A Statistical Analysis of Prawn Cocktail flavoured crisps

Abstract

This paper details an experiment to find the best prawn cocktail flavoured crisp, it details the methodology involved in the experimentation collecting data of multiple crisps over a variety of categories and performs a statistical analysis on the results finally coming to a conclusion.

1. Introduction

Prawn Cocktail were first introduced as a crisp flavouring in the 1970s based on the popular starting dish of the time. They have since become one of the core flavours of crisp and in 2004 they became the second most popular crisp in the UK, at this point I realise nobody cares about this bit, and if you do just read Wikipedia, it's all I was doing.

2. Aim

The aim of this experiment is to settle disagreements about prawn cocktail flavoured crisps and determine which is the best one.

3. Methodology.

To conduct this experiment 8 people rated various Prawn cocktail crisps out of 5 over the following categories.

Texture – the texture of the crisp

Flavour Intensity – how strong the flavours in the crisp are

Flavour Accuracy – How close the crisp gets to tasting like a Prawn Cocktail

Overall Rating – Overall opinion of the person

The crisps were tastes sequentially, with each bag in turn being passed round the room until everyone had the current crisp being tasted, these were then eaten and rated by each person.
The order of the crisps were randomised and was as follows

1.Walkers

2.Seabrooks

3.Walkers Baked

4.Skips

5.Max

6.Wotsit

7.Pringle

8.McCoys

9.Quavers

4. Results.

Walkers		A	B	C	D	E	F	G	H
	Texture	4	5	3	3	3	4	3	3
	Flavour Intensity	4	5	3	3	4	3	4	4
	Flavour Accuracy	5	5	4	3	5	4	4	2
	Overall	5	5	3	3	4	4	4	3
Seabrooks		A	B	C	D	E	F	G	H
	Texture	4	5	2	4	3	5	3	4
	Flavour Intensity	2	3	1	2	2	4	1	2
	Flavour Accuracy	4	3	1	4	4	4	1	2
	Overall	1	3.5	1	2	2	4	2	2
Baked		A	B	C	D	E	F	G	H
	Texture	3	2	3	4	3	3	4	3
	Flavour Intensity	2	2	2	3	3	4	2	4
	Flavour Accuracy	3	2	3	2	4	3	3	3
	Overall	1	2	3	2	3	3	3	3
Skip		A	B	C	D	E	F	G	H
	Texture	5	2.5	3	3	2	5	2	2
	Flavour Intensity	3	3	2	3	3	3	4	2
	Flavour Accuracy	1	2	3	2	2	2	3	2
	Overall	4	2.5	3	2	2	3	3	2
MAX		A	B	C	D	E	F	G	H
	Texture	5	5	4	5	5	5	4	5
	Flavour Intensity	5	4	4	5	5	1	5	5
	Flavour Accuracy	1	2	2	2	2	1	2	1
	Overall	3	4	3	5	4	2	3	3
Wotsit		A	B	C	D	E	F	G	H
	Texture	3	4	2	1	1	2	4	3
	Flavour Intensity	3	4	3	3	3	3	3	4
	Flavour Accuracy	3	3	2	2	2	2	2	3
	Overall	4	4	2	3	2	2	3	3
Pringle		A	B	C	D	E	F	G	H
	Texture	3	1	4	4	3	1	3	4
	Flavour Intensity	4	1	3	3	3	2	4	2
	Flavour Accuracy	3	1	4	3	3	1	3	2
	Overall	4	1	4	3	3	1	4	2
McCoy		A	B	C	D	E	F	G	H
	Texture	5	4	4	5	4	5	4	5
	Flavour Intensity	1	1	2	3	4	3	3	1
	Flavour Accuracy	0	1	2	2	3	3	4	2
	Overall	2	2	2	3	4	3	4	2
Quaver		A	B	C	D	E	F	G	H
	Texture	4	3	3	4	4	3	2	4
	Flavour Intensity	2	1	2	3	2	1	2	1
	Flavour Accuracy	3	1	4	2	4	1	3	1
	Overall	3	2	2	2	3	1	3	2

