Gender differences in linguistic complexity through time

Freek Van de Velde

KU LEUVEN

Quantitative Lexicology and Variational Linguistics

Men's and women's language

- Robust gender differences:
  - Phonology
  - Lexicon
  - Grammar

Labov 1990; Tannen 1994; Rayson et al. 1997; Coates 1998; Biber et al. 1998; Biber & Burges 2000; Härnqvist et al. 2003; Pennebaker et al. 2003; Newman et al. 2008; Yuasa 2010; Keune 2013; Warriner et al. 2013; Podesva & Kajino 2014; Verheijen & Spooren 2017; Hilte et al. 2020, 2022.

Lexicon

- No noticeable differences in vocabulary size
- Noticeable differences in individual words:

Word	P_Male	P_Female	Word	P_Male	P_Female
howitzer	0.84	0.53	peplum	0.13	0.64
thermistor	0.48	0.17	tulle	0.27	0.77
azimuth	0.58	0.27	chignon	0.24	0.72
femtosecond	0.47	0.15	bandeau	0.35	0.81
milliamp	0.69	0.37	freesia	0.27	0.72
aileron	0.55	0.22	chenille	0.34	0.76
servo	0.61	0.28	kohl	0.36	0.77
degauss	0.59	0.26	verbena	0.30	0.70
boson	0.76	0.44	doula	0.21	0.59
checksum	0.58	0.25	ruche	0.18	0.55
piezoelectricity	0.51	0.18	espadrille	0.36	0.73
gauss	0.64	0.31	damask	0.43	0.80
katana	0.80	0.47	jacquard	0.39	0.74
shemale	0.88	0.54	whipstitch	0.37	0.71
neodymium	0.56	0.21	boucle	0.16	0.50
yakuza	0.69	0.32	taffeta	0.53	0.87
teraflop	0.58	0.22	sateen	0.38	0.72
strafe	0.83	0.46	chambray	0.43	0.77
parsec	0.83	0.44	pessary	0.19	0.53
bushido	0.60	0.21	voile	0.34	0.68

Brysbaert et al. 2019

Lexicon and Grammar

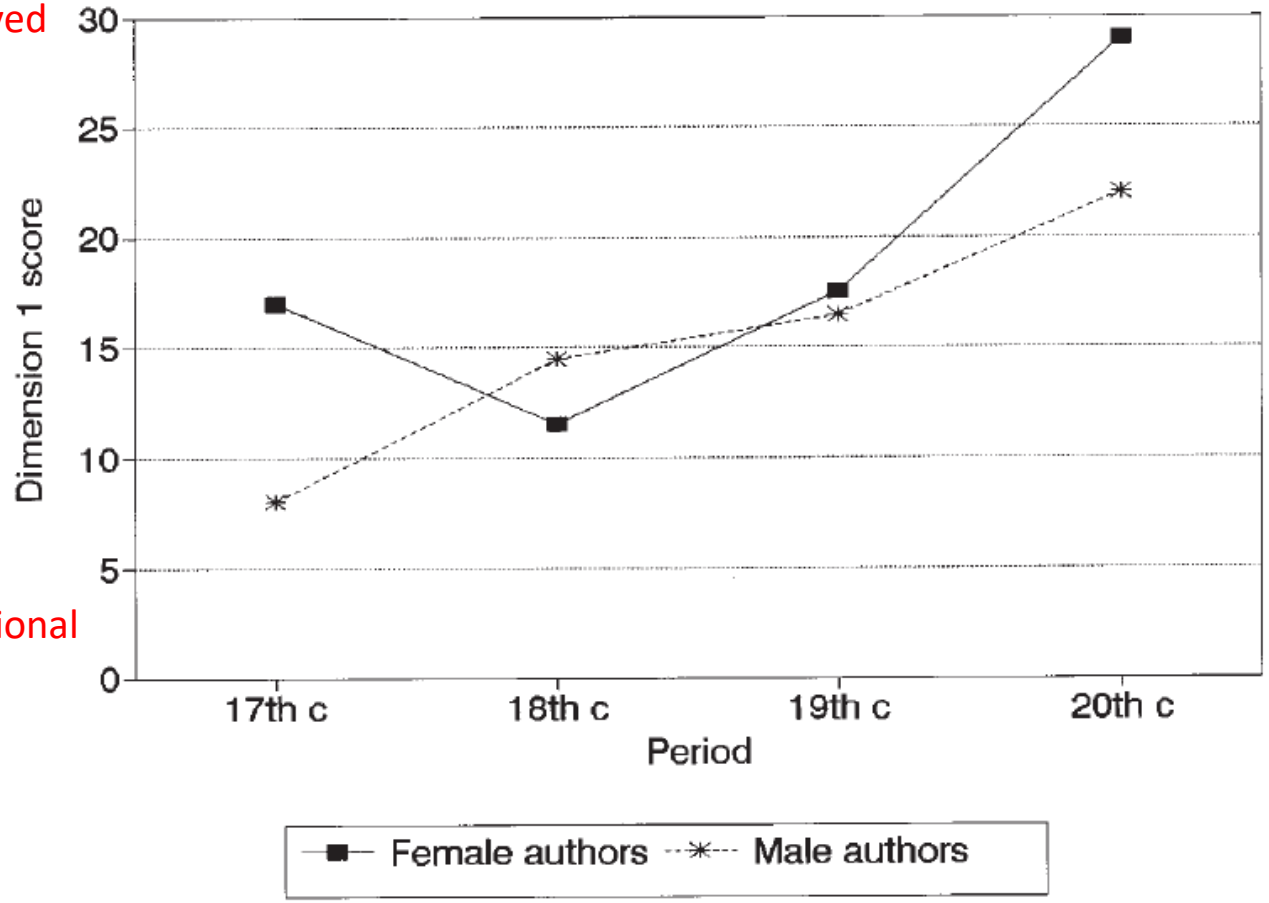
- Differences:
  - Men: 'report' vs. women: 'rapport'
  - Men: 'informative' vs. women 'involved'

Tannen 1994; Biber and Burges 2000; Brownlow et al. 2003.

