

Supplemental Materials

Note:

This document reports supplemental methods and results for the manuscript: Who Exhibits Cognitive Biases? Identifying Predictors of Attention and Interpretation Bias in a Depressed Sample by Mary E. McNamara, Rachel L. Weisenburger, & Christopher G. Beevers.

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1 Geographic location of participants

This figure illustrates the geographic diversity in the study participants. Zip code location for participants in the continental United States is plotted below:



2 Additional Methods Details

Due to word count limitations, we included additional methods information in the supplemental materials.

2.1 Dwell time for sad stimuli

We assessed dwell time for sad stimuli using a behavioral, “mouse-tracking” task that uses computer mouse movements as a proxy for visual attention. Mouse-tracking is an attractive alternative to eye tracking as it can be used in online research, produces good quality data, and correlates well with eye tracking data. We used Mouseview.js, a JavaScript Library that is integrated within Gorilla’s software platform to run the task.

The task is similar to a free-viewing task created by Lazarov et al. 2018. Each trial consisted of 16 faces arranged in a 4 x 4 grid on a white background. The location of the face images in the matrices were semi-random, with the following constraints: (a) each actor could appear only once on the matrix, (b) there was an even split of genders in each matrix (8 men and 8 women), (c) there was an even split of valences in each matrix (e.g., 8 neutral and 8 sad), and (d) the four innermost faces always contained two emotional and two neutral faces. We used facial stimuli from the FACES database, a collection of naturalistic facial expressions

by young, middle-aged, and older male and female actors. To be consistent with the demographics of our study sample, we only used facial stimuli from young and middle-aged actors.

Instructions for the task read: “In this task, you will use your mouse to look at the pictures. You will need to click on the fixation cross to make the pictures appear. You can then look freely at the pictures in any way you choose until they disappear. Press the spacebar when you are ready to continue with the task.” Participants were given a practice trial before the task started. We included the requirement to click the fixation cross at the beginning of each trial to facilitate engagement in the passive-viewing task, as well as to ensure that participants’ mouse was in the same location at the start of every trial. The task included 30 trials separated into 2 blocks of 15 trials each. Each trial lasted 20 seconds and participants were allowed a break in between blocks and told to press the spacebar when they were ready to continue. We refer to this task from herein as the matrix task.

For each trial, the matrix stimuli were blurred. In order to view the stimuli, the participant moved a circular aperture at the location of their computer mouse to view the stimuli (i.e., the blur is removed in the location of the aperture). The coordinates of the aperture are recorded to identify how long and which stimuli participants view. We used the default settings within Gorilla (color = black; alpha (opacity) = 0.8; Gaussian blur = 20, size of viewing aperture 5% of computer screen).

From the resulting data, we created 16 areas-of-interest (AOIs) from the matrix of faces in each trial. When processing the data, we required that participants interact with at least 4 different faces per trial for the trial to be counted as valid. These 16 AOIs were then collapsed into either a sad or neutral AOI for each trial. We computed dwell time by summing the amount of time the aperture was placed over sad and neutral faces, respectively, and then averaged these values across all valid trials.

2.2 Latent Class Analysis

Latent class analysis (LCA) is a statistical technique used to identify unobserved subgroups within a population based on patterns of responses across observed variables. Unlike variable-centered approaches, LCA assumes that the population is heterogeneous and seeks to classify individuals into mutually exclusive latent classes that differ in their profiles. This method is particularly useful for modeling continuous data and uncovering distinct psychological or behavioral phenotypes. Model selection typically involves comparing solutions with varying numbers of classes using fit indices such as the Bayesian Information Criterion (BIC). LCA provides a flexible framework for examining heterogeneity in cognitive bias among depressed individuals.

Latent class analysis (LCA) models become increasingly complex and potentially unstable as the number of indicator variables and latent classes increases, particularly in samples of modest size. Using three observed indicators is generally recommended for sample sizes in the 200–300 range, as it provides sufficient information to detect meaningful latent structure while maintaining model parsimony and estimation reliability. This approach helps to ensure that class solutions are not overfit, parameter estimates are stable, and the likelihood of convergence issues is reduced. Moreover, simulation studies have shown that models with three to four indicators can recover true class membership with acceptable accuracy in samples of this size, especially when indicators show moderate to strong class separation. Thus, in the current study, we used dwell time for sad stimuli, interpretation bias, and brooding rumination as our indicator variables to form latent classes. We provide results of the cluster analysis and elastic-net prediction models for brooding rumination in the Supplemental Materials. We did not include this in the main document primarily for parsimony and because rumination has a much larger empirical literature.

We evaluated models specifying one to four latent classes to determine the optimal class solution. This range was selected to balance parsimony and interpretability while allowing detection of meaningful heterogeneity in cognitive bias profiles. Model selection was guided by several fit indices, including AIC, BIC, AWE, CLC, and KIC. Individuals were assigned to their most likely latent class based on posterior probabilities using maximum-probability assignment. We examined class sizes to ensure interpretability and stability, with each class containing at least 25% of the sample. To identify the optimal class solution, we used an analytic hierarchy process approach, which integrates these indices into a weighted decision framework. This method

provides a data-driven recommendation by balancing model fit and parsimony across competing solutions. Given our sample size (~230) and the use of three continuous indicators, models with up to four classes were considered appropriate to avoid overfitting and estimation instability.

3 Brooding Rumination

For the sake of completeness, we present the cluster analysis and elastic-net prediction for the brooding rumination total score as measured by the RRS-B. We did not include this in the main manuscript due mainly to word limitations and because rumination has a much larger empirical literature.

3.1 Cluster analyses

We first z-score standardized total brooding rumination scores before running the k-means cluster analysis. The elbow method suggests that optimal number of clusters is likely 3 or 4 clusters (see Figure 1A). The silhouette score approach indicates that as many as 10 clusters could represent the optimal number of clusters (see Figure 1B). However, as with the interpretation bias cluster analysis, we are concerned about overfitting. Any solution with 5 or more clusters resulted in at least one cluster with 10 or fewer participants.

Given that the elbow method suggests diminishing returns after 4 clusters and that a 4 cluster solution avoids unacceptably small groups ($ns > 10$), we settled on 4 clusters. Table 1 presents summary statistics for brooding rumination total score for the four groups identified by k-means cluster analyses. The distribution of brooding rumination with the cluster groupings overlaid is presented in Figure 1C.