5. Analysis

Prawn Cocktail crisps rated over multiple catagories
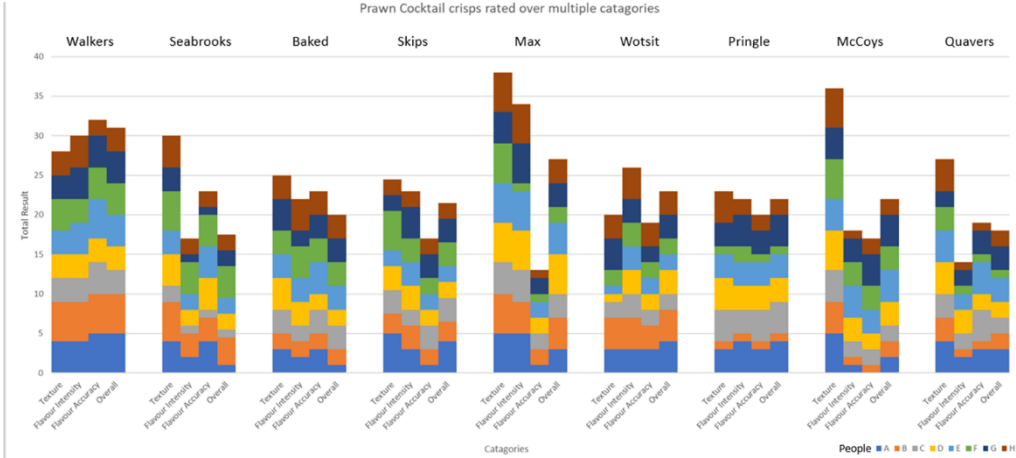
This graph shows the overall results of the experiment for each type of crisp with each participant represented by a different colour.

The area covered by each crisps data gives a total to how many raw points it was awarded. By this measure the winning crisp would be Walkers with a total of 121. Followed by MAX with 112 and McCoys on 93.

The weakest crisp is Quavers on 78 points.

This graph also highlights that Baked, Skips, Wotsits, Pringles and Quavers are ranked lower than Walkers on every category.

Texture is commonly the highest ranked category comprising the largest share of the for all but Walkers and Wotsits

