

IS *OECOLOGIA AUSTRALIS* PROMOTING GENDER EQUALITY IN ITS REVIEW PROCESS?

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Supplementary material

Metada

Data description of data_reviewers_OA.csv:

Each row is one submitted manuscript to *Oecologia Australis*.

year: year of submission from 2018 to 2020

status: final decision of the manuscript - accepted or rejected

type: type of the manuscript - original article, opinion article, short communication or review

first_author: gender of the first author

author_F: number of female authors

author_M: number of male authors

editor: gender of the editor

reviewer_F: number of female reviewers

reviewer_M: number of male reviewers

Data

year	status	type	first_author	author_F	author_M	editor	reviewer_F	reviewer_M
2018	accepted	review	Woman	1	1	Man	1	1
2018	accepted	article	Woman	1	2	Woman	NA	NA
2018	accepted	article	Woman	4	0	Woman	NA	NA
2018	accepted	article	Man	0	4	Woman	1	1
2018	accepted	article	Man	2	1	Man	0	2
2018	accepted	article	Woman	3	1	Woman	1	1
2018	accepted	article	Woman	3	2	Woman	1	0
2018	accepted	short	Man	3	2	Woman	1	1
2018	accepted	short	Man	1	1	Woman	2	1
2018	accepted	short	Woman	2	2	Woman	1	1
2018	accepted	article	Man	0	3	Woman	0	2

2018	accepted	article	Woman	1	1	Man	0	2
2018	accepted	article	Man	0	2	Woman	2	0
2018	accepted	article	Man	1	3	Woman	1	1
2018	accepted	article	Man	0	3	Woman	NA	NA
2018	accepted	article	Man	1	7	Woman	NA	NA
2018	accepted	short	Woman	2	3	Man	0	2
2018	accepted	short	Man	1	3	Woman	1	1
2018	accepted	short	Woman	2	6	Woman	0	3
2018	accepted	short	Woman	2	3	Woman	2	1
2018	accepted	short	Woman	3	2	Woman	1	1
2018	accepted	short	Man	1	2	Woman	NA	NA
2018	rejected	article	Woman	1	4	Woman	0	3
2018	rejected	short	Man	0	3	Woman	1	0
2018	rejected	article	Man	0	1	Woman	1	1
2018	rejected	article	Woman	3	2	Woman	1	2
2018	rejected	article	Woman	4	3	Woman	1	0
2018	rejected	review	Woman	1	0	Woman	1	1
2018	rejected	article	Man	0	2	Woman	1	1
2018	rejected	article	Man	2	6	Woman	1	2
2018	rejected	article	Woman	1	1	Woman	1	1
2018	rejected	article	Man	1	1	Woman	1	1
2018	rejected	short	Man	1	2	Woman	0	2
2018	rejected	article	Man	1	2	Woman	2	1
2018	rejected	article	Man	1	3	Woman	1	0
2018	rejected	article	Man	1	2	Woman	2	0
2018	rejected	article	Man	3	1	Woman	1	1
2018	rejected	short	Woman	3	1	Woman	2	0
2018	rejected	review	Man	0	2	Woman	2	0
2018	rejected	short	Woman	1	0	Man	0	3
2018	rejected	article	Woman	2	1	Man	1	1
2018	rejected	article	Woman	2	5	Man	0	5
2018	rejected	review	Woman	2	2	Man	0	2
2018	rejected	article	Woman	2	1	Man	0	3
2018	rejected	article	Woman	5	0	Man	1	1
2018	rejected	article	Man	1	1	Man	1	1
2018	rejected	short	Man	3	2	Man	0	2
2018	rejected	article	Man	3	4	Man	1	2
2018	rejected	opinion	Man	0	3	Man	1	1
2018	rejected	article	Woman	3	1	Man	1	1
2018	rejected	short	Man	1	3	Man	1	1
2018	rejected	review	Woman	5	1	Man	3	1
2018	rejected	article	Man	2	1	Woman	0	2
2018	rejected	article	Woman	5	0	Woman	4	0
2018	rejected	article	Man	1	4	Woman	2	0
2018	rejected	article	Woman	2	2	Woman	4	1
2018	rejected	article	Woman	1	3	Man	0	2

