Supplementary material

Object identity determines trans-saccadic integration

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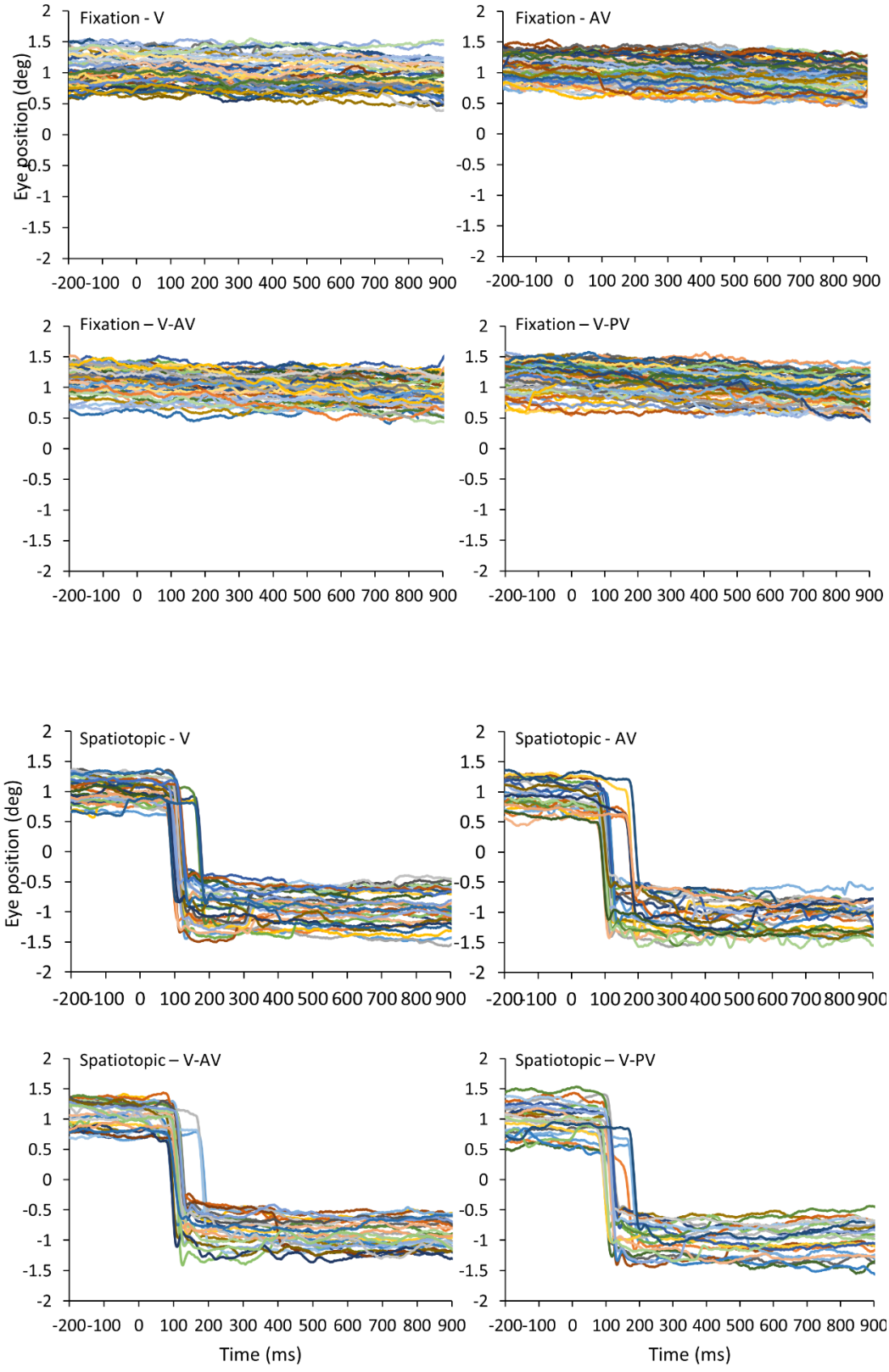
Fixation - V
Fixation - AV
Fixation – V-AV
Fixation – V-PV
Spatiotopic - V
Spatiotopic - AV
Spatiotopic – V-AV
Spatiotopic – V-PV
Eye position (deg)
Time (ms)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-200 -100 0 100 200 300 400 500 600 700 800 900

