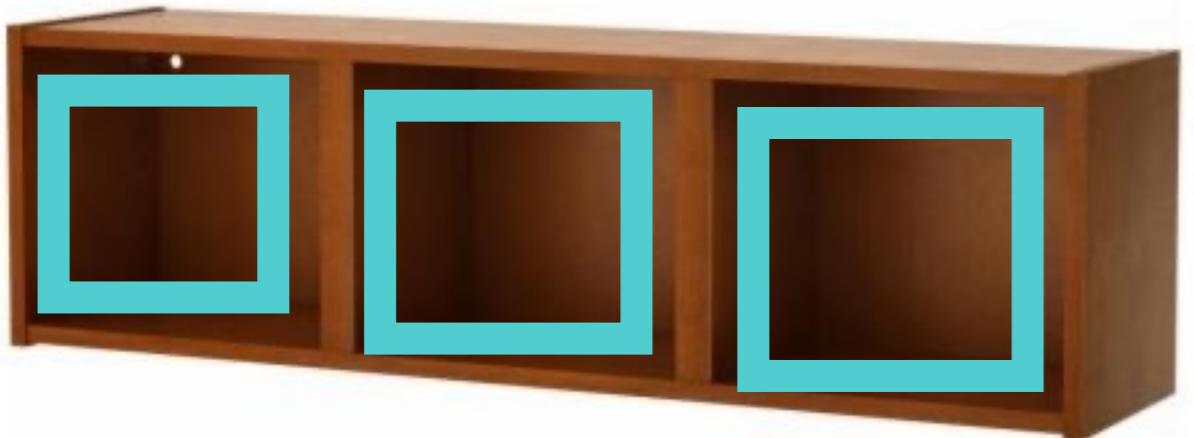


# Introduction to R: Vectors

Research Methods for Human Inquiry  
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This is a big box



It's build from three  
slots side by side



Each of those slots  
is basically just a box



And each of those boxes  
can store things

# Vectors

- Vectors are variables that store multiple pieces of information
- Conceptually, a vector is just an ordered list of values...



```
name <- c( "bunny", "gladly", "flopsy" )
```

# Creating vectors

`c()` combines a set of values, and stores them as a vector...

numeric vectors:

```
> ages <- c(6,7,1)
> ages
[1] 6 7 1
```



character vectors:

```
> name <- c( "bunny", "gladly", "flopsy")
> name
[1] "bunny"  "gladly" "flopsy"
```



logical vectors:

```
> isBunny <- c( TRUE, FALSE, TRUE )
> isBunny
[1] TRUE FALSE TRUE
```



# Creating vectors

Note that all variables in a vector have to be of the same class. If they aren't, R will force them to be (another “silent fail”).



```
> myVector <- c(TRUE,3,3.2)
> myVector
[1] 1.0 3.0 3.2
```

```
> myVector <- c("cat",3,TRUE)
> myVector
[1] "cat"    "3"      "TRUE"
```

# Selecting elements from vectors



How about food? Can we do something with food please? I want to select some food, yum