Table 1: Summary Statistics for K-Means Cluster Groups Based on Dwell Time for Sad Stimuli

Cluster	Mean RRSD-Total	SD	Min	Max	N
1	7.72	1.45	5	9	18
2	11.65	1.17	10	13	78
3	14.88	0.77	14	16	96
4	17.98	0.95	17	20	40

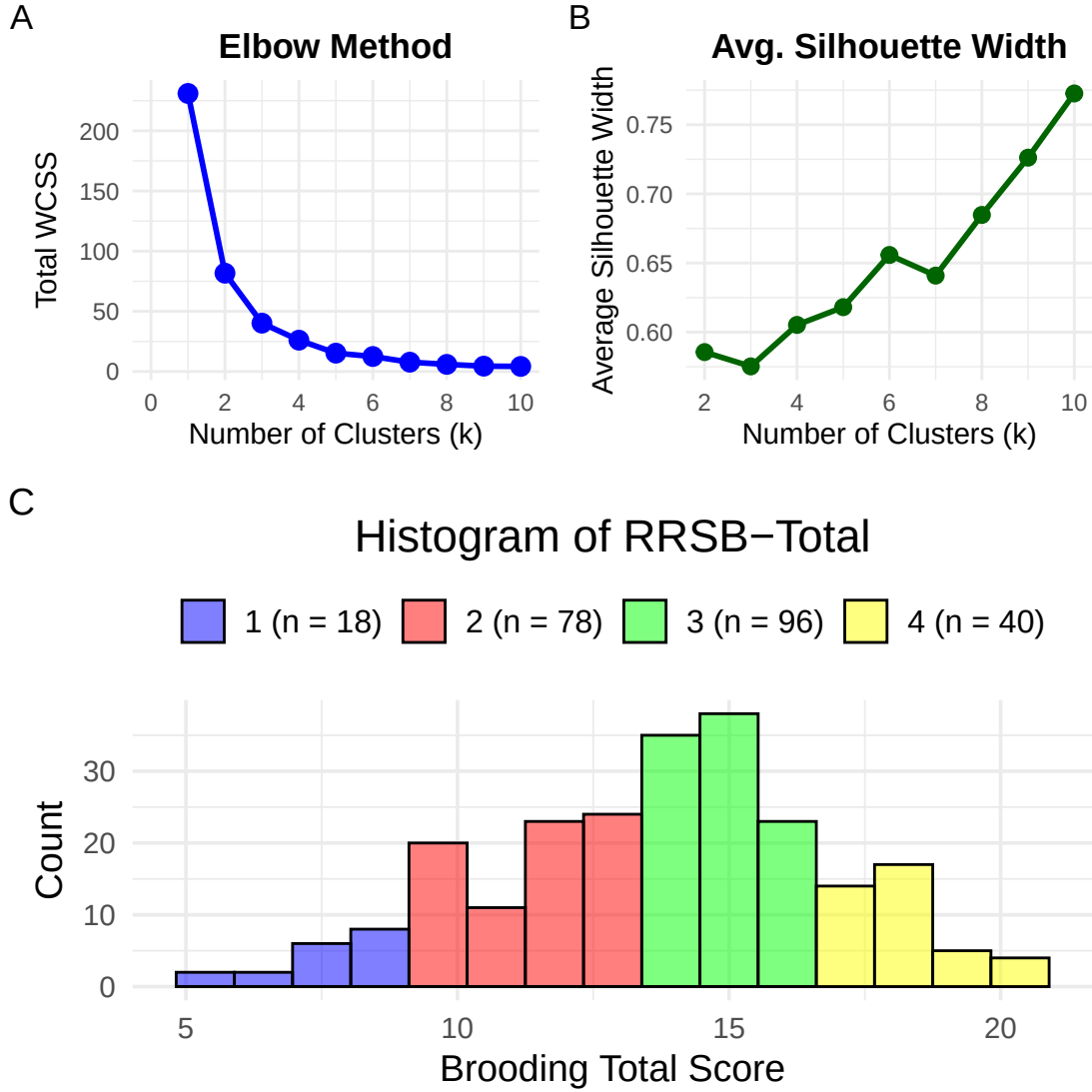


Figure 1: Rumination total scores presented by cluster group.

3.2 Elastic-net prediction

We ran the elastic-net model with the same predictors as for dwell time and interpretation bias, but excluded the PTQ given the content overlap with brooding rumination. This analysis examined the prediction of rumination score as a continuous variable. Following 10-fold nested cross-validation repeated 10 times, a mostly lasso elastic-net model ($\alpha = 0.99$, $\lambda = 0.61$) explained 23.02% (min = 21.41%, max = 25.07%) of the deviance in the holdout sample. This is a moderately strong prediction of brooding rumination.

The non-zero coefficients ranked in order of importance are presented in Figure 2. Notably, the strongest predictor of brooding rumination, perhaps not surprisingly, is dyphoria measured by the IDAS. Item 5 on the IDAS (“I blamed myself for things”) was also an important predictor. As with interpretation bias, dwell time for sad stimuli predicted brooding rumination. PHQ-8 total score and the PHQ-8 self-worth item also predicted brooding rumination. Finally, interpretation bias made a small contribution to the prediction. See Figure 2B for the partial dependence plots of the top 6 predictors.

