Coffee, Cake and Culture

To have another language is to possess a second soul - Charlemagne

# Hypothesis

People with a second language have a broader concept of coffee and cake, because they combine their concepts from both languages.

## Why Choose Coffee and Cake?

It is a cross-cultural experience which has an imprecise definition. Thus it is open to interpretation by participants in the study.

## The Approach

An experimenter supervised questionnaire was administered to 14 volunteer participants. The questionnaire was supervised to ensure a reasonable completion rate and to ensure the participants understood the questions being asked. In in the event some of the questions were challenging for the participants to understand. If a similar questionnaire were to be administered without supervision it would need further refinement to allow the participants to complete it successfully.

The questionnaire consisted of 3 parts.

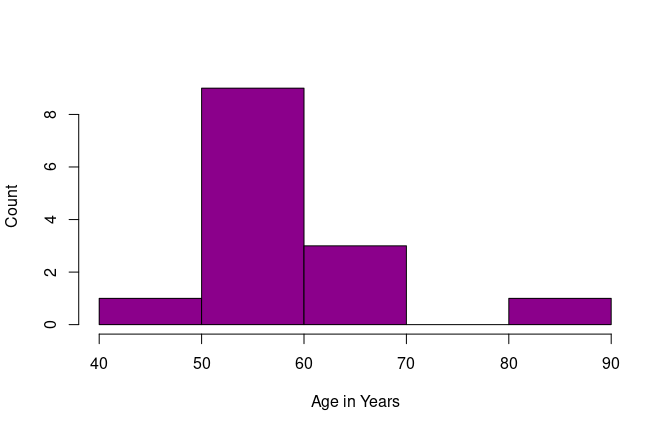
1. Rating Scales - participants were asked to rate their coffee and cake experience on 7 arbitrary scales.
2. Word Assignment - participants were asked to indicate which words from a list (7 positive, 7 negative and 7 neutral) could be applied to their coffee and cake experience.
3. A Cloze Procedure - participants were asked to fill in the blanks in a sentence from Tolstoy’s ‘Anna Karenina’.

# The Participants

The participants were all volunteers selected from the experimenter’s friends and family. This is an undoubtedly biased sample, but using an entirely randomly selected sample would have been too complicated and costly.

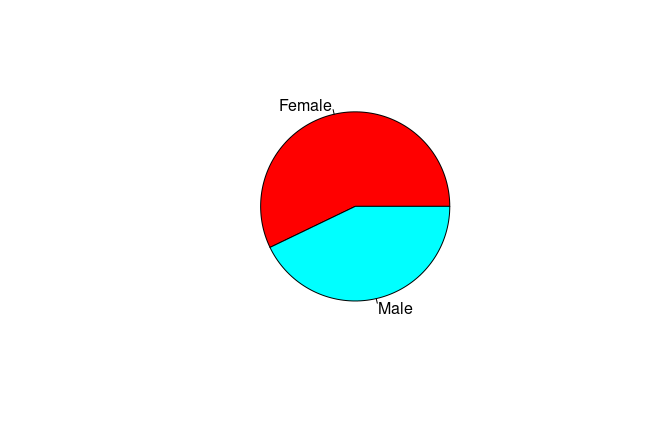
## Age

Average age is 59.4. So the sample is largely middle aged and post retirment.



## Gender

The sample was intended to be gender balanced, but ended up with more females.



## Second Language

A total of 14 participants took part in the study, 7 of whom spoke only English and 7of whom spoke English and one other language.

Mostly North European languages with strong coffee and cake cultures. Half the participants were bilingual and half were monolingual. Unsurprisingly given that the study was conducted in England, the second languages spoken were all from Northern European nations.

##   
## French German Norwegian Spanish Swedish   
## 7 1 2 2 1 1

# Do the two groups have different concepts of coffee and cake?

The data were split the data into those who speak a second language and those that do not.