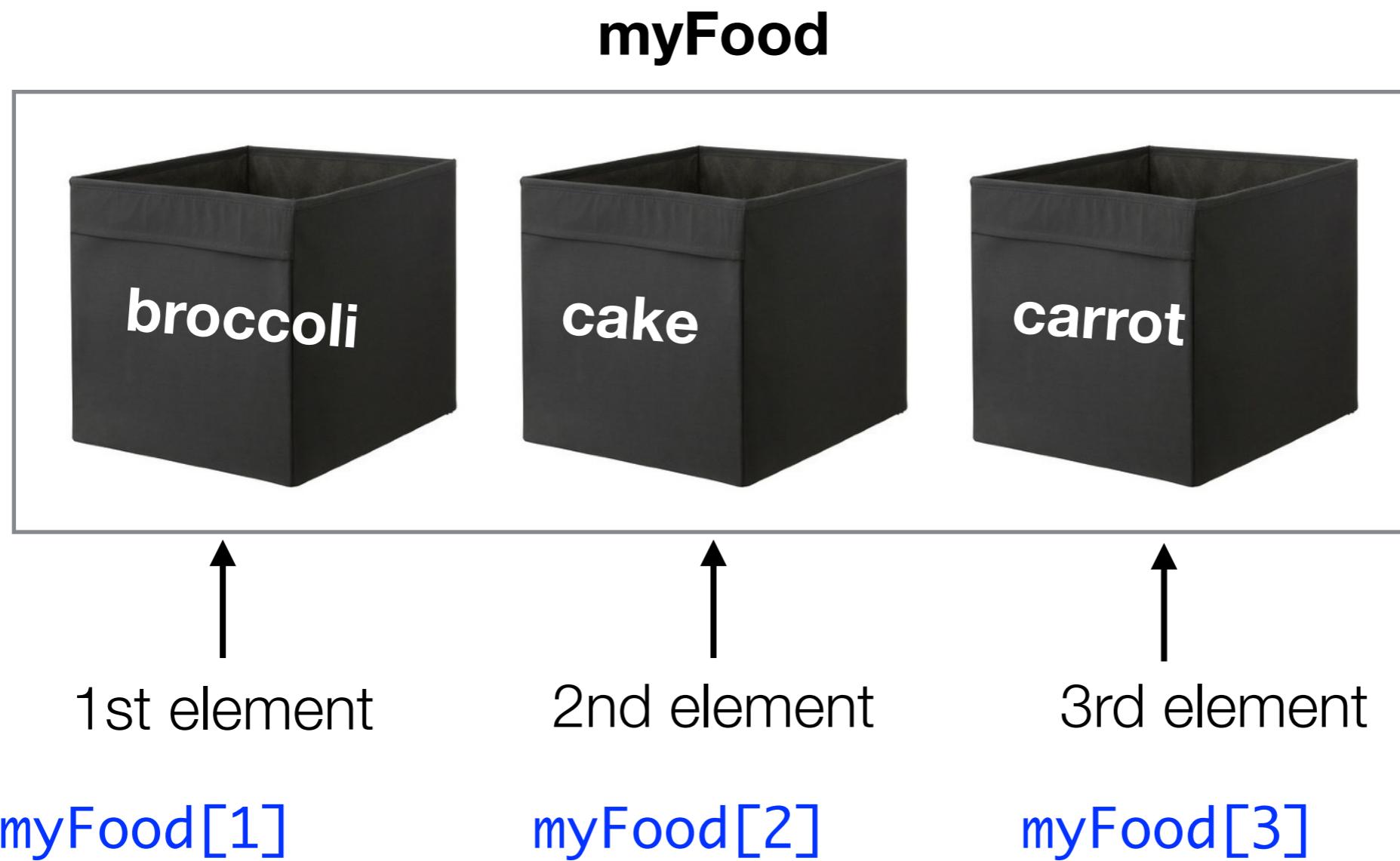
# Selecting elements from vectors

**myFood**



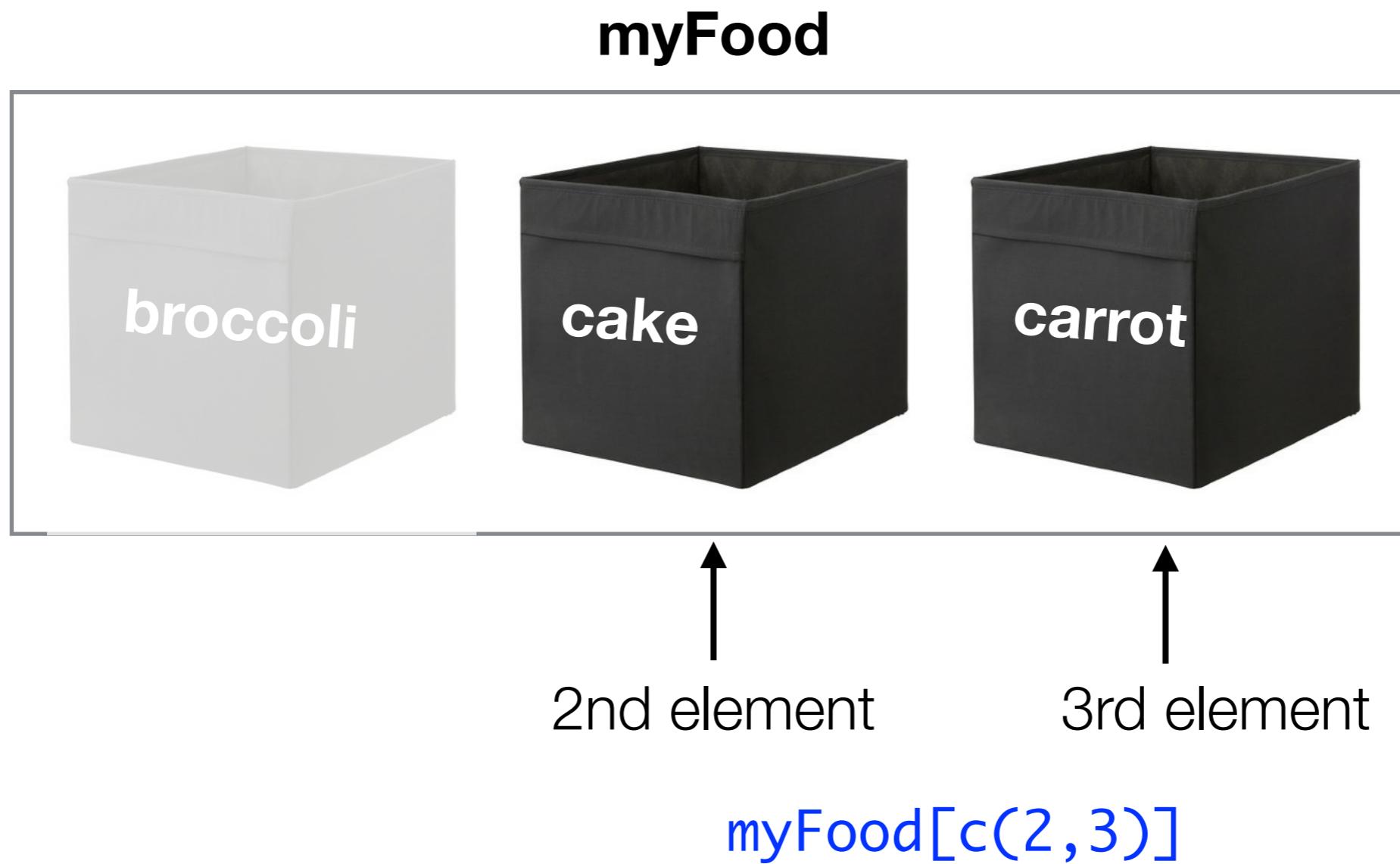
```
> myFood <- c("broccoli", "cake", "carrot")
> myFood
[1] "broccoli" "cake"      "carrot"
```

