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Composite cognitive scores

To obtain more robust proxies of cognitive abilities and minimize the issue of multiple statistical testing, composite cognitive scores were used instead of multiple (sub)tests. For that purpose, performances from different tasks that showed neither ceiling nor floor effects were z-transformed and averaged as follows:

- Verbal abilities

- the semantic verbal fluency (number of animals in 2 min)
- the number of correct responses in the Mill Hill Vocabulary test

- Executive function

- TMT test (time difference between TMT part B and part A)*
- Stroop test (time difference between the interference and color cards)*
- the phonemic verbal fluency (number of words beginning with “p” in 2 min)
- the digit span backwards

- Episodic memory

- 2 free recalls from the *Encoding Storage Retrieval* (ESR) paradigm (two 16-word lists, one being encoded incidentally and superficially, the other after deep and intentional encoding)
- 2 free recalls from a visual version of the ESR paradigm (based on two lists of nonfigurative graphical signs)

* note that before averaging, z scores derived from reaction times were reversed so that increasing values always indicated better performances)

Resulting composite scores are illustrated in Supplementary Figure 1.

Additional information on the original tests (autobiographical fluency and ESR paradigm) can be found in previous references from our lab:

Eustache F, Laisney M, Lalevée C, Pélerin A, Perrotin A, Egret S, et al. Une nouvelle épreuve de mémoire épisodique : l'épreuve ESR-forme réduite (ESR-r), adaptée du paradigme ESR (encodage, stockage, récupération). *Rev Neuropsychol* 2015;me 7:217–25.

La Joie R, Landeau B, Perrotin A, Bejanin A, Egret S, Pélerin A, et al. Intrinsic connectivity identifies the hippocampus as a main crossroad between Alzheimer's and semantic dementia-targeted networks. *Neuron* 2014;81:1417–28. doi:10.1016/j.neuron.2014.01.026.

Mevel K, Landeau B, Fouquet M, La Joie R, Villain N, Mézenge F, et al. Age effect on the default mode network, inner thoughts, and cognitive abilities. *Neurobiol Aging* 2013;34:1292–301. doi:10.1016/j.neurobiolaging.2012.08.018.

Neuroimaging data acquisition and preprocessing

MRI acquisition

For each participant, a high-resolution T1-weighted anatomical volume was acquired on a 3-Tesla scanner (Philips Achieva, Eindhoven, The Netherlands) using a 3-dimensional fast field echo sequence (3D-T1-FFE sagittal; TR/TE=20/4.6 ms; flip angle=10; 180 slices; slice thickness=1 mm; field of view=256x256 mm²; matrix=256x256).

PET acquisition

Florbetapir-PET scans were acquired using a 64-slice Discovery Rx VCT PET-CT scanner (GE Healthcare) with resolution of 3.76x3.76x4.9 mm³ (field of view=157 mm). Forty-seven planes were obtained with a voxel size of 1.95x1.95x3.2 mm³. A transmission scan was performed for attenuation correction before the PET acquisition. Most participants underwent a 20-min PET scan beginning 50 min after the intravenous injection of ≈ 4 MBq/kg of florbetapir. Note that for 6 individuals (2 HAS, 3 SCDclinic, 2 aMCI), only 10 min of PET data were acquired starting 50 min post-injection. The data presented in the main manuscript include all 151 participants but results were not changed without these 7 individuals.

Preprocessing

MRI were segmented using SPM12; resulting gray and white matter segments were used for partial volume effect correction of PET data using a three compartment model implemented in the PMOD package (PMOD Technologies Ltd., Adliswil, Switzerland). PET images were then warped to MNI space using corresponding MRI, and Florbetapir Standardized Uptake Value Ratio (SUVR) images were computed using the cerebellar gray matter as a reference region. A SUVR value was extracted using a predetermined neocortical mask. Participants were classified A β -positive versus A β -negative based on Florbetapir-PET data acquired in a group of 41 healthy adults below 40 years old; the positivity threshold was defined as the mean + 2 SD from this young control group.

Methods for Exploratory Factor Analysis on the CDS questionnaire

As mentioned in the main manuscript, two previous studies have already conducted “factor analysis” on the CDS. However, we decided to conduct our own for two main reasons.

1) We suspected that item covariance in our sample might differ from previous ones. Not only groups differ in their demographic and clinical characteristics, but these studies were conducted two decades before ours: generational and/or lifestyle differences (eg. use of technology to record phone numbers or to set reminders...) might impact patterns of responses.

2) In light of recent literature on EFAs, and notably when used on ordinal scales (see references below), we realized that the methods used in previous studies were sub-optimal and that newly available tools could help us better analyze the questionnaire.

References:

Osborne JW. What is rotating in exploratory factor analysis? *Practical Assessment, Research, and Evaluation* 2015; 20(2), 1-7.

Costello AB & Osborne JW. Exploratory Factor Analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation* 2015; 10(7), 1-9.

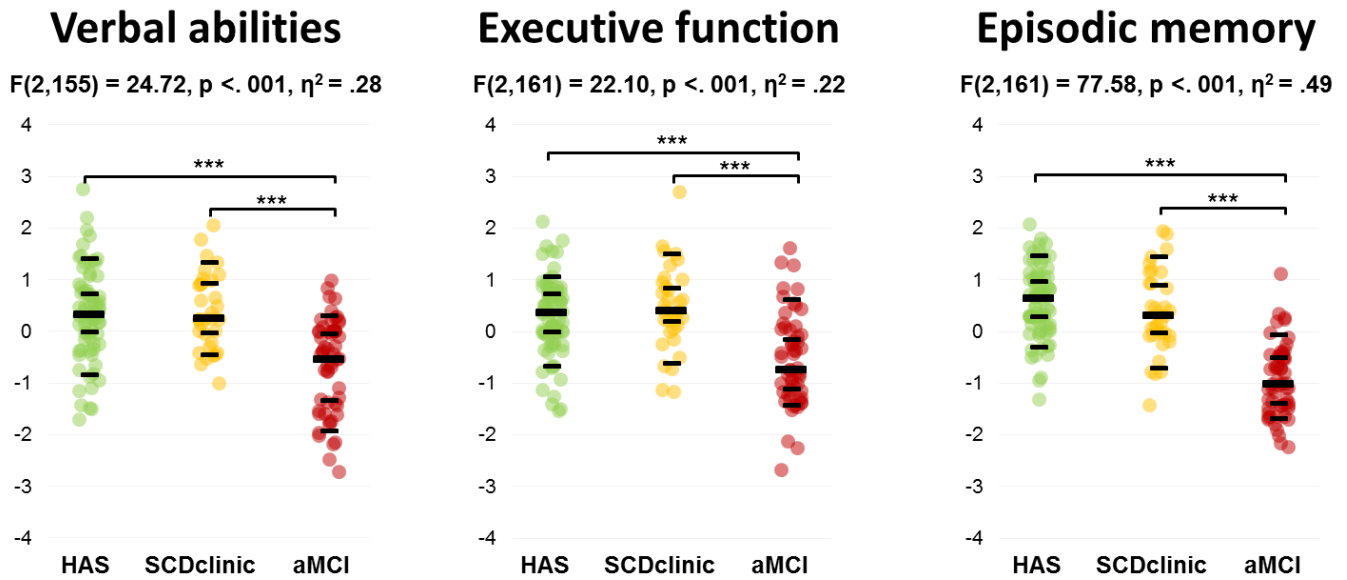
Bernstein IH, Teng G. Factoring items and factoring scales are different: Spurious evidence for multidimensionality due to item categorization. *Psychol Bull* 1989;105:467. doi:10.1037/0033-2909.105.3.467.

