

SUPPLEMENTARY MATERIAL

Table S1: Descriptive Statistics of Grand Mean (across all channels) of AppEn (per group).

	Valid		Invalid		Paradox	
	Control	AN	Control	AN	Control	AN
Mean	1.371	1.259	1.482	1.210	1.389	1.283
St.Dev	0.401	0.130	0.207	0.201	0.335	0.099
Min	0.080	0.958	0.733	0.671	0.180	1.117
Max	1.727	1.408	1.742	1.415	1.674	1.403
Skewness	-1.891	-1.316	-2.125	-1.866	-2.237	-0.617
Kurtosis	3.159	1.513	5.830	4.541	5.651	-1.200

Table S2: Descriptive Statistics of Grand Mean (across all channels) of AppEn (per gender).

	Valid		Invalid		Paradox	
	Male	Female	Male	Female	Male	Female
Mean	1.342	1.337	1.413	1.383	1.353	1.357
St.Dev	0.346	0.349	0.087	0.249	0.372	0.280
Min	0.734	0.080	1.438	0.671	0.697	0.180
Max	1.567	1.727	1.650	1.742	1.586	1.674
Skewness	-2.037	-1.820	0.563	-1.136	-2.061	-2.256
Kurtosis	4.242	4.114	0.476	1.454	4.377	8.144

Table S3: Normality test for Grand Mean (across all channels) of AppEn (per group).

Tests of Normality

group	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
mean_valid_AE	Control	0.293	28	0.000	28	0.000
	ED	0.231	12	0.078	12	0.099
mean_invalid_AE	Control	0.186	28	0.014	28	0.000
	ED	0.200	12	0.200*	12	0.019
mean_paradox_AE	Control	0.244	28	0.000	28	0.000
	ED	0.237	12	0.062	12	0.070

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table S4: Normality test for Grand Mean (across all channels) of AppEn (per gender).

Tests of Normality

gender	Kolmogorov-Smirnov ^a			Shapiro-Wilk			
	Statistic	df	Sig.	Statistic	df	Sig.	
mean_valid_AE	Male	0.355	5	0.038	0.721	5	0.016
	Female	0.187	35	0.003	0.834	35	0.000
mean_invalid_AE	Male	0.225	5	0.200*	0.895	5	0.381
	Female	0.118	35	0.200*	0.914	35	0.010
mean_paradox_AE	Male	0.397	5	0.010	0.700	5	0.010
	Female	0.163	35	0.019	0.806	35	0.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

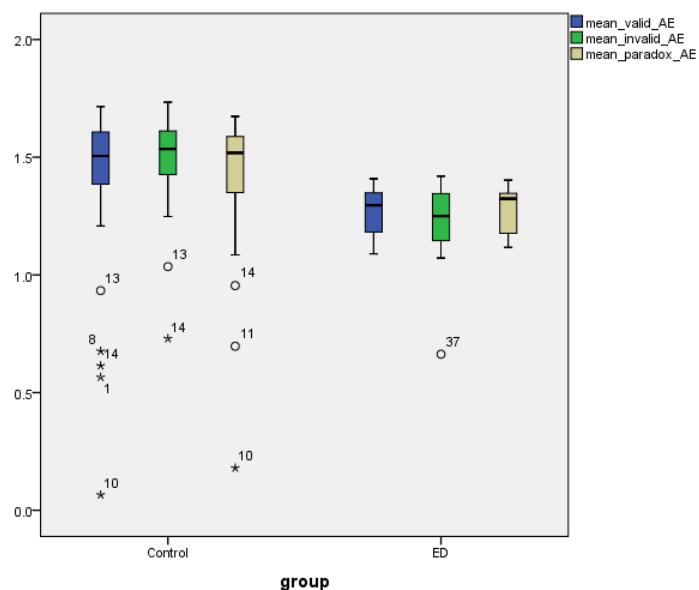


Figure S1: Box plot of the distribution of the Grand Mean (across all channels) of the AppEn (per group).

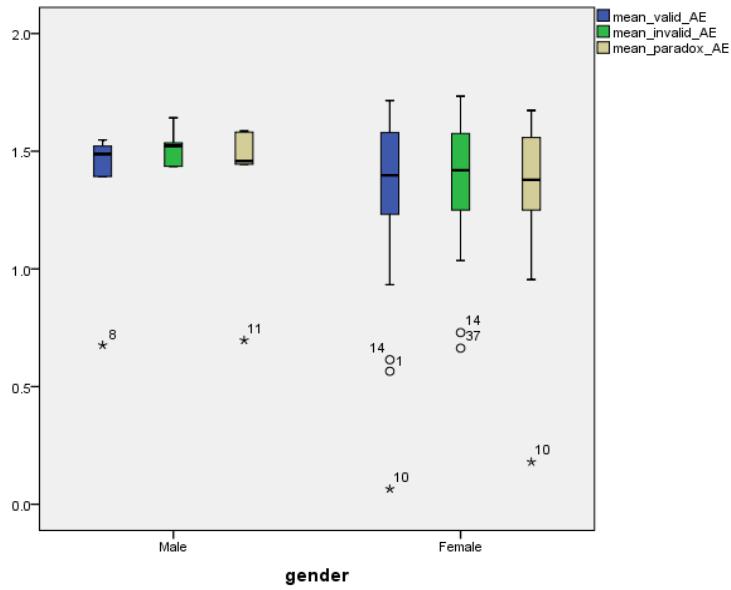


Figure S2: Box plot of the distribution of the Grand Mean (across all channels) of the AppEn (per gender).

Table S5: Descriptive Statistics of Grand Mean (across all channels) of Higuchi FD, per group.

	Valid		Invalid		Paradox	
	Control	AN	Control	AN	Control	AN
Mean	1.679	1.755	1.703	1.726	1.715	1.726
St.Dev	0.102	0.079	0.084	0.105	0.084	0.092
Min	1.488	1.639	1.544	1.543	1.574	1.594
Max	1.887	1.905	1.968	1.910	1.967	1.888
Skewness	-0.299	0.393	0.789	0.337	0.722	0.347
Kurtosis	-0.519	0.637	2.294	0.123	1.620	-0.829

Table S6: Descriptive Statistics of Grand Mean (across all channels) of Higuchi FD, per gender.

	Valid		Invalid		Paradox	
	Male	Female	Male	Female	Male	Female
Mean	1.641	1.710	1.684	1.714	1.677	1.724
St.Dev	0.079	0.102	0.065	0.094	0.050	0.088
Min	1.546	1.488	1.618	1.543	1.606	1.574
Max	1.723	1.905	1.752	1.968	1.728	1.967
Skewness	-0.356	-0.418	0.293	0.579	-0.741	0.480
Kurtosis	-2.697	-0.003	-3.050	0.940	-1.265	0.326

Table S7: Normality test for Grand Mean (across all channels) of Higuchi FD (per group).