# Selecting elements from vectors



Selecting one element by **position**

# Selecting elements from vectors



Selecting one element by **position**

# There's also a neat shortcut

```
> c(3,4,5,6,7,8,9)  
[1] 3 4 5 6 7 8 9
```

The long way

```
> 3:9  
[1] 3 4 5 6 7 8 9
```

The shortcut

## myFood



Keep element 1?  
TRUE

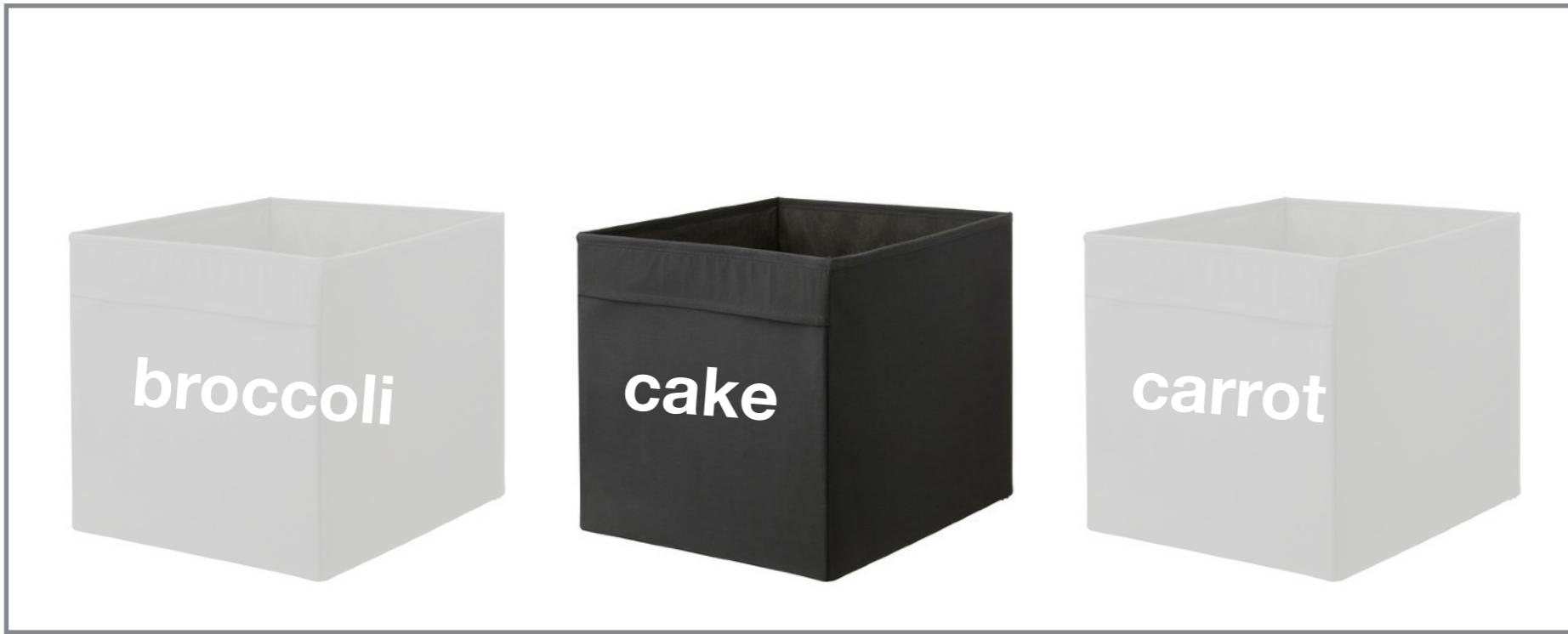
Keep element 2?  
TRUE

Keep element 3?  
FALSE

`myFood[ c( TRUE, TRUE, FALSE) ]`

Selecting elements “logically”

## myFood



Is element 1 equal  
to "cake"? FALSE

Is element 2 equal  
to "cake"? TRUE

Is element 3 equal  
to "cake"? FALSE

`myFood[ myFood == "cake"]`

`myFood[c(FALSE, TRUE, FALSE)]`

Selecting elements “logically”

Why the heck would we ever want to  
select elements logically?

# An almost realistic example

```
> name <- c("bunny", "gladly", "flopsy")  
> age <- c(6, 7, 1)  
> isBunny <- c(TRUE, FALSE, TRUE)
```

Create vectors that contain useful data

```
> name[ isBunny == TRUE ]  
[1] "bunny" "flopsy"
```

Here are the names of the bunnies

```
> name[ age > 5 ]  
[1] "bunny" "gladly"
```

Bunny and Gladly are older than 5

```
> age[ name == "flopsy" ]  
[1] 1
```

Here is the age of Flopsy

```
> name[ isBunny == TRUE & age > 5]  
[1] "bunny"
```

Finds the names of all of the bunnies older than 5

# Exercises

1. Make a vector called `family` with the names of everyone in your family, and another vector called `ages` with their ages (in the same order). If you don't have two or more people in your family, make some up.
2. Have R select the first item in the `ages` vector. Then Have R select the ages that are older than 90. What happens if there are none? (Use a different threshold than 90 if you need to). Do the same thing with 20 instead.
3. Have R return the names of the people in your family who are older than 20.