```
rm(list=ls())                                          #clear work area
files=list.files("experiment3")                        #list files in target subdirectory
n=length(files)                                        #count of files
n=2
print(n)
```

```
## [1] 2
```

```
#
for (i in 1:n){                                        #read each file and extract SGP values
  fname=paste("experiment3/",files[[i]],sep="")        #file to load
  load(fname)
  if(i==1){                                            #initialize data frame with column of le
    df=data.frame(rep(c(1,2,3),1+nrow(MCAS_sgp$Panel_Data)/3)[1:nrow(MCAS_sgp$Panel_Data)])
    colnames(df)=c("levels")
  }
  df=cbind(df,MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP)   #add column for SGP values
}
str(df)                                                #show structure of data frame
```

```
## 'data.frame': 70000 obs. of  3 variables:
##  $ levels                                    : num  1 2 3 1 2 3 1 2 3 1 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  1 2 1 5 2 1 27 15 2 68 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  6 6 1 51 6 1 6 51 1 1 ...
```

```
means=apply(df[,2:ncol(df)],1,mean)                    #compute vector of row means
sds=apply(df[,2:ncol(df)],1,sd)                        #compute vector of row standard deviatio
levels=as.factor(rep(c(1,2,3),1+length(means)/3))[1:length(means)]   #vector of levels for m
df2=data.frame(levels,means,sds)                       #data frame for means and standard devia
str(df2)
```

```
## 'data.frame': 70000 obs. of  3 variables:
##  $ levels: Factor w/ 3 levels "1","2","3": 1 2 3 1 2 3 1 2 3 1 ...
##  $ means : num  3.5 4 1 28 4 1 16.5 33 1.5 34.5 ...
##  $ sds   : num  3.54 2.83 0 32.53 2.83 ...
```

```
dfs=split(df2,df2$levels)                              #split by level
mean(dfs[[1]]$means)                                   #mean of level 1 growth percentiles
```

```
## [1] 62.60127
```

```
sd(dfs[[1]]$means)                                     #sd of level 1 growth percentiles
```

```
## [1] 18.6149
```

```
mean(dfs[[2]]$means)                                   #mean of level 2 growth percentiles
```

```
## [1] 48.44133
```

```r
sd(dfs[[2]]$means)                                    #sd of level 2 growth percentiles
```

```
## [1] 19.81823
```

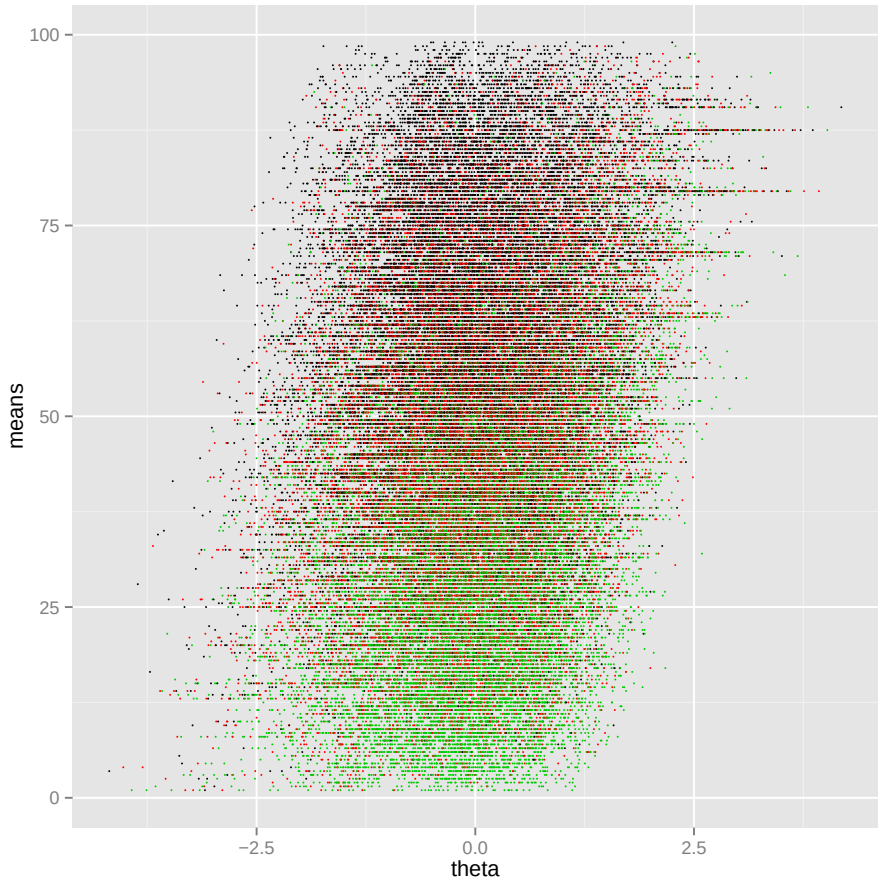
```r
mean(dfs[[3]]$means)                                  #mean of level 3 growth percentiles
```

```
## [1] 34.42973
```

```r
sd(dfs[[3]]$means)                                    #sd of level 3 growth percentiles
```

```
## [1] 19.15446
```

```r
library(ggplot2)
load("Rdata/samplen70.Rdata")
theta=thetas$theta
df3=cbind(df2,theta)
p=ggplot(df2,aes(x=theta,y=means))
p+geom_point(color=levels,size=0.5)
```




```
library(ggplot2)
load("Rdata/samplen70.Rdata")
theta=thetas$theta
df3=cbind(df2,theta)
p=ggplot(df2,aes(x=theta,y=sds))
p+geom_point(color=levels,size=0.5)
```


60
40
20
0
sds
−2.5
0.0
2.5
theta