Tests of Normality

	group	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
mean_valid_higuchi	Control	0.116	28	0.200*	0.971	28	0.601
	ED	0.116	12	0.200*	0.974	12	0.951
mean_invalid_higuchi	Control	0.129	28	0.200*	0.946	28	0.158
	ED	0.188	12	0.200*	0.945	12	0.562
mean_paradox_higuchi	Control	0.085	28	0.200*	0.957	28	0.288
	ED	0.134	12	0.200*	0.956	12	0.732

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table S8: Normality test for Grand Mean (across all channels) of Higuchi FD (per gender).

Tests of Normality

	gender	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
mean_valid_higuchi	Male	0.214	5	0.200*	0.893	5	0.373
	Female	0.080	35	0.200*	0.974	35	0.563
mean_invalid_higuchi	Male	0.249	5	0.200*	0.829	5	0.138
	Female	0.122	35	0.200*	0.959	35	0.210
mean_paradox_higuchi	Male	0.267	5	0.200*	0.915	5	0.497
	Female	0.075	35	0.200*	0.975	35	0.598

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

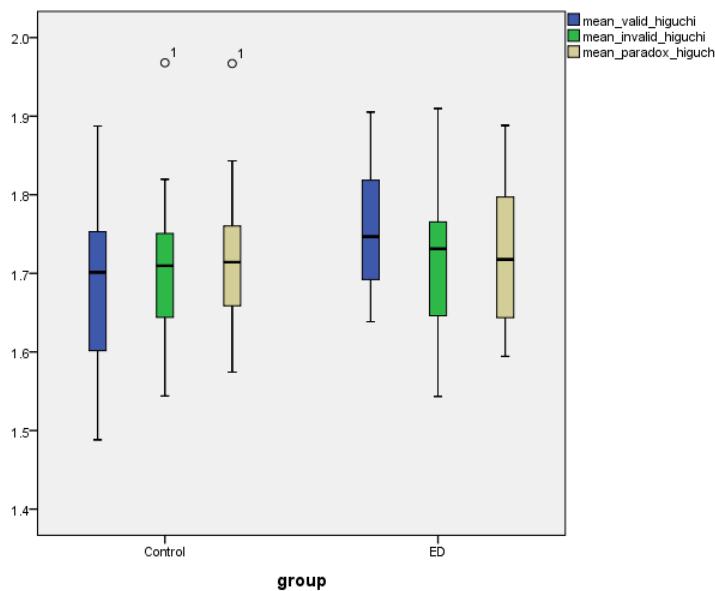


Figure S3: Box plot of the distribution of the Grand Mean (across all channels) of the Higuchi FD (per group).

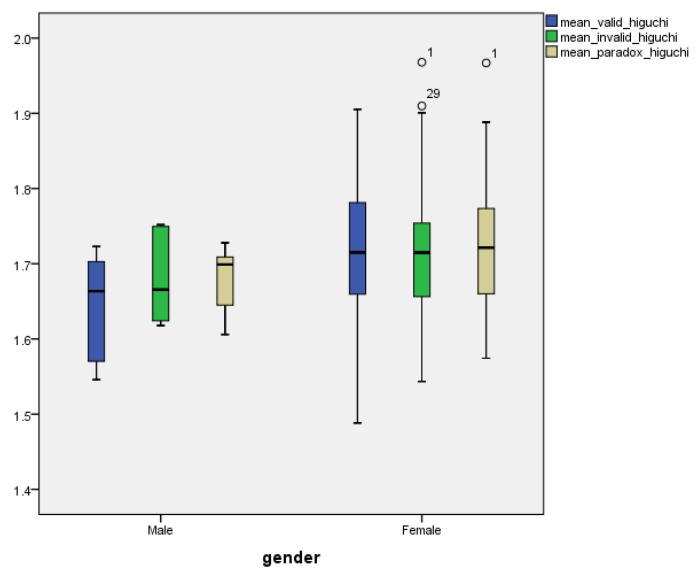


Figure S4: Box plot of the distribution of the Grand Mean (across all channels) of the Higuchi FD (per gender).

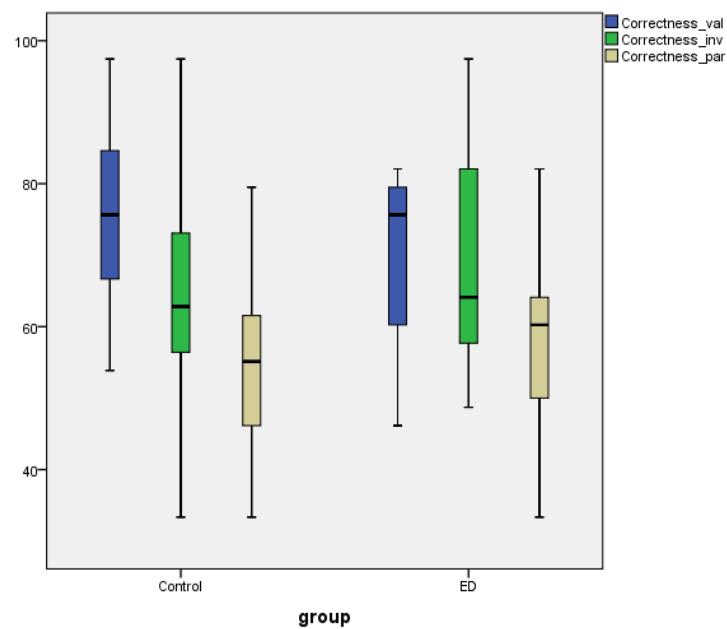


Figure S5: Distribution of the % correctness, across syllogisms and groups.

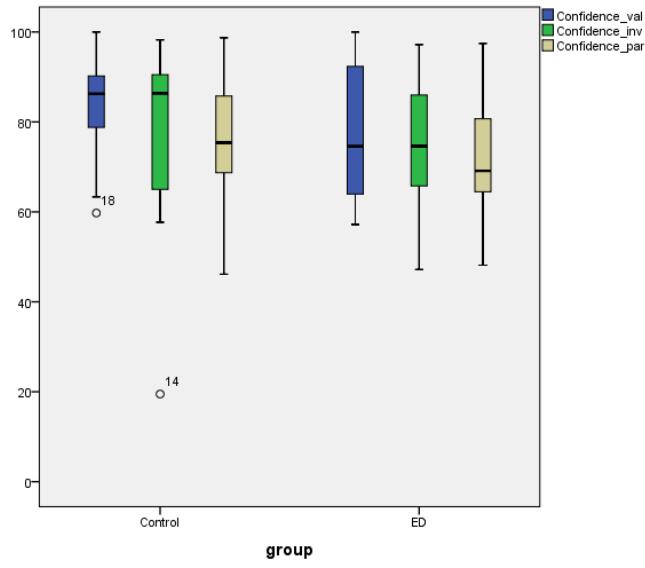


Figure S6: Distribution of the % degree of confidence (DoC), across syllogisms and groups.

Table S9: Correlation of Behavioral data (emotional intensity, emotional control, mood and number of correct answers) with **AppEn, Valid** syllogism, Healthy Controls.

