

# R Notebook

```
knitr::opts_chunk$set(echo = TRUE)
library("ggplot2")
library("tidyverse")

## -- Attaching packages ----- tidyverse 1.2.1 --

## v tibble 2.1.3      v purrr 0.3.2
## v tidyr 1.0.0       v dplyr 0.8.3
## v readr 1.3.1       v stringr 1.4.0
## v tibble 2.1.3      v forcats 0.4.0

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()

Load results.

get_data <- function(filename){
  load(filename)
  res <- data.frame(cv_errs_data)
  return(res)
}

my_get_aoa_err_results <- function(result_dir){
  files = list.files(path=result_dir, pattern="*_cv_errs_data.RData", full.names=TRUE, recursive=FALSE)
  df.aoa_err_results = files %>% map(get_data) %>% reduce(rbind)
  return(df.aoa_err_results)
}

result_dir = "../data/aoa_predictors/"
model_errs_all = my_get_aoa_err_results(result_dir)

Do data wrangling for plots

model_errs_no_surp = model_errs_all %>%
  filter(model %in% c("full_set", "freq_only", "freq_MLU")) %>%
  select(-c(group, child_name))

model_errs_with_surp = model_errs_all %>%
  filter(!(model %in% c("full_set", "freq_only", "freq_MLU")))

combine_errs <- function(surp_model, nosurp_model){
  model_errs_with_surp_full = model_errs_with_surp %>%
    filter(model == surp_model) %>%
    gather(err_, value_surp, c(mse_, rmse_, mae_))

  model_errs_no_surp_full = model_errs_no_surp %>%
    filter(model == nosurp_model) %>%
    select(-c(kfolds, model)) %>%
    gather(err_, value_nosurp, c(mse_, rmse_, mae_))

  model_errs_full = model_errs_with_surp_full %>%
```

```

    left_join(model_errs_no_surp_full)
  return(model_errs_full)
}

model_errs_full = combine_errs("full_surp", "full_set")

## Joining, by = c("measure", "err_")
model_errs_freq = combine_errs("freq_surp", "freq_only")

## Joining, by = c("measure", "err_")
model_errs_freq_MLU = combine_errs("freq_MLU_surp", "freq_MLU")

## Joining, by = c("measure", "err_")
model_errs = rbind(model_errs_full, model_errs_freq, model_errs_freq_MLU)
plot_data = model_errs %>% gather(has_surp, value, c(value_surp, value_nosurp))

