

## Supplementary material

Deformations at given (semi)landmark neighbourhoods on surfaces are analysed conventionally in *overall shape space*; this includes large scale deformations which operate in a linear manner across the whole object, referred to as *affine space*. However, as recently described (Katina, 2012), it is now possible to resolve more complex changes in *non-affine space* in which deformation at given locations is not assumed to be uniform, to reflect the practical reality that each location often has a distinct structural environment (Wen et al., 2012; Hufnagel, 2015); this is the focus and primary analysis in the present study (Table 1). Secondary analyses in *overall shape space* (Supplementary materials Table S1) and *affine space* (Supplementary materials Table S2), which were not informative, are provided below for completeness:

Table S1. Principal component analysis for *overall shape space*

PC	Variance		Bipolar vs controls		Schizophrenia vs controls	
	Explained %	Cumulative %	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
PC1	20.6%	20.6%	1.892	0.062	-1.452	0.150
PC2	12.6%	33.1%	-2.570	0.012	-0.610	0.544
PC3	11.7%	44.8%	0.655	0.515	-1.587	0.116
PC4	7.0%	51.8%	0.378	0.707	-0.686	0.495
PC5	6.1%	57.9%	-0.536	0.593	-0.372	0.711

Variance and cumulative variance explained by each principal component (PC), with probability values adjusted for age and sex by a linear regression model for each PC in distinguishing bipolar and schizophrenia patients from controls;  $p$  values should be compared to the Bonferroni adjusted significance level  $0.05/10 = 0.005$ .

Table S2. Principal component analysis for *affine space*.

PC	Variance		Bipolar vs controls		Schizophrenia vs controls	
	Explained %	Cumulative %	$t$	$p$	$t$	$p$
PC1	43.2%	43.2%	1.017	0.312	-1.297	0.198
PC2	28.0%	71.3%	1.224	0.225	1.385	0.170
PC3	23.6%	94.9%	-2.006	0.048	1.135	0.260
PC4	2.7%	97.6%	0.353	0.725	0.454	0.651
PC5	2.4%	99.9%	0.271	0.787	-0.151	0.880

Variance and cumulative variance explained by each principal component (PC), with probability values adjusted for age and sex by a linear regression model for each PC in distinguishing bipolar and schizophrenia patients from controls;  $p$  values should be compared to the Bonferroni adjusted significance level  $0.05/10 = 0.005$ .