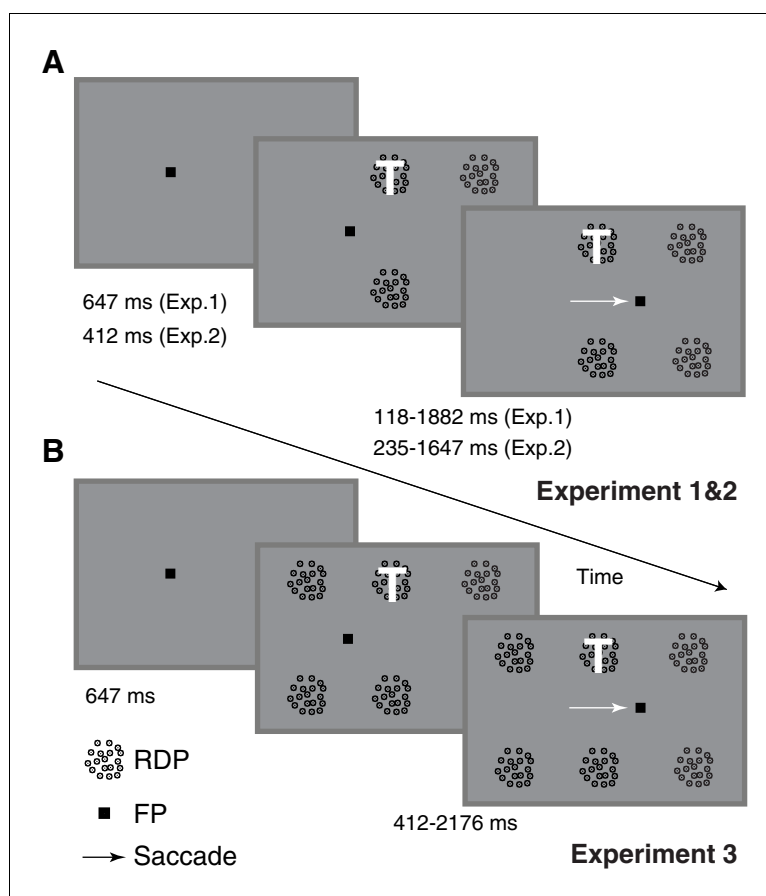


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## Figures and figure supplements

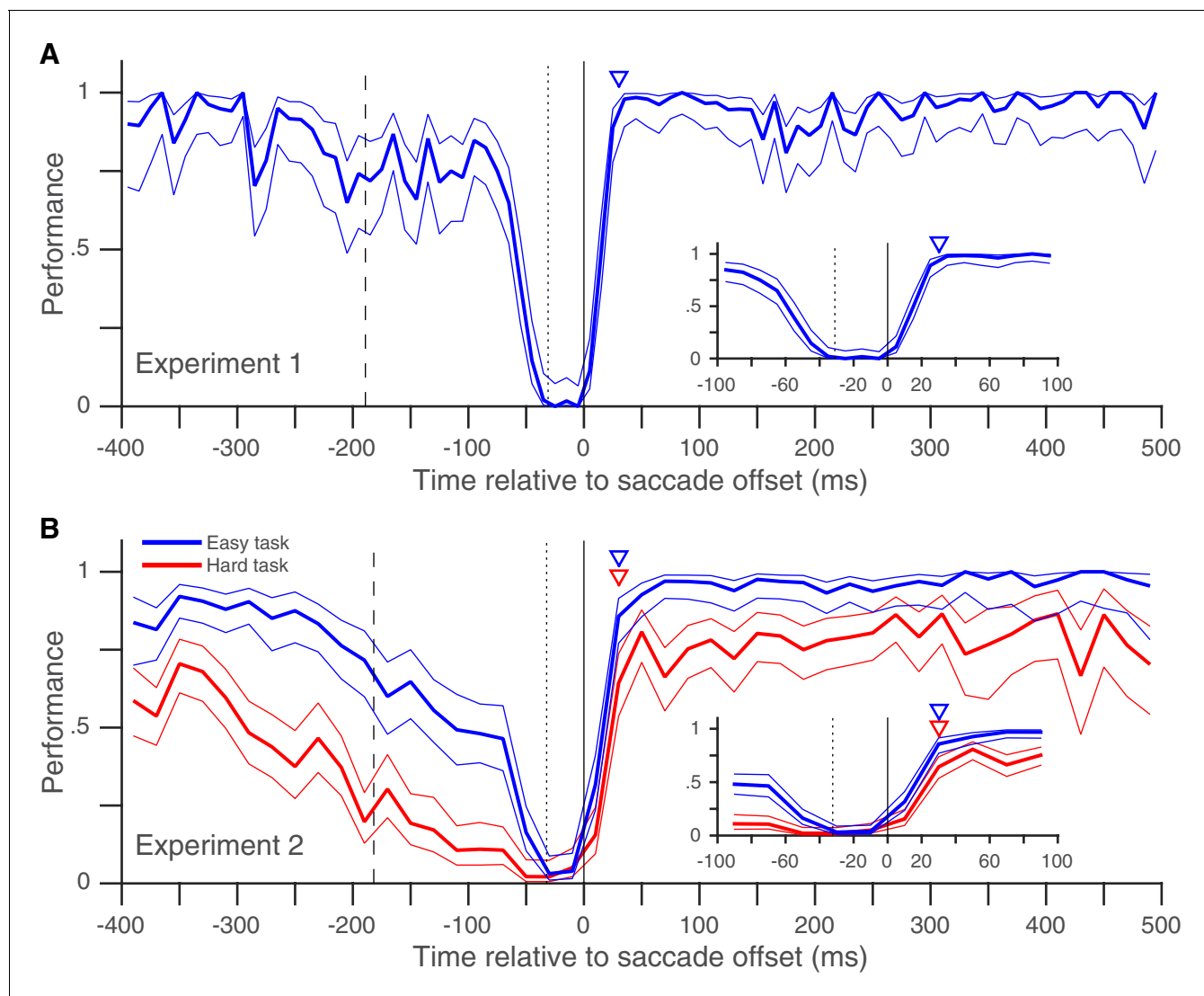
Visual attention is available at a task-relevant location rapidly after a saccade