```

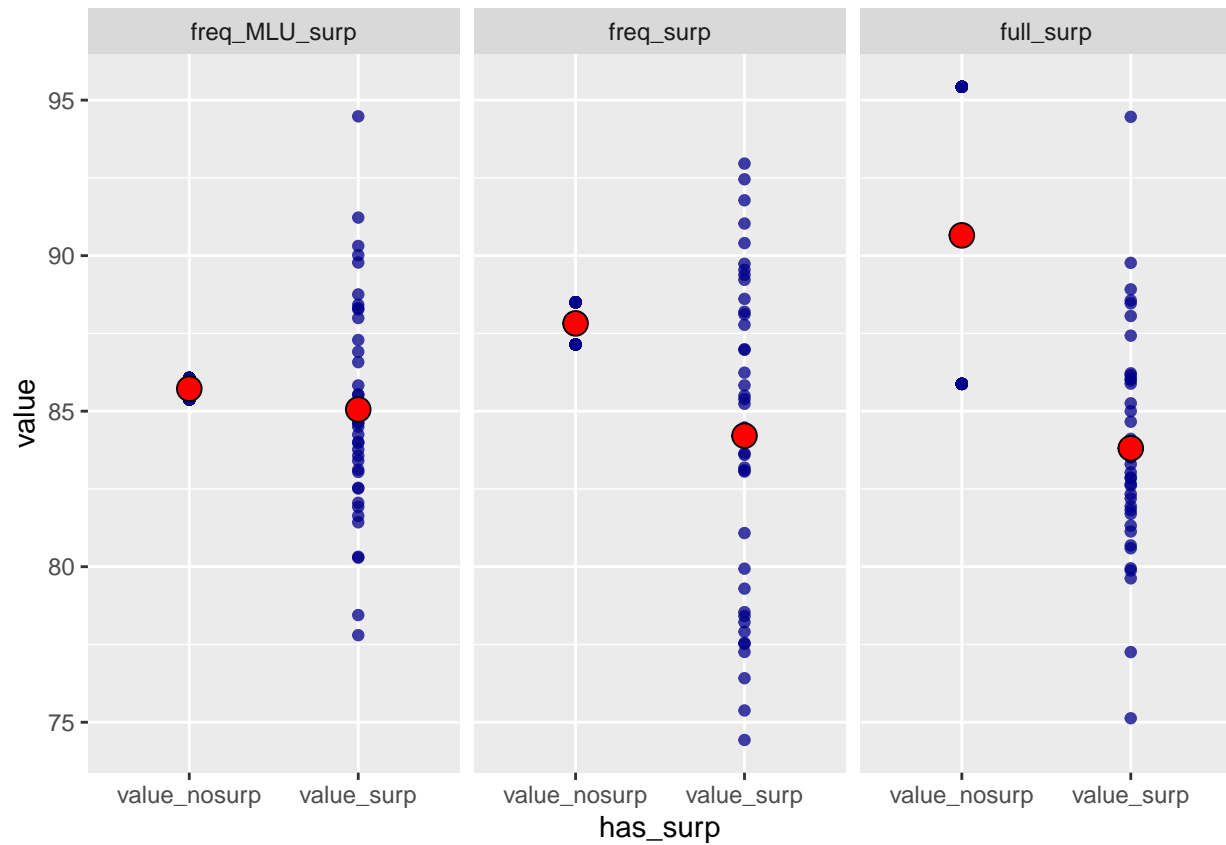
## MSE results

‘Produces’

```

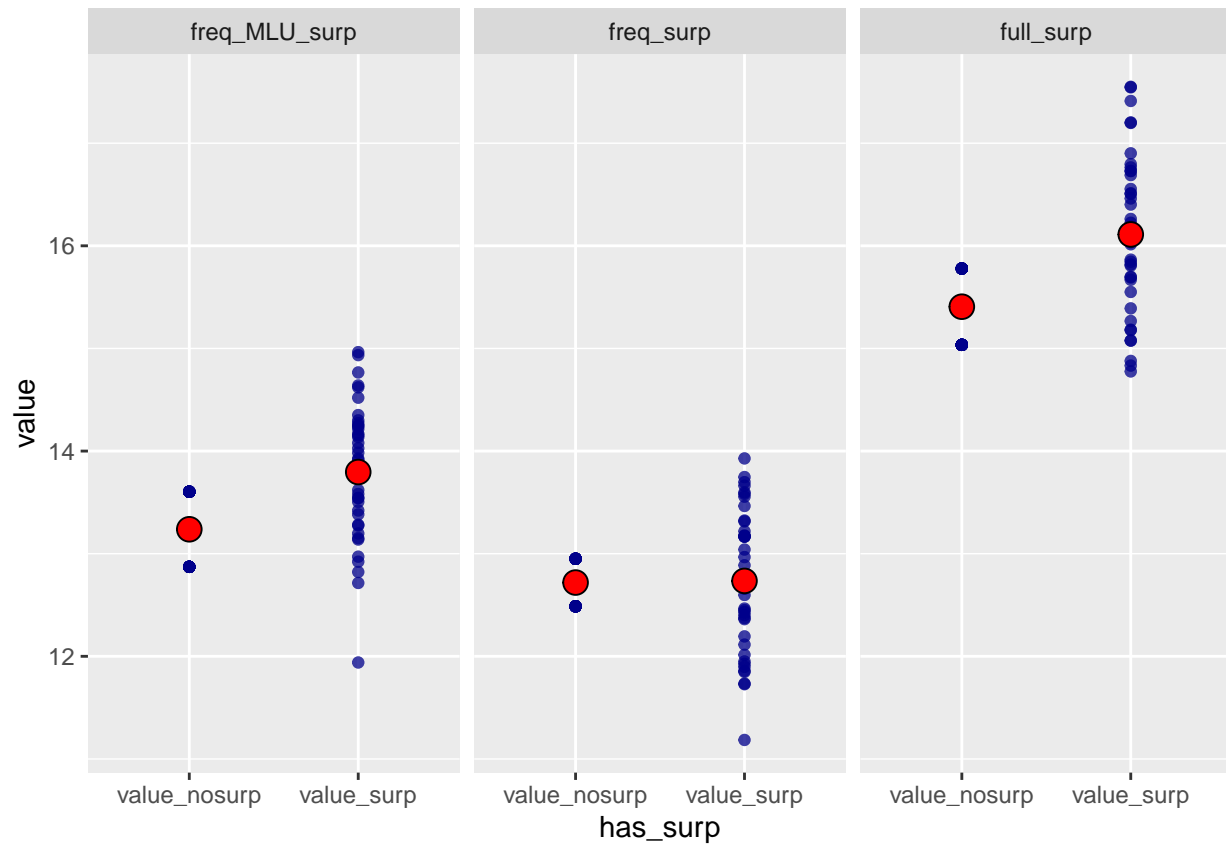
ggplot(data = (plot_data %>% filter(err_=="mse_" & measure=="produces")),
  mapping = aes(x = has_surp, y = value)) +
  geom_point(alpha = 0.5, color="dark blue") +
  stat_summary(fun.y = "mean",
    geom = "point",
    shape = 21,
    fill = "red",
    size = 4) +
  facet_wrap(vars(model))