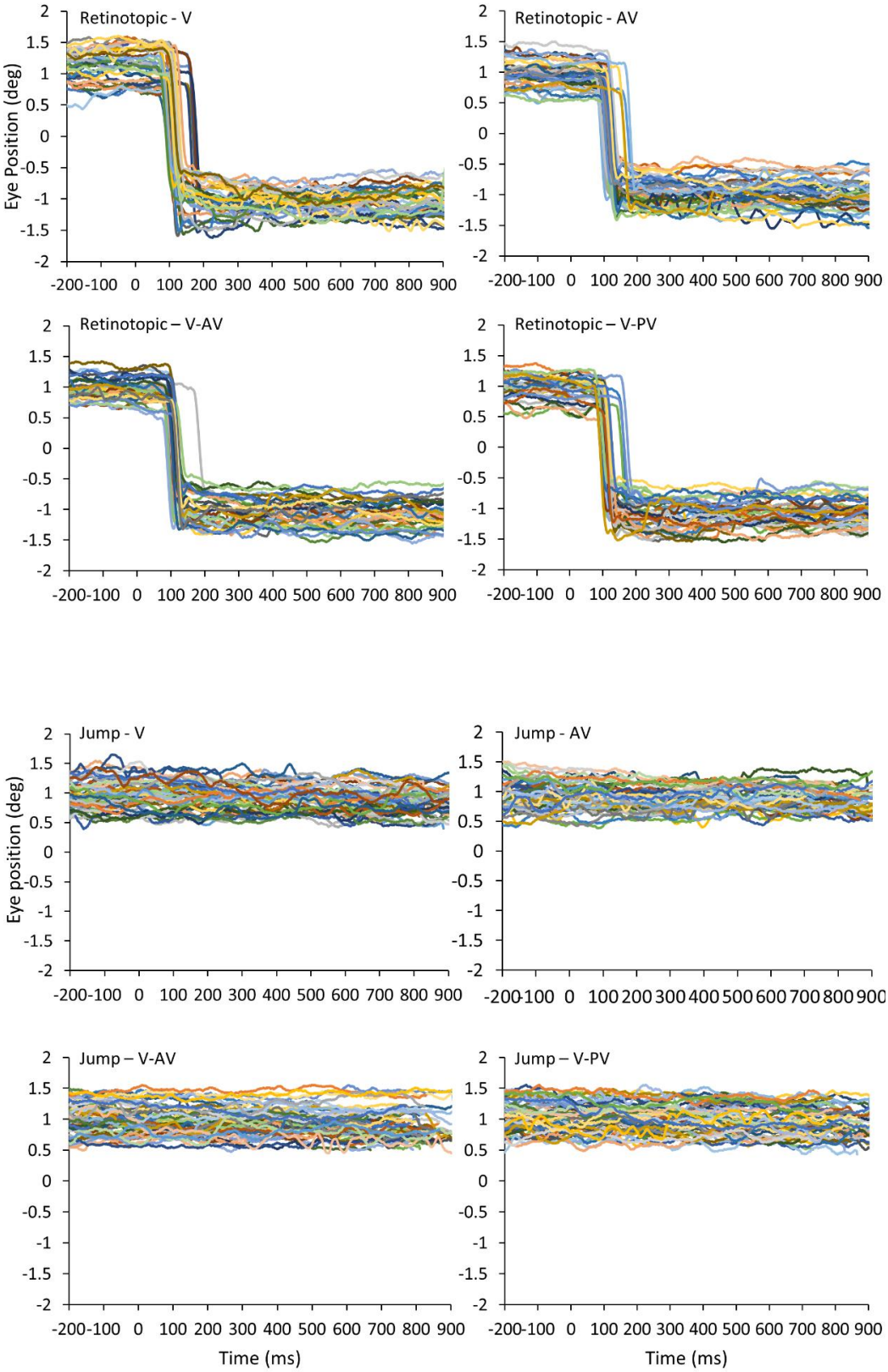

Figure S1. Saccade data set of one observer for the selected trials of Experiment 1(see Methods).

