R Code for Conditional Distribution Plots

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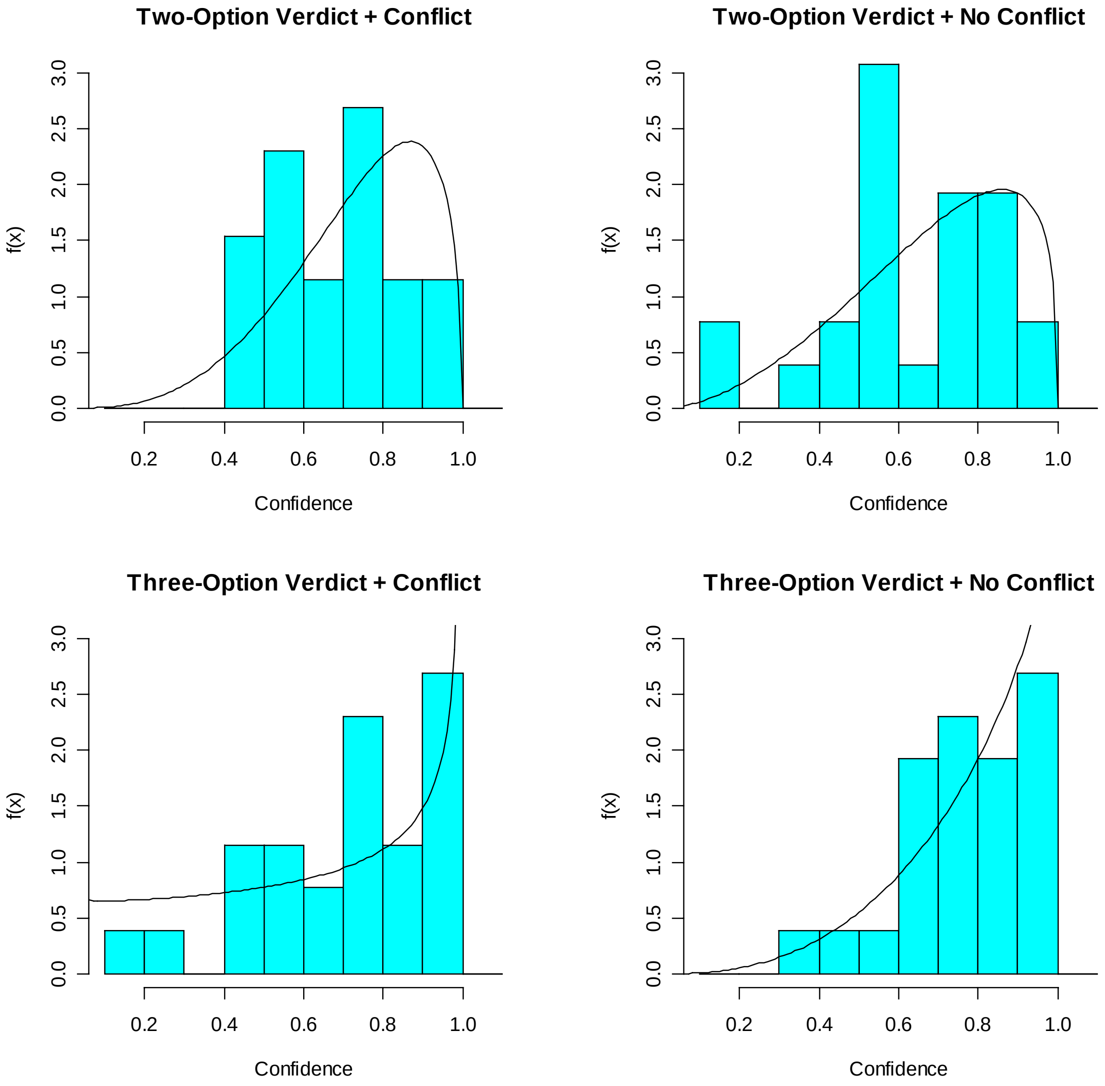
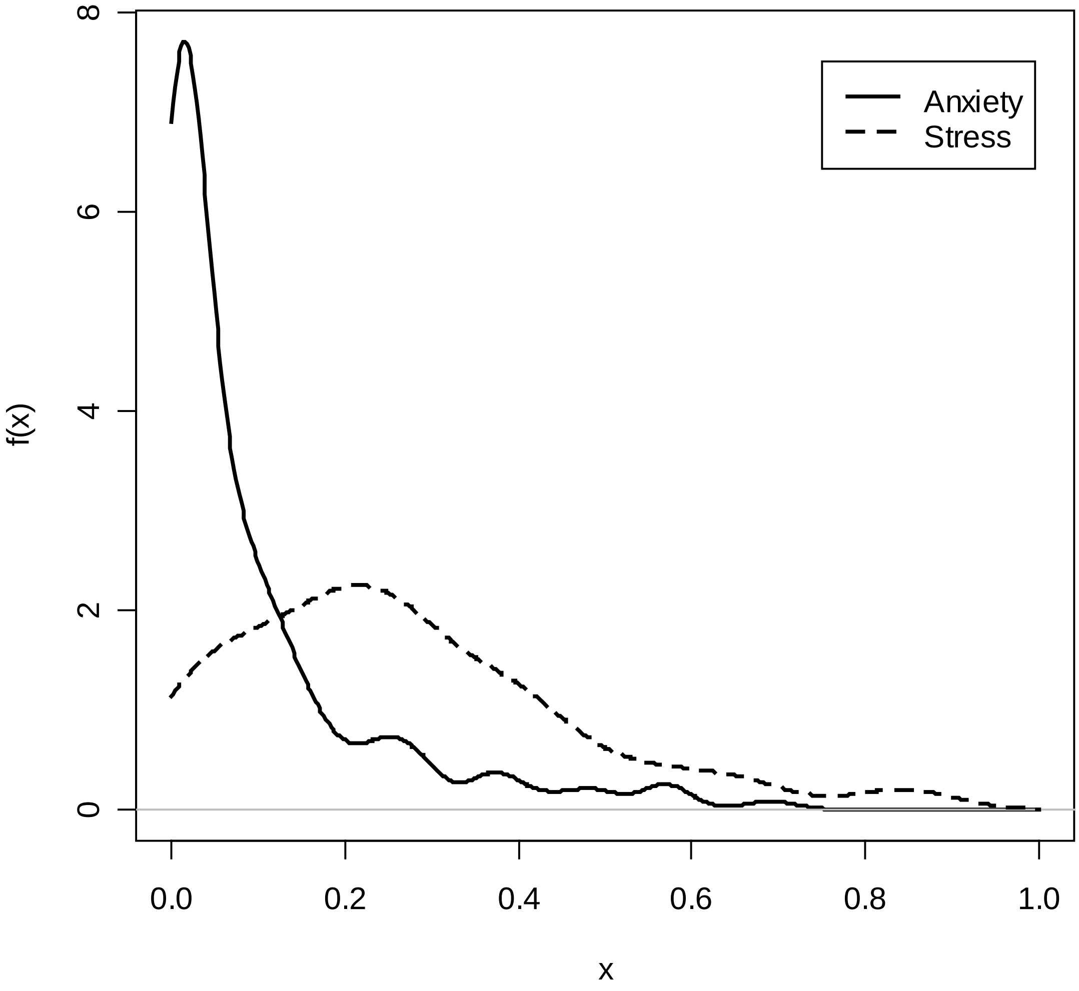
The annotated code provided in this document can be used to generate conditional distribution graphs overlaid onto histograms, as in the figures illustrating the three examples in Smithson & Verkuilen (2005).