Baglin J. Improving Your Exploratory Factor Analysis for Ordinal Data: A Demonstration Using FACTOR. *Pract Assess Res Eval* 2014;19:1–14.

The table below summarizes the differences between our study and previous ones, and details the rationale for our methodological choices.

	Derouesne et al (1993)	Gass et al 1997	Present study	Comments / justifications
Sample	1648 cognitively normal [45-75 yo]	255 patients referred for closed-head injury (52.6 ± 15 yo)	185 non demented elders age = 70.5 ± 7.5 [55-85]	Our sample is significantly older than previous studies and encompasses different diagnostic groups. Given that previous studies were published 2 decades ago, we could also suspect generation differences, especially for items related to aspects of daily life that have been recently impacted by digital devices (eg. "Remembering phone numbers"...))
Extraction method	Principal Component Analysis (PCA)		Exploratory Factor Analysis with Unweighted Least Squares extraction	Decision based on recommendations (<i>Costello and Osborne, PractAssessResEval 2005</i>). PCA is more a data reduction method than a true factor analysis: it computes the analysis without regard to the underlying latent structure of the variables, using all the variance in the manifest variables.
Correlation matrix based on	(supposedly) pearson correlation coefficient (not specified in any of the papers but classically the default method)		polychoric correlation coefficient	Polychoric correlations are better suited to ordinal scales than Pearson coefficients as the latter usually gives rise to spurious multidimensionality and biased factor loadings (<i>Bernstein and Teng, Psychological Bulletin 1989, Baglin PractAssessResEval 2014</i>)
Method to determine # of factors	Number of factors determined using Kaiser's criteria (eigenvalue >1) ↓ 6 factors (51.9% variance)	7 factors (59% variance)	Parallel analysis 3 factors (46.4% variance)	Kaiser's criterion has been criticized for overestimating the number of dimensions compared to the more accurate parallel analyses (<i>Baglin PractAssessResEval 2014</i>). Note that using Kaiser's criteria on our data, we would reach a 7-factor solution accounting for 60% of variance
Factor rotation	Varimax (orthogonal) rotation		Promin (oblique) rotation	Based on a prioris and initial data inspection, we expected factors to be somewhat correlated while orthogonal methods would have artificially made them uncorrelated (<i>Osbourne PractAssessResEval 2015</i>).

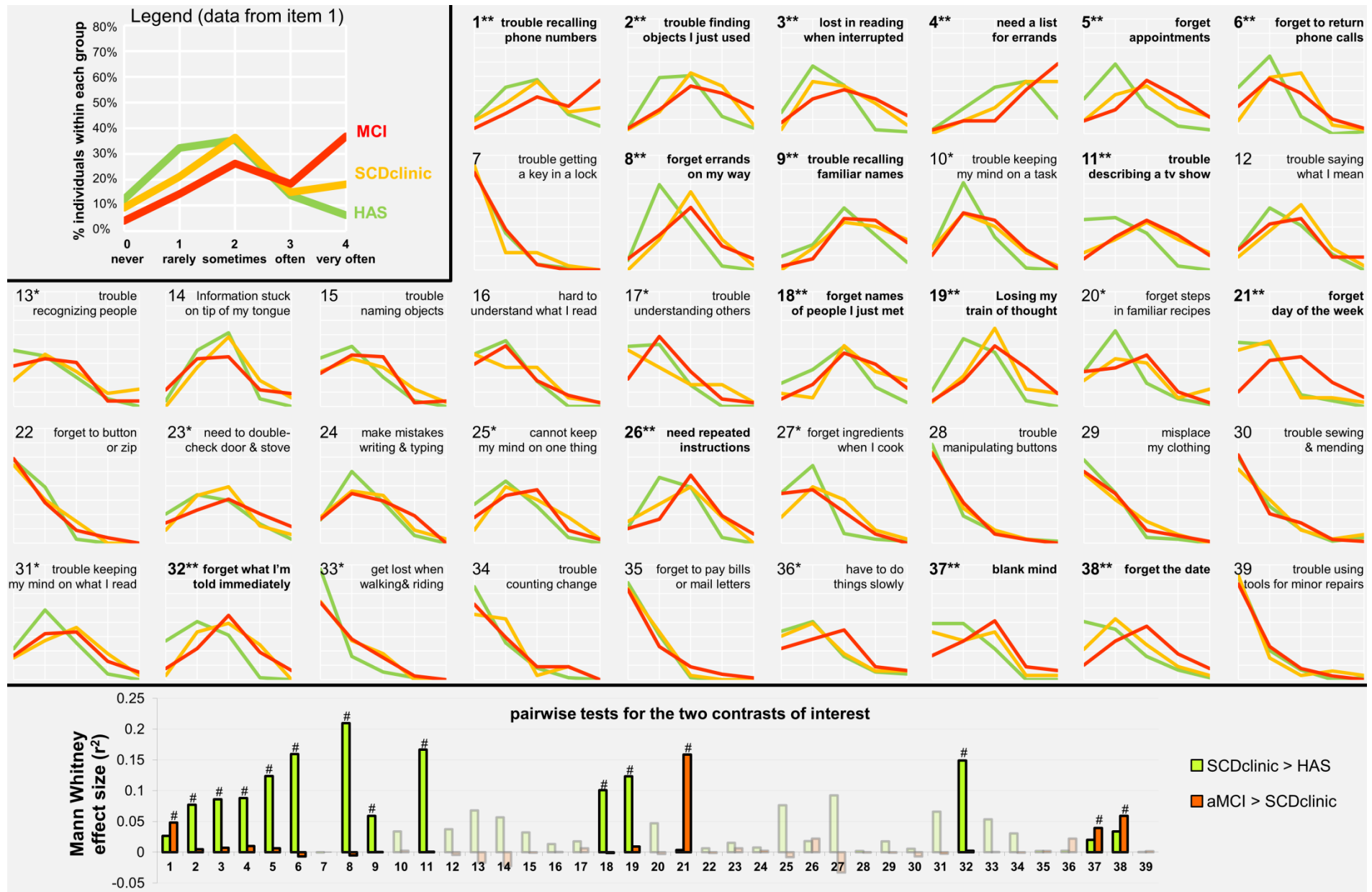
Supplementary figure 1. Composite cognitive scores across clinical groups