```



### 'Understands'

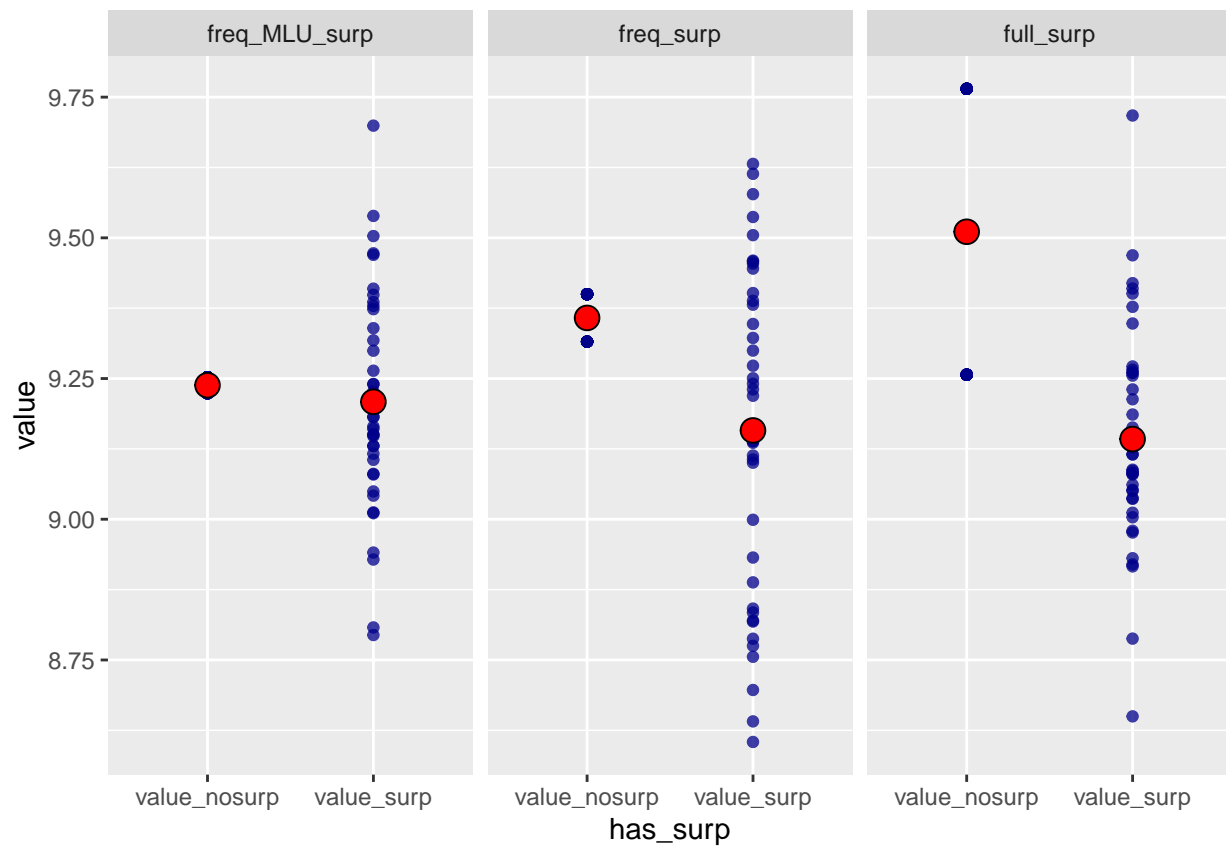
```
ggplot(data = (plot_data %>% filter(err_=="mse_" & measure=="understands")),
  mapping = aes(x = has_surp, y = value)) +
  geom_point(alpha = 0.5, color="dark blue") +
  stat_summary(fun.y = "mean",
    geom = "point",
    shape = 21,
    fill = "red",
    size = 4) +
  facet_wrap(vars(model))
```



## RMSE results

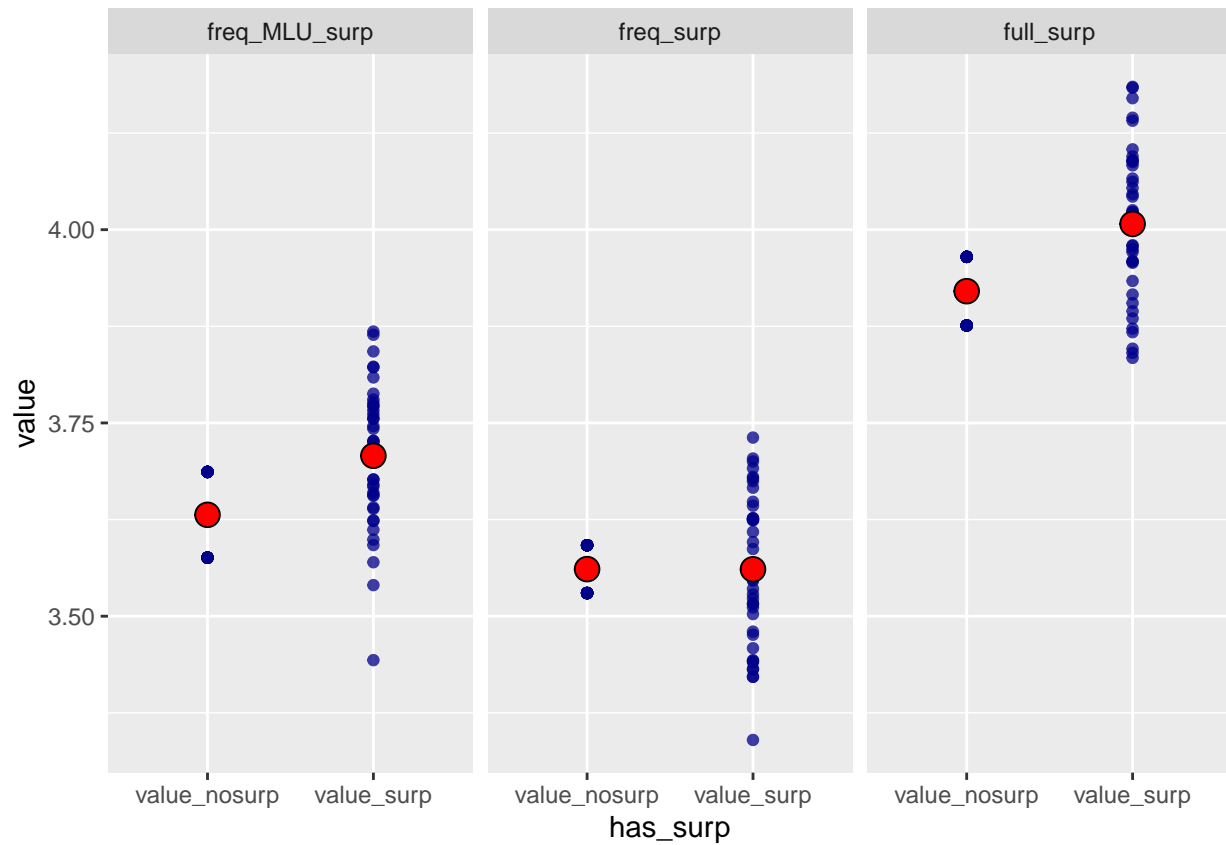
‘Produces’

```
ggplot(data = (plot_data %>% filter(err=="rmse_" & measure=="produces")),
  mapping = aes(x = has_surp, y = value)) +
  geom_point(alpha = 0.5, color="dark blue") +
  stat_summary(fun.y = "mean",
    geom = "point",
    shape = 21,
    fill = "red",
    size = 4) +
  facet_wrap(vars(model))
```



