

# Self-Referential Processing in Neuronal Populations of Ventromedial and Orbitofrontal Cortex

```
% -*- UFT -*-
% Author: behira
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% loading the data
clc
clear
data = readtable('data\stimlock.tsv', FileType='text'); % reading that tabular data
```

## Subject and Experimental Condition

```
% create report object
report = stat_report(data, 'data\BHV.json', 'data\FrontalEcogvsSeeg.json'); % stat_report insta
% print some info
Uniq_id = report.report("num_indiv");
```

The total number of pt is: 22

```
report.report("number_total_elec"); % statistical summary of number of electrodes
```

The total number of elec is: 253, in total patients 22  
mean (std) # elec: 11.50(10.60), range = [1,38]

## Behavioral Data

```
report.report("number_trials"); % statistical summary of number of trials per condition
```

EP # trails: mean (std): 24 (1.2)  
SJ # trails: mean (std): 24 (1.9)  
MTH # trails: mean (std): 39 (1.7)

```
report.report("number_true_false") % statistical summary of number of trials responded with tru
```

EP true # trails replied with true: mean (std): 9 (4), range = [4,22]  
EP false # trails replied with true: mean (std): 15 (4), range = [4,21]  
SJ true # trails replied with true: mean (std): 16 (3), range = [8,23]  
SJ false # trails replied with true: mean (std): 8 (3), range = [3,14]  
MTH true # trails replied with true: mean (std): 21 (4), range = [15,31]  
MTH false # trails replied with true: mean (std): 16 (3), range = [9,20]  
ans = struct with fields:

true: {[9 4 4 22] [16 3 8 23] [21 4 15 31]}

false: {[15 4 4 21] [8 3 3 14] [16 3 9 20]}

```
report.report("reaction_time") % statistical summary of RT responded with true and false
```

EP true RT replied with true: mean (std): 3.67 (1.40), range = [1.35,6.48]  
EP false RT replied with true: mean (std): 3.62 (1.40), range = [1.38,6.45]  
SJ true RT replied with true: mean (std): 3.06 (1.33), range = [0.96,5.49]  
SJ false RT replied with true: mean (std): 3.56 (1.27), range = [1.16,5.86]

```

MTH true RT replied with true: mean (std): 4.65 (1.84), range = [1.22,8.32]
MTH false RT replied with true: mean (std): 5.37 (2.04), range = [1.34,9.47]
ans = struct with fields:
    true: {[3.6700 1.4000 1.3500 6.4800] [3.0600 1.3300 0.9600 5.4900] [4.6500 1.8400 1.2200 8.3200]}
    false: {[3.6200 1.4000 1.3800 6.4500] [3.5600 1.2700 1.1600 5.8600] [5.3700 2.0400 1.3400 9.4700]}

report.report("veridicality") % statistical summary of response veridicality.

```

```

EP true veridicality replied with true: mean (std): 0.47 (0.15), range = [0.24,0.82]
EP false veridicality replied with true: mean (std): 0.70 (0.21), range = [0.11,0.96]
MTH true veridicality replied with true: mean (std): 0.87 (0.11), range = [0.60,1.00]
MTH false veridicality replied with true: mean (std): 0.79 (0.20), range = [0.29,1.00]
ans = struct with fields:
    true: {[0.4700 0.1500 0.2400 0.8200] [0.8700 0.1100 0.6000 1]}
    false: {[0.7000 0.2100 0.1100 0.9600] [0.7900 0.2000 0.2900 1]}

