



```

name: <unnamed>
log: \\wsl.localhost\Debian\home\lsys\neutrality\analysis\logs/table3.smcl
log type: smcl
opened on: 2 Dec 2025, 12:20:44

1 .
2 . do init.do
3 . cls                                // Clear results window
4 . clear all                          // Start with a clean slate
5 . set more off, perm      // Disable partitioned output
   (set more preference recorded)
6 . macro drop _all          // Clear all macros to avoid namespace conflicts
7 . set linesize 150           // Line size limit to make output more readable, affects log
> s
8 . set varabbrev off, perm // Turn off variable abbreviation
   (set varabbrev preference recorded)
9 . // pause on                  // Enable pause mode for debugging
10. version 13.1                // Set Stata version to 13.1
11. set matsize 10000
12.
13. *=====
14. // Set root path
15. // cap net install here, from("https://raw.githubusercontent.com/korenmiklos/here/m
   > ster/")
16. cap here
17. if _rc == 0 {
18.     here, set
19.     cd ${here}
20. }
21. else {
22.     global here "\\wsl.localhost\Debian\home\lsys\neutrality\analysis"
23.     cd $here
\\wsl.localhost\Debian\home\lsys\neutrality\analysis
24. }
25.
26. *=====
27. // Point to ado programs
28. adopath ++ ./ado
[1]          "./ado"
[2]  (BASE)      "C:\Program Files (x86)\Stata13\ado\base/"
[3]  (SITE)      "C:\Program Files (x86)\Stata13\ado\site/"
[4]          "."
[5]  (PERSONAL)  "c:\ado\personal/"
[6]  (PLUS)       "c:\ado\plus/"
[7]  (OLDPLACE)   "c:\ado/"
29.

```

```
30. use ".../pipeline/out/media.dta", clear
31. do preamble
32. *-----
33. * IDENTIFIERS AND METADATA
34. *-----
35. label var qid      "Quote ID"
36. label var article_id  "News article ID (title-date tuple)"
37. label var speech_id   "Speech ID"
38.
39. label var date       "Publication date"
40. label var matched_date "Matched speech date"
41. label var matched_score "Matched score in semi-automated assessing"
42.
43. label var mp        "MP ID"
44. label var party     "Party of politician (string code)"
45. label var opposition  "=1 if from an opposition party"
46. gen ruling = (party == "pap")
47. label var ruling   "=1 if from the government party"
48. label var non_partisan "=1 if non-partisan MP"
49. assert (1 == opposition + ruling + non_partisan)
50. label var speaker    "=1 if making speech in capacity of speaker"
51.
52. label var section    "Original article section"
53.
54. *=====
55. * MP CAREER
56. *=====
57. label var start "Start date of MP's parliamentary service"
58. rename _end end
59. label var end   "End date of MP's parliamentary service"
60.
61. *--- Rank of MP -----
62. label define rank_label ///
>      1 "pm" 2 "dpm" 3 "minister" 4 "sms" 5 "mos" 6 "mayor" 7 "sps" ///
>      8 "parl sec" 9 "speaker" 10 "mp" 11 "ncmp" 12 "nmp"
63. encode rank, gen(mp_rank) label(rank_label)
64. drop rank
```

```
65. rename mp_rank rank
66. label var rank "Rank of MP at time of speech"
67. fvset base 10 rank // base: Member of Parliament
68.
69. *--- Tenure -----
70. gen _tenure = tenure / 365
71. drop tenure
72. rename _tenure tenure
73. label var tenure "Seniority of politician at time of speech (years)"
74.
75. gen tenure2 = tenure^2
76. label var tenure2 "Square of tenure"
77.
78. *=====
79. * INDIVIDUAL DEMOGRAPHICS
80. *=====
81. label var dob "Date of birth of MP"
82. label var yob "Year of birth of MP"
83.
84. *--- Gender (0 = male, 1 = female) -----
85. label define gender_label 0 "male" 1 "female"
86. encode gender, gen(sex) label(gender_label)
87. drop gender
88. rename sex gender
89. fvset base 0 gender
90. label var gender "Gender of politician"
91.
92. *--- Race -----
93. label define race_label 0 "chinese" 1 "malay" 2 "indian" 3 "eurasian"
94. encode race, gen(ethnic) label(race_label)
95. drop race
96. rename ethnic race
97. fvset base 0 race
98. label var race "Race of politician (Chinese, Malay, Indian, Eurasian/other)"
99.
100 *--- Age -----
101 gen _age = age / 365
```

```

102 drop age

103 rename _age age

104 label var age "Age of politician at time of speech (years)"

105
106 gen age2      = age^2

107 label var age2 "Square of age"

108
109 *=====
110 * MINISTRY
111 *=====
112 label var MND      "=1 if speech made while at Ministry of National Development"
113 label var MinDef   "=1 if speech made while at Ministry of Defence"
114 label var MFA      "=1 if speech made while at Ministry of Foreign Affairs"
115 label var MinLaw   "=1 if speech made while at Ministry of Law"
116 label var MHA      "=1 if speech made while at Ministry of Home Affairs"
117 label var MOT      "=1 if speech made while at Ministry of Transport"
118 label var MOF      "=1 if speech made while at Ministry of Finance"
119 label var MOM      "=1 if speech made while at Ministry of Manpower"
120 label var MTI      "=1 if speech made while at Ministry of Trade and Industry"
121 label var MCCY     "=1 if speech made while at Ministry of Culture, Community and Youth"
122 label var MSF      "=1 if speech made while at Ministry of Social and Family Development"
123 label var MOH      "=1 if speech made while at Ministry of Health"
124 label var PMO      "=1 if speech made while at Prime Minister's Office"
125 label var MEWR     "=1 if speech made while at Ministry of the Environment and Water Resources"
126 label var MCI      "=1 if speech made while at Ministry of Communications and Information"
127 label var MOE      "=1 if speech made while at Ministry of Education"

128
129 recode MFA PMO MEWR MCI MTI MHA MCCY MinLaw MOH MOM MinDef MSF MOT MND MOF MOE (. =
> 0)
(MFA: 13913 changes made)
(PMO: 14288 changes made)
(MEWR: 14348 changes made)
(MCI: 14173 changes made)
(MTI: 14135 changes made)
(MHA: 13392 changes made)
(MCCY: 14301 changes made)
(MinLaw: 13971 changes made)
(MOH: 14054 changes made)
(MOM: 14058 changes made)
(MinDef: 13790 changes made)
(MSF: 14693 changes made)
(MOT: 13884 changes made)
(MND: 13741 changes made)
(MOF: 13401 changes made)
(MOE: 13792 changes made)