Correlations

		valid_emotional_intensity_AE	valid_emotional_control_AE	valid_mood_AE	valid_correct_answers_AE	mean_valid_AE
valid_emotional_intensity_AE	Pearson Correlation		-0.369	-0.323	-0.064	-0.205
	Sig. (2-tailed)		0.053	0.094	0.746	0.294
	N	28	28	28	28	28
valid_emotional_control_AE	Pearson Correlation	-0.369	1	0.352	0.041	0.096
	Sig. (2-tailed)	0.053		0.067	0.837	0.626
	N	28	28	28	28	28
valid_mood_AE	Pearson Correlation	-0.323	0.352	1	-0.115	0.141
	Sig. (2-tailed)	0.094	0.067		0.561	0.476
	N	28	28	28	28	28
valid_correct_answers_AE	Pearson Correlation	-0.064	0.041	-0.115	1	-0.036
	Sig. (2-tailed)	0.746	0.837	0.561		0.856
	N	28	28	28	28	28
mean_valid_AE	Pearson Correlation	-0.205	0.096	0.141	-0.036	1
	Sig. (2-tailed)	0.294	0.626	0.476	0.856	
	N	28	28	28	28	28

Table S10: Correlation of Behavioral data (emotional intensity, emotional control, mood and number of correct answers) with **AppEn, Invalid** syllogism, Healthy Controls.

Correlations

		invalid_emotional_intensity AE	invalid_emotional_control AE	invalid_mood AE	invalid_correct_answers AE	mean_invalid AE
invalid_emotional_intensity AE	Pearson Correlation Sig. (2-tailed) N	1 28	-0.627** 0.000 28	-0.539** 0.003 28	-0.452* 0.016 28	-0.103 0.602 28
invalid_emotional_control_AE	Pearson Correlation Sig. (2-tailed) N	-0.627** 0.000 28	1 28	0.480** 0.010 28	0.480** 0.010 28	-0.203 0.300 28
invalid_mood_AE	Pearson Correlation Sig. (2-tailed) N	-0.539** 0.003 28	0.480** 0.010 28	1 28	0.440* 0.019 28	0.089 0.654 28
invalid_correct_answers_AE	Pearson Correlation Sig. (2-tailed) N	-0.452* 0.016 28	0.480** 0.010 28	0.440* 0.019 28	1 28	-0.147 0.454 28
mean_invalid_AE	Pearson Correlation Sig. (2-tailed) N	-0.103 0.602 28	-0.203 0.300 28	0.089 0.654 28	-0.147 0.454 28	1 28

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table S11: Correlation of Behavioral data (emotional intensity, emotional control, mood and number of correct answers) with **AppEn, Paradox** syllogism, Healthy Controls.

Correlations

		paradox_emotional_intensity AE	paradox_emotional_control AE	paradox_mood AE	paradox_correct_answers AE	mean_paradox AE
paradox_emotional_intensity_AE	Pearson Correlation Sig. (2-tailed) N	1 28	-0.630** 0.000 28	-0.325 0.092 28	0.028 0.887 28	-0.272 0.162 28
paradox_emotional_control_AE	Pearson Correlation Sig. (2-tailed) N	-0.630** 0.000 28	1 28	0.311 0.107 28	-0.194 0.323 28	0.421* 0.026 28
paradox_mood_AE	Pearson Correlation Sig. (2-tailed) N	-0.325 0.092 28	0.311 0.107 28	1 28	-0.244 0.211 28	0.164 0.405 28
paradox_correct_answers_AE	Pearson Correlation Sig. (2-tailed) N	0.028 0.887 28	-0.194 0.323 28	-0.244 0.211 28	1 28	-0.067 0.734 28
mean_paradox_AE	Pearson Correlation Sig. (2-tailed) N	-0.272 0.162 28	0.421* 0.026 28	0.164 0.405 28	-0.067 0.734 28	1 28

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table S12: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **AppEn, valid** syllogism, AN patients.

Correlations

		valid_emotional_intensity AE	valid_emotional_control AE	valid_mood AE	valid_correct_answers AE	mean_valid AE
valid_emotional_intensity_AE	Pearson Correlation Sig. (2-tailed) N	1 12	-0.543 0.068 12	-0.535 0.073 12	0.282 0.375 12	0.217 0.497 12
valid_emotional_control_AE	Pearson Correlation Sig. (2-tailed) N	-0.543 0.068 12	1 12	0.493 0.103 12	-0.189 0.556 12	-0.048 0.883 12

valid_mood _AE	Pearson Correlation Sig. (2-tailed) N	-0.535 0.073 12	0.493 0.103 12	1 12	-0.328 0.298 12	-0.212 0.508 12
valid_correct_ answers_AE	Pearson Correlation Sig. (2-tailed) N	0.282 0.375 12	-0.189 0.556 12	-0.328 0.298 12	1 12	0.089 0.784 12
mean_valid _AE	Pearson Correlation Sig. (2-tailed) N	0.217 0.497 12	-0.048 0.883 12	-0.212 0.508 12	0.089 0.784 12	1 12

Table S13: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **AppEn, Invalid** syllogism, AN patients.

Correlations

		invalid_emotional_intensity_AE	invalid_emotional_control_AE	invalid_mood_AE	invalid_correct_answers_AE	mean_invalid_AE
invalid_emotional_intensity_AE	Pearson Correlation Sig. (2-tailed) N	1 12	-0.429 0.164 12	-0.523 0.081 12	-0.466 0.126 12	-0.148 0.646 12
invalid_emotional_control_AE	Pearson Correlation Sig. (2-tailed) N	-0.429 0.164 12	1 12	0.672* 0.017 12	0.100 0.756 12	0.635* 0.027 12
invalid_mood_AE	Pearson Correlation Sig. (2-tailed) N	-0.523 0.081 12	0.672* 0.017 12	1 12	0.049 0.879 12	0.480 0.115 12
invalid_correct_answers_AE	Pearson Correlation Sig. (2-tailed) N	-0.466 0.126 12	0.100 0.756 12	0.049 0.879 12	1 12	-0.167 0.603 12
mean_invalid_AE	Pearson Correlation Sig. (2-tailed) N	-0.148 0.646 12	0.635* 0.027 12	0.480 0.115 12	-0.167 0.603 12	1 12

*. Correlation is significant at the 0.05 level (2-tailed).

Table S14: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **AppEn, Paradox** syllogism, AN patients.

Correlations

		paradox_emotional_intensity_AE	paradox_emotional_control_AE	paradox_mood_AE	paradox_correct_answers_AE	mean_paradox_AE
paradox_emotional_intensity_AE	Pearson Correlation Sig. (2-tailed) N	1 12	-0.706* 0.010 12	-0.243 0.447 12	0.413 0.182 12	0.227 0.477 12
paradox_emotional_control_AE	Pearson Correlation Sig. (2-tailed) N	-0.706* 0.010 12	1 12	0.587* 0.045 12	0.082 0.799 12	-0.530 0.076 12
paradox_mood_AE	Pearson Correlation Sig. (2-tailed) N	-0.243 0.447 12	0.587* 0.045 12	1 12	0.355 0.258 12	-0.472 0.121 12
paradox_correct_answers_AE	Pearson Correlation Sig. (2-tailed) N	0.413 0.182 12	0.082 0.799 12	0.355 0.258 12	1 12	-0.300 0.344 12
mean_paradox_AE	Pearson Correlation Sig. (2-tailed) N	0.227 0.477 12	-0.530 0.076 12	-0.472 0.121 12	-0.300 0.344 12	1 12

*. Correlation is significant at the 0.05 level (2-tailed).

