

A top-down photograph of an orange ceramic coffee cup and saucer. The cup is tilted, causing a large pile of dark brown coffee beans to spill out onto a dark, textured surface. The lighting highlights the glossy finish of the cup and the smooth texture of the beans.

How Would You Like Your Coffee?

Choose Your Favorite Coffee with
Experimental Design

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Agenda

- Motivation
- Survey
- Experiment
- Conclusion & Application

Motivation



Motivation

"Americans drink more than 400 million cups of coffee a year, but despite the copious consumption, most casual drinkers would be hard pressed to identify the difference between one brand and another."



Motivation

Can you identify the difference in a blind taste test?



"Highest quality coffee"



High quality + Hand drip

Factor

Quality of
Coffee



Brewing
Method



Quality of
Water



Motivation

- How would you like your coffee?

✓ Experiment 1: Survey

✓ Experiment 2: Blind taste test

Design of Survey

Block

Level 1: Not Coffee Lovers

Level 2: Coffee Lovers



Survey Result

	Pattern	Block	Coffee	Cooking	Water	Y
1	---	1	1	1	-1	7.5
2	-++	1	-1	1	1	3
3	++-	1	1	-1	1	5
4	---	1	-1	-1	-1	1
5	-+-	1	-1	1	-1	3
6	--+	1	-1	-1	1	2.25
7	+-+	1	1	-1	-1	7
8	+++	1	1	1	1	9.5
9	-++	2	-1	1	1	4.5
10	+-+	2	1	-1	1	6
11	++-	2	1	1	-1	5
12	---	2	-1	-1	-1	0.75
13	--+	2	-1	-1	1	2.5
14	-+-	2	1	-1	-1	3.75
15	-+-	2	-1	1	-1	1.25
16	+++	2	1	1	1	9.5

