

Why do we care?

What are we looking for?

Pediatric Pain data

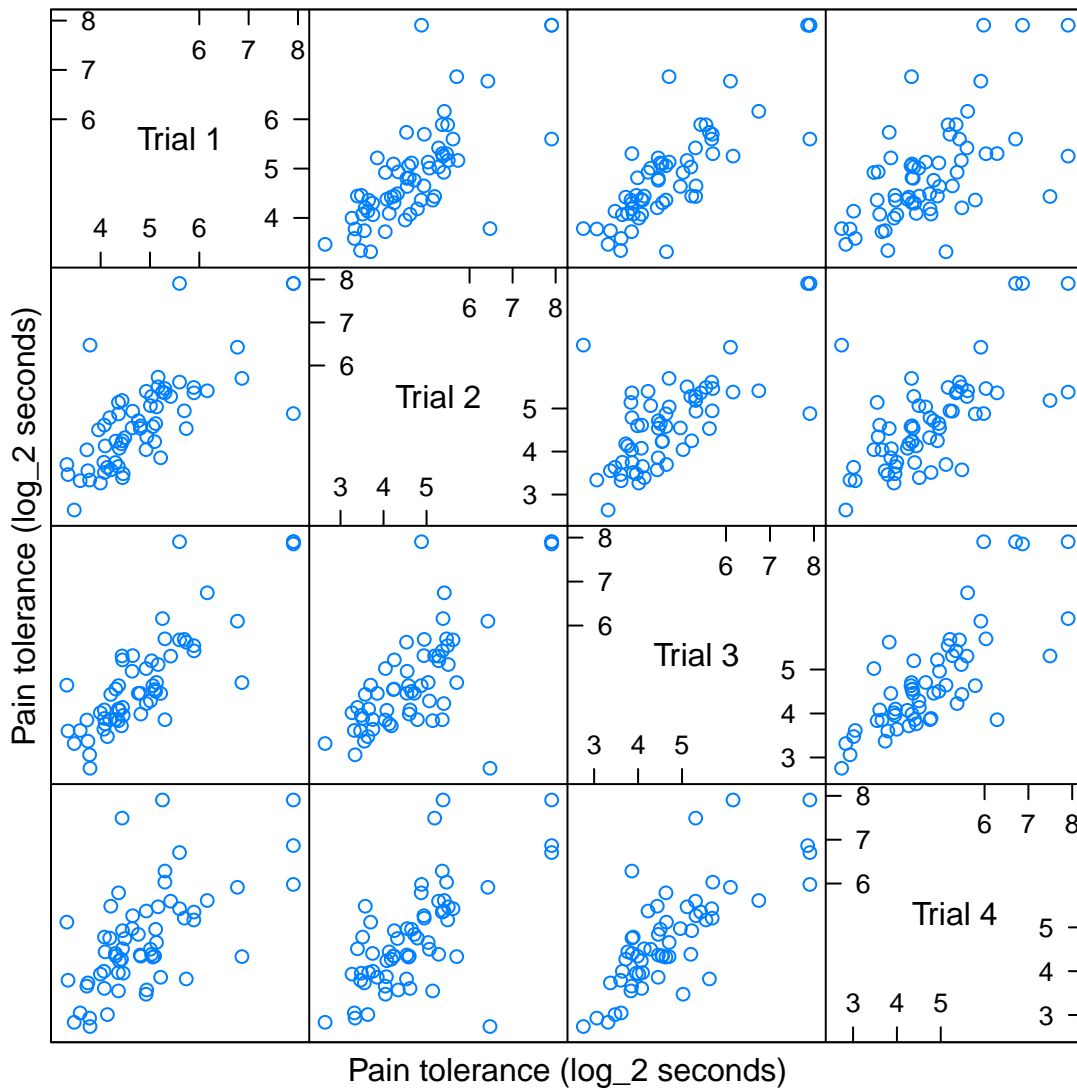
Correlation Matrix

```
> pp <- read.delim("http://rem.ph.ucla.edu/rob/mld/data/tabdelimiteddata/pain.txt")
> pp2 <- cast(id ~ trial, value = "l2paintol", data = pp)
> ppcor <- cor(pp2[, 2:5], use = "pairwise.complete.obs")
> rownames(ppcor) <- colnames(ppcor) <- names(pp2)[2:5]
> round(ppcor, 2)
```