### 'Understands'

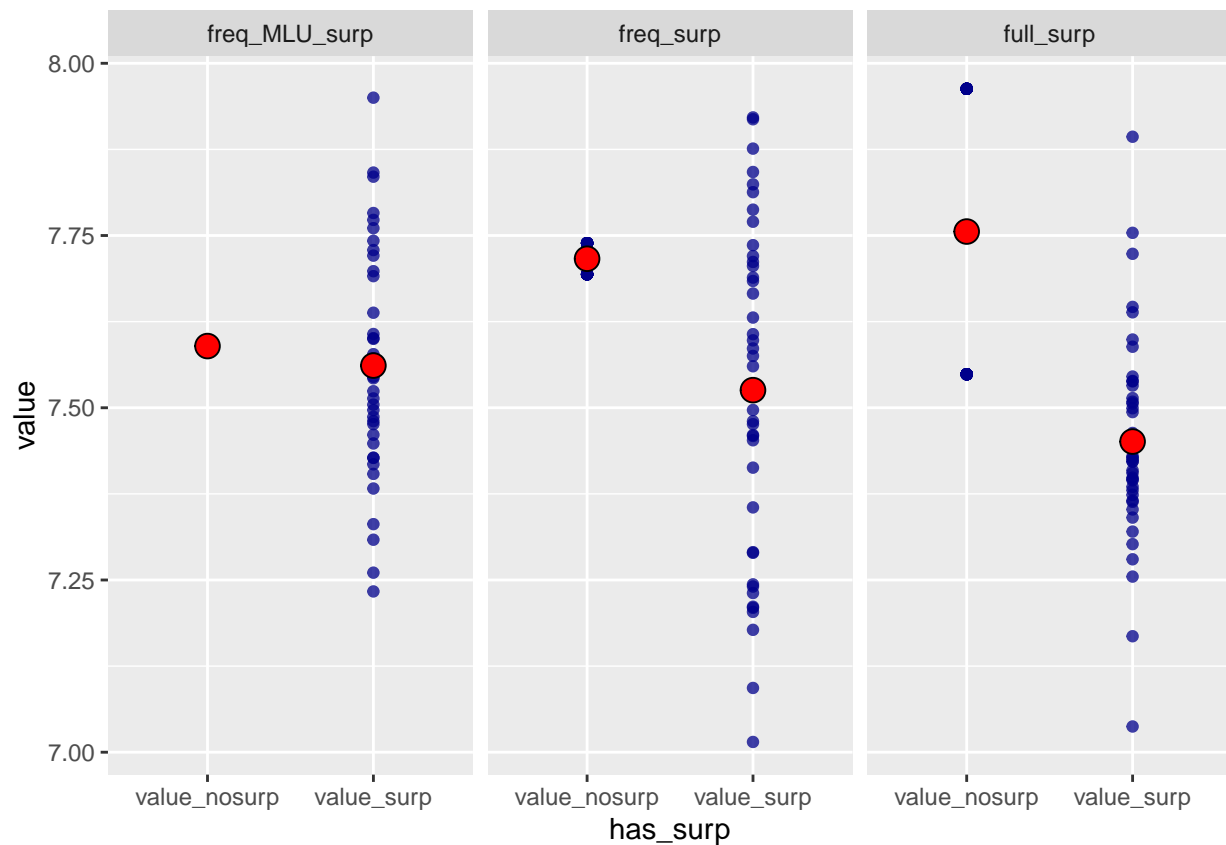
```
ggplot(data = (plot_data %>% filter(err_=="rmse_" & measure=="understands")),
  mapping = aes(x = has_surp, y = value)) +
  geom_point(alpha = 0.5, color="dark blue") +
  stat_summary(fun.y = "mean",
    geom = "point",
    shape = 21,
    fill = "red",
    size = 4) +
  facet_wrap(vars(model))
```