```

```

130
131 *=====
132 * STRING SIMILARITY AND SEMANTIC MATCHING
133 *=====
134
135 *--- String similarity 1 (partialscore) -----
136 rename partialscore_quote_to_fullspeech ss1_quote_to_speech

137 label var ss1_quote_to_speech           "String similarity score 1 for quote to spe
> ech"

138
139 rename partialscore_quote_to_paragraph ss1_quote_to_paragraph

140 label var ss1_quote_to_paragraph         "String similarity score 1 for quote to par
> agraph"

141
142 rename partialscore_quote_to_sentence   ss1_quote_to_sentence

143 label var ss1_quote_to_sentence          "String similarity score 1 for quote to sen
> tence"

144
145 rename _partialscore_speech            _ss1_quote_to_speech

146 label var _ss1_quote_to_speech          "(no stopwords) string similarity score 1 f
> or quote to speech"

147
148 rename _partialscore_paragraph         _ss1_quote_to_paragraph

149 label var _ss1_quote_to_paragraph       "(no stopwords) string similarity score 1 f
> or quote to paragraph"

150
151 rename _partialscore_sentence          _ss1_quote_to_sentence

152 label var _ss1_quote_to_sentence        "(no stopwords) string similarity score 1 f
> or quote to sentence"

153
154 *--- String similarity 2 (tokensecscore) -----
155 rename tokensecscore_quote_to_sentence ss2_quote_to_sentence

156 label var ss2_quote_to_sentence         "String similarity score 2 for quote to sen
> tence"

157
158 rename tokensecscore_quote_to_paragraph ss2_quote_to_paragraph

159 label var ss2_quote_to_paragraph        "String similarity score 2 for quote to par
> agraph"

160
161 rename tokensecscore_quote_to_fullspeec ss2_quote_to_speech

162 label var ss2_quote_to_speech           "String similarity score 2 for quote to spe
> ech"

```

```

163
164 rename tokensestscore_quote_to_sentence_ _ss2_quote_to_sentence
165 label var _ss2_quote_to_sentence "(no stopwords) string similarity score 2 f
> or quote to sentence"
166
167 rename _0tokensestscore_quote_to_paragra _ss2_quote_to_paragraph
168 label var _ss2_quote_to_paragraph "(no stopwords) string similarity score 2 f
> or quote to paragraph"
169
170 rename _1tokensestscore_quote_to_fullspe _ss2_quote_to_speech
171 label var _ss2_quote_to_speech "(no stopwords) string similarity score 2 f
> or quote to speech"
172
173 *--- Semantic matching scores -----
174 replace ce_max_quote2speech = 100 * ce_max_quote2speech
(14903 real changes made)
175 label var be_max_quote2speech "Best embedding-based biencoder score for quote to spe
> ech"
176 label var ce_max_quote2speech "Cross-encoder semantic score for quote to speech (0-1
> 00)"
177
178 *=====
179 * CONSTITUENCY AND ELECTORAL VARIABLES
180 *=====
181 rename num group_size
182 label var group_size "Politician size of constituency (1 to 6)"
183
184 label var voters "Electoral size of constituency for current parliam
> ent"
185 label var valid_votes "Number of valid votes in constituency"
186 label var winners_majority "Number of votes for winning party/candidate"
187 label var vote "Number of votes for current parliament"
188 label var vote_share "Percentage of votes for current parliament"
189 label var winners_majority_share "Winners' majority share (percent of valid votes)"
190 label var swing "Electoral swing in ruling party vote share (percen
> tage points)"
191
192 *=====
193 * PARLIAMENT, YEAR, ELECTION TIMING, WEEKDAY
194 *=====
195 *--- Parliament life: dummies + factor -----
196 label var parl10 "=1 if speech occurred in 10th Parliament"