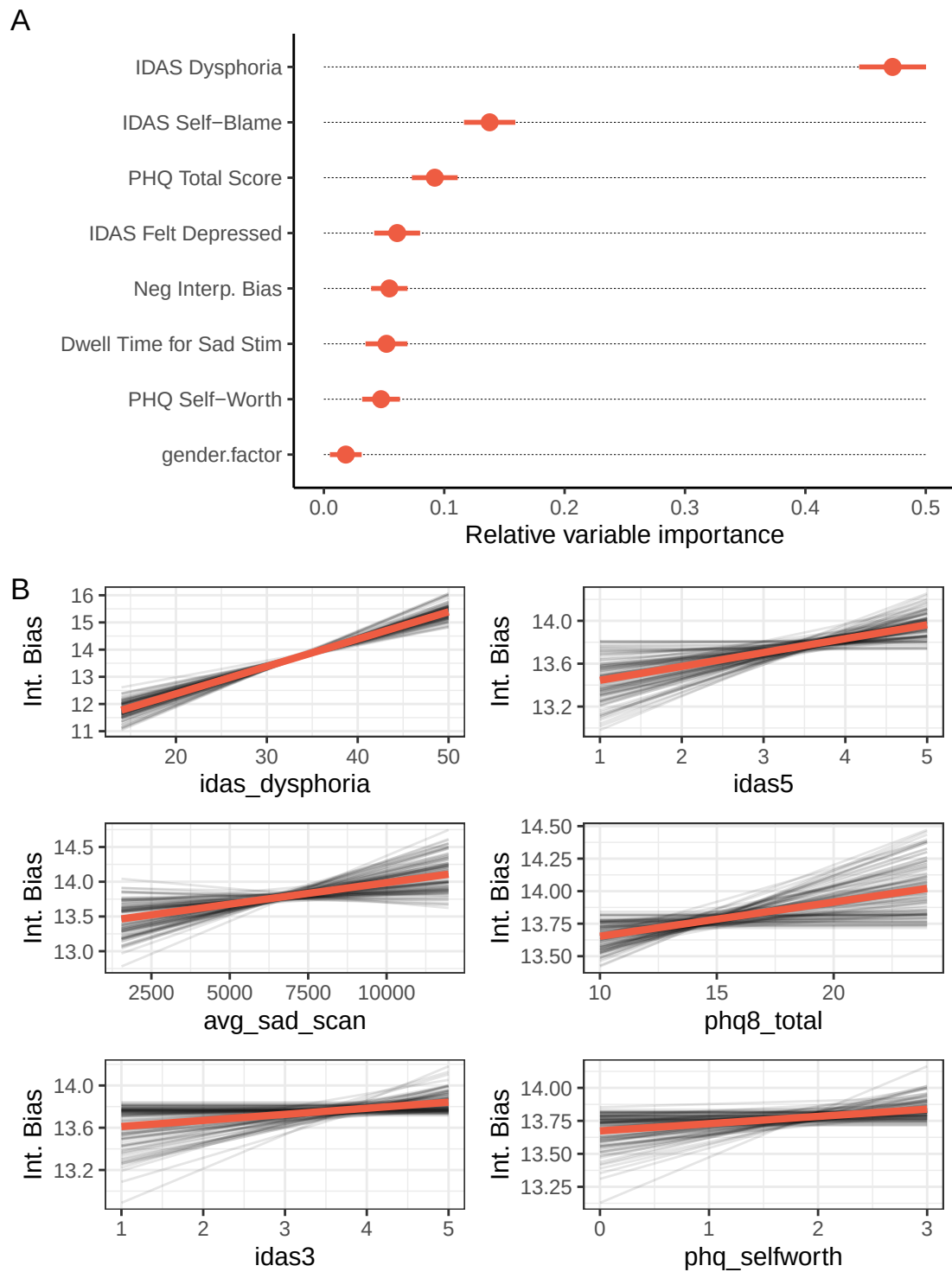


Figure 2: Importance plot (A) of the non-zero coefficients and partial dependence plots (B) for top 6 most important predictors of rumination brooding.

4 Alternative Cluster Analysis for Interpretation Bias

Although we ultimately decided to retain a 4 cluster solution, a 9 cluster solution had the lowest silhouette score. The silhouette method often favors many small, well separated clusters because adding clusters tightens local structure and increases silhouette width. However, this comes at the cost of overfitting the data. Nevertheless, we present the 9 cluster solution to the interested reader.

Table 2: Summary Statistics for K-Means Cluster Groups Based on Proportion of Sentences Unscrambled Negatively

Cluster	Proportion	SD	Min	Max	N
1	0.11	0.04	0.05	0.15	5
2	0.25	0.03	0.20	0.29	20
3	0.35	0.03	0.31	0.39	20
4	0.44	0.02	0.40	0.47	35
5	0.52	0.02	0.50	0.56	36
6	0.61	0.03	0.57	0.67	47
7	0.73	0.03	0.68	0.79	32
8	0.86	0.03	0.80	0.91	26
9	0.98	0.03	0.92	1.00	11

As can be seen in Table 2, a 9 cluster solution returns at least two clusters with 10 or fewer participants, which suggests overfitting. As can be seen in Figure 3, this solution creates more clusters along the interpretation bias continuum.

