**Absolute Activity**

**Split 12-ways**

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| --- | --- | --- | --- |
| **Descriptive Statistics** | | | |
|  | Mean | Std. Deviation | N |
| L1T\_LH | -1.56822 | 3.824973 | 28 |
| L1T\_RH | -3.48092 | 4.406169 | 28 |
| R1T\_LH | -2.81742 | 4.222907 | 28 |
| R1T\_RH | -1.92631 | 4.058637 | 28 |
| L2T\_LH | -.90240 | 4.767687 | 28 |
| L2T\_RH | -4.24678 | 4.993607 | 28 |
| R2T\_LH | -3.30329 | 5.325933 | 28 |
| R2T\_RH | -2.67329 | 5.626862 | 28 |
| L4T\_LH | .48598 | 3.716324 | 28 |
| L4T\_RH | -3.46564 | 3.409349 | 28 |
| R4T\_LH | -2.17318 | 4.350582 | 28 |
| R4T\_RH | -2.69436 | 4.187690 | 28 |

**Collapsed across target hemifield conditions**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Paired Samples Statistics** | | | | | |
|  | | Mean | N | Std. Deviation | Std. Error Mean |
| Pair 1 | LE\_1T | -2.19283 | 28 | 3.739702 | .706737 |
| RE\_1T | -2.70361 | 28 | 3.924970 | .741750 |
| Pair 2 | LE\_2T | -2.10283 | 28 | 4.745221 | .896763 |
| RE\_2T | -3.46004 | 28 | 4.898692 | .925766 |
| Pair 3 | LE\_4T | -.84359 | 28 | 3.273036 | .618546 |
| RE\_4T | -3.08000 | 28 | 3.263667 | .616775 |

**Collapsed Across Number of Targets**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Paired Samples Statistics** | | | | | |
|  | | Mean | N | Std. Deviation | Std. Error Mean |
| Pair 1 | LT\_LE | -.66155 | 28 | 3.533917 | .667847 |
| LT\_RE | -3.73111 | 28 | 3.653218 | .690393 |
| Pair 2 | RT\_LE | -2.76462 | 28 | 4.115274 | .777714 |
| RT\_RE | -2.43132 | 28 | 4.057179 | .766735 |

The assumption of sphericity was not violated for any of the effects (all p>.05). However, the difference was marginal for nTarg\*tHemi (p=.088) and nTarg\*tHemi\*eHemi (p=.051). I have reported both the sphericity assumed and Greenhouse-Geisser corrected values for these below.

There was no main effect of the number of targets cued for tracking *F*(2,54)=1.408, *p*=.253.

There was no main effect of which hemifield the tracked targets were in *F*(1,27)=1.515, *p*=.229.

Activity over right hemisphere electrodes (*M*=-3.081, *SD*=3.729) was overall more negative than that over left hemisphere electrodes (*M*=-1.713, *SD*=3.710), *F*(1,27)=16.352, *p*<.001, *ηp2*=.377.

There was no reliable interaction between the number of targets and which hemifield the tracked targets were in, *F*(2,54)=0.554, *p*=.578. *OR* *F*(1.709,46.138)=0.554, *p*=.551.

There was a significant interaction between the number of targets and which hemisphere activity was recorded over, *F*(2,54)=28.116, *p*<.001, *ηp2*=.510.

* Activity was significantly more negative over the right hemisphere than left for 2 targets (Right: *M*=-3.460,*SD*=4.900; Left: *M*=-2.103,*SD*=4.745, *t*(27)=3.769, *p*=.001) and 4 targets (Right: *M*=-3.080,*SD*=3.264; Left: *M*=-0.844, *SD*=3.273, *t*(27)=5.680, *p*<.001), but there was no reliable difference between hemispheres when tracking 1 target (Right: *M*=-2.704, *SD*=3.925; Left: *M*=-2.193, *SD*=3.734, *t*(27)=1.529, *p*=.138).

There was a significant interaction between the hemifield the tracked targets were in and which hemisphere the activity was recorded over, *F*(1,27)=89.199, *p*<.001, *ηp2*=.768.

* When tracking left hemifield targets, activity over the right/contralateral hemisphere was significantly more negative (*M*=-3.731,*SD*=3.653) then over the left/ipsilateral hemisphere (*M*=-0.662,*SD*=3.534, *t*(27)=8.085, *p*<.001). However, when tracking right hemifield targets, the activity over the left/contralateral hemisphere was not significantly lower (*M*=-2.764,SD=4.115) than over the right/ipsilateral hemisphere (*M*=-2.431,*SD*=4.057, *t*(27)=0.861, *p*=.397)

There was a significant interaction between the number of targets tracked, which hemifield they were presented in, and which hemisphere activity was recorded over, *F*(2,54)=3.541, *p*=.036, *ηp2*=.116 *OR* *F*(1.660,44.807)=3.541, *p*=.045, *ηp2*=.116.