## Difference in Rating

Participants found rating their coffee and cake experience on a set of arbitrary scales challenging. Some of the scales made no obvious sense to the participants so placing a numerical value against that scale was equally non-sensical. It was necessary to encourage participants to attempt an ‘intuitive’ or ‘gut feeling’ response.

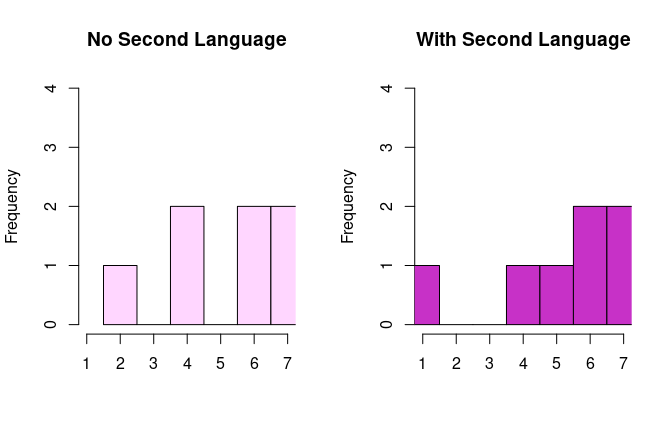
The hypothesis was that participants with a second language would have a broader concept of their coffee and cake experience. This would be expected to show up with the participants with a second language, providing more variable ratings for their coffee and cake experience. Whilst those with a single language might consistently rate their coffee and cake experience at one end of the scale.

As can see seen below, in every case there is little or nothing to distinguish between the two groups of participants. This is confirmed by means of an F-test.

It may be that participants were choosing a random number to be able to answer the question. However, this was not evident during the administration of the questionnaire. Each of the participants appear to give the rating scales some thoughtful consideration. This is born out in the distributions shows below, in that they do not appear to be random and the two groups of participants appear to be consistent.

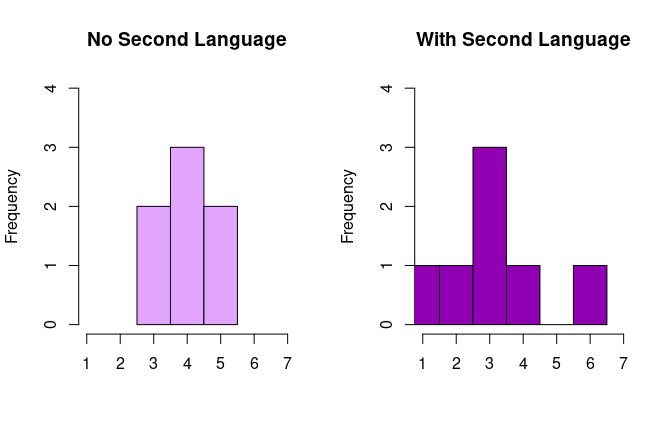
It would seem that when forced to rate their coffee and cake experience, both those with a second language and those without rate their experience similarly.

### Hot-Cold



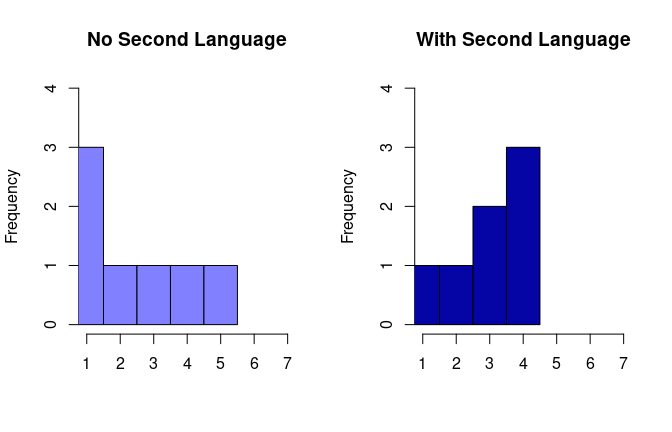
##   
## F test to compare two variances  
##   
## data: monolinguals$cold.hot and bilinguals$cold.hot  
## F = 0.7766, num df = 6, denom df = 6, p-value = 0.7667  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 0.1334413 4.5195982  
## sample estimates:  
## ratio of variances   
## 0.7765957