Table S15: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **HFD**, **Valid** syllogism, Healthy Controls.

Correlations

		valid_emotional_intensity_HI	valid_emotional_control_HI	valid_mood_HI	valid_correct_answers_HI	mean_valid_HI
valid_emotional_intensity_HI	Pearson Correlation Sig. (2-tailed) N	1 28	-0.369 0.053 28	-0.323 0.094 28	-0.064 0.746 28	0.116 0.558 28
valid_emotional_control_HI	Pearson Correlation Sig. (2-tailed) N	-0.369 0.053 28	1 28	0.352 0.067 28	0.041 0.837 28	0.134 0.496 28
valid_mood_HI	Pearson Correlation Sig. (2-tailed) N	-0.323 0.094 28	0.352 0.067 28	1 28	-0.115 0.561 28	0.259 0.183 28
valid_correct_answers_HI	Pearson Correlation Sig. (2-tailed) N	-0.064 0.746 28	0.041 0.837 28	-0.115 0.561 28	1 28	-0.049 0.806 28
mean_valid_HI	Pearson Correlation Sig. (2-tailed) N	0.116 0.558 28	0.134 0.496 28	0.259 0.183 28	-0.049 0.806 28	1 28

Table S16: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **HFD**, **Invalid** syllogism, Healthy Controls.

Correlations

		invalid_emotional_intensity_HI	invalid_emotional_control_HI	invalid_mood_HI	invalid_correct_answers_HI	mean_invalid_HI
invalid_emotional_intensity_HI	Pearson Correlation Sig. (2-tailed) N	1 28	-0.627** 0.000 28	-0.539** 0.003 28	-0.452* 0.016 28	-0.322 0.095 28
invalid_emotional_control_HI	Pearson Correlation Sig. (2-tailed) N	-0.627** 0.000 28	1 28	0.480** 0.010 28	0.480** 0.010 28	0.107 0.587 28
invalid_mood_HI	Pearson Correlation Sig. (2-tailed) N	-0.539** 0.003 28	0.480** 0.010 28	1 28	0.440* 0.019 28	0.010 0.958 28
invalid_correct_answers_HI	Pearson Correlation Sig. (2-tailed) N	-0.452* 0.016 28	0.480** 0.010 28	0.440* 0.019 28	1 28	-0.044 0.823 28
mean_invalid_HI	Pearson Correlation Sig. (2-tailed) N	-0.322 0.095 28	0.107 0.587 28	0.010 0.958 28	-0.044 0.823 28	1 28

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table S17: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **HFD**, **Paradox** syllogism, Healthy Controls.

Correlations

		paradox_emotional_intensity_HI	paradox_emotional_control_HI	paradox_mood_HI	paradox_correct_answers_HI	mean_paradox_HI
paradox_emotional_intensity_HI	Pearson Correlation	1	-0.630**	-0.325	0.028	-0.033
	Sig. (2-tailed)		0.000	0.092	0.887	0.868
	N	28	28	28	28	28
paradox_emotional_control_HI	Pearson Correlation	-0.630**	1	0.311	-0.194	0.053
	Sig. (2-tailed)	0.000		0.107	0.323	0.788
	N	28	28	28	28	28
paradox_mood_HI	Pearson Correlation	-0.325	0.311	1	-0.244	-0.076
	Sig. (2-tailed)	0.092	0.107		0.211	0.702
	N	28	28	28	28	28
paradox_correct_answers_HI	Pearson Correlation	0.028	-0.194	-0.244	1	-0.023
	Sig. (2-tailed)	0.887	0.323	0.211		0.907
	N	28	28	28	28	28
mean_paradox_HI	Pearson Correlation	-0.033	0.053	-0.076	-0.023	1
	Sig. (2-tailed)	0.868	0.788	0.702	0.907	
	N	28	28	28	28	28

**. Correlation is significant at the 0.01 level (2-tailed).

Table S18: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **HFD, Valid** syllogism, AN patients.

Correlations

		valid_emotional_intensity_HI	valid_emotional_control_HI	valid_mood_HI	valid_correct_answers_HI	mean_valid_HI
valid_emotional_intensity_HI	Pearson Correlation	1	-0.543	-0.535	0.282	-0.146
	Sig. (2-tailed)		0.068	0.073	0.375	0.650
	N	12	12	12	12	12
valid_emotional_control_HI	Pearson Correlation	-0.543	1	0.493	-0.189	-0.315
	Sig. (2-tailed)	0.068		0.103	0.556	0.318
	N	12	12	12	12	12
valid_mood_HI	Pearson Correlation	-0.535	0.493	1	-0.328	0.092
	Sig. (2-tailed)	0.073	0.103		0.298	0.776
	N	12	12	12	12	12
valid_correct_answers_HI	Pearson Correlation	0.282	-0.189	-0.328	1	0.346
	Sig. (2-tailed)	0.375	0.556	0.298		0.270
	N	12	12	12	12	12
mean_valid_HI	Pearson Correlation	-0.146	-0.315	0.092	0.346	1
	Sig. (2-tailed)	0.650	0.318	0.776	0.270	
	N	12	12	12	12	12

Table S19: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **HFD, Invalid** syllogism, AN patients.

Correlations

		invalid_emotional_intensity_HI	invalid_emotional_control_HI	invalid_mood_HI	invalid_correct_answers_HI	mean_invalid_HI
invalid_emotional_intensity_HI	Pearson Correlation	1	-0.429	-0.523	-0.466	-0.588*
	Sig. (2-tailed)		0.164	0.081	0.126	0.045
	N	12	12	12	12	12
invalid_emotional_control_HI	Pearson Correlation	-0.429	1	0.672*	0.100	0.364
	Sig. (2-tailed)	0.164		0.017	0.756	0.244
	N	12	12	12	12	12
invalid_mood_HI	Pearson Correlation	-0.523	0.672*	1	0.049	0.378
	Sig. (2-tailed)	0.081	0.017		0.879	0.226
	N	12	12	12	12	12

invalid_correct_answers_HI	Pearson Correlation Sig. (2-tailed) N	-0.466 0.126 12	0.100 0.756 12	0.049 0.879 12	1 12	0.009 0.977 12
mean_invalid_HI	Pearson Correlation Sig. (2-tailed) N	-0.588* 0.045 12	0.364 0.244 12	0.378 0.226 12	0.009 0.977 12	1 12

*. Correlation is significant at the 0.05 level (2-tailed).

Table S20: Correlation of Behavioral data (emotional intensity, emotional control, mood, and number of correct answers) with **HFD, Paradox** syllogism, AN patients.

