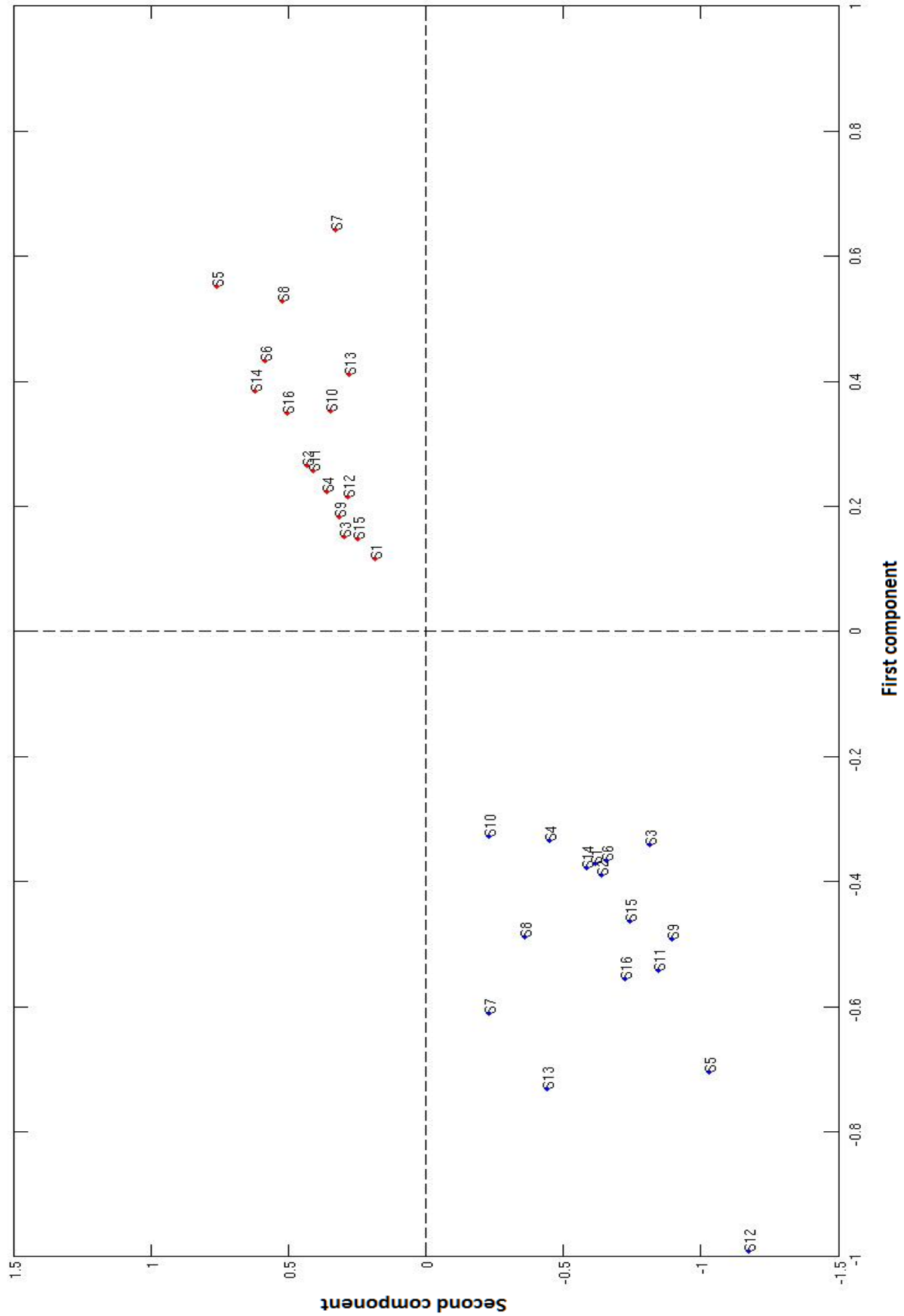
Eigen distance matrix analysis: testing out the method

To test the method I carried out an analysis on previously collected fMRI data. I wanted to find out whether two different types of information (visual vs. semantic) were encoded in different ways (summed activation vs. distributed coding). A question separate from their localisation in the brain which is the one typically asked in similar studies. Using an 8mm searchlight, I ran eigen-distance matrix analysis on each participant's data individually using two different models, C1 and semantic features. The former was based on the same parameters used in previous chapters while the latter was formulated using semantic feature norms, again, as in previous chapters. **β**-values were collected for each model were then pooled and averaged for each participant. I then plotted the average **β**–values for the first two components – see Figure. High values along the first component means that the type of information (instantiated by the model) is mostly captured by the summed activity of the voxel ensemble. I found that visual information is encoded within the distributed pattern of voxel ensembles while semantic information is encoded with the summed activity (see Figure and Table; semantic vs. visual: paired t-test $t(15) = 11.06$; $p < 0.01$ for first component; $t(15) = 11.44$; $p < 0.01$ for second component).

	First component		Second component	
	C1	semantic	C1	semantic
S1	0.012	0.058	0.019	0.110
S2	0.023	0.116	-0.001	0.169
S3	0.028	0.088	-0.011	0.133
S4	0.036	0.119	-0.002	0.096
S5	0.000	0.156	-0.046	0.202
S6	0.030	0.138	0.025	0.241
S7	0.033	0.228	-0.001	0.079
S8	0.039	0.215	-0.023	0.104
S9	0.028	0.115	-0.009	0.134
S10	0.011	0.126	-0.002	0.070
S11	0.012	0.118	-0.006	0.161
S12	-0.008	0.131	0.047	0.253
S13	0.003	0.139	0.015	0.112
S14	0.029	0.136	0.024	0.218
S15	0.041	0.114	0.046	0.202
S16	0.028	0.153	-0.015	0.159
Mean	***0.022***	***0.134***	***0.004***	***0.153***

Average β–values for each participant and model.



Scatter-plot depicting the average β-values for each participant. Points in blue denote values for visual model (**C1**) while points in red denote values for semantic model (**McRae feature norms**). Original figure was rotated 90 degrees anti-clockwise for presentation purposes.