Radar graphs for each crisp

Walkers — Seabrooks — Baked

Skip — MAX — Wotsit

Pringle — McCoys — Quavers
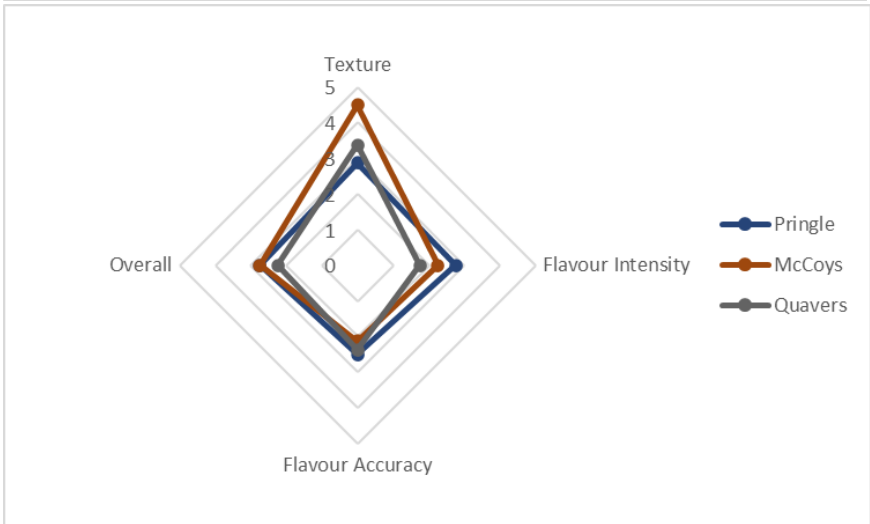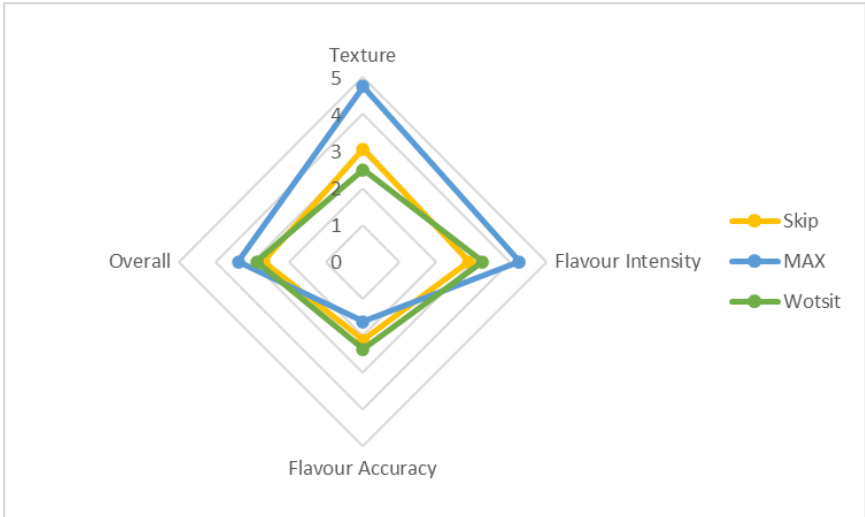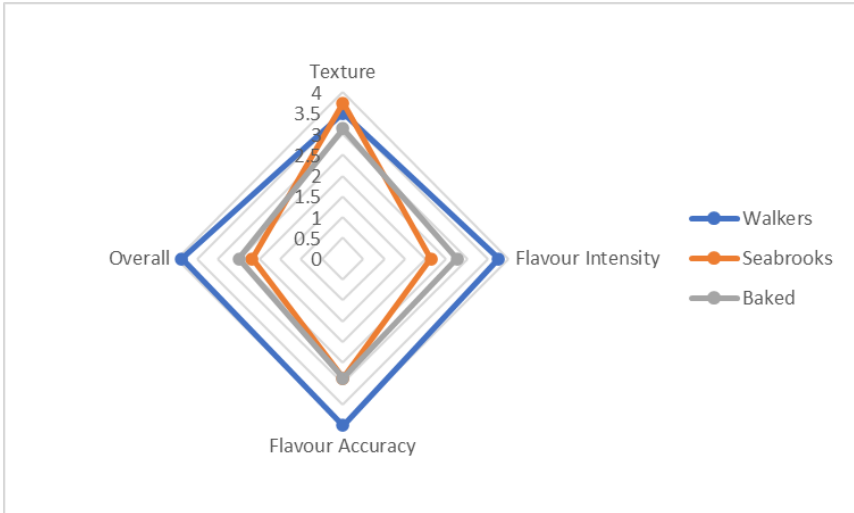
Walkers, good all round, MAX, high Texture and Intensity, low elsewhere. McCoys, High texture, low elsewhere
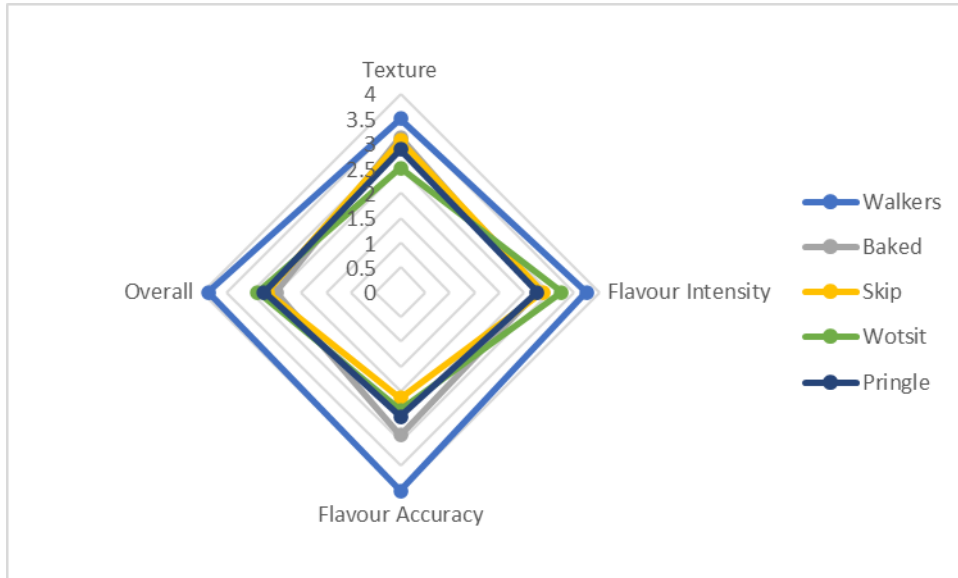

