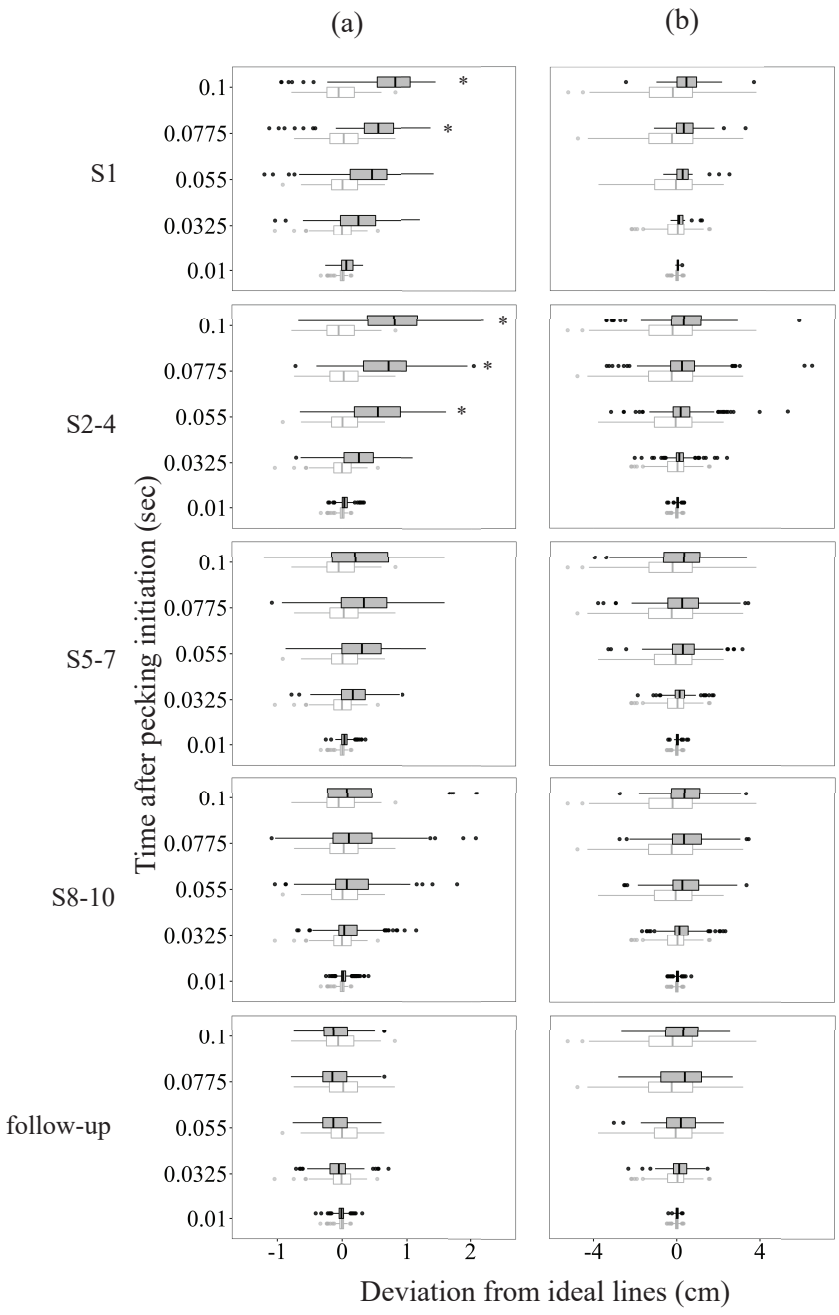

Figure S1. Lateral deviation from the ideal line during 0.1 sec after the initiation of pecking in pigeons (a) and crows (b). Positive and negative values represent rightward and leftward deviations, respectively. The translucent white boxes denote the control phase. (a) In pigeons, comparisons with 95% confidence intervals, following the confirmation of a significant interaction by a mixed model ($\chi^2 = 423.04$, $df = 20$, $p < 0.001$), revealed significant deviations (*) at the 0.1 and 0.0775 sec points in S1, and at the 0.1, 0.0775, and 0.055 sec points in the S2 – 4 phases. (b) In crows, comparisons with 95% confidence intervals, following the confirmation of a significant interaction by a mixed model ($\chi^2 = 55.28$, $df = 20$, $p < 0.002$), produced no significant deviations at any time points of any phases. Note that the scale of deviation (horizontal axis) was different between pigeons and crows.