Fisher's LSD was used as a post hoc test, *** $p < .001$.

Scatter plot show individual values, as well as 10th, 30th, 50th, 70th and 90th percentiles within each group (black lines).

Supplementary figure 2. Alternative presentation of item endorsement in each group



Supplementary Table 1. Associations between demographic variables and SCD factor scores in each clinical group.

age	<u>HAS (n=74)</u>		<u>SCDclinic (n=33)</u>		<u>aMCI (n=78)</u>	
Factor 1	r = .153	p = .19	r = .265	p = .15	r = -.166	p = .15
Factor 2	r = .158	p = .18	r = .259	p = .15	r = -.076	p = .51
Factor 3	r = .152	p = .20	r = .192	p = .29	r = -.013	p = .91
CDS total score	r = .175	p = .14	r = .275	p = .12	r = -.102	p = .38
education	<u>HAS (n=74)</u>		<u>SCDclinic (n=33)</u>		<u>aMCI (n=75)</u>	
Factor 1	r = -.118	p = .32	r = .204	p = .26	r = -.058	p = .62
Factor 2	r = .087	p = .46	r = .125	p = .49	r = -.049	p = .68
Factor 3	r = -.003	p = .98	r = .206	p = .25	r = .107	p = .36
CDS total score	r = -.007	p = .95	r = .219	p = .22	r = -.002	p = .99
gender	<u>HAS (n=74)</u>		<u>SCDclinic (n=33)</u>		<u>aMCI (n=78)</u>	
Factor 1	t = -.605	p = 0.55	t = .188	p = 0.85	t = .470	p = 0.64
Factor 2	t = .025	p = 0.98	t = -.441	p = 0.66	t = -.353	p = 0.72
Factor 3	t = -1.086	p = 0.28	t = -1.200	p = 0.24	t = -.765	p = 0.45
CDS total score	t = -.758	p = 0.45	t = -.549	p = 0.59	t = -.460	p = 0.65

Supplementary Table 2. Extensive description of item endorsement in each clinical group (data presented in Figure 1).

Statistical comparisons are available in Supplementary Table 3.

	HAS (n=74)							SCDclinic (n=33)							aMCI (n=78)						
	mean	sd	min	Q1	med	Q3	max	mean	sd	min	Q1	med	Q3	max	mean	sd	min	Q1	med	Q3	max
item1	1.70	1.02	0	1	2	2	4	2.12	1.22	0	1	2	3	4	2.72	1.22	0	2	3	4	4
item2	1.73	0.88	0	1	2	2	4	2.24	0.90	0	2	2	3	4	2.40	1.09	0	2	2	3	4
item3	1.28	0.80	0	1	1	2	4	1.91	0.98	0	1	2	3	4	2.10	1.15	0	1	2	3	4
item4	2.35	0.99	0	2	2	3	4	3.00	0.97	1	2	3	4	4	3.14	1.08	0	3	3	4	4
item5	1.14	0.94	0	1	1	2	4	1.97	1.16	0	1	2	3	4	2.14	1.11	0	1	2	3	4
item6	0.84	0.74	0	0	1	1	4	1.55	0.87	0	1	2	2	4	1.41	1.04	0	1	1	2	4
item7	0.38	0.63	0	0	0	1	3	0.45	0.83	0	0	0	1	3	0.36	0.56	0	0	0	1	2
item8	1.30	0.64	0	1	1	2	3	2.06	0.75	1	2	2	2	4	1.92	1.02	0	1	2	2	4
item9	1.99	1.01	0	1	2	3	4	2.58	1.00	1	2	3	3	4	2.60	0.97	0	2	3	3	4
item10	1.11	0.65	0	1	1	1	3	1.48	1.00	0	1	1	2	4	1.56	0.91	0	1	2	2	4
item11	0.96	0.85	0	0	1	2	3	2.00	1.20	0	1	2	3	4	2.06	1.10	0	1	2	3	4
item12	1.38	0.87	0	1	1	2	3	1.76	0.94	0	1	2	2	4	1.67	1.11	0	1	2	2	4
item13	0.92	0.90	0	0	1	2	3	1.61	1.25	0	1	1	2	4	1.22	1.03	0	0	1	2	4
item14	1.58	0.66	0	1	2	2	3	2.03	0.85	1	1	2	2	4	1.73	1.10	0	1	2	2	4
item15	0.95	0.84	0	0	1	1	3	1.36	1.08	0	1	1	2	4	1.28	0.98	0	1	1	2	4
item16	0.81	0.72	0	0	1	1	2	1.12	1.08	0	0	1	2	4	1.12	1.01	0	0	1	2	4
item17	0.73	0.71	0	0	1	1	2	1.15	1.20	0	0	1	2	4	1.23	0.91	0	1	1	2	4
item18	1.61	1.00	0	1	2	2	4	2.36	1.14	0	2	2	3	4	2.29	1.05	0	2	2	3	4
item19	1.35	0.73	0	1	1	2	3	2.03	0.92	0	2	2	2	4	2.19	0.97	0	2	2	3	4
item20	1.07	0.87	0	1	1	1	4	1.61	1.22	0	1	1	2	4	1.40	1.05	0	1	1	2	4
item21	0.72	0.79	0	0	1	1	3	0.88	0.99	0	0	1	1	4	1.77	1.06	0	1	2	2	4
item22	0.45	0.55	0	0	0	1	2	0.61	0.75	0	0	0	1	2	0.58	0.81	0	0	0	1	3
item23	1.45	1.05	0	1	1	2	4	1.73	1.01	0	1	2	2	4	1.92	1.21	0	1	2	3	4
item24	1.23	0.79	0	1	1	2	3	1.42	1.00	0	1	1	2	4	1.51	0.99	0	1	1	2	3
item25	1.07	0.83	0	0	1	2	3	1.67	0.99	0	1	2	2	4	1.45	0.98	0	1	1	2	4
item26	1.36	0.73	0	1	1	2	3	1.61	0.97	0	1	2	2	3	1.95	1.02	0	1	2	3	4
item27	0.81	0.79	0	0	1	1	4	1.39	1.00	0	1	1	2	4	1.00	0.91	0	0	1	2	3
item28	0.49	0.86	0	0	0	1	4	0.52	0.80	0	0	0	1	3	0.49	0.73	0	0	0	1	3
item29	0.51	0.71	0	0	0	1	3	0.79	0.93	0	0	1	1	3	0.73	0.92	0	0	1	1	4
item30	0.65	1.00	0	0	0	1	4	0.82	1.13	0	0	0	1	4	0.62	0.91	0	0	0	1	4
item31	1.12	0.79	0	1	1	2	3	1.67	1.05	0	1	2	2	4	1.58	1.08	0	1	2	2	4
item32	1.07	0.80	0	0	1	2	3	1.85	0.83	0	1	2	2	3	1.95	0.99	0	1	2	3	4
item33	0.31	0.64	0	0	0	0	3	0.64	0.78	0	0	0	1	2	0.67	0.83	0	0	0	1	3
item34	0.46	0.71	0	0	0	1	3	0.76	0.90	0	0	1	1	3	0.74	0.96	0	0	0	1	3
item35	0.34	0.50	0	0	0	1	2	0.39	0.56	0	0	0	1	2	0.58	0.90	0	0	0	1	4
item36	1.05	1.05	0	0	1	2	4	1.18	1.13	0	0	1	2	4	1.50	1.13	0	1	2	2	4
item37	0.82	0.76	0	0	1	1	2	1.15	1.03	0	0	1	2	4	1.62	1.07	0	1	2	2	4
item38	0.93	0.98	0	0	1	1	4	1.30	1.02	0	1	1	2	4	1.86	1.08	0	1	2	3	4
item39	0.39	0.74	0	0	0	1	4	0.52	1.03	0	0	0	1	4	0.46	0.75	0	0	0	1	3