Score : 0 - 10

Block

1: Not Coffee Lovers

2: Coffee Lovers

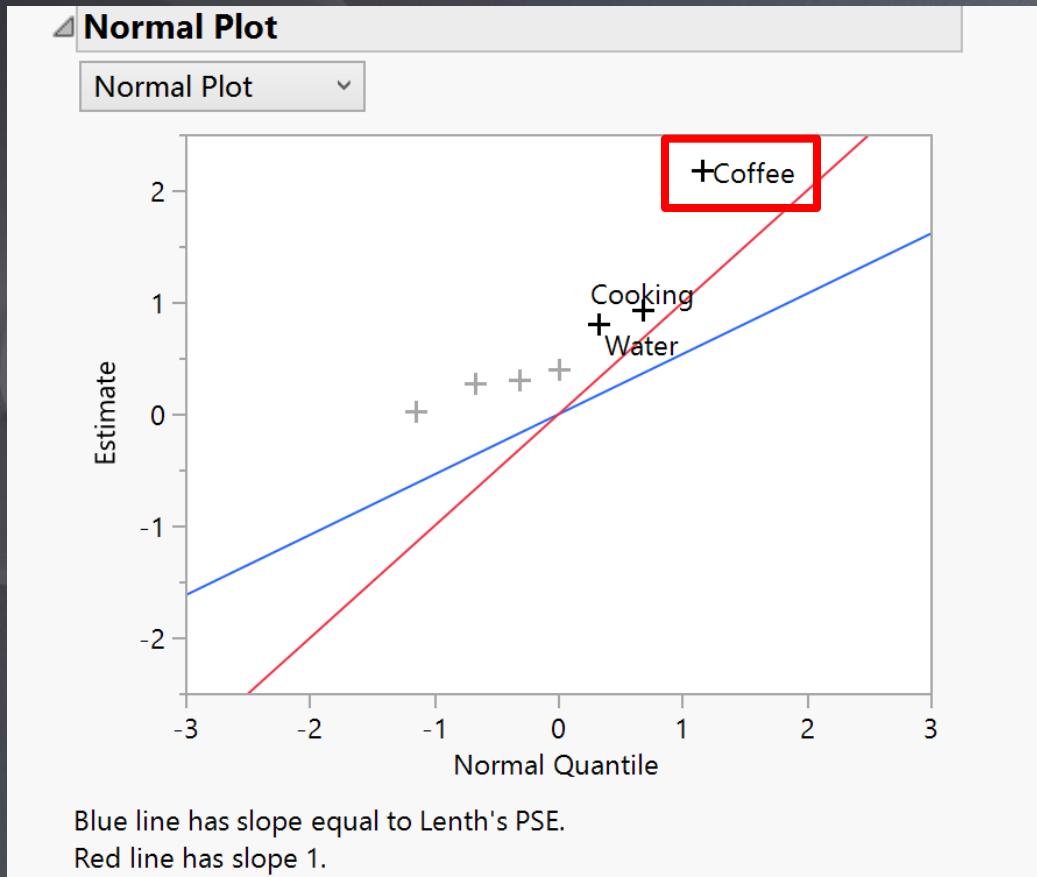
Effect Summary

Effect Summary

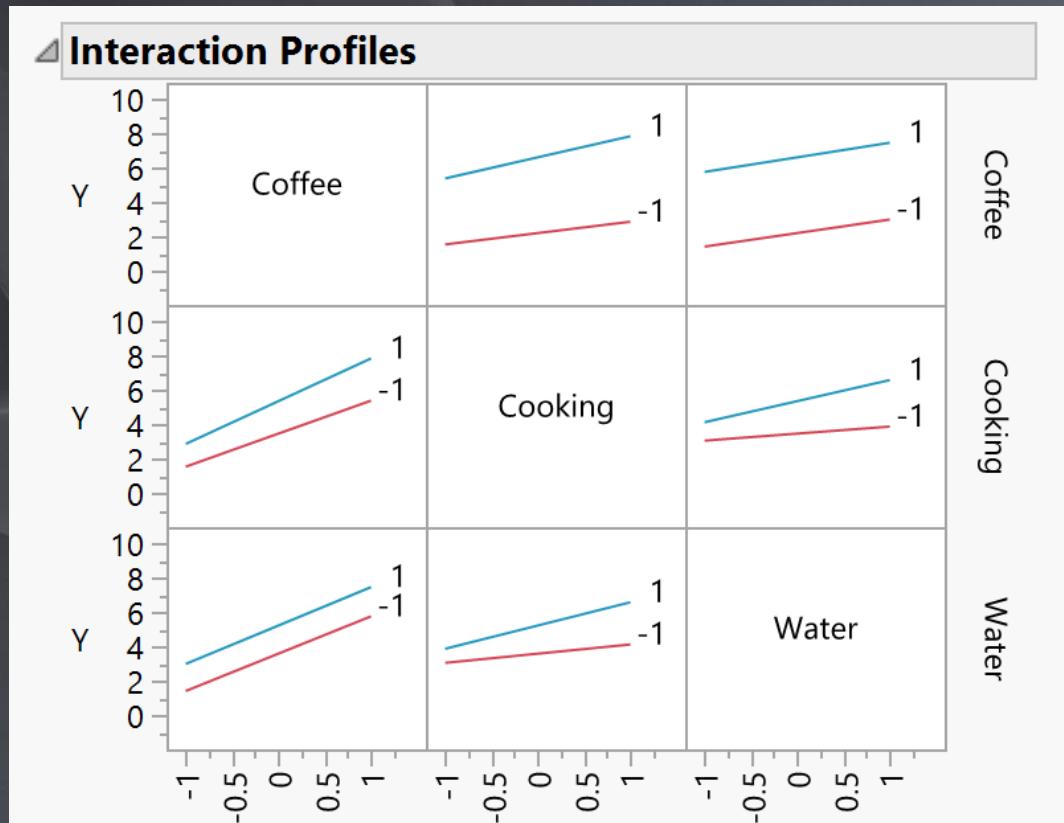
Source	LogWorth	PValue
Coffee	3.971	0.00011
Cooking	1.783	0.01649
Water	1.513	0.03066
Cooking*Water	0.645	0.22660
Block	0.465	0.34315
Coffee*Cooking	0.408	0.39099
Coffee*Water	0.035	0.92222