```
##Example 1
##you need to load the MASS library to create these plots
```

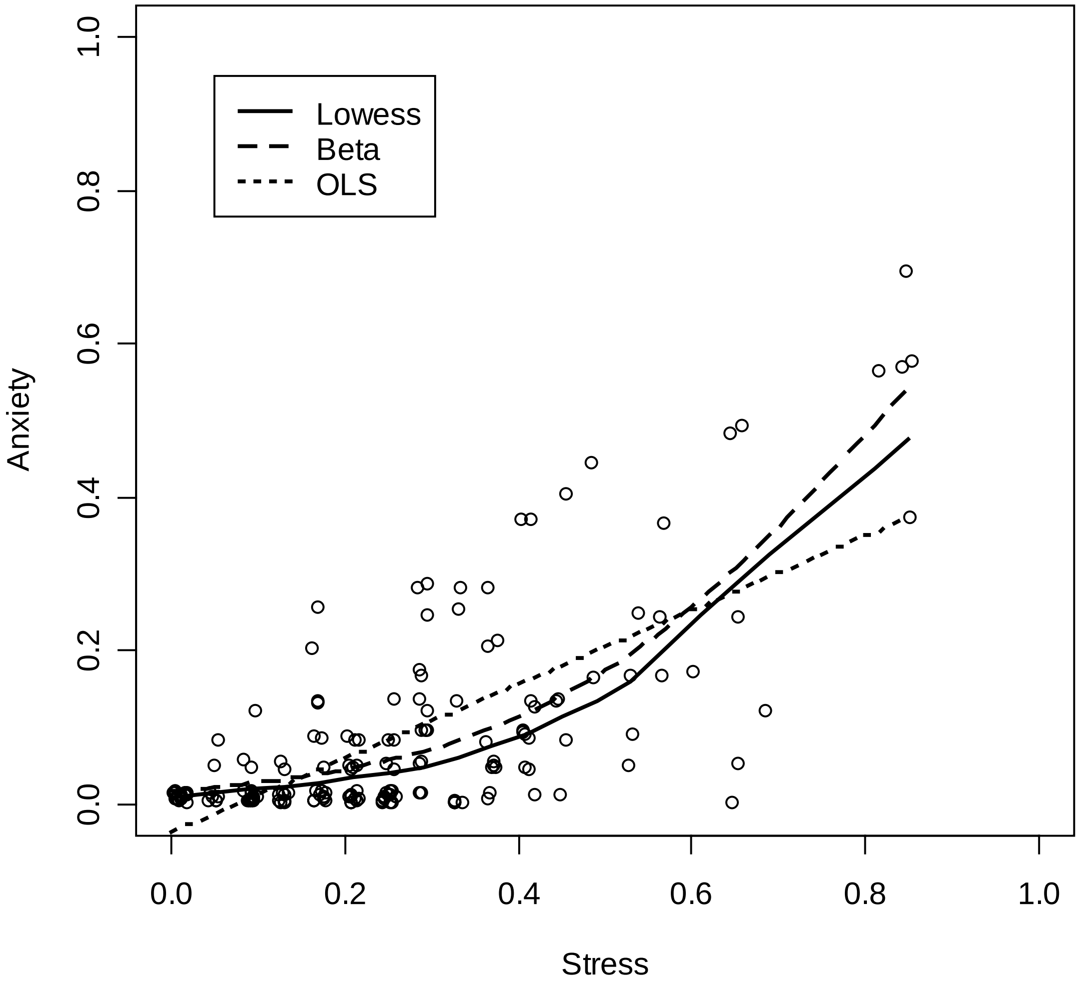


```
##This is the dependent variable

crc99 <-
c(.5,.7,.8,.7,.8,.9,.5,.6,.75,.6,.8,.7,.6,.95,.5,.8,.5,.6,.
75,.6,.99,.9,.99,.6,.8,.9,.5,.95,.5,.8,.8,.6,.75,.7,.65,.6,
.99,.9,.99,.2,.9,.8,.75,.99,.6,.5,.95,.99,.99,.9,.3,.75,.75
,.99,.9,.9,.6,.5,.6,.5,.6,.6,.75,.6,.95,.2,.6,.9,.9,.2,.9,.
6,.8,.6,.7,.8,.75,.4,.7,.6,.65,.9,.8,.7,.7,.85,.95,.8,.99,.
8,.8,.99,.9,.99,.98,.4,.5,.8,.8,.9,.95,.7,.99,.85)

##These are group variables

crc99.1 <= crc99[1:26]
crc99.2 <= crc99[27:52]
crc99.3 <= crc99[53:78]
crc99.4 <= crc99[79:104]


##These plots have two things: First is the truehist (from
##MASS library), and second are the predicted values, which
##use the lines command to overlay on the truehist

 truehist(crc99.1,breaks=seq(0:10)/10,
ylim=c(0,3),xlab="Confidence",ylab="f(x)",main="Two-Option
Verdict + Conflict")
lines(x,dbeta(x,4.013,1.459))

truehist(crc99.2,breaks=seq(0:10)/10,ylim=c(0,3),xlab="Conf
idence",ylab="f(x)",main="Three-Option Verdict + Conflict")
lines(x,dbeta(x,0.953, 0.581))

truehist(crc99.3,breaks=seq(0:10)/10,
ylim=c(0,3),xlab="Confidence",ylab="f(x)",main="Two-Option
Verdict + No Conflict")
lines(x,dbeta(x,2.896,1.31))

truehist(crc99.4,breaks=seq(0:10)/10,xlab="Confidence",
ylim=c(0,3),ylab="f(x)",main="Three-Option Verdict + No
Conflict")
lines(x,dbeta(x,3.501,.91))
```

```
##Example 2
##the two vectors are the IV and DV from the stress/anxiety
##example

stress<-
c(0.01,0.29,0.17,0.41,0.21,0.45,0.21,0.01,0.25,0.45,0.21,0.53,0.13,0.17
,0.01,0.25,0.05,0.41,0.09,0.01,0.25,0.25,0.29,0.17,0.29,0.25,0.25,0.25,
0.09,0.09,0.01,0.25,0.41,0.37,0.25,0.37,0.33,0.21,0.21,0.33,0.17,0.41,0
.21,0.37,0.37,0.13,0.13,0.17,0.33,0.29,0.57,0.33,0.01,0.21,0.81,0.05,0.