**Tao Yao *et al***



**Figure 1.** Task-design and timing. Human subjects performed a task that involved attending to a target (marked with a white T and always at the same location) presented as one among four (A) or six (B) moving RDPs while also making a visually guided saccade if the fixation point jumped seven degrees to the right (1235 ms after trial onset). The subjects were instructed to respond with a key-press when the target RDP briefly changed speed and direction, but to ignore similar changes in any of the remaining RDPs. Target and distractor changes occurred at different times around the saccade, enabling the measurement of peri-saccadic performance in this attention task. Two different task-difficulties were used in Experiment 2, while six RDPs were used in Experiment 3 instead of four. There were also minor differences in timing between the three tasks.

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**Figure 2.** Rapid post-saccadic recovery of performance. (A) Detection-performance (hit-rate) of motion-direction drops around the time of the saccade and recovers within 30 ms after the saccade. The figure shows the mean detection-performance (and 95% confidence bands) for all trials pooled over 8 subjects calculated in non-overlapping 10 ms time-bins of the abscissa (time of target-change relative to saccade offset). The inset shows the same data, focusing on the time between  $-100$  and  $100$  ms. Data from individual subjects show little inter-individual variability in the time-course of recovery (**Figure 2—figure supplement 1**). The triangle indicates the earliest time (30 ms) at which performance is statistically indistinguishable from that over the 100 to 500 ms time-period (using Boschloo's exact test; see 'Materials and methods'). The dashed vertical line indicates the mean time of fixation-point offset and the stippled vertical line indicates the mean saccade onset time. See also **Figure 2—figure supplement 1** and **3**. (B) Similar results were obtained when two different task-difficulties were used (data pooled over 5 subjects). The data from the higher-difficulty task (in red) show that the rapid recovery is not an artifact of a ceiling effect on performance. Data plotted using 20 ms time-bins. Figure conventions as in **Figure 2A**. See also **Figure 2—figure supplement 2** for data from individual subjects. **Figure 2—figure supplement 4** and **5** replot the same data as in **Figure 2A** and **B** and in the same format, but **Figure 2—figure supplement 4** uses the time of target-change relative to saccade onset and **Figure 2—figure supplement 5** only includes trials where a fixation window of  $0.5^\circ$  was used (see corresponding legends for details).