2018	rejected	article	Man	2	5	Man	2	2
2018	rejected	short	Man	1	5	Man	0	1
2018	rejected	article	Man	0	4	Man	1	1
2018	rejected	short	Man	0	6	Woman	1	1
2018	rejected	article	Woman	3	0	Woman	2	0
2018	rejected	article	Man	0	3	Woman	1	1
2018	rejected	article	Man	0	6	Woman	1	1
2018	rejected	short	Man	1	5	Woman	1	1
2018	rejected	article	Man	2	3	Woman	2	0
2018	rejected	article	Man	2	2	Woman	2	1
2018	rejected	short	Man	1	3	Woman	1	1
2018	rejected	article	Man	2	5	Woman	0	3
2018	rejected	article	Man	2	1	Woman	2	0
2018	rejected	article	Man	0	2	Woman	0	3
2018	rejected	article	Woman	1	1	Man	0	2
2019	accepted	review	Woman	1	1	Woman	0	2
2019	accepted	article	Woman	1	2	Woman	3	0
2019	accepted	article	Man	1	1	Man	0	2
2019	accepted	article	Man	1	3	Woman	0	2
2019	accepted	article	Woman	1	3	Woman	1	0
2019	accepted	article	Woman	5	1	Woman	1	1
2019	accepted	article	Man	3	3	Woman	1	1
2019	accepted	article	Man	1	1	Woman	1	2
2019	accepted	article	Man	5	3	Man	2	0
2019	accepted	article	Man	0	2	Man	1	1
2019	accepted	short	Woman	1	2	Man	0	2
2019	accepted	short	Man	2	2	Woman	0	2
2019	accepted	short	Man	1	1	Man	2	1
2019	accepted	short	Man	0	3	Woman	1	1
2019	accepted	short	Man	1	6	Man	1	1
2019	accepted	article	Man	2	2	Woman	1	2
2019	accepted	article	Man	0	2	Man	0	4
2019	accepted	article	Woman	2	1	Man	1	1
2019	accepted	article	Woman	3	4	Woman	1	1
2019	accepted	article	Woman	2	3	Man	2	0
2019	accepted	article	Woman	4	1	Woman	1	2
2019	accepted	article	Woman	2	2	Woman	1	1
2019	accepted	article	Man	0	4	Woman	1	3
2019	accepted	article	Woman	1	3	Man	0	2
2019	accepted	article	Woman	2	2	Man	0	2
2019	accepted	article	Man	0	7	Woman	2	0
2019	accepted	article	Woman	3	1	Man	0	2
2019	accepted	article	Man	2	2	Man	0	2
2019	accepted	article	Man	4	2	Woman	1	1
2019	accepted	article	Man	2	1	Woman	2	1
2019	accepted	article	Man	0	2	Woman	0	2