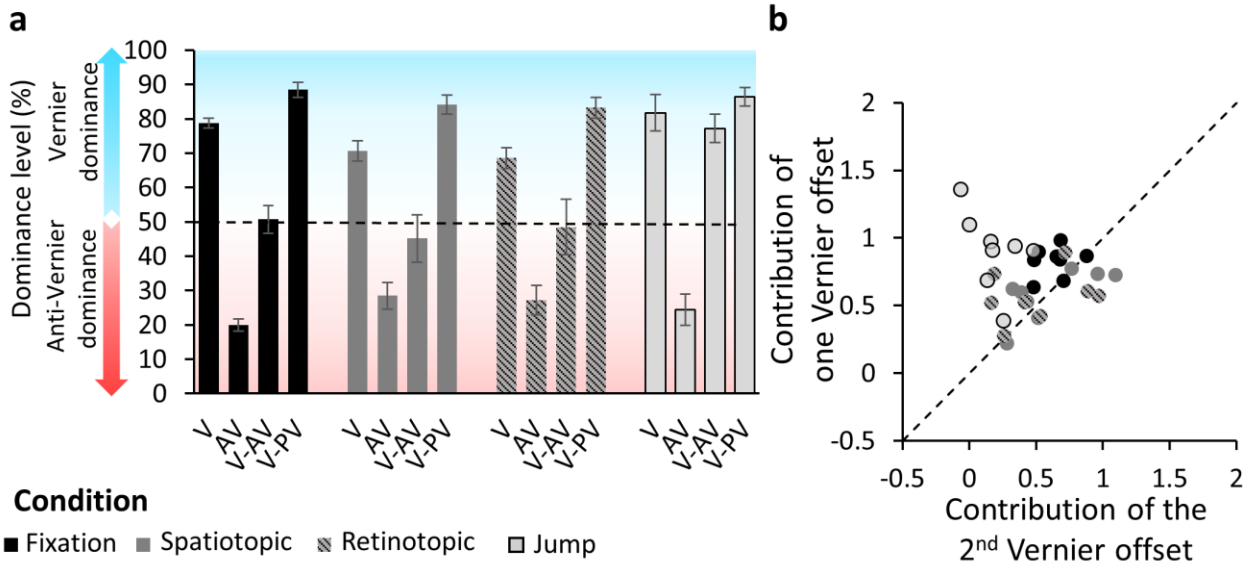

Figure S2: Results of Experiment 1 using the raw data. **a**. Dominance level as a function of the different configurations of the SQM for the Fixation (black), Spatiotopic (dark grey), Retinotopic (dark grey grey, dashed) and Jump (light grey) conditions. Integration occurs in the Fixation (V-AV versus V: $t(7) = 6.6$, $p_{Holm} = 0.0024$, Cohen's $d = 2.34$, 95% CI [-3.7 -0.94]; V-AV versus 50%:: $t(7) = 0.176$, $p_{Holm} = 1.0$, Cohen's $d = 0.062$, 95% CI [-0.63 0.75]), Spatiotopic (V-AV versus V: $t(7) = 4.27$, $p_{Holm} = 0.024$, Cohen's $d = 1.51$, 95% CI [-2.53 -0.45]; V-AV versus 50%: $t(7) = 0.7$, $p_{Holm} = 1.0$, Cohen's $d = 0.25$, 95% CI [-0.94 0.47]) and Retinotopic conditions (V-AV versus V: $t(7) = 3.4$, $p = 0.012$, $p_{Holm} = 0.06$, Cohen's $d = 1.2$, 95% CI [-2.1 -0.25]; V-AV versus 50%: $t(7) = 0.19$, $p_{Holm} = 1.0$, Cohen's $d = 0.068$, 95% CI [-0.76 0.63). The offsets did not integrate in the Jump condition (V-AV versus V: $t(7) = 0.95$, $p_{Holm} = 1.0$, Cohen's $d = 0.34$, 95% CI [-1.04 0.4]; V-AV versus 50%: $t(7) = 6.54$, $p_{Holm} = 0.0024$, Cohen's $d = 2.31$, 95% CI [0.92 3.67]). Please note that the *p*-value for the V-AV versus V comparison in the Retinotopic condition did not survive the Holm correction. The raw data is a bit noisier than the filtered data. However, the pattern is the same. Error bars represent standard error of the mean (SEM). **b.** Contribution of one vernier offset (average of percent correct in V and AV) as a function of the contribution of the other vernier offset ([(V-PV)-(V-AV)]/2), when both offsets are present for each observer and each condition in z-score

space. The diagonal represents perfect integration (both offsets contribute equally to the performance).