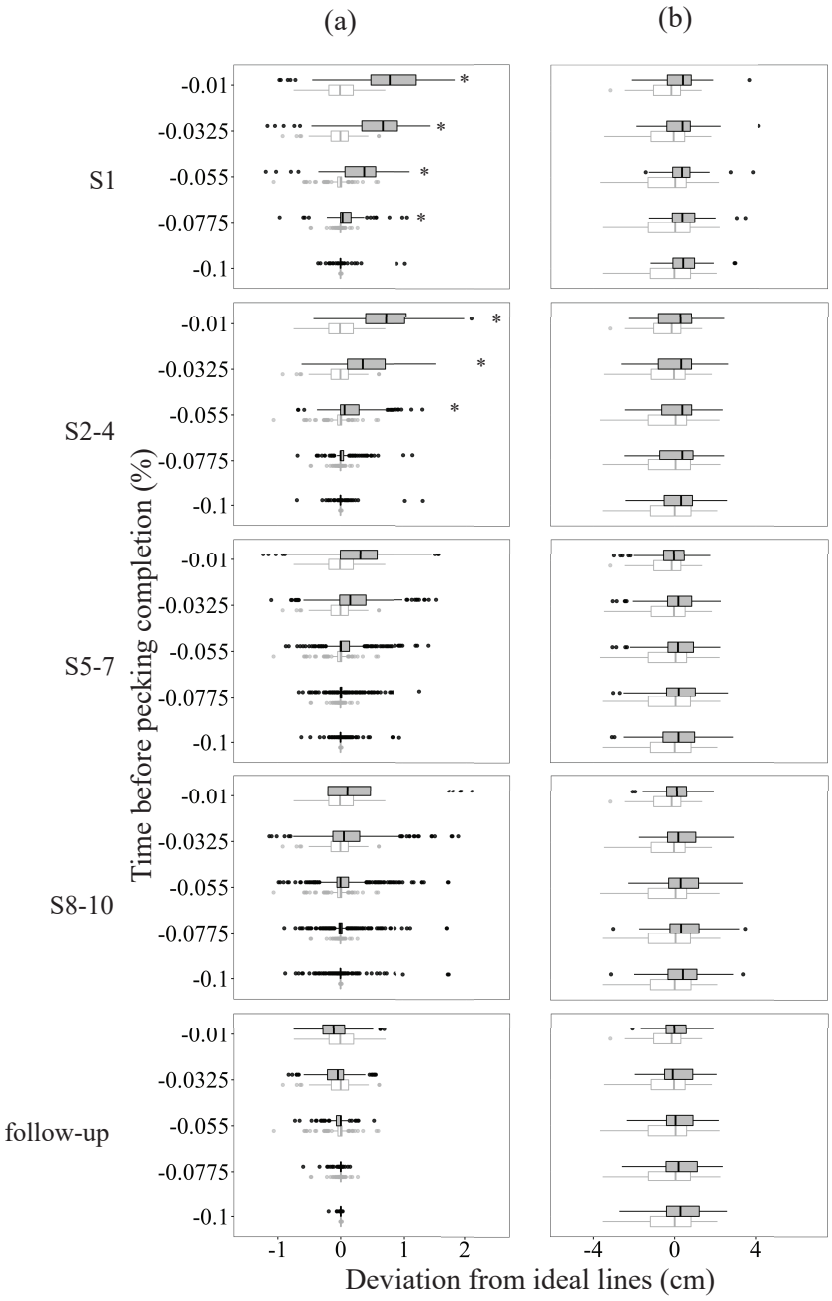

Figure S2. Lateral deviation from the ideal line during 0.1 sec before the completion of pecking in pigeons (a) and crows (b). Positive and negative values represent rightward and leftward deviations, respectively. The translucent white boxes denote control phase. (a) In pigeons, comparisons with 95% confidence intervals, following the confirmation of a significant interaction by a mixed model ($\chi^2 = 527.10$, $df = 20$, $p < 0.001$), revealed significant deviations (*) at the -0.01, -0.0325, -0.055, and -0.0775 sec points in S1, and at the -0.01, -0.0325, -0.055 sec points in the S2 – 4 phases. (b) In crows, no significant interaction was found by a mixed model analysis ($\chi^2 = 7.26$, $df = 20$, *ns*) and, thus, comparison with 95% confidence intervals was not applied. Note that the scale of deviation (horizontal axis) was different between pigeons and crows.

