
尊敬表現のバリエーションの理解に向けて

統計数理研究所言語系共同研究グループ研究発表会

「言語と統計 2021」（セミナーシリーズ No. 16）

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日時：2021/3/20（土・祝） 0930～1630

会場：Zoom でのオンライン開催

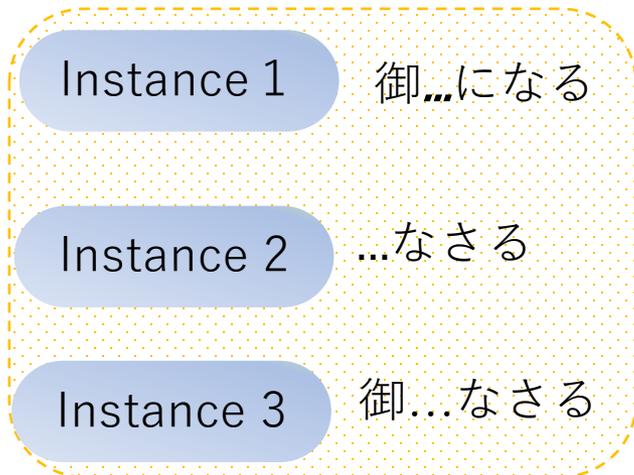


1 Introduction

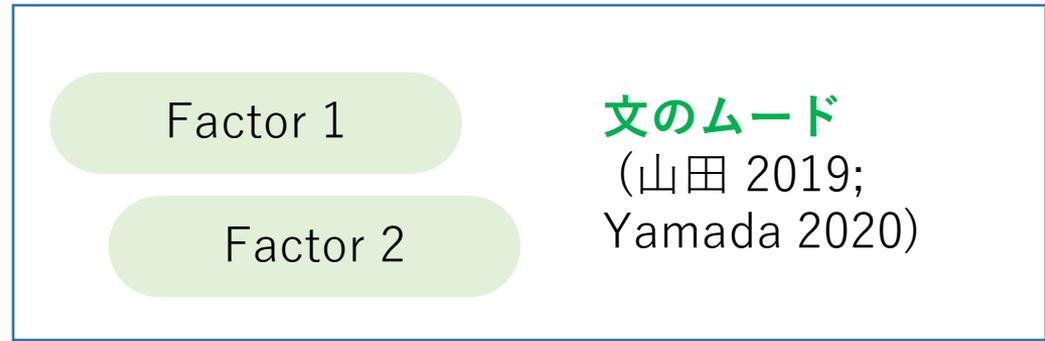
I Introduction

Topic: 言語変異…秩序だった多様性 (Orderly Heterogeneous; **Weinlich et al.** 1968)

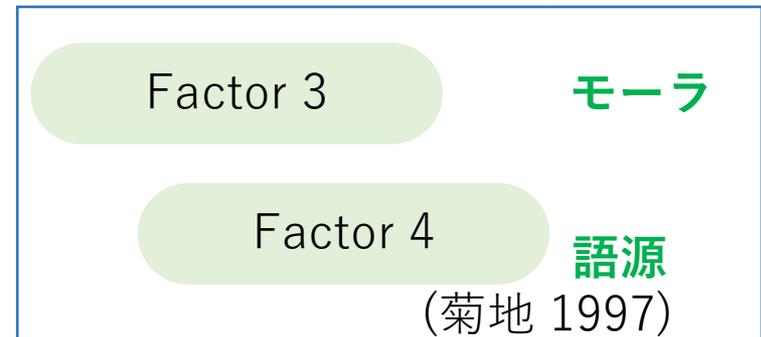
日本語の尊敬語

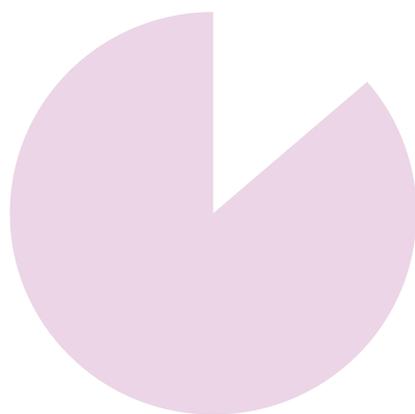
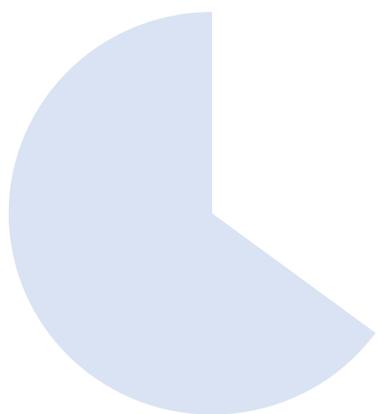