```

```
197 label var parl11 "=1 if speech occurred in 11th Parliament"
198 label var parl12 "=1 if speech occurred in 12th Parliament"
199 label var parl13 "=1 if speech occurred in 13th Parliament"
200
201 label define parl_label 0 "10th parliament" 1 "11th parliament" 2 "12th parliament"
> 3 "13th parliament"
202 encode parl, gen(parliament) label(parl_label)
203 drop parl
204 rename parliament parl
205 fvset base 0 parl
206 label var parl "Parliament life (categorical)"
207
208 *=====
209 * ELECTION TIMING INDICATORS
210 *=====
211 *--- General elections -----
212 label var ge2006      "=1 if article published in year of General Election 2006"
213 label var ge2011      "=1 if article published in year of General Election 2011"
214 label var ge2015      "=1 if article published in year of General Election 2015"
215
216 label var ge2006_1mth  "=1 if article within 1 month of General Election 2006"
217 label var ge2006_3mths "=1 if article within 3 months of General Election 2006"
218 label var ge2006_6mths "=1 if article within 6 months of General Election 2006"
219
220 label var ge2011_1mth  "=1 if article within 1 month of General Election 2011"
221 label var ge2011_3mths "=1 if article within 3 months of General Election 2011"
222 label var ge2011_6mths "=1 if article within 6 months of General Election 2011"
223
224 label var ge2015_1mth  "=1 if article within 1 month of General Election 2015"
225 label var ge2015_3mths "=1 if article within 3 months of General Election 2015"
226 label var ge2015_6mths "=1 if article within 6 months of General Election 2015"
227
228 *--- By-elections -----
229 label var be2012      "=1 if article published in year of By-election 2012"
230 label var be2013      "=1 if article published in year of By-election 2013"
231 label var be2016      "=1 if article published in year of By-election 2016"
```

```

232
233 label var be2012_1mth "=1 if article within 1 month of By-election 2012"
234 label var be2012_3mths "=1 if article within 3 months of By-election 2012"
235 label var be2013_1mth "=1 if article within 1 month of By-election 2013"
236 label var be2013_3mths "=1 if article within 3 months of By-election 2013"
237 label var be2016_1mth "=1 if article within 1 month of By-election 2016"
238 label var be2016_3mths "=1 if article within 3 months of By-election 2016"

239
240 *--- Presidential elections -----
241 label var pe2005      "=1 if article published in year of Presidential Election 200
> 5"
242 label var pe2011      "=1 if article published in year of Presidential Election 201
> 1"
243
244 label var pe2005_1mth "=1 if article within 1 month of Presidential Election 2005"
245 label var pe2005_3mths "=1 if article within 3 months of Presidential Election 2005"
246 label var pe2005_6mths "=1 if article within 6 months of Presidential Election 2005"
247
248 label var pe2011_1mth "=1 if article within 1 month of Presidential Election 2011"
249 label var pe2011_3mths "=1 if article within 3 months of Presidential Election 2011"
250 label var pe2011_6mths "=1 if article within 6 months of Presidential Election 2011"
251
252 *=====
253 * ARTICLE-LEVEL VARIABLES: SECTION, AUTHOR, LANGUAGE, BEAT
254 *=====
255 * Encoded section with 'others' as base
256 label define section2_label ///
>     1 "home" 2 "insight" 3 "money" 4 "news" 5 "opinion" 6 "others" ///
>     7 "prime news" 8 "review - insight" 9 "singapore" 10 "sports" ///
>     11 "st" 12 "think" 13 "top of the news" 14 "world"
257 encode section2, gen(sect2) label(section2_label)
258 drop section2
259 rename sect2 section2
260 fvset base 6 section2
261 label var section2 "Section of article (base: others)"
262
263 * Language / translation flags
264 label var malay      "=1 if quote is in Malay"
265 label var mandarin   "=1 if quote is in Mandarin"

```

```
266 label var tamil      "=1 if quote is in Tamil"
267 label var vernacular  "=1 if quote is in a non-English vernacular language"
268 label var translations "=1 if quote translated from vernacular to English"
269
270 * Author and beat
271 rename author_cleaned2 authorID
272 label var authorID "Author ID"
273
274 encode beat, gen(beat2)
275 drop beat
276 rename beat2 beat
277 label var beat "Beat assignment of reporter"
278
279 *---- Weekday of publication -----
280 label define weekday_label ///
>     1 "monday" 2 "tuesday" 3 "wednesday" 4 "thursday" 5 "friday" 6 "saturday" 7 "sun
> day"
281 encode weekday, gen(dayofweek) label(weekday_label)
282 drop weekday
283 rename dayofweek weekday
284 fvset base 1 weekday
285 label var weekday "Day of week of article publication"
286
287 *=====
288 * TEXT LENGTH
289 *=====
290 * Word counts
291 rename wordcount_quote      quote
292 label var quote           "Word count of quote"
293
294 rename wordcount_paragraph paragraph
295 label var paragraph        "Word count of paragraph"
296
297 rename wordcount_fullspeech speech
298 label var speech          "Word count of full speech"
299
300 rename wordcount          article
301 label var article         "Article length (words)"
```

```

302
303 * Character counts
304 rename char_count_quote      quote_char
305 label var quote_char         "Character count of quote"
306
307 rename char_count_paragraph paragraph_char
308 label var paragraph_char     "Character count of paragraph"
309
310 rename char_count_fullspeech speech_char
311 label var speech_char        "Character count of speech"
312
313 rename article_len_char     article_char
314 label var article_char       "Article length (characters)"
315
316 * Log transformations
317 #delimit ;
  delimiter now ;
318 global log_variables "
  >      quote
  >      quote_char
  >      paragraph
  >      paragraph_char
  >      speech
  >      speech_char
  >      article
  >      article_char
  >  ";
319 #delimit cr
  delimiter now cr
320
321 foreach var in $log_variables {
  2.      gen ln_`var' = ln(`var')
  3.      label var ln_`var' "ln of `var'"
  4.  }
(2 missing values generated)
(2 missing values generated)

322 *=====
323 * TOPIC DISTRIBUTIONS
324 *=====
325 *=====
326
327 * 50-topic models: quote, speech, article
328 forvalues i = 1/50 {
  2.      label var quote_50K_`i'    "Probability for topic `i'/50 for quote"
  3.      label var speech_50K_`i'   "Probability for topic `i'/50 for speech"
  4.      label var article_50K_`i'  "Probability for topic `i'/50 for article"
  5.  }
329 * 92-topic models: quote, speech, sentence

```

```

331 forvalues i = 1/92 {
2.      label var quote_92K_`i'      "Probability for topic `i'/92 for quote"
3.      label var speech_92K_`i'     "Probability for topic `i'/92 for speech"
4.      label var sentence_92K_`i'   "Probability for topic `i'/92 for sentence"
5. }

332
333 * 100-topic models: quote, speech
334 forvalues i = 1/100 {
2.      label var quote_100K_`i'    "Probability for topic `i'/100 for quote"
3.      label var speech_100K_`i'   "Probability for topic `i'/100 for speech"
4. }

335
336 * Article-level topic models (30 and 40 topics)
337 forvalues i = 1/30 {
2.      label var article_30K_`i'   "Probability for topic `i'/30 for article"
3. }

338
339 forvalues i = 1/40 {
2.      label var article_40K_`i'   "Probability for topic `i'/40 for article"
3. }

340
341 *=====
342 * LEXICAL RICHNESS
343 *=====
344 label var ttr      "Type-token ratio"

345 label var rttr     "Root type-token ratio"
346 label var cttr     "Corrected type-token ratio"
347 label var herdan   "Herdan's C lexical diversity"
348 label var summer   "Summer lexical diversity index"
349 label var dugast   "Dugast lexical diversity index"
350 label var maas     "Maas lexical diversity index"
351 label var msttr    "Mean segmental type-token ratio"
352 label var mattr    "Moving-average type-token ratio"
353 label var mtld     "Measure of textual lexical diversity"
354 label var hdd      "Hypergeometric distribution diversity"

355
356 *=====
357 * READABILITY
358 *=====
359 label var dalechall "Dale-Chall readability index"

360 label var flesch     "Flesch reading ease score"
361 label var fleschkincaid "Flesch-Kincaid grade level"