## MAE results

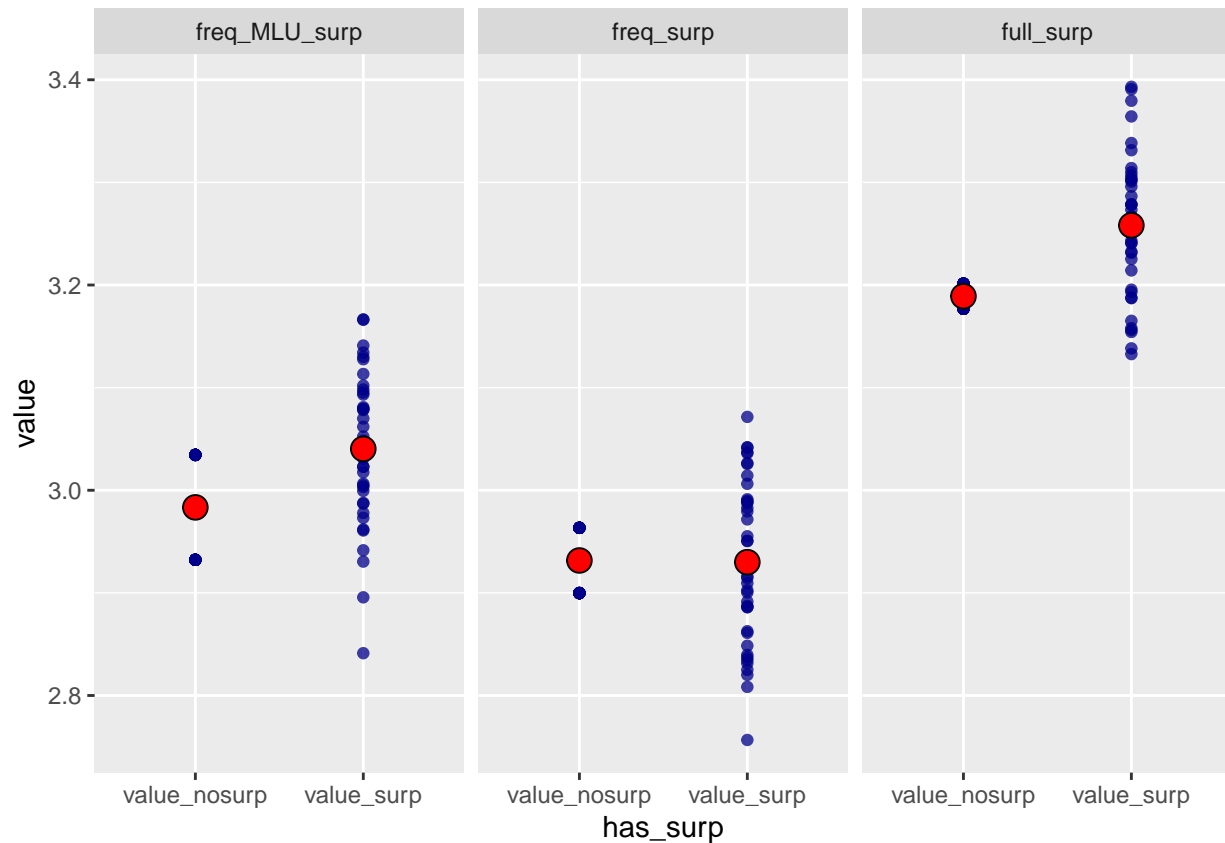
‘Produces’

```
ggplot(data = (plot_data %>% filter(err=="mae_" & measure=="produces")),
  mapping = aes(x = has_surp, y = value)) +
  geom_point(alpha = 0.5, color="dark blue") +
  stat_summary(fun.y = "mean",
    geom = "point",
    shape = 21,
    fill = "red",
    size = 4) +
  facet_wrap(vars(model))
```



### 'Understands'

```
ggplot(data = (plot_data %>% filter(err_=="mae_" & measure=="understands")),
  mapping = aes(x = has_surp, y = value)) +
  geom_point(alpha = 0.5, color="dark blue") +
  stat_summary(fun.y = "mean",
    geom = "point",
    shape = 21,
    fill = "red",
    size = 4) +
  facet_wrap(vars(model))
```



## Average Child Results

```
load("../..../data/aoa_predictors/Average_child_cv_errs_data.RData")

avg_errs_no_surp = cv_errs_data %>%
  filter(model %in% c("full_set", "freq_only", "freq_MLU")) %>%
  select(-c(group, child_name))

avg_errs_with_surp = cv_errs_data %>%
  filter(!(model %in% c("full_set", "freq_only", "freq_MLU")))

combine_errs_avg <- function(surp_model, nosurp_model){
  avg_errs_with_surp_full = avg_errs_with_surp %>%
    filter(model == surp_model) %>%
    gather(err_, value_surp, c(mse_, rmse_, mae_))

  avg_errs_no_surp_full = avg_errs_no_surp %>%
    filter(model == nosurp_model) %>%
    select(-c(kfolds, model)) %>%
    gather(err_, value_nosurp, c(mse_, rmse_, mae_))

  model_errs_full = avg_errs_with_surp_full %>%
    left_join(avg_errs_no_surp_full)
```



```

    return(model_errs_full)
}

avg_errs_full = combine_errs_avg("full_surp", "full_set")

## Joining, by = c("measure", "err_")
avg_errs_freq = combine_errs_avg("freq_surp", "freq_only")

## Joining, by = c("measure", "err_")
avg_errs_freq_MLU = combine_errs_avg("freq_MLU_surp", "freq_MLU")

## Joining, by = c("measure", "err_")
avg_errs = rbind(avg_errs_full, avg_errs_freq, avg_errs_freq_MLU)
plot_data_avg = avg_errs %>% gather(has_surp, value, c(value_surp, value_nosurp))

