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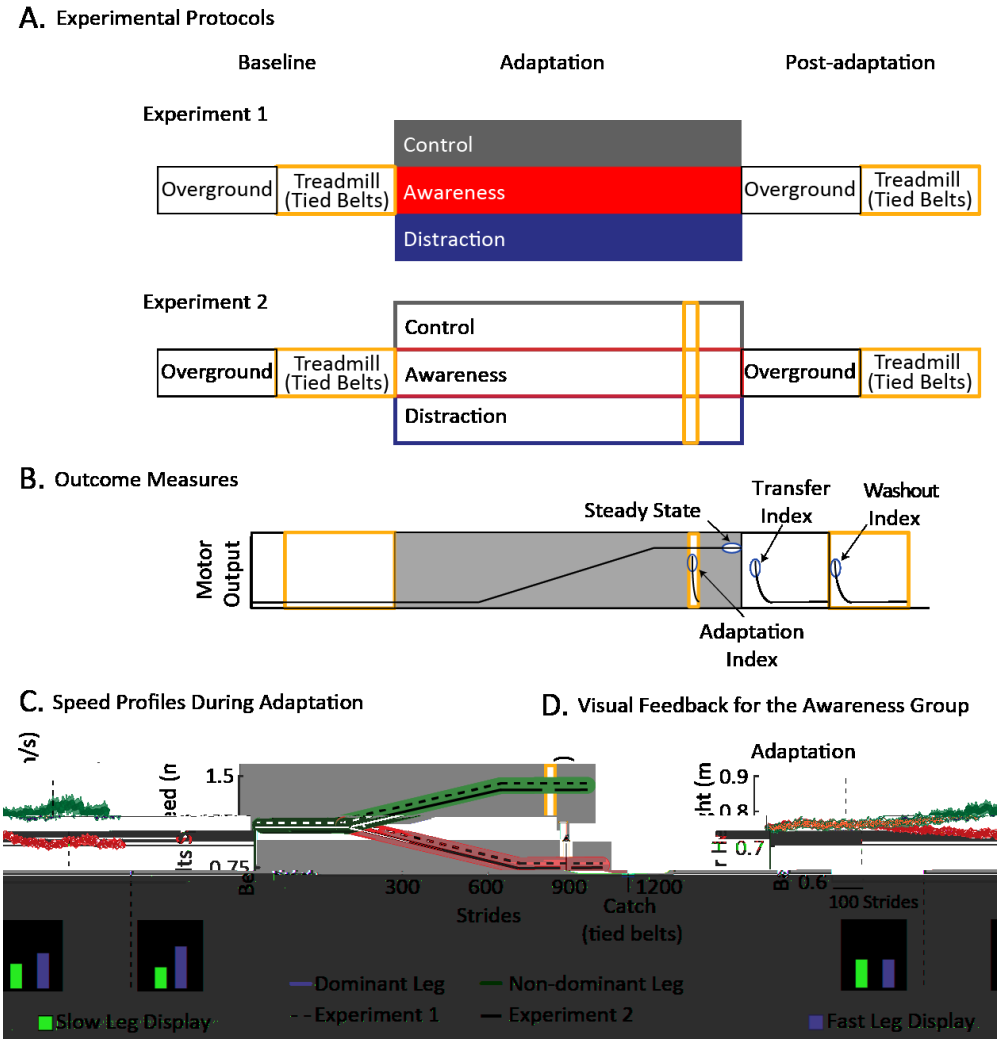

Figure1: A. Experimental protocols. These consisted of three epochs: Baseline, Adaptation, and Post-adaptation, each of which had distinct blocks outlined with distinct colors. The adaptation block was further divided into three colors to indicate the distinct cognitive load experienced by each group: control (without altered cognitive load), awareness (with altered cognitive load by receiving information about speed difference between the feet) and distraction (with altered cognitive load by performing a secondary task unrelated to split-belt walking). Only the subjects tested in Experiment 2 experienced a 10-stride catch trial (two legs moving at the same speed) during the Adaptation epoch B. Outcome measures. Adaptation index, Steady State, Transfer index, and Washout index were collected at time periods indicated on of interest C. Speed profiles. We illustrate the time course of the speed at which the dominant (green) and non-dominant leg (red) walked during the Adaptation epoch. Speed profiles for the legs in Experiment 1 (black solid lines) and Experiment 2 (black dashed lines) are also presented to illustrate that only Experiment 2 had a catch trial during which both belts moved at 1.125m/s. D. Visual feedback that the Awareness groups received during Adaptation. Subjects observed progression bars that informed them about each foot speed. The averaged time courses ± standard errors are displayed for each bar. We also show snap shots of image that subjects observed during the pre-ramp, ramp, and hold phases during Adaptation.