	1	2	3	4
1	1.00	0.73	0.84	0.60
2	0.73	1.00	0.72	0.66
3	0.84	0.72	1.00	0.76
4	0.60	0.66	0.76	1.00

Scatterplot Matrix

```
> lab <- "Pain tolerance (log_2 seconds)"  
> names(pp2)[2:5] <- paste("Trial", names(pp2)[2:5])  
  
> plot(splom(~pp2[2:5], data = pp, as.matrix = TRUE, xlab = lab,  
+          ylab = lab))
```



Small mice data

```
> sm <- read.delim("http://rem.ph.ucla.edu/rob/mld/data/tabdelimiteddata/smallmice.txt")
```

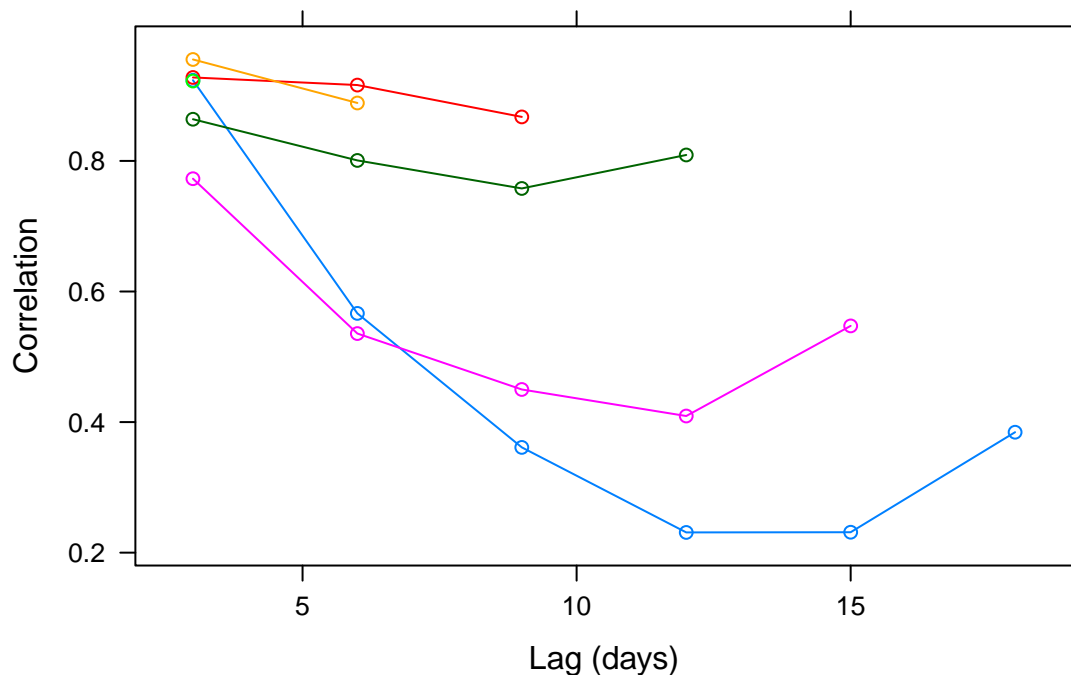
Correlation matrix

```
> sm2 <- cast(id ~ day, value = "weight", data = sm)
> smcor <- cor(sm2[, 2:8])
> rownames(smcor) <- colnames(smcor) <- names(sm2)[2:8]
> round(smcor, 2)
```

	2	5	8	11	14	17	20
2	1.00	0.92	0.57	0.36	0.23	0.23	0.38
5	0.92	1.00	0.77	0.54	0.45	0.41	0.55
8	0.57	0.77	1.00	0.86	0.80	0.76	0.81
11	0.36	0.54	0.86	1.00	0.93	0.92	0.87
14	0.23	0.45	0.80	0.93	1.00	0.96	0.89
17	0.23	0.41	0.76	0.92	0.96	1.00	0.92
20	0.38	0.55	0.81	0.87	0.89	0.92	1.00