文レベルの要因



動詞 (グループ) 要因





2 Data, Model and Estimation

2 Data, Model, and Estimation

Outline

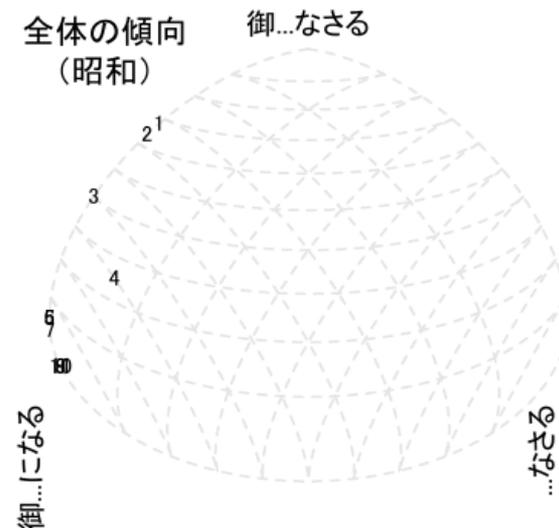
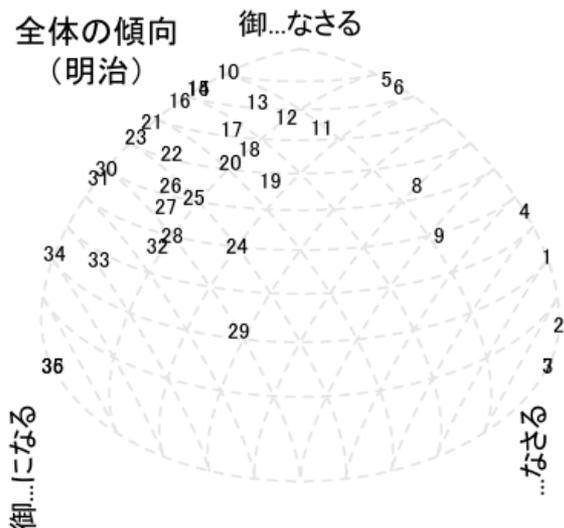
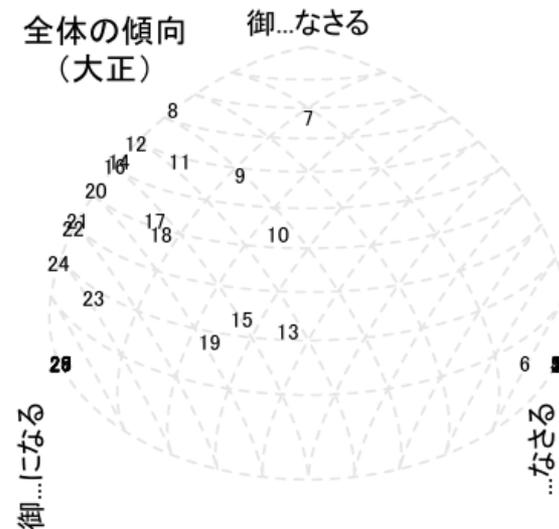
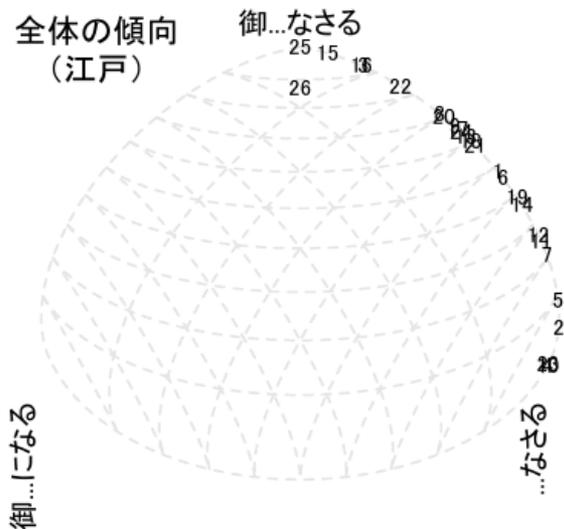
Data