```

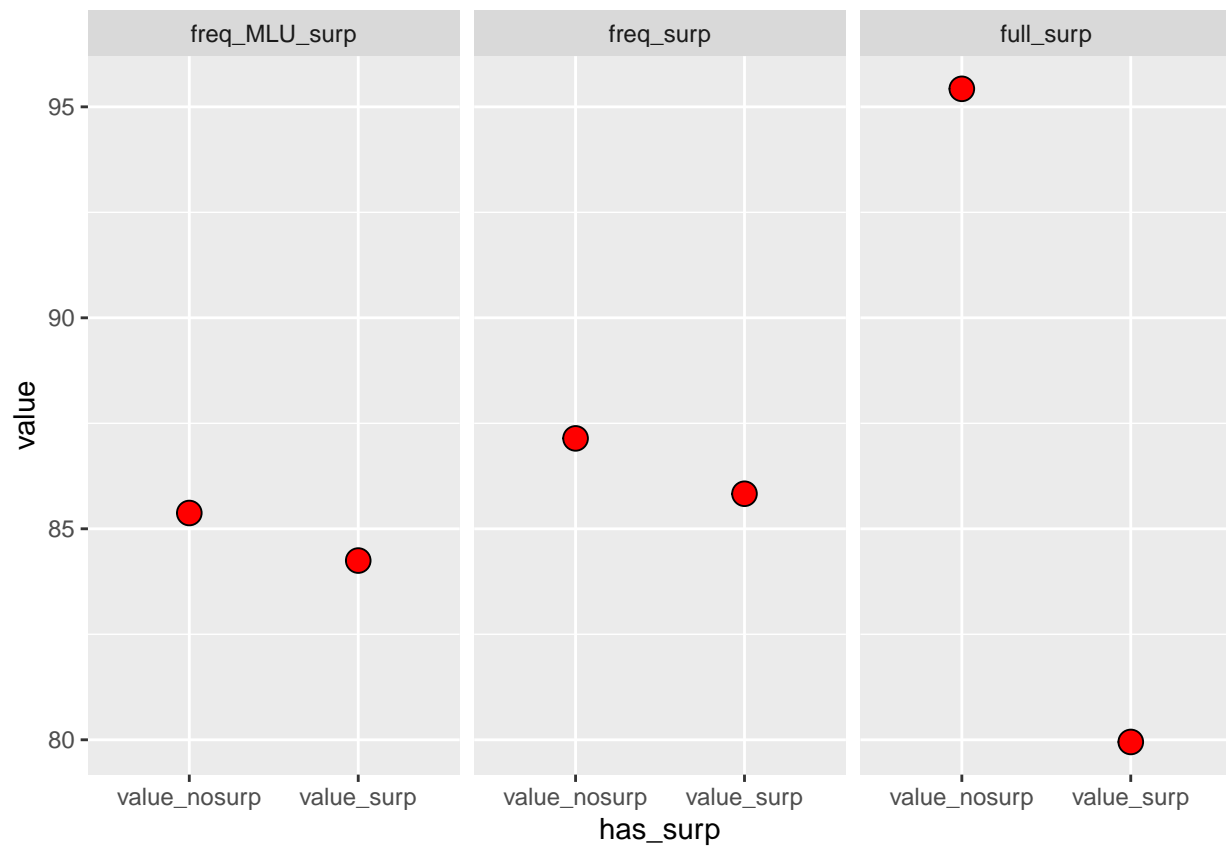
## MSE results

‘Produces’

```

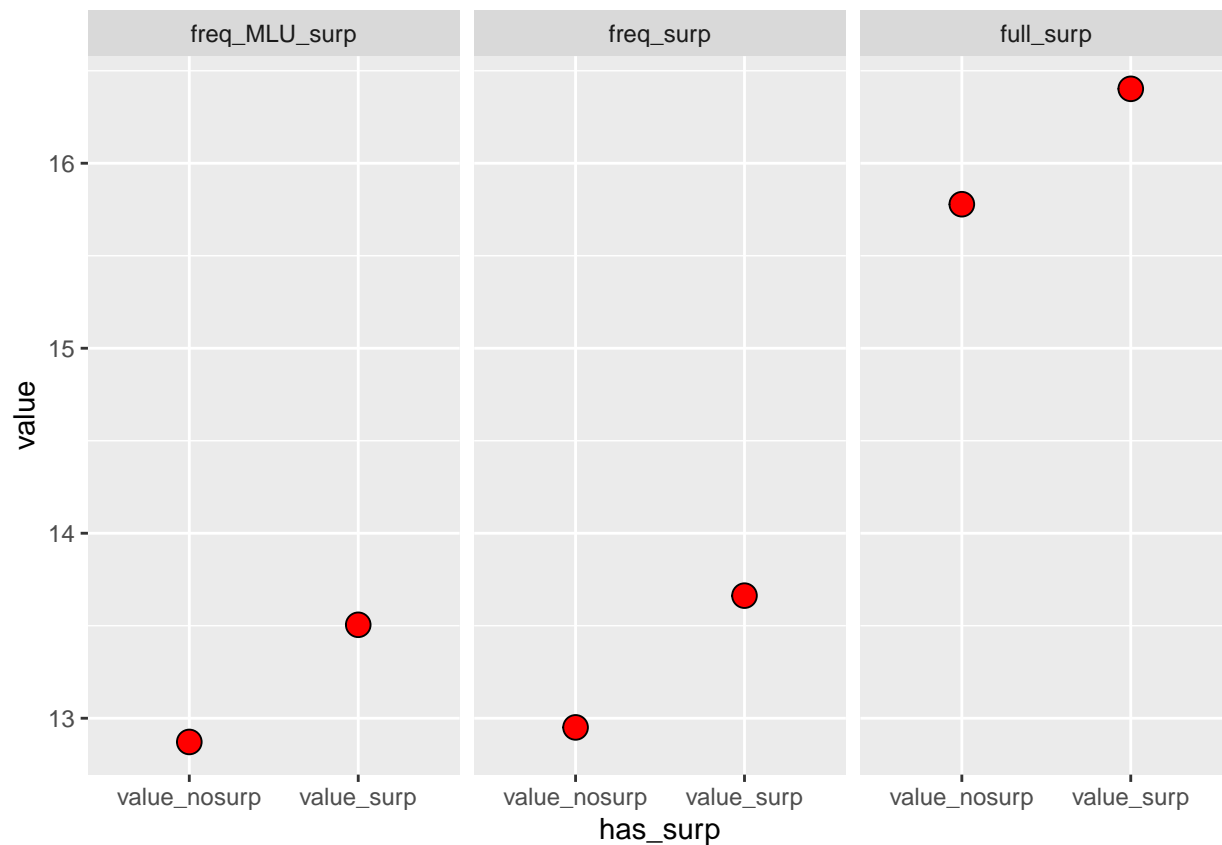
ggplot(data = (plot_data_avg %>% filter(err_=="mse_" & measure=="produces")),
      mapping = aes(x = has_surp, y = value)) +
  stat_summary(fun.y = "mean",
              geom = "point",
              shape = 21,
              fill = "red",
              size = 4) +
  facet_wrap(vars(model))