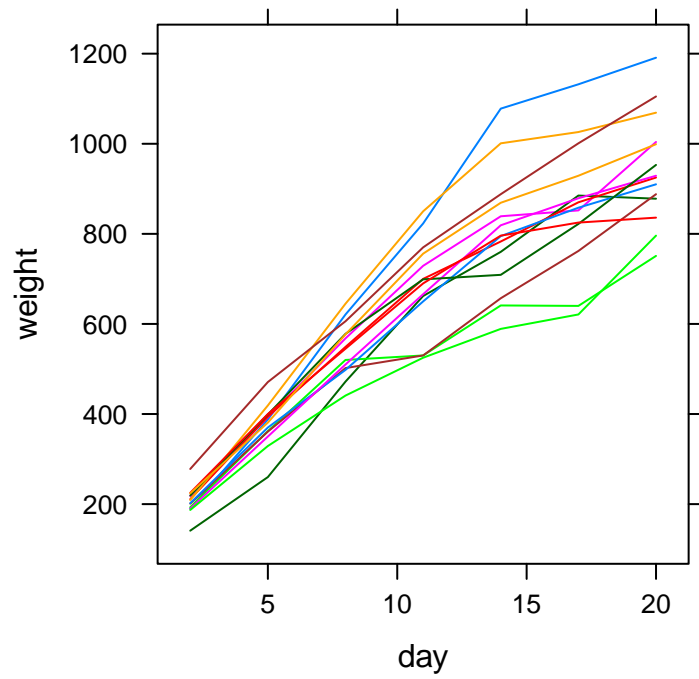
Correlogram

```
> smcorm <- melt(smcor, measure.var = 1:7)
> smcorm$lag <- smcorm$X2 - smcorm$X1
> smcorm <- subset(smcorm, lag > 0)
> plot(xyplot(value ~ lag, group = X1, data = smcorm, type = c("p",
+ "l"), xlab = "Lag (days)", ylab = "Correlation"))
```



profile plot:

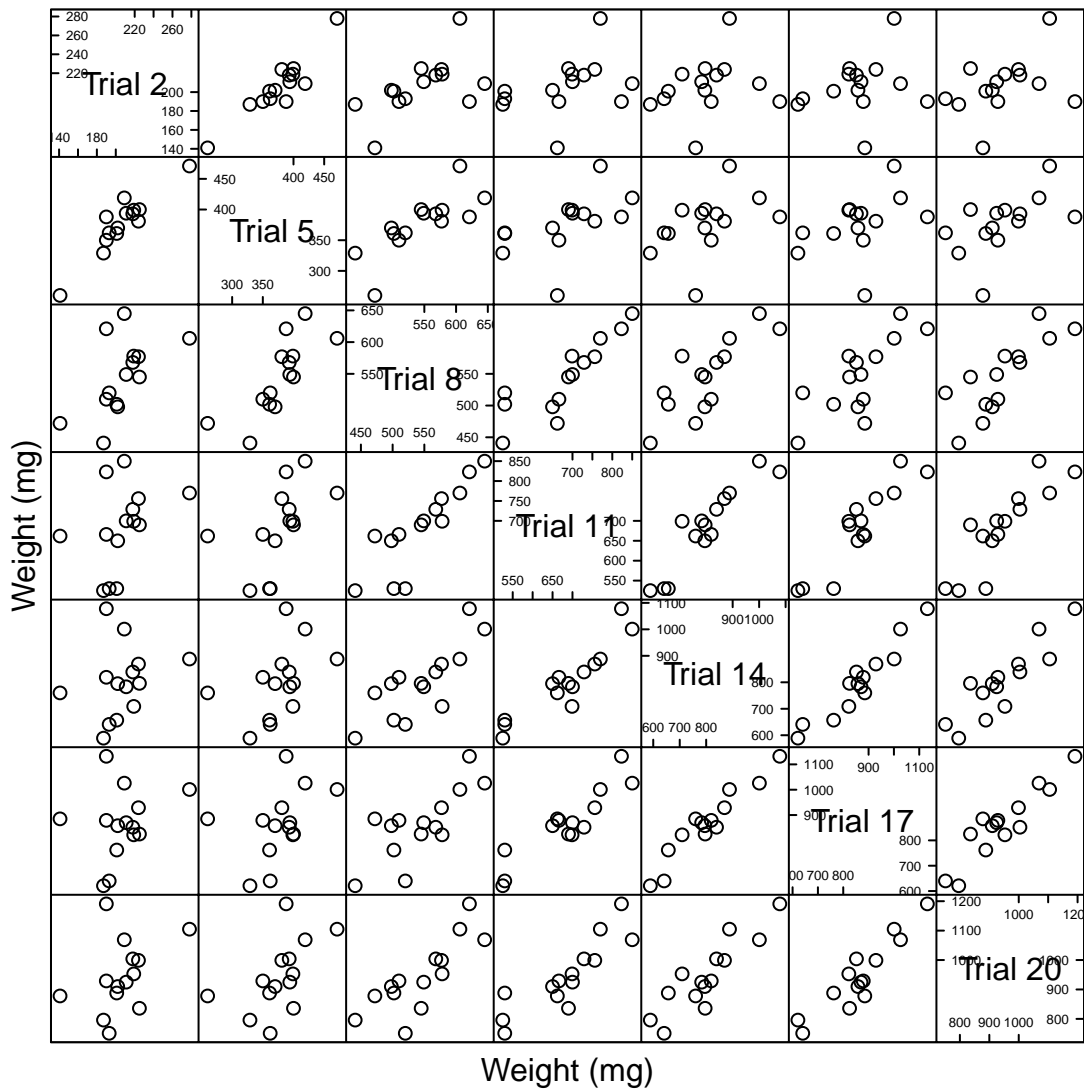
```
> plot(xyplot(weight ~ day, group = id, data = sm, type = "l"))
```