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The following source data is available for figure 2:

**Source data 1.** Data plotted in **Figure 2A** and **Figure 2—figure supplement 1**.

DOI: [10.7554/eLife.18009.005](https://doi.org/10.7554/eLife.18009.005)

**Source data 2.** Data plotted in **Figure 2B** and **Figure 2—figure supplement 2**.

DOI: [10.7554/eLife.18009.006](https://doi.org/10.7554/eLife.18009.006)

**Source data 3.** Data plotted in **Figure 2—figure supplement 3**.

DOI: [10.7554/eLife.18009.007](https://doi.org/10.7554/eLife.18009.007)

**Source data 4.** Data plotted in **Figure 2—figure supplement 4**.

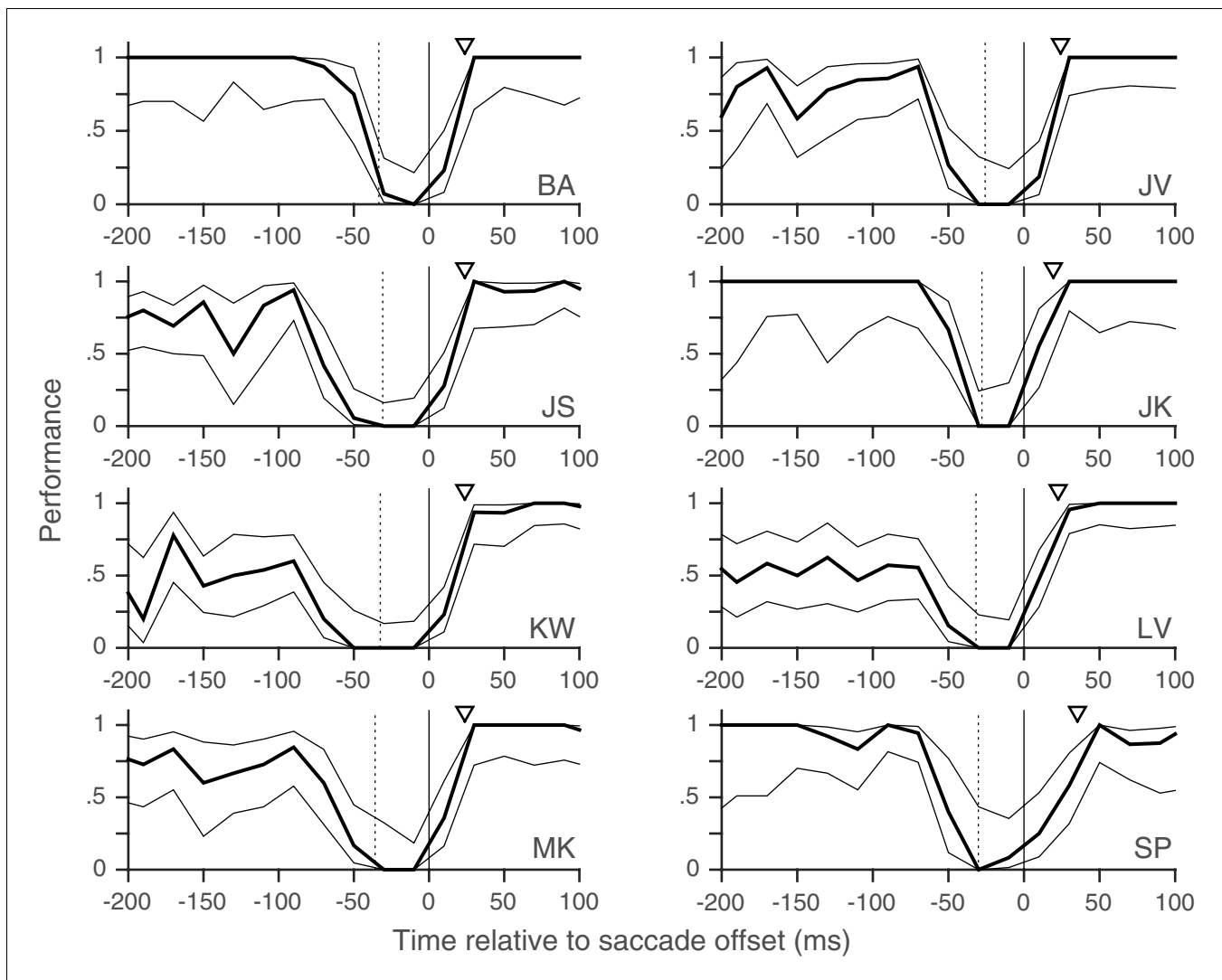
Figure 2 continued on next page

Figure 2 continued

DOI: [10.7554/eLife.18009.008](https://doi.org/10.7554/eLife.18009.008)