25,0.17,0.25,0.17,0.17,0.33,0.25,0.41,0.41,0.21,0.25,0.29,0.25,0.41,0.0
9,0.13,0.01,0.09,0.29,0.13,0.85,0.01,0.01,0.29,0.09,0.01,0.01,0.05,0.13
,0.01,0.05,0.37,0.65,0.13,0.29,0.01,0.57,0.21,0.29,0.53,0.45,0.25,0.09,
0.13,0.17,0.05,0.17,0.21,0.29,0.13,0.21,0.17,0.37,0.09,0.85,0.65,0.21,0
.29,0.17,0.65,0.53,0.25,0.17,0.01,0.33,0.25,0.61,0.29,0.85,0.21,0.09,0.
01,0.41,0.01,0.29,0.65,0.49,0.17,0.01,0.41,0.37,0.21,0.49,0.05,0.09,0.0
9,0.37,0.41,0.37,0.05,0.57,0.09,0.13,0.17,0.69,0.85,0.29,0.33,0.09,0.45
,0.45,0.21,0.41,0.21,0.05,0.37,0.53,0.65,0.17,0.09)

anxiety<-
c(0.01,0.17,0.01,0.05,0.09,0.41,0.05,0.01,0.13,0.01,0.05,0.17,0.01,0.09
,0.01,0.05,0.09,0.09,0.05,0.01,0.01,0.01,0.29,0.01,0.01,0.01,0.01,0.01,
0.01,0.01,0.01,0.09,0.37,0.05,0.01,0.05,0.29,0.09,0.01,0.25,0.01,0.09,0
.01,0.05,0.21,0.01,0.01,0.01,0.13,0.17,0.37,0.01,0.01,0.09,0.57,0.01,0.
01,0.13,0.05,0.01,0.01,0.01,0.01,0.09,0.13,0.01,0.01,0.09,0.09,0.37,0.0
1,0.05,0.01,0.01,0.13,0.01,0.57,0.01,0.01,0.09,0.01,0.01,0.01,0.01,0.01
,0.01,0.05,0.01,0.01,0.01,0.13,0.01,0.25,0.01,0.01,0.09,0.13,0.01,0.01,
0.05,0.13,0.01,0.09,0.01,0.05,0.01,0.05,0.01,0.09,0.01,0.37,0.25,0.05,0
.05,0.25,0.05,0.05,0.01,0.05,0.01,0.01,0.01,0.17,0.29,0.57,0.01,0.05,0.