Scatterplot Matrix

```
> lab <- "Weight (mg)"
> names(sm2)[2:8] <- paste("Trial", names(sm2)[2:8])

> plot(splom(~sm2[2:8], data = sm2, as.matrix = TRUE, xlab = lab,
+         ylab = lab, par.settings = mtheme))
```



Ozone data

Correlation Matrix:

```
> oz <- read.delim("http://rem.ph.ucla.edu/rob/mld/data/tabdelimiteddata/newozone1.txt")
> oz2 <- cast(site + day ~ hour, value = "ozone", data = oz)
> ozcor <- cor(oz2[, 3:14], use = "pairwise.complete.obs")
> rownames(ozcor) <- colnames(ozcor) <- names(oz2)[3:14]
> round(ozcor, 2)
```

	7	8	9	10	11	12	13	14	15	16	17	18
7	1.00	0.28	-0.02	-0.16	-0.23	-0.26	-0.26	-0.26	-0.30	-0.29	-0.25	-0.23
8	0.28	1.00	0.53	0.33	0.03	-0.10	-0.10	-0.19	-0.20	-0.13	-0.07	0.03
9	-0.02	0.53	1.00	0.75	0.49	0.32	0.24	0.22	0.29	0.38	0.39	0.47
10	-0.16	0.33	0.75	1.00	0.79	0.59	0.39	0.25	0.33	0.37	0.37	0.47
11	-0.23	0.03	0.49	0.79	1.00	0.86	0.60	0.45	0.51	0.49	0.51	0.54
12	-0.26	-0.10	0.32	0.59	0.86	1.00	0.83	0.70	0.68	0.64	0.59	0.51
13	-0.26	-0.10	0.24	0.39	0.60	0.83	1.00	0.89	0.81	0.73	0.62	0.50
14	-0.26	-0.19	0.22	0.25	0.45	0.70	0.89	1.00	0.94	0.86	0.77	0.63
15	-0.30	-0.20	0.29	0.33	0.51	0.68	0.81	0.94	1.00	0.93	0.84	0.75
16	-0.29	-0.13	0.38	0.37	0.49	0.64	0.73	0.86	0.93	1.00	0.91	0.81
17	-0.25	-0.07	0.39	0.37	0.51	0.59	0.62	0.77	0.84	0.91	1.00	0.93
18	-0.23	0.03	0.47	0.47	0.54	0.51	0.50	0.63	0.75	0.81	0.93	1.00