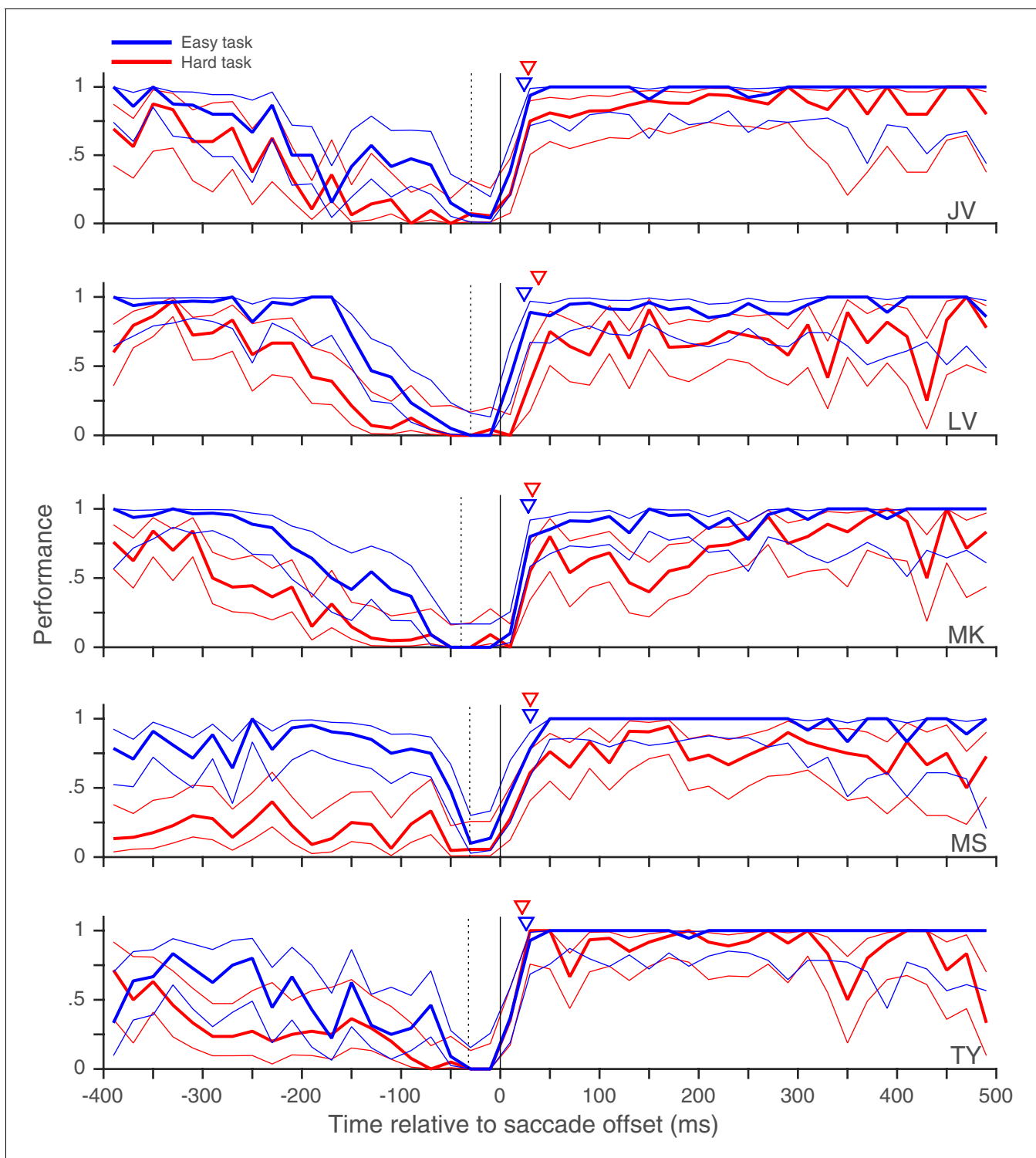
**Source data 5.** Data plotted in **Figure 2—figure supplement 4**.

