Stat 411/511

Some Basic R

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Today

* Some R (to make sure you all see it before lab)
* Subsetting
* Basic plotting with ggplot2

you've seen this a few times

```
library(Sleuth3)
```

$ubsetting

The $ lets you get columns out of a data.frame

```
case0101$Score
case0101$Treatment


mean(case0101$Score)
sd(case0101$Score)
table(case0101$Treatment)
```

Subsetting rows

The function `subset` is useful for getting specific rows in a data.frame.

E.g.

```
subset(case0101, Treatment == "Extrinsic")
```

data.frame

logical statement
evaluates to TRUE or FALSE
for each row

Returns another data.frame

Logical statements

== equal

!= not equal

> greater than

< less than

>=

<=

! not

& and

| or

%in%

```
x <- 1:5
y <- c("a","a","b","b","c")
```

```
x == 2
x > 2
x != 2
y == "a"
y == "a" & x == 2
subset(y, x == 2)
y %in% c("b","c")
```

TRUE, FALSE or NA

```
> pets
  pet_name type owner_name age
1   Dexter  cat  Charlotte   3
2   Scylla  cat  Charlotte   2
3   Medusa  cat       Josh  11
4     Mina  dog     Hadley   5
```

Write subset commands that will return:

1. Charlotte's pets
2. pet's that don't belong to Charlotte
3. cats
4. cats that are older than 2
5. dogs that are younger than 4

Combine them with `$` and `mean` to find:

1. The average age of Charlotte's pets
2. The average age of pet's that don't belong to Charlotte

`[` , general subsetting

give it:

* logical
* positive numbers
* negative numbers
* empty

See R cookbook (link given in lab)

To master R you should aim to master subsetting with [

For 411/511 master `subset`

Plotting with ggplot2

```
library(ggplot2)
```

Variable on the y-axis
(vertical axis)

```
qplot(x = Treatment, y = Score,
      data = case0101)
```

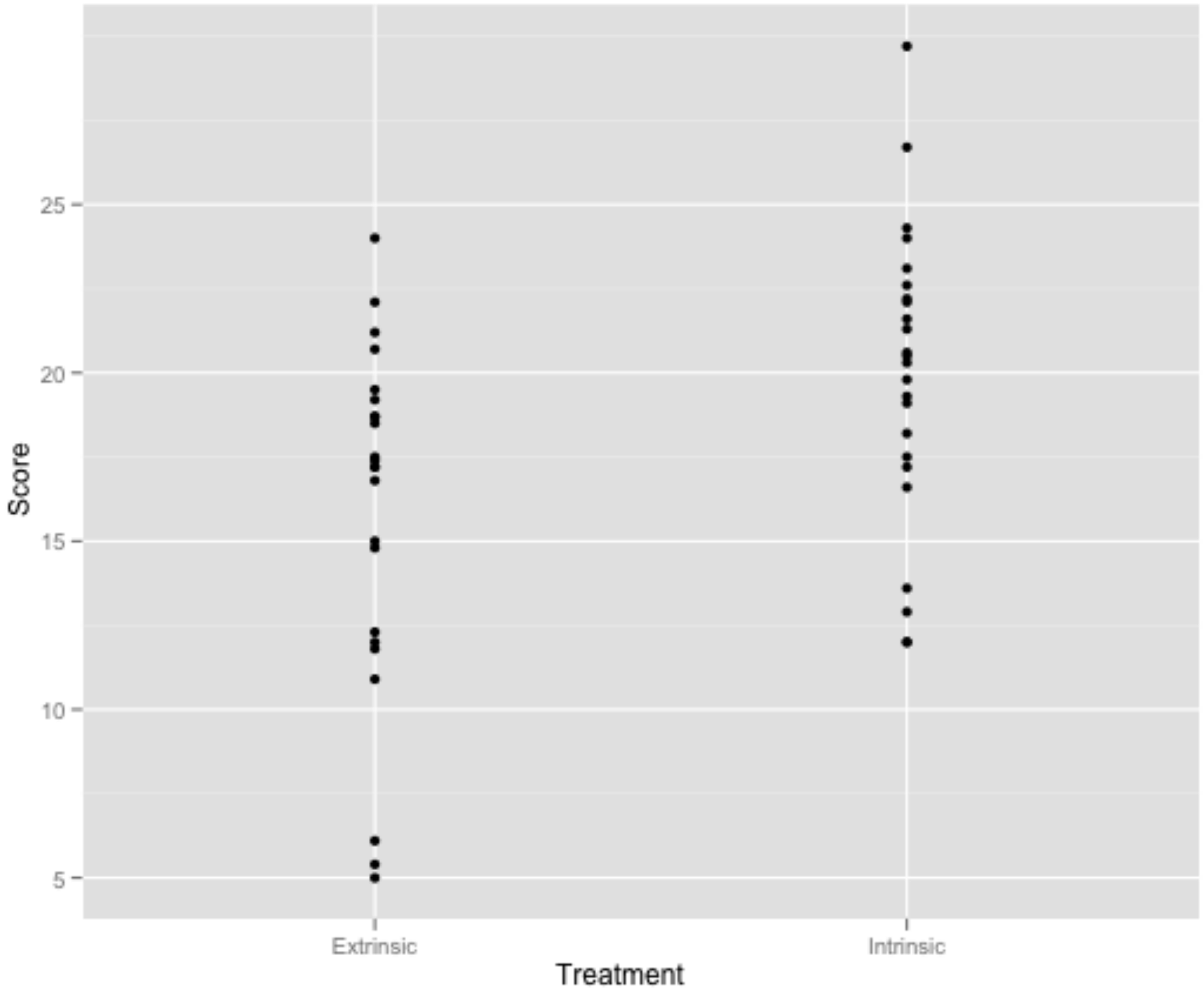
Variable on the x-axis
(horizontal axis)