```

## Self-Referential Neuronal Population Activity in the OFC and vmPFC

```
report.report("ECoGSEEG") % statisitcal summary of number of ECoG and SEEG electrodes as well as
```

```

S01 -- electype: ECOG
S02 -- electype: ECOG
S03 -- electype: ECOG
S04 -- electype: ECOG
S05 -- electype: ECOG
S06 -- electype: ECOG
S07 -- electype: ECOG
S08 -- electype: ECOG
S09 -- electype: ECOG
S10 -- electype: ECOG
S11 -- electype: ECOG
S12 -- electype: ECOG
S13 -- electype: ECOG
S14 -- electype: ECOG
S15 -- electype: ECOG
S16 -- electype: ECOG
S17 -- electype: SEEG
S18 -- electype: ECOG
S19 -- electype: SEEG
S20 -- electype: ECOG
S21 -- electype: SEEG
S22 -- electype: SEEG
ECOG = 13 +/- 11, [2, 38]
OFC = 0.76 +/- 0.33
MPFC = 0.24 +/- 0.33
SEEG = 6 +/- 6, [1, 13]
OFC = 0.50 +/- 0.58
MPFC = 0.50 +/- 0.58

```

```

R = resultEEG(data, 'data\BHV.json', 'data\FrontalEcogvsSeeg.json'); % cerate an instance of
% define the colors for electrode activity in hex
col = ["#0065C1",... blue for self-referential
        "#A63838"]; % red for math
R.LocalizeSelfMath(col);

```

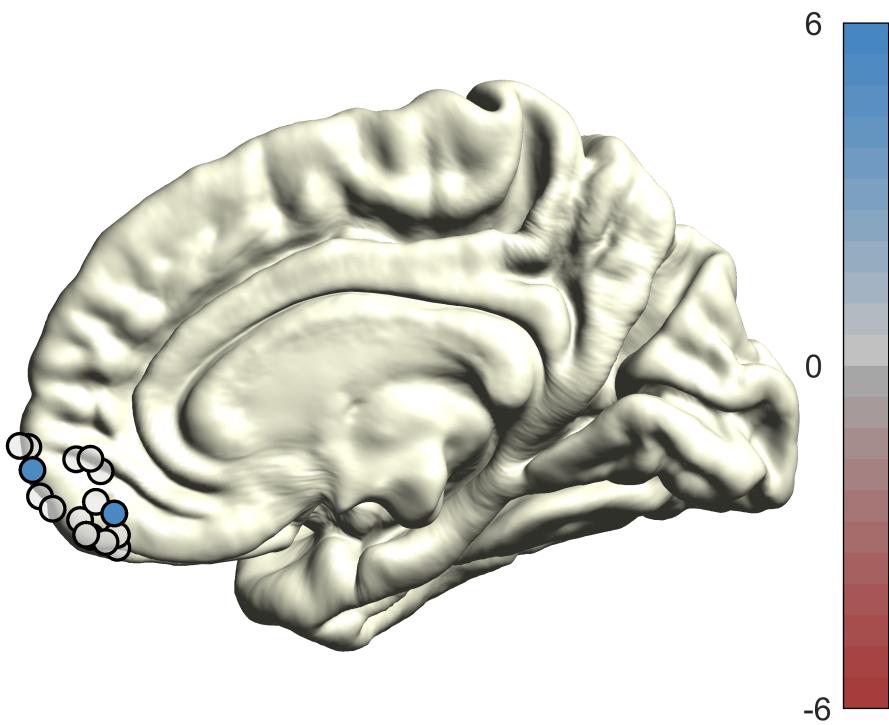
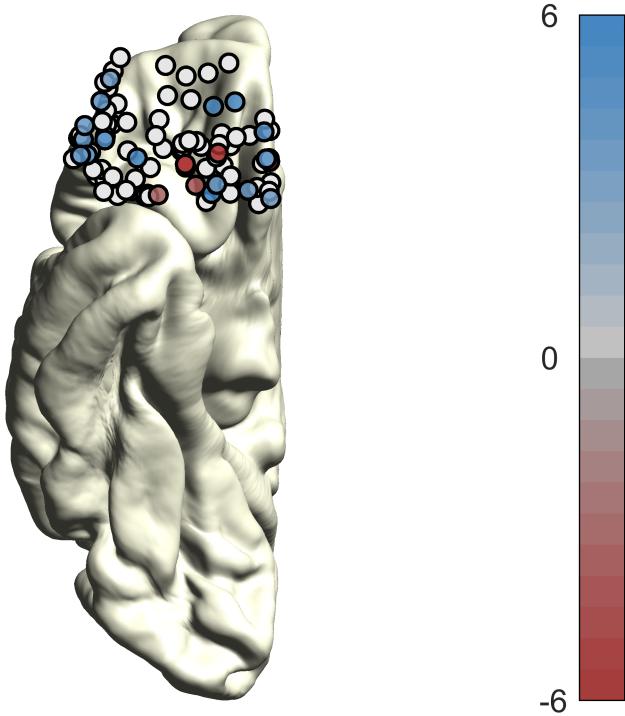
```

Warning: idxing stats at zero adding 1 to faces
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observation 2 of 107
observation 3 of 107
observation 4 of 107
observation 6 of 107

