An Example of Sharing Graphical Objects in Grid

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Grid graphical objects are implemented as "external pointers". This is easiest to explain by example:

```
> line <- grid.lines()
> line2 <- line
> grid.edit(line2, gp = gpar(col = "green"))
> get.value(line)
```

The output from the final command shows that `line` is also now "green".

In the above, we create a graphical object and assign it to `line`. We then assign `line` to `line2`. In most cases in R, this would copy the *value* of `line` to `line2`, but in this case it actually copies a *reference* to the value of `line` to `line2`. In other words, `line` and `line2` "point" to the same value. Thus when we modify `line2`, the change is reflected in `line`.

Shared Axes

Suppose that I am drawing two graphs on a page, which are the results from two subjects in an experiment. I want the graphs to have the same axes to aid in comparison of the subjects.

First of all, I will split the page up into two bits for the two graphs.

```
> push.viewport(viewport(layout = grid.layout(1, 2, respect = TRUE)))
```

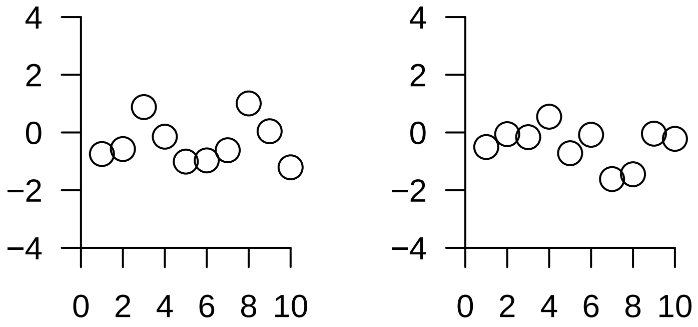
Now I generate some data and draw the first plot.

```
> x <- 1:10
> y1 <- rnorm(10)
> vp1a <- viewport(layout.pos.col = 1)
> vp1b <- viewport(width = 0.6, height = 0.6, xscale = c(0, 11),
+     yscale = c(-4, 4))
> push.viewport(vp1a, vp1b)
> xa <- grid.xaxis()
> ya <- grid.yaxis()
> grid.points(x, y1)
> pop.viewport(2)
```

Notice that I have saved the graphical objects for the axes. Now when I draw the second plot I will just reuse these graphical objects rather than creating new ones.

```
> y2 <- rnorm(10)
> vp2a <- viewport(layout.pos.col = 2)
> vp2b <- viewport(width = 0.6, height = 0.6, xscale = c(0, 11),
+     yscale = c(-4, 4))
> push.viewport(vp2a, vp2b)
> grid.draw(xa)
> grid.draw(ya)
> grid.points(x, y2)
> pop.viewport(2)
```

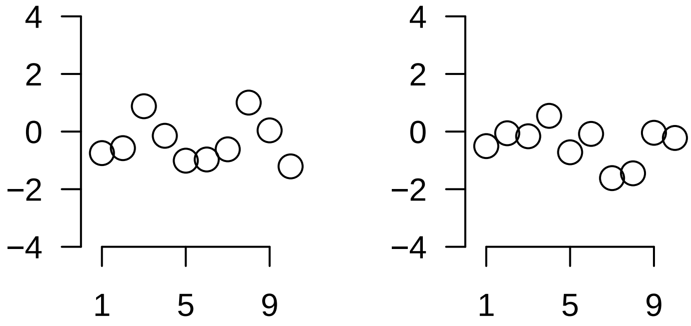
The output looks like the figure below.



Because I have used the same graphical object in both plots, I can edit the axes for both plots simultaneously rather than having to edit each one in turn. For example ...

```
> grid.edit(xa, at = c(1, 5, 9))
```

The output now looks like the figure below.



This might seem a very small gain in this example, but it is potentially of great use in, for example, the implementation of a scatterplot matrix.