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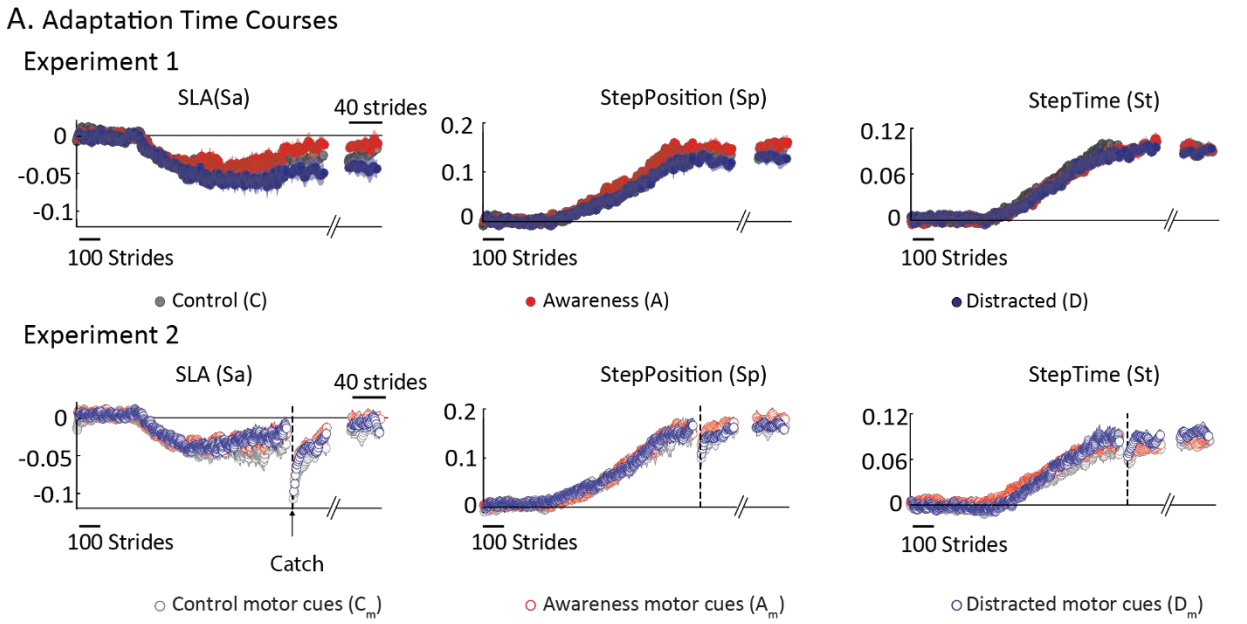

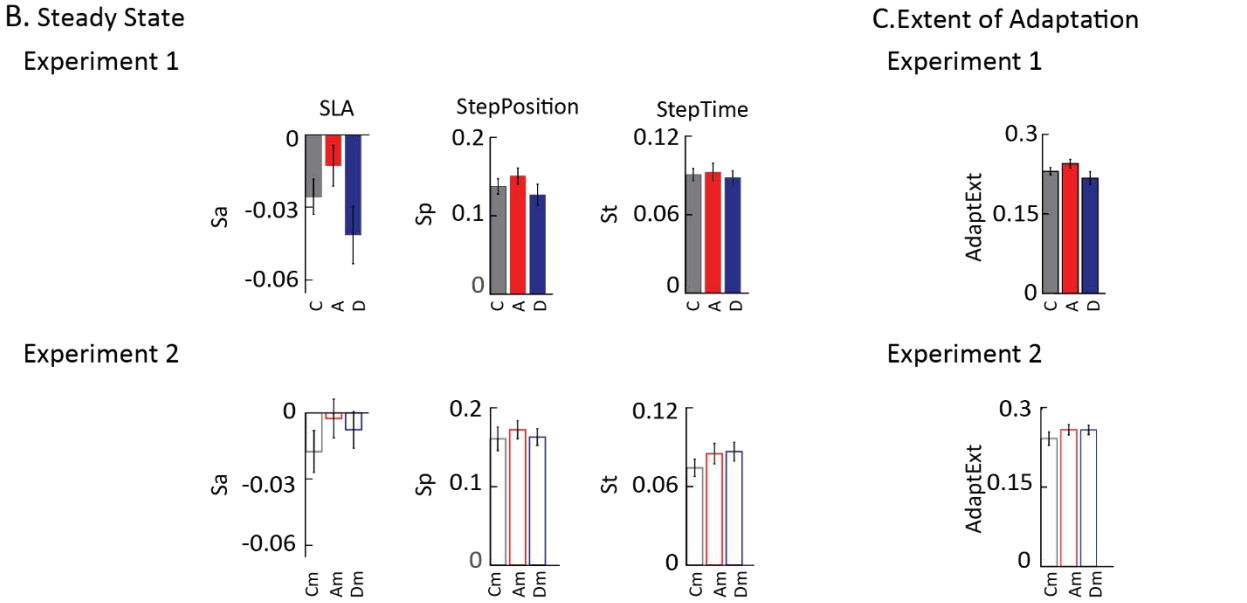

Figure 2: A. Time courses for each parameter during the Adaptation epochs of Experiment 1 (top row) and Experiment 2 (bottom row). B. Steady State at the end of the Adaptation epochs of Experiment 1 (top row) and Experiment 2 (bottom row). Bar plots indicate the mean adapted steady state per group ± standard errors. Note that we did not find a group effect for any gait parameter, indicating that cognitive load did not have an impact on the Steady State behavior prior to overground walking. C. Measure of adaptation extent for all groups. Bars' height indicates the mean per group ± standard errors. All groups adapted their gait similarly.