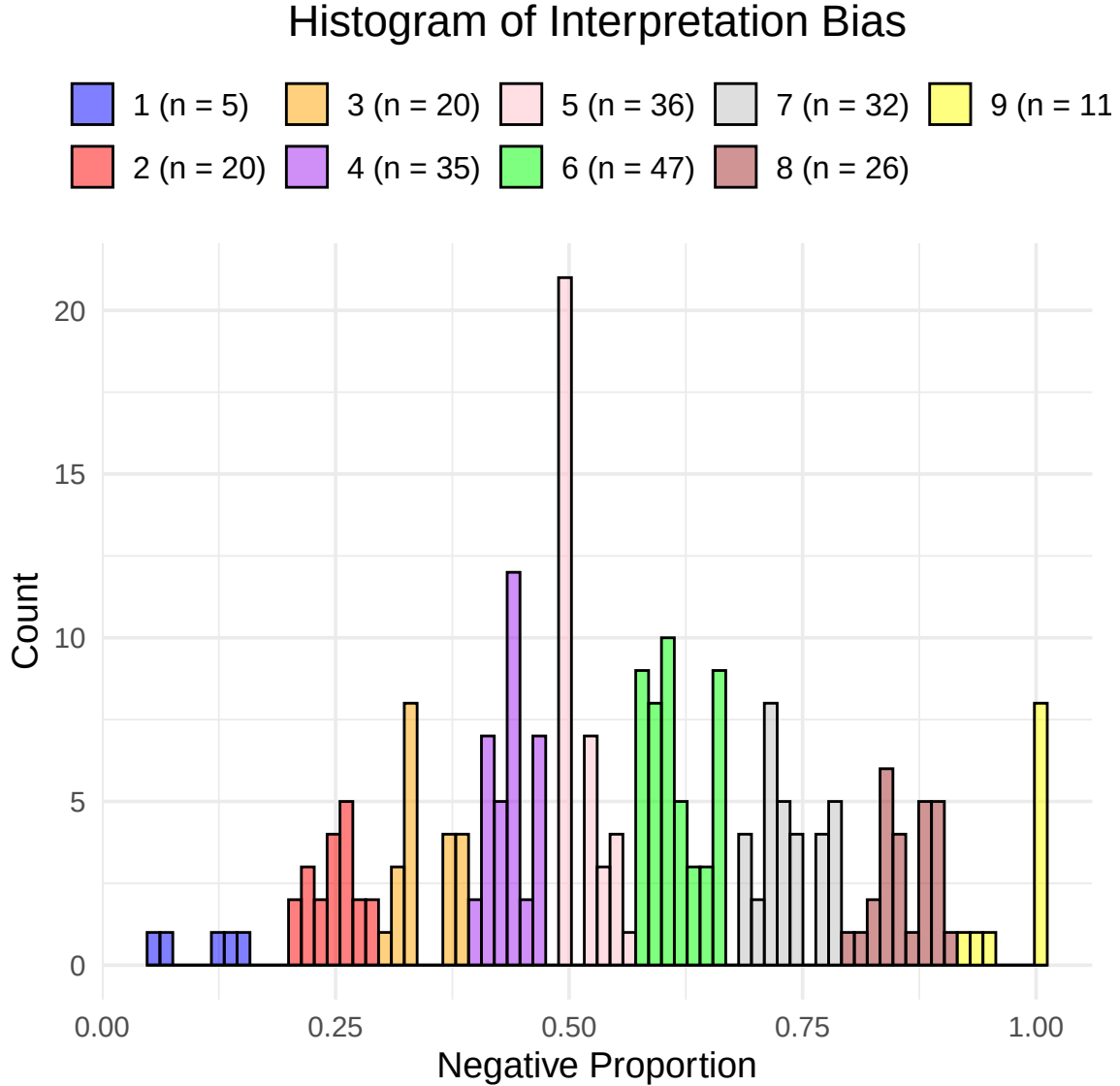


Figure 3: Proportion of sentences unscrambled negatively presented by cluster group. Cluster labels are applied sequentially to each cluster as mean proportion of unscrambled negative sentences increases.

5 Latent Profile Analysis

5.1 Expanded description of the latent profile analysis methods

We conducted latent profile analysis (LPA) using the tidyLPA package in R to identify subgroups of individuals with similar cognitive bias patterns. Models specifying one to four latent classes were estimated to allow for the detection of meaningful heterogeneity while balancing parsimony and interpretability. Given our sample size (~230) and the use of three continuous indicators, we limited the number of profiles to avoid overfitting and estimation instability (Collins & Lanza, 2010; Nylund et al., 2007).

All models were estimated with the assumptions of equal variances across classes and zero covariances among indicators. Model selection was guided by a combination of fit indices, including the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Approximate Weight of Evidence Criterion (AWE),

Classification Likelihood Criterion (CLC), and Kullback Information Criterion (KIC). These indices were integrated using an analytic hierarchy process (AHP) approach (Akogul & Erisoglu, 2017), which identifies the optimal solution by balancing model fit and parsimony across competing solutions. The AHP method is implemented via `compare_solutions()` in tidyLPA.

Individuals were assigned to their most likely latent class based on posterior probabilities using maximum-probability assignment. We examined class sizes to ensure interpretability and stability, with each class containing at least 25% of the sample.

5.2 Depression severity by latent profile class

Raincloud plots of PHQ8 total score are presented in in Figure 4. There is clearly overlap between the profiles, but there is a clear upward shift in depression scores for the high bias group. This is not surprising given that the two groups differ in depression symptom severity.

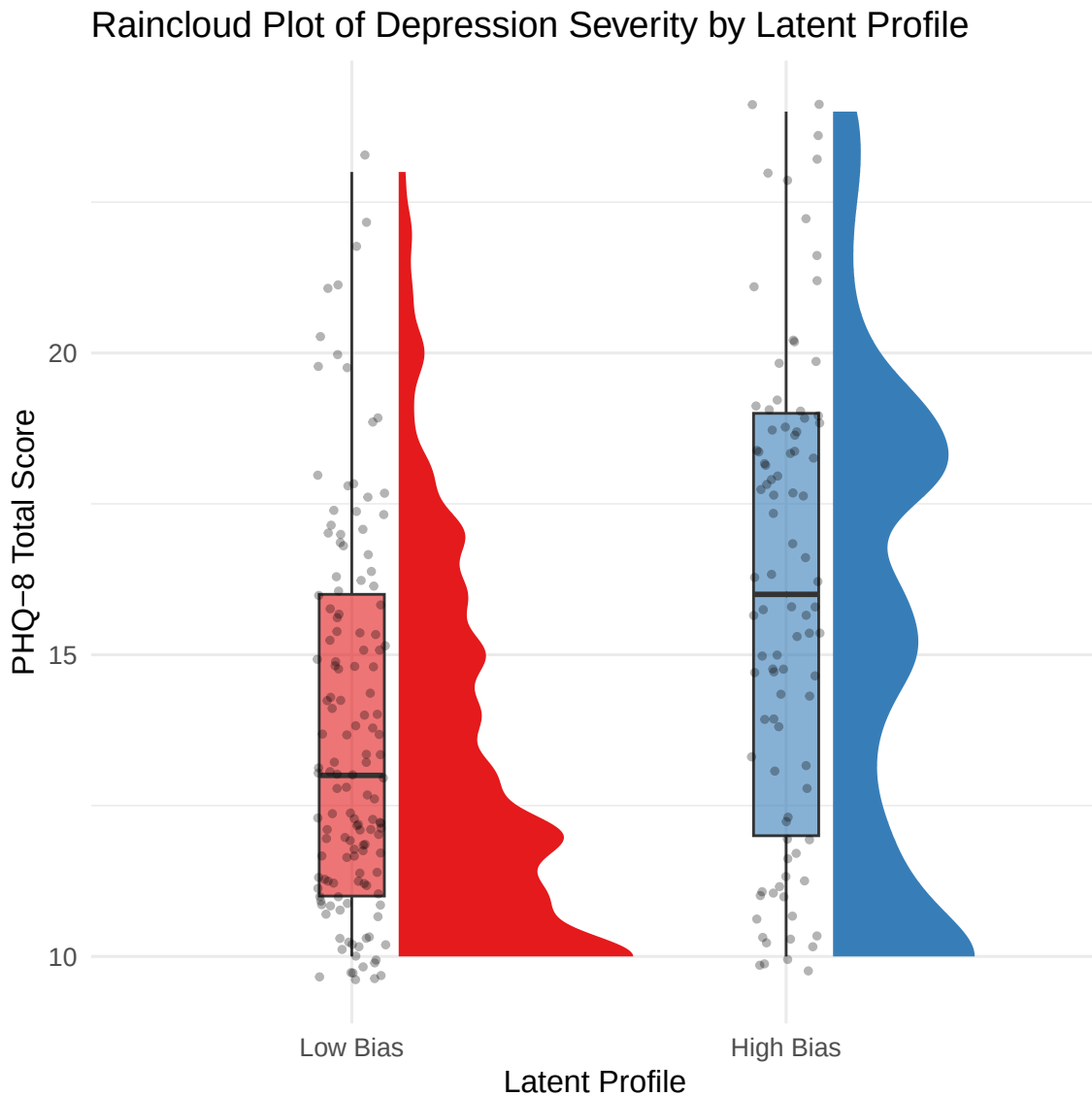


Figure 4: Raincloud plots for depression severity presented by latent class group. The high cognitive bias group has greater depression severity, although there is also clear overlap between the two groups.

