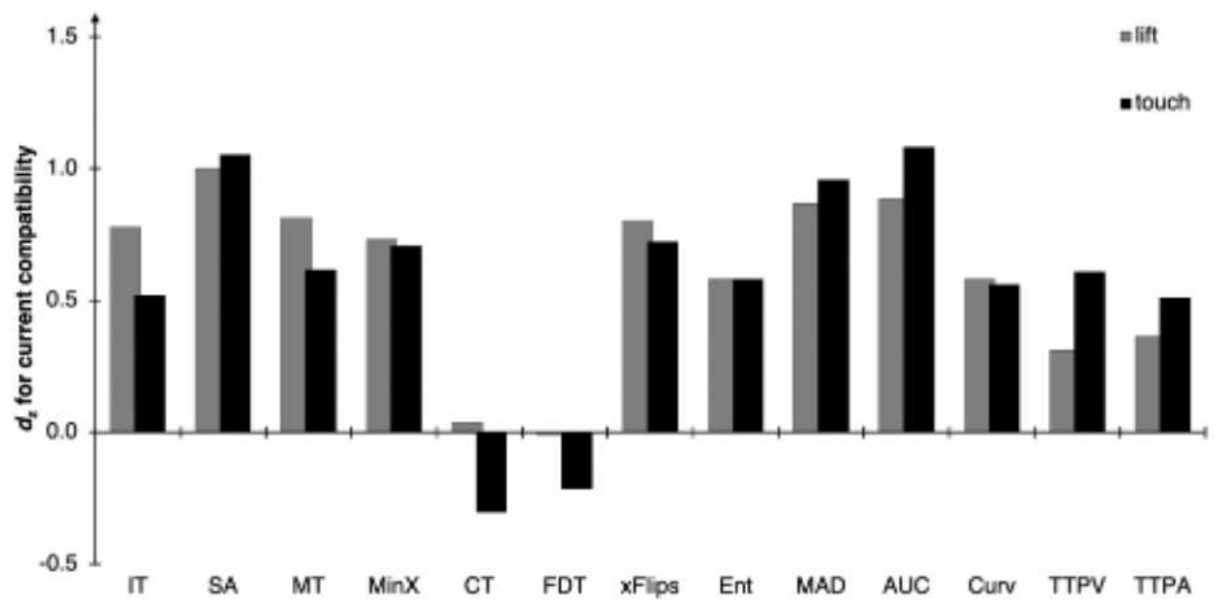

Figure 6. Results for all measures of Experiment 5. Standardized effect sizes d_z for the effect of

current compatibility (computed as current incompatible minus current compatible) for each of the computer DV (x-axis) and separate for each hit condition (columns).

Initiation times. Data showed significantly faster response initiation for current compatible trials (377 ms) than for incompatible trials (390 ms), $F(1, 23) = 20.75$, $p < .001$, $\eta_p^2 = .47$, as well as between after compatible trials (378 ms) and after incompatible trials (389 ms), $F(1, 23) = 18.63$, $p < .001$, $\eta_p^2 = .45$. Sequential adaptation effects emerged, $F(1, 23) = 10.54$, $p = .004$, $\eta_p^2 = .31$. The factor hit condition produced neither main effect nor any interaction, and no other effects were significant, Fs < 1.

Starting angles. Data showed significantly steeper response initiation for current incompatible trials (3.7°) than for compatible trials (9.1°), $F(1, 23) = 41.60$, $p < .001$, $\eta_p^2 = .64$. Sequential adaptation effects emerged, $F(1, 23) = 19.66$, $p < .001$, $\eta_p^2 = .46$. No other effects were significant, Fs ≤ 1.94, ps ≥ .177.