Diachrony

Lexicon and grammar

more involved
'rapport'



more informational
'report'

Biber & Burges (2000)

Lexicon and grammar

DE GRUYTER MOUTON Linguistics 2022; aop

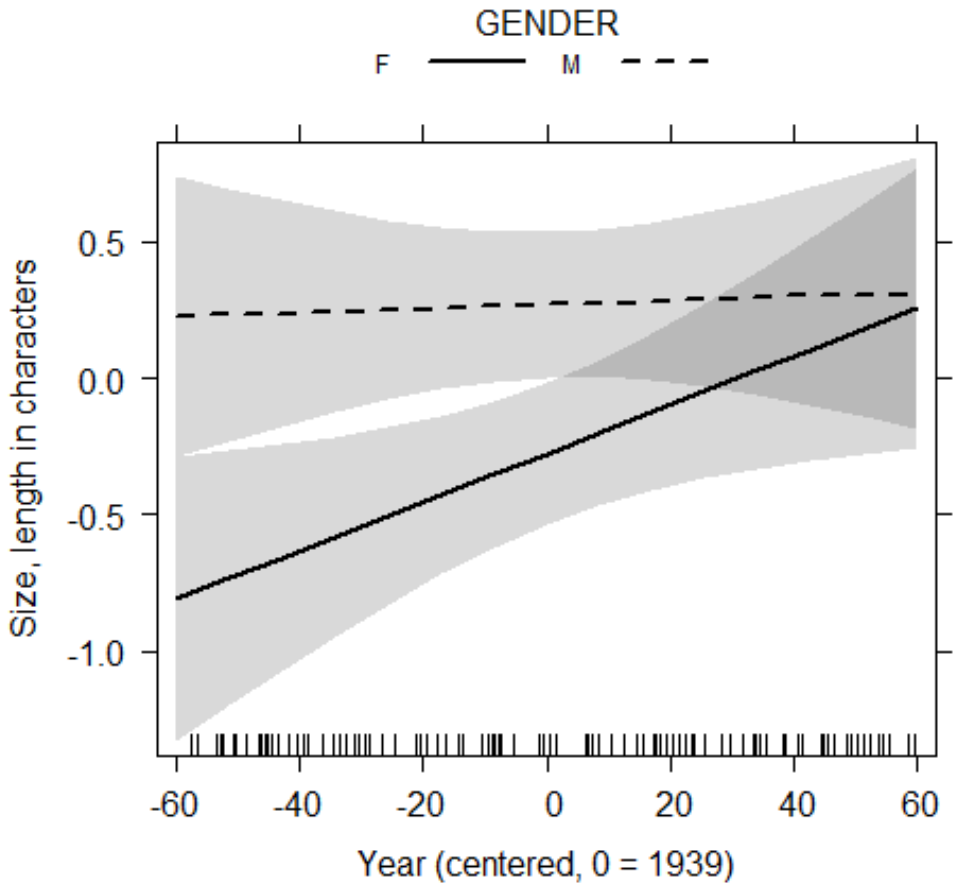
Jozefien Piersoul and Freek Van de Velde*

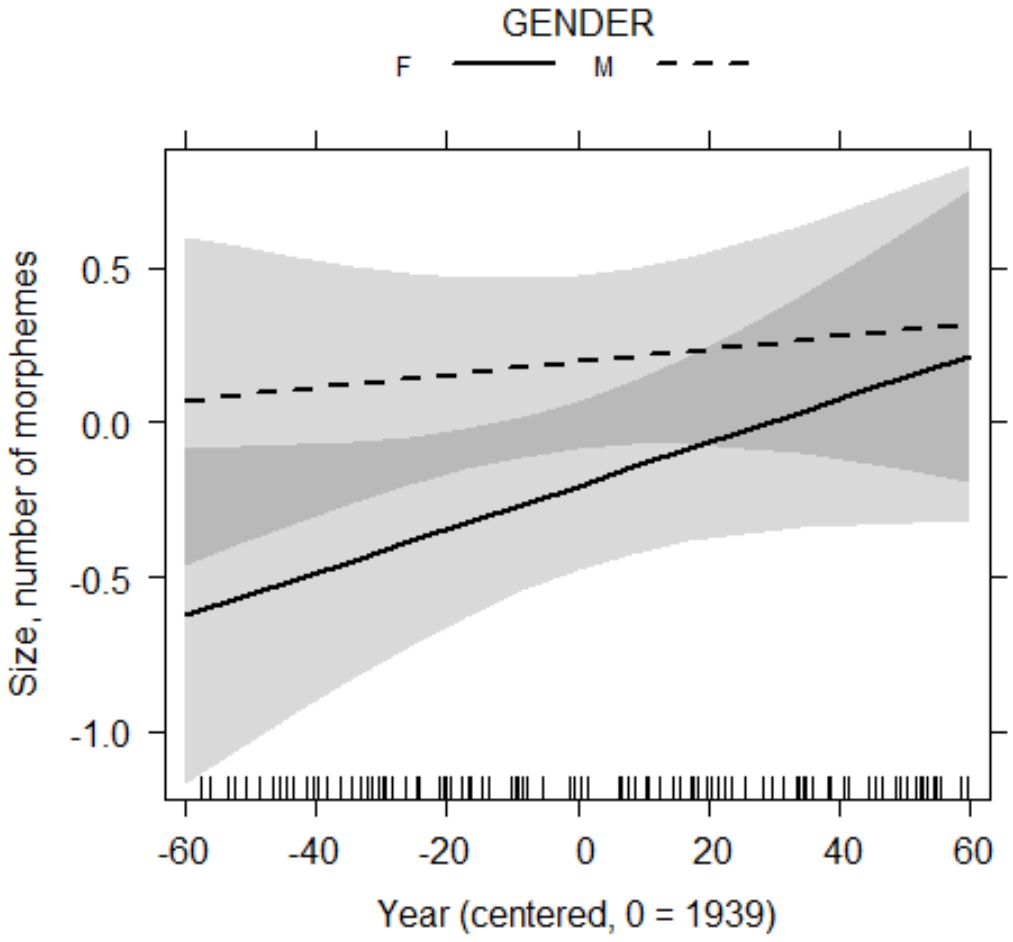
Men use more complex language than women, but the difference has decreased over time: a study on 120 years of written Dutch

https://doi.org/10.1515/ling-2021-0022
Received February 15, 2021; accepted July 2, 2022; published online October 19, 2022

