

data wrangling and plots

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R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
## loading libraries
pacman::p_load(metafor, tidyverse)
#devtools::install_github("itchyshin/orchard_plot", subdir = "orchard", force = TRUE, build_vignettes =
#library(orchard)
```

```
#load data
dat_MA_0<- read_csv("maggie_MA_2_8_21.csv")
```

```
## Parsed with column specification:
## cols(
##   .default = col_double(),
##   study_id = col_character(),
##   origin = col_character(),
##   resp_def = col_character(),
##   resp_units = col_character(),
##   genus = col_character(),
##   species = col_character(),
##   add_covariate = col_character(),
##   add_covariate_value = col_character(),
##   extra_covariate = col_character(),
##   extra_value = col_character(),
##   add_info = col_logical(),
##   time_units = col_character(),
##   'same_mean (y/n)' = col_character()
## )
```

```
## See spec(...) for full column specifications.
```

```
##
## Multivariate Meta-Analysis Model (k = 210; method: REML)
##
##      logLik      Deviance      AIC      BIC      AICc
## -1016.7025    2033.4050    2041.4050    2054.7743    2041.6010
```

```

##
## Variance Components:
##
##      estim      sqrt  nlvls  fixed      factor
## sigma^2.1  0.0000  0.0000    10    no      response_id
## sigma^2.2  0.0000  0.0002    15    no      response_id/experiment_id
## sigma^2.3  3.9573  1.9893    60    no      response_id/experiment_id/study_id
##
## Test for Heterogeneity:
## Q(df = 209) = 4269.2455, p-val < .0001
##
## Model Results:
##
## estimate      se      zval      pval      ci.lb      ci.ub
##    1.2248    0.2589    4.7301    <.0001    0.7173    1.7324    ***
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##
## Multivariate Meta-Analysis Model (k = 210; method: REML)
##
##      logLik      Deviance      AIC      BIC      AICc
## -1511.1334    3022.2668    3030.2668    3043.6362    3030.4629
##
## Variance Components:
##
##      estim      sqrt  nlvls  fixed      factor
## sigma^2.1  0.2689  0.5186    10    no      response_id
## sigma^2.2  0.0000  0.0004    15    no      response_id/experiment_id
## sigma^2.3  4.6387  2.1538    60    no      response_id/experiment_id/study_id
##
## Test for Heterogeneity:
## Q(df = 209) = 5733.4320, p-val < .0001
##
## Model Results:
##
## estimate      se      zval      pval      ci.lb      ci.ub
##    0.0860    0.3591    0.2396    0.8107    -0.6179    0.7899
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##      flux_range  n
## 1           2.0  5
## 2           4.0 10
## 3           6.0 36
## 4           6.5  1
## 5           7.0  4
## 6          10.0 46
## 7          12.0 21
## 8          12.5  1
## 9          13.0  4
## 10         14.0 27

```

```
## 11      15.0 51
## 12      20.0 4
```

```
##          resp_units  n
## 1          eggs laid 38
## 2              g    38
## 3              mm    28
## 4              days  20
## 5          percent  17
## 6 CFU * g dry weight manure-1 14
## 7          1 day -1    9
## 8              mg    8
## 9              C     7
## 10         kJ *day-1 *kg-1 4
## 11              m * s-1 4
## 12         time to death (hour) 4
## 13              cm    3
## 14              m     3
## 15         wing centroid    3
## 16         offspring per mating 2
## 17         offspring/female    2
## 18              pixels    2
## 19         total offspring    2
## 20         nmol CHE / mgww    1
## 21 uM Trolox Equivalents/ mgww 1
```

