Supplemental Material for

Task-relevance and change detection in action-effect binding

The distribution of strong and weak presses in Experiment 2

While participants had an individual force threshold that marked the boundary between weak and strong actions, this approach was often inadequate in properly separating the actions. As Figure S1 illustrates, some participants did not press the FSR hard enough when intending to produce strong presses. This is apparent, for example, in the case of participants 07, 11, 12, 29, 33, 55 etc.
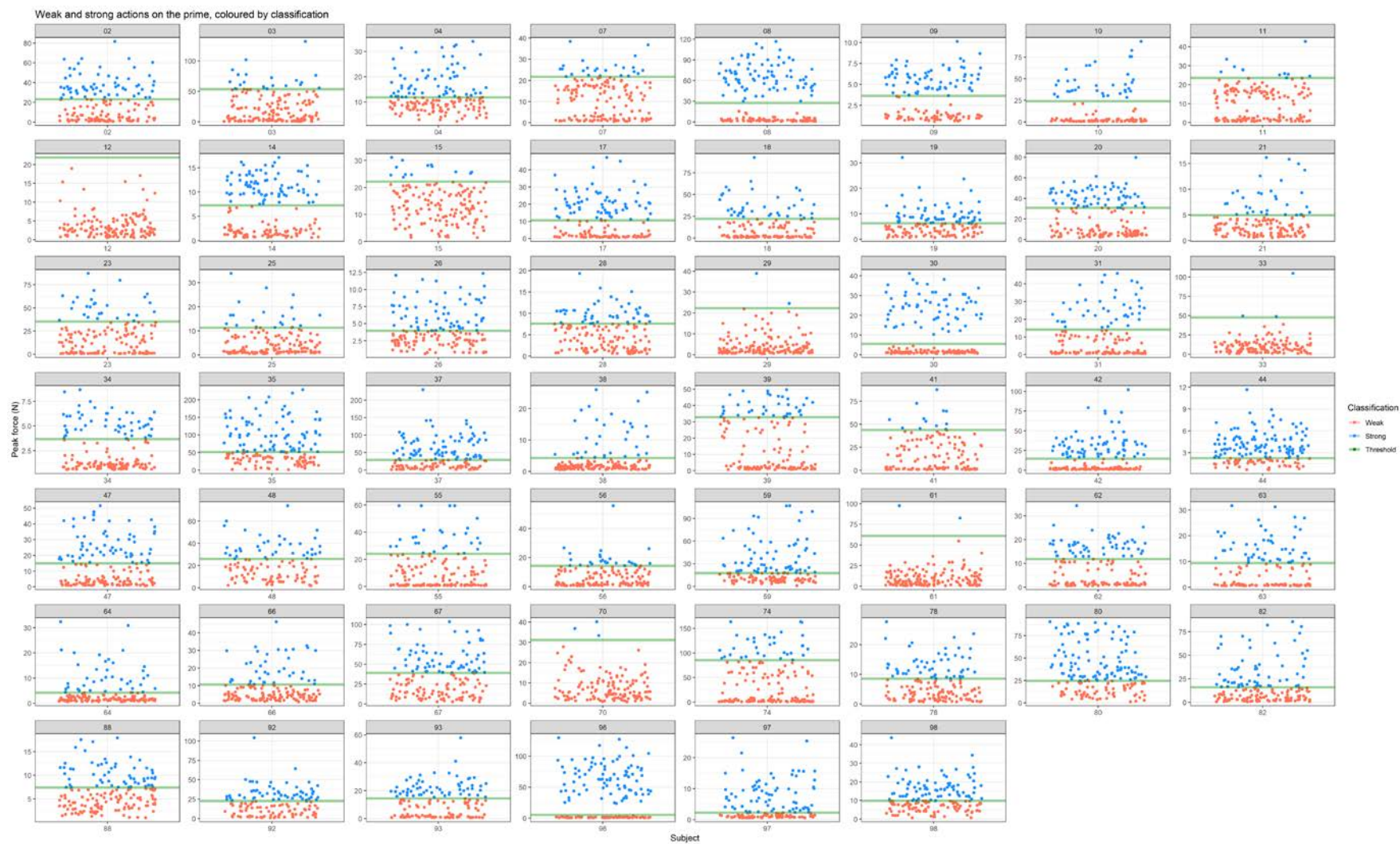
Figure S1. Peak forces of all actions on the prime in Experiment 2 for each participant. Green horizontal lines represent the individual threshold that separated strong (blue dots) and weak (red dots) actions.

Force and duration comparisons with prime pitch and congruency

We performed 2x2 repeated-measures ANOVAs using prime pitch and congruency as factors, and Fisher's Z-transformed correlations of force (AUC) and duration as dependent variables.

Experiment 1 (Experimental condition)

The analysis on force (AUC) did not result in significant main effects of either congruency ($F_{(1,50)} = 1.68$, $p = .200$, $\eta^2_G = .003$) or prime pitch ($F_{(1,50)} = 1.51$, $p = .225$, $\eta^2_G = .002$) and the interaction was not significant either ($F_{(1,50)} = 0.21$, $p = .652$, $\eta^2_G < .001$).