- articles from Dutch CCLAMP corpus (1880-1999)
- 117 articles, 80611 words, 59 female authors, 58 male authors
- Tscan software (Kraf & Pander Maat 2009; Pander Maat et al. 2019)

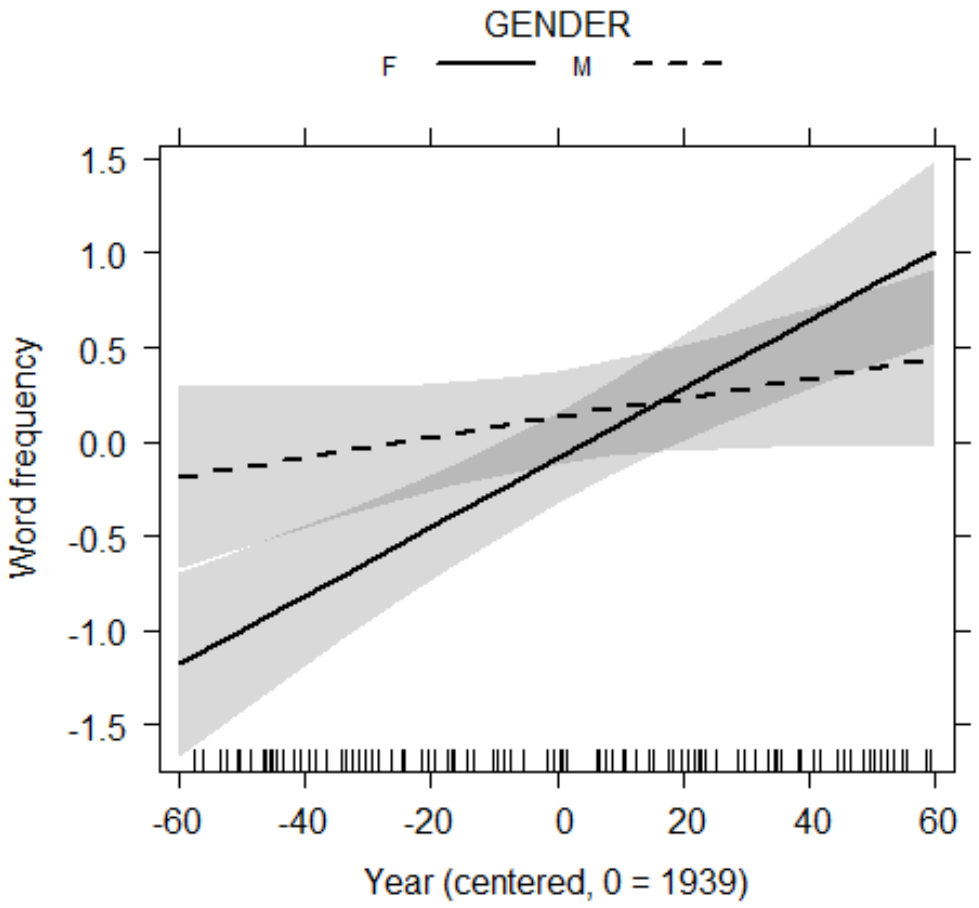
Size used to matter

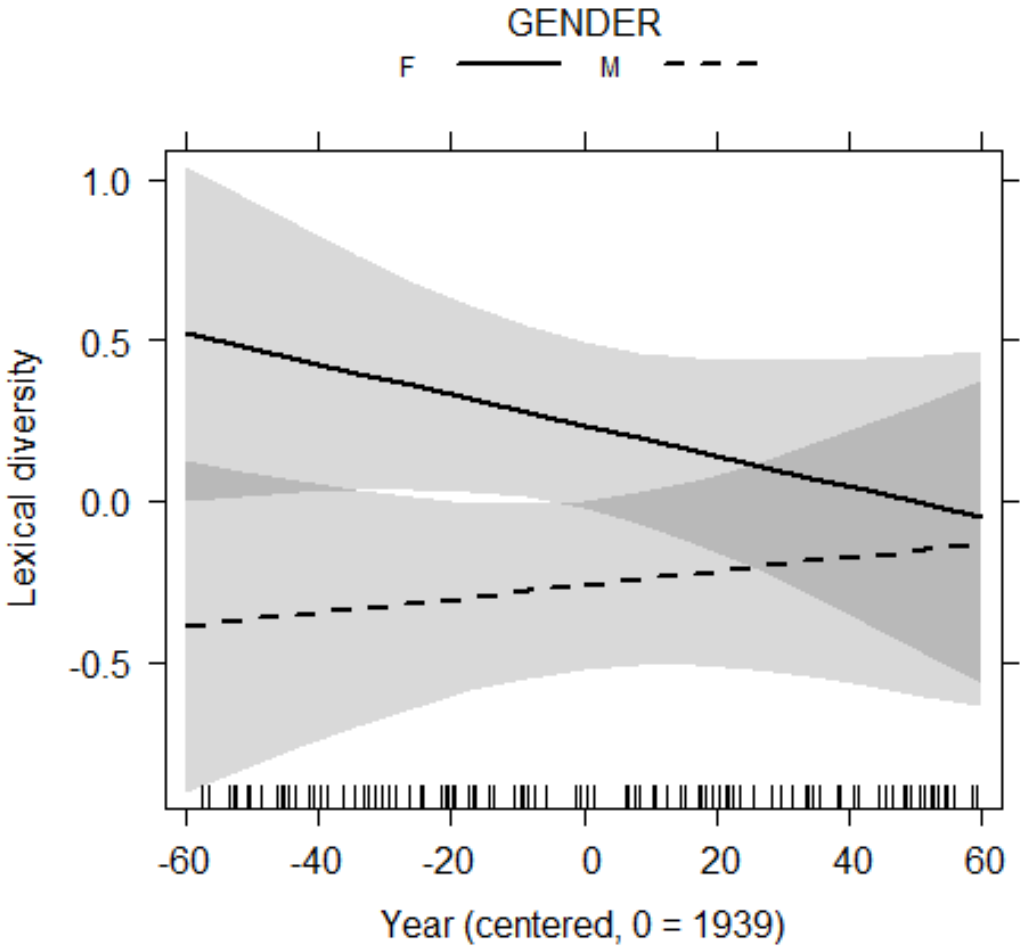




in praesentia (syntagmatic) ⇨ men more complex, female-to-male convergence

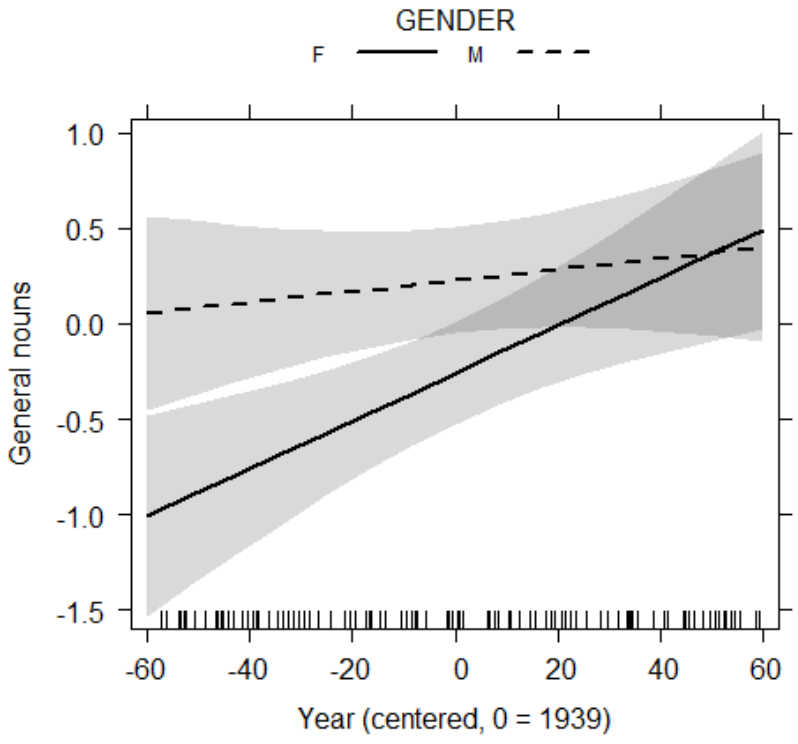