Correlations						
		paradox_emotional_intensity_HI	paradox_emotional_control_HI	paradox_mood_HI	paradox_correct_answers_HI	mean_paradox_HI
paradox_emotional_intensity_HI	Pearson Correlation Sig. (2-tailed) N	1 0.12 12	-0.706* 0.010 12	-0.243 0.447 12	0.413 0.182 12	0.359 0.252 12
paradox_emotional_control_HI	Pearson Correlation Sig. (2-tailed) N	-0.706* 0.010 12	1 0.045 12	0.587* 0.045 12	0.082 0.799 12	-0.574 0.051 12
paradox_mood_HI	Pearson Correlation Sig. (2-tailed) N	-0.243 0.447 12	0.587* 0.045 12	1 0.12 12	0.355 0.258 12	-0.244 0.444 12
paradox_correct_answers_HI	Pearson Correlation Sig. (2-tailed) N	0.413 0.182 12	0.082 0.799 12	0.355 0.258 12	1 0.12 12	0.284 0.371 12
mean_paradox_HI	Pearson Correlation Sig. (2-tailed) N	0.359 0.252 12	-0.574 0.051 12	-0.244 0.444 12	0.284 0.371 12	1 12

*. Correlation is significant at the 0.05 level (2-tailed).

Table S21: Correlations of Behavioral Data (% Degree of Confidence, DoC and % Correctness) with AppEn (Spearman's rho, Nonparametric), Healthy Controls.

Correlations											
		mean_val_id_AE	mean_inv_id_AE	mean_paradox_AE	Confidence_val	Confidence_inv	Confidence_par	Correctness_val	Correctness_inv	Correctness_par	
Spearman's rho	mean_valid_AE	Correlation Coefficient Sig. (2-tailed) N	1.000 .000 28	0.711** 0.002 28	0.568** 0.360 28	0.180 0.28	0.018 0.929 28	0.169 0.390 28	0.010 0.961 28	0.294 0.129 28	-0.111 0.573 28
	mean_invalid_AE	Correlation Coefficient Sig. (2-tailed) N	0.711** 0.000 28	1.000 .004 28	0.530** 0.576 28	0.110 0.28	0.092 0.643 28	0.095 0.632 28	0.061 0.758 28	0.196 0.318 28	-0.078 0.694 28
	mean_paradox_AE	Correlation Coefficient Sig. (2-tailed) N	0.568** 0.002 28	0.530** 0.004 28	1.000 .28	0.157 0.426 28	0.252 0.196 28	0.299 0.122 28	0.180 0.359 28	0.013 0.947 28	0.001 0.994 28
	Confidence_val	Correlation Coefficient Sig. (2-tailed) N	0.180 0.360 28	0.110 0.576 28	0.157 0.426 28	1.000 .28	0.693** 0.000 28	0.848** 0.000 28	0.284 0.143 28	0.052 0.791 28	-0.099 0.615 28
	Confidence_inv	Correlation Coefficient Sig. (2-tailed) N	0.018 0.929 28	0.092 0.643 28	0.252 0.196 28	0.693** 0.000 28	1.000 .28	0.779** 0.000 28	0.012 0.950 28	0.290 0.135 28	-0.111 0.575 28
	Confidence_par	Correlation Coefficient Sig. (2-tailed) N	0.169 0.390 28	0.095 0.632 28	0.299 0.122 28	0.848** 0.000 28	0.779** 0.000 28	1.000 .28	0.137 0.487 28	0.066 0.738 28	-0.167 0.397 28

Correctness_val	Correlation Coefficient Sig. (2-tailed) N	0.010 0.961 28	0.061 0.758 28	0.180 0.359 28	0.284 0.143 28	0.012 0.950 28	0.137 0.487 28	1.000 .28	-0.555** 0.002 28	0.306 0.114 28
Correctness_inv	Correlation Coefficient Sig. (2-tailed) N	0.294 0.129 28	0.196 0.318 28	0.013 0.947 28	0.052 0.791 28	0.290 0.135 28	0.066 0.738 28	-0.555** 0.002 28	1.000 .28	-0.435* 0.021 28
Correctness_par	Correlation Coefficient Sig. (2-tailed) N	-0.111 0.573 28	-0.078 0.694 28	0.001 0.994 28	-0.099 0.615 28	-0.111 0.575 28	-0.167 0.397 28	0.306 0.114 28	-0.435* 0.021 28	1.000 .28

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table S22: Correlations of Behavioral Data (% Degree of Confidence, DoC and % Correctness) with AppEn (Spearman's rho, Nonparametric), AN patients.

Correlations

		mean_val_id_AE	mean_inv_id_AE	mean_paradox_AE	Confidence_val	Confidence_inv	Confidence_par	Correctness_val	Correctness_inv	Correctness_par	
Spearman's rho	mean_valid_AE	Correlation Coefficient Sig. (2-tailed) N	1.000 .12	0.280 0.379 12	0.524 0.080 12	0.427 0.127 12	0.720** 0.008 12	0.401 0.196 12	0.226 0.480 12	-0.246 0.440 12	-0.070 0.828 12
	mean_invalid_AE	Correlation Coefficient Sig. (2-tailed) N	0.280 0.379 12	1.000 .12	0.350 0.265 12	0.238 0.457 12	0.503 0.095 12	0.190 0.554 12	-0.053 0.870 12	0.123 0.703 12	-0.112 0.728 12
	mean_paradox_AE	Correlation Coefficient Sig. (2-tailed) N	0.524 0.080 12	0.350 0.265 12	1.000 .12	0.336 0.286 12	0.336 0.286 12	0.289 0.363 12	0.155 0.629 12	-0.479 0.115 12	-0.446 0.147 12
	Confidence_val	Correlation Coefficient Sig. (2-tailed) N	0.427 0.167 12	0.238 0.457 12	0.336 0.286 12	1.000 .12	0.797** 0.002 12	0.986** 0.000 12	0.629* 0.028 12	0.127 0.695 12	0.109 0.736 12
	Confidence_inv	Correlation Coefficient Sig. (2-tailed) N	0.720** 0.008 12	0.503 0.095 12	0.336 0.286 12	0.797** 0.002 12	1.000 .12	0.782** 0.003 12	0.459 0.133 12	0.222 0.488 12	0.077 0.812 12
	Confidence_par	Correlation Coefficient Sig. (2-tailed) N	0.401 0.196 12	0.190 0.554 12	0.289 0.363 12	0.986** 0.000 12	0.782** 0.003 12	1.000 .12	0.680* 0.015 12	0.096 0.767 12	0.205 0.523 12
	Correctness_val	Correlation Coefficient Sig. (2-tailed) N	0.226 0.480 12	-0.053 0.870 12	0.155 0.629 12	0.629* 0.028 12	0.459 0.133 12	0.680* 0.015 12	1.000 .12	-0.203 0.527 12	0.473 0.120 12
	Correctness_inv	Correlation Coefficient Sig. (2-tailed) N	-0.246 0.440 12	0.123 0.703 12	-0.479 0.115 12	0.127 0.695 12	0.222 0.488 12	0.096 0.767 12	-0.203 0.527 12	1.000 .12	0.035 0.913 12
	Correctness_par	Correlation Coefficient Sig. (2-tailed) N	-0.070 0.828 12	-0.112 0.728 12	-0.446 0.147 12	0.109 0.736 12	0.077 0.812 12	0.205 0.523 12	0.473 0.120 12	0.035 0.913 12	1.000 .12

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table S23: Correlations of Behavioral Data (% Degree of Confidence, DoC and % Correctness) with HFD (Spearman's rho, Nonparametric), Healthy Controls.