Baked, Skips, Wotsits and Pringles completely fit inside of Walkers. This demonstrates that on average scores Walkers is better than each of them in every single category.
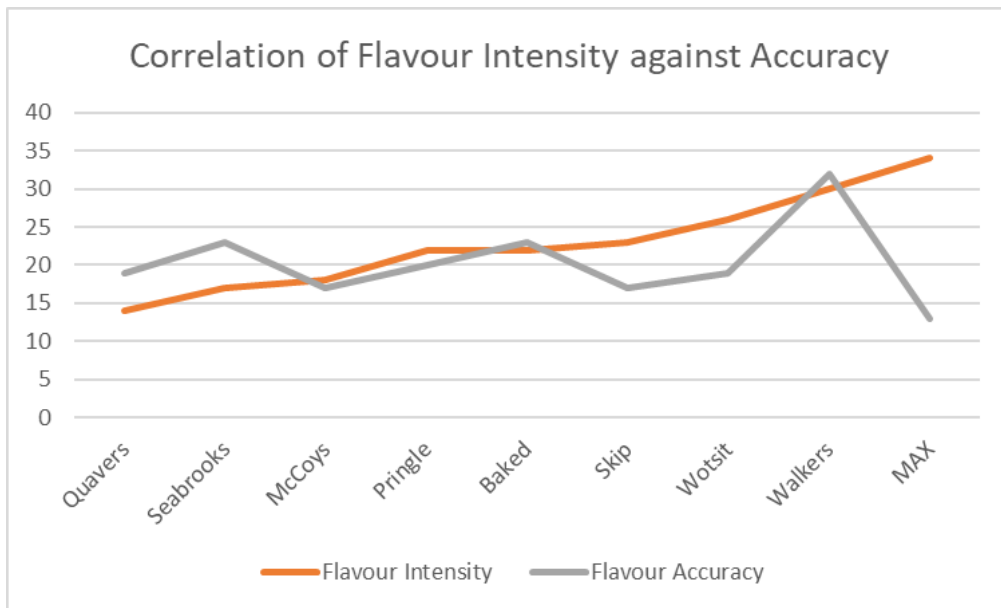

Comparing the Intensity and accuracy of crisp flavours shows a weak correlation between the two, I theorise this is due to the flavours becoming bolder and more distinct with the increase in intensity, however this is up until a threshold point where