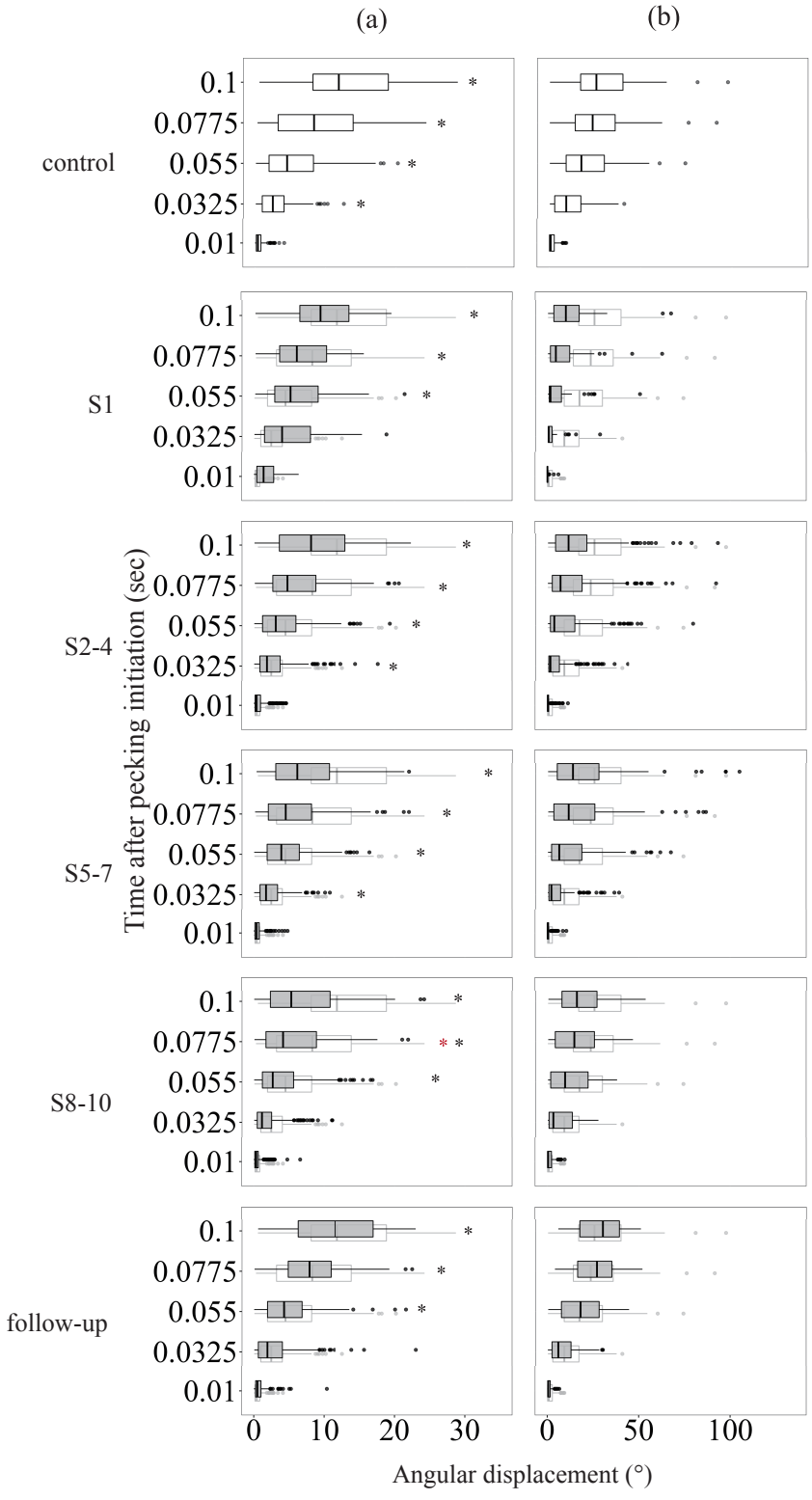

Figure S3. Angular displacement to the head/bill orientation at the initiation of pecking during 0.1 sec after initiating pecking in pigeons (a) and crows (b). The translucent white boxes denote the control phase. (a) In pigeons, a mixed model analysis produced a significant interaction ($\chi^2 = 43.22$, $df = 20$, $p < 0.002$). Comparisons with 95% confidence intervals revealed that angular displacements to the initial head/bill orientation were larger at the time points 0.055, 0.0775, and 0.1 sec, than at 0.01 sec, consistently in all the phases (black asterisks). At only one time point (0.0775 sec), the angular displacement in S8 – 10 was smaller than that in the control (red asterisk). (b) In crows, a mixed model analysis produced significant main effects for the phase ($\chi^2 = 280.21$, $df = 5$, $p < 0.001$) and the time variables ($\chi^2 = 2335.69$, $df = 4$, $p < 0.001$) with no significant interactions ($\chi^2 = 19.15$, $df = 20$, $p = 0.512$, *ns*). For the main effect of the phase variable, the significant decrease of angular displacement was found only in S1 in comparison to the control. Note that the scale of angular displacement (horizontal axis) was different between pigeons and crows.