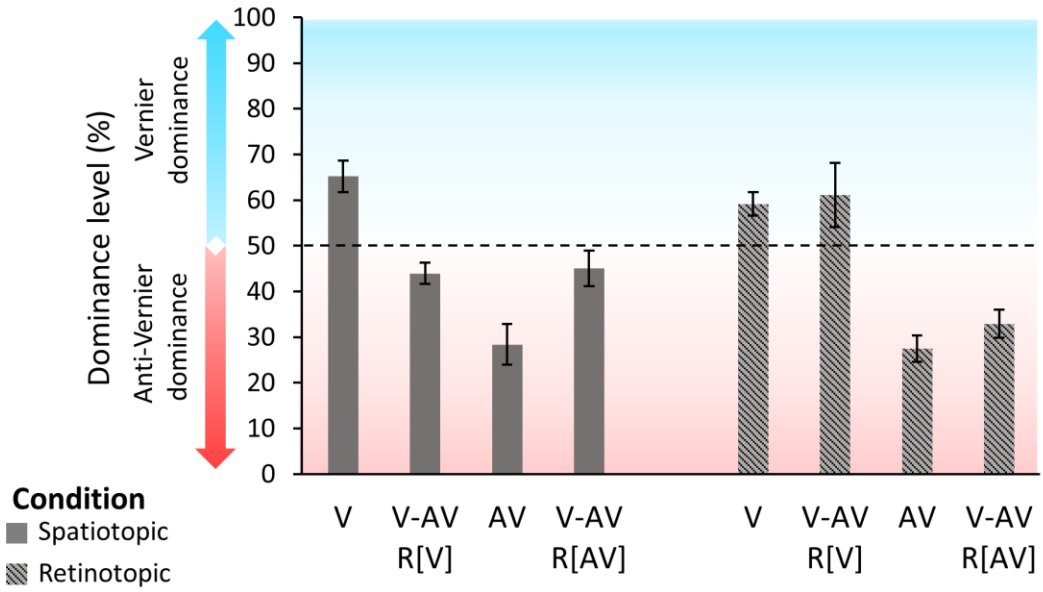

Figure S3. Results of Experiment 2 using the raw data. Dominance level as a function of the different configurations of the SQM in the Spatiotopic (dark grey) and Retinotopic (grey, dashed) conditions. V-AV R[V]: participants were instructed to report the central vernier offset direction. V-AV R[AV]: participants were instructed to report the anti-vernier offset direction.

Integration *is* mandatory in the Spatiotopic condition (two-sided Holm corrected paired t-tests, V versus (V-AV R[V]): $t(5) = 4.27$, $p_{Holm} = 0.032$, Cohen's $d = 1.74$, 95% CI [0.4 3.04] ; AV versus (V-AV R[AV]): $t(5) = 3.8$, $p_{Holm} = 0.039$, Cohen's $d = 1.55$, 95% CI [-2.7 -0.29]). In the Retinotopic condition, observers are able to report the individual offsets since dominances in the V-AV conditions are similar to the V and AV conditions (two-sided Holm corrected paired t-tests, V versus (V-AV R[V]): $t(5) = 0.24$, $p_{Holm} = 0.82$, Cohen's $d = 0.1$, 95% CI [-0.9 0.71]; AV versus (V-AV R[AV]): $t(5) = 1.48$, $p_{Holm} = 0.4$, Cohen's $d = 0.6$, 95% CI [-1.46 0.3]).