5.3 Model Comparison for LPA

Table 3 presents the model comparison statistics for latent profile analyses with one to four classes. Model 1 with 2 classes is the best model based on BIC alone or an analytic hierarchy process, based on the fit indices AIC, AWE, BIC, CLC, and KIC.

Table 3: LPA Comparison Statistics

Model	Classes	BIC	AIC	AWE	CLC	KIC
1	1	2004.84	1984.16	2053.52	1974.16	1993.16
1	2	1995.27	1960.8	2078.79	1941.75	1973.8
1	3	2007.44	1959.19	2124.68	1932.2	1976.19
1	4	2014.78	1952.74	2165.5	1918.06	1973.74

5.4 Three latent profiles

Table 4 presents a 3 class solution. This grouping has the high cognitive bias group (class 1), the low cognitive bias group (class 2), and a group with average rumination and interpretation bias with very low dwell time for sad stimuli. It suggests that people with low dwell time for sad stimuli are a relatively unique group, although the two group solution is the preferred solution based on BIC and other criteria used for model selection.

Table 4: Scaled Mean on Cognitive Bias Measures Presented by Class

Class	N (%)	Rumination	Int Bias	Dwell Time
1	55 (23.7%)	0.84	1.23	0.53
2	138 (59.5%)	0.11	-0.31	-0.14
3	39 (16.8%)	-1.59	-0.65	-0.24

6 Descriptive statistics and correlations among variables

Given the large number of variables in the dataset, we provide the descriptive statistics in supplemental materials. Given the large number of variables, we opted to group them into thematic blocks combined with a heatmap of the correlations across all numeric variables at the end of this section.

6.1 Descriptives

Table 5: Eye-tracking / Bias indices

Characteristic	N	N = 232
avg sad scan	232	6,546.54 (1,600.02)
avg neu scan	232	6,494.77 (1,537.66)
negative prop	232	0.57 (0.21)
¹ Mean (SD)		

Table 6: PHQ-8 items & total

Characteristic	N	N = 232
phq anhedonia	232	1.95 (0.79)
phq mood	232	1.99 (0.81)
phq sleep	232	2.19 (0.89)
phq energy	232	2.57 (0.63)
phq appetite	232	1.69 (1.01)
phq selfworth	232	1.82 (0.93)
phq concentration	232	1.84 (0.94)
phq psychomotor	232	0.53 (0.77)
phq8 total	232	14.58 (3.59)
¹ Mean (SD)		

Table 7: IDAS Dysphoria items & total

Characteristic	N	N = 232
idas1	232	3.54 (1.02)
idas2	232	2.77 (1.31)
idas3	232	3.81 (1.00)
idas4	232	3.62 (1.12)
idas5	232	3.54 (1.14)
idas6	232	3.91 (1.04)
idas7	232	3.95 (0.87)
idas8	232	3.55 (1.18)
idas9	232	1.60 (0.96)
idas10	232	3.62 (1.15)
idas dysphoria	232	33.91 (6.49)
¹ Mean (SD)		

Table 8: RRS Brooding items & total

Characteristic	N	N = 232
rrsb1	232	2.12 (0.93)
rrsb2	232	2.66 (0.88)
rrsb3	232	3.30 (0.75)
rrsb4	232	2.56 (1.04)
rrsb5	232	3.13 (0.87)
rrsb total	232	13.77 (2.99)
¹ Mean (SD)		

Table 9: GAD-7 items & total

Characteristic	N	N = 232
gad7 pre1	232	2.04 (0.92)
gad7 pre2	232	1.73 (1.05)
gad7 pre3	232	1.91 (0.96)
gad7 pre4	232	1.91 (0.98)
gad7 pre5	232	1.02 (1.00)
gad7 pre6	232	1.56 (1.02)
gad7 pre7	232	1.24 (0.99)
gad7 pre impairment	232	1.48 (0.80)
gad total	232	11.42 (5.01)
¹ Mean (SD)		

Table 10: Perseverative Thinking Questionnaire (PTQ)

Characteristic	N	N = 232
ptq pre 1	232	2.92 (0.98)
ptq pre 2	232	2.77 (1.07)
ptq pre 3	232	2.84 (0.98)
ptq pre 4	232	2.50 (1.04)
ptq pre 5	232	2.06 (1.10)
ptq pre 6	232	2.78 (0.98)
ptq pre 7	232	2.72 (1.03)
ptq pre 8	232	2.63 (1.11)
ptq pre 9	232	2.27 (1.13)
ptq pre 10	232	2.43 (1.02)
ptq pre 11	232	2.60 (1.05)
ptq pre 12	232	2.67 (1.06)
ptq pre 13	232	2.19 (1.22)
ptq pre 14	232	2.33 (1.08)
ptq pre 15	232	2.25 (1.05)
ptq total	232	37.96 (11.85)
ptq rep	232	8.31 (2.69)
ptq intrusive	232	8.16 (2.90)
ptq disengage	232	7.65 (2.89)
ptq unproductive	232	7.10 (2.68)
ptq capacity	232	6.74 (2.82)
ptq core	232	24.12 (7.72)
¹ Mean (SD)		

Table 11: Clinical screens / Other continuous

Characteristic	N	N = 232
age	232	30.50 (7.00)
pds psychosis total	232	32 / 232 (13.8%)
pds alc total	232	17 / 232 (7.3%)
¹ Mean (SD); n / N (%)		

Table 12: Demographics & SES (categorical)

Characteristic	N	N = 232
gender	232	
Decline to state		1 / 232 (0.4%)
Female		188 / 232 (81.0%)
Genderqueer		14 / 232 (6.0%)
Male		17 / 232 (7.3%)
Other (please specify)		6 / 232 (2.6%)
TransMale/Transman		6 / 232 (2.6%)
sexual orientation	232	
Asexual		12 / 232 (5.2%)
Bisexual		54 / 232 (23.3%)
Gay		5 / 232 (2.2%)
Heterosexual		119 / 232 (51.3%)
Lesbian		6 / 232 (2.6%)
Pansexual		12 / 232 (5.2%)
Queer		17 / 232 (7.3%)
Questioning or Unsure		7 / 232 (3.0%)
race 2	232	26 / 232 (11.2%)