```
## mean_temp_constant      study_id  n
## 1          7.0          semenov2007 4
## 2         10.0          piccau2017  1
## 3         15.0          garcaruiz2011 1
## 4         16.0          semenov2007  9
## 5         17.0          saxon2017   3
## 6         18.0          garcaruiz2011 1
## 7         18.0 kern_2015plasticity  4
## 8         18.3 pendlebury2004    8
## 9         20.1          delava2016  8
## 10        21.0          garcaruiz2011 1
## 11        21.0          saxon2017   1
## 12        23.0          maneti2014 12
## 13        23.0          semenov2007  7
## 14        24.0          garcaruiz2011 1
## 15        24.0          kern_2015phys 15
## 16        24.0          kern2014    4
## 17        24.0          rolandi2018 38
## 18        24.0          saxon2017   3
## 19        25.0          lowenborg2012 5
## 20        27.0          garcaruiz2011 1
## 21        27.0          qu2014    20
## 22        28.0          du2009    32
## 23        28.0          glass2019   8
## 24        29.5          triedel 2015 2
## 25        30.0          garcaruiz2011 1
## 26        31.0          simonici2019 5
## 27        32.0          garcaruiz2011 1
```

## 28	32.0	simonici2019	10
## 29	33.0	semenov2007	3
## 30	34.0	garcaruiz2011	1

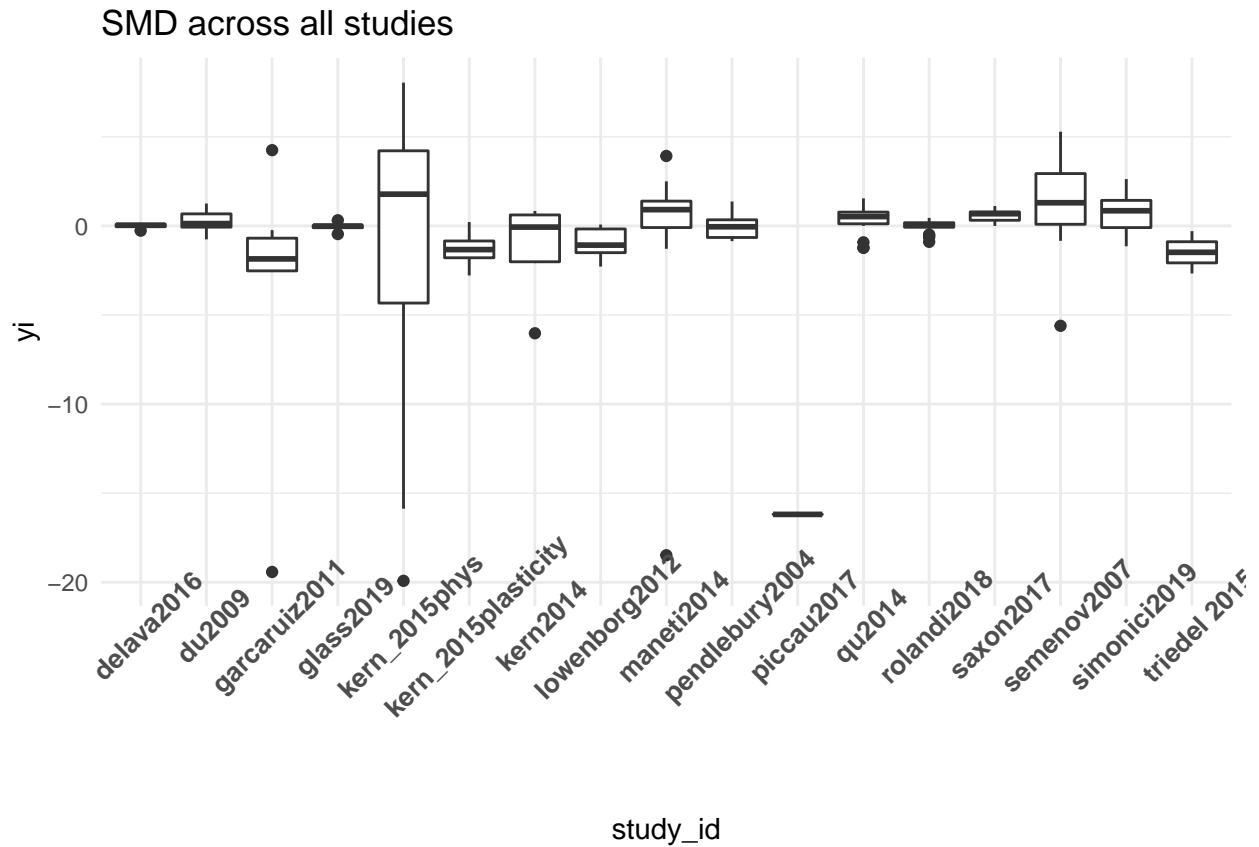
##		resp_def	n
## 1		body mass	31
## 2	average cumulative number of eggs laid per female		19
## 3	average number of eggs laid per female		19
## 4		survival	18
## 5		developmental time	10
## 6		rate of change	9
## 7		CT max	7
## 8		tail length	5
## 9		carapace height	4
## 10		carapace width	4
## 11	daily energy expenditure		4
## 12		egg mass	4
## 13		ovary mass, dry	4
## 14		testes mass, dry	4
## 15		body length	3
## 16	development to stages 35-37		3
## 17		hatching success	3
## 18		incubation period	3
## 19		mass	3
## 20		percent females	3
## 21		total length	