the intensity becomes overpowering and reduces the accuracy of the flavour as shown with MAX. This looks to be within the 32-35 range.
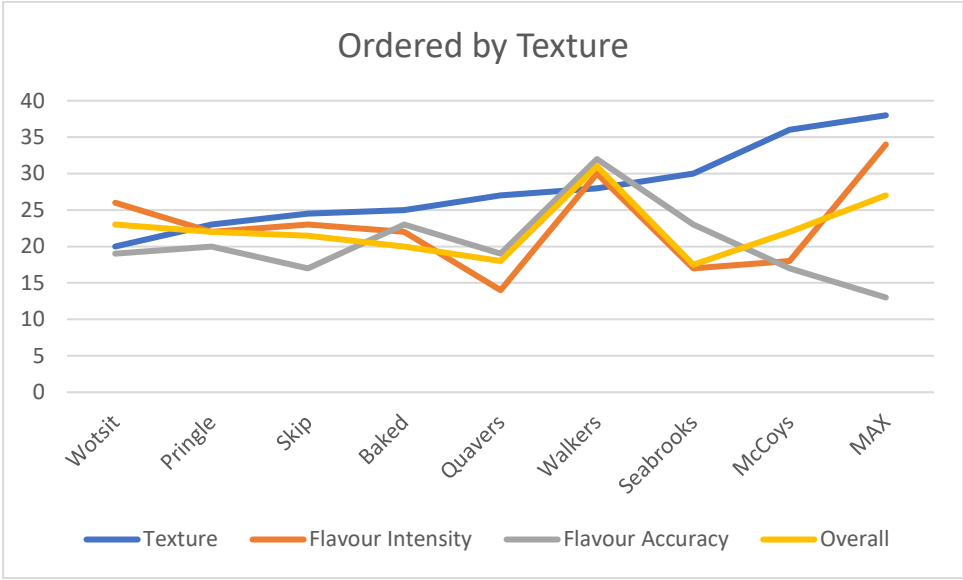

Ordered by Texture

When the data is ordered by texture all 3 other categories show a sharp peak at Walkers, with Accuracy then going on a consistent decline afterwards. This peak is the highest point on the graph for both Accuracy and Overall.
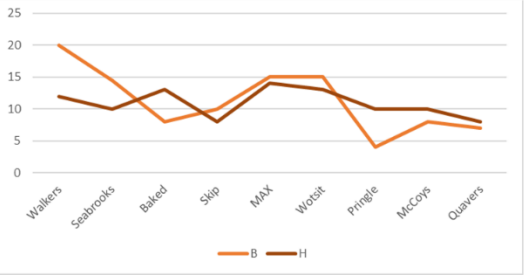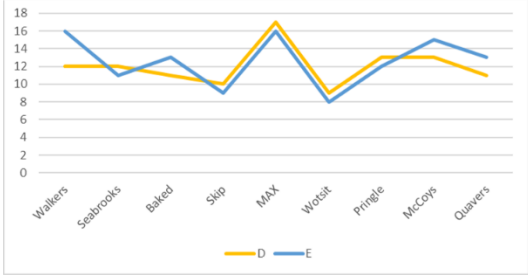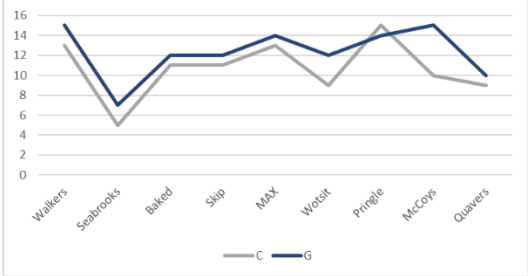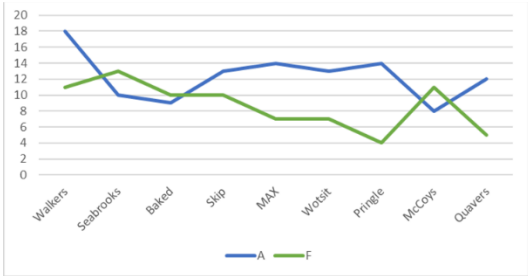
Graphing people against each other shows similar tastes between person C and person G, as well as person D and person E.