Movement times. Data showed significantly faster response execution for current compatible trials (413 ms) than for incompatible trials (438 ms), $F(1, 23) = 21.70$, $p < .001$, $\eta_p^2 = .49$, as well as between after compatible trials (430 ms) and after incompatible trials (420 ms), $F(1, 23) = 6.72$, $p = .016$, $\eta_p^2 = .23$. Response execution was overall faster in the touch condition (388 ms) relative to the lift condition (462 ms), $F(1, 23) = 17.39$, $p < .001$, $\eta_p^2 = .43$. Sequential adaptation effects emerged, $F(1, 23) = 55.24$, $p < .001$, $\eta_p^2 = .71$. No other effects were significant, Fs < 1.

Minimum X. Data showed significant differences in deviation towards the opposite side between current incompatible trials (-27 px) and compatible trials (-17 px), $F(1, 23) = 18.62$, $p < .001$, $\eta_p^2 = .45$, as well as between after compatible trials (-24 px) and after incompatible trials

(-20 px), $F(1, 23) = 8.60$, $p = .007$, $\eta_p^2 = .27$. Sequential adaptation effects emerged, $F(1, 23) = 30.51$, $p < .001$, $\eta_p^2 = .57$. No other effects were significant, Fs < 1.

Click times. Finger release was fastest in the touch condition (111 ms) relative to the lift condition (165 ms), $F(1, 23) = 66.24$, $p < .001$, $\eta_p^2 = .74$. No other effects were significant, Fs < 1.

Final distance to target. Residual target distance was smaller in the lift condition (13 px) relative to the touch condition (53 px), $F(1, 23) = 30.52$, $p < .001$, $\eta_p^2 = .57$. No other effects were significant, Fs ≤ 2.13, ps ≥ .158.

X flips. Data showed significantly more directional changes in current incompatible trials (1.33 per trial) than for compatible trials (1.17 per trial), $F(1, 23) = 21.31$, $p < .001$, $\eta_p^2 = .48$, as well as after compatible trials (1.27 per trial) relative to after incompatible trials (1.22 per trial), $F(1, 23) = 6.62$, $p = .017$, $\eta_p^2 = .22$. Sequential adaptation effects emerged, $F(1, 23) = 32.52$, $p < .001$, $\eta_p^2 = .59$. No other effects were significant, Fs ≤ 4.08, ps ≥ .055.

Entropy. Movement complexity was higher in current incompatible trials (0.0573) than for compatible trials (0.0533), $F(1, 23) = 10.96$, $p = .003$, $\eta_p^2 = .32$, as well as after compatible trials (0.0562) relative to after incompatible trials (0.0544), $F(1, 23) = 12.30$, $p = .002$, $\eta_p^2 = .35$. Sequential adaptation effects emerged, $F(1, 23) = 37.93$, $p < .001$, $\eta_p^2 = .62$. No other effects were significant, Fs < 1.

Maximum absolute deviation. Movements showed significantly greater spatial deviations for current incompatible trials (76 px) than for compatible trials (54 px), $F(1, 23) = 29.11$, $p < .001$, $\eta_p^2 = .56$, as well as after compatible trials (69 px) relative to after incompatible trials (61

px), $F(1, 23) = 11.36$, $p = .003$, $\eta_p^2 = .33$. Sequential adaptation effects emerged, $F(1, 23) = 40.12$, $p < .001$, $\eta_p^2 = .64$. No other effects were significant, Fs < 1.

Area under the curve. Movements showed significantly greater spatial deviations for current incompatible trials (26035 px^2) than for compatible trials (18957 px^2), $F(1, 23) = 34.24$, $p < .001$, $\eta_p^2 = .60$, as well as after compatible trials (23782 px^2) relative to after incompatible trials (21210 px^2), $F(1, 23) = 16.20$, $p = .001$, $\eta_p^2 = .41$. Sequential adaptation effects emerged, $F(1, 23) = 42.26$, $p < .001$, $\eta_p^2 = .64$. No other effects were significant, Fs ≤ 1.04, ps ≥ .318.