[Remove](#) [Add](#) [Edit](#) FDR

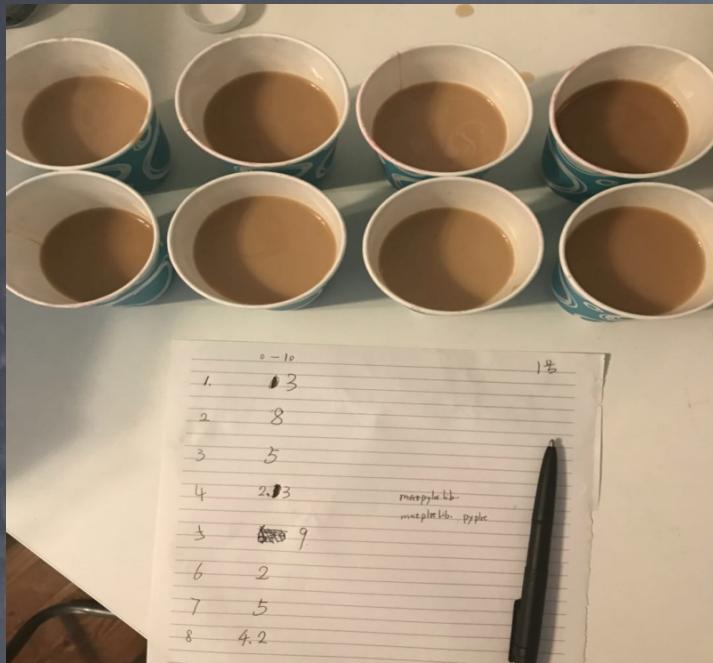
Normal Plot



Interaction Profiles



Experiment



Experiment Data

	Pattern	Block	Coffee	Cooking	Water	Y
1	---	1	1	1	-1	6
2	-++	1	-1	1	1	3.75
3	++-	1	1	-1	1	6
4	---	1	-1	-1	-1	4.75
5	-+-	1	-1	1	-1	5.5
6	--+	1	-1	-1	1	2.5
7	+-+	1	1	-1	-1	8
8	+++	1	1	1	1	5.85
9	-++	2	-1	1	1	4.25
10	++-	2	1	-1	1	7.5
11	+-+	2	1	1	-1	2.65
12	---	2	-1	-1	-1	2.5
13	--+	2	-1	-1	1	2.25
14	-+-	2	1	-1	-1	8
15	-+-	2	-1	1	-1	3.75
16	+++	2	1	1	1	3.75