3
## 22		wing centroid	3
## 23		abdomen length	2
## 24		body (centroid) size	2
## 25		dessication tolerance	2
## 26		development time	2
## 27	egg to adult viability		2
## 28		fore-limb length	2
## 29		head length	2
## 30		head width	2
## 31		hind-limb length	2
## 32		infestation rate	2
## 33		maximal length	2
## 34	offspring per mating		2
## 35		productivity	2
## 36		snout-vent length	2
## 37		sprint speed	2
## 38	startvation tolerance		2
## 39	success of parasitism		2
## 40		total offspring	2
## 41		aquatic speed	1
## 42	days to first slough		1
## 43		distance covered	1
## 44		germination	1
## 45		incubation time	1
## 46		oxidative damage	1
## 47		TAC	1
## 48	terrestrial speed		1

##	genus	study_id	n
## 1	Caiman	simonici2019	15
## 2	Chinemys	du2009	32
## 3	Clematis	piccau2017	1
## 4	Coturnix	pendlebury2004	8
## 5	Drosophila	delava2016	2
## 6	Drosophila	maneti2014	12
## 7	Drosophila	saxon2017	7
## 8	Escherichia	semenov2007	12
## 9	Gryllus	glass2019	8
## 10	Leptopilina	delava2016	6
## 11	Limnodynastes	kern_2015phys	10
## 12	Limnodynastes	kern_2015plasticity	4
## 13	Natrix	lowenborg2012	5
## 14	Platyplectrum	kern_2015phys	5
## 15	Platyplectrum	kern2014	4
## 16	Plestiodon	qu2014	20
## 17	Rhodnius	rolandi2018	38
## 18	Salmonella	semenov2007	11
## 19	Trachemys	triedel 2015	2
## 20	Xylotrechus	garcaruiz2011	8

##	genus	n
## 1	Caiman	15
## 2	Chinemys	32
## 3	Clematis	1
## 4	Coturnix	8
## 5	Drosophila	21
## 6	Escherichia	12
## 7	Gryllus	8
## 8	Leptopilina	6
## 9	Limnodynastes	14
## 10	Natrix	5
## 11	Platyplectrum	9
## 12	Plestiodon	20
## 13	Rhodnius	38
## 14	Salmonella	11
## 15	Trachemys	2
## 16	Xylotrechus	8

##	size	n
## 1	0	23
## 2	1	82
## 3	2	90
## 4	3	15

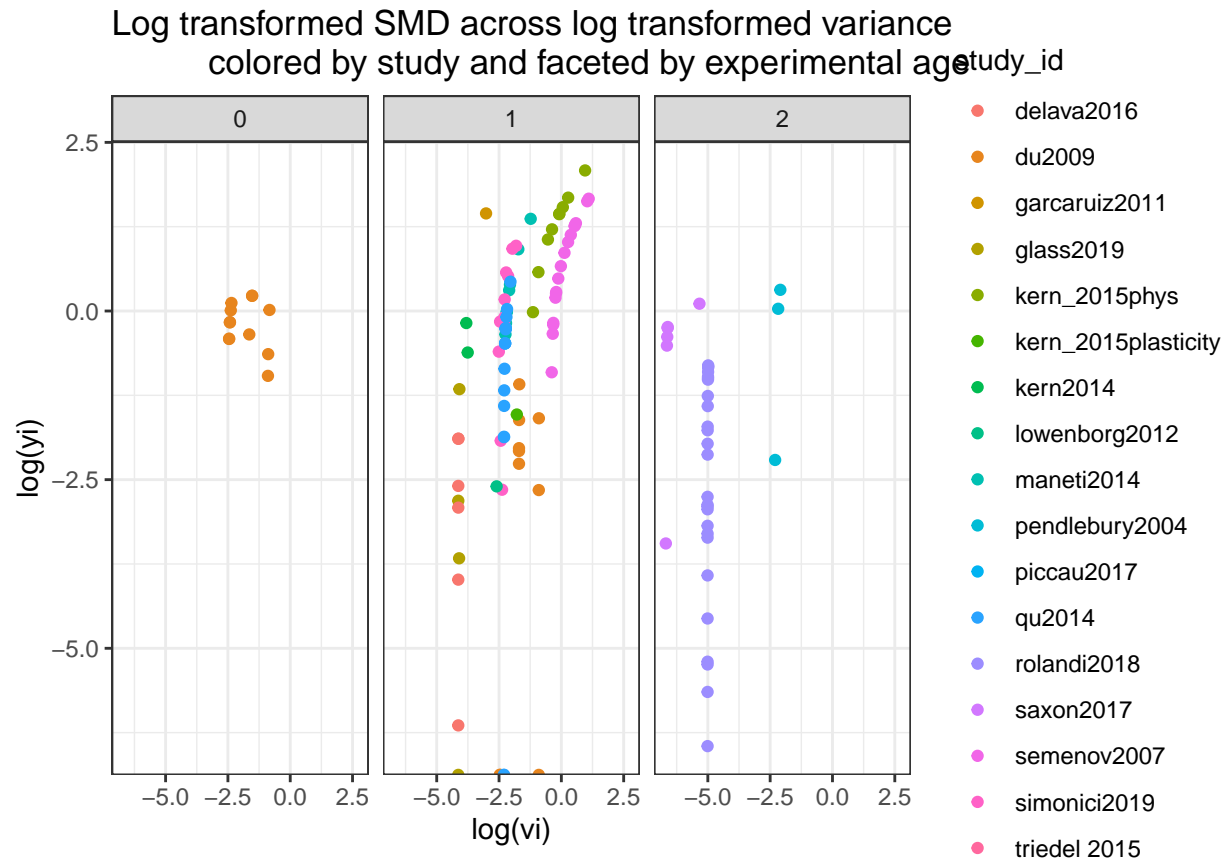
##	larger_group	n
## 1	0	1
## 2	1	186
## 3	3	23



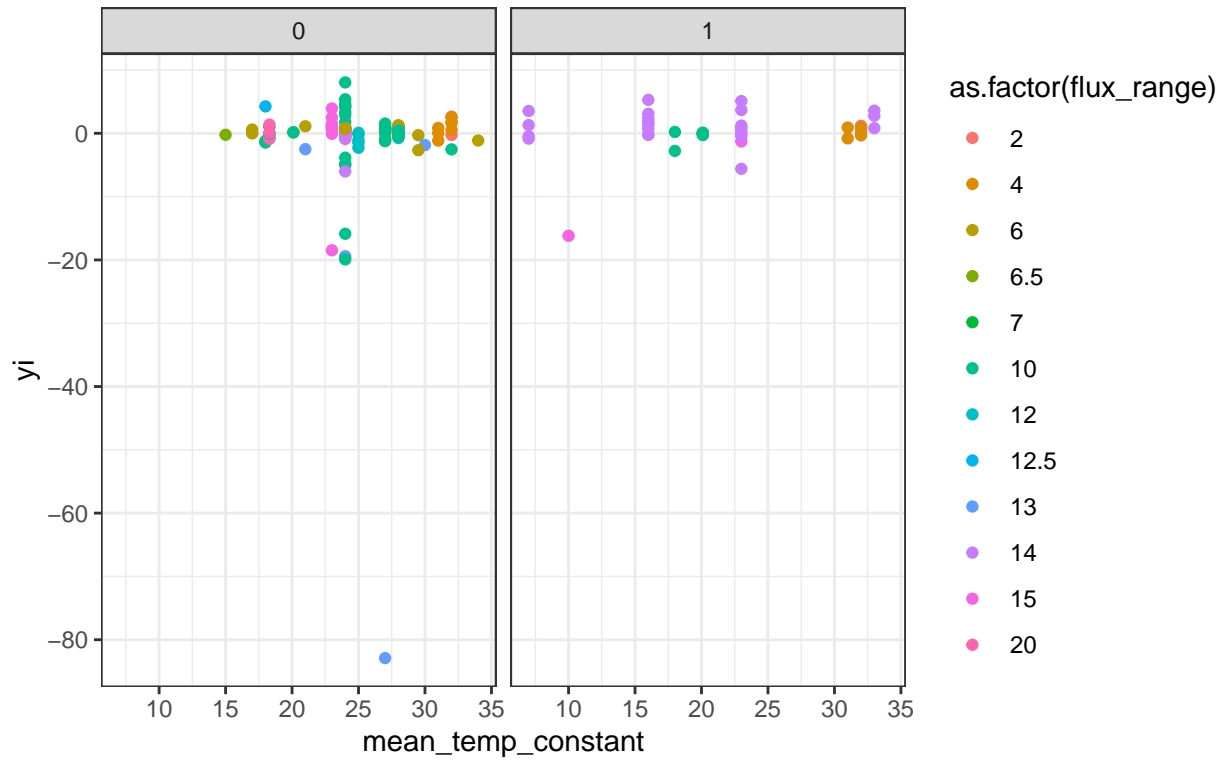
```
## Warning in log(yi): NaNs produced
```