2019	accepted	article	Man	1	3	Man	0	2
2019	accepted	article	Woman	2	1	Woman	2	0
2019	accepted	article	Woman	1	1	Woman	0	2
2019	accepted	short	Woman	4	2	Woman	1	1
2019	accepted	short	Man	0	2	Man	0	2
2019	accepted	short	Woman	1	2	Woman	0	2
2019	accepted	short	Man	0	3	Woman	0	1
2019	accepted	short	Woman	1	1	Man	0	2
2019	accepted	short	Man	1	4	Woman	1	2
2019	accepted	short	Man	0	2	Man	0	2
2019	accepted	short	Woman	1	2	Woman	0	2
2019	accepted	short	Man	1	2	Man	1	1
2019	rejected	short	Woman	1	2	Man	2	0
2019	rejected	article	Woman	1	3	Man	2	1
2019	rejected	review	Man	0	2	Man	0	2
2019	rejected	article	Woman	1	7	Man	2	0
2019	rejected	article	Woman	2	1	Woman	0	2
2019	rejected	article	Woman	2	1	Man	1	1
2019	rejected	article	Woman	3	0	Man	2	0
2019	rejected	article	Man	3	2	Woman	2	0
2019	rejected	article	Man	2	2	Woman	1	2
2019	rejected	article	Man	1	3	Woman	2	1
2019	rejected	article	Man	2	3	Woman	0	2
2019	rejected	article	Man	0	2	Woman	0	2
2019	rejected	article	Man	1	4	Woman	2	0
2019	rejected	article	Woman	1	5	Woman	1	2
2019	rejected	article	Man	2	1	Woman	0	3
2019	rejected	article	Man	1	3	Man	0	2
2019	rejected	article	Man	0	2	Man	2	1
2019	rejected	review	Woman	3	2	Woman	2	0
2019	rejected	article	Man	0	4	Man	1	1
2019	rejected	article	Man	0	4	Man	2	1
2019	rejected	article	Man	0	3	Man	2	1
2019	rejected	short	Man	0	3	Man	2	0
2019	rejected	article	Man	0	6	Man	0	2
2019	rejected	article	Woman	2	1	Man	3	0
2019	rejected	short	Man	2	4	Woman	2	1
2019	rejected	review	Man	0	1	Man	0	2
2019	rejected	short	Man	0	2	Man	2	0
2019	rejected	review	Woman	1	1	Man	1	1
2019	rejected	review	Man	1	2	Man	1	1
2019	rejected	article	Woman	1	2	Man	3	0
2019	rejected	review	Man	1	3	Man	0	2
2019	rejected	review	Man	1	2	Man	1	1
2019	rejected	article	Woman	2	0	Man	1	1
2019	rejected	article	Man	2	4	Man	0	2

2019	rejected	article	Man	0	4	Woman	0	2
2019	rejected	article	Woman	3	2	Man	3	1
2019	rejected	article	Woman	5	0	Man	4	4
2019	rejected	article	Man	1	7	Woman	0	1
2019	rejected	short	Man	2	2	Woman	1	1
2019	rejected	article	Woman	4	0	Woman	2	0
2019	rejected	short	Man	2	2	Woman	1	1
2019	rejected	review	Man	1	3	Woman	0	1
2019	rejected	article	Woman	2	0	Woman	1	1
2019	rejected	short	Man	0	4	Woman	0	2
2019	rejected	short	Man	3	3	Woman	2	1
2019	rejected	article	Man	0	3	Woman	0	2
2019	rejected	article	Woman	3	2	Man	1	1
2019	rejected	article	Man	0	3	Man	0	2
2019	rejected	article	Woman	3	1	Man	2	0
2019	rejected	article	Man	0	2	Man	0	2
2019	rejected	article	Woman	2	1	Man	1	3
2019	rejected	article	Woman	1	1	Man	1	1
2019	rejected	short	Woman	2	1	Man	2	0
2019	rejected	short	Woman	1	1	Man	1	1
2019	rejected	article	Woman	1	2	Man	2	0
2020	accepted	review	Woman	5	0	Man	0	2
2020	accepted	review	Man	1	1	Man	1	1
2020	accepted	review	Man	1	2	Woman	1	4
2020	accepted	review	Man	3	2	Man	1	1
2020	accepted	review	Man	2	1	Man	1	1
2020	accepted	article	Man	1	3	Woman	1	1
2020	accepted	article	Woman	3	3	Woman	1	1
2020	accepted	article	Man	4	1	Woman	2	1
2020	accepted	article	Man	0	6	Man	0	1
2020	accepted	article	Woman	4	1	Woman	3	1
2020	accepted	article	Woman	6	0	Woman	2	0
2020	accepted	article	Woman	1	2	Man	2	0
2020	accepted	article	Woman	1	4	Woman	1	2
2020	accepted	short	Man	1	2	Man	1	1
2020	accepted	short	Man	2	3	Woman	0	2
2020	accepted	short	Woman	2	0	Woman	0	2
2020	accepted	short	Man	1	4	Woman	1	1
2020	accepted	short	Woman	2	1	Man	1	1
2020	accepted	short	Woman	2	2	Woman	1	2
2020	accepted	short	Woman	1	3	Woman	0	2
2020	accepted	short	Man	0	1	Man	1	1
2020	accepted	short	Woman	2	5	Woman	0	2
2020	accepted	short	Woman	5	0	Man	0	3
2020	accepted	short	Woman	1	0	Man	0	2
2020	accepted	short	Man	0	1	Man	1	1