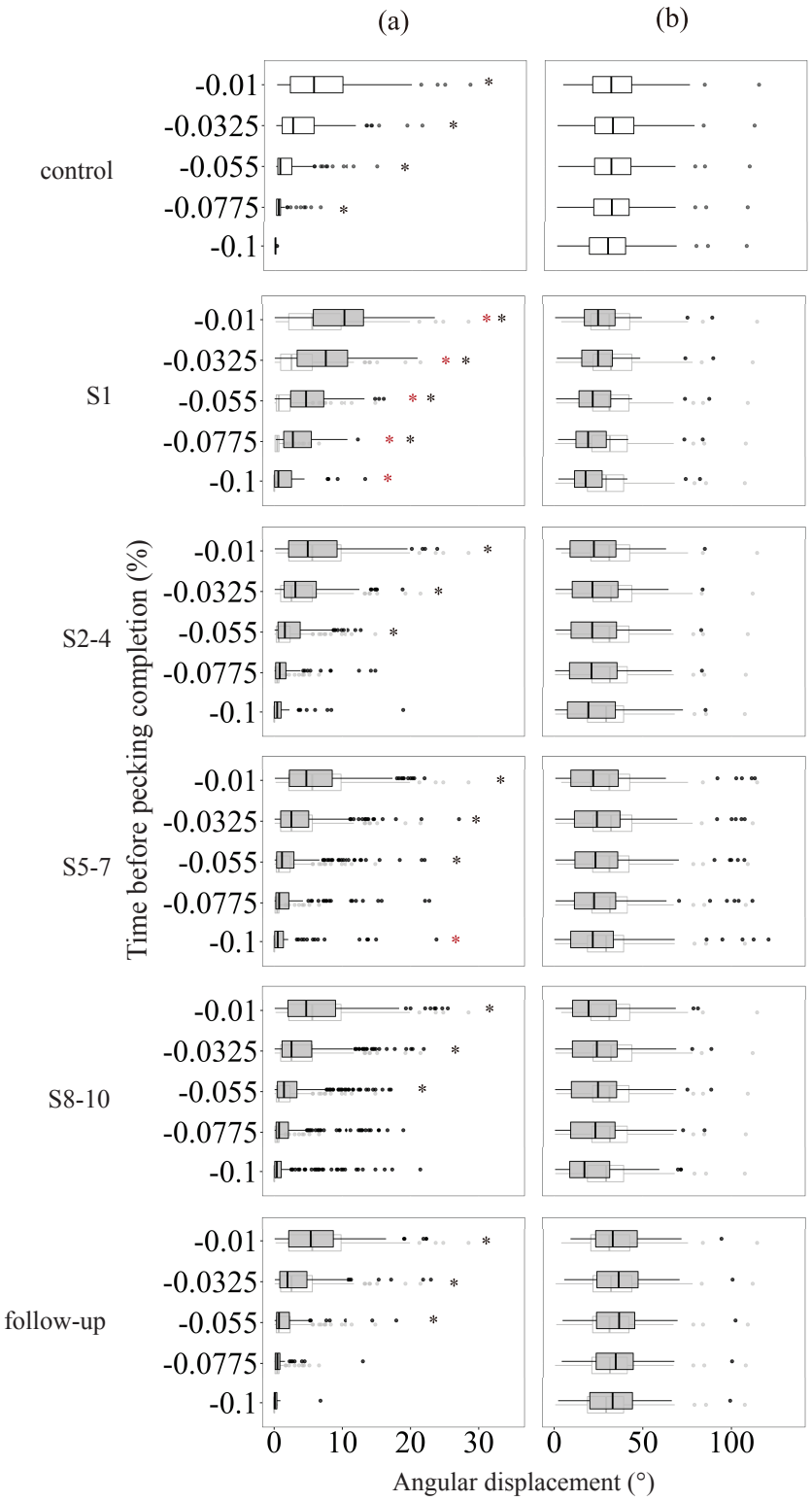

Figure S4. Angular displacement to the head/bill orientation during 0.1 sec before the completion of pecking in pigeons (a) and crows (b). The translucent white boxes denote the control phase. (a) In pigeons, a mixed model analysis produced a significant interaction ($\chi^2 = 83.85$, $df = 20$, $p < 0.001$). Comparisons with 95% confidence intervals revealed that angular displacements to the initial head/bill orientation were larger at the time points -0.01, -0.0325, -0.055 sec, than at -0.1 sec, consistently in all the phases (with black asterisk). A significant difference among phases was found only at the -0.1 sec point in S5 – 7, where the displacement was larger than in the control (with red asterisk). (b) In crows, a mixed model analysis yielded the significant main effect of only the phase variable ($\chi^2 = 174.00$, $df = 5$, $p < 0.001$) with no significant interaction between the phase and the time ($\chi^2 = 4.11$, $df = 20$, $p = 0.999$, *ns*). For the main effect of the phase variable, however, no significant difference was found between the control and any phases using 95% confidence intervals. Note that the scale of angular displacement (horizontal axis) was different between pigeons and crows.

Table S1. Individual data of corrective pecking trials

	crow			pigeon		
individual	#1	#2	#3	#1	#2	#3
S1	1/2	0/1	1/1	0	0	0
S2-4	7/10	0	0	0/2	0/5	0
S5-7	0	0	1/1	0/32	0/14	0
S8-10	2/2	0	0	0/4	0/9	0

Values on the left and right on each cell denote success and total numbers of corrective pecking trials, respectively.