```

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observation 57 of 107  
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observation 97 of 107  
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observation 100 of 107

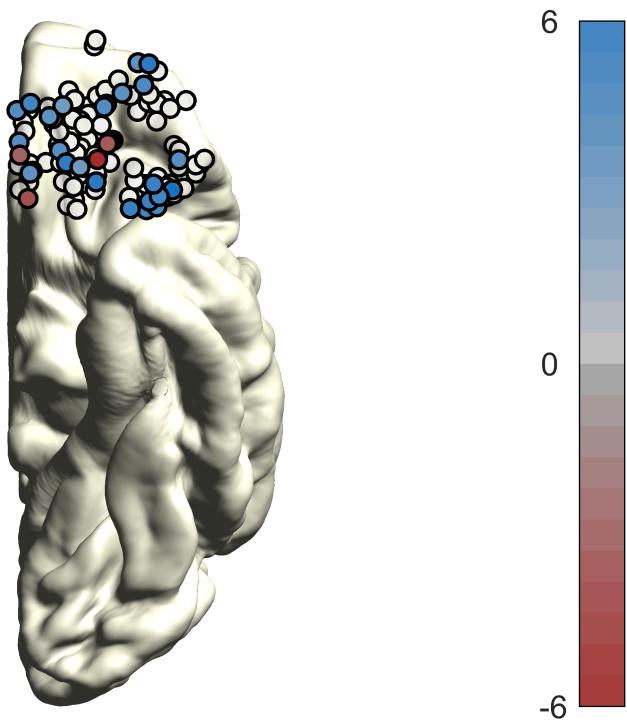


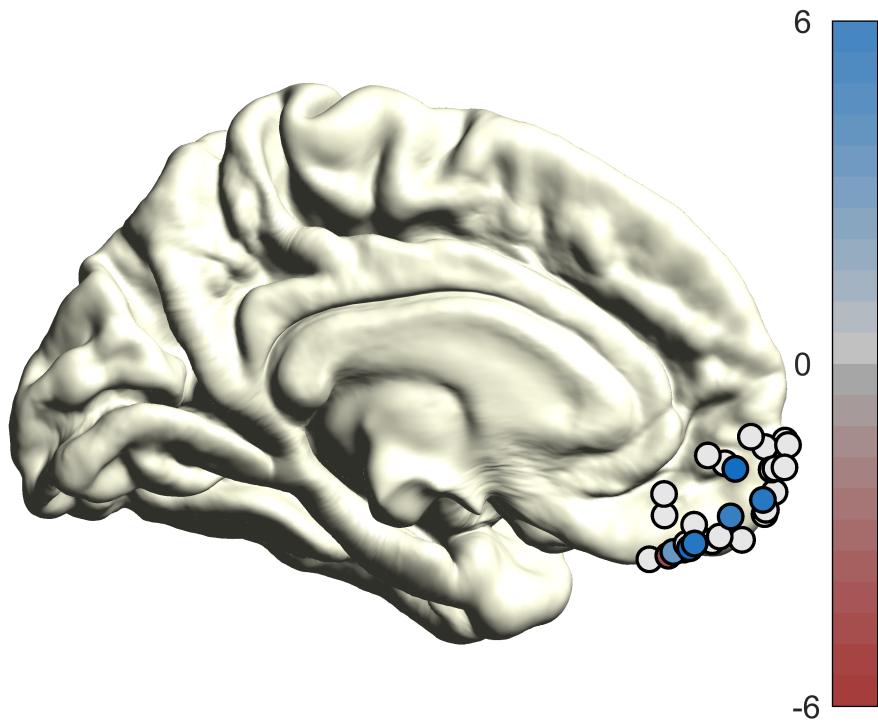
Warning: indexing stats at zero adding 1 to faces  
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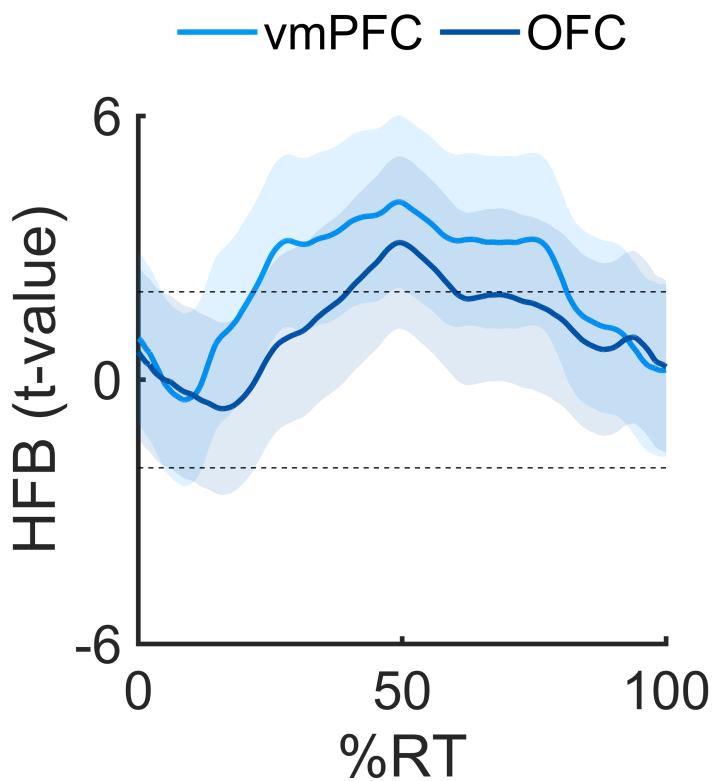
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```
% read the time warped HFB envelope
HFB_tw.data = R.getTimeWarpedHFB('data\Stimlock-TimeWarped_ieeg.dat');
% read labels
HFB_tw.label = readtable('data\Stimlock-TimeWarped.tsv', FileType = 'text');
% trials were warped to 0:100% of RT
HFB_tw.time = (0:size(HFB_tw.data,2)-1)./512 - .5; % pre = 500ms, fsamp = 512
% define colors
col = ["#0097FB", "#0051A6"]; % light and dark blue
R.plot_HFB(HFB_tw, .1, col) % smoothing .1s
```



```
{
  "Anatomy": [
    "MPFC",
    "OFC"
  ],
  "time": [
    22,
    40
  ],
  "tvalue": [
    2.0582317462587456,
    2.0515793356025762
  ],
  "dof": [
    38,
    207
  ],
  "pvalue": [
    0.046473355236149594,
    0.041469574463316672
  ],
  "CI": [
    [
      -0.052999750339447149,
      0.067882795654500033
    ],
    [
      -0.11636782753021721,
      0.131640396275843
    ]
  ]
}
ans = 0
```