```

```

362 label var gunningfog      "Gunning-Fog readability index"
363 label var smog            "SMOG readability index"
364 label var notdalechall   "Share of difficult words (not in Dale-Chall list)"
365 label var polysyllable    "Number of polysyllabic words (more than 3 syllables)"
366 label var syllables       "Total number of syllables"
367 label var sentences       "Total number of sentences"

368
369 *=====
370 * SUBJECTIVITY, OBJECTIVITY, POLARITY
371 *=====
372 * Subjectivity (0 = objective, 1 = subjective)
373 gen speech_objectivity     = 1 - speech_subjectivity

374 label var speech_subjectivity "Speech subjectivity (0 objective - 1 subjective)"

375
376 gen para_objectivity      = 1 - para_subjectivity
(2 missing values generated)

377 label var para_subjectivity "Paragraph subjectivity (0-1)"

378
379 gen sentence_objectivity   = 1 - sentence_subjectivity
(2 missing values generated)

380 label var sentence_subjectivity "Sentence subjectivity (0-1)"

381
382 gen quote_objectivity     = 1 - quote_subjectivity

383 label var quote_subjectivity "Quote subjectivity (0-1)"

384
385 gen quote_sentence_objectivity = 1 - quote_sentence_subjectivity
(1 missing value generated)

386 label var quote_sentence_subjectivity "Quote sentence subjectivity (0-1)"

387
388 label var speech_objectivity      "Speech objectivity (0 objective - 1 subjective"
> )"

389 label var para_objectivity       "Paragraph objectivity (0-1)"

390 label var sentence_objectivity   "Sentence objectivity (0-1)"

391 label var quote_objectivity     "Quote objectivity (0-1)"

392 label var quote_sentence_objectivity "Quote sentence objectivity (0-1)"

393
394 * Polarity (-1 = negative, +1 = positive)
395 label var speech_polarity      "Speech polarity (-1 negative to +1 positive), Pat
> ternAnalyzer"

```

```
396 label var para_polarity          "Paragraph polarity (-1 to +1), PatternAnalyzer"
397 label var sentence_polarity      "Sentence polarity (-1 to +1), PatternAnalyzer"
398 label var quote_polarity         "Quote polarity (-1 to +1), PatternAnalyzer"
399 label var quote_sentence_polarity "Quote sentence polarity (-1 to +1), PatternAnalyzer"
> er"
400
end of do-file
401
402 global TABSAVEDIR ../results/tables
403 global FIGSAVEDIR ../results/figures
404 global graphformats png pdf eps tif
405
406
407 *=====
408 * Global macros
409 *=====
410 #delimit;
  delimiter now ;
411 global time
  >           i.parl
  >           i.year
  > ;
412 global ind
  >           i.gender
  >           i.race
  >           c.age
  >           c.age2
  >           c.tenure
  >           c.tenure2
  > ;
413     global article
  >           i.weekday
  >           i.section2
  >           translations
  > ;
414     global portfolio
  >           MFA
  >           PMO
  >           MEWR
  >           MCI
  >           MTI
  >           MHA
  >           MCCY
  >           MinLaw
  >           MOH
  >           MOM
  >           MinDef
  >           MSF
  >           MOT
  >           MND
  >           MOF
  >           MOE
  >           speaker
  > ;
```

```
415      global electoral
>      c.group_size
>      c.voters
>      c.vote_share
>      c.winners_majority_share
> ;

416      global topics
>      speech_92K*
>      quote_92K*
>      article_40K*
> ;

417      global objectivity
>      speech_objectivity
>      para_objectivity
>      sentence_objectivity
>      quote_objectivity
>      quote_sentence_objectivity
> ;

418      global polarity
>      speech_polarity
>      para_polarity
>      sentence_polarity
>      quote_polarity
>      quote_sentence_polarity
> ;

419      global readability
>      flesch
>      fleschkincaid
>      gunningfog
>      smog
>      dalechall
>      notdalechall
>      sentences
>      syllables
>      polysyllable
> ;

420      global lexical
>      ttr
>      rttr
>      cttr
>      herdan
>      summer
>      dugast
>      maas
>      msttr
>      mattr
>      mtld
>      hdd
> ;

421      global length_s
>      quote
>      speech
>      article
> ;
```

```

422 global length_s
>     ln_quote
>     ln_speech
>     ln_article
> ;

423 assert_macros "portfolio time ind article topics";
Checking portfolio:
portfolio contains: MFA      PMO      MEWR      MCI      MTI      MHA      MCCY      MinLaw
> MOH      MOM      MinDef     MSF      MOT      MND      MOF      MOE      speaker
Checking time:
time contains: i.parl          i.year
Checking ind:
ind contains: i.gender        i.race       c.age       c.age2      c.tenure      c.tenure2
Checking article:
article contains: i.weekday    i.section2   translations
Checking topics:
topics contains: speech_92K*   quote_92K*   article_40K*
424 global min
>     i.rank
>     $portfolio
>     i.rank#($portfolio)
> ;
425     global base_controls
>     $time
>     $ind
>     $article
>     $topics
> ;
426     global base_controls_min
>     $time
>     $ind
>     $article
>     $topics
>     $min
> ;
427 #delimit cr
delimiter now cr
428 *=====
429 * COEFFICIENT LABELS
430 * =====
431 * =====
432 #delimit;
delimiter now ;
433 global coeff_labels
>     "
>     1.opposition "Opposition"
>     1.opposition#c.trend "Opposition $\times$ Year"
>     trend "Year"
>     pcl_objectivity "Objectivity of speech and quote"
>     pcl_polarity "Polarity of speech and quote"
>     pcl_readability "Grade/readability score of speech transcript"
>     pcl_lexical "Lexical richness of speech transcript"
>     "
> ;