```
## Warning in log(yi): NaNs produced
```

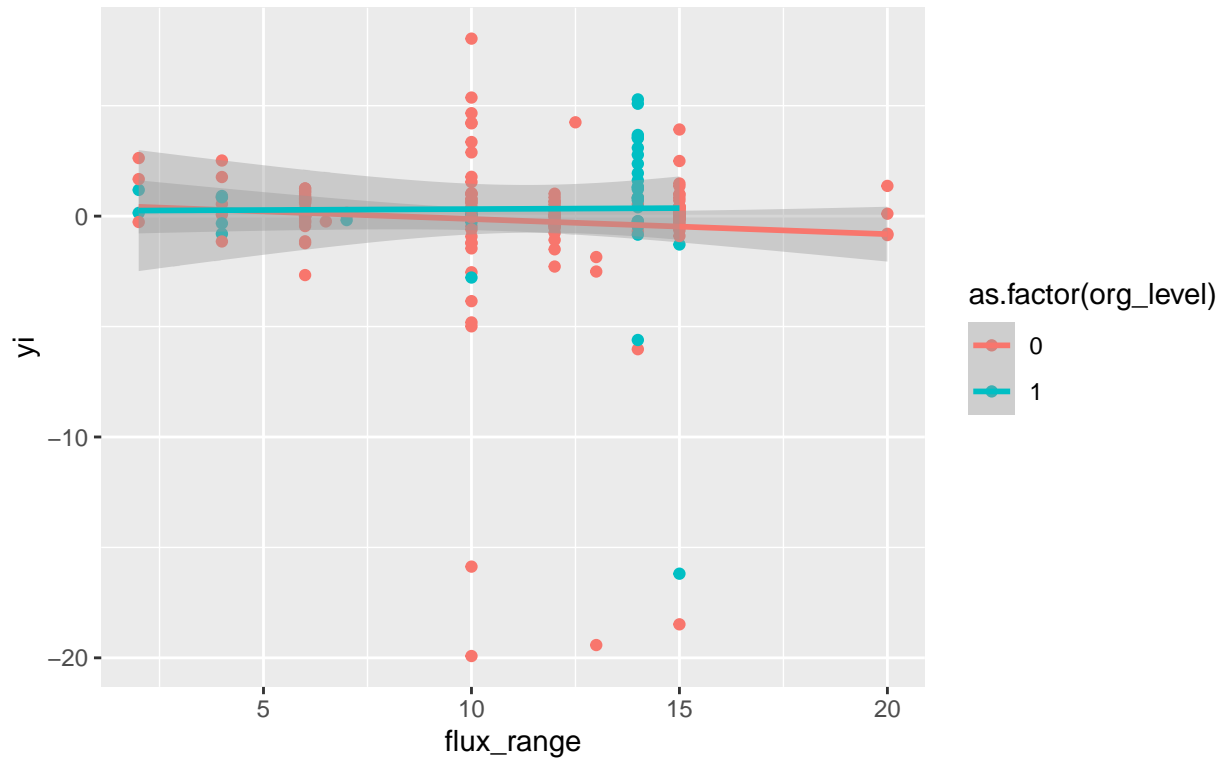
```
## Warning: Removed 76 rows containing missing values (geom_point).
```

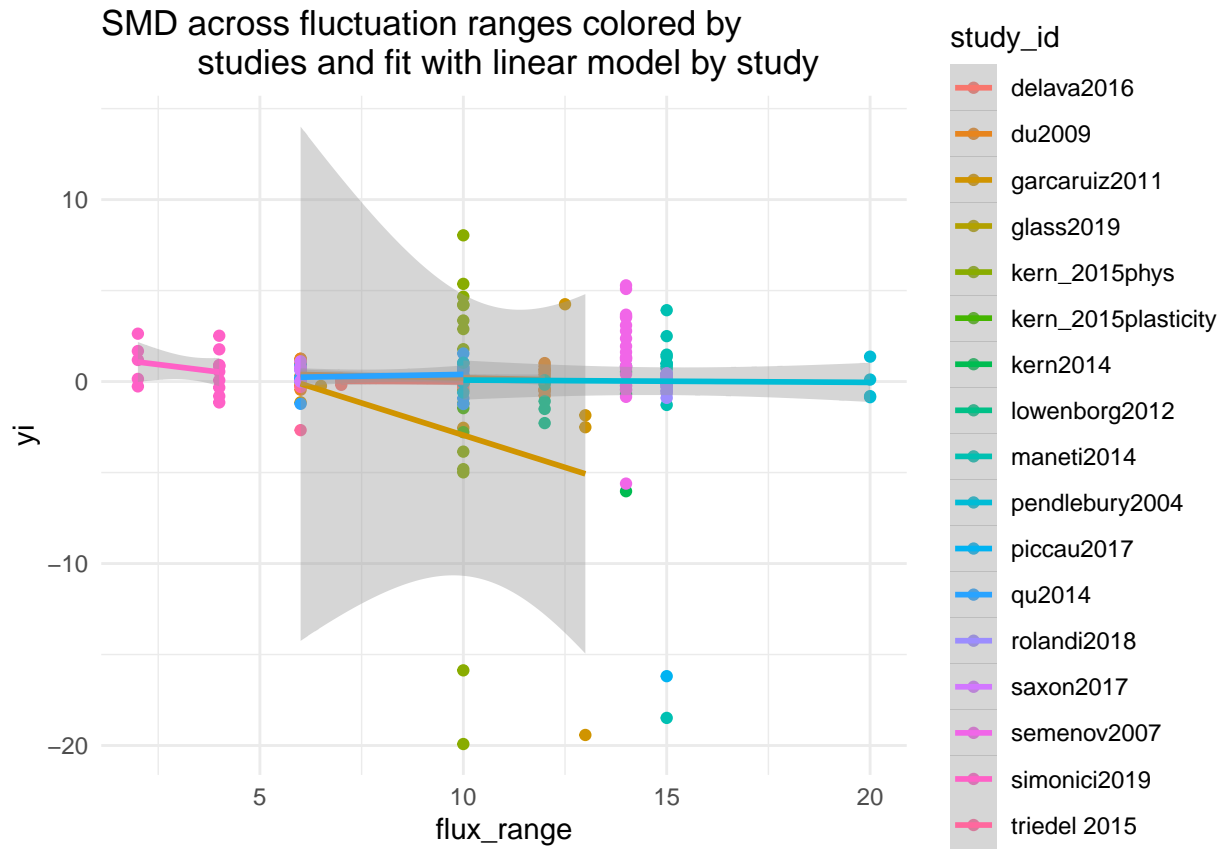


