

# Multidimensional analysis instructions

1) The tool expects input in the following format (only a small part of the dataset is shown).

	A	B	C	D	E	F	G	H	I	J	K
1	Filename	Register	PAST	PERF	PRES	PLACE	TIME	1PRON	2PRON	3PRON	IT
2	AmE06_A01	News_reportage	4.75	0.49	4.45	0.49	0.49	1.43	0.3	3.02	1.24
3	AmE06_A02	News_reportage	3.92	0.83	4.51	0.29	0.74	1.23	0.2	3.19	0.64
4	AmE06_A03	News_reportage	4.64	0.55	3.54	0.2	0.35	0.3	0.05	1.85	1.25
5	AmE06_A04	News_reportage	1.83	0.4	4.85	0.25	0.2	1.04	0.1	0.54	1.04
6	AmE06_A05	News_reportage	3.13	0.65	5.91	0.1	0.4	2.43	0.4	1.54	1.09
7	AmE06_A06	News_reportage	1.97	1.03	6.85	0.25	0.44	0.44	0	1.72	0.43
8	AmE06_A07	News_reportage	2.21	0.8	4.47	0.4	0.3	0.55	0.05	1.56	0.43
9	AmE06_A08	News_reportage	2.83	1.07	5.85	0.24	0.78	1.17	0.68	3.22	1.37
10	AmE06_A09	News_reportage	5.84	0.45	3.46	0.25	0.54	1.14	0.1	1.14	1.43
11	AmE06_A10	News_reportage	3.97	0.69	4.31	0.25	0.35	0.59	0.05	2.97	0.94
12	AmE06_A11	News_reportage	2.92	0.68	4.19	0.44	1.17	0.24	0.1	0.68	1.7
13	AmE06_A12	News_reportage	2.89	0.8	4.58	0.4	0.65	0.55	0.2	2.24	0.95
14	AmE06_A13	News_reportage	2.7	0.95	5.8	0.4	0.2	0.8	0.1	2.25	0.7
15	AmE06_A14	News_reportage	3.67	1.04	3.18	0.35	0.45	0.7	0.1	1.69	1.04
16	AmE06_A15	News_reportage	5.54	1.1	3.94	0.3	0.7	0.5	0.45	2.49	1.04
17	AmE06_A16	News_reportage	4.77	0.98	4.97	0.44	0.39				
18	AmE06_A17	News_reportage	1.78	0.64	5.88	0.49	0.44				
19	AmE06_A18	News_reportage	3.8	0.49	6.18	0.74	0.2				

Relative frequencies of linguistic variables in the individual files.

2) If the comparison is to be made with Biber's (1988) dimensions ( Comparison with Biber's (1988) dimensions ), the linguistic variables and their *order* need to correspond to those in Biber's work (see the end of this document).

## Biber variables (abbreviated):

1	PAST	15	GER	29	TSUB	43	TTR	57	SUAV
2	PERF	16	NN	30	TOBJ	44	MWL	58	SMAP
3	PRES	17	PASS	31	WHSUB	45	CONJ	59	CONT
4	PLACE	18	BYPASS	32	WHOBJ	46	DWNT	60	THATD
5	TIME	19	BE	33	PIRE	47	HDG	61	STPR
6	1PRON	20	EXIST	34	SERE	48	AMP	62	SPINF
7	2PRON	21	THVC	35	CAUS	49	EMPH	63	SPAU
8	3PRON	22	THAC	36	CONC	50	DPAR	64	PHC
9	IT	23	WHCL	37	COND	51	DEMO	65	ANDC
10	DEMPRON	24	INF	38	OSUB	52	POSS	66	SYNEG
11	INDPRON	25	PRESP	39	PP	53	NECESS	67	ANNEG
12	DO	26	PASTP	40	JJATR	54	PRED		
13	WHQU	27	WZPAST	41	JJPRED	55	PUBV		
14	NOMZ	28	WZPRES	42	ADV	56	PRIV		

3) The output for the tool can be obtained from any corpus tool which is able to provide a breakdown of frequencies for individual files (e.g. CQPweb, SketchEngine, MonoConc Pro). For full comparability with Biber's (1988) dimensions, the output from Biber tagger would be required.