Data

CHJ (江戸～昭和)

Token 3,411件

Type 44動詞



2 Data, Model, and Estimation

Outline

Data

Data

CHJ (江戸～昭和)

Token 3,411件

Type 44動詞

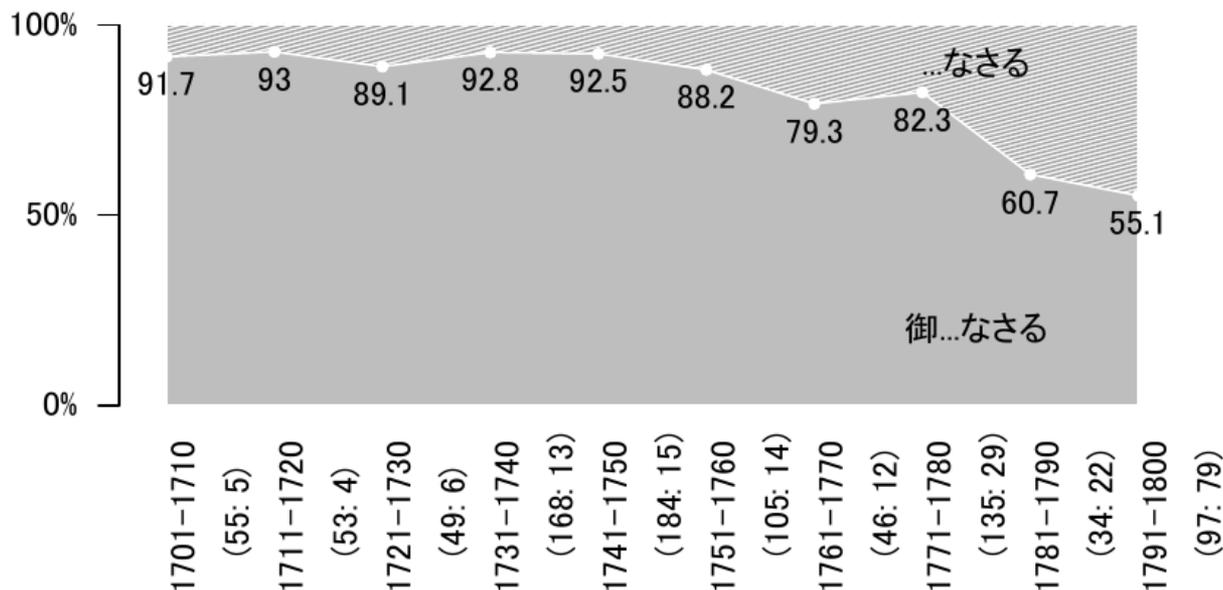


Fig. 1: 18世紀における「御...になさる」対「...なさる」の使用比率 (村上 2005:23 より作成)

2 Data, Model, and Estimation

Outline

Data



Model

多項混合効果ロジスティック回帰

$$y_{i(jk)} \sim \text{Categorical}(\vec{\pi}_{i(jk)})$$

$$\vec{\pi}_{i(jk)} = \text{inv_logit}(\vec{\eta}_{i(jk)})$$

$$\vec{\eta}_{i(jk)} = \begin{pmatrix} 0 \\ \gamma_{00}^{(2)} + \gamma_{01}^{(2)} x_{ORIGIN,j} + \gamma_{02}^{(2)} x_{MORA,j} + \gamma_{03}^{(2)} x_{SUPPL,j} \\ + \beta_{01}^{(2)} x_{AUX,i(j)} + \beta_{02}^{(2)} x_{IMP_s,i(j)} + \beta_{03}^{(2)} x_{IMP_w,i(j)} + u_j^{(2)} + v_k^{(2)} \\ \gamma_{00}^{(3)} + \gamma_{01}^{(3)} x_{ORIGIN,j} + \gamma_{02}^{(3)} x_{MORA,j} + \gamma_{03}^{(3)} x_{SUPPL,j} \\ + \beta_{01}^{(3)} x_{AUX,i(j)} + \beta_{02}^{(3)} x_{IMP_s,i(j)} + \beta_{03}^{(3)} x_{IMP_w,i(j)} + u_j^{(3)} + v_k^{(3)} \end{pmatrix}$$