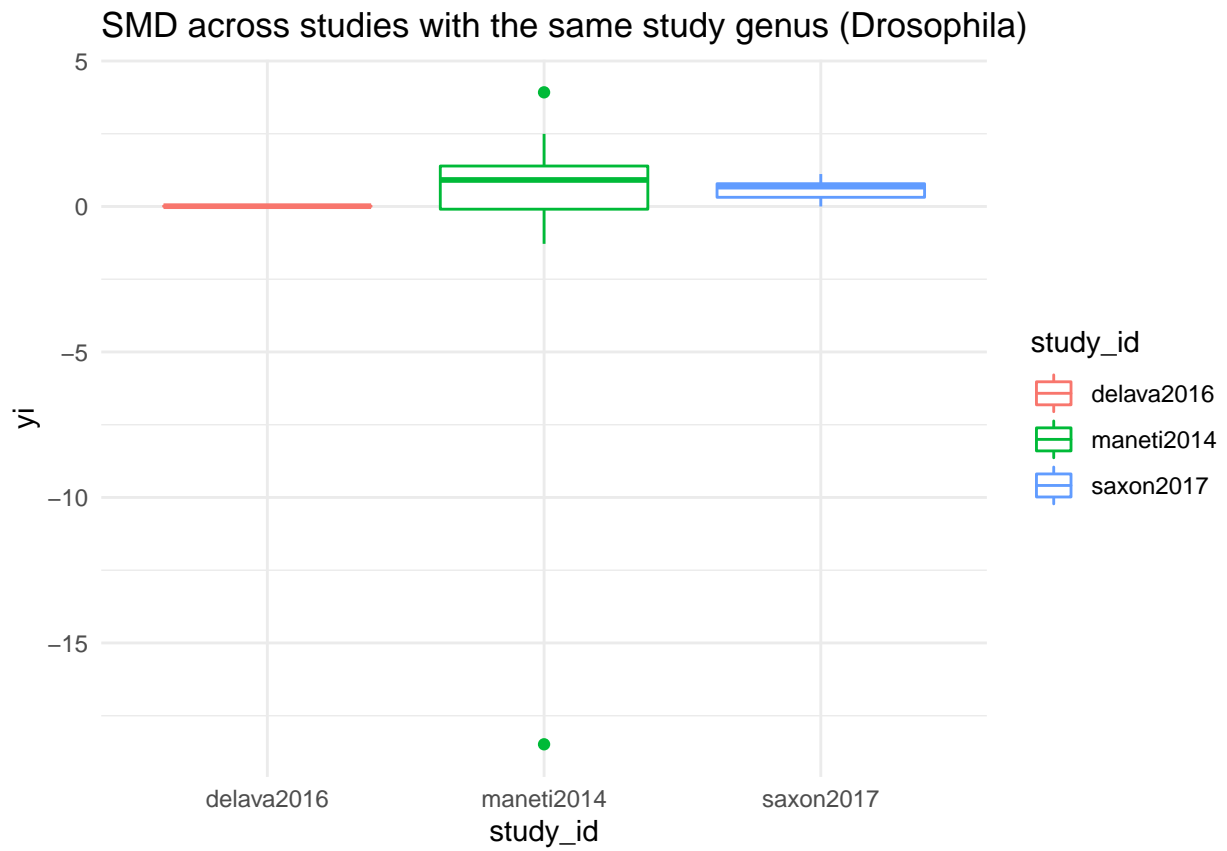
SMD across mean temperature colored by fluctuation range
and faceted by organization level



SMD across fluctuation ranges colored by organization level
and fit with linear model