### Fat-Thin



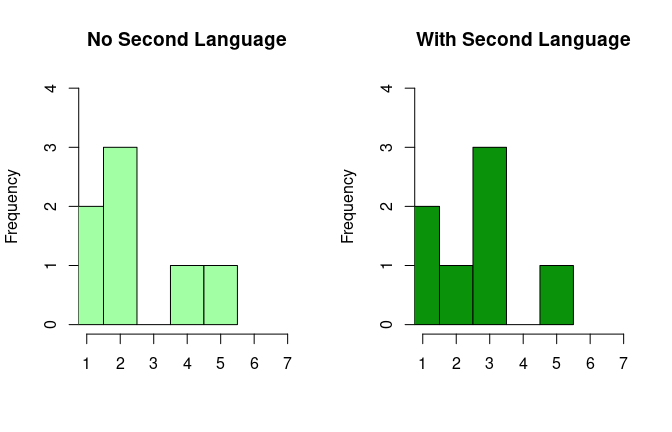
##   
## F test to compare two variances  
##   
## data: monolinguals$fat.thin and bilinguals$fat.thin  
## F = 0.26923, num df = 6, denom df = 6, p-value = 0.1353  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 0.04626152 1.56685754  
## sample estimates:  
## ratio of variances   
## 0.2692308

### Funny-Sad



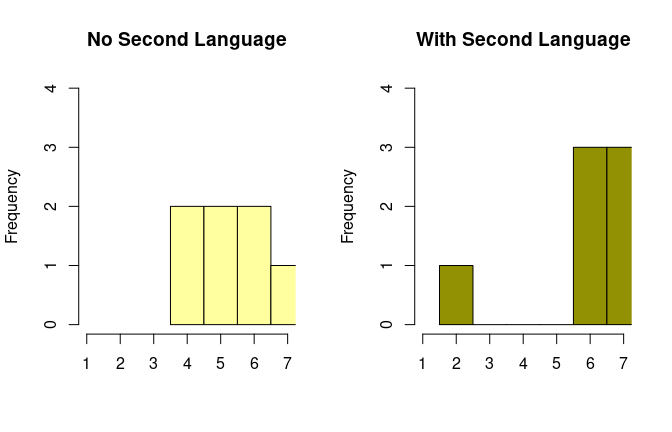
##   
## F test to compare two variances  
##   
## data: monolinguals$funny.sad and bilinguals$funny.sad  
## F = 1.9643, num df = 6, denom df = 6, p-value = 0.4317  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 0.3375203 11.4316647  
## sample estimates:  
## ratio of variances   
## 1.964286

### Red-Green



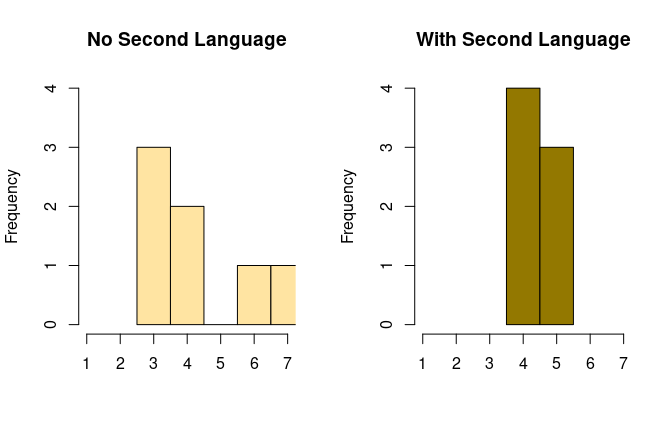
##   
## F test to compare two variances  
##   
## data: monolinguals$red.green and bilinguals$red  
## F = 1.1707, num df = 6, denom df = 6, p-value = 0.8531  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 0.2011651 6.8133736  
## sample estimates:  
## ratio of variances   
## 1.170732