Correlations

		mean_val_id_higuchi	mean_inv_id_higuchi	mean_paradox_id_higuchi	Confidence_val	Confidence_inv	Confidence_par	Correctness_val	Correctness_inv	Correctness_par	
Spearman's rho	mean_valid_higuchi	Correlation Coefficient Sig. (2-tailed) N	1.000 .28	0.456* 0.015 28	0.528** 0.004 28	-0.022 0.912 28	-0.135 0.493 28	-0.025 0.901 28	0.136 0.490 28	0.007 0.973 28	0.035 0.861 28
	mean_invalid_higuchi	Correlation Coefficient Sig. (2-tailed) N	0.456* 0.015 28	1.000 .28	0.719** 0.000 28	0.255 0.190 28	0.254 0.192 28	0.264 0.175 28	0.005 0.981 28	0.195 0.321 28	-0.104 0.597 28
	mean_paradox_higuchi	Correlation Coefficient	0.528** 0.004	0.719** 0.000	1.000 .28	0.162 0.409	0.246 0.207	0.240 0.219	-0.036 0.855	0.167 0.395	-0.069 0.729

	Sig. (2-tailed) N	28	28	28	28	28	28	28	28
Confidence_val	Correlation Coefficient Sig. (2-tailed) N	-0.022 0.912 28	0.255 0.190 28	0.162 0.409 28	1.000 .28	0.693** 0.000 28	0.848** 0.000 28	0.284 0.143 28	0.052 0.791 28
Confidence_inv	Correlation Coefficient Sig. (2-tailed) N	-0.135 0.493 28	0.254 0.192 28	0.246 0.207 28	0.693** 0.000 28	1.000 .28	0.779** 0.000 28	0.012 0.950 28	0.290 0.135 28
Confidence_par	Correlation Coefficient Sig. (2-tailed) N	-0.025 0.901 28	0.264 0.175 28	0.240 0.219 28	0.848** 0.000 28	0.779** 0.000 28	1.000 .28	0.137 0.487 28	0.066 0.738 28
Correctness_val	Correlation Coefficient Sig. (2-tailed) N	0.136 0.490 28	0.005 0.981 28	-0.036 0.855 28	0.284 0.143 28	0.012 0.950 28	0.137 0.487 28	1.000 .28	-0.555** 0.002 28
Correctness_inv	Correlation Coefficient Sig. (2-tailed) N	0.007 0.973 28	0.195 0.321 28	0.167 0.395 28	0.052 0.791 28	0.290 0.135 28	0.066 0.738 28	-0.555** 0.002 28	1.000 .28
Correctness_par	Correlation Coefficient Sig. (2-tailed) N	0.035 0.861 28	-0.104 0.597 28	-0.069 0.729 28	-0.099 0.615 28	-0.111 0.575 28	-0.167 0.397 28	0.306 0.114 28	-0.435* 0.021 28

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table S24: Correlations of Behavioral Data (% Degree of Confidence, DoC and % Correctness) with HFD (Spearman's rho, Nonparametric), AN patients.

Correlations										
		mean_val_id_higuchi	mean_inv_idid_higuchi	mean_paradox_higuchi	Confidence_val	Confidence_inv	Confidence_par	Correctness_val	Correctness_inv	Correctness_par
Spearman's rho	mean_valid_higuchi	Correlation Coefficient Sig. (2-tailed) N	1.000 .12	0.678* 0.015 12	0.706* 0.010 12	-0.126 0.697 12	-0.084 0.795 12	-0.099 0.760 12	0.244 0.445 12	-0.560 0.058 12
	mean_invalid_higuchi	Correlation Coefficient Sig. (2-tailed) N	0.678* 0.015 12	1.000 .000 12	0.881** 0.331 12	0.308 0.331 12	0.322 0.308 12	0.331 0.293 12	0.442 0.151 12	-0.190 0.554 12
	mean_paradox_higuchi	Correlation Coefficient Sig. (2-tailed) N	0.706* 0.010 12	0.881** 0.000 12	1.000 .12	0.343 0.276 12	0.259 0.417 12	0.352 0.262 12	0.339 0.281 12	-0.208 0.517 12
	Confidence_val	Correlation Coefficient Sig. (2-tailed) N	-0.126 0.697 12	0.308 0.331 12	0.343 0.276 12	1.000 .12	0.797** 0.002 12	0.986** 0.000 12	0.629* 0.028 12	0.127 0.695 12
	Confidence_inv	Correlation Coefficient Sig. (2-tailed) N	-0.084 0.795 12	0.322 0.308 12	0.259 0.417 12	0.797** 0.002 12	1.000 .12	0.782** 0.003 12	0.459 0.133 12	0.222 0.488 12
	Confidence_par	Correlation Coefficient Sig. (2-tailed) N	-0.099 0.760 12	0.331 0.293 12	0.352 0.262 12	0.986** 0.000 12	0.782** 0.003 12	1.000 .12	0.680* 0.015 12	0.096 0.767 12
	Correctness_val	Correlation Coefficient Sig. (2-tailed) N	0.244 0.445 12	0.442 0.151 12	0.339 0.281 12	0.629* 0.028 12	0.459 0.133 12	0.680* 0.015 12	1.000 .12	-0.203 0.527 12
	Correctness_inv	Correlation Coefficient Sig. (2-tailed) N	-0.560 0.058 12	-0.190 0.554 12	-0.208 0.517 12	0.127 0.695 12	0.096 0.488 12	-0.203 0.527 12	1.000 .12	0.035 0.913 12
	Correctness_par	Correlation Coefficient Sig. (2-tailed) N	0.344 0.274 12	0.102 0.753 12	0.130 0.688 12	0.109 0.736 12	0.077 0.812 12	0.205 0.523 12	0.473 0.120 12	1.000 .12

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table S25: Independent samples t-test of % DoC and % Correctness.

Variable	t	df	p-value
% DoC_valid	1.615	38	0.057 partial (0.115/2)

% Correctness_Valid	1.595	38	0.059 Partial (0.119/2)
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Table S26: Kruskal-Wallis test for the AppEn, valid syllogism.