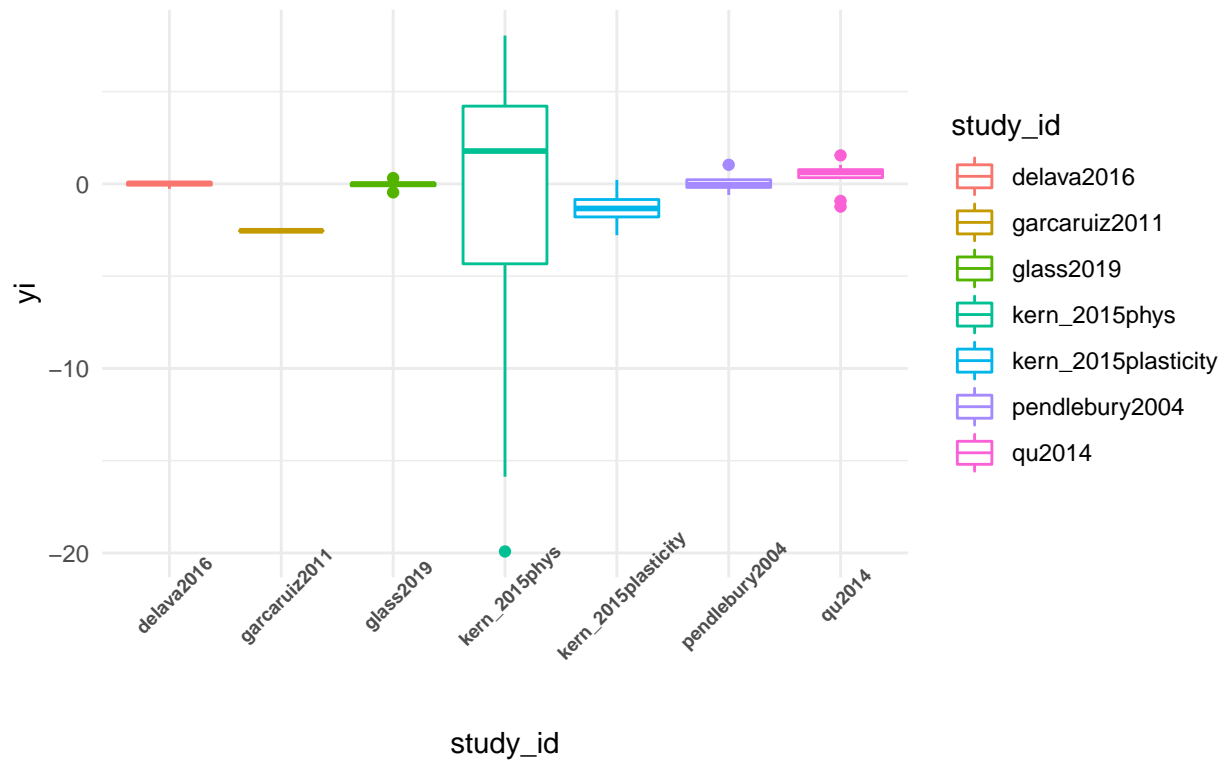




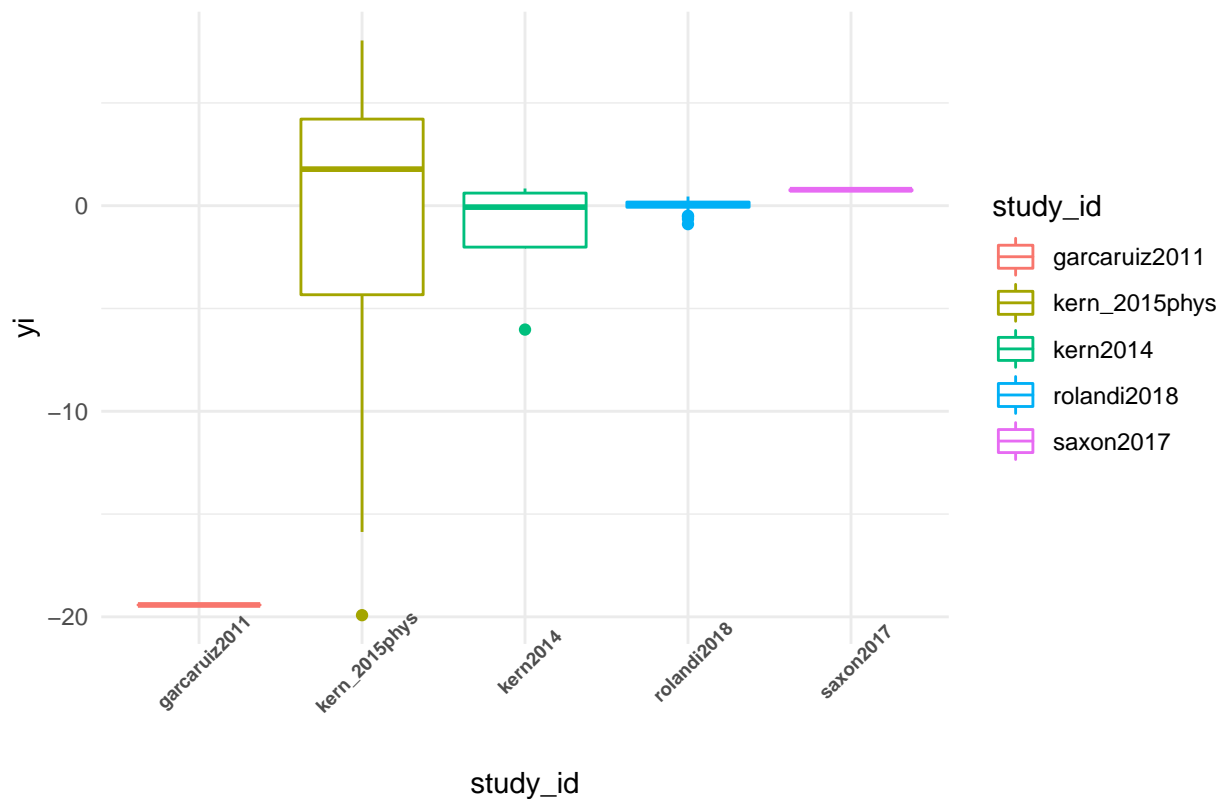




SMD across studies with the same
temperature fluctuation range (10 C)



SMD across studies with the same mean temperature (24 C)