### Horrible-Fantastic



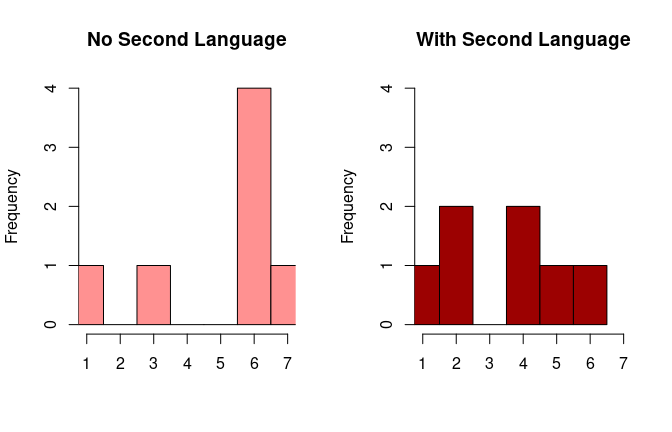
##   
## F test to compare two variances  
##   
## data: monolinguals$horrible.fantastic and bilinguals$horrible.fantastic  
## F = 0.39394, num df = 6, denom df = 6, p-value = 0.2817  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 0.06769001 2.29263138  
## sample estimates:  
## ratio of variances   
## 0.3939394

### Stupid-Intellectual



##   
## F test to compare two variances  
##   
## data: monolinguals$stupid.intellectual and bilinguals$stupid.intellectual  
## F = 9, num df = 6, denom df = 6, p-value = 0.01712  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 1.546456 52.377809  
## sample estimates:  
## ratio of variances   
## 9

### Sparkling-Still



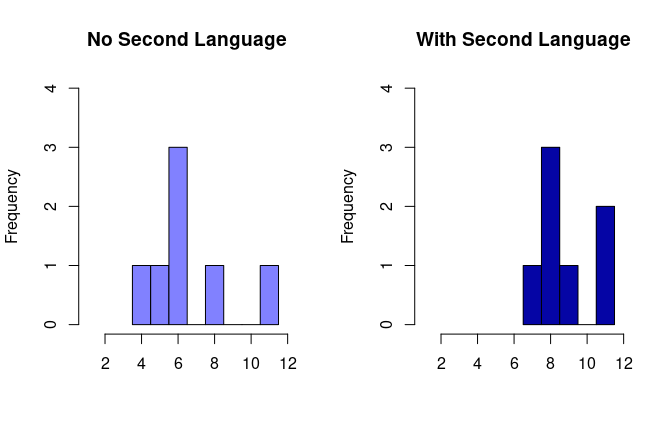
##   
## F test to compare two variances  
##   
## data: monolinguals$sparkling.still and bilinguals$sparkling  
## F = 1.4203, num df = 6, denom df = 6, p-value = 0.6809  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 0.2440463 8.2657412  
## sample estimates:  
## ratio of variances   
## 1.42029

## Word Assignment

It was readily apparent during the administration of the questionnaires, that the participants could easily determine which word could be applied to their coffee and cake experience.

If the hypothesis is correct that those with a second language would have a broader concept of coffee and cake. As a result one would expect them to select more words from the word list to reflect their broader concept.

Taking the total number of words selected it is clear that those with a second language consistently selected more words than those without a second language.



The average for those with a second language was 8.8571429 where as for those without a second language the average was 6.5714286. Using an F-test this is confirmed to be a statistically significant difference.

##   
## F test to compare two variances  
##   
## data: bilinguals$total\_selected and monolinguals$total\_selected  
## F = 0.46847, num df = 6, denom df = 6, p-value = 0.3783  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 0.08049623 2.72637245  
## sample estimates:  
## ratio of variances   
## 0.4684685

### Word Cloud

Looking at word cloud of the most popular words choosen, it appears that the positive words were favoured over the negative and neutral words. It is clear that all the participants have a positive conceptualization of their coffee and cake experience.

## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.1 ──

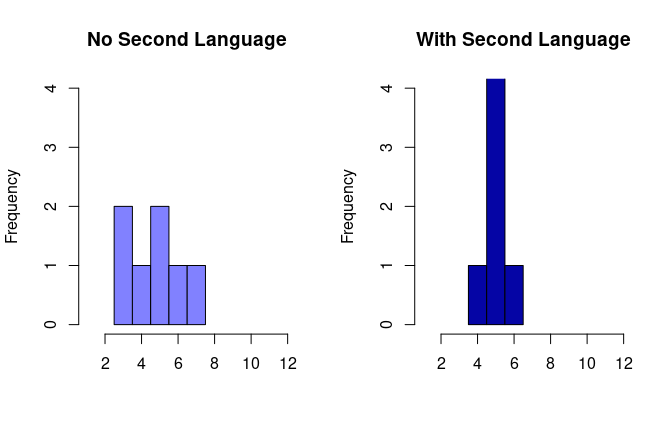
## ✓ ggplot2 3.3.3 ✓ purrr 0.3.4  
## ✓ tibble 3.1.1 ✓ dplyr 1.0.5  
## ✓ tidyr 1.1.3 ✓ stringr 1.4.0  
## ✓ readr 1.4.0 ✓ forcats 0.5.1

## ── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
## x dplyr::filter() masks stats::filter()  
## x dplyr::lag() masks stats::lag()



### Positive Words

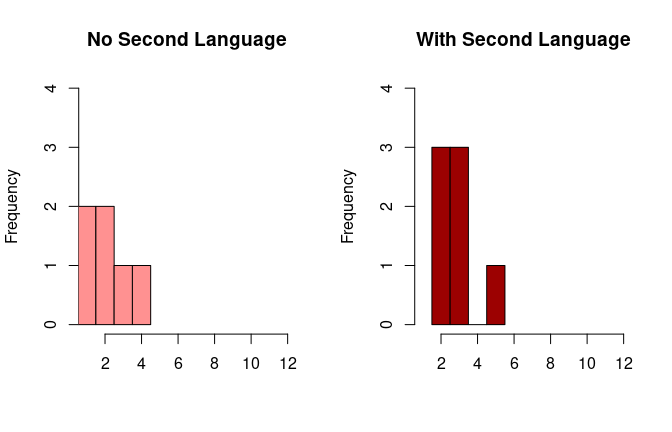
Indeed it is clear that the difference between those with a second language and those without is driven by the positive words. This is demonstrated to be statistically significant using an F-test.



##   
## F test to compare two variances  
##   
## data: monolinguals$total\_selected\_positive and bilinguals$total\_selected\_positive  
## F = 6.7143, num df = 6, denom df = 6, p-value = 0.03553  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 1.153706 39.075508  
## sample estimates:  
## ratio of variances   
## 6.714286

### Neutral Words

However there is no significant difference between the two groups based on their selections of neutral words.



##   
## F test to compare two variances  
##   
## data: monolinguals$total\_selected\_neutral and bilinguals$total\_selected\_neutral  
## F = 1.5833, num df = 6, denom df = 6, p-value = 0.5908  
## alternative hypothesis: true ratio of variances is not equal to 1  
## 95 percent confidence interval:  
## 0.2720618 9.2146146  
## sample estimates:  
## ratio of variances   
## 1.583333

Neither group selected sufficient of the negative words to draw any inferences.

It is apparent that the group of participants with a second language did select more positive words to describe their coffee and cake experience that those without a second language.

### For Cloze Procedure

Completing the Cloze procedure was clearly those most challenging task for all the participants in the study. None of them was sufficiently familiar with the extract from ‘Anna Karenina’ to complete the original sentence and all the participants required a great deal of encouragement. Only one word was chosen by two different participants (red) but it is hard to ascribe anything meaningful to this result. One is forced to conclude that most of the participants simply choose a random word it order to be able to complete the task and that any priming concerning coffee and cake was overwhelmed by a desire to complete the task.