2020	accepted	review	Man	0	1	Man	2	0
2020	accepted	review	Woman	2	0	Man	4	2
2020	accepted	review	Woman	3	0	Woman	1	1
2020	accepted	article	Woman	3	4	Man	0	2
2020	accepted	article	Woman	3	1	Woman	3	1
2020	accepted	article	Woman	2	2	Man	1	1
2020	accepted	article	Woman	3	2	Woman	2	0
2020	accepted	article	Woman	1	1	Man	1	1
2020	accepted	article	Man	1	4	Man	1	2
2020	accepted	article	Man	1	1	Man	0	1
2020	accepted	article	Man	0	4	Man	1	1
2020	accepted	article	Man	1	2	Man	2	2
2020	accepted	short	Woman	1	1	Man	1	1
2020	accepted	short	Woman	3	0	Woman	1	1
2020	accepted	short	Man	1	2	Man	0	2
2020	accepted	short	Man	0	3	Man	1	1
2020	accepted	short	Man	4	1	Woman	2	0
2020	accepted	short	Woman	2	2	Man	1	2
2020	accepted	short	Woman	2	3	Woman	1	0
2020	accepted	short	Man	0	2	Woman	2	0
2020	accepted	review	Woman	6	4	Man	2	3
2020	accepted	article	Woman	3	3	Man	0	2
2020	accepted	article	Man	4	6	Man	2	1
2020	accepted	article	Woman	2	2	Man	2	0
2020	accepted	article	Woman	2	2	Man	0	3
2020	accepted	article	Man	0	6	Man	1	1
2020	accepted	article	Man	1	4	Man	1	1
2020	accepted	article	Man	3	2	Man	0	2
2020	accepted	article	Woman	4	0	Man	0	2
2020	accepted	article	Woman	2	0	Man	2	1
2020	accepted	article	Man	1	2	Man	1	2
2020	accepted	article	Woman	1	5	Man	2	0
2020	accepted	short	Man	3	4	Woman	0	2
2020	accepted	short	Man	0	1	Man	1	1
2020	accepted	short	Man	0	3	Man	0	1
2020	accepted	short	Man	0	1	Woman	1	1
2020	accepted	short	Man	3	5	Man	1	2
2020	accepted	short	Man	1	2	Man	0	2
2020	accepted	short	Woman	1	2	Man	0	2
2020	accepted	opinion	Woman	3	0	Woman	0	1
2020	accepted	opinion	Man	0	4	Woman	0	1
2020	rejected	short	Man	3	1	Woman	0	2
2020	rejected	article	Man	1	1	Woman	2	1
2020	rejected	article	Man	2	2	Woman	1	2
2020	rejected	article	Man	2	2	Woman	0	1
2020	rejected	article	Woman	4	0	Woman	2	0