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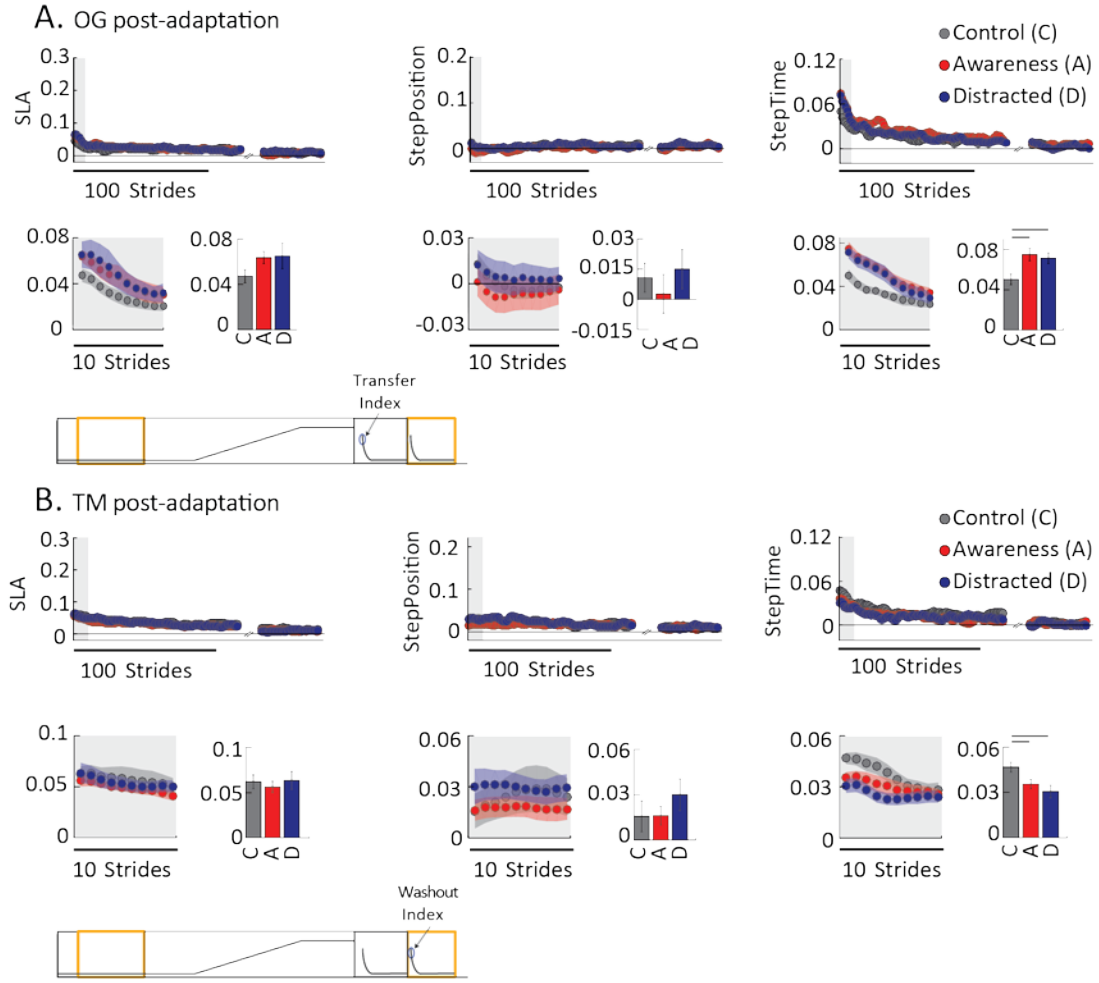

Figure 3: A. Stride-by-stride time courses and mean transfer values (i.e., overground aftereffects) are shown for all parameters during the post-adaptation block overground. B. Stride-by-stride time courses and mean washout values (i.e. remaining treadmill aftereffects) are shown for all parameters during the post-adaptation block on the treadmill. In both panels, gray shaded areas indicate the strides that are zoomed in the inserts. Each dot represents the average of 5 consecutive strides and colored shaded areas indicate the standard error for each group. Bar plots indicate either the mean transfer value (in Panel A) or the mean washout value (in Panel B) for each group ± standard errors. The black horizontal lines indicate significant statistical differences between groups. Recall that Experiment 1 was designed without a catch, thus aftereffects in the training context are not recorded for this group. For display purposes we use the axes are scaled as in Figure 4A presenting the aftereffects during catch for Experiment 2. This was done to qualitatively show that aftereffects overground and remaining aftereffects on the treadmill in Experiment 1 are much smaller than those observed during the catch.