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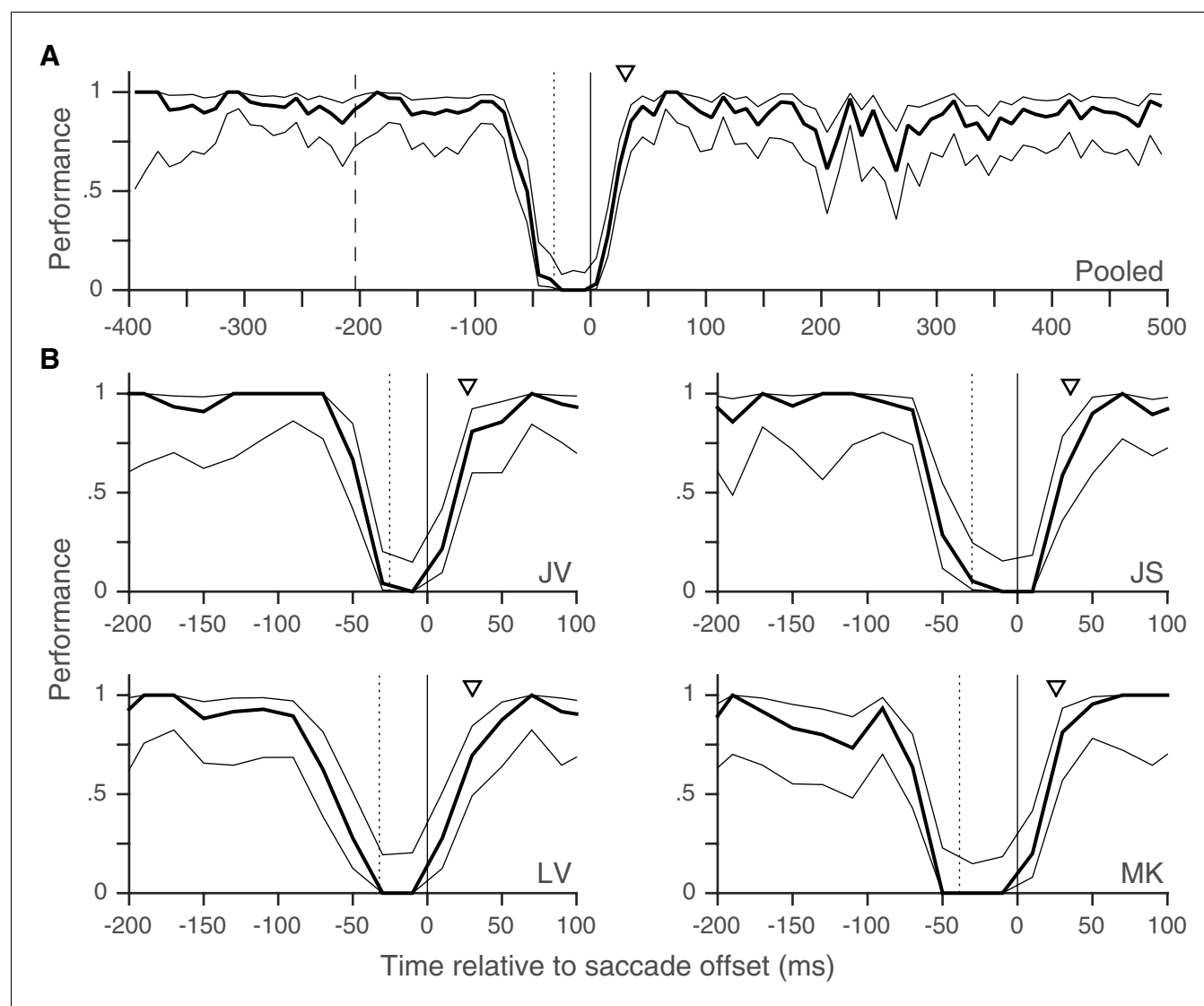
**Figure 2—figure supplement 1.** Individual subjects – rapid post-saccadic recovery of performance. Data from the eight individual subjects whose pooled data appear in **Figure 2A**. Triangles indicate time at which performance reaches 80% of baseline (see 'Materials and methods'); the values of this time are 24, 24, 23, 19, 24, 22, 23 and 35 ms for Subjects BA, JV, JS, JK, KW, LV, MK and SP respectively. Data plotted using 20 ms time-bins. All other conventions as in **Figure 2A**. Related to **Figure 2A**.