Currently, a freeware tool MAT is available (<https://sites.google.com/site/multidimensionaltagger/>) that replicates Biber's tagging. The tool was created by Andrea Nini. The output of the tool can be directly copied into the Multidimensional tool. However, some minor adjustment is required (see the expected data format above).

**DIRECT COMPARISON OF THE DATASET WITH BIBER'S DIMENSIONS**

4a) Paste the data into the text box, select 'Comparison with Biber's (1988)' dimension and press 'Perform MD analysis'.

1. Paste tab delimited data including header row and id column. For help click [here](#).

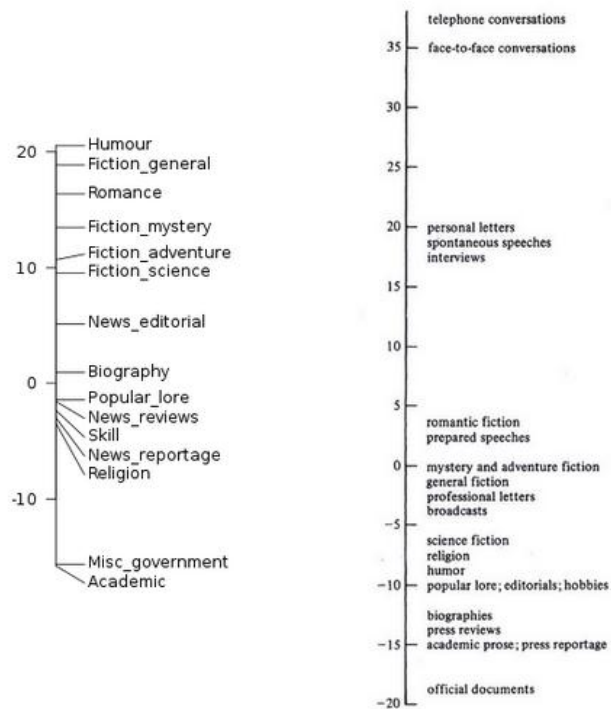
0.2	0.05	0.1	0.05	0	0.1	0.1	0.1	0.1	0.25	0.1	2.27	2.07	0.89
3.95	191	4.28	0.05	0.2	0.15	0.39	0.99	0.1	0.89	0.35	0.1	0.94	1.13
2.52	0.35	0.05	2.17	0.99	0.15	0	0.15	0.15	0.54	0.05	1.53		
BE_R08	Humour	7.24	0.89	1.79	0.6	0.6	1.44	1.19	8.18	1.49	0.3	0	0.25
0.05	0.5	1.09	20.04	0.55	0.1	1.59	0.3	0.05	0.05	0.1	2.03	0.64	0.1
0.1	0.35	0.1	0.15	0	0.05	0	0.1	0	0.1	0.3	0.15	9.77	5.56
0.79	4.17	239	4.25	0	0.15	0	0.1	0.3	0.15	0.05	0.64	0.25	1.29
0.35	1.34	0.2	0.15	2.58	0.45	0.55	0.05	0.1	0.5	0.64	0.15	1.24	
BE_R09	Humour	2.11	0.1	8.64	0.29	0.58	5.9	0.77	2.64	2.5	0.53	0.19	0.19
0.91	0.53	19.53	0.48	0.1	2.69	0.24	0.19	0	0.05	1.97	0.1	0.19	0.05
0.53	0.24	0.05	0.14	0	0.1	0.14	0.34	0.1	0.24	0.1	8.83	6.09	1.01
4.22	228	4.28	0.05	0.19	0.1	0.19	1.25	0.14	0.82	0.48	0.14	0.72	0.67
2.4	0.38	0.19	4.94	0.34	0.19	0.14	0.19	0.96	0.96	0	1.49		

2. Select the type of analysis you want to carry out.

Full MD
  Comparison with Biber's (1988) dimensions

5a) The expected output is a series of six dimensions with individual registers based on the dataset (left) and Biber's (1988) dimensions (right) for comparison.