Table 12: **Demographics & SES (categorical)** (*continued*)

Characteristic	N	N = 232
race 5	232	198 / 232 (85.3%)
ethnicity	232	22 / 232 (9.5%)
residence	232	
Apartment or condominium		102 / 232 (44.0%)
Detached house		104 / 232 (44.8%)
Mobile home		7 / 232 (3.0%)
Rooming house or hotel		1 / 232 (0.4%)
Rowhouse or townhouse		18 / 232 (7.8%)
marital status	232	
Cohabiting with partner		42 / 232 (18.1%)
Divorced		6 / 232 (2.6%)
Married		54 / 232 (23.3%)
Never married		124 / 232 (53.4%)
Other (please specify)		1 / 232 (0.4%)
Separated		4 / 232 (1.7%)
Widowed		1 / 232 (0.4%)
highest degree	232	
Associate Degree/Technical Degree		21 / 232 (9.1%)
College Diploma		99 / 232 (42.7%)
Doctorate or Professional Degree (e.g., MD, PhD, JD)		11 / 232 (4.7%)
GED		6 / 232 (2.6%)
High School Diploma		37 / 232 (15.9%)
Masters Degree		57 / 232 (24.6%)
None		1 / 232 (0.4%)
employment	232	
Full-time employed for pay		108 / 232 (46.6%)
Looking for employment		15 / 232 (6.5%)
Not looking for employment		26 / 232 (11.2%)
Part-time employed for pay		47 / 232 (20.3%)
Self-employed for pay		12 / 232 (5.2%)
Unemployed		24 / 232 (10.3%)
income	232	
\$0-\$24,999		41 / 232 (17.7%)
\$100,000 or more		49 / 232 (21.1%)
\$25,000 - \$49,999		60 / 232 (25.9%)
\$50,000 - \$74,999		52 / 232 (22.4%)
\$75,000 - \$99,999		30 / 232 (12.9%)
insurance	232	
Medicaid		38 / 232 (16.4%)
Medicare		7 / 232 (3.0%)
Private Insurance		187 / 232 (80.6%)
¹ n / N (%)		

Table 13: **Family history (checkbox items)**

Characteristic	N	N = 232
Family history – mom 1	232	101 / 232 (43.5%)
Family history – mom 2	232	111 / 232 (47.8%)
Family history – mom 4	232	21 / 232 (9.1%)
Family history – mom 5	232	14 / 232 (6.0%)
Family history – mom 6	232	16 / 232 (6.9%)
Family history – dad 1	232	135 / 232 (58.2%)
Family history – dad 2	232	62 / 232 (26.7%)

Table 13: **Family history (checkbox items)** (*continued*)

Characteristic	N	N = 232
Family history – dad 4	232	35 / 232 (15.1%)
Family history – dad 5	232	20 / 232 (8.6%)
Family history – siblings 1	232	109 / 232 (47.0%)
Family history – siblings 2	232	101 / 232 (43.5%)
Family history – siblings 3	232	16 / 232 (6.9%)
Family history – siblings 4	232	27 / 232 (11.6%)
Family history – siblings 5	232	24 / 232 (10.3%)
Family history – siblings 6	232	23 / 232 (9.9%)
Family history – children 1	232	219 / 232 (94.4%)
Family history – children 2	232	13 / 232 (5.6%)

¹ Each row is a family history variable, reporting the proportion of participants who selected 'Yes' (n / N, %).

6.2 Correlation tables

Table 14: Correlations – Eye-tracking / Bias indices

	avg_sad_scan	avg_neu_scan	negative_prop
avg_sad_scan	1.00	0.55	0.17
avg_neu_scan	0.55	1.00	-0.02
negative_prop	0.17	-0.02	1.00

Note: Entries are Pearson correlations (pairwise complete observations).

Table 15: Correlations – PHQ-8 items & total

	phq_anhedonia	phq_mood	phq_sleep	phq_energy	phq_appetite	phq_selfworth	phq_concentration	phq_psychomotor	phq8_total
phq_anhedonia	1.00	0.59	0.09	0.26	0.08	0.15	0.14	0.19	0.56
phq_mood	0.59	1.00	0.09	0.23	0.12	0.47	0.19	0.22	0.67
phq_sleep	0.09	0.09	1.00	0.23	0.25	-0.03	0.14	0.15	0.46
phq_energy	0.26	0.23	0.23	1.00	0.15	0.04	0.08	0.06	0.43
phq_appetite	0.08	0.12	0.25	0.15	1.00	0.14	0.17	0.11	0.52
phq_selfworth	0.15	0.47	-0.03	0.04	0.14	1.00	0.17	0.25	0.53
phq_concentration	0.14	0.19	0.14	0.08	0.17	0.17	1.00	0.28	0.54
phq_psychomotor	0.19	0.22	0.15	0.06	0.11	0.25	0.28	1.00	0.52
phq8_total	0.56	0.67	0.46	0.43	0.52	0.53	0.54	0.52	1.00

Note: Entries are Pearson correlations (pairwise complete observations).

Table 16: Correlations – IDAS Dysphoria items & total

	idas1	idas2	idas3	idas4	idas5	idas6	idas7	idas8	idas9	idas10	idas_dysphoria
idas1	1.00	0.08	0.50	0.19	0.23	0.27	0.29	0.18	0.21	0.28	0.52
idas2	0.08	1.00	0.12	0.28	0.08	0.10	0.18	0.33	0.25	0.29	0.48
idas3	0.50	0.12	1.00	0.20	0.35	0.37	0.48	0.35	0.21	0.24	0.61
idas4	0.19	0.28	0.20	1.00	0.30	0.28	0.35	0.40	0.27	0.43	0.62
idas5	0.23	0.08	0.35	0.30	1.00	0.71	0.52	0.40	0.22	0.18	0.65
idas6	0.27	0.10	0.37	0.28	0.71	1.00	0.61	0.34	0.19	0.29	0.68
idas7	0.29	0.18	0.48	0.35	0.52	0.61	1.00	0.39	0.22	0.28	0.69
idas8	0.18	0.33	0.35	0.40	0.40	0.34	0.39	1.00	0.25	0.28	0.66
idas9	0.21	0.25	0.21	0.27	0.22	0.19	0.22	0.25	1.00	0.30	0.51
idas10	0.28	0.29	0.24	0.43	0.18	0.29	0.28	0.28	0.30	1.00	0.60
idas_dysphoria	0.52	0.48	0.61	0.62	0.65	0.68	0.69	0.66	0.51	0.60	1.00

Note: Entries are Pearson correlations (pairwise complete observations).