Data.frame the
variables are in

```
qplot(Treatment, Score, data = case0101)
```

This is the short hand version

```
qplot(Treatment, Score, data = case0101)
```



Geometric objects

Points are just one type of geometric object (and the default in qplot)

```
qplot(Treatment, Score, data = case0101,
   geom = "point")
```

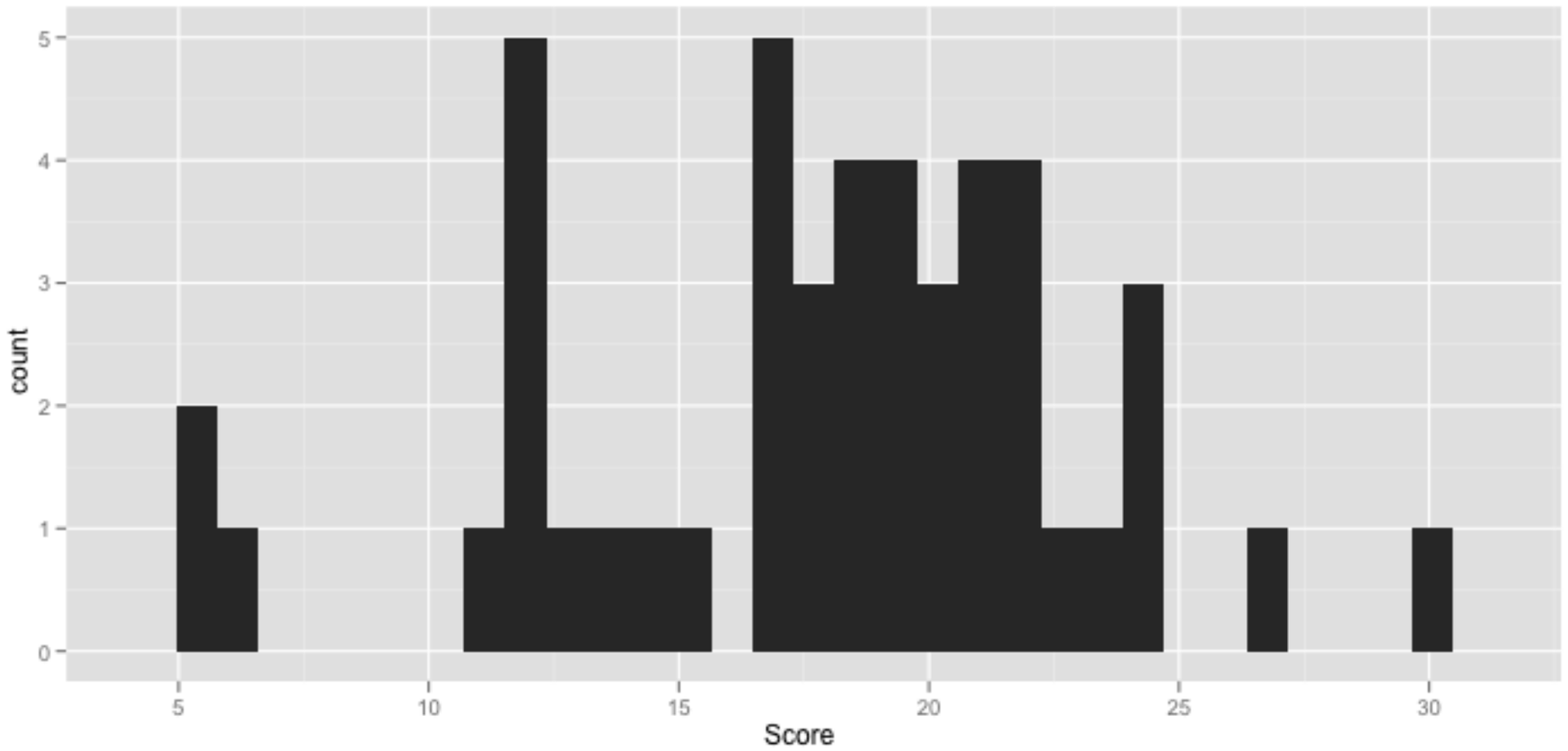
```
qplot(Treatment, Score, data = case0101,
   geom = "jitter")
```