2 Data, Model, and Estimation

Outline

Data



Model

応答変数

$y_{i(jk)}$

$iid \sim \text{Categorical}$

$\pi_{i(jk)}$

$= \text{inv_logit}(\eta_{i(jk)})$

説明変数

$\eta_{i(jk)}$

β_1

(命令文 (強))

β_2

(命令文 (弱))

Population-level
(Level 1)
Factors

β_{0j}

γ_2

(モーラ)

Group-level
(Level 2)
Factors

γ_0

(intercept)

u_j

(語彙素：動詞)

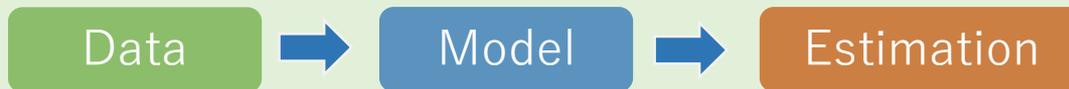
β_{0k}

v_j

(レジスター)

2 Data, Model, and Estimation

Outline



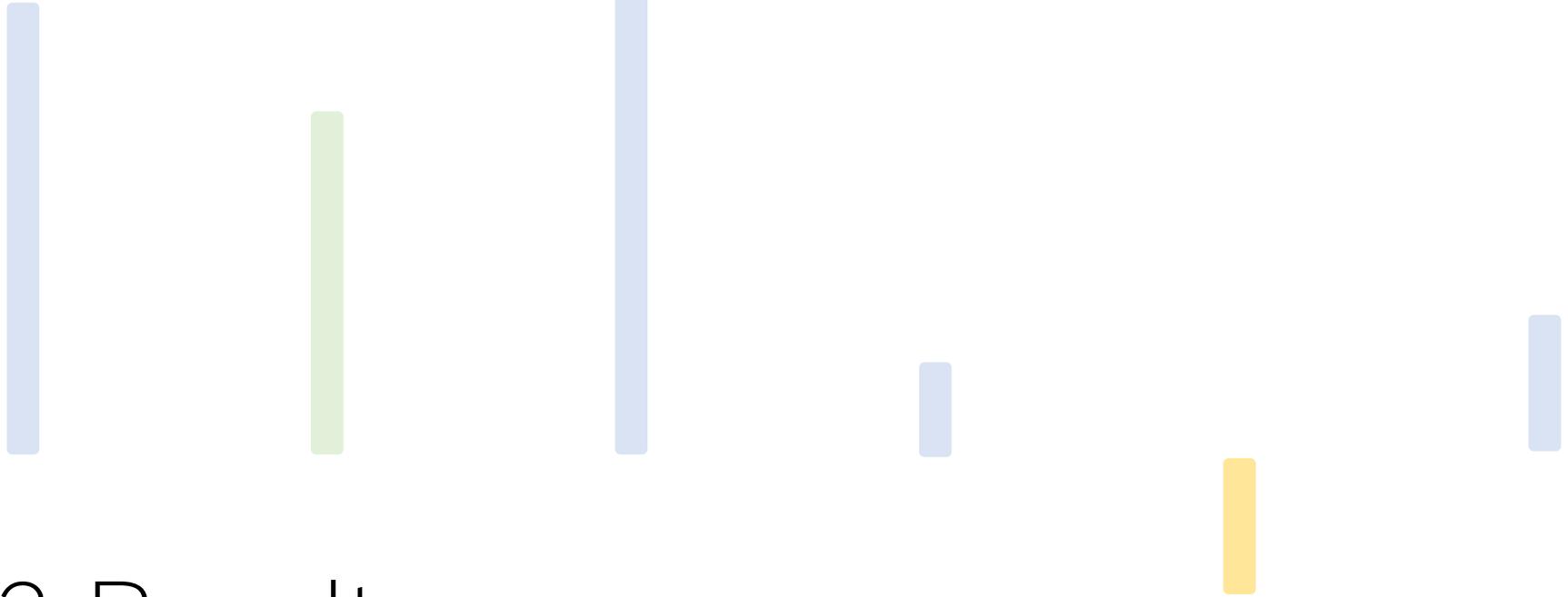
Stan

R/python

Stan
C++

R/python

```
1 | data{
2 |     //##### TRAINING DATA #####
3 |     int <lower = 1> C;
4 |     // ( 1 ) Subscripts
5 |     int <lower = 1> N;
6 |     int <lower = 1> J;
7 |     int <lower = 1, upper = J> scriptJ[N];
8 |     int <lower = 1> K;
9 |     int <lower = 1, upper = K> scriptK[N];
10 |    // ( 2 ) Variables
11 |    int <lower = 1, upper = C> Y[N];
12 |    //--Level 2
13 |    int <lower = 0, upper = 1> wJ01[J];
14 |    int <lower = 0, upper = 1> wJ02[J];
15 |    int <lower = 0, upper = 1> wJ03[J];
16 |    int <lower = 0, upper = 1> wJ04[J];
17 |    //--Level 1
18 |    int <lower = 0, upper = 1> x05[N];
19 |    int <lower = 0, upper = 1> x06[N];
20 |    int <lower = 0, upper = 1> x07[N];
21 | }
22 |
23 | transformed data{
24 |     vector[N] Zeros;
25 |     Zeros = rep_vector(0, N);
26 | }
27 |
28 | parameters{
29 |     //##### Parameter B (For the second category of the outcome variable)
30 |     //--Level 1 (Intercept)
31 |     real gamma00b;
32 |     //--Level 2 (Grouped Factors)
33 |     real gamma01b;
```



