Selection on within-individual variation in flowering time in Lathyrus vernus

Data preparation

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Contents

Read data from Excel file

```
data_ids_87 <- read_excel("data/edited/individual_characteristics.xlsx",
                          sheet = "1987")
data_ids_88 <- read_excel("data/edited/individual_characteristics.xlsx",
                          sheet = "1988")
data_ids_89 <- read_excel("data/edited/individual_characteristics.xlsx",
                          sheet = "1989")
```

Remove empty rows and columns, and standardized columns

```
data_ids_87 <- data_ids_87 %>% drop_na(ID)%>% # Remove second, empty row
  # and 3 rows at the bottom (one empty, two where mean and SD were calculated)
  select(-c(...3, ...5, ...19, ...22))%>% # Remove 4 empty columns
  select(-c(MeanSTD:IntactREL))
data_ids_88 <- data_ids_88 %>% drop_na(ID)%>% # Remove second, empty row
  select(-c(...3, ...5)) # Remove 2 empty columns
data_ids_89 <- data_ids_89 %>% drop_na(ID)%>% # Remove second, empty row
  select(-c(...3, ...5)) # Remove 2 empty columns
nrow(data_ids_87)
```

```
## [1] 231
```

```
# 231 rows
nrow(data_ids_88)
```

```
## [1] 169
```

```
# 169 rows
nrow(data_ids_89)
```

```
## [1] 96
```

```
# 96 rows
```

Rename columns

```
data_ids_87 <- data_ids_87 %>%
  rename(id = ID, subplot = Subplot, composite_id = Ind, MFD = `Mean (MFD)`,
         skew =  Skew, kurt = Kurtosis,LFD = `Max (LFD)`, FFD = `Min (FFD)`,
         dur = `Range (Duration)`, n_fl = `Flower N`, n_fr = Fruits,
         fr_init = `Fruit init (fr/fl)`, n_seed = `Total seeds`,
         n_preyed_seed = `Preyed seeds`,
         fitness = `Intact seeds (fitness)`,
         n_seed_per_fr = `Seeds per fruit`,
         prop_seed_preyed = `Proportion preyed`,
         imp_seed_preyed = `Imputed values for seed number and predation`)
data_ids_88 <- data_ids_88 %>%
  rename(id = ID, subplot = Subplot, composite_id = Ind, MFD = `Mean (MFD)`,
         skew =  Skew, kurt = Kurtosis,LFD = `Max (LFD)`, FFD = `Min (FFD)`,
         dur = `Range (Duration)`, n_fl = `Flower N`, n_fr = Fruits,
         fr_init = `Fruit init (fr/fl)`, n_seed = `Total seeds`,
         n_preyed_seed = `Preyed seeds`,
         fitness = `Intact seeds (fitness)`,
         imp_seed_preyed = `Imputed values for seed number and predation`)
data_ids_89 <- data_ids_89 %>%
  rename(id = ID, subplot = Subplot, composite_id = Ind, MFD = `Mean (MFD)`,
         skew =  Skew, kurt = Kurtosis,LFD = `Max (LFD)`, FFD = `Min (FFD)`,
         dur = `Range (Duration)`, n_fl = `Flower N`, n_fr = Fruits,
         fr_init = `Fruit init (fr/fl)`, n_seed = `Total seeds`,
```

```
         n_preyed_seed = `Preyed seeds`,
         fitness = `Intact seeds (fitness)`,
         imp_seed_preyed = Imputed)
```

Calculate number of seeds per fruit and proportion of seeds preyed in 1988-89

```
data_ids_88 <- data_ids_88 %>%
  mutate(n_seed_per_fr = ifelse(n_fr==0, NA, n_seed / n_fr),
         prop_seed_preyed = ifelse(n_seed==0, NA, n_preyed_seed / n_seed))
data_ids_89 <- data_ids_89 %>%
  mutate(n_seed_per_fr = ifelse(n_fr==0, NA, n_seed / n_fr),
         prop_seed_preyed = ifelse(n_seed==0, NA, n_preyed_seed / n_seed))
```