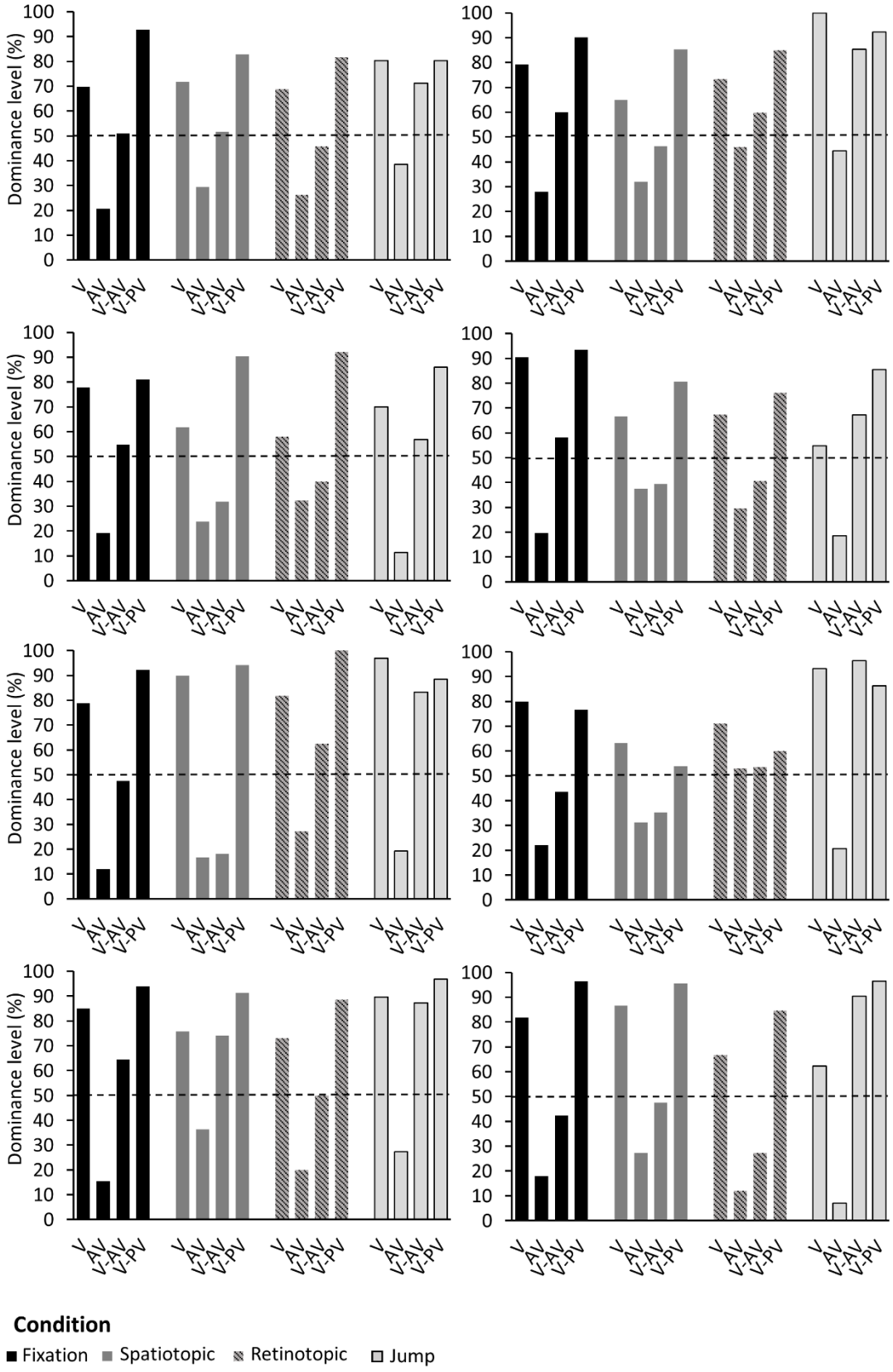
Dominance level (%)
100
90
80
70
60
50
40
30
20
10
0
V
AV
V-AV
V-PV
Condition
Fixation
Spatiotopic
Retinotopic
Jump

Figure S4. Individual data of experiment 1. Dominance level as a function of the different configurations of the SQM for the Fixation (black), Spatiotopic (dark grey), Retinotopic (dark grey grey, dashed) and Jump (light grey) conditions for each observer.