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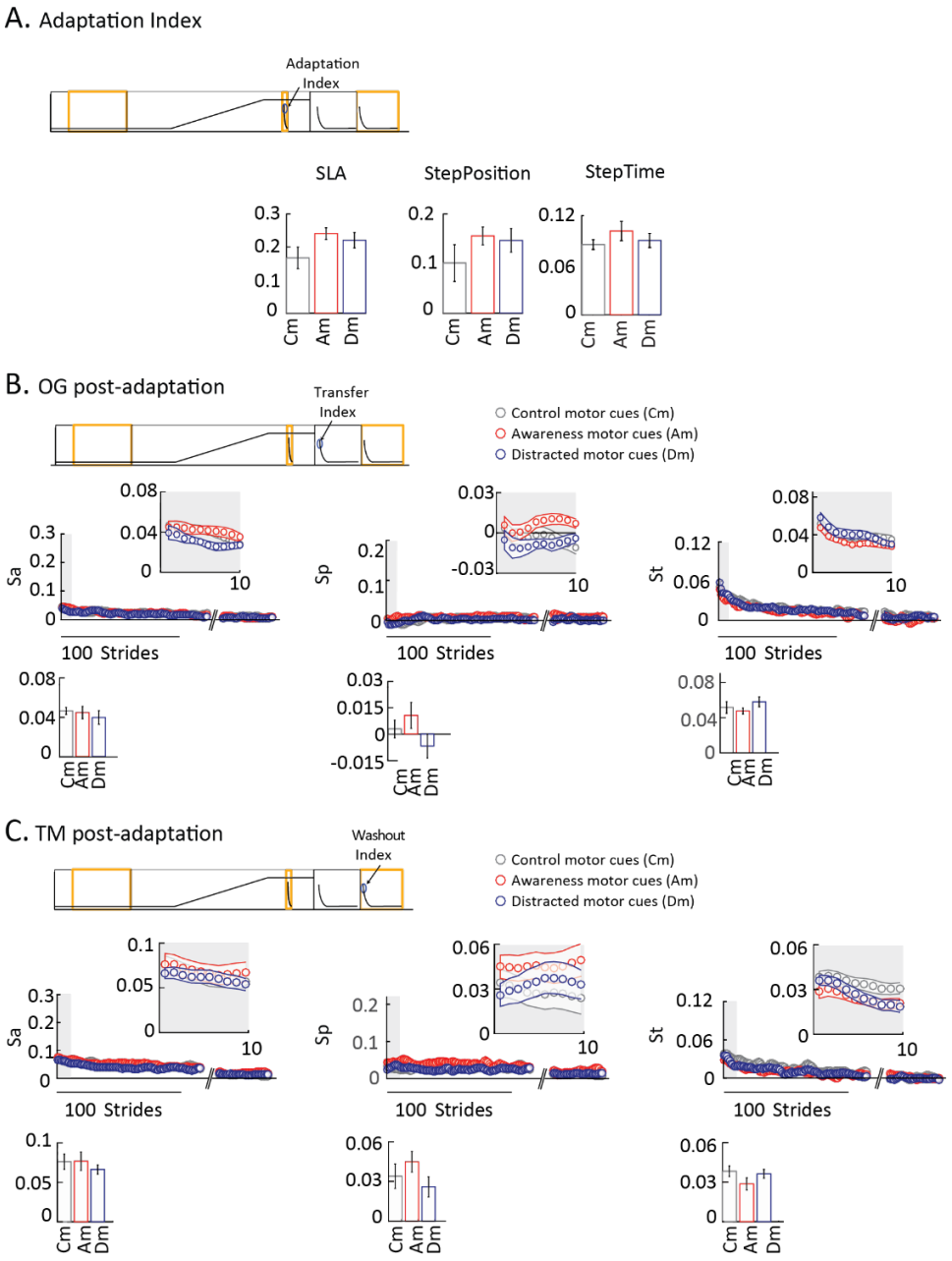

Figure 4: A. Mean adaptation index per group indicating the mean value for aftereffects experienced on the treadmill the first time that the split condition is removed. Error bars indicate standard errors. B. Stride-by-stride time courses and mean transfer values (i.e., overground aftereffects) are shown for all parameters during the post-adaptation block overground. C. Stride-by-stride time courses and mean washout values (i.e. remaining treadmill aftereffects) are shown for all parameters during the post-adaptation block on the treadmill. In both panels, gray shaded areas indicate the strides that are zoomed in the inserts. Each dot represents the average of 5 consecutive strides and colored shaded areas indicate the standard error for each group. Bar plots indicate either the mean transfer value (in Panel B) or the mean washout value (in Panel C) for each group ± standard errors. Cognitive condition did not have an effect on aftereffects on the treadmill and overground when large errors were experienced.