Dimension 1: Involved vs. Informational



Example of the output (only first dimension is shown)

### FULL MULTIDIMENSIONAL ANALYSIS

4b) Paste the data into the text box, select 'Full MD' and press 'Perform MD analysis'.

Correlation calculator Cluster tool **Multidimensional analysis**  Video tutorials

1. Paste tab delimited data including header row and id column. For help click [here](#).

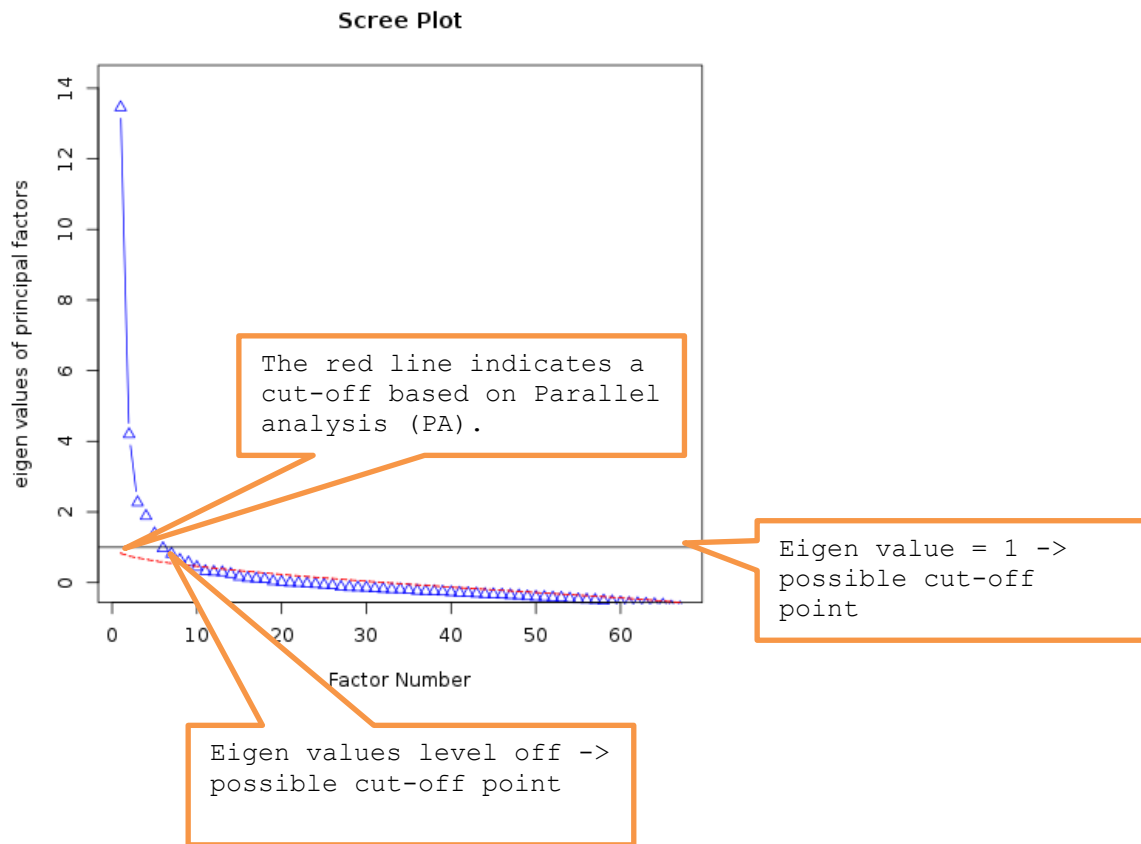
0.2	0.09	0.1	0.09	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3.95	191	4.28	0.05	0.2	0.15	0.39	0.99	0.1	0.89	0.35	0.1	0.94	1.13
2.52	0.35	0.05	2.17	0.99	0.15	0	0.15	0.15	0.54	0.05	1.53		
BE_R08	Humour	7.24	0.89	1.79	0.6	0.6	1.44	1.19	8.18	1.49	0.3	0	0.25
0.05	0.5	1.09	20.04	0.55	0.1	1.59	0.3	0.05	0.05	0.1	2.03	0.64	0.1
0.1	0.35	0.1	0.15	0	0.05	0	0.1	0	0.1	0.3	0.15	9.77	5.56
0.79	4.17	239	4.25	0	0.15	0	0.1	0.3	0.15	0.05	0.64	0.25	1.29
0.35	1.34	0.2	0.15	2.58	0.45	0.55	0.05	0.1	0.5	0.64	0.15	1.24	
BE_R09	Humour	2.11	0.1	8.64	0.29	0.58	5.9	0.77	2.64	2.5	0.53	0.19	0.19
0.91	0.53	19.53	0.48	0.1	2.69	0.24	0.19	0	0.05	1.97	0.1	0.19	0.05
0.53	0.24	0.05	0.14	0	0.1	0.14	0.34	0.1	0.24	0.1	8.83	6.09	1.01
4.22	228	4.28	0.05	0.19	0.1	0.19	1.25	0.14	0.82	0.48	0.14	0.72	0.67
2.4	0.38	0.19	4.94	0.34	0.19	0.14	0.19	0.96	0.96	0	1.49		