```



### 'Understands'

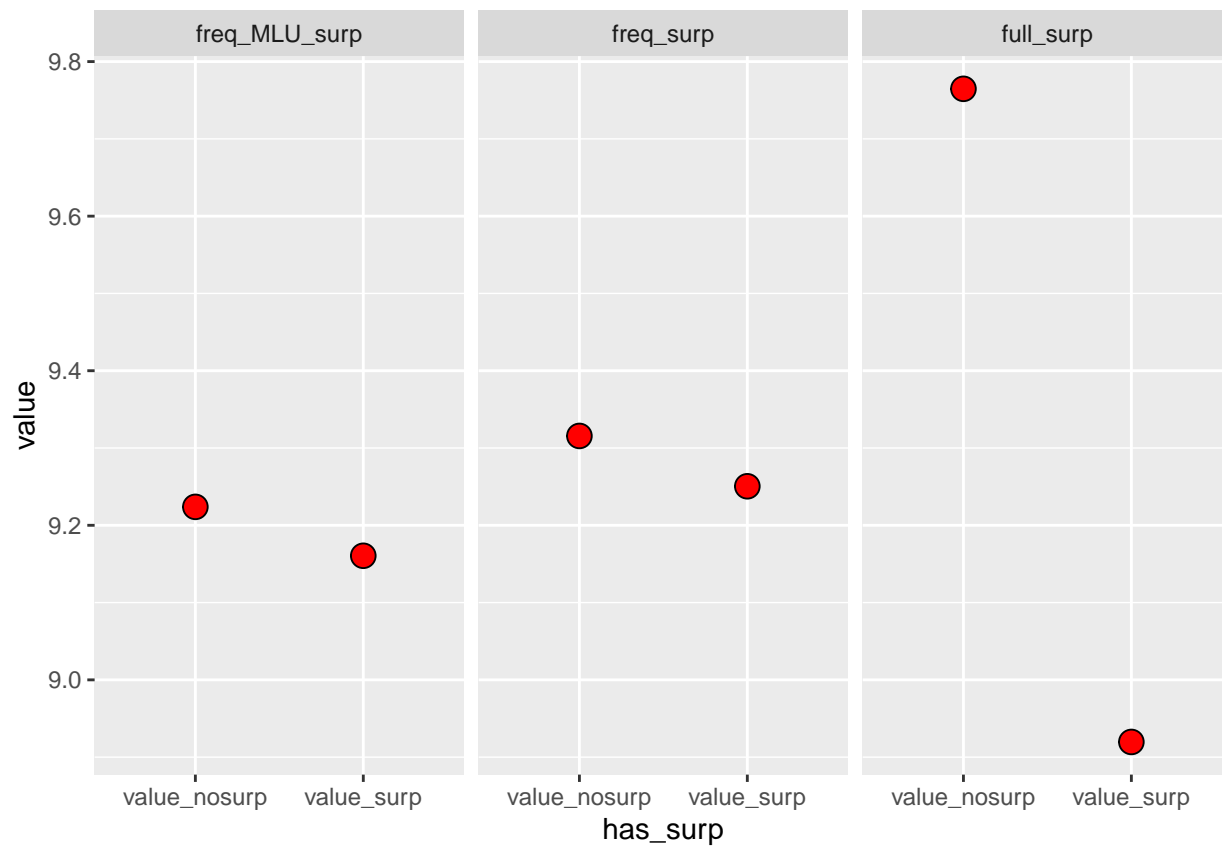
```
ggplot(data = (plot_data_avg %>% filter(err=="mse_" & measure=="understands")),
  mapping = aes(x = has_surp, y = value)) +
  stat_summary(fun.y = "mean",
    geom = "point",
    shape = 21,
    fill = "red",
    size = 4) +
  facet_wrap(vars(model))
```



## RMSE results

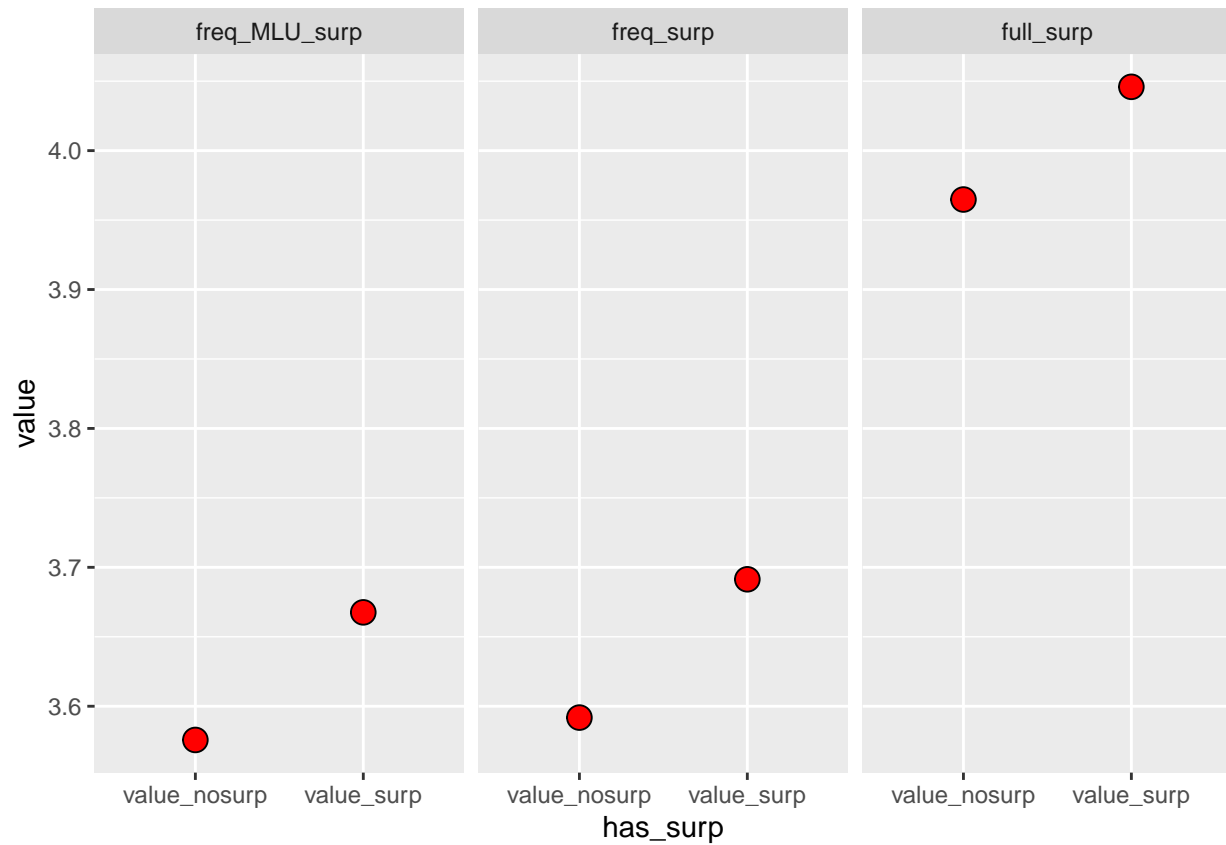
‘Produces’

```
ggplot(data = (plot_data_avg %>% filter(err_=="rmse_" & measure=="produces")),
  mapping = aes(x = has_surp, y = value)) +
  stat_summary(fun.y = "mean",
    geom = "point",
    shape = 21,
    fill = "red",
    size = 4) +
  facet_wrap(vars(model))
```