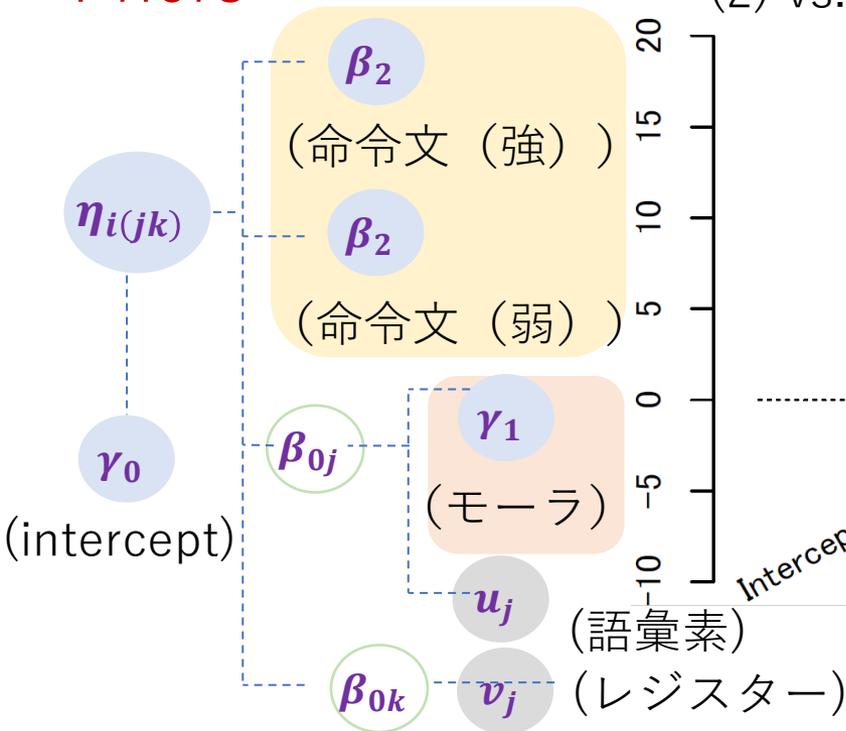
3 Results

3 Results

Outline

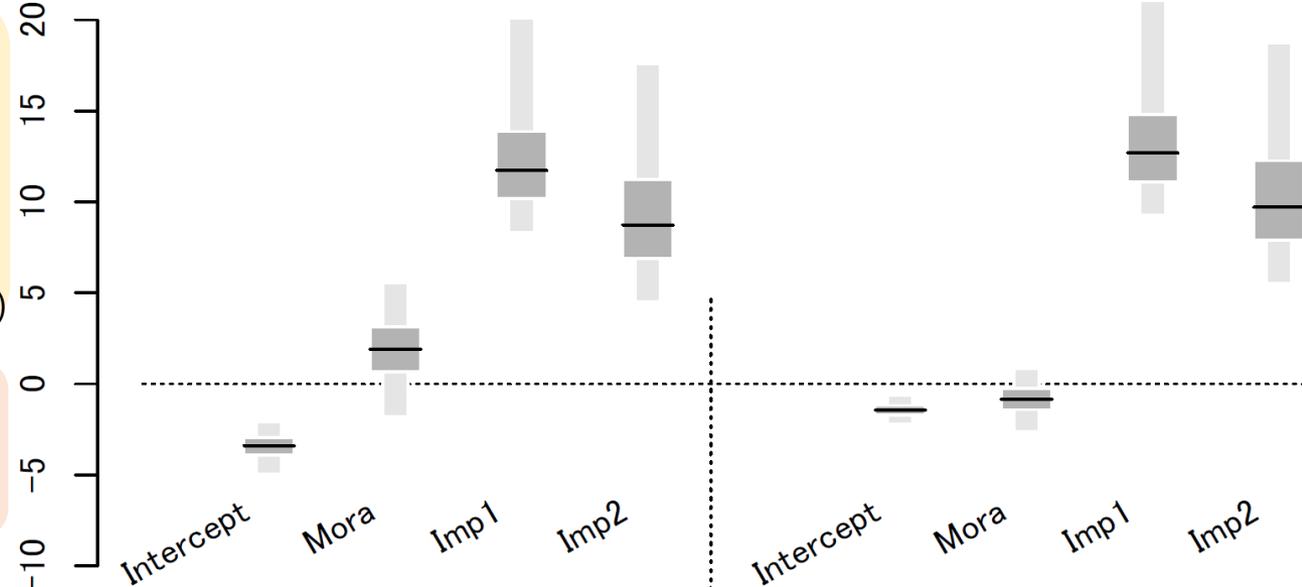
Posteriors

Priors



(2) vs. *nasar-*

(3) vs. *o-...nasar-*



3 Results

Outline

Posteriors

For Random Effects

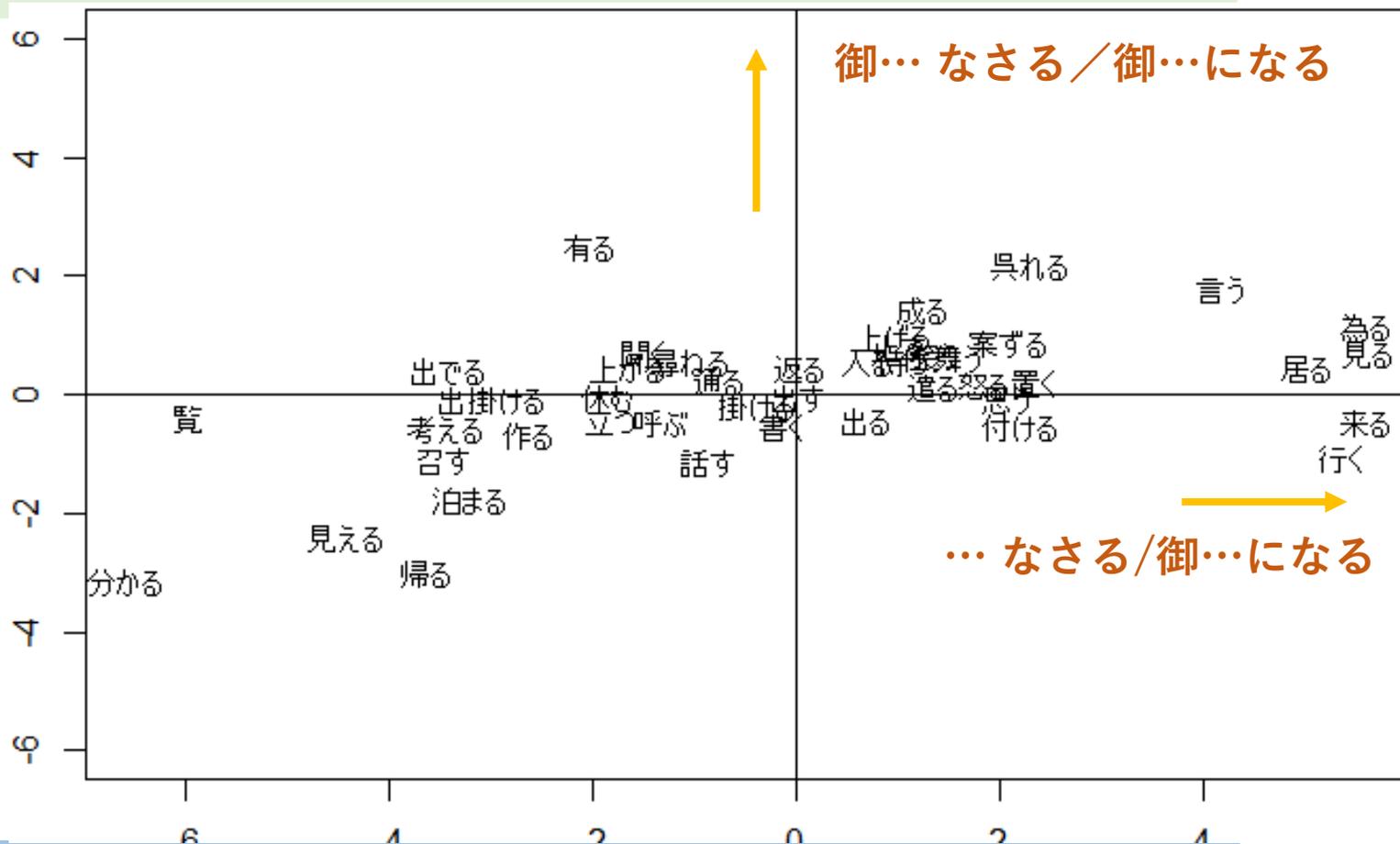
3 Results

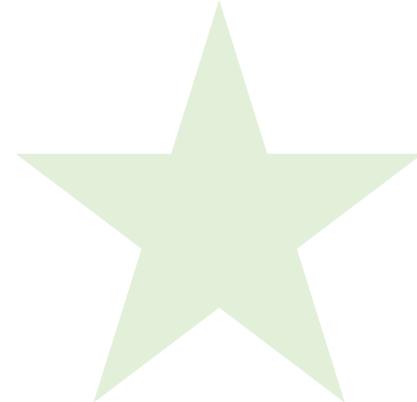