* For 1 target only, there was no reliable main effect of target hemifield, *F*(1,27)=0.74, *p*=.788, nor electrode hemisphere, *F*(1,27)=2.338, *p*=.138. However, there was a significant hemifield by hemisphere interaction, *F*(1,27)=73.600, *p*<.001, *ηp2*=.732.
  + When tracking one target in the left hemifield, activity over the right hemisphere was more negative (*M*=-3.481,*SD*=4.406) the left hemisphere (*M*=-1.568,*SD*=3.825, *t*(27)=5.325, *p*<.001). However, this pattern was reversed for right hemifield targets, such that activity over the right hemisphere was more positive (*M*=-1.926,*SD*=4.059) than over the left (*M*=-2.817,*SD*=4.222, *t*(27)=2.32, *p*=.028). i.e. when tracking one target, activity over contralateral electrodes was significantly more negative than over ipsilateral electrodes.
* For 2 targets only, there was no reliable main effect of target hemifield, *F*(1,27)=0.368,*p*=.549. However, overall activity over the right hemisphere was more negative (*M*=-3.460,*SD*=4.899) then over the left hemisphere (*M*=-2.103, *SD*=4.745, *F*(1,27)=14.201, *p*=.001, *ηp2*=.345. There was also a significant interaction between the target hemi field and electrode hemisphere, *F*(1,27)=67.436, *p*<.001, *ηp2*=.714.
  + When tracking 2 targets in the left hemifield, activity was more negative over the right/contralateral hemisphere (*M*=-4.247,*SD*=4.994) than the left/ipsilateral (M=-0.902,*SD*=4.768, *t*(27)=7.336, *p*<.001). However, when tracking two items in the right hemifield, activity in the right/ipsilateral hemisphere was no longer significantly more positive (*M*=-2.673,*SD*=5.627) than over the left/contralateral hemisphere (*M*=-3.303,*SD*=5.326, *t*(27)=1.534, *p*=.137).
* For 4 targets only, there was no reliable effect of target hemifield, *F*(1,27)=1.428, *p*=.243. However, activity was overall more negative over right hemisphere electrodes (*M*=-3.080,*SD*=3.264) then left hemisphere electrodes (*M*=-0.844,*SD*=3.273, *F*(1,27)=32.259, *p*<.001). There was also a significant interaction between the target hemifield and electrode hemisphere, *F*(1,27)=48.582, p<.001, *ηp2*=.643.
  + When tracking 4 items in the left hemifield, activity over the right/contralateral hemisphere was more negative (*M*=-3.466,*SD*=3.409) than over the left/ipsilateral hemisphere (*M*=0.486,*SD*=3.716, *t*(27)=8.511, *p*<.001). However, when tracking 4 items in the right hemifield, activity over the right/ipsilateral hemisphere (*M*=-2.694,*SD*=4.188) was no longer significantly more positive than the left/contralateral hemisphere (*M*=-2.173, *SD*=4.351, *t*(27)=1.122, *p*=.272), and was now even very slightly more negative.
* In summary, CDA activity (more negative activity over the contralateral than ipsilateral hemisphere) was observed for tracking 1, 2 and 4 targets in the left hemifield, but only for tracking 1 target in the right hemifield. When tracking 2 or 4 in the right hemifield, the left hemisphere was not reliably more negative than the right, and this relationship even slightly reversed for 4 targets.

**CDA Amplitude**

However, it remains possible that variability between participants in their absolute activity may have masked CDA effects, which can be defined as the relative difference in activity between the contralateral and ipsilateral electrodes when tracking a target in a given hemifield. When calculating CDA activity as ipsilateral activity minus contralateral activity (i.e. more positive ipsilateral than contralateral would result in a positive CDA, and vice versa):

Sphericity was almost violated for the number of targets main effect (*p*=.051) so below reported both the sphericity assumed and Greenhouse-Geisser values for this analysis. The interaction between number of targets and target hemifield was not significantly violated (*p*=.151).

There was a significant main effect of the number of targets tracked, *F*(2,54)=3.541, *p*=.036, *ηp2*=.116 *OR GG*: *F*(1.660,44.808)=3.541,*p*=.045, *ηp2*=.116.

* This was driven by a significant increase in CDA amplitude when tracking 2 targets (*M*=1.987,*SD*=1.281) than 1 target (*M*=1.402,*SD*=0.865, *t*(27)=2.404, *p*=.023. The CDA when tracking 4 targets (*M*=1.715,*SD*=1.302) was not significantly greater than when tracking 1 (*t*(27)=1.283, *p*=2.10) and was even slightly, but not significantly, less than when tracking 2 targets, *t*(27)=1.283, *p*=.106.

CDA amplitude was significantly greater when tracking targets in the left hemifield (*M*=3.070,*SD*=2.001) than in the right hemifield (*M*=0.333,*SD*=2.047, *F*(1,27)=16.352, *p*<.001, *ηp2*=.377.

There was also a significant interaction between the number of targets tracked and which hemifield they were in, *F*(2,54)=28.117, *p*<.001, *ηp2*=.510.

* When tracking items in the left field, there was a significant effect of the number of items tracked, *F*(1.603, 43.270)=18.270, *p*<.001, *ηp2*=.404).
  + CDA magnitude was significantly greater when tracking 2 left targets (*M*=3.344,*SD*=2.412) than 1 left target (*M*=1.913,*SD*=1.900, *t*(27)=4.373, *p*<.001). Tracking 4 left items was also significantly greater (*M*=3.952,*SD*=2.457) than both when tracking 1 item (*t*(27)=4.848, *p*<.001) and 2 items (*t*(27)=2.205, *p*=.036).
* When tracking items in the right hemifield, there is also a main effect of the number of items tracked, *F*(2,54)=13.631, *p*<.001.
  + CDA activity was now significantly more negative when tracking 4 items (*M*=-0.521,*SD*=2.457) than when tracking either 1 item (*M*=0.891,*SD*=2.033, *t*(27)=4.991, *p*<.001) or 2 items (*M*=0.630, *SD*=2.173, *t*(27)=3.910, *p*=.001). CDA amplitude was slightly more negative when tracking 2 items than 1, but this difference was not reliable, *t*(27)=0.913, *p*=.369.

In summary, CDA amplitude increased as the number of items in the left hemifield was tracked increased, but decreased as the number of items in the right hemifield was tracked increased. This suggests that electrodes over the right hemisphere may have shown an increasingly more negative activity relative to the left hemisphere as the number of items was increased, regardless of which hemifield they were in, but that this effect was more pronounced for left (contralateral) targets.