

Multi-dimensional predictions of psychotic symptoms via machine learning

Supplemental Material

Methods

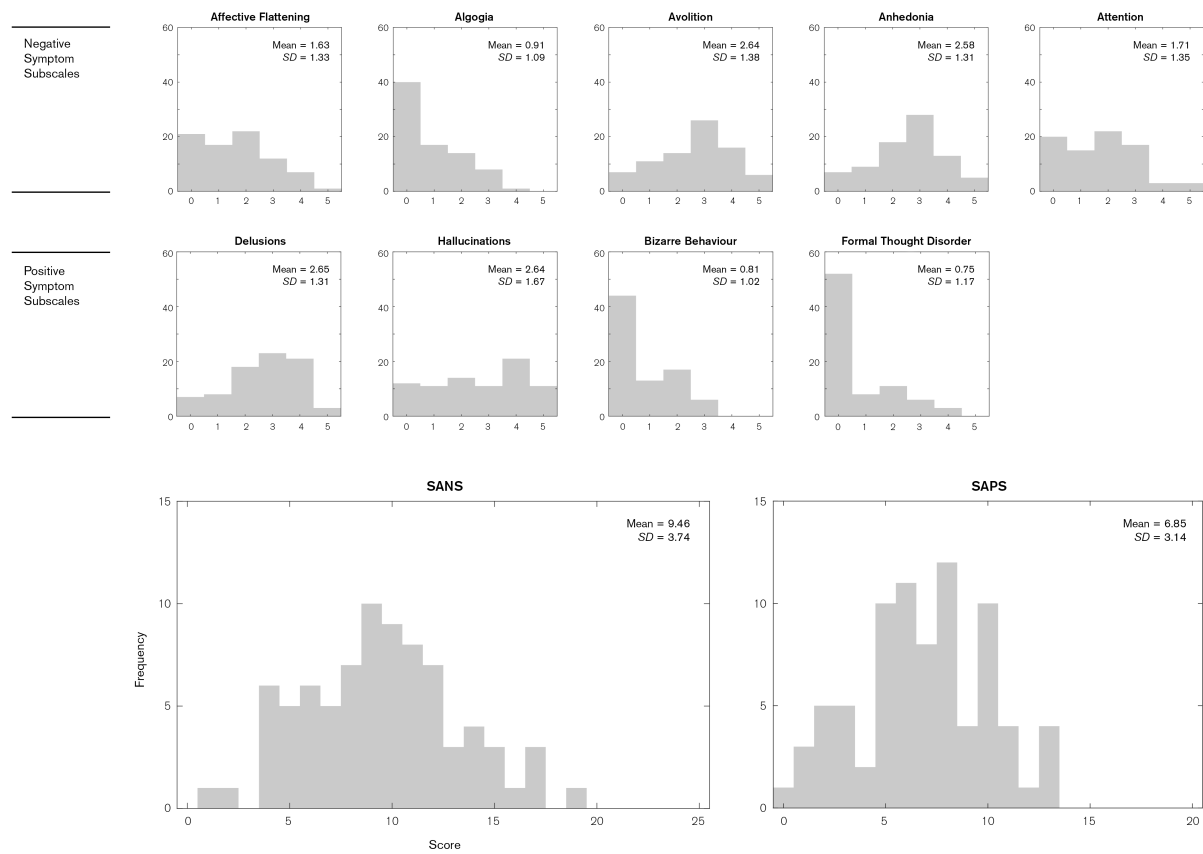


FIGURE S1 — Summary of symptom subscales and summary scores for SANS and SAPS. Each subscale is scored on a 0 to 5 scale with composite scores the sum of all subscales.

TABLE S1 — Regions-of-interest applied to the fMRI contrasts. Anatomical masks for each region were defined using the Harvard-Oxford cortical and subcortical atlases with a probability threshold of 50%. Hemispherical divisions of cortical structures were made using the left and right cerebral cortex as masks. The temporal parietal junction mask was defined as the union of the surrounding regions, as specified by Schurz et al. (1): the lateral occipital cortex, superior division; angular gyrus; supramarginal gyrus, posterior division; middle temporal gyrus, temporooccipital part.