Table 17: Correlations – RRS Brooding items & total

	rrsb1	rrsb2	rrsb3	rrsb4	rrsb5	rrsb_total
rrsb1	1.00	0.14	0.18	0.49	0.12	0.61
rrsb2	0.14	1.00	0.30	0.26	0.57	0.67
rrsb3	0.18	0.30	1.00	0.26	0.37	0.59
rrsb4	0.49	0.26	0.26	1.00	0.35	0.74
rrsb5	0.12	0.57	0.37	0.35	1.00	0.71
rrsb_total	0.61	0.67	0.59	0.74	0.71	1.00

Note: Entries are Pearson correlations (pairwise complete observations).

Table 18: Correlations – GAD-7 items & total

	gad7_pre1	gad7_pre2	gad7_pre3	gad7_pre4	gad7_pre5	gad7_pre6	gad7_pre7	gad7_pre_impairment	gad_total
gad7_pre1	1.00	0.67	0.68	0.59	0.32	0.34	0.34	0.53	0.77
gad7_pre2	0.67	1.00	0.83	0.61	0.35	0.31	0.54	0.51	0.85
gad7_pre3	0.68	0.83	1.00	0.60	0.30	0.35	0.53	0.52	0.84
gad7_pre4	0.59	0.61	0.60	1.00	0.44	0.34	0.40	0.48	0.78
gad7_pre5	0.32	0.35	0.30	0.44	1.00	0.28	0.24	0.35	0.58
gad7_pre6	0.34	0.31	0.35	0.34	0.28	1.00	0.31	0.47	0.58
gad7_pre7	0.34	0.54	0.53	0.40	0.24	0.31	1.00	0.36	0.66
gad7_pre_impairment	0.53	0.51	0.52	0.48	0.35	0.47	0.36	1.00	0.63
gad_total	0.77	0.85	0.84	0.78	0.58	0.58	0.66	0.63	1.00

Note: Entries are Pearson correlations (pairwise complete observations).

Table 19: Correlations – Perseverative Thinking Questionnaire (PTQ)

	ptq_pre_1	ptq_pre_2	ptq_pre_3	ptq_pre_4	ptq_pre_5	ptq_pre_6	ptq_pre_7	ptq_pre_8	ptq_pre_9	ptq_pre_10	ptq_pre_11	ptq_pre_12	ptq_pre_13	ptq_pre_14	ptq_pre_15	ptq_total	ptq_rep	ptq_intrusive	ptq_disengage	ptq_unproductive	ptq_capacity	ptq_core
ptq_pre_1	1.00	0.65	0.74	0.32	0.40	0.73	0.57	0.64	0.47	0.43	0.69	0.49	0.53	0.41	0.52	0.76	0.90	0.63	0.72	0.49	0.50	0.82
ptq_pre_2	0.65	1.00	0.71	0.28	0.39	0.73	0.80	0.62	0.41	0.41	0.59	0.69	0.51	0.42	0.52	0.78	0.73	0.91	0.69	0.45	0.49	0.85
ptq_pre_3	0.74	0.71	1.00	0.39	0.54	0.70	0.62	0.72	0.51	0.52	0.67	0.53	0.59	0.45	0.64	0.83	0.78	0.67	0.86	0.55	0.64	0.85
ptq_pre_4	0.32	0.28	0.39	1.00	0.45	0.45	0.28	0.38	0.65	0.41	0.38	0.28	0.43	0.46	0.43	0.59	0.43	0.31	0.46	0.84	0.49	0.44
ptq_pre_5	0.40	0.39	0.54	0.45	1.00	0.50	0.40	0.62	0.44	0.72	0.47	0.37	0.56	0.39	0.68	0.71	0.51	0.42	0.66	0.52	0.90	0.58
ptq_pre_6	0.73	0.70	0.45	0.50	1.00	0.72	0.66	0.54	0.51	0.71	0.60	0.58	0.49	0.59	0.84	0.90	0.63	0.75	0.73	0.60	0.60	0.87
ptq_pre_7	0.57	0.80	0.62	0.28	0.40	0.72	1.00	0.59	0.41	0.44	0.58	0.80	0.43	0.38	0.47	0.75	0.69	0.94	0.62	0.44	0.49	0.83
ptq_pre_8	0.64	0.62	0.72	0.38	0.62	0.66	0.59	1.00	0.52	0.60	0.63	0.47	0.63	0.40	0.64	0.82	0.72	0.61	0.89	0.53	0.70	0.81
ptq_pre_9	0.47	0.41	0.51	0.65	0.44	0.54	0.41	0.52	1.00	0.49	0.56	0.35	0.54	0.47	0.50	0.70	0.58	0.42	0.60	0.86	0.53	0.59
ptq_pre_10	0.43	0.41	0.52	0.41	0.72	0.51	0.44	0.60	0.49	1.00	0.54	0.44	0.56	0.39	0.67	0.73	0.55	0.47	0.64	0.52	0.89	0.61
ptq_pre_11	0.69	0.59	0.67	0.38	0.47	0.71	0.58	0.63	0.56	0.54	1.00	0.50	0.65	0.44	0.57	0.80	0.90	0.61	0.74	0.56	0.59	0.82
ptq_pre_12	0.49	0.69	0.53	0.28	0.37	0.60	0.80	0.47	0.35	0.44	0.50	1.00	0.48	0.42	0.47	0.70	0.59	0.90	0.56	0.42	0.48	0.76
ptq_pre_13	0.53	0.51	0.59	0.43	0.56	0.58	0.43	0.63	0.54	0.56	0.65	0.48	1.00	0.49	0.59	0.77	0.65	0.52	0.87	0.59	0.64	0.75
ptq_pre_14	0.41	0.42	0.45	0.46	0.39	0.49	0.38	0.40	0.47	0.39	0.44	0.42	0.49	1.00	0.55	0.64	0.49	0.45	0.51	0.78	0.50	0.53
ptq_pre_15	0.52	0.52	0.64	0.43	0.68	0.59	0.47	0.64	0.50	0.67	0.57	0.47	0.59	0.55	1.00	0.79	0.62	0.53	0.71	0.60	0.88	0.68
ptq_total	0.76	0.78	0.83	0.59	0.71	0.84	0.75	0.82	0.70	0.73	0.80	0.70	0.77	0.64	0.79	1.00	0.89	0.81	0.92	0.78	0.83	0.96
ptq_rep	0.90	0.73	0.78	0.43	0.51	0.90	0.60	0.72	0.58	0.55	0.90	0.59	0.65	0.49	0.62	0.89	1.00	0.73	0.82	0.61	0.63	0.93
ptq_intrusive	0.63	0.91	0.67	0.31	0.42	0.75	0.94	0.61	0.42	0.47	0.61	0.90	0.52	0.45	0.53	0.81	0.73	1.00	0.68	0.48	0.53	0.89
ptq_disengage	0.72	0.69	0.86	0.46	0.66	0.73	0.62	0.89	0.60	0.64	0.74	0.56	0.87	0.51	0.71	0.92	0.82	0.68	1.00	0.64	0.75	0.91
ptq_unproductive	0.49	0.45	0.55	0.84	0.52	0.60	0.44	0.53	0.86	0.52	0.56	0.42	0.59	0.78	0.60	0.78	0.61	0.48	0.64	1.00	0.61	0.63
ptq_capacity	0.50	0.49	0.64	0.49	0.90	0.60	0.49	0.70	0.53	0.89	0.59	0.48	0.64	0.50	0.88	0.83	0.63	0.53	0.75	0.61	1.00	0.70
ptq_core	0.82	0.85	0.85	0.44	0.58	0.87	0.83	0.81	0.59	0.61	0.82	0.76	0.75	0.53	0.68	0.96	0.93	0.89	0.91	0.63	0.70	1.00