2020	rejected	short	Woman	2	1	Woman	0	4
2020	rejected	article	Man	3	5	Woman	2	0
2020	rejected	short	Woman	1	1	Woman	3	0
2020	rejected	article	Man	0	3	Man	0	2
2020	rejected	short	Man	0	3	Man	1	1
2020	rejected	short	Man	0	3	Man	0	3
2020	rejected	short	Man	1	2	Man	2	1
2020	rejected	short	Man	2	1	Man	1	2
2020	rejected	short	Man	0	1	Man	0	2
2020	rejected	article	Man	0	3	Man	1	1
2020	rejected	article	Man	0	2	Woman	0	2
2020	rejected	article	Man	0	3	Man	0	2
2020	rejected	short	Man	2	4	Man	2	0
2020	rejected	short	Woman	3	2	Man	0	2
2020	rejected	article	Woman	1	4	Man	2	1
2020	rejected	short	Woman	3	1	Man	1	1
2020	rejected	short	Man	0	2	Woman	3	2
2020	rejected	short	Man	1	2	Woman	1	1
2020	rejected	article	Man	1	3	Woman	1	2
2020	rejected	article	Man	0	2	Man	2	1
2020	rejected	article	Man	1	2	Man	1	0
2020	rejected	article	Man	0	2	Man	1	3
2020	rejected	article	Woman	2	3	Man	0	2
2020	rejected	short	Woman	2	2	Man	1	1
2020	rejected	article	Man	1	4	Man	1	2

R code

```
#####
##### Code for analysis in Barros et al. #####
# IS OECOLOGIA AUSTRALIS PROMOTING GENDER EQUALITY IN ITS REVIEW PROCESS? #
#####

# May 2021

# libraries
library(tidyverse)
library(DHARMa) # for residual diagnostic
library(ggeffects) # prediction models
library(glmmTMB) # zero inflated mode
library(cowplot); library(patchwork) # figures
```

```

library(ggbeeswarm) # figures
theme_set(theme_cowplot())

##### DATASET #####

dados = read.csv("data_reviewers_OA.csv")
head(dados)
str(dados)

dados$acceptance <- ifelse(dados$status=="accepted",1,0)
summary(dados)

##### QUESTION 1 #####

# overall acceptance rate
table(dados$acceptance)
131/(135+131)

#### model ####
m1=glm(acceptance~first_author*editor, family=binomial, data=dados)

summary(m1)

# residuals check with DHARMA:
plot(simulateResiduals(m1))

### Figure ###

dados$xis[dados$editor == "Man" & dados$first_author == "Woman"] <- 1
dados$xis[dados$editor == "Man" & dados$first_author == "Man"] <- 2
dados$xis[dados$editor == "Woman" & dados$first_author == "Woman"] <- 4
dados$xis[dados$editor == "Woman" & dados$first_author == "Man"] <- 5

mydf <- ggpredict(m1, terms = c("editor", "first_author"))
figmydf <- as.data.frame(mydf)
figmydf$xis <- c(1,2,4,5)

```



```

p1=ggplot(figmydf, aes(x=xis, y=predicted, col=group)) +
  geom_point(size=3) +
  geom_errorbar(aes(ymin=conf.low,ymax=conf.high), width=0.4,
    size=1.1) +
  scale_x_continuous(limits=c(0.5,6), breaks=c(1.5,4.5),
    labels=c("Man", "Woman")) +
  ylab("Manuscript acceptance rate") +
  ylim(-0.01,1)+
  xlab("Section editor") +
  scale_colour_discrete(name= "First author") +
  ggtitle("") +
  geom_quasirandom(data=dados, aes(y=acceptance, x=xis, col=first_author),
    groupOnX = TRUE,
    shape=21, size=2.5, alpha=0.8) +
  geom_hline(yintercept = 0.5, linetype="dashed", col="gray")