```
## 'geom_smooth()' using method = 'loess'

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : pseudoinverse used at 5.93

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : neighborhood radius 6.07

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : reciprocal condition number 1.4632e-16

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : There are other near singularities as well. 16

## Warning in predLoess(object$y, object$x, newx = if
## (is.null(newdata)) object$x else if (is.data.frame(newdata))
## as.matrix(model.frame(delete.response(terms(object))), : pseudoinverse used at
## 5.93

## Warning in predLoess(object$y, object$x, newx = if
## (is.null(newdata)) object$x else if (is.data.frame(newdata))
## as.matrix(model.frame(delete.response(terms(object))), : neighborhood radius 6.07
```

```

## Warning in predLoess(object$y, object$x, newx = if
## (is.null(newdata)) object$x else if (is.data.frame(newdata))
## as.matrix(model.frame(delete.response(terms(object))), : reciprocal condition
## number 1.4632e-16

## Warning in predLoess(object$y, object$x, newx = if
## (is.null(newdata)) object$x else if (is.data.frame(newdata))
## as.matrix(model.frame(delete.response(terms(object))), : There are other near
## singularities as well. 16

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : pseudoinverse used at 1.99

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : neighborhood radius 2.01

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : reciprocal condition number 0

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric =
## parametric, : There are other near singularities as well. 4.0401

## Warning in predLoess(object$y, object$x, newx = if
## (is.null(newdata)) object$x else if (is.data.frame(newdata))
## as.matrix(model.frame(delete.response(terms(object))), : pseudoinverse used at
## 1.99

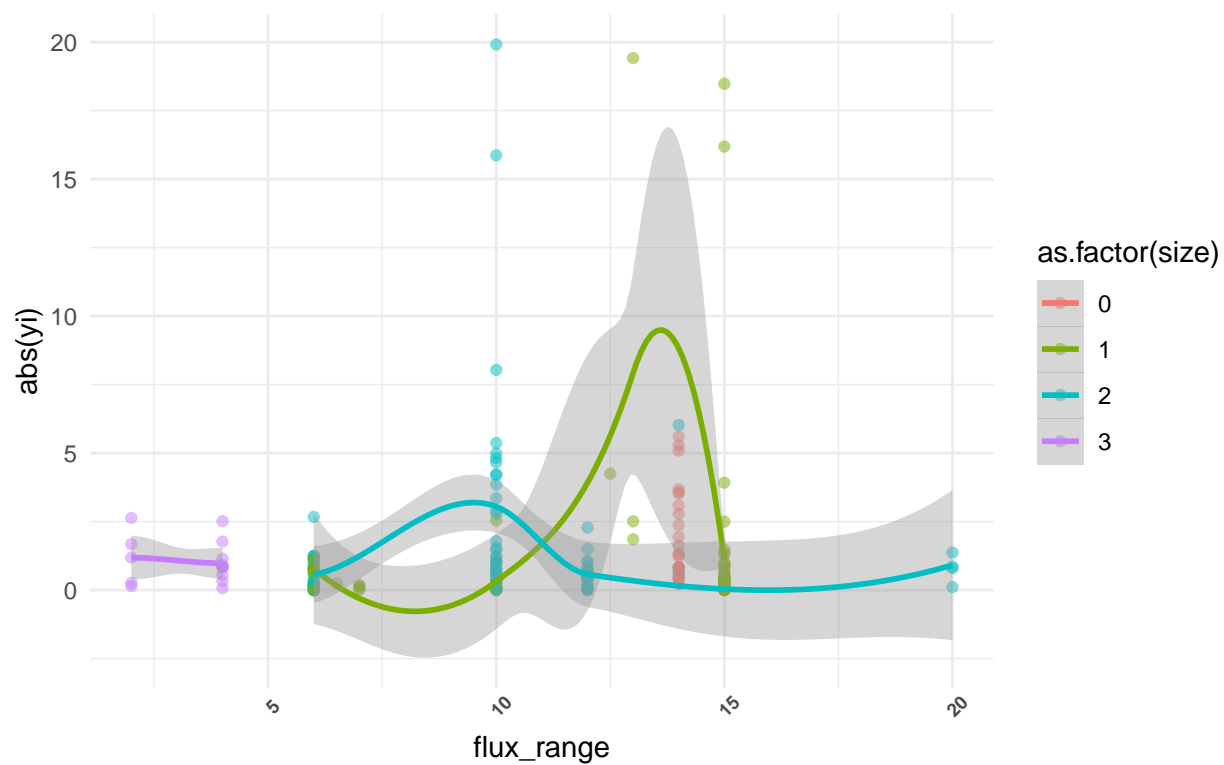
## Warning in predLoess(object$y, object$x, newx = if
## (is.null(newdata)) object$x else if (is.data.frame(newdata))
## as.matrix(model.frame(delete.response(terms(object))), : neighborhood radius 2.01