Supplementary Table 3. Statistical comparisons between the three clinical groups performed on each item.

Post hoc were performed for items for which the Kruskal Wallis test was significant using a Bonferroni-corrected α threshold ($0.05/39=0.001282$, bolded). Effect sizes were computed as follows: for Kruskal Wallis: $ES = H / [(n^2-1)/(n+1)]$; for Mann Whitney, $ES = Z^2 / n$.

	Kruskal Wallis ANOVA					Mann Whitney (HAS versus SCDclinic)					Mann Whitney (SCDclinic versus aMCI)				
	adj H	df	P value	-LOG(p)	effect size	U	adj Z	P value	-LOG(p)	effect size	U	adj Z	P value	-LOG(p)	effect size
item1	25.82	2	2.48E-06	5.61	0.13	981.0	-1.685	9.19E-02	1.04	0.03	940.5	-2.309	2.09E-02	1.68	0.05
item2	18.28	2	1.07E-04	3.97	0.09	818.5	-2.871	4.09E-03	2.39	0.08	1180.0	-0.716	4.74E-01	0.32	0.00
item3	23.04	2	9.95E-06	5	0.11	800.0	-3.032	2.43E-03	2.61	0.09	1151.5	-0.902	3.67E-01	0.44	0.01
item4	26.13	2	2.12E-06	5.67	0.13	784.5	-3.067	2.17E-03	2.66	0.09	1135.5	-1.043	2.97E-01	0.53	0.01
item5	33.70	2	4.81E-08	7.32	0.17	708.0	-3.635	2.78E-04	3.56	0.12	1159.5	-0.850	3.96E-01	0.40	0.01
item6	20.83	2	3.00E-05	4.52	0.10	655.5	-4.128	3.67E-05	4.44	0.16	1159.0	0.866	3.87E-01	0.41	-0.01
item7	0.01	2	9.96E-01	0	0.00	1213.5	0.059	9.53E-01	0.02	0.00	1276.0	-0.084	9.33E-01	0.03	0.00
item8	27.89	2	8.80E-07	6.06	0.13	579.0	-4.736	2.18E-06	5.66	0.21	1176.0	0.761	4.47E-01	0.35	-0.01
item9	14.47	2	7.22E-04	3.14	0.07	864.5	-2.516	1.19E-02	1.93	0.06	1255.5	-0.210	8.34E-01	0.08	0.00
item10	10.88	2	4.33E-03	2.36	0.05	966.0	-1.894	5.82E-02	1.24	0.03	1214.0	-0.494	6.21E-01	0.21	0.00
item11	39.61	2	2.50E-09	8.6	0.20	619.0	-4.223	2.42E-05	4.62	0.17	1249.0	-0.250	8.02E-01	0.10	0.00
item12	4.39	2	1.11E-01	0.95	0.02	941.0	-1.993	4.63E-02	1.33	0.04	1184.0	0.693	4.88E-01	0.31	0.00
item13	8.01	2	1.82E-02	1.74	0.04	839.0	-2.698	6.98E-03	2.16	0.07	1081.5	1.379	1.68E-01	0.78	-0.02
item14	5.09	2	7.84E-02	1.11	0.02	888.5	-2.464	1.37E-02	1.86	0.06	1052.0	1.589	1.12E-01	0.95	-0.02
item15	5.83	2	5.42E-02	1.27	0.03	961.0	-1.846	6.48E-02	1.19	0.03	1242.0	0.301	7.63E-01	0.12	0.00
item16	2.99	2	2.25E-01	0.65	0.01	1054.5	-1.195	2.32E-01	0.63	0.01	1283.5	-0.020	9.84E-01	0.01	0.00
item17	11.23	2	3.65E-03	2.44	0.05	1031.0	-1.370	1.71E-01	0.77	0.02	1163.0	-0.841	4.00E-01	0.40	0.01
item18	18.87	2	7.98E-05	4.1	0.09	756.0	-3.284	1.02E-03	2.99	0.10	1231.0	0.374	7.08E-01	0.15	0.00
item19	32.74	2	7.76E-08	7.11	0.16	721.5	-3.631	2.82E-04	3.55	0.12	1140.0	-1.005	3.15E-01	0.50	0.01
item20	6.75	2	3.42E-02	1.47	0.03	909.5	-2.239	2.52E-02	1.60	0.05	1200.5	0.577	5.64E-01	0.25	0.00
item21	43.28	2	3.99E-10	9.4	0.21	1137.5	-0.613	5.40E-01	0.27	0.00	661.0	-4.194	2.75E-05	4.56	0.16