01,0.09,0.01,0.09,0.49,0.45,0.01,0.01,0.01,0.05,0.01,0.17,0.01,0.13,0.0
1,0.21,0.13,0.01,0.01,0.17,0.01,0.01,0.21,0.13,0.69,0.25,0.01,0.01,0.09
,0.13,0.01,0.05,0.01,0.01,0.29,0.25,0.49,0.01,0.01)

###Kernel density plot

plot(density(Anxiety,from=0,to=1),ylab="f(x)",xlab=”x”,main
=””,lwd=2)
lines(density(Stress,from=0,to=1),lty=2,lwd=2)
legtext <- c("Anxiety","Stress")
legend(.75,7.5,legtext,lty=1:2,lwd=2)
```

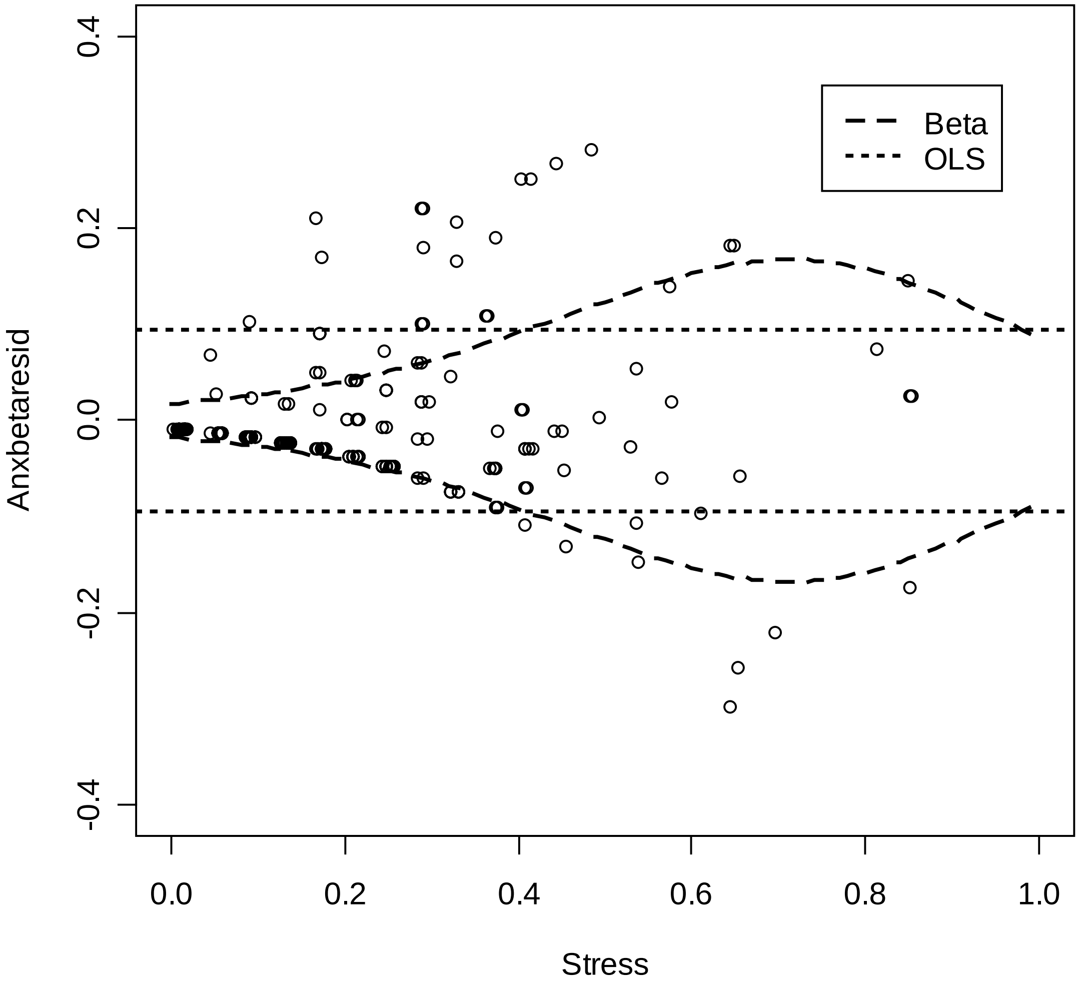


```
####Predicted Value plots

x <- seq(0:85)/100 - .01
Anxpredbeta <- exp(-4.0237 + 4.9414*x)/(1 + exp(-4.0237 +
4.9414*x))
Anxpredls <- -.03642 + .483*x
plot(jitter(Stress),jitter(Anxiety),xlim=c(0,1),ylim=c(0,1)
,xlab="Stress",ylab="Anxiety")
lines(lowess(Anxiety~Stress),lwd=2)
lines(x,Anxpredbeta,lty=2,lwd=2)
lines(x,Anxpredls,lty=3,lwd=2)
legtext <- c("Lowess","Beta","OLS")
legend(.05,.95,legtext,lty=1:3,lwd=2)
```

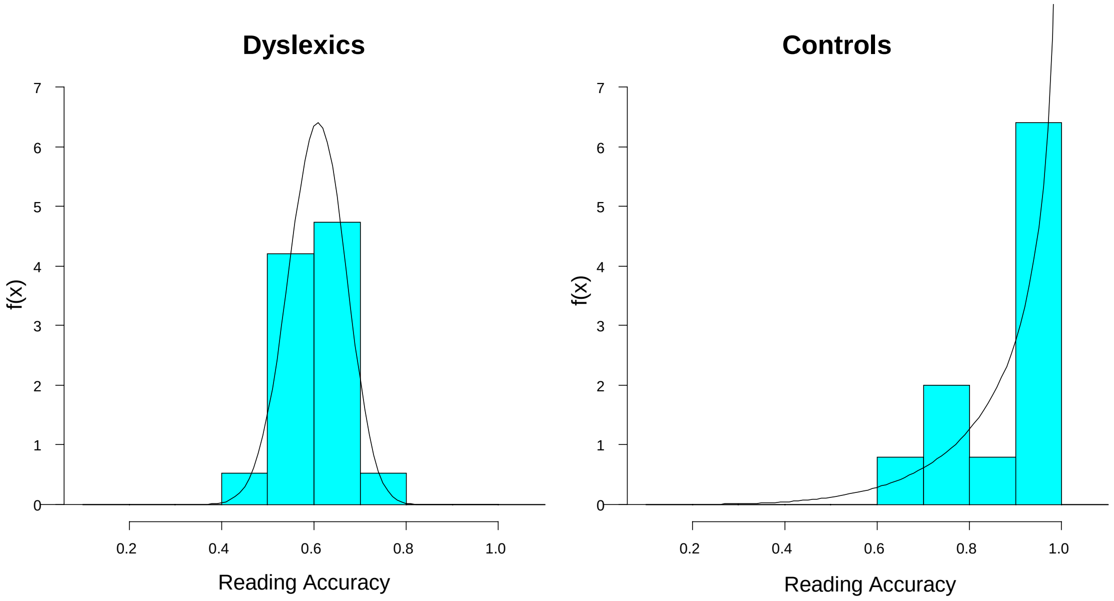


```
####Conditional SE Plot
Anxpredbeta <- exp(-4.0237 + 4.9414*Stress)/(1 + exp(-
4.0237 + 4.9414*Stress))
Anxbetaresid <- Anxiety - Anxpredbeta
plot(jitter(Stress),jitter(Anxbetaresid),xlab="Stress",ylab
="Anxbetaresid",main=””,xlim=c(0,1),ylim=c(-.4,.4))

##OLS SE
abline(h=.094,lwd=2,lty=3,xlim=c(0,1))
abline(h=-.094,lwd=2,lty=3,xlim=c(0,1))
```

```
##Beta conditional SE
x <- seq(0:100)/100 - .01