2. Select the type of analysis you want to carry out.

Full MD  Comparison with Biber's (1988) dimensions

**Perform MD analysis**

5b) Based on the Scree plot, decide how many factors you want to extract. Press 'Select'



6) Both factor loadings and new dimensions based on the extracted factors are displayed. Factor loadings that are larger than 0.35 or smaller than -0.35 are considered.

Features	Factor1	Factor2	Factor3	Factor4	Dimension 1
PAST	0.370	-0.076	0.169	0.871	
PERF	0.137	0.105	0.155	0.411	
PRES	0.303	0.004	-0.091	-0.905	
PLACE	0.235	-0.400	0.015	0.236	
TIME	0.303	-0.321	0.024	0.101	
X1PRON	0.600	-0.113	0.032	-0.061	
X2PRON	0.624	-0.111	-0.053	-0.241	
X3PRON	0.480	-0.171	0.267	0.471	
IT	0.577	-0.188	0.285	-0.139	
DEMPRON	0.167	0.182	0.375	-0.121	
INDPRON	0.368	-0.085	0.269	0.180	
DO	0.536	-0.119	0.165	-0.046	
WHQU	0.458	0.003	0.188	0.096	
NOMZ	-0.653	0.538	0.058	-0.058	
GER	-0.238	0.000	-0.092	-0.135	
NN	-0.467	-0.153	-0.665	-0.178	
					<ul style="list-style-type: none"> <li>Fiction_general</li> <li>Romance</li> <li>Fiction_mystery</li> <li>Humour</li> <li>Fiction_science</li> <li>Fiction_adventure</li> <li>News_editorial</li> <li>News_reportage</li> <li>Biography</li> <li>News_reviews</li> <li>Skill</li> <li>Popular_lore</li> <li>Religion</li> <li>Misc_government</li> <li>Academic</li> </ul>