Person A and person F have very different opinions with Baked being the closest scoring crisp between the two of them.
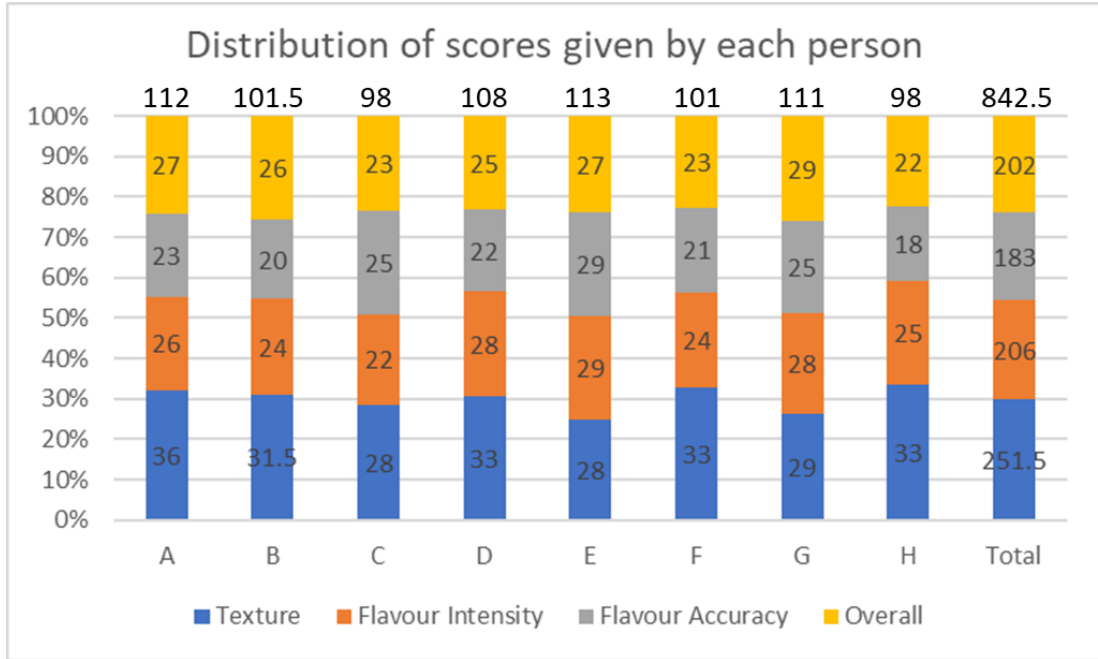
Most points were given to Texture with about 30%. Approximately 20% of the points went to the Accuracy of the flavour. Interestingly this is still close to the 25% per category and there is not one category dominating with the points.

Person E was the most generous with scores, giving 113, E is also the only person not to give the most points to Texture.

There is a 15 point range between the largest and smallest number of points given. This equates to 1.67 per crisp, since this is relatively small there is no need to adjust the points to be percentages of points given by each person rather than raw data. Doing this would have negated any skew of results by one person being really generous compared to another person giving out few points.
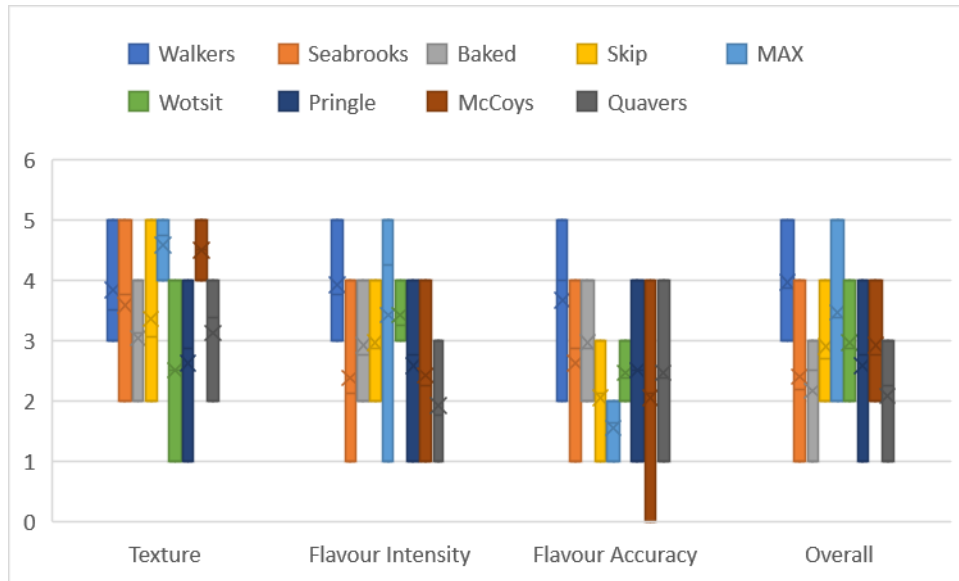
This graph details the minimum and maximum values given to each crisp on each category, Walkers is the only type of crisp to have been given the max value on each category and only dips below a 3 on Accuracy.