item22	0.63	2	7.30E-01	0.14	0.00	1115.0	-0.813	4.16E-01	0.38	0.01	1232.5	0.394	6.94E-01	0.16	0.00
item23	6.32	2	4.25E-02	1.37	0.03	1040.0	-1.269	2.04E-01	0.69	0.02	1160.5	-0.840	4.01E-01	0.40	0.01
item24	3.30	2	1.92E-01	0.72	0.02	1095.5	-0.903	3.67E-01	0.44	0.01	1213.0	-0.495	6.21E-01	0.21	0.00
item25	10.15	2	6.25E-03	2.2	0.05	820.0	-2.855	4.30E-03	2.37	0.08	1145.0	0.958	3.38E-01	0.47	-0.01
item26	15.62	2	4.05E-04	3.39	0.08	1027.5	-1.394	1.63E-01	0.79	0.02	1057.0	-1.567	1.17E-01	0.93	0.02
item27	9.19	2	1.01E-02	2	0.04	791.5	-3.141	1.69E-03	2.77	0.09	1004.0	1.916	5.54E-02	1.26	-0.03
item28	0.35	2	8.38E-01	0.08	0.00	1166.5	-0.440	6.60E-01	0.18	0.00	1282.0	0.034	9.73E-01	0.01	0.00
item29	2.59	2	2.74E-01	0.56	0.01	1039.5	-1.370	1.71E-01	0.77	0.02	1239.5	0.331	7.41E-01	0.13	0.00
item30	0.84	2	6.58E-01	0.18	0.00	1118.0	-0.776	4.38E-01	0.36	0.01	1166.5	0.874	3.82E-01	0.42	-0.01
item31	10.00	2	6.73E-03	2.17	0.05	849.0	-2.651	8.01E-03	2.10	0.07	1210.0	0.513	6.08E-01	0.22	0.00
item32	33.25	2	6.03E-08	7.22	0.16	659.5	-3.994	6.49E-05	4.19	0.15	1213.0	-0.502	6.16E-01	0.21	0.00
item33	10.32	2	5.74E-03	2.24	0.04	936.0	-2.385	1.71E-02	1.77	0.05	1275.0	-0.082	9.35E-01	0.03	0.00
item34	4.44	2	1.09E-01	0.96	0.02	986.5	-1.803	7.14E-02	1.15	0.03	1240.5	0.325	7.45E-01	0.13	0.00
item35	1.30	2	5.23E-01	0.28	0.01	1167.0	-0.439	6.61E-01	0.18	0.00	1223.0	-0.479	6.32E-01	0.20	0.00
item36	7.57	2	2.27E-02	1.64	0.04	1148.0	-0.517	6.05E-01	0.22	0.00	1054.0	-1.558	1.19E-01	0.92	0.02
item37	21.96	2	1.70E-05	4.77	0.11	1017.0	-1.458	1.45E-01	0.84	0.02	978.0	-2.085	3.71E-02	1.43	0.04
item38	28.27	2	7.27E-07	6.14	0.14	954.0	-1.895	5.80E-02	1.24	0.03	905.0	-2.559	1.05E-02	1.98	0.06
item39	0.50	2	7.81E-01	0.11	0.00	1213.5	-0.060	9.52E-01	0.02	0.00	1234.0	-0.414	6.79E-01	0.17	0.00

Supplementary Table 4. . SCD factor scores in clinical groups (data presented in Figure 2).

	descriptive values: mean \pm sd [Q1, Med, Q3]			Cohen's d [IC _{95%}]	
	HAS (n=74)	SCDclinic (n=33)	aMCI (n=78)	HAS / SCDclinic	SCDclinic/MCI
SCD Factor 1	-0.484 \pm 0.751 [-0.994, -0.379, 0.067]	0.386 \pm 1.061 [-0.352, 0.209, 1.001]	0.296 \pm 1.012 [-0.385, 0.269, 0.815]	1.01 [0.65, 1.19]	-0.09 [-0.31, 0.27]
SCD Factor 2	-0.617 \pm 0.733 [-1.116, -0.715, -0.220]	0.106 \pm 0.853 [-0.618, 0.047, 0.776]	0.540 \pm 0.961 [-0.197, 0.370, 1.199]	0.94 [0.64, 1.10]	0.47 [0.25, 0.76]
SCD Factor 3	-0.176 \pm 0.869 [-0.815, -0.347, 0.188]	0.210 \pm 1.183 [-0.716, 0.003, 0.824]	0.078 \pm 1.025 [-0.748, -0.070, 0.593]	0.4 [-0.01, 0.59]	-0.12 [-0.35, 0.28]

Supplementary Table 5. Item-by-item comparison between A β - and A β + healthy aged subjects.