```

```

434 #delimit cr
  delimiter now cr
435
  end of do-file

436
437 tictoc tic 1
----- Time log -----
Start time: 2 Dec 2025 12:20:45
-----
```

```

438 assert_macros "objectivity polarity readability"
  Checking objectivity:
    objectivity contains: speech_objectivity      para_objectivity      sentence_objectivity
    >      quote_objectivity      quote_sentence_objectivity
  Checking polarity:
    polarity contains: speech_polarity      para_polarity      sentence_polarity      quote_p
    >      olarity      quote_sentence_polarity
  Checking readability:
    readability contains: flesch      fleschkincaid      gunningfog      smog      dalechall
    >      notdalechall      sentences      syllables      polysyllable
```

```

439
440 pca $objectivity
```

Principal components/correlation	Number of obs = 14901
	Number of comp. = 5
	Trace = 5
Rotation: (unrotated = principal)	Rho = 1.0000

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.78163	1.69215	0.5563	0.5563
Comp2	1.08948	.546644	0.2179	0.7742
Comp3	.542831	.186271	0.1086	0.8828
Comp4	.356561	.127054	0.0713	0.9541
Comp5	.229507	.	0.0459	1.0000

Principal components (eigenvectors)

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Unexplained
speech_obj~y	0.2489	0.7656	0.5843	0.1023	0.0005	0
para_objec~y	0.3922	0.4756	-0.7521	-0.2187	0.0806	0
sentence_o~y	0.5076	-0.1857	-0.1111	0.7910	-0.2643	0
quote_obje~y	0.5157	-0.3013	0.1949	-0.1174	0.7691	0
quote_sent..	0.5105	-0.2497	0.2064	-0.5497	-0.5764	0

```

441 predict pcl_objectivity, score
(4 components skipped)
```

Scoring coefficients
 sum of squares(column-loading) = 1

Variable	Comp1	Comp2	Comp3	Comp4	Comp5
speech_obj~y	0.2489	0.7656	0.5843	0.1023	0.0005
para_objec~y	0.3922	0.4756	-0.7521	-0.2187	0.0806
sentence_o~y	0.5076	-0.1857	-0.1111	0.7910	-0.2643
quote_obje~y	0.5157	-0.3013	0.1949	-0.1174	0.7691
quote_sent..	0.5105	-0.2497	0.2064	-0.5497	-0.5764

```
442 label variable pc1_objectivity "1st PC of objectivity scores"
```

```
443
```

```
444 pca $polarity
```

Principal components/correlation

Number of obs	=	14901
Number of comp.	=	5
Trace	=	5
Rho	=	1.0000

Rotation: (unrotated = principal)

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.06248	2.05593	0.6125	0.6125
Comp2	1.00655	.528862	0.2013	0.8138
Comp3	.477687	.183807	0.0955	0.9093
Comp4	.293879	.134476	0.0588	0.9681
Comp5	.159404	.	0.0319	1.0000

Principal components (eigenvectors)

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Unexplained
speech_pol~y	0.2633	0.8066	0.5246	-0.0700	-0.0010	0
para_polar~y	0.4172	0.3945	-0.7878	0.2115	-0.0709	0
sentence_p~y	0.4995	-0.1874	-0.0681	-0.7958	0.2783	0
quote_pola~y	0.5079	-0.2985	0.2160	0.1006	-0.7721	0
quote_s~rity	0.4992	-0.2638	0.2300	0.5540	0.5669	0

```
445 predict pc1_polarity, score  
(4 components skipped)
```

Scoring coefficients

sum of squares(column-loading) = 1

Variable	Comp1	Comp2	Comp3	Comp4	Comp5
speech_pol~y	0.2633	0.8066	0.5246	-0.0700	-0.0010
para_polar~y	0.4172	0.3945	-0.7878	0.2115	-0.0709
sentence_p~y	0.4995	-0.1874	-0.0681	-0.7958	0.2783
quote_pola~y	0.5079	-0.2985	0.2160	0.1006	-0.7721
quote_s~rity	0.4992	-0.2638	0.2300	0.5540	0.5669

```
446 label variable pc1_polarity "1st PC of polarity scores"
```

```
447
```

```
448 pca $readability
```

Principal components/correlation

Number of obs	=	14892
Number of comp.	=	9
Trace	=	9
Rho	=	1.0000

Rotation: (unrotated = principal)

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	4.66346	.918432	0.5182	0.5182
Comp2	3.74502	3.36503	0.4161	0.9343
Comp3	.379996	.290044	0.0422	0.9765
Comp4	.0899524	.0314177	0.0100	0.9865
Comp5	.0585347	.0128057	0.0065	0.9930
Comp6	.045729	.0363148	0.0051	0.9981
Comp7	.00941423	.00384603	0.0010	0.9991
Comp8	.0055682	.00324227	0.0006	0.9997
Comp9	.00232593	.	0.0003	1.0000

Principal components (eigenvectors)

> 7	Variable Comp8		Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp
			Comp9	Unexplained					
	flesch		-0.4214	-0.1897	0.0939	0.2212	-0.0950	0.7910	0.065
> 5	0.1126	0.2776	0						
	fleschkinc~d		0.4241	0.1467	0.3530	0.5914	-0.0282	-0.1558	0.007
> 8	0.1404	0.5286	0						
	gunningfog		0.4267	0.1482	0.3901	0.1310	-0.0042	0.4146	0.158
> 2	-0.2599	-0.6018	0						
	smog		0.4181	0.1883	0.1086	-0.6787	0.0938	0.3241	-0.215
> 2	0.1716	0.3573	0						
	dalechall		0.3409	0.2257	-0.8242	0.2474	0.0786	0.2546	0.129
> 9	0.0670	-0.0031	0						
	notdalechall		-0.1712	0.4759	-0.0546	0.1282	-0.3507	0.0584	-0.691
> 3	-0.3470	-0.0009	0						
	sentences		-0.2673	0.4103	0.0765	0.0194	0.7534	0.0132	0.149
> 8	-0.3685	0.1676	0						
	syllables		-0.2158	0.4542	0.1161	0.0766	0.1299	-0.0170	-0.085
> 1	0.7756	-0.3191	0						
	polysyllable		-0.1490	0.4828	0.0324	-0.1989	-0.5174	-0.0673	0.632
> 3	-0.0915	0.1540	0						