Frequency and lexical diversity

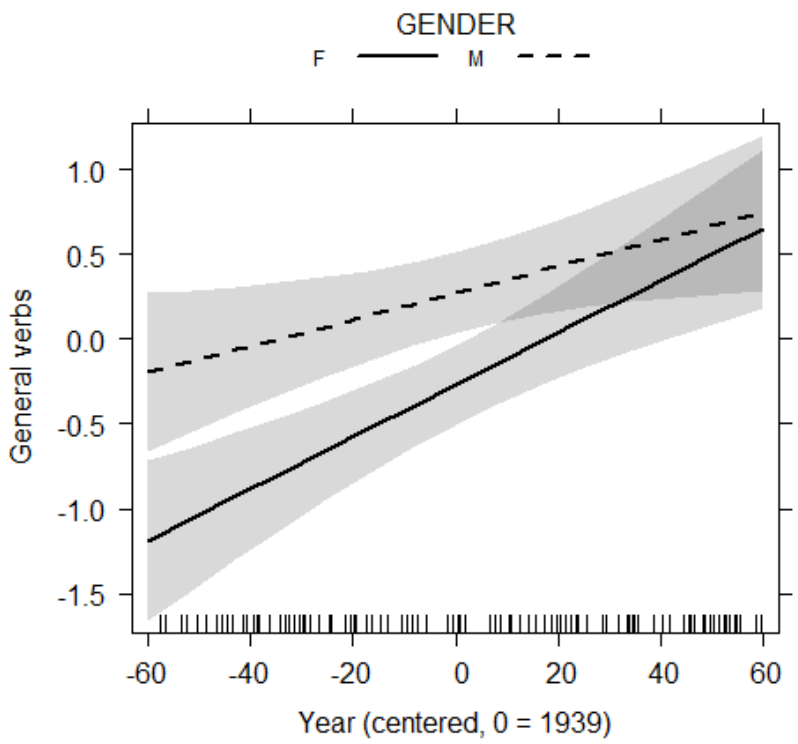


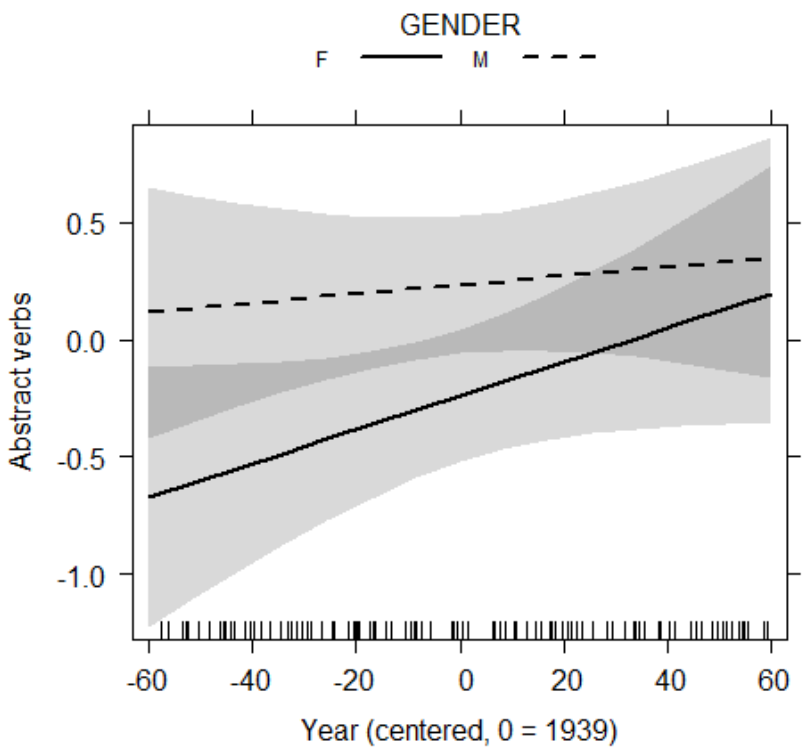


in absentia (paradigmatic) ⇨ men less complex, female-to-male convergence

Semantics

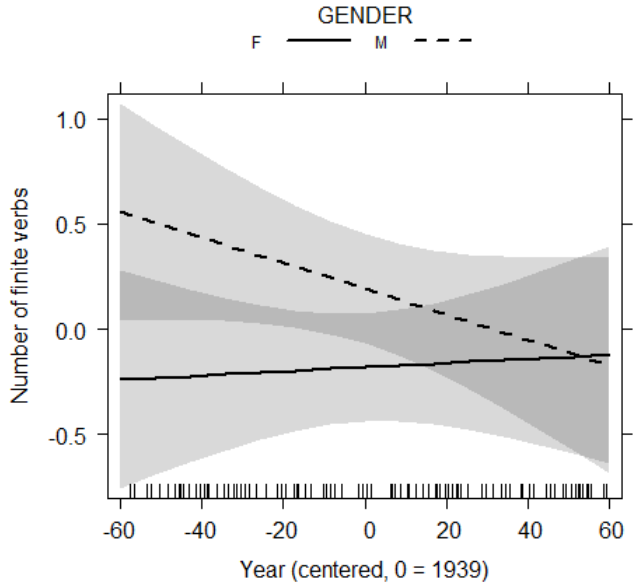


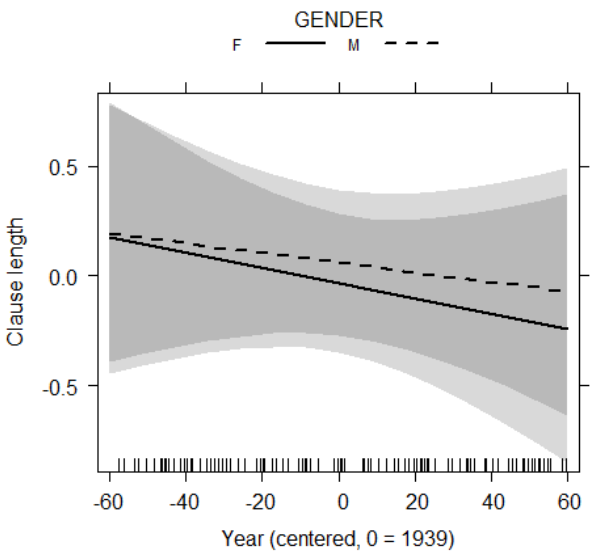


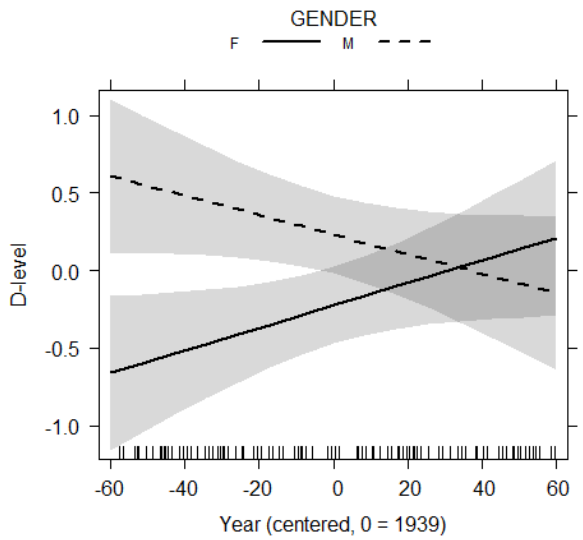


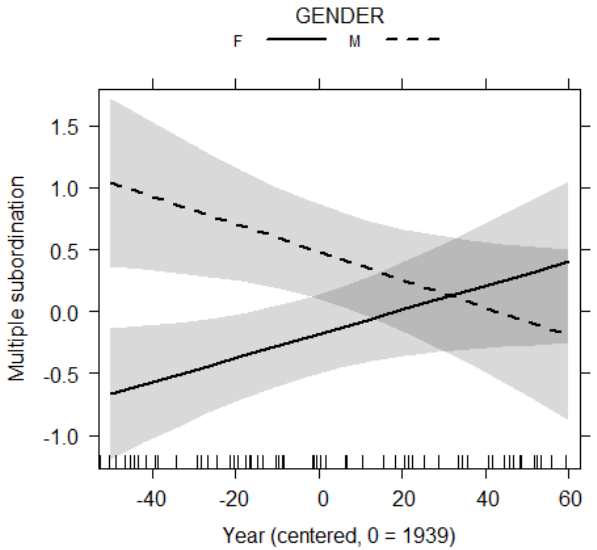
in absentia (paradigmatic) ⇨ men more complex, female-to-male convergence

Syntax









in praesentia (syntagmatic) ⇨ men more complex, male-to-female convergence

Explanations

- For the difference:
  - Conformity to social roles (gender as social construct)
  - Biological differences (behavioral dimorphism)

- For the convergence
  - Decreasing behavioral dimorphism (in occupational roles etc.)

