

The P600 effect when singular gendered antecedents are co-indexed with (a) *himself* or *herself* (b) *themselves*

Joanna Morris

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This script, on the advice of reviewer 1, conducts an ANOVA examining the P600 PROST data with Referentiality and Gender as within variables. Gender Identity status will be examined as a post-hoc variable. Analysis 1 examines the data for antecedents that are co-indexed with *himself* or *herself*, while Analysis 2 examines the P600 effect when antecedents are co-indexed with *themselves*

Define functions, set parameters and load

Define standard error of mean function

```
sem <- function(x) sd(x)/sqrt(length(x))
```

Before we begin, let's set some general parameters for `ggplot2`. We will set a general theme using the `theme_set()` function. We will use the 'classic' theme which gives us clean white background rather than the default grey with white grid lines. We will position the legend at the top of the graph rather than at the right side which is the default.

Then we re-order factor levels for *Referentiality*

```
## [1] "Referential"      "NonReferential"
## [1] "Referential"      "NonReferential"
```

Analysis 1: The P600 effect when antecedents are co-indexed with *himself* or *herself*

```
ezANOVA(data = prost_2022_singular
, dv = diff_score
, wid = SubjID
, within = .(Referentiality, Gender_Status)
, type = 3
, return_aov = F
)
```

```
## $ANOVA
##               Effect DFn DFd           F      p p<.05      ges
## 2      Referentiality    1  37 24.535367 1.629358e-05 * 0.15971214
## 3      Gender_Status    1  37  2.082389 1.574202e-01  0.01556740
## 4 Referentiality:Gender_Status 1  37  5.367258 2.615954e-02 * 0.02768817
```

Condition Means for Analysis 1

The P600 effect when antecedents are co-indexed with *himself* or *herself*.

Significant Effects: **Referentiality**; **Referentiality x Gender Status**

Referentiality	Mean	SE	SD	Max	Min
Referential	-0.34	0.16	1.42	4.15	-4.41
NonReferential	1.03	0.20	1.78	6.52	-3.33

Gender_Status	Mean	SE	SD	Max	Min
Gendered	0.54	0.23	1.97	6.52	-4.41
NonGendered	0.15	0.17	1.47	4.02	-3.33

Referentiality	Gender_Status	Mean	SE	SD	Max	Min
Referential	Gendered	-0.40	0.26	1.63	4.15	-4.41
Referential	NonGendered	-0.27	0.19	1.18	2.54	-2.50
NonReferential	Gendered	1.49	0.30	1.84	6.52	-1.66
NonReferential	NonGendered	0.57	0.26	1.62	4.02	-3.33

Post-hoc tests for Analysis 1: Gender Status x Referentiality

The following chunk runs post-hoc tests for the 32-way “*Gender Status x Referentiality*” Interaction
 “Some woman... himself” vs. “Mary... himself”

Table 4: Paired t-test: diff_score by Referentiality

Test statistic	df	P value	Alternative hypothesis	mean difference
-4.833	37	2.36e-05 * * *	two.sided	-1.893

“Someone... himself” vs. “The participant... himself”

Table 5: Paired t-test: diff_score by Referentiality

Test statistic	df	P value	Alternative hypothesis	mean difference
-2.614	37	0.01286 *	two.sided	-0.8365

“The participant... himself” vs. “Mary... himself”

Referential

Table 6: Paired t-test: diff_score by Gender_Status

Test statistic	df	P value	Alternative hypothesis	mean difference
-0.3661	37	0.7164	two.sided	-0.1346

“Someone... himself” vs. “Some woman... himself”