Curvature. Movements showed significantly greater curvature for current incompatible trials (ratio of 1.08) than for compatible trials (1.05), $F(1, 23) = 12.34$, $p = .002$, $\eta_p^2 = .35$, as well as after compatible trials (1.07) relative to after incompatible trials (1.06), $F(1, 23) = 6.80$, $p = .016$, $\eta_p^2 = .23$. Sequential adaptation effects emerged, $F(1, 23) = 55.71$, $p < .001$, $\eta_p^2 = .71$. No other effects were significant, Fs < 1.

Time to peak velocity. Peak speed was reached earlier for current compatible trials (peak velocity at 51.2% of the movement) than for incompatible trials (52.5%), $F(1, 23) = 8.60$, $p = .007$, $\eta_p^2 = .27$. Sequential adaptation effects emerged, $F(1, 23) = 40.35$, $p < .001$, $\eta_p^2 = .64$. No other effects were significant, Fs ≤ 1.85, ps ≥ .187.

Time to peak acceleration. Movements accelerated earlier for current compatible trials (peak acceleration at 49.7% of the movement) than for incompatible trials (51.1%), $F(1, 23) = 8.43$, $p = .008$, $\eta_p^2 = .27$, as well as after compatible trials (50.8%) relative to after incompatible trials (50.0%), $F(1, 23) = 6.02$, $p = .022$, $\eta_p^2 = .21$. Sequential adaptation effects emerged, $F(1, 23) = 53.85$, $p < .001$, $\eta_p^2 = .70$. No other effects were significant, Fs ≤ 2.12, ps ≥ .159.

	lift condition				touch condition			
preceding compatibility	compatible		incompatible		compatible		incompatible	
current compatibility	compatible	incompatible	compatible	incompatible	compatible	incompatible	compatible	incompatible
IT	363 (107)	393 (130)	390 (122)	388 (107)	365 (136)	390 (150)	390 (142)	389 (137)
SA	10,4 (7,6)	1,4 (7,5)	7,6 (5,8)	5,5 (7,9)	9,7 (8)	2,5 (8)	8,8 (6,7)	5,4 (9,3)
MT	432 (133)	500 (140)	466 (137)	451 (125)	366 (108)	424 (131)	386 (111)	377 (120)
MinX	-14 (12)	-33 (23)	-19 (13)	-19 (14)	-16 (14)	-33 (29)	-20 (15)	-21 (20)
CT	164 (58)	167 (63)	165 (64)	162 (55)	111 (39)	112 (38)	114 (40)	108 (36)
FDT	13 (2)	13 (3)	13 (2)	12 (2)	53 (37)	54 (36)	54 (37)	52 (35)
xFlips	1,08 (0,29)	1,43 (0,33)	1,26 (0,28)	1,25 (0,33)	1,15 (0,34)	1,42 (0,34)	1,17 (0,24)	1,22 (0,35)
Ent	0,0532 (0,0115)	0,0612 (0,0126)	0,0548 (0,0109)	0,0551 (0,0118)	0,051 (0,0096)	0,0595 (0,0146)	0,0543 (0,0099)	0,0534 (0,0125)
MAD	46 (45)	89 (56)	59 (36)	59 (44)	52 (52)	90 (76)	61 (50)	66 (62)
AUC	16186 (16529)	29436 (17929)	19595 (13022)	20057 (15414)	18684 (19674)	30824 (25005)	21364 (19164)	23824 (22925)
Curv	1,04 (0,08)	1,11 (0,1)	1,07 (0,06)	1,05 (0,06)	1,04 (0,09)	1,1 (0,13)	1,07 (0,08)	1,05 (0,1)
TTPV	49,3 (6,6)	53,2 (6,3)	51,5 (6)	49,7 (7,8)	50,8 (8,2)	55,1 (8,8)	53,4 (8,2)	52 (9)
TTPA	48,1 (6)	52,1 (5,9)	49,6 (5,3)	48 (7,7)	49,2 (7,6)	54 (8,2)	52 (7,4)	50,1 (8,1)

Table 6. Means (and standard deviations) for all measures and for all combinations of experimental factors of Experiment 5.