Lines are bolded when p<.05 (uncorrected). None of the difference was significant when using a stringent Bonferroni correction (0.05/39=0.001282).

	amyloid negative HAS (n=49)							amyloid positive HAS (n=19)							Mann-Whitney			
	mean	sd	min	Q1	med	Q3	max	mean	sd	min	Q1	med	Q3	max	U	adjusted Z	p-value	Effect size
age	68.12	7.08	56	63	68	73	82	72.11	7.53	60	66	72	78	85	338.5	-1.731	0.08	0.04
education	12.45	3.84	7	9	12	15	20	11.21	4.21	7	7	12	14	20	370.0	1.309	0.19	0.03
MMSE	28.78	1.18	26	28	29	30	30	29.16	1.12	26	29	29	30	30	372.5	-1.326	0.18	0.03
item1	1.78	0.98	0	1	2	2	4	1.42	1.12	0	1	1	2	4	369.5	1.371	0.17	0.03
item2	1.65	0.88	0	1	2	2	4	1.84	0.90	1	1	2	2	4	420.5	-0.653	0.51	0.01
item3	1.12	0.73	0	1	1	2	3	1.74	0.73	1	1	2	2	4	271.5	-2.886	0.004	0.12
item4	2.22	1.03	0	2	2	3	4	2.53	0.90	1	2	3	3	4	386.0	-1.129	0.26	0.02
item5	1.06	0.85	0	1	1	1	4	1.26	1.19	0	0	1	2	4	447.5	-0.259	0.80	0.00
item6	0.80	0.61	0	0	1	1	2	0.89	1.05	0	0	1	1	4	455.0	0.152	0.88	0.00
item7	0.31	0.51	0	0	0	1	2	0.58	0.90	0	0	0	1	3	409.0	-0.946	0.34	0.01
item8	1.22	0.65	0	1	1	2	3	1.47	0.61	1	1	1	2	3	381.0	-1.311	0.19	0.03
item9	1.84	1.03	0	1	2	2	4	2.42	0.84	1	2	2	3	4	322.5	-2.059	0.04	0.06
item10	1.02	0.63	0	1	1	1	2	1.42	0.61	1	1	1	2	3	330.0	-2.132	0.03	0.07
item11	0.86	0.76	0	0	1	1	2	1.32	0.95	0	1	1	2	3	340.0	-1.813	0.07	0.05
item12	1.33	0.77	0	1	1	2	3	1.47	1.07	0	1	1	2	3	431.0	-0.495	0.62	0.00
item13	0.86	0.91	0	0	1	1	3	1.16	0.90	0	0	1	2	3	372.5	-1.339	0.18	0.03
item14	1.51	0.68	0	1	2	2	3	1.79	0.63	1	1	2	2	3	372.0	-1.414	0.16	0.03
item15	0.84	0.77	0	0	1	1	3	1.26	0.93	0	1	1	2	3	346.0	-1.740	0.08	0.05
item16	0.82	0.75	0	0	1	1	2	0.84	0.60	0	0	1	1	2	447.5	-0.260	0.79	0.00
item17	0.71	0.65	0	0	1	1	2	0.79	0.85	0	0	1	2	2	455.5	-0.142	0.89	0.00
item18	1.51	0.94	0	1	2	2	4	1.89	1.05	0	2	2	2	4	351.5	-1.643	0.10	0.04
item19	1.18	0.67	0	1	1	2	2	1.84	0.69	1	1	2	2	3	254.0	-3.149	0.002	0.15
item20	0.98	0.69	0	1	1	1	3	1.26	1.05	0	0	1	2	3	403.5	-0.921	0.36	0.01
item21	0.71	0.76	0	0	1	1	3	0.74	0.87	0	0	1	1	3	461.0	0.060	0.95	0.00
item22	0.39	0.53	0	0	0	1	2	0.53	0.61	0	0	0	1	2	411.5	-0.855	0.39	0.01
item23	1.41	1.04	0	1	1	2	4	1.63	1.12	0	1	1	3	3	411.5	-0.761	0.45	0.01
item24	1.29	0.76	0	1	1	2	3	1.11	0.74	0	1	1	2	2	417.0	0.718	0.47	0.01
item25	0.96	0.73	0	0	1	1	3	1.42	0.84	0	1	2	2	3	315.5	-2.198	0.03	0.07
item26	1.27	0.70	0	1	1	2	3	1.79	0.63	1	1	2	2	3	288.5	-2.640	0.008	0.10
item27	0.73	0.60	0	0	1	1	2	0.95	0.91	0	0	1	1	3	425.0	-0.616	0.54	0.01
item28	0.43	0.71	0	0	0	1	3	0.53	0.96	0	0	0	1	3	458.0	0.118	0.91	0.00
item29	0.51	0.68	0	0	0	1	3	0.53	0.61	0	0	0	1	2	448.0	-0.265	0.79	0.00
item30	0.59	0.89	0	0	0	1	4	0.74	1.10	0	0	0	1	4	444.0	-0.326	0.74	0.00
item31	0.94	0.72	0	0	1	1	3	1.53	0.84	0	1	2	2	3	283.5	-2.689	0.007	0.11
item32	0.88	0.75	0	0	1	1	3	1.53	0.77	0	1	2	2	2	251.0	-3.107	0.002	0.14
item33	0.29	0.68	0	0	0	0	3	0.42	0.61	0	0	0	1	2	389.5	-1.393	0.16	0.03
item34	0.47	0.77	0	0	0	1	3	0.42	0.51	0	0	0	1	1	445.5	-0.316	0.75	0.00
item35	0.35	0.52	0	0	0	1	2	0.37	0.50	0	0	0	1	1	449.5	-0.258	0.80	0.00
item36	0.90	0.90	0	0	1	1	3	1.53	1.35	0	1	1	2	4	344.5	-1.741	0.08	0.05
item37	0.67	0.72	0	0	1	1	2	1.21	0.79	0	1	1	2	2	293.5	-2.512	0.01	0.09
item38	0.84	0.96	0	0	1	1	4	1.21	1.08	0	0	1	2	3	371.5	-1.357	0.17	0.03
item39	0.27	0.57	0	0	0	0	2	0.68	1.00	0	0	0	1	4	342.0	-2.140	0.03	0.07
total CDS	37.49	14.99	7	27	36	50	72	48.05	17.56	25	35	43	56	84	324.5	-1.921	0.05	0.05

Supplementary Table 6. Item-by-item comparison between A β - and A β + patients with aMCI.Lines are bolded when $p < .05$ (uncorrected). None of the difference was significant when using a stringent Bonferroni correction ($0.05/39 = 0.001282$).