Anxpredbeta <- exp(-4.0237 + 4.9414*x)/(1 + exp(-4.0237 +
4.9414*x))
betaSE <- Anxpredbeta*(1-Anxpredbeta)/(1+exp(-
3.9608+4.2733*x))
lines(x,betaSE,lty=2,lwd=2)
lines(x,-1*betaSE,lty=2,lwd=2)

legtext <- c("Beta","OLS")
legend(.05,.95,legtext,lty=2:3,lwd=2)
```



```
##Example 3
## Plots for the reading accuracy and dyslexia example
##you need to load the MASS library to create these plots
```



```
##These are the raw data for the first group
#
grp1 <-
c(0.57794,0.64038,0.45932,0.65286,0.60916,0.60916,0.54048,0
.5717,0.70281,0.56546,0.53424,0.57794,0.69032,0.54673,0.684
08,0.59043,0.62165,0.67159,0.66535)
#
##These plots contain both the truehist (from the
##MASS library), and the predicted values, using the
##lines command to superimpose a beta pdf on the truehist
#
truehist(grp1,breaks=seq(0:10)/10,
ylim=c(0,7),xlab="Reading
Accuracy",ylab="f(x)",main="Dyslexics")
x <- 1:100/100
lines(x,dbeta(x, 37.4515, 24.3715))
#
##These are the raw data and plotting commands
##for the second group
#
grp2 <-
c(0.88386,0.76524,0.91508,0.98376,0.88386,0.70905,0.77148,0
.99,0.99,0.99,0.99,0.99,0.99,0.99,0.99,0.99,0.70281,0.99,0.
66535,0.99,0.95878,0.99,0.73402,0.64662,0.99)
#
```

```
truehist(grp2,breaks=seq(0:10)/10,
ylim=c(0,7),xlab="Reading
Accuracy",ylab="f(x)",main="Controls")
lines(x,dbeta(x, 5.08151, 0.565772))
```