Test Statistics ^{a,b}														
	Ch1_v alid	Ch2_va lid	Ch3_va lid	Ch4_va lid	Ch5_va lid	Ch6_va lid	Ch7_va lid	Ch8_va lid	Ch9_va lid	Ch10_v alid	Ch11_v alid	Ch12_v alid	Ch13_v alid	Ch14_v alid
Chi-Square	1.258	2.447	8.028	3.348	8.028	8.028	6.001	4.268	7.534	9.063	5.031	3.457	4.268	2.178
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.262	0.118	0.005	0.067	0.005	0.005	0.014	0.039	0.006	0.003	0.025	0.063	0.039	0.140

a. Kruskal Wallis Test

b. Grouping Variable: group

Table S27: Kruskal-Wallis test for AppEn, the invalid syllogism.

Test Statistics ^{a,b}														
	Ch1_inva lid	Ch2_inva lid	Ch3_in valid	Ch4_in valid	Ch5_in valid	Ch6_in valid	Ch7_in valid	Ch8_in valid	Ch9_in valid	Ch10_in valid	Ch11_inv alid	Ch12_inv alid	Ch13_inv alid	Ch14_inv alid
Chi-Square	9.422	9.973	11.123	10.540	17.073	17.564	13.829	11.520	10.540	13.829	8.711	8.711	12.129	6.900
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.003	0.003	0.000	0.009

a. Kruskal Wallis Test

b. Grouping Variable: group

Table S28: Kruskal-Wallis test for the AppEn, paradox syllogism.

Test Statistics ^{a,b}														
	Ch1_para dox	Ch2_para dox	Ch3_para dox	Ch4_para dox	Ch5_para dox	Ch6_para dox	Ch7_para dox	Ch8_para dox	Ch9_para dox	Ch10_par adox	Ch11_par adox	Ch12_par adox	Ch13_par adox	Ch14_par adox
Chi-Square	3.136	2.635	3.348	7.056	6.746	4.516	5.715	7.373	8.537	8.366	3.794	6.593	5.575	0.223
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.077	0.105	0.067	0.008	0.009	0.034	0.017	0.007	0.003	0.004	0.051	0.010	0.018	0.637

a. Kruskal Wallis Test

b. Grouping Variable: group

Table S29: Non-parametric, Kruskal-Wallis test for the *Grand mean values* of AppEn.

Test Statistics ^{a,b}				
	mean_valid_AE	mean_invalid_AE	mean_paradox_AE	
Chi-Square	8.028	15.409	6.900	
df	1	1	1	1
Asymp. Sig.	0.005	0.000	0.009	

a. Kruskal Wallis Test

b. Grouping Variable: group

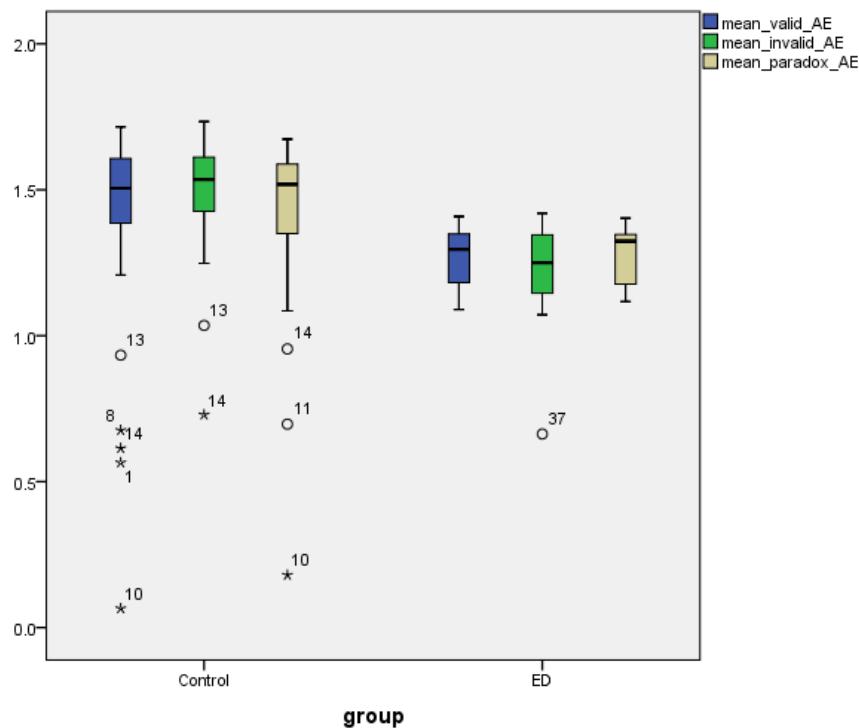


Figure S7: Box plot of Grand mean AppEn values for the two groups, across 14 channels, all syllogisms.

Table S30: Kruskal-Wallis Test of EEG Alpha rhythm, valid syllogism.

Asymp. Sig.	0.507	0.523	0.715	0.820	0.227	0.778	0.978	0.594	0.573	0.067	0.779	0.823	0.385	0.056
a. Kruskal Wallis Test b. Grouping Variable: group														

Table S31: Kruskal-Wallis Test of EEG Alpha rhythm, invalid syllogism.

	Test Statistics ^{a,b}													
	Ch1_inva lid	Ch2_inva lid	Ch3_in valid	Ch4_in valid	Ch5_in valid	Ch6_in valid	Ch7_in valid	Ch8_in valid	Ch9_in valid	Ch10_in valid	Ch11_inv alid	Ch12_inv alid	Ch13_inv alid	Ch14_inv alid
Chi-Square df Asymp. Sig.	0.293 1 0.589	1.899 1 0.168	0.013 1 0.910	2.679 1 0.102	0.016 1 0.899	0.535 1 0.465	0.720 1 0.396	0.231 1 0.631	3.964 1 0.046	2.551 1 0.110	0.079 1 0.778	3.749 1 0.053	1.180 1 0.277	0.064 1 0.800

a. Kruskal Wallis Test
b. Grouping Variable: group

Table S32: Kruskal-Wallis Test of EEG Alpha rhythm, paradox syllogism.

	Test Statistics ^{a,b}													
	Ch1_para dox	Ch2_para dox	Ch3_para dox	Ch4_para dox	Ch5_para dox	Ch6_para dox	Ch7_para dox	Ch8_para dox	Ch9_para dox	Ch10_par adox	Ch11_par adox	Ch13_par adox	Ch14_par adox	
Chi-Square df Asymp. Sig.	0.620 1 0.431	3.999 1 0.046	1.812 1 0.178	0.154 1 0.694	0.781 1 0.377	0.273 1 0.602	0.064 1 0.800	0.096 1 0.757	0.618 1 0.432	3.976 1 0.046	4.420 1 0.036	0.058 1 0.810	4.244 1 0.039	

a. Kruskal Wallis Test
b. Grouping Variable: group

Table S33: Kruskal-Wallis Test of EEG Beta rhythm, valid syllogism.