	amyloid negative aMCI (n=15)							amyloid positive aMCI (n=35)							Mann-Whitney			
	mean	sd	min	Q1	med	Q3	max	mean	sd	min	Q1	med	Q3	max	U	adjusted Z	p-value	Effect size
age	71.60	7.36	58	65	71	78	84	73.03	7.10	60	67	74	79	85	233.0	-0.615	0.54	0.01
education	10.00	2.67	7	7	10	12	15	11.74	3.89	6	9	10	14	20	193.0	-1.482	0.14	0.04
MMSE	26.87	1.96	22	26	27	28	30	26.80	1.94	22	26	27	28	30	255.5	0.140	0.89	0.00
item1	2.13	1.30	0	1	2	3	4	2.74	1.15	0	2	3	4	4	189.5	-1.584	0.11	0.05
item2	2.07	1.16	0	1	2	3	4	2.37	1.06	0	2	2	3	4	231.0	-0.682	0.49	0.01
item3	1.93	0.96	0	1	2	3	3	2.03	1.04	0	1	2	3	4	254.5	-0.166	0.87	0.00
item4	3.13	1.06	1	3	3	4	4	2.94	1.19	0	2	3	4	4	240.0	0.495	0.62	0.01
item5	1.80	1.21	0	1	2	2	4	2.06	1.06	0	2	2	3	4	217.0	-0.999	0.32	0.02
item6	1.33	1.23	0	0	1	2	4	1.63	1.00	0	1	1	2	4	221.5	-0.896	0.37	0.02
item7	0.53	0.64	0	0	0	1	2	0.29	0.52	0	0	0	1	2	206.5	1.442	0.15	0.04
item8	1.80	1.08	0	1	2	2	4	1.80	0.96	0	1	2	2	4	260.0	0.045	0.96	0.00
item9	2.87	1.13	0	2	3	4	4	2.29	0.96	0	2	2	3	4	171.0	2.022	0.04	0.08
item10	1.53	0.64	0	1	2	2	2	1.49	0.82	0	1	1	2	3	243.5	0.425	0.67	0.00
item11	2.33	0.98	0	2	2	3	4	1.83	1.04	0	1	2	2	4	179.0	1.832	0.07	0.07
item12	1.93	1.10	0	1	2	2	4	1.57	1.12	0	1	1	2	4	209.0	1.175	0.24	0.03
item13	1.53	0.74	0	1	2	2	3	0.94	1.00	0	0	1	2	4	163.5	2.197	0.03	0.10
item14	1.93	1.16	0	1	2	3	4	1.43	0.98	0	1	1	2	4	200.5	1.365	0.17	0.04
item15	1.67	1.05	0	1	2	2	4	1.00	0.77	0	0	1	2	2	165.0	2.174	0.03	0.10
item16	1.40	0.99	0	1	1	2	3	0.94	0.84	0	0	1	1	3	190.5	1.609	0.11	0.05
item17	1.20	0.68	0	1	1	2	2	1.03	0.92	0	0	1	1	4	217.0	1.033	0.30	0.02
item18	2.20	1.15	0	1	2	3	4	2.29	0.86	0	2	2	3	4	252.5	-0.216	0.83	0.00
item19	2.13	1.13	0	1	2	3	4	2.11	0.93	0	1	2	3	4	261.5	0.011	0.99	0.00
item20	1.53	1.06	0	0	2	2	3	1.46	0.98	0	1	1	2	4	240.0	-0.491	0.62	0.01
item21	1.13	1.06	0	0	1	2	4	1.89	0.93	0	1	2	3	4	144.5	2.599	0.009	0.14
item22	0.53	0.74	0	0	0	1	2	0.49	0.74	0	0	0	1	3	252.0	-0.246	0.82	0.00
item23	1.73	1.33	0	1	2	3	4	1.94	1.08	0	1	2	3	4	231.0	0.678	0.50	0.01
item24	1.20	0.94	0	0	1	2	3	1.49	0.98	0	1	1	2	3	221.5	0.895	0.37	0.02
item25	1.40	0.83	0	1	1	2	3	1.40	0.85	0	1	1	2	4	256.5	-0.126	0.90	0.00
item26	1.93	1.22	0	1	2	3	4	1.97	0.95	0	1	2	2	4	252.0	-0.228	0.82	0.00
item27	1.07	0.88	0	0	1	2	2	1.17	0.86	0	1	1	2	3	252.5	0.214	0.83	0.00
item28	0.73	0.80	0	0	1	1	2	0.43	0.70	0	0	0	1	3	204.0	-1.411	0.16	0.04
item29	0.67	0.90	0	0	0	1	3	0.86	0.97	0	0	1	1	4	230.0	0.739	0.46	0.01
item30	1.00	0.93	0	0	1	2	3	0.63	0.88	0	0	0	1	3	198.0	-1.482	0.14	0.04
item31	1.73	0.88	0	1	2	2	4	1.34	0.87	0	1	1	2	4	193.0	-1.575	0.12	0.05
item32	1.67	1.23	0	1	2	3	4	1.83	0.89	0	1	2	2	4	237.5	0.551	0.58	0.01
item33	0.73	0.80	0	0	1	1	2	0.63	0.88	0	0	0	1	3	236.0	-0.613	0.54	0.01
item34	0.80	0.86	0	0	1	1	3	0.63	0.81	0	0	0	1	3	230.0	-0.745	0.46	0.01
item35	0.53	1.06	0	0	0	1	4	0.46	0.74	0	0	0	1	3	260.0	0.051	0.96	0.00
item36	1.40	1.06	0	1	1	2	4	1.46	1.20	0	0	2	2	4	254.5	0.165	0.87	0.00
item37	1.73	1.10	0	1	2	2	4	1.43	0.81	0	1	2	2	3	223.0	-0.881	0.38	0.02
item38	1.27	1.16	0	0	1	2	4	1.89	0.99	0	1	2	3	4	170.5	2.009	0.04	0.08
item39	0.40	0.63	0	0	0	1	2	0.46	0.66	0	0	0	1	2	251.5	0.263	0.79	0.00
total CDS	58.67	23.43	14	44	55	74	114	56.60	18.55	24	45	53	68	98	242.5	-0.413	0.68	0.00

Supplementary Table 7. Item-by-item correlation between item endorsement and cognitive measures in each groupCorrelation are bolded when $p < .05$ (uncorrected) and in red when surviving stringent Bonferroni correction ($0.05/39=0.001282$).