DOI: [10.7554/eLife.18009.010](https://doi.org/10.7554/eLife.18009.010)



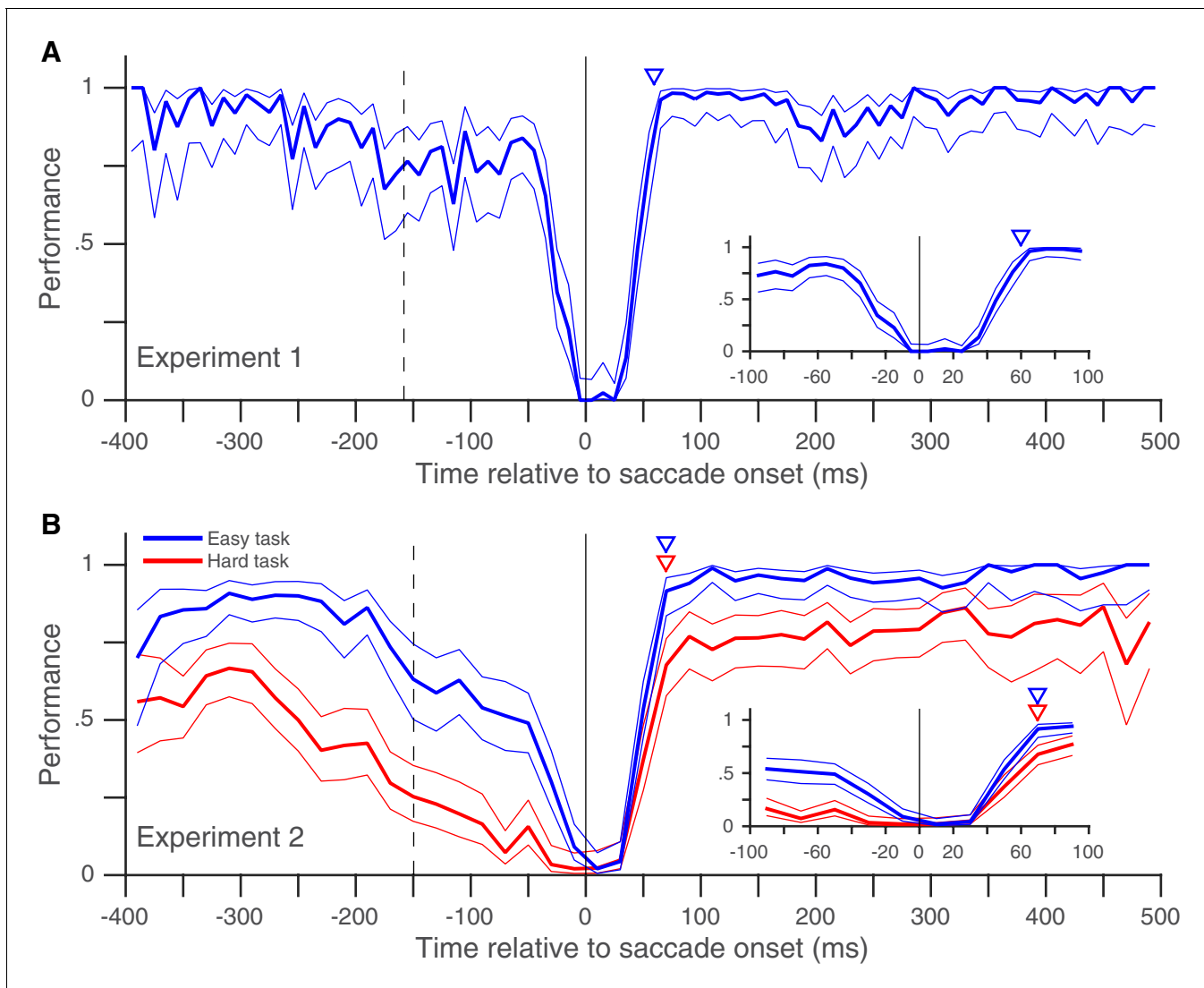
**Figure 2—figure supplement 2.** Individual subjects – rapid post-saccadic recovery of performance for two task difficulties. Data from the five individual subjects whose pooled data appear in **Figure 2B**. Triangles indicate time at which performance reaches 80% of baseline (see 'Materials and methods'); the values of this time are 25, 24, 29, 30, and 25 ms for the easier task and 29, 40, 32, 30, and 21 ms for the harder task for subjects JV, LV, MK, MS and TY respectively. All other conventions as in **Figure 2B**. Related to **Figure 2B**.