Classification	Region	Abbreviation	Atlas Label	Atlas ID
Ventral attention	Temporal parietal junction	TPJ	Lateral occipital cortex, superior division	22
			Angular gyrus	21
			Supramarginal gyrus, posterior division	20
			Middle temporal gyrus, temporooccipital part	13
	Anterior insula	AI	Insular cortex	2
	Anterior middle frontal gyrus	aMFG	Middle frontal gyrus	4
Anterior cingulate cortex	ACC	Cingulate gyrus, anterior division	29	
Dorsal attention	Inferior frontal junction	IFJ	Inferior frontal gyrus, pars triangularis	5
			Inferior frontal gyrus, pars opercularis	6
	Superior parietal lobule	SPL	Superior parietal lobule	18
Auditory	Transverse gyrus	HG	Heschl's gyrus	45
	Superior temporal gyrus	STG	Superior temporal gyrus, anterior division	9
			Superior temporal gyrus, posterior division	10
Lingual gyrus	LiG	Lingual gyrus	36	
Other cortical	Precentral gyrus	PrG	Precentral gyrus	7
	Postcentral gyrus	PoG	Postcentral gyrus	17
	Lateral IPS/IPL		N/A	N/A
	Posterior cingulate cortex	PCC	Cingulate gyrus, posterior division	30
Subcortical	Amygdala	Amg	Amygdala	10/20
	Putamen	Pu	Putamen	6/17
	Thalamus	Th	Thalamus	4/15
	Cerebellum		N/A	N/A

Results

TABLE S2 — Output fusion weights for statistically significant subscale models, indicating relative contribution of each feature set at Stage 3 of the framework shown in main manuscript, Figure 1. Values shown are normalised with crosses indicating the entire feature set was marked as irrelevant by the *lasso* algorithm.

		Target	Novel	Behaviour	Nuisance
Negative symptoms	Avolition	0.57	0.35	0.05	0.02
	Anhedonia	0.42	0.58	×	×
	Attention	0.34	0.38	0.17	0.11
Positive symptoms	Hallucinations	0.49	0.34	×	0.18

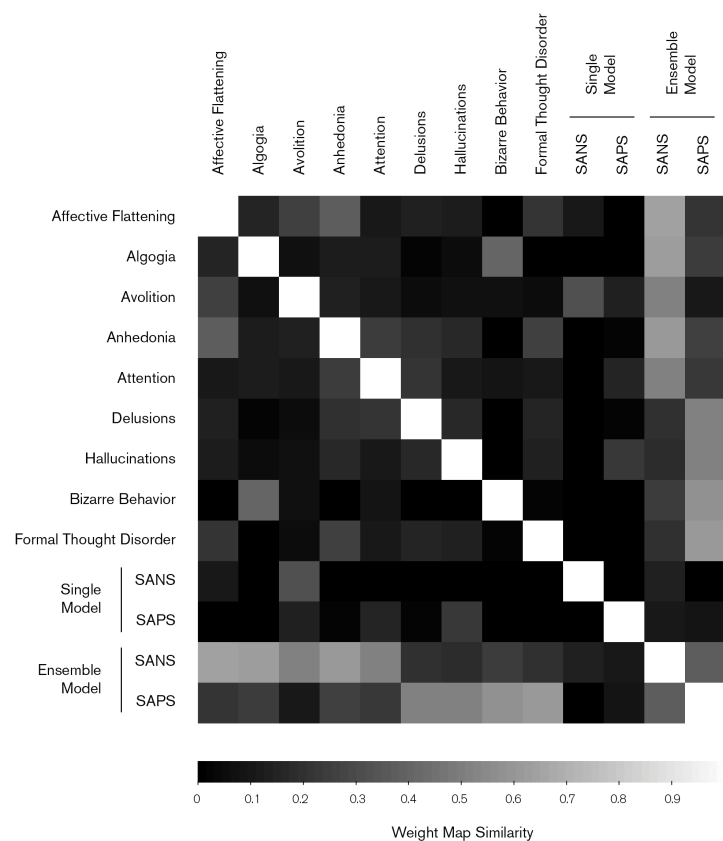


FIGURE S2 — Similarity matrix comparing the weight maps from each model. Pairwise similarities computed as the dot product between weight vectors with values ranging from 0 for dissimilar, orthogonal maps to 1 for similar, collinear maps.

References

1. Schurz M, Tholen MG, Perner J, Mars RB, Sallet J (2017): Specifying the brain anatomy underlying temporo-parietal junction activations for theory of mind: A review using probabilistic atlases from different imaging modalities. *Human Brain Mapping*. 38:4788-4805.