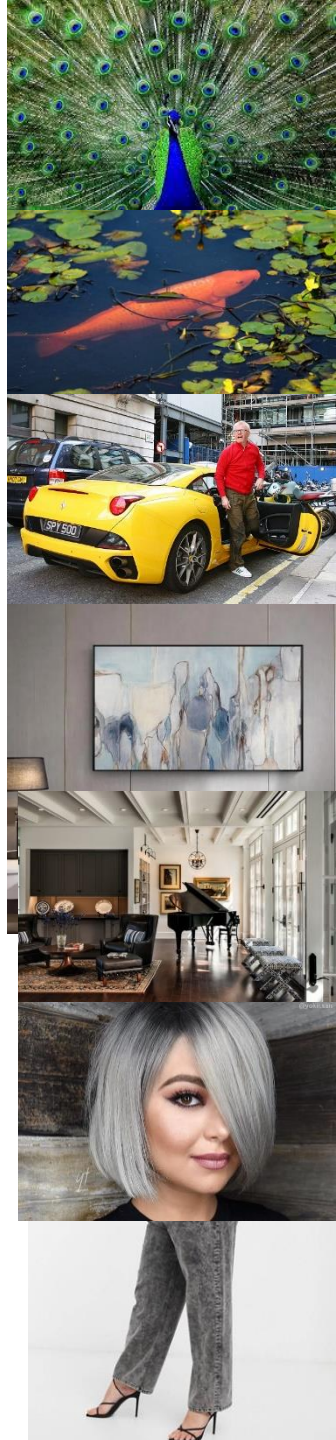
Differences in the explanation

- In linguistics: heavy reliance on gender as a social construct
- In social psychology: readiness to accept evolutionary accounts
  - Sexual selection
  - Linguistic complexity as a Zahavi handicap (Zahavi 1997)
  - Ostentatious display in a moderate tournament species

    "Effective verbal courtship is a reliable fitness indicator precisely because it is costly and difficult." (Miller 2000: 382)

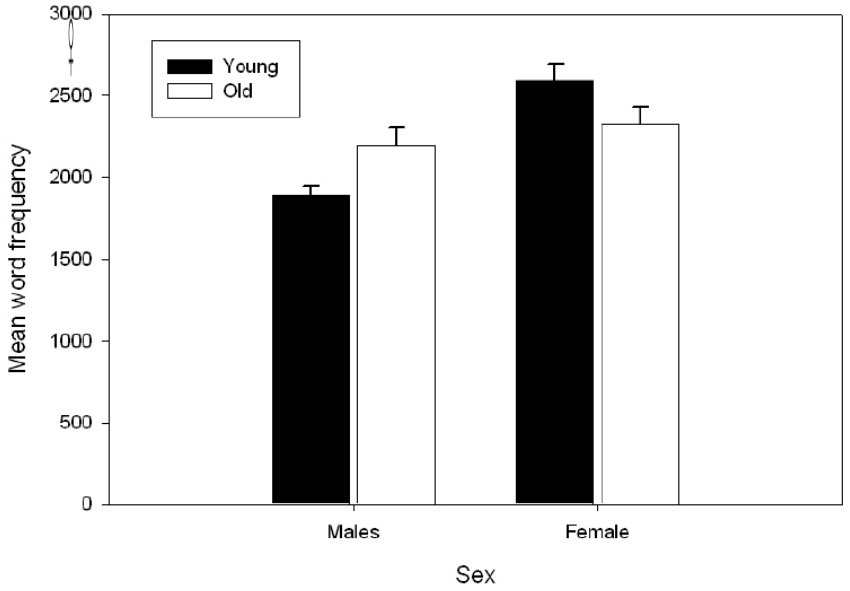
    "[T]he idea that language evolved for verbal courtship solves the altruism problem by identifying a sexual payoff for speaking well. (...) Language complexity could have evolved through a combination of runaway sexual selection, mental biases in favor of well-articulated thoughts, and fitness indicator effects." (Miller 2000: 353)

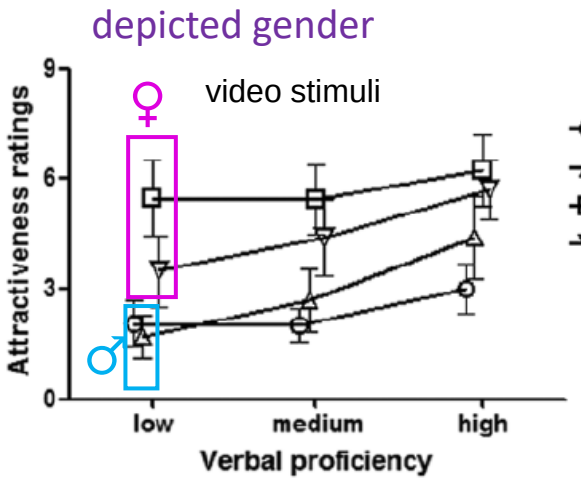
    "Good language skills may indeed enhance reproductive success." (Christiansen & Chater 2008: 498)

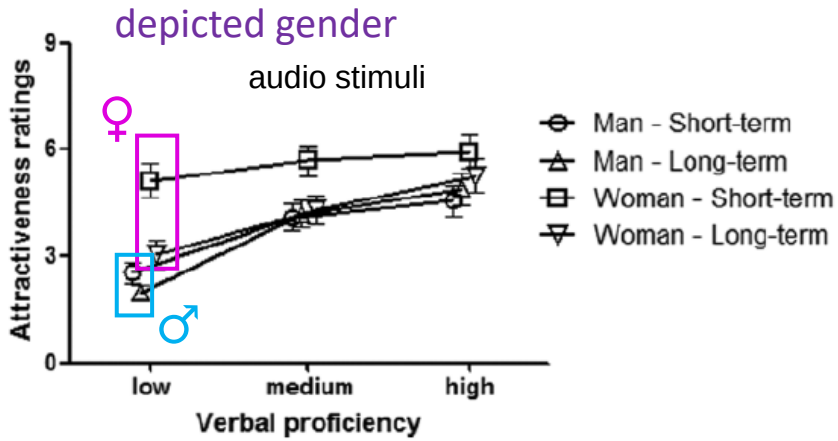


Lexicon

- Men use more complex words in flirtatious contexts (Rosenberg & Tunney 2008)
- Women are more attracted to verbal display (according to themselves) (Cohen's d 0.24, $p < 0.05$) (Lange 2011)
- Language proficiency is an important factor in attraction, especially with female assessors (Lange et al. 2014)