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**Figure 2—figure supplement 3.** Results from Experiment 3, where distractor changes are more numerous and more salient also show rapid post-saccadic recovery of performance (within 30 ms), and no evidence for post-saccadic retinotopic persistence or pre-saccadic predictive shifts. Pooled data in **A** and data from individual subjects in **B**. Triangles in **B** indicate time at which performance reaches 80% of baseline (see 'Materials and methods'); the values of this time are 28, 35, 30, and 26 ms for subjects JV, JS, LV and MK respectively. All other conventions as in **Figure 2A**. Related to **Figure 2A**.

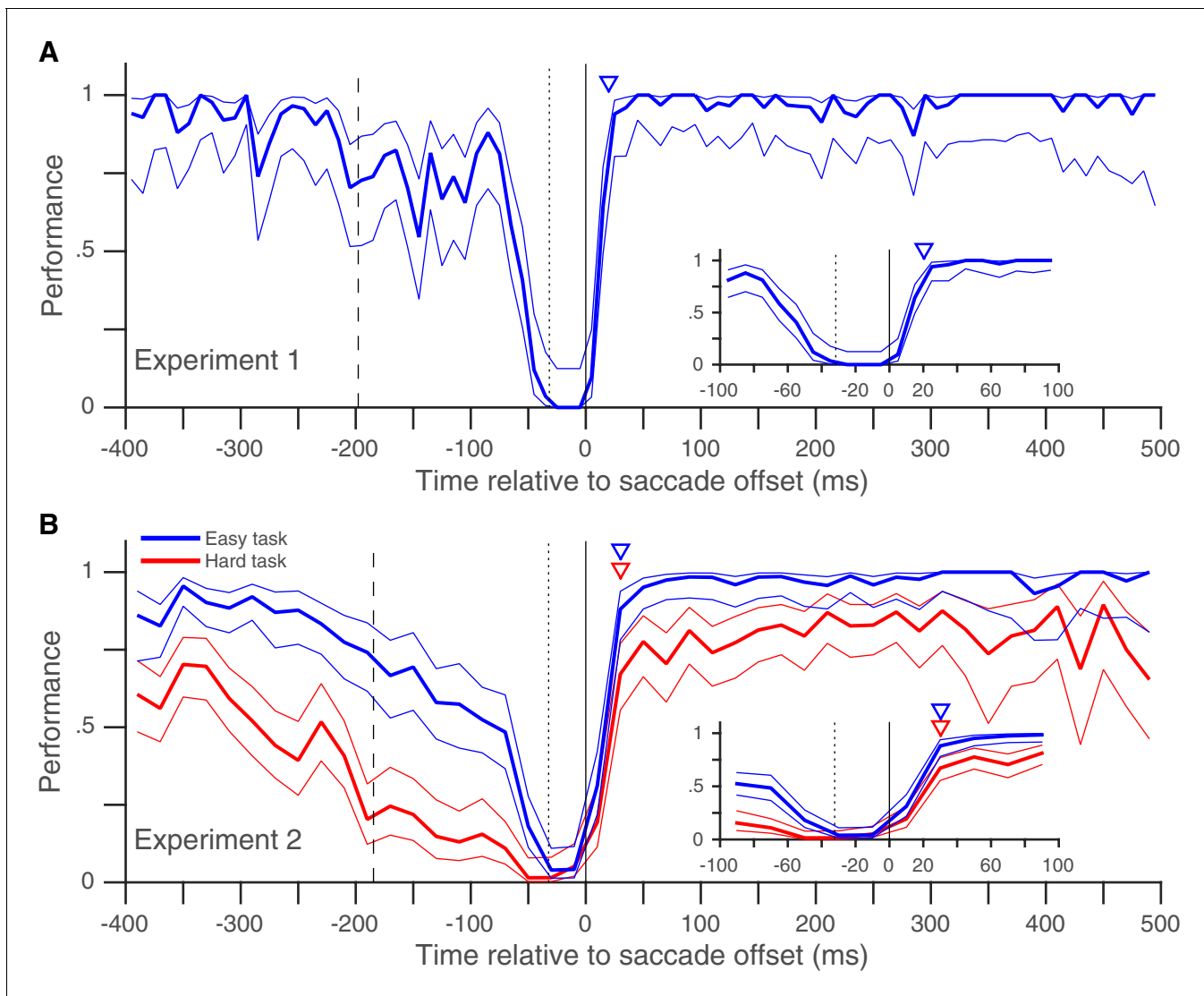
DOI: [10.7554/eLife.18009.012](https://doi.org/10.7554/eLife.18009.012)



**Figure 2—figure supplement 4.** Post-saccadic recovery of performance plotted relative to saccade onset. This figure is identical to **Figure 2**, except that the performance (in Experiments 1 and 2) is plotted as a function of the time of target change relative to saccade onset. Recovery times relative to saccade onset are 60 ms in **A** and 70 ms for both tasks in **B**. Related to **Figure 2A and B**.