449 predict pcl_readability, score
(8 components skipped)

Scoring coefficients
sum of squares(column-loading) = 1

> 7	Variable Comp8		Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp
			Comp9						
	flesch		-0.4214	-0.1897	0.0939	0.2212	-0.0950	0.7910	0.065
> 5	0.1126	0.2776	0						
	fleschkinc~d		0.4241	0.1467	0.3530	0.5914	-0.0282	-0.1558	0.007
> 8	0.1404	0.5286	0						
	gunningfog		0.4267	0.1482	0.3901	0.1310	-0.0042	0.4146	0.158
> 2	-0.2599	-0.6018	0						
	smog		0.4181	0.1883	0.1086	-0.6787	0.0938	0.3241	-0.215
> 2	0.1716	0.3573	0						
	dalechall		0.3409	0.2257	-0.8242	0.2474	0.0786	0.2546	0.129
> 9	0.0670	-0.0031	0						
	notdalechall		-0.1712	0.4759	-0.0546	0.1282	-0.3507	0.0584	-0.691
> 3	-0.3470	-0.0009	0						
	sentences		-0.2673	0.4103	0.0765	0.0194	0.7534	0.0132	0.149
> 8	-0.3685	0.1676	0						
	syllables		-0.2158	0.4542	0.1161	0.0766	0.1299	-0.0170	-0.085
> 1	0.7756	-0.3191	0						
	polysyllable		-0.1490	0.4828	0.0324	-0.1989	-0.5174	-0.0673	0.632
> 3	-0.0915	0.1540	0						

```

450 label variable pc1_readability "1st PC of readability scores"
451
452 pca cttr msttr mattr mtld hdd maas // rttr and cttr are perfectly correlated, so rtt
> r is removed, herdan, ttr, and summer are removed because their kmo < 0.5

```

Principal components/correlation

	Number of obs	=	14850
	Number of comp.	=	6
	Trace	=	6
Rotation: (unrotated = principal)	Rho	=	1.0000

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	4.42888	3.53813	0.7381	0.7381
Comp2	.89075	.609435	0.1485	0.8866
Comp3	.281314	.106136	0.0469	0.9335
Comp4	.175178	.00385213	0.0292	0.9627
Comp5	.171326	.118774	0.0286	0.9912
Comp6	.0525522	.	0.0088	1.0000

Principal components (eigenvectors)

ained	Variable	Unexpl					
		Comp1	Comp2	Comp3	Comp4	Comp5	Comp6
> 0	cttr	0.2980	0.7855	-0.2293	0.4612	-0.1698	0.0103
> 0	msttr	0.4420	-0.2432	0.0978	0.3595	0.4571	-0.6306
> 0	mattr	0.4492	-0.2339	0.0407	0.2271	0.3147	0.7689
> 0	mtld	0.4271	-0.1620	0.5502	0.0179	-0.6971	-0.0479
> 0	hdd	0.4071	0.4021	0.2079	-0.7320	0.3037	-0.0346
> 0	maas	-0.4072	0.2850	0.7683	0.2652	0.2915	0.0863

```

453 predict pc1_lexical, score
(5 components skipped)

```

Scoring coefficients
sum of squares(column-loading) = 1

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6
cttr	0.2980	0.7855	-0.2293	0.4612	-0.1698	0.0103
msttr	0.4420	-0.2432	0.0978	0.3595	0.4571	-0.6306
mattr	0.4492	-0.2339	0.0407	0.2271	0.3147	0.7689
mtld	0.4271	-0.1620	0.5502	0.0179	-0.6971	-0.0479
hdd	0.4071	0.4021	0.2079	-0.7320	0.3037	-0.0346
maas	-0.4072	0.2850	0.7683	0.2652	0.2915	0.0863

```

454 label variable pc1_lexical          "1st PC of lexical richness scores"
455
456
457 assert_macros "length_s base_controls_min"
  Checking length_s:
    length_s contains: ln_quote      ln_speech      ln_article
  Checking base_controls_min:
    base_controls_min contains: i.parl          i.year          i.gender          i.race          c.age
    > c.age2          c.tenure        c.tenure2        i.weekday        i.section2      translations
    > speech_92K*     quote_92K*     article_40K*     i.rank          MFA          PMO          MEWR
    > MCI            MTI          MHA          MCCY          MinLaw          MOH          MOM          MinDef          MSF          MOT
    > MND            MOF          MOE          speaker        i.rank#(MFA)    PMO          MEWR          MCI          MT
    > I              MHA          MCCY          MinLaw        MOH          MOM          MinDef          MSF          MOT
    > MOF            MOE          speaker
458 *-----
459 *----- Panel A. String simlarity 1 with PC controls
460 *-----
461 eststo clear
462
463 eststo: qui reg ss1_quote_to_speech i.opposition $length_s $base_controls_min,
  >
  >           vce(cluster article_id)
  (est1 stored)
464 eststo: qui reg ss1_quote_to_speech i.opposition $length_s $base_controls_min pc1_obj
  > jectivity,
  >           vce(cluster article_id)
  (est2 stored)
465 eststo: qui reg ss1_quote_to_speech i.opposition $length_s $base_controls_min
  >           pc1_polarity,
  >           vce(cluster article_id)
  (est3 stored)
466 eststo: qui reg ss1_quote_to_speech i.opposition $length_s $base_controls_min
  >           pc1_readability,
  >           vce(cluster article_id)
  (est4 stored)
467 eststo: qui reg ss1_quote_to_speech i.opposition $length_s $base_controls_min
  >           pc1_l
  > exical, vce(cluster article_id)
  (est5 stored)
468 eststo: qui reg ss1_quote_to_speech i.opposition $length_s $base_controls_min pc1_obj
  > jectivity pc1_polarity pc1_readability pc1_lexical, vce(cluster article_id)
  (est6 stored)
469
470 #delimit ;
  delimiter now ;
471 esttab, keep(
  >           1.opposition
  >           pc1_objjectivity
  >           pc1_polarity
  >           pc1_readability
  >           pc1_lexical
  >           )
  >           coeflabel(`my_coeflabel')
  >           `esttab_options'
  >           order(`keep_coeff')
  > ;

