

Supplementary Table 1. Multivariate analysis of variance to test the interaction between MSP and facial symmetry

Measurements	Effect	Pillai's trace	F	Hypothesis df	Error df	Sig
ANS	MSP	0.355	10.262	3	56	0.000
	MSP * group	0.290	7.630	3	56	0.000
Mx_Dev	MSP	0.352	5.879	5	54	0.000
	MSP * group	0.284	4.280	5	54	0.002
Mx_Ndev	MSP	0.344	5.653	5	54	0.000
	MSP * group	0.271	4.013	5	54	0.004
Mx_Diff	MSP	0.348	5.753	5	54	0.000
	MSP * group	0.278	4.157	5	54	0.003
Ramus angle_Dev	MSP	0.367	6.263	5	54	0.000
	MSP * group	0.291	4.429	5	54	0.002
Ramus angle_Ndev	MSP	0.401	7.242	5	54	0.000
	MSP * group	0.295	4.528	5	54	0.002
Ramus angle_Diff	MSP	0.385	6.770	5	54	0.000
	MSP * group	0.294	4.489	5	54	0.002
Me	MSP	0.414	7.616	5	54	0.000
	MSP * group	0.300	4.638	5	54	0.001
U1	MSP	0.392	6.976	5	54	0.000
	MSP * group	0.302	4.677	5	54	0.001
U3_Dev	MSP	0.373	6.426	5	54	0.000
	MSP * group	0.291	4.431	5	54	0.002
U3_Ndev	MSP	0.379	6.585	5	54	0.000
	MSP * group	0.288	4.369	5	54	0.002
U3_Diff	MSP	0.376	6.514	5	54	0.000
	MSP * group	0.290	4.401	5	54	0.002
U6_Dev	MSP	0.387	6.808	5	54	0.000
	MSP * group	0.281	4.231	5	54	0.003
U6_Ndev	MSP	0.365	6.216	5	54	0.000
	MSP * group	0.293	4.483	5	54	0.002
U6_Diff	MSP	0.376	6.510	5	54	0.000
	MSP * group	0.287	4.342	5	54	0.002
Maxillary skeletal yaw	MSP	0.317	5.021	5	54	0.001
	MSP * group	0.271	4.019	5	54	0.004
Maxillary dental yaw	MSP	0.308	4.813	5	54	0.001
	MSP * group	0.282	4.248	5	54	0.002
Mandibular skeletal yaw	MSP	0.299	4.611	5	54	0.001
	MSP * group	0.298	4.584	5	54	0.001
Mandibular dental yaw	MSP	0.302	4.684	5	54	0.001
	MSP * group	0.272	4.045	5	54	0.003

MSP, midsagittal plane; df, degrees of freedom; ANS, anterior nasal spine; Group, symmetric and asymmetric groups; Dev, deviated side; Ndev, non-deviated side; Diff, difference; U1, upper incisor; U3, upper canine; U6, upper first molar; Me, menton; Mx, maxilla.

Supplementary Table 2. Simple main effect analysis testing the effect of MSPs on each symmetric and asymmetric group

Measurements	Group	Pillai's trace	F	Hypothesis df	Error df	Sig*
ANS	Sym	0.019	0.358	3	56	0.784
	Asym	0.484	17.534	3	56	0.000
Mx_Dev	Sym	0.060	0.686	5	54	0.636
	Asym	0.467	9.473	5	54	0.000
Mx_Ndev	Sym	0.060	0.687	5	54	0.636
	Asym	0.454	8.979	5	54	0.000
Mx_Diff	Sym	0.060	0.691	5	54	0.632
	Asym	0.461	9.219	5	54	0.000
Ramus angle_Dev	Sym	0.031	0.346	5	54	0.883
	Asym	0.489	10.346	5	54	0.000
Ramus angle_Ndev	Sym	0.049	0.558	5	54	0.732
	Asym	0.509	11.212	5	54	0.000
Ramus angle_Diff	Sym	0.040	0.449	5	54	0.812
	Asym	0.500	10.810	5	54	0.000
Me	Sym	0.046	0.515	5	54	0.763
	Asym	0.521	11.739	5	54	0.000
U1	Sym	0.035	0.386	5	54	0.856
	Asym	0.511	11.267	5	54	0.000
U3_Dev	Sym	0.041	0.461	5	54	0.804
	Asym	0.490	10.396	5	54	0.000
U3_Ndev	Sym	0.046	0.518	5	54	0.762
	Asym	0.491	10.436	5	54	0.000
U3_Diff	Sym	0.044	0.495	5	54	0.778
	Asym	0.491	10.42	5	54	0.000
U6_Dev	Sym	0.109	1.319	5	54	0.270
	Asym	0.474	9.72	5	54	0.000
U6_Ndev	Sym	0.120	1.469	5	54	0.215
	Asym	0.461	9.23	5	54	0.000
U6_Diff	Sym	0.111	1.352	5	54	0.257
	Asym	0.468	9.5	5	54	0.000
Maxillary skeletal yaw	Sym	0.057	0.649	5	54	0.663
	Asym	0.437	8.391	5	54	0.000
Maxillary dental yaw	Sym	0.048	0.544	5	54	0.742
	Asym	0.441	8.517	5	54	0.000
Mandibular skeletal yaw	Sym	0.024	0.26	5	54	0.933
	Asym	0.453	8.935	5	54	0.000
Mandibular dental yaw	Sym	0.046	0.515	5	54	0.764
	Asym	0.432	8.213	5	54	0.000