The analysis on duration resulted in similarly non-significant main effects of congruency ($F_{(1,50)} = 0.11$, $p = .738$, $\eta^2_G < .001$) and prime pitch ($F_{(1,50)} = .001$, $p = .972$, $\eta^2_G < .001$), and there was no significant interaction ($F_{(1,50)} < 0.01$, $p = .997$, $\eta^2_G < .001$).

Experiment 2

The analysis using force (AUC) resulted in a significant main effect of congruency ($F_{(1,53)} = 11.48$, $p = .001$, $\eta^2_G = .011$), while the main effect of prime pitch ($F_{(1,53)} = 0.55$, $p = .462$, $\eta^2_G < .001$), and the interaction between prime pitch and congruency ($F_{(1,53)} = 2.32$, $p = .134$, $\eta^2_G = .003$) was not significant.

The same type of analysis using duration resulted in a similar main effect of congruency ($F_{(1,53)} = 22.90$, $p < .001$, $\eta^2_G = .024$), and no significant main effect of prime pitch ($F_{(1,53)} < 0.01$, $p = .939$, $\eta^2_G < .001$). The interaction between prime pitch and congruency was similarly non-significant ($F_{(1,53)} = 0.26$, $p = .612$, $\eta^2_G < .001$).

Force curves of three representative participants in Experiment 2

Full-size figures are also available at https://osf.io/wch2e/

Figure S2. 14 representative trials of 3 participants. 0 ms depicts the point where the threshold was reached.
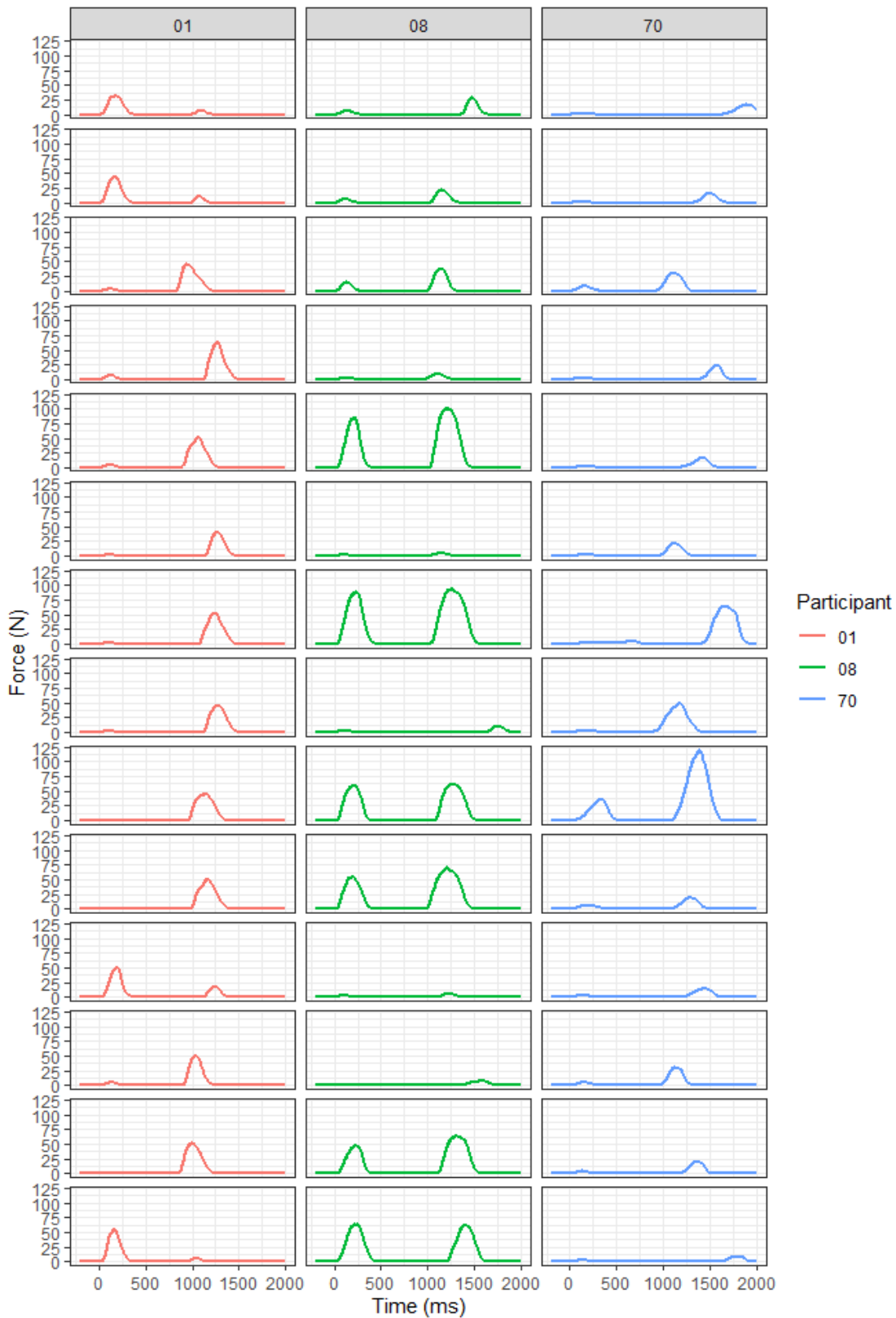
Figure S3. Individual correlation between prime and probe AUC in congruent and incongruent trials