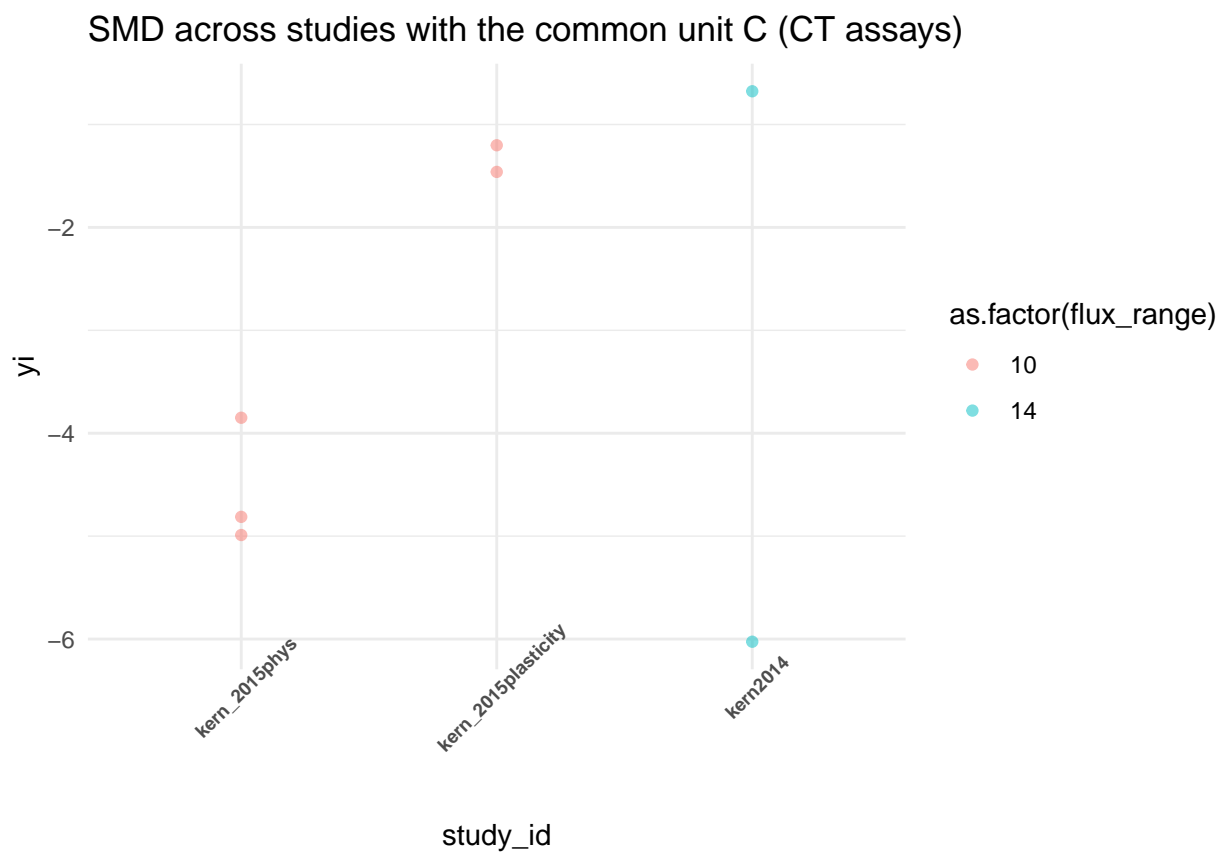
## Warning in predLoess(object$y, object$x, newx = if
## (is.null(newdata)) object$x else if (is.data.frame(newdata))
## as.matrix(model.frame(delete.response(terms(object))), : reciprocal condition
## number 0

## Warning in predLoess(object$y, object$x, newx = if
## (is.null(newdata)) object$x else if (is.data.frame(newdata))
## as.matrix(model.frame(delete.response(terms(object))), : There are other near
## singularities as well. 4.0401

```

Absolute SMD across fluctuation ranges colored
by size of study organism and fitted with model curve





SMD across fluctuation ranges colored by studies with the common unit gra