Max and McCoys have the most consistent high scoring texture with everyone agreeing that it is either a 4 or a 5. This shows a real difference with these against Wotsits, Pringles and Quavers which were never given above a 4. Max however had a consistent low scone for accuracy with either a 1 or 2 being given.

In the overall category Walkers had a real difference against Baked and Quavers. As its minimum value is equal to their maximums

Wotsits are the most consistent crisp overall with a range of 7 between all its scores given across the 4 categories, this includes a real difference against Quavers in Intensity and against MAX in Accuracy.

Pringles are the most varied with a range of 12. This is between 1 and 4 in each category.
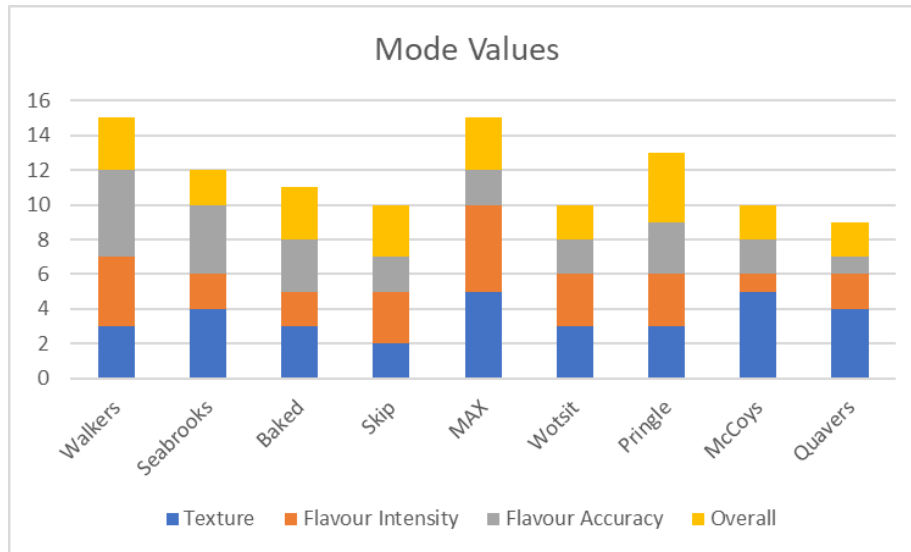
Looking at the mode (most commonly given score) for each crisp and category shows Walkers and Max at the top with 15 of the 20 available points.
Quavers is the lowest with 9 points.

Walkers were most commonly awarded full points on Accuracy, with MAX gaining full points on both Texture and Intensity most of the time.

6. Conclusion

In conclusion the best crisp is Walkers, this is due to it having consistent high scores across all categories, This has the highest total points as well as joint highest modally, it is the only crisp to have the maximum value on each. It is also consistent in its values only once scoring below a 3.
Walkers is also the most accurately flavoured crisp and the most preferred in the overall category.

The weakest crisp is Quavers. This has the lowest points in the raw data and modally, Quavers is also the only crisp to not get higher than a 3 on 2 of the 4 categories (Intensity and Overall)