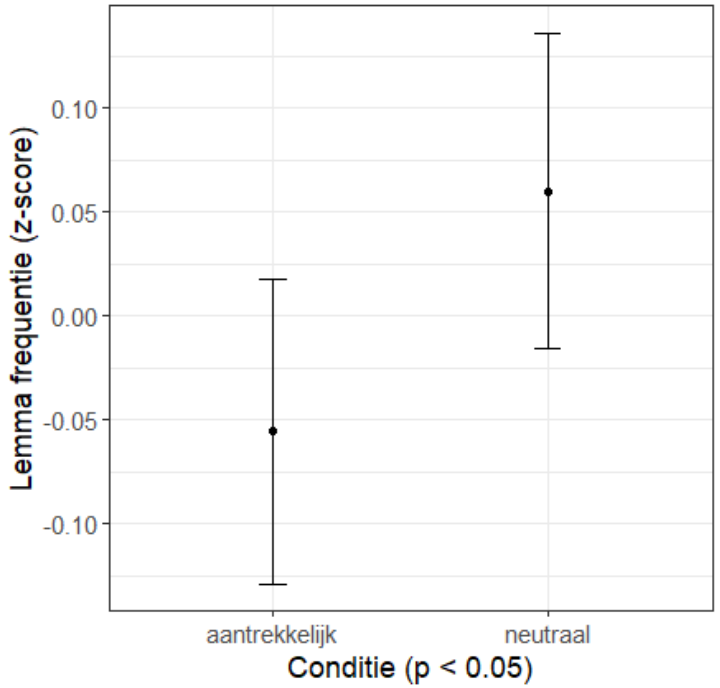


Lexicon

- Men use more complex words when talking to an attractive women, even in *non*-flirtatious contexts (Essers & Van de Velde 2020)

Cohen's d = 1.31

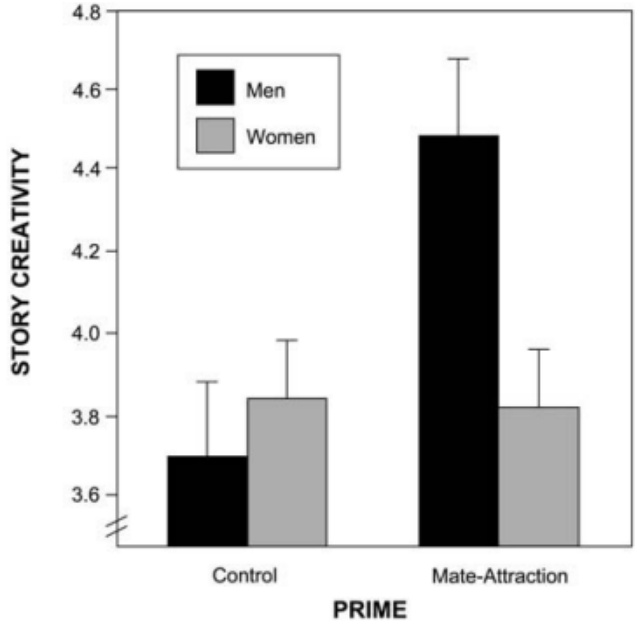
Cohen's d = 0.11

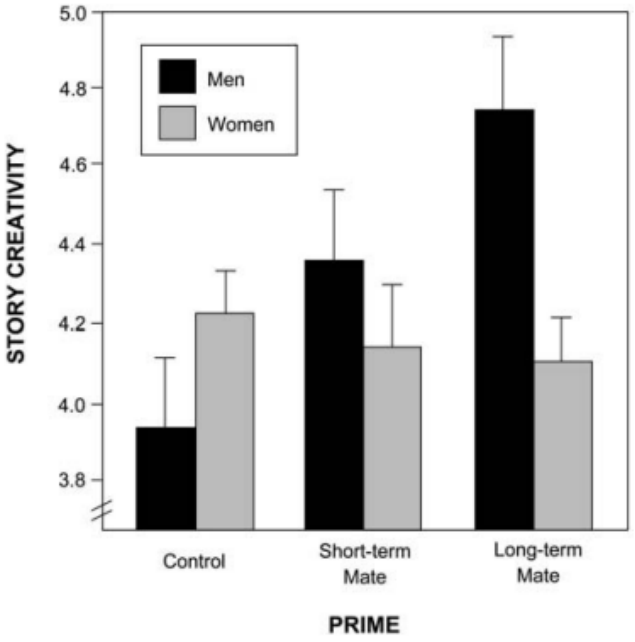


Effect plot linear mixed-model

Support for the evolutionary account

- (Young urban) men use more English code-switching / nonce borrowings in mixed-gender settings (Zenner et al. 2014)
- Effect of attraction on story telling creativity (Griskevicius 2006)





Conclusion

- Robust differences between men and women
- Men use more complex language, especially in praesentia
- This does NOT mean that men are more proficient in languages
- Differences are small, and diminishing through time, maybe in respons to decreasing behavioral dimorphism