```

	(1)	(2)	(3)	(4)	
> (5)	(6) ss1_quote~ch ~ch ss1_quote~ch	ss1_quote~ch	ss1_quote~ch	ss1_quote~ch	ss1_quote
1.opposition	-1.858** -2.024** (-2.61) (-2.83)	-1.808* (-2.54)	-1.855** (-2.61)	-2.120** (-2.97)	-1. (-2.)
> 764*					
> 48)					
pcl_object~y	-0.129* (-2.04)	-0.127* (-2.03)			
>					
pcl_polarity	-0.0287 (-0.47)		-0.0183 (-0.30)		
>					
pcl_readab~y	0.642*** (7.35)			0.649*** (7.73)	
>					
pcl_lexical	0.309*** (4.00)				0. (4.)
> 361***					
> 72)					
N	14901 14836	14899	14899	14890	14

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

```
472 esttab using $TABSavedIR/add-linguistics-panelA-substring-accuracy.tex,
>         replace
>         booktabs
>         fragment
>         keep(
>             1.opposition
>             pcl_objectivity
>             pcl_polarity
>             pcl_readability
>             pcl_lexical
>         )
>         coeflabel($coeff_labels)
>         b(%9.2fc)
>         se(%9.2fc)
>         star (* 0.1 ** 0.05 *** 0.01)
>         label
>         noobs
>         nomtitle
>         nonumbers
>         nolines
>         nogaps
>         noeqlines
>         nodepvars
> ;
(output written to ../results/tables/add-linguistics-panelA-substring-accuracy.tex)
```

```

473 esttab using $TABSAVEDIR/add-linguistics-panelA-substring-accuracy.md,
>     replace
>     se
>     star (* 0.1 ** 0.05 *** 0.01)
>     keep(
>         1.opposition
>         pcl_objectivity
>         pcl_polarity
>         pcl_readability
>         pcl_lexical
>     )
>     coeflabel($coeff_labels)
>     b(%9.2f)
>     se(%9.2f)
>     nonumbers
>     style(mmd)
>     mtitle("(1) Baseline" "(2) +Objectivity" "(3) +Polarity" "(4) +Readability" "(5)
> +Lexical" "(6) +All")
> ;
(output written to ../results/tables/add-linguistics-panelA-substring-accuracy.md)

474 #delimit cr
delimiter now cr
475
476 *-----
> -----
477 * Panel B. String similarity 2 with PC controls
478 *-----
> -----
479 eststo clear

480
481 eststo: qui reg ss2_quote_to_speech i.opposition $length_s $base_controls_min,
>
>           vce(cluster article_id)
(est1 stored)

482 eststo: qui reg ss2_quote_to_speech i.opposition $length_s $base_controls_min pcl_ob
> jectivity,
>           vce(cluster article_id)
(est2 stored)

483 eststo: qui reg ss2_quote_to_speech i.opposition $length_s $base_controls_min
>           pcl_polarity,
>           vce(cluster article_id)
(est3 stored)

484 eststo: qui reg ss2_quote_to_speech i.opposition $length_s $base_controls_min
>           pcl_readability,
>           vce(cluster article_id)
(est4 stored)

485 eststo: qui reg ss2_quote_to_speech i.opposition $length_s $base_controls_min
>           pcl_l
> exical, vce(cluster article_id)
(est5 stored)

486 eststo: qui reg ss2_quote_to_speech i.opposition $length_s $base_controls_min pcl_ob
> jectivity pcl_polarity pcl_readability pcl_lexical, vce(cluster article_id)
(est6 stored)

```

```

487
488 #delimit ;
  delimiter now ;
489 esttab, keep(
  >           1.opposition
  >           pcl_objectivity
  >           pcl_polarity
  >           pcl_readability
  >           pcl_lexical
  >       )
  >       coeflabel(`my_coeflabel')
  >       `esttab_options'
  >       order(`keep_coeff')
  > ;



---



|              | (1)             | (2)             | (3)             | (4)             |
|--------------|-----------------|-----------------|-----------------|-----------------|
| > (5) (6)    | ss2_quote~ch    | ss2_quote~ch    | ss2_quote~ch    | ss2_quote~ch    |
| > ~ch        | ss2_quote~ch    |                 |                 | ss2_quote       |
| 1.opposition | <b>-2.149**</b> | <b>-2.124**</b> | <b>-2.145**</b> | <b>-2.238**</b> |
| > 151**      | <b>-2.226**</b> |                 |                 |                 |
|              | (-3.07)         | (-3.03)         | (-3.07)         | (-3.19)         |
| > 09)        | (-3.18)         |                 |                 | (-3.)           |
| pcl_object~y |                 | <b>-0.0790</b>  |                 |                 |
| >            | <b>-0.0787</b>  |                 |                 |                 |
|              |                 | (-1.58)         |                 |                 |
| >            | (-1.55)         |                 |                 |                 |
| pcl_polarity |                 |                 | <b>0.0234</b>   |                 |
| >            | <b>0.00837</b>  |                 |                 |                 |
|              |                 |                 | (0.50)          |                 |
| >            | (0.17)          |                 |                 |                 |
| pcl_readab~y |                 |                 |                 | <b>0.219**</b>  |
| >            | <b>0.221**</b>  |                 |                 |                 |
|              |                 |                 |                 | (2.99)          |
| >            | (2.83)          |                 |                 |                 |
| pcl_lexical  |                 |                 |                 | 0.              |
| > 136        | <b>0.117</b>    |                 |                 |                 |
| > 78)        | (1.49)          |                 |                 | (1.)            |



---



| N     | 14901        | 14899 | 14899 | 14890 | 14 |
|-------|--------------|-------|-------|-------|----|
| > 848 | <b>14836</b> |       |       |       |    |



---



t statistics in parentheses  

  * p<0.05, ** p<0.01, *** p<0.001



```

490 esttab using $TABSavedIR/add-linguistics-panelB-bow-accuracy.tex,
 > replace
 > booktabs
 > fragment
 > keep(
 > 1.opposition
 > pcl_objectivity
 > pcl_polarity
 > pcl_readability
 > pcl_lexical
 >)
 > coeflabel($coeff_labels)
 > b(%9.2fc)
 > se(%9.2fc)
 > star (* 0.1 ** 0.05 *** 0.01)
 > label

```


