

**Improving fMRI Prediction of Purchases with Penalized Discriminant Analysis**  
Supplementary Material

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S1. SHOP task trial design

S2. Talairach coordinates for all voxels

S3. Logistic regression and linear discriminant analysis coefficients

S4. Video presentation of model coefficients.

## Supplement 1: SHOP task trial design



Figure S1.1 Above is an example of the layout of one trial of the SHOP task. In each trial the subject sees a labeled product for four seconds (product period), then the price offered along with the product for four seconds (price period) then the subject is give a choice to buy the item or not (choice period).

## Supplement 2: Talairach coordinates for all voxels

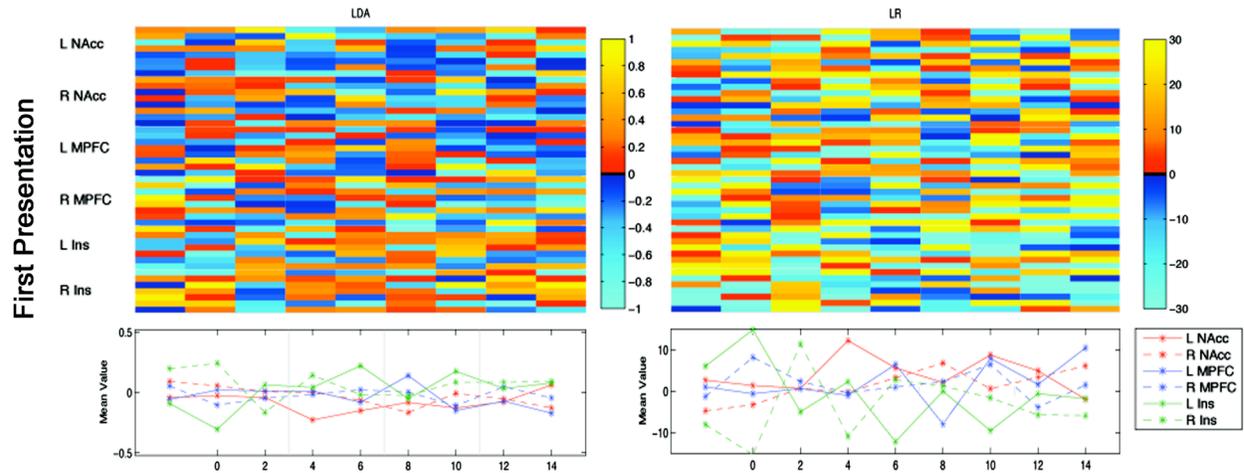
Table S2.1 Talairach coordinates for all 46 voxels included in analysis. Voxels are organized to match the y-axis of the coefficient heat maps.

<b>L NAcc</b>	<b>R</b>	<b>A</b>	<b>S</b>
v1	-12	12	-1
v2	-9	12	-1
v3	-9	12	-4
v4	-12	12	-4
v5	-10	15	-1
v6	-10	15	-4
v7	-10	9	-1
v8	-10	9	-4
<b>R NAcc</b>			
v9	12	12	-1
v10	9	12	-1
v11	9	12	-4
v12	12	12	-4
v13	10	15	-1
v14	10	15	-4
v15	10	9	-1
v16	10	9	-4
<b>L MPFC</b>			
v17	-2	55	-3
v18	-6	55	-3
v19	-6	55	-6
v20	-2	55	-6
v21	-2	52	-3
v22	-6	52	-3
v23	-6	52	-6
v24	-2	52	-6
<b>R MPFC</b>			
v25	2	55	-3
v26	6	55	-3
v27	6	55	-6
v28	2	55	-6
v29	2	52	-3
v30	6	52	-3
v31	6	52	-6
v32	2	52	-6
<b>L Insula</b>			
v33	-33	8	9
v34	-33	8	12
v35	-33	8	5
v36	-30	8	8
v37	-37	8	8

v38	-33	12	8
v39	-33	4	8
<b>R Insula</b>			
v40	33	8	9
v41	33	8	12
v42	33	8	5
v43	30	8	8
v44	37	8	8
v45	33	12	8
v46	33	4	8

### Supplement 3: Logistic regression and linear discriminant analysis coefficients

Figure S3.1 Spatiotemporal coefficient heat maps and averages for LDA and LR Models for the first presentation dataset.



Coefficients for the LDA and LR models are noisy and vary widely in magnitude and sign. This is partially due to the fact that these are non-penalized methods that do not perform automatic variable selection. This is exacerbated by the high dimensionality and high degree of correlated variables found in fMRI data. While classification rates are significantly above chance in this example ( $p < .01$ ; uncorrected), the model coefficients are difficult if not impossible to interpret.

#### **Supplement 4: Video presentation of model coefficients.**

Videos of the coefficients for the three PDA models over time are included as multimedia in this submission.

In the videos, coefficients are overlaid on averaged brain volumes at the location corresponding to the respective voxel location. Each frame of the video corresponds to one time point in the trial.