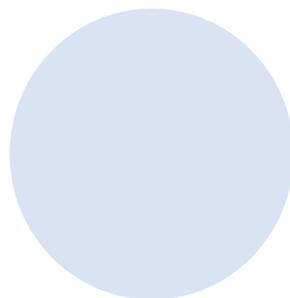
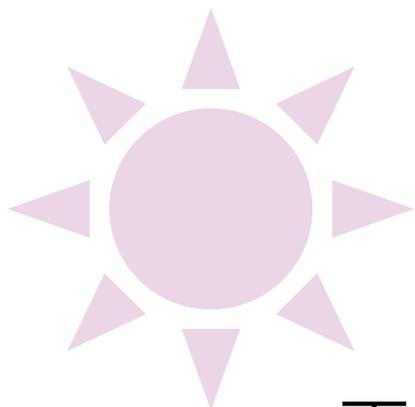
Outline

Posteriors

Residuals

残差：動詞





Thank you very much
for your attention!

引用文献

菊地康人 (1997) 『敬語』 講談社学術文庫

村上謙 (2005) 近世上方における補助動詞ナサルの変遷 『国語国文』 74(2)

Weinreich, U., Labov, W. & Herzog, M. (1968) Empirical foundations for a theory of language change. In W. Lehman and Y. Maliet (eds.) Directions for historical linguistics. Austin, Texas: University of Texas. 97-195.

山田彬堯 (2019). 和語起源の動詞と競合する尊敬語構文. 『軽量国語学会第六十三回大会予稿集』 66-71.

Yamada, Akitaka (2020) Multinomial Mixed-Effects Models and Linguistic Variation: Competitions among Japanese Subject-Honorific Constructions JADH 2020, Online. Nov. 22.