```

```

>      noobs
>      nomtitle
>      nonumbers
>      nolines
>      nogaps
>      noeqlines
>      nodepvars
> ;
(output written to ../results/tables/add-linguistics-panelB-bow-accuracy.tex)

491 esttab using $TABSAVEDIR/add-linguistics-panelB-bow-accuracy.md,
>         replace
>         se
>         star (* 0.1 ** 0.05 *** 0.01)
>         keep(
>             1.opposition
>             pcl_objectivity
>             pcl_polarity
>             pcl_readability
>             pcl_lexical
>         )
>         coeflabel($coeff_labels)
>         b(%9.2f)
>         se(%9.2f)
>         nonumbers
>         style(mmd)
>         mtitle("(1) Baseline" "(2) +Objectivity" "(3) +Polarity" "(4) +Readability" "(5)
> +Lexical" "(6) +All")
> ;
(output written to ../results/tables/add-linguistics-panelB-bow-accuracy.md)

492 #delimit cr
delimiter now cr
493 -----
> -----
495 * Panel C. Semantic similarity with PC controls
496 -----
> -----
497 eststo clear

498 eststo: qui reg ce_max_quote2speech i.opposition $length_s $base_controls_min,
>
>           vce(cluster article_id)
(est1 stored)

499 eststo: qui reg ce_max_quote2speech i.opposition $length_s $base_controls_min pcl_ob
> jectivity,
>           vce(cluster article_id)
(est2 stored)

500 eststo: qui reg ce_max_quote2speech i.opposition $length_s $base_controls_min
>           pcl_polarity,
>           vce(cluster article_id)
(est3 stored)

501 eststo: qui reg ce_max_quote2speech i.opposition $length_s $base_controls_min
>           pcl_readability,
>           vce(cluster article_id)
(est4 stored)

```

```

502 eststo: qui reg ce_max_quote2speech i.opposition $length_s $base_controls_min
>                                         pc1_1
> exical, vce(cluster article_id)
(est5 stored)

503 eststo: qui reg ce_max_quote2speech i.opposition $length_s $base_controls_min pc1_ob
> jectivity pc1_polarity pc1_readability pc1_lexical, vce(cluster article_id)
(est6 stored)

504
505 #delimit ;
506 delimiter now ;
506 esttab, keep(
>                               1.opposition
>                               pc1_objectivity
>                               pc1_polarity
>                               pc1_readability
>                               pc1_lexical
>                               )           coeflabel(`my_coeflabel')
> esttab_options'
>                               order(`keep_coeff')
> ;



---



|                    | (1)          | (2)          | (3)          | (4)          |
|--------------------|--------------|--------------|--------------|--------------|
| > (5) (6)          | ce_max_quo~h | ce_max_quo~h | ce_max_quo~h | ce_max_quo~h |
| > o~h ce_max_quo~h |              |              |              |              |
| 1.opposition       | -4.053**     | -4.104**     | -4.097**     | -4.078**     |
| > 882**            | -3.969**     |              |              |              |
|                    | (-2.78)      | (-2.81)      | (-2.81)      | (-2.80)      |
| > 65)              | (-2.71)      |              |              |              |
| pc1_object~y       |              | 0.0897       |              |              |
| >                  | 0.0787       |              |              |              |
|                    | (0.62)       | (0.73)       |              |              |
| pc1_polarity       |              |              | -0.100       |              |
| >                  | -0.0739      |              | (-0.82)      |              |
|                    | (-0.58)      |              |              |              |
| pc1_readab~y       |              |              |              | 0.0911       |
| >                  | 0.0550       |              |              | (0.57)       |
|                    | (0.33)       |              |              |              |
| pc1_lexical        |              |              |              | 0.           |
| > 420**            | 0.414**      |              |              | (2.)         |
| > 75)              | (2.68)       |              |              |              |
| N                  | 14901        | 14899        | 14899        | 14890        |
| > 848              | 14836        |              |              | 14           |



---



t statistics in parentheses  

* p<0.05, ** p<0.01, *** p<0.001


```

```

507 esttab using $TABSAVEDIR/add-linguistics-panelC-semantic-accuracy.tex,
>     replace
>     booktabs
>     fragment
>     keep(
>         1.opposition
>         pc1_objectivity
>         pc1_polarity
>         pc1_readability
>         pc1_lexical
>     )
>     coeflabel($coeff_labels)
>     b(%9.2fc)
>     se(%9.2fc)
>     star (* 0.1 ** 0.05 *** 0.01)
>     label
>     noobs
>     nomtitle
>     nonumbers
>     nolines
>     nogaps
>     noeqlines
>     nodepvars
> ;
(output written to ../results/tables/add-linguistics-panelC-semantic-accuracy.tex)

508 esttab using $TABSAVEDIR/add-linguistics-panelC-semantic-accuracy.md,
>     replace
>     se
>     star (* 0.1 ** 0.05 *** 0.01)
>     keep(
>         1.opposition
>         pc1_objectivity
>         pc1_polarity
>         pc1_readability
>         pc1_lexical
>     )
>     coeflabel($coeff_labels)
>     b(%9.2f)
>     se(%9.2f)
>     nonumbers
>     style(mmd)
>     mtitle("(1) Baseline" "(2) +Objectivity" "(3) +Polarity" "(4) +Readability" "(5)
> +Lexical" "(6) +All")
> ;
(output written to ../results/tables/add-linguistics-panelC-semantic-accuracy.md)

509 #delimit cr
delimiter now cr
510
511
512 tictoc toc 1
-----
Time log -----
Start time: 2 Dec 2025 12:20:45
End time: 2 Dec 2025 12:21:54
Elapsed seconds: 68
Elapsed minutes: 1
Elapsed hours: .02
-----
513 beepme 2
514 log close
    name: <unnamed>
    log: \\wsl.localhost\Debian\home\lsys\neutrality\analysis\logs\table3.smcl
    log type: smcl
    closed on: 2 Dec 2025, 12:21:56

```