## The full set of Biber's (1988) features:

- A. Tense and aspect markers
  - 1. past tense
  - 2. perfect aspect
  - 3. present tense
- B. Place and time adverbials
  - 4. place adverbials (e.g., *behind, downstairs, locally*)
  - 5. time adverbials (e.g., *eventually, immediately, nowadays*)
- C. Pronouns and pro-verbs
  - 6. first-person pronouns
  - 7. second-person pronouns
  - 8. third-person personal pronouns (excluding *it*)
  - 9. pronoun *it*
  - 10. demonstrative pronouns (*that, this, these, those* as pronouns)
  - 11. indefinite pronouns (e.g., *anyone, everybody, nothing*)
  - 12. pro-verb *do*
- D. Questions
  - 13. direct *Wh* questions
- E. Nominal forms
  - 14. nominalizations (ending in *-tion, -ment, -ness, -ity*)
  - 15. gerunds (participial forms functioning as nouns)
  - 16. total other nouns
- F. Passives
  - 17. agentless passives
  - 18. *by*-passives
- G. Stative forms
  - 19. *be* as main verb
  - 20. existential *there*
- H. Subordination features
  - 21. *that* verb complements (e.g., *We felt that we needed a financial base.*)
  - 22. *that* adjective complements (e.g., *It's quite obvious that certain things can be sexlinked.*)
  - 23. *Wh* clauses (e.g., *I wondered what to do.*)
  - 24. infinitives
  - 25. present participial adverbial clauses (e.g., *Screaming with rage, he ran up the stairs.*)
  - 26. past participial adverbial clauses (e.g., *Given these characteristics, it is not surprising that . . .*)
  - 27. past participial postnominal (reduced relative) clauses (e.g., *the exhaust air volume required by the 6-ft. x 4-ft. grid*)
  - 28. present participial postnominal (reduced relative) clauses (e.g., *the currents of dissent swirling beneath the surface*)
  - 29. *that* relative clauses on subject position (e.g., *the papers that are on the table*)
  - 30. *that* relative clauses on object position (e.g., *the papers that she thought would be interesting*)
  - 33. pied-piping relative clauses (e.g., *the way in which food is digested*),
  - 34. sentence relatives (e.g., *We waited for six hours, which was ridiculous.*)
  - 35. causative adverbial subordinator (*because*)
  - 36. concessive adverbial subordinators (*although, though*)
  - 37. conditional adverbial subordinators (*if, unless*)
  - 38. other adverbial subordinators (e.g., *insomuch as, such that, while*)
- I. Prepositional phrases, adjectives, and adverbs
  - 39. total prepositional phrases
  - 40. attributive adjectives (e.g., *the small room*)
  - 41. predicative adjectives (e.g., *the room is small*)
  - 42. total adverbs
- J. Lexical specificity
  - 43. type/token ratio
  - 44. mean word length
- K. Lexical classes
  - 45. conjuncts (e.g., *alternatively, nevertheless, therefore*)
  - 46. downtoners (e.g., *mildly, partially, somewhat*)
  - 47. hedges (e.g., *almost, maybe, sort of* [except as true noun] )
  - 48. amplifiers (e.g., *completely, totally, utterly*)
  - 49. emphatics (e.g., *a lot, for sure, really*)
  - 50. discourse particles (e.g., sentence initial *anyhow, now, well*)
  - 51. demonstratives
- L. Modals
  - 52. possibility modals (*can, could, may, might*)
  - 53. necessity modals (*must, ought, should*)
  - 54. predictive modals (*shall, will, would*)
- M. Specialized verb classes
  - 55. public verbs (e.g., *complain, explain, promise*)
  - 56. private verbs (e.g., *believe, think, know*)
  - 57. suasive verbs (e.g., *command, propose, recommend*)
  - 58. *seem* and *appear*
- N. Reduced forms and dispreferred structures
  - 59. contractions
  - 60. complementizer *that* deletion (e.g., *I think [ø] he's gone already.*)
  - 61. stranded prepositions (e.g., *the person that I was talking to*)
  - 62. split infinitives (e.g., *I want to completely convince you that . . .*)
  - 63. split auxiliaries (e.g., *they have apparently sold it all . . .*)
- O. Coordination
  - 64. phrasal coordination (NOUN *and* NOUN; ADJ *and* ADJ; VERB *and* VERB; ADV *and* ADV)
  - 65. independent clause coordination (clause initial *and*)
- P. Negation

[Notes]