	Test Statistics ^{a,b}													
	Ch1_v alid	Ch2_va lid	Ch3_va lid	Ch4_va lid	Ch5_va lid	Ch6_va lid	Ch7_va lid	Ch8_va lid	Ch9_va lid	Ch10_v alid	Ch11_v alid	Ch12_v alid	Ch13_v alid	Ch14_v alid
Chi-Square df Asymp. Sig.	5.375 1 0.020	0.113 1 0.736	7.020 1 0.008	5.860 1 0.015	0.000 1 1.000	0.017 1 0.897	0.409 1 0.522	2.570 1 0.109	0.205 1 0.651	2.081 1 0.149	7.440 1 0.006	0.252 1 0.616	0.276 1 0.600	2.843 1 0.092

a. Kruskal Wallis Test
b. Grouping Variable: group

Table S34: Kruskal-Wallis Test of EEG Beta rhythm, invalid syllogism.

	Test Statistics ^{a,b}													
	Ch1_inva lid	Ch2_inva lid	Ch3_in valid	Ch4_in valid	Ch5_in valid	Ch6_in valid	Ch7_in valid	Ch8_in valid	Ch9_in valid	Ch10_in valid	Ch11_inv alid	Ch12_inv alid	Ch13_inv alid	Ch14_inv alid
Chi-Square df Asymp. Sig.	5.474 1 0.019	0.149 1 0.700	2.942 1 0.086	0.137 1 0.711	1.032 1 0.310	4.141 1 0.042	0.054 1 0.816	0.993 1 0.319	0.164 1 0.686	1.241 1 0.265	2.177 1 0.140	0.294 1 0.588	2.109 1 0.146	2.637 1 0.104

a. Kruskal Wallis Test
b. Grouping Variable: group

Table S35: Kruskal-Wallis Test of EEG Beta rhythm, paradox syllogism.

	Test Statistics ^{a,b}													
	Ch1_para dox	Ch2_para dox	Ch3_para dox	Ch4_para dox	Ch5_para dox	Ch6_para dox	Ch7_para dox	Ch8_para dox	Ch9_para dox	Ch10_par adox	Ch11_par adox	Ch12_par adox	Ch13_par adox	Ch14_par adox

Chi-Square	2.344	0.743	2.451	1.441	1.642	1.238	0.409	0.039	1.636	0.673	0.040	0.338	0.647	0.024
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.126	0.389	0.117	0.230	0.200	0.266	0.522	0.043	0.201	0.412	0.842	0.561	0.421	0.876

a. Kruskal Wallis Test

b. Grouping Variable: group

Table S36: Kruskal-Wallis Test of EEG Delta rhythm, valid syllogism.

Test Statistics ^{a,b}														
	Ch1_v alid	Ch2_va lid	Ch3_va lid	Ch4_va lid	Ch5_va lid	Ch6_va lid	Ch7_va lid	Ch8_va lid	Ch9_va lid	Ch10_v alid	Ch11_v alid	Ch12_v alid	Ch13_v alid	Ch14_v alid
Chi-Square	1.133	0.133	0.007	0.000	0.531	0.078	1.256	2.374	0.572	0.064	0.227	0.133	0.113	0.615
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.287	0.716	0.933	1.000	0.466	0.779	0.262	0.123	0.449	0.801	0.634	0.716	0.737	0.433

a. Kruskal Wallis Test

b. Grouping Variable: group

Table S37: Kruskal-Wallis Test of EEG Delta rhythm, invalid syllogism.

Test Statistics ^{a,b}														
	Ch1_inva lid	Ch2_inva lid	Ch3_in valid	Ch4_in valid	Ch5_in valid	Ch6_in valid	Ch7_in valid	Ch8_in valid	Ch9_in valid	Ch10_in valid	Ch11_inv alid	Ch12_inv alid	Ch13_inv alid	Ch14_inv alid
Chi-Square	0.038	0.346	0.804	0.113	2.826	0.452	0.660	0.227	0.254	0.020	0.154	1.075	0.227	1.590
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.845	0.556	0.370	0.737	0.093	0.501	0.416	0.634	0.614	0.889	0.695	0.300	0.634	0.207

a. Kruskal Wallis Test

b. Grouping Variable: group

Table S38: Kruskal-Wallis Test of EEG Delta rhythm, paradox syllogism.

Test Statistics ^{a,b}														
	Ch1_para dox	Ch2_para dox	Ch3_para dox	Ch4_para dox	Ch5_para dox	Ch6_para dox	Ch7_para dox	Ch8_para dox	Ch9_para dox	Ch10_par adox	Ch11_par adox	Ch12_par adox	Ch13_par adox	Ch14_par adox
Chi-Square	0.078	1.520	0.095	0.154	6.358	1.451	1.194	0.254	2.042	0.346	0.615	0.415	1.075	0.001
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.779	0.218	0.758	0.695	0.012	0.228	0.275	0.614	0.153	0.556	0.433	0.519	0.300	0.978

a. Kruskal Wallis Test

b. Grouping Variable: group

Table S39: Kruskal-Wallis Test of EEG Theta rhythm, valid syllogism.

Test Statistics ^{a,b}														
	Ch1_v alid	Ch2_va lid	Ch3_va lid	Ch4_va lid	Ch5_va lid	Ch6_va lid	Ch7_va lid	Ch8_va lid	Ch9_va lid	Ch10_v alid	Ch11_v alid	Ch12_v alid	Ch13_v alid	Ch14_v alid
Chi-Square	0.234	0.020	0.016	0.021	2.436	0.096	1.112	0.491	0.020	0.013	0.034	0.815	0.002	1.742
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.628	0.888	0.899	0.885	0.119	0.756	0.292	0.483	0.888	0.911	0.854	0.367	0.966	0.187

a. Kruskal Wallis Test

b. Grouping Variable: group

Table S40: Kruskal-Wallis Test of EEG Theta rhythm, invalid syllogism.

Test Statistics^{a,b}

	Ch1_inva lid	Ch2_inva lid	Ch3_in valid	Ch4_in valid	Ch5_in valid	Ch6_in valid	Ch7_in valid	Ch8_in valid	Ch9_in valid	Ch10_in valid	Ch11_inv alid	Ch12_inv alid	Ch13_inv alid	Ch14_inv alid
Chi-Square	0.029	5.103	0.010	0.965	0.758	0.126	2.788	4.087	2.867	0.785	5.699	1.146	3.249	4.034
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.865	0.024	0.922	0.326	0.384	0.723	0.095	0.043	0.090	0.376	0.017	0.284	0.071	0.045

a. Kruskal Wallis Test
b. Grouping Variable: group

Table S41: Kruskal-Wallis Test of EEG Theta rhythm, paradox syllogism.

Test Statistics^{a,b}

	Ch1_para dox	Ch2_para dox	Ch3_para dox	Ch4_para dox	Ch5_para dox	Ch6_para dox	Ch7_para dox	Ch8_para dox	Ch9_para dox	Ch10_par adox	Ch11_par adox	Ch12_par adox	Ch13_par adox	Ch14_par adox
Chi-Square	3.239	0.114	0.711	2.692	0.013	0.001	0.013	0.144	0.064	0.064	0.114	1.069	0.457	0.020
df	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.072	0.735	0.399	0.101	0.910	0.978	0.910	0.704	0.800	0.800	0.735	0.301	0.499	0.887

a. Kruskal Wallis Test
b. Grouping Variable: group