‘Understands’

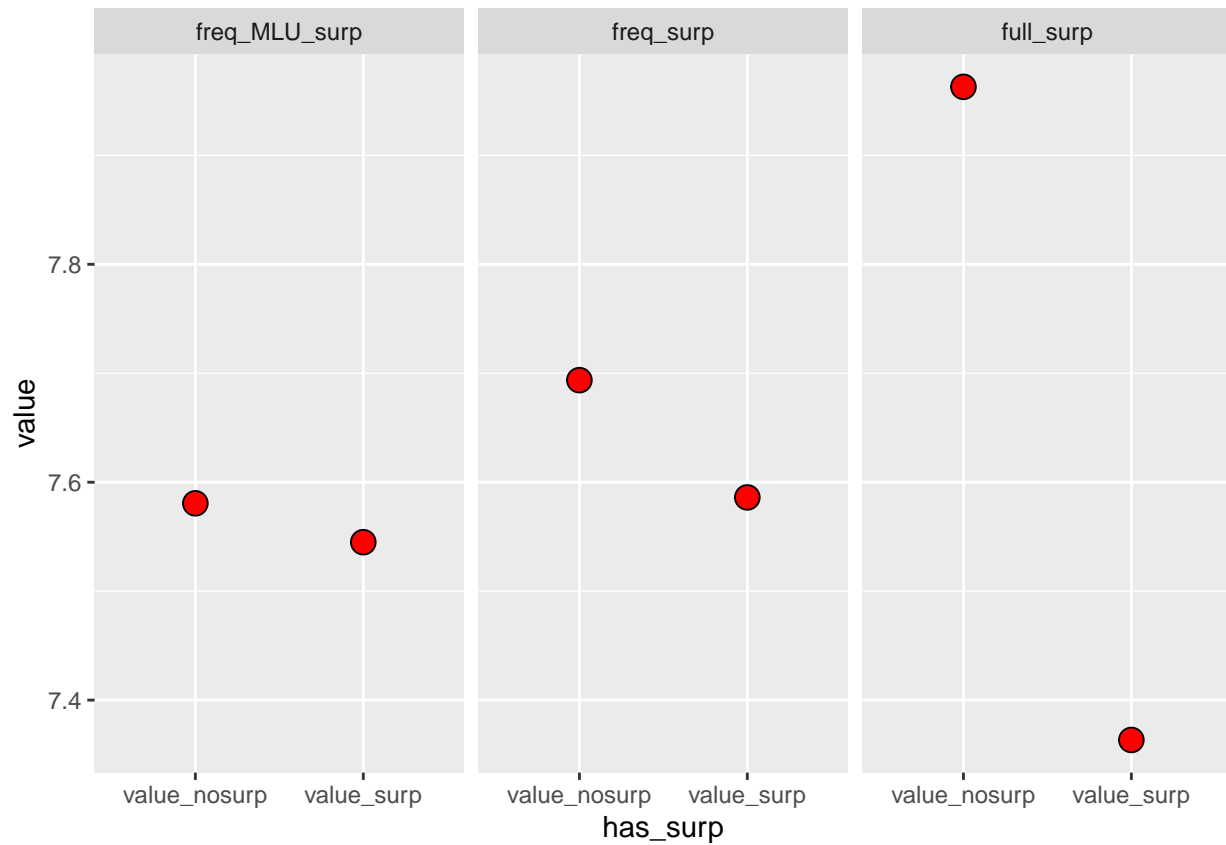
```
ggplot(data = (plot_data_avg %>% filter(err_=="rmse_" & measure=="understands")),
       mapping = aes(x = has_surp, y = value)) +
  stat_summary(fun.y = "mean",
              geom = "point",
              shape = 21,
              fill = "red",
              size = 4) +
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```



## MAE results

‘Produces’

```
ggplot(data = (plot_data_avg %>% filter(err_=="mae_" & measure=="produces")),
  mapping = aes(x = has_surp, y = value)) +
  stat_summary(fun.y = "mean",
    geom = "point",
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‘Understands’

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ggplot(data = (plot_data_avg %>% filter(err_=="mae_" & measure=="understands")),
       mapping = aes(x = has_surp, y = value)) +
  stat_summary(fun.y = "mean",
              geom = "point",
              shape = 21,
              fill = "red",
              size = 4) +
  facet_wrap(vars(model))
```