Change column types

```
data_ids_87 <- data_ids_87 %>%
  mutate(imp_seed_preyed = as.factor(imp_seed_preyed))
data_ids_88 <- data_ids_88 %>%
  mutate(imp_seed_preyed = as.factor(imp_seed_preyed))
data_ids_89 <- data_ids_89 %>%
  mutate(imp_seed_preyed = as.factor(imp_seed_preyed))
# See if I keep integer values as "double"!
```

Standardize traits and relativize fitness

```
data_ids_87 <- data_ids_87 %>%
  mutate(across(c(MFD:n_fl), scale, .names = "{col}_std"))%>%
  mutate(fitness_rel = fitness / mean(fitness))
data_ids_88 <- data_ids_88 %>%
  mutate(across(c(MFD:n_fl), scale, .names = "{col}_std"))%>%
  mutate(fitness_rel = fitness / mean(fitness))
data_ids_89 <- data_ids_89 %>%
  mutate(across(c(MFD:n_fl), scale, .names = "{col}_std"))%>%
  mutate(fitness_rel = fitness / mean(fitness))
```

Merge data for the 3 years

```
data_ids_87 <- data_ids_87 %>%
  mutate(year = as.integer(1987))
data_ids_88 <- data_ids_88 %>%
```

```
  mutate(year = as.integer(1988))
data_ids_89 <- data_ids_89 %>%
  mutate(year = as.integer(1989))
data_ids <- full_join(full_join(data_ids_87,data_ids_88),data_ids_89)
data_ids <- data_ids %>% mutate(year = as.factor(year))
```

```
sessionInfo()
```

```
## R version 4.2.2 (2022-10-31 ucrt)
## Platform: x86_64-w64-mingw32/x64 (64-bit)
## Running under: Windows 10 x64 (build 22621)
##
## Matrix products: default
##
## locale:
## [1] LC_COLLATE=English_United States.utf8
## [2] LC_CTYPE=English_United States.utf8
## [3] LC_MONETARY=English_United States.utf8
## [4] LC_NUMERIC=C
## [5] LC_TIME=English_United States.utf8
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
##  [1] moments_0.14.1   lubridate_1.9.0  timechange_0.1.1 readxl_1.4.1
##  [5] forcats_0.5.2    stringr_1.5.0    dplyr_1.0.10     purrr_1.0.0
##  [9] readr_2.1.3      tidyr_1.2.1      tibble_3.1.8     ggplot2_3.4.0
## [13] tidyverse_1.3.2
##
## loaded via a namespace (and not attached):
##  [1] tidyselect_1.2.0    xfun_0.36           haven_2.5.1
##  [4] gargle_1.2.1        colorspace_2.0-3    vctrs_0.5.1
##  [7] generics_0.1.3      htmltools_0.5.4     yaml_2.3.6
## [10] utf8_1.2.2          rlang_1.0.6         pillar_1.8.1
## [13] withr_2.5.0         glue_1.6.2          DBI_1.1.3
## [16] dbplyr_2.2.1        modelr_0.1.10       lifecycle_1.0.3
## [19] munsell_0.5.0       gtable_0.3.1        cellranger_1.1.0
## [22] rvest_1.0.3         evaluate_0.19       knitr_1.41
## [25] tzdb_0.3.0          fastmap_1.1.0       fansi_1.0.3
## [28] broom_1.0.2         scales_1.2.1        backports_1.4.1
## [31] googlesheets4_1.0.1 jsonlite_1.8.4      fs_1.5.2
## [34] hms_1.1.2           digest_0.6.31       stringi_1.7.8
## [37] grid_4.2.2          cli_3.5.0           tools_4.2.2
## [40] magrittr_2.0.3      crayon_1.5.2        pkgconfig_2.0.3
## [43] ellipsis_0.3.2      xml2_1.3.3          reprex_2.0.2
## [46] googledrive_2.0.0   assertthat_0.2.1    rmarkdown_2.19
## [49] httr_1.4.4          rstudioapi_0.14     R6_2.5.1
## [52] compiler_4.2.2
```