	verbal abilities						executive function						episodic memory					
	HAS (74)		SCD (32)		aMCI (52)		HAS (74)		SCD (33)		aMCI (57)		HAS (74)		SCD (33)		aMCI (57)	
	r	p	r	p	r	p	r	p	r	p	r	p	r	p	r	p	r	p
item 1	.148	.21	-.405	.02	.069	.63	-.039	.74	-.146	.42	.016	.91	.064	.59	-.447	.009	-.259	.05
item 2	.111	.35	-.292	.11	-.044	.76	-.008	.95	-.260	.14	-.153	.26	-.219	.06	-.274	.12	.023	.87
item 3	-.180	.12	-.079	.67	-.066	.64	-.215	.07	.054	.77	-.165	.22	-.124	.29	-.264	.14	-.047	.73
item 4	.153	.19	-.129	.48	.293	.03	.201	.09	-.031	.86	.113	.40	-.108	.36	-.242	.17	.006	.96
item 5	.140	.24	.054	.77	.047	.74	.177	.13	.114	.53	-.012	.93	.086	.47	-.177	.32	-.083	.54
item 6	-.144	.22	.051	.78	.038	.79	-.065	.58	.164	.36	-.020	.88	-.087	.46	-.001	1.00	.010	.94
item 7	-.040	.73	-.095	.61	-.002	.99	.046	.70	.103	.57	-.171	.20	-.015	.90	-.242	.17	.142	.29
item 8	.045	.70	-.138	.45	-.117	.41	.017	.89	.069	.70	-.181	.18	.029	.80	-.204	.25	-.027	.84
item 9	-.045	.70	-.095	.60	-.068	.63	-.026	.83	.102	.57	.103	.45	-.169	.15	-.015	.93	.212	.11
item 10	.063	.60	.001	1.00	-.078	.58	-.181	.12	.121	.50	-.064	.64	-.089	.45	-.191	.29	.367	.005
item 11	-.270	.02	-.203	.27	-.214	.13	.001	1.00	.199	.27	-.021	.88	-.081	.49	-.093	.61	.257	.05
item 12	-.028	.81	-.140	.45	-.250	.07	.045	.70	.180	.32	-.224	.09	-.038	.75	.160	.37	.213	.11
item 13	.005	.96	.026	.89	-.165	.24	.000	1.00	.169	.35	-.099	.46	.015	.90	-.196	.28	.482	<.001
item 14	-.112	.34	-.108	.56	-.150	.29	.140	.23	.040	.82	-.197	.14	-.086	.46	.129	.47	.240	.07
item 15	-.142	.23	.001	.99	-.184	.19	-.235	.04	.025	.89	-.075	.58	-.217	.06	-.008	.96	.331	.01
item 16	-.095	.42	-.306	.09	-.324	.02	-.172	.14	-.058	.75	-.152	.26	-.093	.43	-.142	.43	.237	.08
item 17	-.097	.41	-.256	.16	-.056	.69	-.318	.006	.045	.80	-.167	.21	-.106	.37	-.083	.65	.125	.35
item 18	.150	.20	-.017	.93	-.163	.25	.086	.47	.190	.29	-.128	.34	-.205	.08	.064	.72	-.061	.65
item 19	-.037	.75	.115	.53	-.176	.21	.017	.88	.211	.24	-.055	.68	-.030	.80	.238	.18	-.021	.88
item 20	-.140	.23	-.038	.83	-.068	.63	-.076	.52	.058	.75	-.007	.96	-.129	.27	.004	.98	.035	.79
item 21	-.071	.55	-.391	.03	.128	.37	-.080	.50	-.135	.45	.032	.81	-.183	.12	-.203	.26	-.404	.002
item 22	-.027	.82	-.199	.27	.038	.79	-.033	.78	.157	.38	.083	.54	-.089	.45	-.265	.14	.017	.90
item 23	.081	.49	-.142	.44	.041	.77	.126	.28	-.012	.95	.098	.47	.174	.14	-.268	.13	-.055	.68
item 24	-.412	<.001	-.405	.02	-.427	.002	-.263	.02	-.104	.56	-.280	.04	-.161	.17	-.068	.71	-.118	.38
item 25	-.085	.47	-.147	.42	-.361	.009	-.103	.38	-.013	.94	-.195	.15	.051	.67	.082	.65	.016	.91
item 26	.067	.57	.073	.69	-.133	.35	.062	.60	.115	.52	-.029	.83	-.165	.16	-.037	.84	-.115	.40
item 27	-.001	.99	.083	.65	.081	.57	-.250	.03	.133	.46	.080	.56	-.172	.14	.072	.69	.129	.34
item 28	.091	.44	-.248	.17	-.066	.64	.071	.55	-.192	.29	-.126	.35	-.208	.07	-.422	.01	.112	.41
item 29	-.234	.04	-.285	.11	-.100	.48	-.010	.93	-.209	.24	.007	.96	.118	.32	-.288	.10	-.008	.95
item 30	-.164	.16	-.244	.18	-.051	.72	.043	.71	-.215	.23	-.128	.34	.064	.59	-.271	.13	.022	.87
item 31	.092	.43	.121	.51	-.342	.01	.009	.94	.367	.04	-.084	.54	-.029	.81	-.019	.92	.249	.06
item 32	-.021	.86	.009	.96	-.220	.12	.081	.49	.220	.22	-.196	.14	-.048	.69	.074	.68	-.280	.03
item 33	.038	.74	.240	.19	.139	.32	.041	.73	.118	.51	.105	.44	.137	.25	-.206	.25	.021	.88
item 34	.072	.54	-.041	.82	-.186	.19	-.017	.88	-.013	.94	-.124	.36	-.166	.16	-.128	.48	.068	.61
item 35	.070	.55	-.019	.92	.049	.73	.143	.23	-.060	.74	.031	.82	.127	.28	-.147	.41	-.016	.91
item 36	-.159	.18	.075	.68	.020	.89	-.140	.23	.111	.54	-.186	.17	-.066	.58	-.082	.65	-.110	.42
item 37	-.137	.25	-.050	.79	-.128	.36	.047	.69	-.047	.80	-.025	.85	-.053	.66	-.185	.30	.053	.69
item 38	-.015	.90	-.487	.005	.116	.41	.042	.72	-.395	.02	.016	.91	-.153	.19	-.496	.003	-.366	.005
item 39	-.004	.97	.087	.64	.002	.99	.054	.65	-.094	.60	-.113	.40	.009	.94	-.142	.43	-.097	.47