points with random jitter in both x and y

```
qplot(Treatment, Score, data = case0101,
   geom = "boxplot")
```

boxplots for each unique x value (if x is categorical)

Histograms



Which variable is on the y-axis of a histogram?

```
qplot(Score, data = case0101,
      geom = "histogram")
```

Facetting

Facetting produces the same plot for different subsets of the data

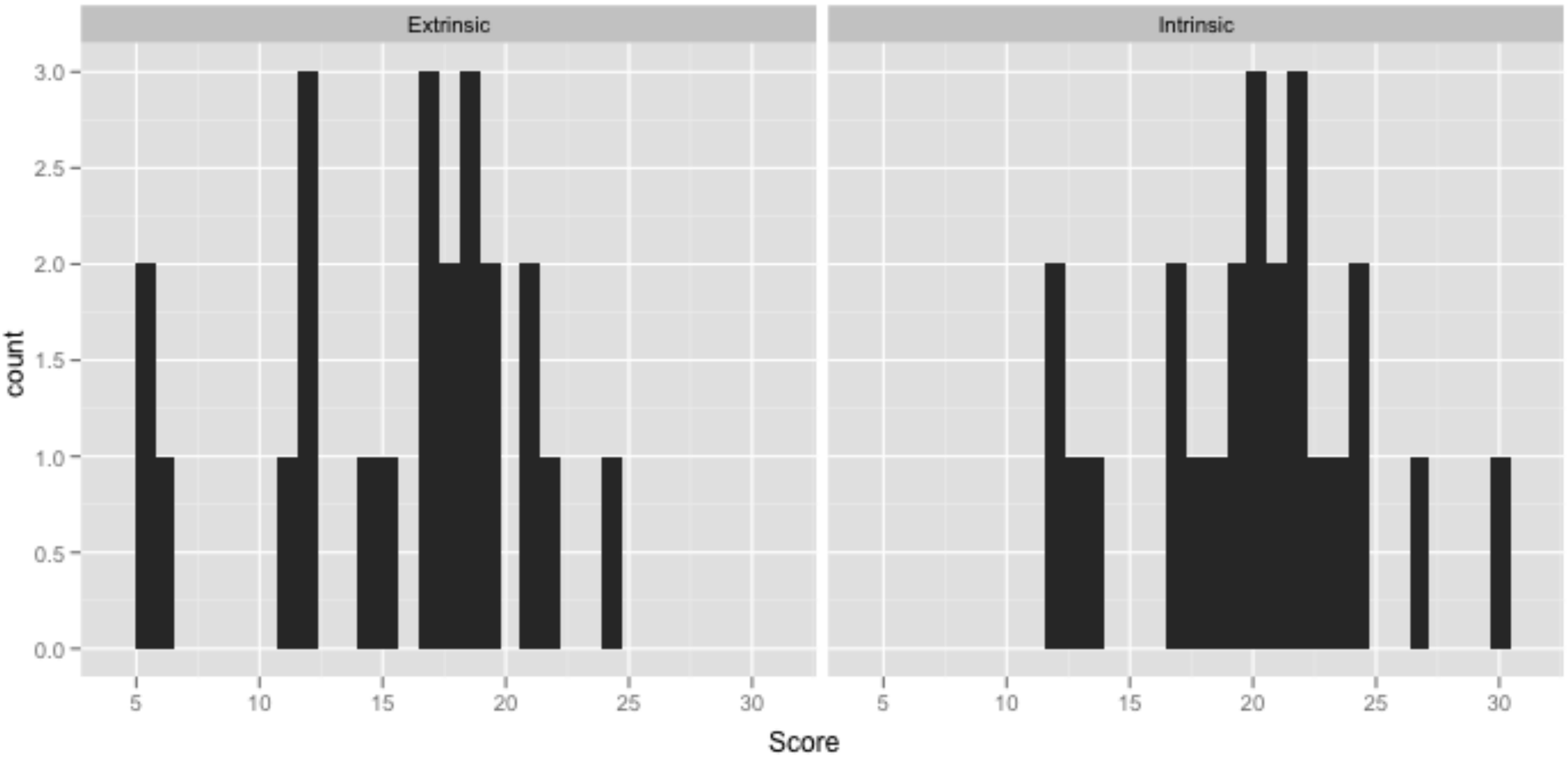
```
qplot(Score, data = case0101,
    geom = "histogram") +
    facet_wrap( ~ Treatment)
```