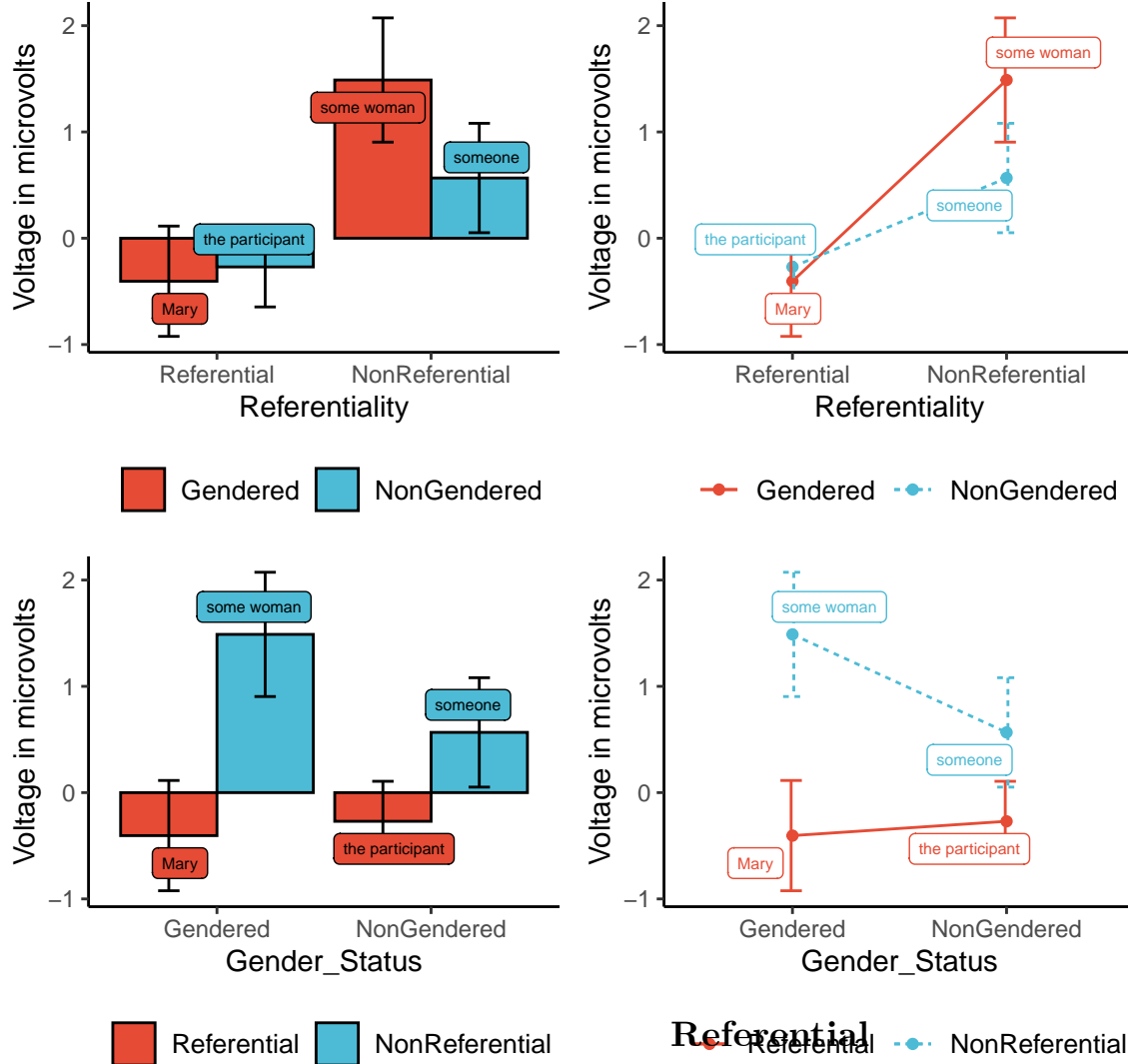
Non-Referential

Table 7: Paired t-test: diff_score by Gender_Status

Test statistic	df	P value	Alternative hypothesis	mean difference
2.688	37	0.01071 *	two.sided	0.9219

Interaction Plots: Gender Status x Referentiality *himself*

Gender Status by Referentiality Interaction



Analysis 2: The P600 effect when antecedents are co-indexed with *themselves*

```
ezANOVA(data = prost_2022_plural
, dv = diff_score
, wid = SubjID
, within = .(Referentiality, Gender_Status)
, type = 3
, return_aov = F
)
```

```
## $ANOVA
##              Effect DFn DFd          F      p p<.05      ges
## 2      Referentiality  1  37 5.3779903 0.02601998    * 0.023704137
## 3      Gender_Status  1  37 0.5943946 0.44562042      0.003473303
## 4 Referentiality:Gender_Status  1  37 4.7394407 0.03593238    * 0.044724472
```

Condition Means for Analysis 2

The P600 effect when antecedents are co-indexed with *himself* or *herself*.

Significant Effects: **Referentiality**; **Referentiality x Gender Status**

Referentiality	Mean	SE	SD	Max	Min
Referential	0.49	0.19	1.66	4.45	-4.03
NonReferential	0.00	0.18	1.60	3.52	-4.29

Gender_Status	Mean	SE	SD	Max	Min
Gendered	0.34	0.18	1.56	4.45	-2.77
NonGendered	0.15	0.20	1.72	3.52	-4.29

Referentiality	Gender_Status	Mean	SE	SD	Max	Min
Referential	Gendered	0.93	0.25	1.52	4.45	-2.35
Referential	NonGendered	0.06	0.28	1.70	3.52	-4.03
NonReferential	Gendered	-0.25	0.23	1.40	3.52	-2.77
NonReferential	NonGendered	0.25	0.29	1.76	3.18	-4.29

Post-hoc tests for Analysis 2: Gender Status x Referentiality

The following chunk runs post-hoc tests for the 3-way “*Group x Gender Status x Referentiality*” Interaction

“Some woman...themselves” vs. “Mary...themselves”

Table 11: Paired t-test: diff_score by Referentiality

Test statistic	df	P value	Alternative hypothesis	mean difference
3.366	37	0.001787 * *	two.sided	1.174

“Someone...themselves” vs. “The participant...themselves”

Table 12: Paired t-test: diff_score by Referentiality

Test statistic	df	P value	Alternative hypothesis	mean difference
-0.4705	37	0.6407	two.sided	-0.191

“The participant...themselves” vs. “Mary...themselves” Referential

Table 13: Paired t-test: diff_score by Gender_Status

Test statistic	df	P value	Alternative hypothesis	mean difference
2.157	37	0.03754 *	two.sided	0.8688

“Someone...themselves” vs. “Some woman...themselves” Non-Referential

Table 14: Paired t-test: diff_score by Gender_Status

Test statistic	df	P value	Alternative hypothesis	mean difference
-1.277	37	0.2097	two.sided	-0.4963

Interaction Plots: Gender Status by Referentiality *themselves*

Gender Status by Referentiality Interaction

