

Gelman and Hill Exercise 12.2

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This exercise can be found in Chapter 14 of the Gelman+Hill Hierarchical Model Book

12.2.1

```
allvar$newpid <- as.factor(allvar$newpid)

allvar$VDATE <- mdy(allvar$VDATE)

allvar <- allvar %>%
  filter(!is.na(CD4PCT)) %>%
  group_by(newpid) %>%
  mutate(elapsed_months = (as.numeric(VDATE - mdy("1/1/1988")))/30)

M1 <- lmer(data = allvar, CD4PCT ~ elapsed_months + (1|newpid))

summary(M1)
```

```
## Linear mixed model fit by REML ['lmerMod']
## Formula: CD4PCT ~ elapsed_months + (1 | newpid)
## Data: allvar
##
## REML criterion at convergence: 7921.5
##
## Scaled residuals:
## Min 1Q Median 3Q Max
## -4.4903 -0.4452 -0.0588 0.3719 6.6902
##
## Random effects:
## Groups Name Variance Std.Dev.
## newpid (Intercept) 136.78 11.695
## Residual 53.39 7.307
## Number of obs: 1075, groups: newpid, 251
##
## Fixed effects:
## Estimate Std. Error t value
## (Intercept) 26.80973 1.08053 24.812
## elapsed_months -0.17846 0.03964 -4.502
##
## Correlation of Fixed Effects:
## (Intr)
## elpsd_mnth -0.690
```

The Coefficient for time is -0.1784641, with the average intercept across children (a fixed effects model) being 26.8097311.