typed

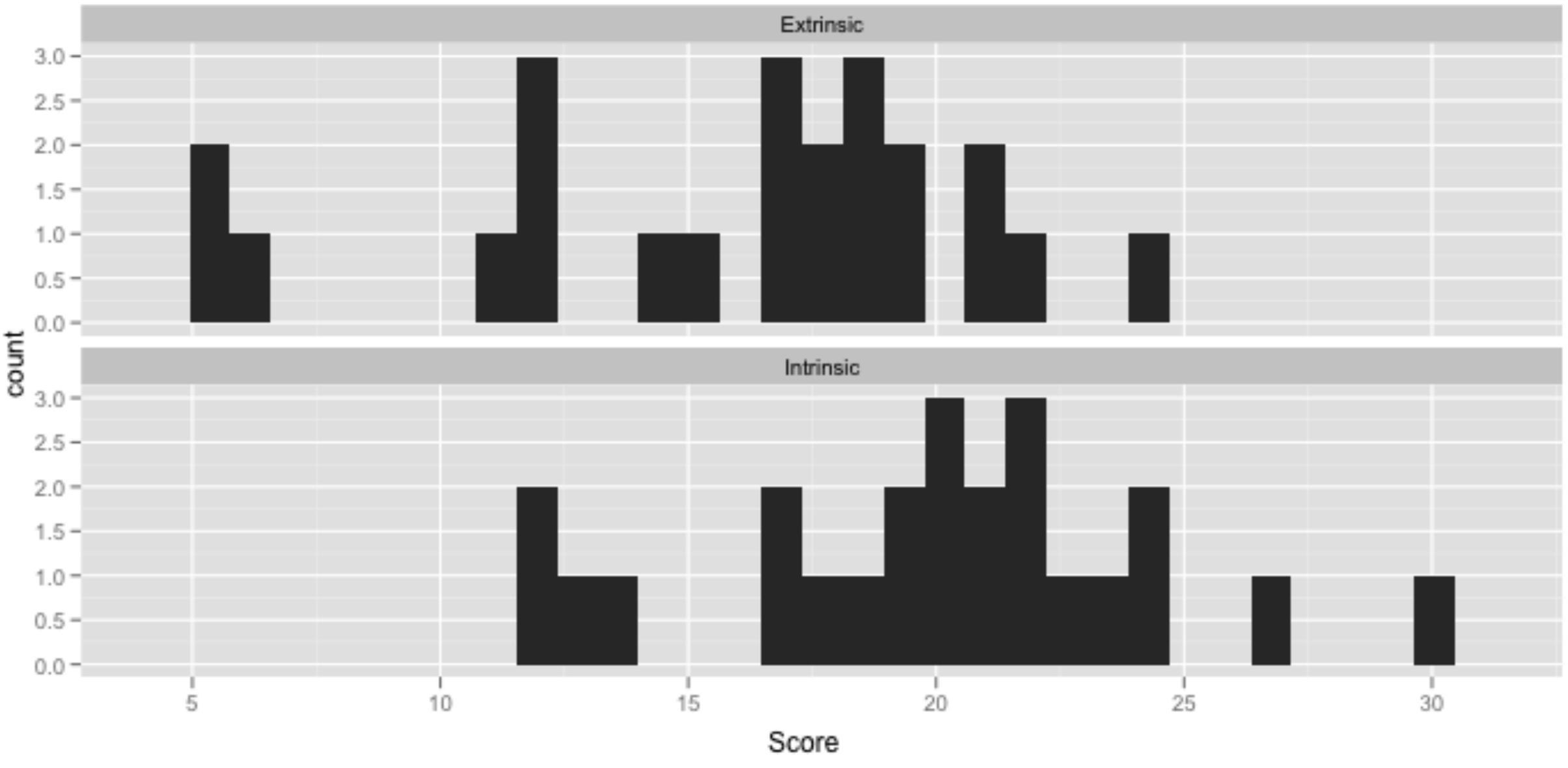
the name of another column in data

A facet for each unique value of Treatment

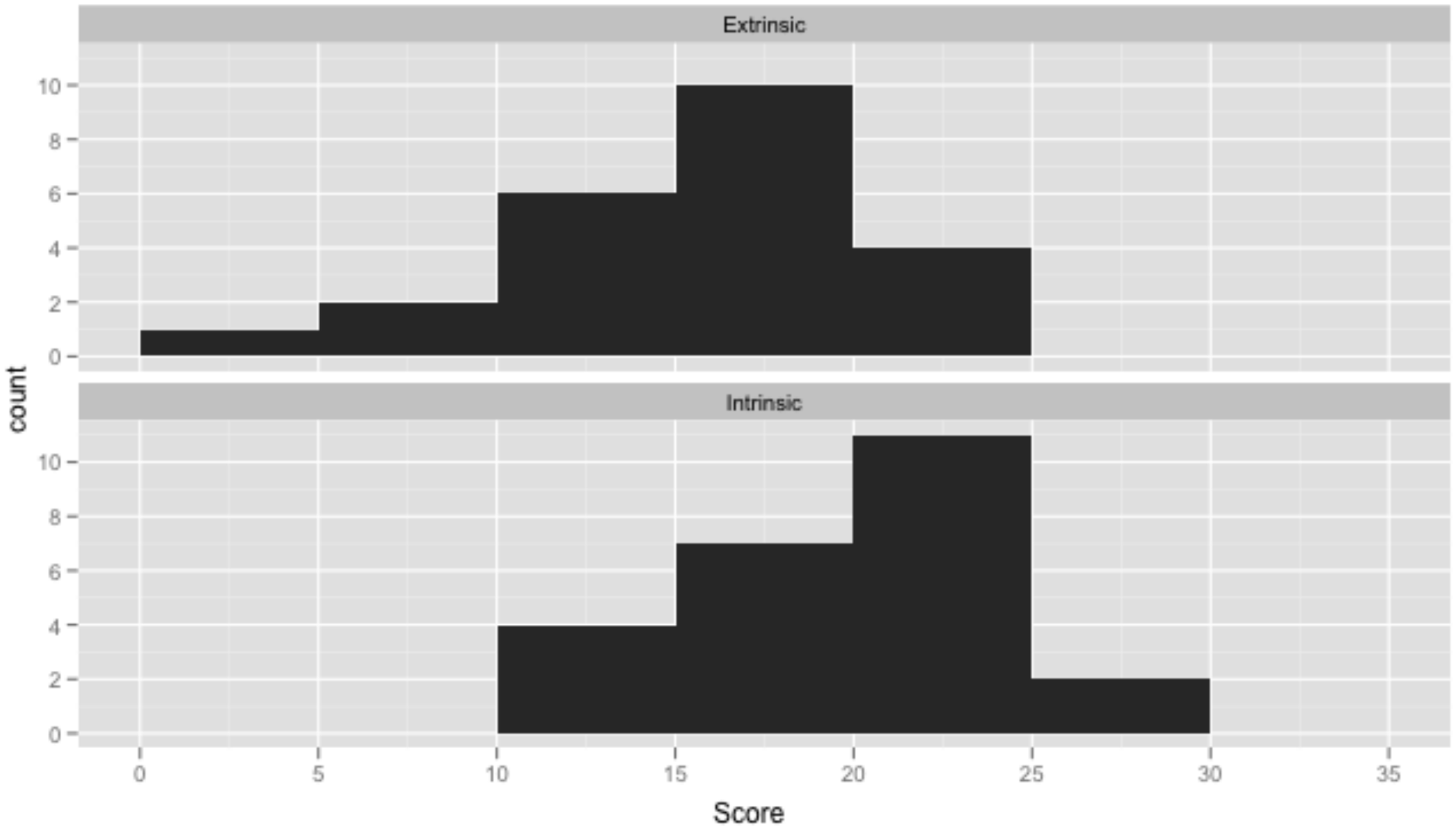
```
qplot(Score, data = case0101,
    geom = "histogram") +
    facet_wrap( ~ Treatment)
```



```
qplot(Score, data = case0101,
    geom = "histogram") +
    facet_wrap( ~ Treatment, ncol = 1)
```



```
qplot(Score, data = case0101,
    geom = "histogram", binwidth = 5) +
    facet_wrap( ~ Treatment, ncol = 1)
```



```
> head(case0202)
  Unaffected Affected
1       1.94     1.27
2       1.44     1.63
3       1.56     1.47
4       1.58     1.39
5       2.06     1.93
6       1.66     1.26
```

How could you reproduce this plot?