```

```
pdf("acceptance_rate.pdf", height = 4, width = 6)
```

```
p1
```

```
dev.off()
```

```
##### QUESTION 2 #####
```

```
# remove NAs
```

```
dados2 <- dados[!is.na(dados$reviewer_F),]
```

```
dados2$Rprop <- dados2$reviewer_F/(dados2$reviewer_M+dados2$reviewer_F)
```

```
# Proportion of 0% women reviewers by editor
```

```
table(dados2[dados2$reviewer_F == 0,"editor"])
```

```
# Proportion of 100% women reviewers by editor
```

```
table(dados2[dados2$reviewer_F == 1,"editor"])
```

```
#### model ####
```

```
m2 <- glm(cbind(reviewer_F,reviewer_M)~editor, data=dados2, family= "binomial")
```

```

summary(m2)

arm::invlogit(confint(m2)) # original scale coeffs

# residuals check with DHARMA:
plot(simulateResiduals(m2))

### figure ###

mydf2 <- ggpredict(m2, terms="editor")

p2 <- ggplot(as.data.frame(mydf2), aes(x=x, y=predicted)) +
  geom_point( col="red", size=3) +
  geom_errorbar(aes(ymin=conf.low,ymax=conf.high), col="red", width=0.2,
    size=1.1) +
  geom_quasirandom(data=dados2, aes(y=Rprop, x=editor),
    shape=21, size=2.5, alpha=0.8) +
  scale_x_discrete(name="Section Editor") +
  ylab("Proportion of women \n reviewers") +
  ylim(-0.01,1)+
  geom_hline(yintercept = 0.5, linetype="dashed", col="gray")

pdf("prop_Freviewers.pdf", height = 4, width = 6)
p2
dev.off()

##### QUESTION 3 #####

# Overall number of authors
todos <- dados2$author_F+dados2$author_M
summary(todos)

mean(todos[dados2$first_author == "Woman"])
sd(todos[dados2$first_author == "Woman"])

mean(todos[dados2$first_author == "Man"])

```

```

sd(todos[dados2$first_author == "Man"])

# Exclude MS with only one author
dados3 <- dados[dados$author_F + dados$author_M > 1,]

# excluding the first author from authors list:
dados3$author_F[dados3$first_author == "Woman"] <- dados3$author_F[dados3$first_author ==
"Woman"] - 1
dados3$author_M[dados3$first_author == "Man"] <- dados3$author_M[dados3$first_author == "Man"] -
1

# mean number of co-authors
summary(dados3$author_F+dados3$author_M)

#### model ####

m3 <- glm(cbind(author_F,author_M)~first_author, data=dados3, family= "binomial")

summary(m3)

# residuals check with DHARMA:
plot(simulateResiduals(m3))
# overdispersion problem
testZeroInflation(m3)

# Zero inflated model
m3z <- glmmTMB(cbind(author_F,author_M)~first_author, data=dados3, family= binomial(), ziformula
= ~1)

summary(m3z)

# residuals check with DHARMA:
plot(simulateResiduals(m3z))

#### figure ####

mydf3z <- ggpredict(m3z, terms="first_author")

```

```

dmydf3z <- as.data.frame(mydf3z) %>%
  mutate(x=fct_relevel(x, "Man", "Woman"))

dados3$Aprop <- dados3$author_F/(dados3$author_F+dados3$author_M)
dplot3 <- dados3 %>% count(first_author,Aprop)

p3=ggplot(dmydf3z, aes(x=x, y=predicted)) +
  geom_point( col="red", size=3) +
  geom_errorbar(aes(ymin=conf.low,ymax=conf.high), col="red", width=0.2, size=1.1) +
  geom_quasirandom(data=dados3, aes(y=Aprop, x=editor), shape=21, size=2.5, alpha=0.8) +
  # geom_point(data=dplot3, aes(y=Aprop,x=first_author, size=n), shape=21) +
  xlab("First author") +
  ylim(-0.01,1)+
  #scale_size_continuous(name= "N", limits=c(1,52), range=c(1,20)) +
  ylab("Proportion of women \n co-authors") +
  geom_hline(yintercept = 0.5, linetype="dashed", col="gray")

pdf("prop_Fauthors.pdf", height = 4, width = 6)
p3
dev.off()

##### FINAL FIGURE #####

jpeg("Figure_1.jpeg", height = 32, width = 15, units="cm", res=150, quality=100)
p1+theme(legend.position =c(0.85,0.80),
  legend.background = element_rect(fill="gray95"),
  legend.title=element_text(size=11),
  legend.text=element_text(size=9)) + plot_spacer()+
p2+theme(legend.position= 'none') +plot_spacer()+
p3+theme(legend.position= 'none')+
  plot_layout(ncol=1, heights = c(1,0.1,1,0.1,1)) + plot_annotation(tag_levels = "A")
dev.off()

# END

```