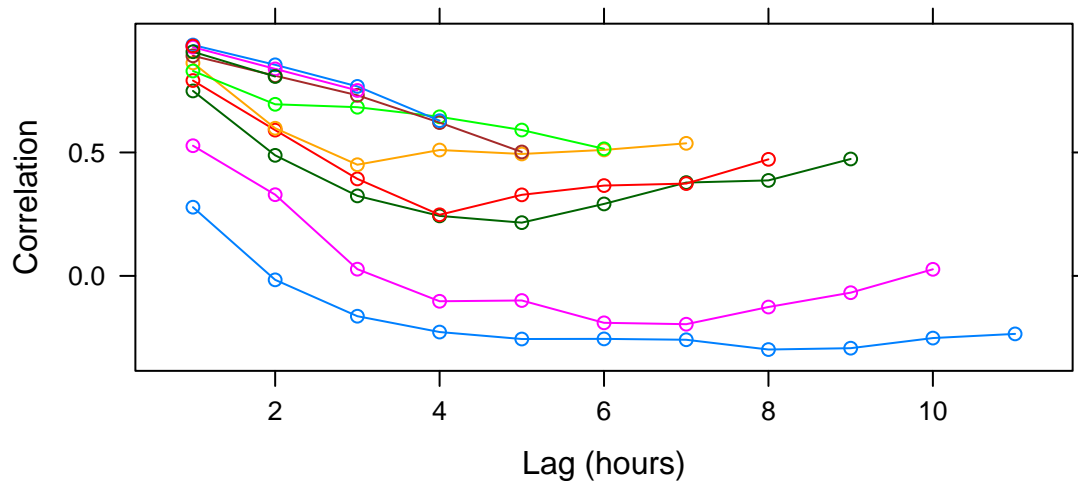
Covariance/correlation/standard deviation matrix:

```
> ozcov <- cov(oz2[, 3:14], use = "pairwise.complete.obs")
> rownames(ozcov) <- colnames(ozcov) <- names(oz2)[3:14]
> ozcc <- ozcor
> diag(ozcc) <- sqrt(diag(ozcov))
> lt <- lower.tri(ozcc)
> ozcc[lt] <- ozcov[lt]
> round(ozcc, 2)
```

	7	8	9	10	11	12	13	14	15	16	17	18
7	0.63	0.28	-0.02	-0.16	-0.23	-0.26	-0.26	-0.26	-0.30	-0.29	-0.25	-0.23
8	0.13	0.73	0.53	0.33	0.03	-0.10	-0.10	-0.19	-0.20	-0.13	-0.07	0.03
9	-0.01	0.56	1.44	0.75	0.49	0.32	0.24	0.22	0.29	0.38	0.39	0.47
10	-0.19	0.45	2.02	1.87	0.79	0.59	0.39	0.25	0.33	0.37	0.37	0.47
11	-0.35	0.05	1.71	3.61	2.43	0.86	0.60	0.45	0.51	0.49	0.51	0.54
12	-0.53	-0.25	1.52	3.61	6.86	3.26	0.83	0.70	0.68	0.64	0.59	0.51
13	-0.66	-0.30	1.43	3.00	5.95	11.07	4.08	0.89	0.81	0.73	0.62	0.50
14	-0.87	-0.75	1.66	2.48	5.86	12.13	19.46	5.35	0.94	0.86	0.77	0.63
15	-1.14	-0.87	2.55	3.73	7.53	13.54	20.09	30.34	6.07	0.93	0.84	0.75
16	-1.08	-0.54	3.18	4.01	7.03	12.31	17.47	26.74	32.88	5.85	0.91	0.81
17	-0.80	-0.25	2.81	3.54	6.28	9.75	12.81	20.73	25.70	26.83	5.05	0.93
18	-0.58	0.08	2.68	3.48	5.15	6.61	8.07	13.23	17.94	18.59	18.51	3.94

Correlogram

```
> ozcorm <- melt(ozcor, measure.var = 1:12)
> ozcorm$lag <- ozcorm$X2 - ozcorm$X1
> ozcorm <- subset(ozcorm, lag > 0)
> plot(xyplot(value ~ lag, group = X1, data = ozcorm, type = c("p",
+   "l"), xlab = "Lag (hours)", ylab = "Correlation"))
```



profile plot

```
> plot(xyplot(ozone ~ hour | factor(day), group = site, data = oz,
+   type = "l", layout = c(3, 1)))
```

