

How can I create a Bland-Altman plot in R?

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A Bland-Altman plot is a graphical method used to assess the agreement between two quantitative measurements. In order to create a Bland-Altman plot in R, the first step is to import the data containing the two measurements into R. Next, the R package "BlandAltmanLeh" needs to be installed and loaded. This package includes the necessary functions to create a Bland-Altman plot. The plot can be generated by using the function "BlandAltman()" and specifying the columns containing the two measurements. The resulting plot will display the difference between the two measurements on the y-axis and the average of the two measurements on the x-axis. The limits of agreement, which indicate the range of acceptable differences between the two measurements, can also be added to the plot. Overall, creating a Bland-Altman plot in R is a simple and effective way to visually assess the agreement between two measurements.

Create a Bland-Altman Plot in R (Step-by-Step)

A is used to visualize the differences in measurements between two different instruments or two different measurement techniques.

It's useful for determining how similar two instruments or techniques are at measuring the same construct.

This tutorial provides a step-by-step example of how to create a Bland-Altman plot in R.

Step 1: Create the Data

Suppose a biologist uses two different instruments (A and B) to measure the weight of the same set of 20 different frogs, in grams.

We'll create the following data frame in R that

represents the weight of each frog, as measured by each instrument:

```
#create data
```

```
df <- data.frame(A=c(5, 5, 5, 6, 6, 7, 7, 7, 8, 8, 9,  
10, 11, 13, 14, 14, 15, 18, 22, 25),  
B=c(4, 4, 5, 5, 5, 7, 8, 6, 9, 7, 7, 11,  
13, 13, 12, 13, 14, 19, 19, 24))
```

```
#view first six rows of data
```

```
head(df)
```

```
A B
```

```
1 5 4
```

```
2 5 4
```

```
3 5 5
```

```
4 6 5
```

```
5 6 5
```

```
6 7 7
```

Step 2: Calculate the Difference in Measurements

Next, we'll create two new columns in the data frame that contain the average measurement for each frog along with the difference in measurements:

```
#create new column for average measurementdf$avg <-  
rowMeans(df)  
#create new column for difference in measurements  
df$diff <- df$A - df$B#view first six rows of data  
head(df)
```

```
A B avg diff
```

```
1 5 4 4.5 1
```

```
2 5 4 4.5 1
```

```
3 5 5 5.0 0
```

```
4 6 5 5.5 1
```

```
5 6 5 5.5 1
```

```
6 7 7 7.0 0
```

Step 3: Calculate the Average Difference & Confidence Interval

Next, we'll calculate the average difference in measurements between the two instruments along with the upper and lower 95% confidence interval limits for the average difference:

```
#find average differencemean_diff <- mean(df$diff)
```

```
mean_diff
```

```
0.5
```

```
#find lower 95% confidence interval limits
```

```
lower <- mean_diff - 1.96*sd(df$diff)
```

```
-1.921465
```

```
#find upper 95% confidence interval limits
```

```
upper <- mean_diff + 1.96*sd(df$diff)
```

The average difference turns out to be 0.5 and the 95% confidence interval for the average difference is .

Step 4: Create the Bland-Altman Plot

Next, we'll use the following code to create a Bland-Altman plot using the data visualization package:

```
#load ggplot2
```

```
library(ggplot2)
```

```
#create Bland-Altman plot
```

```
ggplot(df, aes(x = avg, y = diff)) +
```

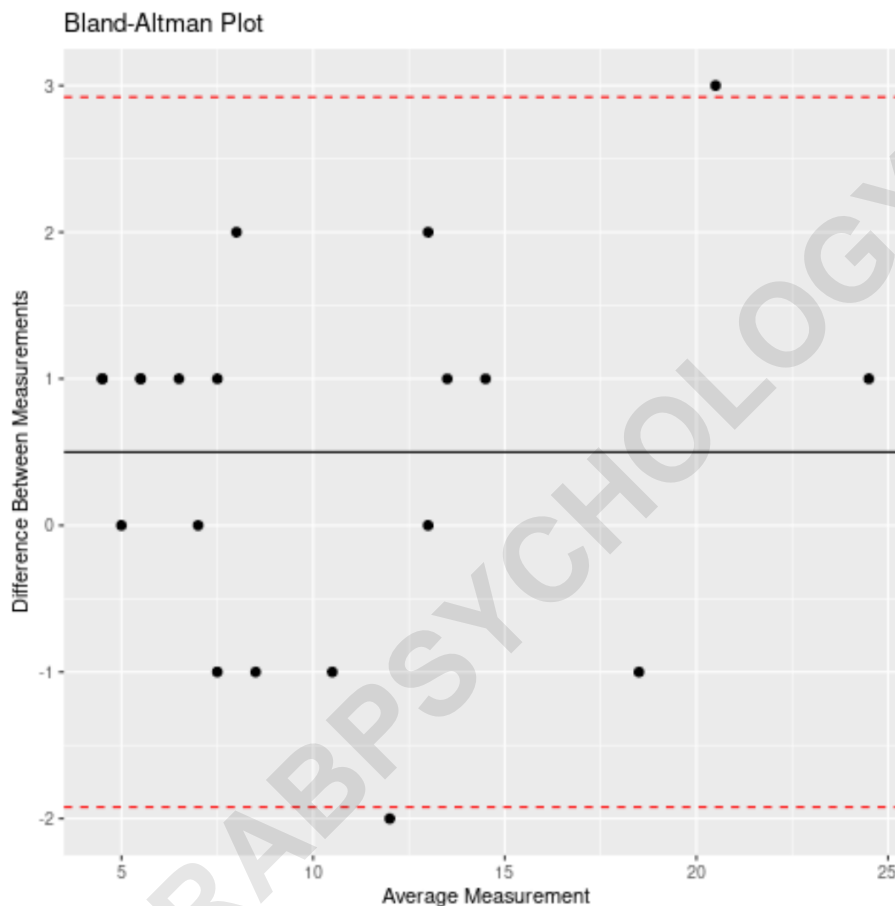
```
geom_point(size=2) +
```

```
geom_hline(yintercept = mean_diff) +
```

```
geom_hline(yintercept = lower, color = "red",  
linetype="dashed") +
```

```
geom_hline(yintercept = upper, color = "red",
```

```
linetype="dashed") +  
ggtitle("Bland-Altman Plot") +  
ylab("Difference Between Measurements") +  
xlab("Average Measurement")
```



The x-axis of the plot displays the average measurement of the two instruments and the y-axis displays the difference in measurements between the two instruments.

The black line represents the average difference in measurements between the two instruments while the two red dashed lines represent the 95% confidence interval limits for the average difference.

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