MSP, midsagittal plane; df, degree of freedom; ANS, anterior nasal spine; Sym, the symmetric group; Asym, the asymmetric group; Dev, deviated side; Ndev, non-deviated side; Diff, difference; U1, upper incisor; U3, upper canine; U6, upper first molar; Me, menton; Mx, maxilla.

*The results of multivariate analysis of variance for each group testing the effect of different MSPs on the measurements.

Supplementary Table 3. Pairwise comparison among MSPs in the asymmetric group

Measurements	MSP I & MSP II (FZS, N & FH, Ba-N)		MSP II & MSP III (FH, Ba-N & FH, Ba-ANS)		MSP III & MSP IV (FH, Ba-ANS & Ba-N-ANS)		MSP IV & MSP V (Ba-N-ANS & PNS-N-ANS)		MSP V & MSP VI (PNS-N-ANS & Ba-S-N)	
	Mean difference (I-II)	Sig [†]	Mean difference (II-III)	Sig [†]	Mean difference (III-IV)	Sig [†]	Mean difference (IV-V)	Sig [†]	Mean difference (V-VI)	Sig [†]
ANS	-0.01	1.000	1.32***	0.000	0.00	-	0.00	-	-0.10	1.000
Mx_Dev	0.07	1.000	0.94***	0.000	0.18***	0.000	-0.27*	0.021	0.20	1.000
Mx_Ndev	-0.06	1.000	-0.93***	0.000	-0.17***	0.000	0.27*	0.022	-0.17	1.000
Mx_Diff	0.13	1.000	1.87***	0.000	0.35***	0.000	-0.53*	0.021	0.36	1.000
Ramus angle_Dev	0.03	1.000	-0.06*	0.017	-1.27***	0.000	-0.01	1.000	0.14	1.000
Ramus angle_Ndev	-0.03	1.000	0.10***	0.000	1.27***	0.000	0.04	0.205	-0.16	1.000
Ramus angle_Diff	0.06	1.000	-0.16**	0.001	-2.54***	0.000	-0.05	1.000	0.30	1.000
Me	-0.04	1.000	1.30***	0.000	1.63***	0.000	-0.04	1.000	-0.19	1.000
U1	-0.04	1.000	1.38***	0.000	0.65***	0.000	0.01	1.000	-0.17	1.000
U3_Dev	-0.01	1.000	1.25***	0.000	0.66***	0.000	-0.06	0.080	-0.07	1.000
U3_Ndev	0.02	1.000	-1.42***	0.000	-0.66***	0.000	0.07*	0.047	0.07	1.000
U3_Diff	-0.03	1.000	2.50***	0.000	1.33***	0.000	-0.13	0.057	-0.13	1.000
U6_Dev	0.05	1.000	0.97***	0.000	0.69***	0.000	-0.12	1.000	-0.04	1.000
U6_Ndev	-0.04	1.000	-0.96***	0.000	-0.64***	0.000	0.06	1.000	0.05	1.000
U6_Diff	0.09	1.000	1.93***	0.000	1.32***	0.000	-0.18	1.000	-0.09	1.000
Maxillary skeletal yaw	-0.17	1.000	0.83***	0.000	-1.37***	0.000	0.92***	0.000	-0.89	0.169
Maxillary dental yaw	-0.17	1.000	0.83***	0.000	-0.84***	0.000	0.91***	0.000	-0.98***	0.000
Mandibular skeletal yaw	-0.19	1.000	0.83***	0.000	0.44***	0.000	0.88***	0.000	-1.04	0.211
Mandibular dental yaw	-0.18	1.000	0.83***	0.000	-1.16***	0.000	0.92***	0.000	-0.95**	0.006

MSP, midsagittal plane; FZS, frontozygomatic suture; N, nasion; FH, Frankfort horizontal plane; Ba, basion; ANS, anterior nasal spine; PNS, posterior nasal spine; S, sella; Dev, deviated side; Ndev, non-deviated side; Diff, subtraction of Ndev from Dev; U1, upper incisor; U3, upper canine; U6, upper first molar; Me, menton; Mx, maxilla.

*Significance less than or equal to 0.05; **significance less than or equal to 0.01; ***significance less than or equal to 0.001.

[†]Bonferroni correction with 5% significance level.