Note: Entries are Pearson correlations (pairwise complete observations).

Table 20: Correlations – Clinical screens / Other continuous

	age	pds_psychosis_total	pds_alc_total
age	1.00	-0.04	0.06
pds_psychosis_total	-0.04	1.00	0.03
pds_alc_total	0.06	0.03	1.00

Note: Entries are Pearson correlations (pairwise complete observations).

Table 21: Correlations – Demographics & SES (categorical)

Fewer than 2 numeric/non-constant variables.

Table 22: Correlations – Family history (checkbox items)

Fewer than 2 numeric/non-constant variables.

6.3 Overall correlation heatmap

Heatmap of correlations among all numeric variables.

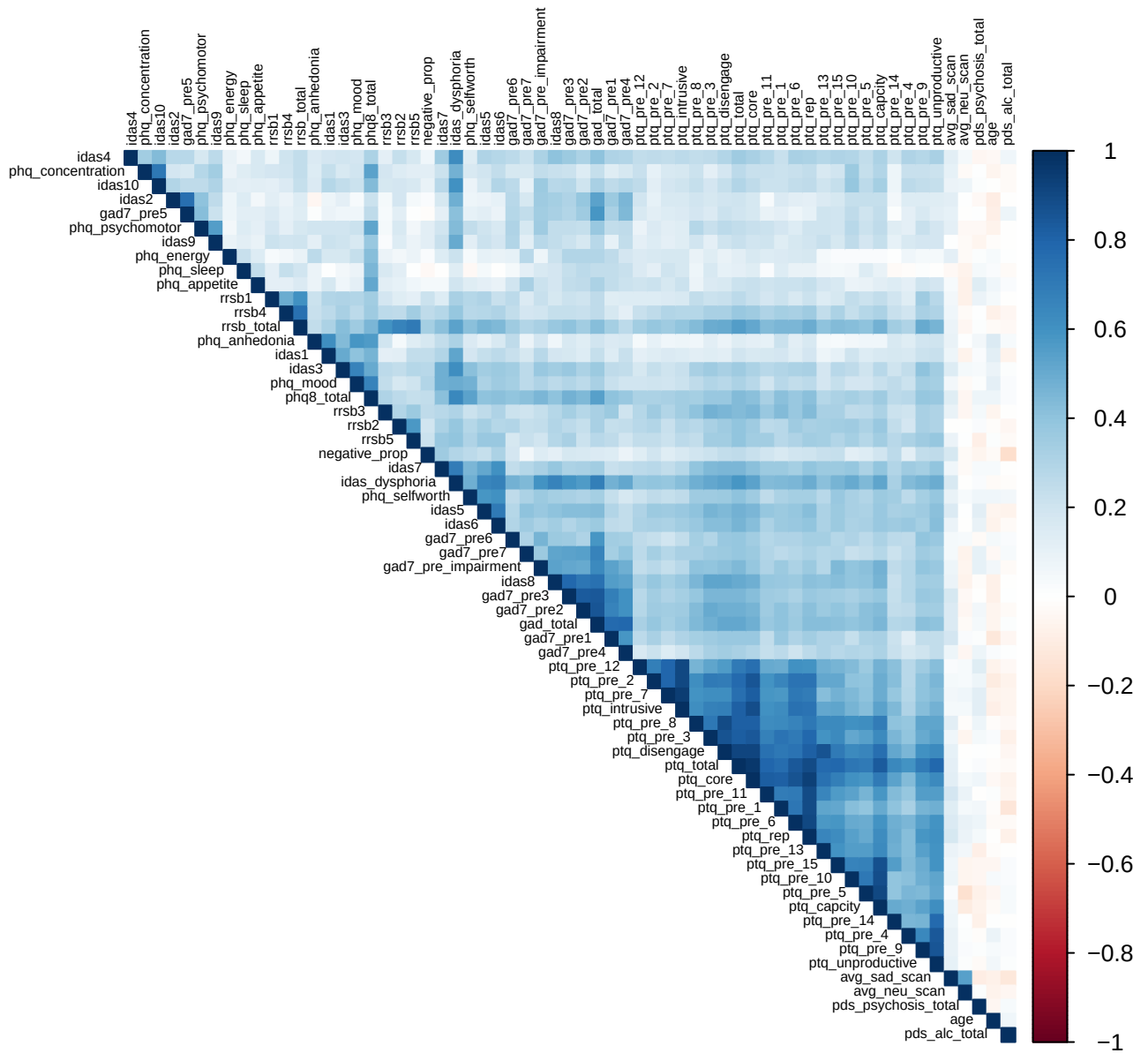


Figure 5: Overall correlations among numeric variables