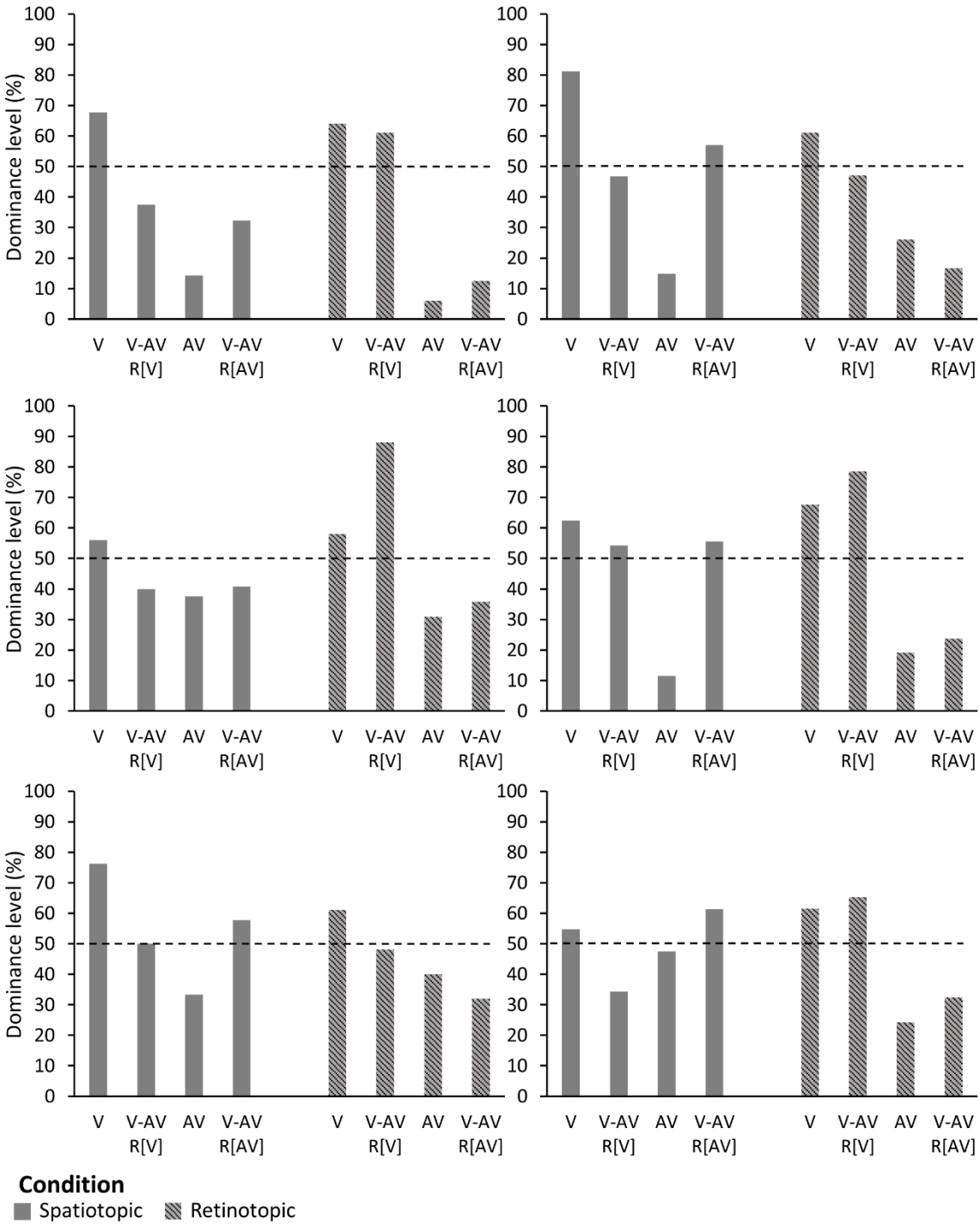

Figure S5. Individual data of experiment 2. Dominance level as a function of the different configurations of the SQM in the Spatiotopic (dark grey) and Retinotopic (grey, dashed) conditions for each observer. V-AV R[V]: participants were instructed to report the central

vernier offset direction. V-AV R[AV]: participants were instructed to report the anti-vernier offset direction.