References

- Biber D., S. Conrad & R. Reppen. 1998. *Corpus linguistics: investigating language structure and use*. Cambridge: CUP.
- Biber, D. & J. Burges. 2000. 'Historical change in the language use of women and men: gender differences in dramatic dialogue'. *Journal of English Linguistics* 28(1): 21-37.
- Brownlow, S., J. Rosamond & J. Parker. 2003. 'Gender-linked linguistic behavior in television interviews'. *Sex Roles* 49: 121-132.
- Brysbaert, M., P. Mandera, S.F. McCormick et al. 2019. 'Word prevalence norms for 62,000 English lemmas'. *Behavior Research Methods* 51: 467-479.
- Christiansen, M.H. & N. Chater. 2008. 'Language as shaped by the brain'. Behavioral and Brain Sciences 31(5): 489-508.
- Coates, J. 1998. *Language and gender: a reader*. Oxford: Blackwell.
- Degaetano-Ortlieb, S., T. Säily & Y. Bizzoni. 2021. 'Registerial adaptation vs. innovation across situational contexts: 18th century women in transition'. *Frontiers in Artificial Intelligence* 4, 609970.
- Essers, Charlotte & Freek Van de Velde. 2020. 'Linguistic complexity increases as a function of attractiveness in intersexual communication. Tentative experimental support'. In: Molly Flaherty, Katie Mudd, Hannah Little, Tessa Verhoef, Andrea Ravignani, Chiara Barbieri, Yannick Jadoul, Ella Lattenkamp, Mauricio Martins (eds.), *The evolution of language. Proceedings of the 13th International Conference on the Evolution of Language (EvoLang13)*. 87-89.
- Foolen, A. 2005. 'Language origins and sexual selection'. In: H. Jacobs & L. Wetzels (eds.), *Liber Amicorum Bernard Bichakjian*. Maastricht: Shaker. 37-58.
- Griskevicius, V., R.B. Cialdini & D.T. Kenrick. 2006. 'Peacocks, Picasso, and parental investment: the effects of romantic motives on creativity'. *Journal of Personality and Social Psychology* 91(1): 63-76.
- Härnqvist, K., U. Christianson, D. Ridings & J.-G. Tingsell. 2003. 'Vocabulary in interviews as related to respondent characteristics'. *Computers and the Humanities* 37: 179-204.
- Hilte, L., W. Daelemans & R. Vandekerckhove. 2020. 'Lexical patterns in adolescents' online writing: the impact of age, gender, and education'. *Written Communication* 37(3): 365-400.
- Hilte, L., R. Vandekerckhove & W. Daelemans. 2022. 'Linguistic accommodation in teenagers' social media writing: convergence patterns in mixed-gender conversations'. *Journal of Quantitative Linguistics* 29(2): 241-268.

References (continued)

- Keune, K. 2013. *Explaining register and sociolinguistic variation in the lexicon: corpus studies on Dutch*. Utrecht: LOT Dissertation.
- Labov, W. 1990. 'The intersection of sex and social class in the course of linguistic change'. *Language Variation and Change* 2(2): 205-254.
- Lange, B.P. 2011. 'Male proneness to verbal display production'. *Acta Linguistica* 5: 97-104.
- Lange, B.P., E. Zaretsky, S. Schwarz & H.A. Euler. 2014. 'Words won't fail: experimental evidence on the role of verbal proficiency in mate choice'. *Journal of Language and Social Psychology* 33(5): 482-499.
- Miller, G. 2002. *The mating mind: How sexual choice shaped the evolution of human nature*. New York: Doubleday.
- Newman, M., C. Groom, L. Handelman & J. Pennebaker. 2008. 'Gender differences in language use: an analysis of 14,000 text samples'. *Discourse Processes* 45: 211-236.
- Palander-Collin, M. 1999. 'Male and female styles in 17th century correspondence: I THINK'. *Language Variation and Change* 11: 123-141.
- Pander Maat, H., R. Kraft, A. Van den Bosch, M. Van Gompel, S. Kleijn, T. Sanders & K. Van der Sloot. 2014. 'T-Scan: a new tool for analyzing Dutch text'. *Computational Linguistics in the Netherlands Journal* 4: 53-74.
- Pennebaker, J., M. Mehl &K. Niederhoffer. 2003. 'Psychological aspects of natural language use: our words, our selves'. *Annual Review of Psychology* 54: 547-577.
- Piersoul, J., R. De Troij & F. Van de Velde. 2021. '150 Years of written Dutch: the construction of the Dutch corpus of contemporary and late modern periodicals'. *Nederlandse Taalkunde* 26(3): 339-362.
- Podesva, R. & S. Kajino. 2014. 'Sociophonetics, gender, and sexuality'. In: S. Ehrlich, M. Meyerhoff & J. Holmes (eds.), *The handbook of language, gender and sexuality*. 2nd edn. Chichester: Wiley Blackwell. 103-122.
- Rayson, P., G. Leech & M. Hodges. 1997. 'Social differentiation in the use of English vocabulary: some analyses of the conversational component of the British National Corpus'. *International Journal of Corpus Linguistics* 2(1): 133-152.
- Rosenberg, J. & R.J. Tunney. 2008. 'Human vocabulary use as display'. *Evolutionary Psychology* 6(3): 538-549.
- Tannen, D. 1994. *Gender and discourse*. Oxford: Oxford University Press.
- Verheijen, L. & W. Spooren. 2017. 'The impact of WhatsApp on Dutch youths' school writing'. In: E. Stemle & C. Wigham (eds.), P*roceedings of the 5th conference on CMC and social media corpora for the humanities (cmccorpora17).* 6-10.

References (continued)

- Warriner, A.B., V. Kuperman & M. Brysbaert. 2013. 'Norms of valence, arousal, and dominance for 13,915 English lemmas'. *Behavior Research Methods* 45: 1191-1207.
- Yuasa, I.P. 2010. 'Creaky voice: a new feminine voice quality for young urban-oriented upwardly mobile America in women?'. *American Speech* 85: 315-337.
- Zahavi, A. 1997. *The handicap principle: a missing piece of Darwin's puzzle*. Oxford: Oxford University Press.
- Zenner, E., D. Speelman & D. Geeraerts. 2014. 'A sociolinguistic analysis of borrowing in weak contact situations: English loanwords and phrases in expressive utterances in a Dutch reality TV show'. *International Journal Of Bilingualism* 19(3): 333-346.