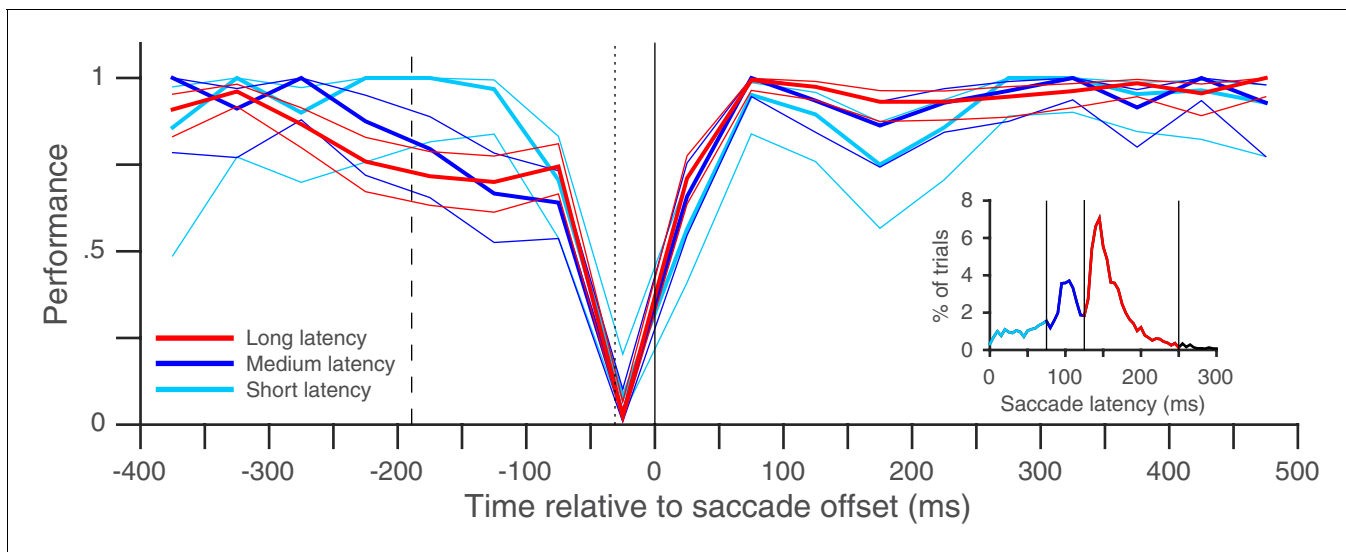
DOI: [10.7554/eLife.18009.013](https://doi.org/10.7554/eLife.18009.013)





**Figure 2—figure supplement 5.** Post-saccadic recovery of performance plotted with a smaller fixation window. This figure is identical to **Figure 2**, except that we only included trials where the horizontal and vertical eye-positions did not diverge by more than  $0.5^\circ$  during fixation from their median values (see 'Materials and methods'). Estimated recovery times are 20 ms in **A** and 30 ms for both tasks in **B**. Despite the much smaller fixation window, **A** and **B** include 59% and 78% of the trials in **Figure 2A** and **B** respectively. Related to **Figure 2A** and **B**.

DOI: [10.7554/eLife.18009.014](https://doi.org/10.7554/eLife.18009.014)



**Figure 3.** Rapid post-saccadic performance recovery is independent of saccade latency. The time-course of recovery was indistinguishable for saccades in three different latency ranges in the same dataset used in **Figure 2A** (8 subjects, color coding in inset): 0–75 ms (predictive saccades), 75–125 ms (express saccades), 125–250 ms (regular-latency saccades). The inset plots the pooled saccade latency distribution. Figure conventions as in **Figure 2A**, except that non-overlapping 50 ms time-bins were used.

DOI: [10.7554/eLife.18009.015](https://doi.org/10.7554/eLife.18009.015)

The following source data is available for figure 3:

**Source data 1.** Data plotted in **Figure 3**.

DOI: [10.7554/eLife.18009.016](https://doi.org/10.7554/eLife.18009.016)