Score : 0 - 10

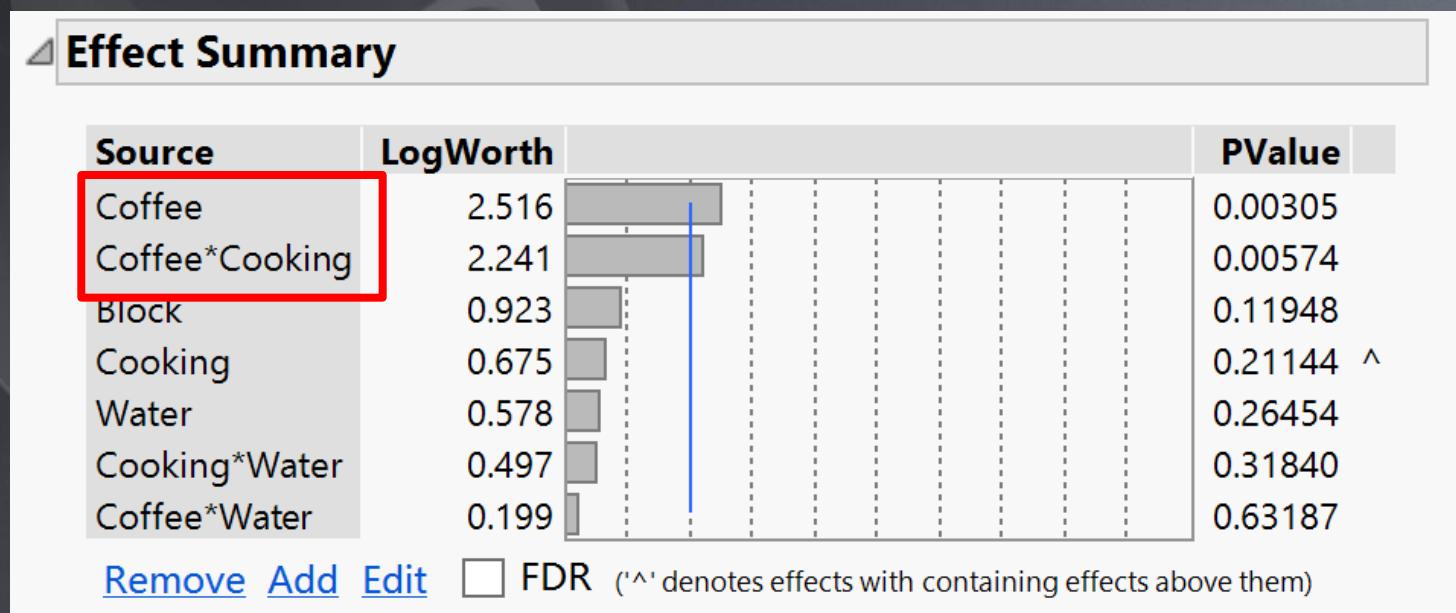
Block

1: Not Coffee Lovers

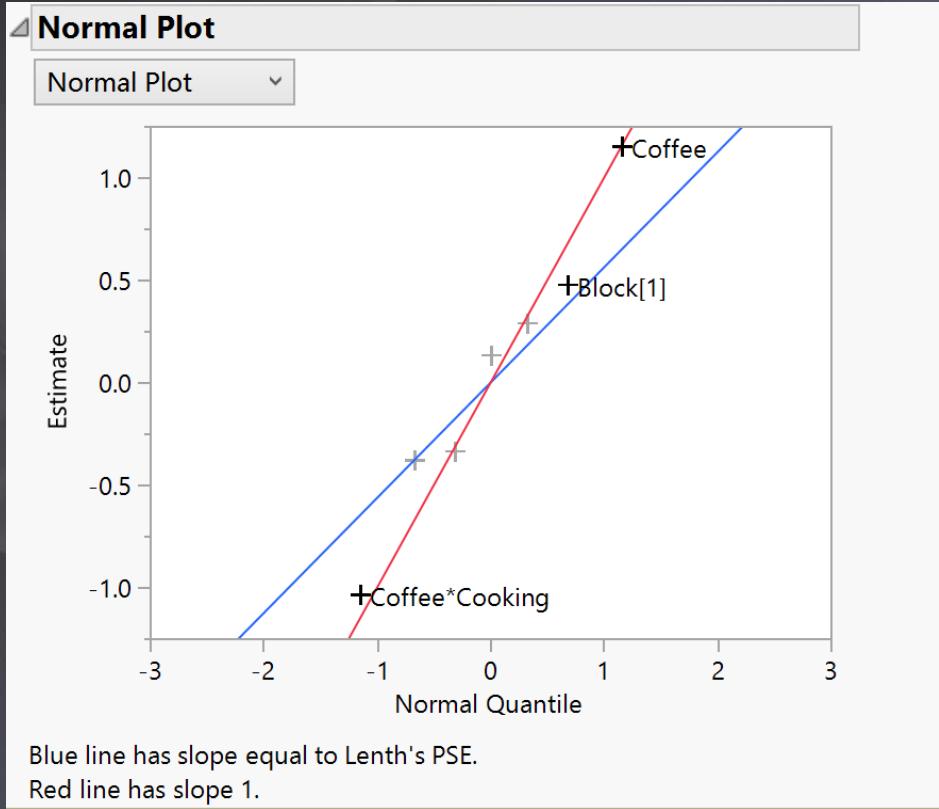
2: Coffee Lovers

8 runs

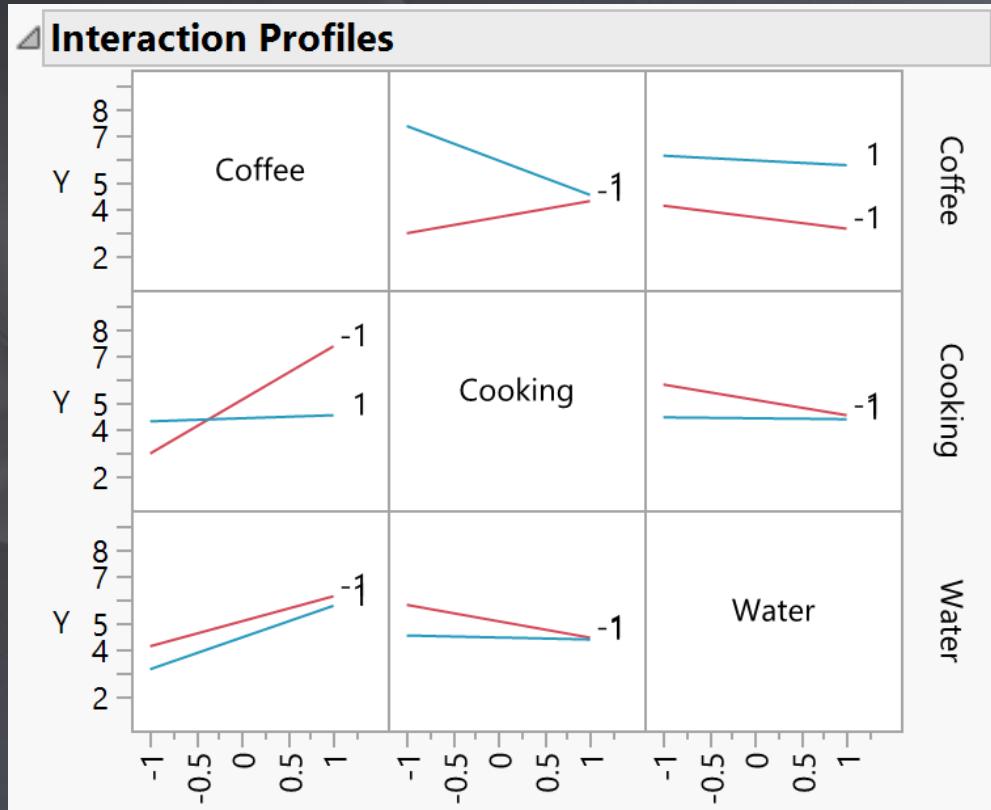
Effect Summary



Normal plot



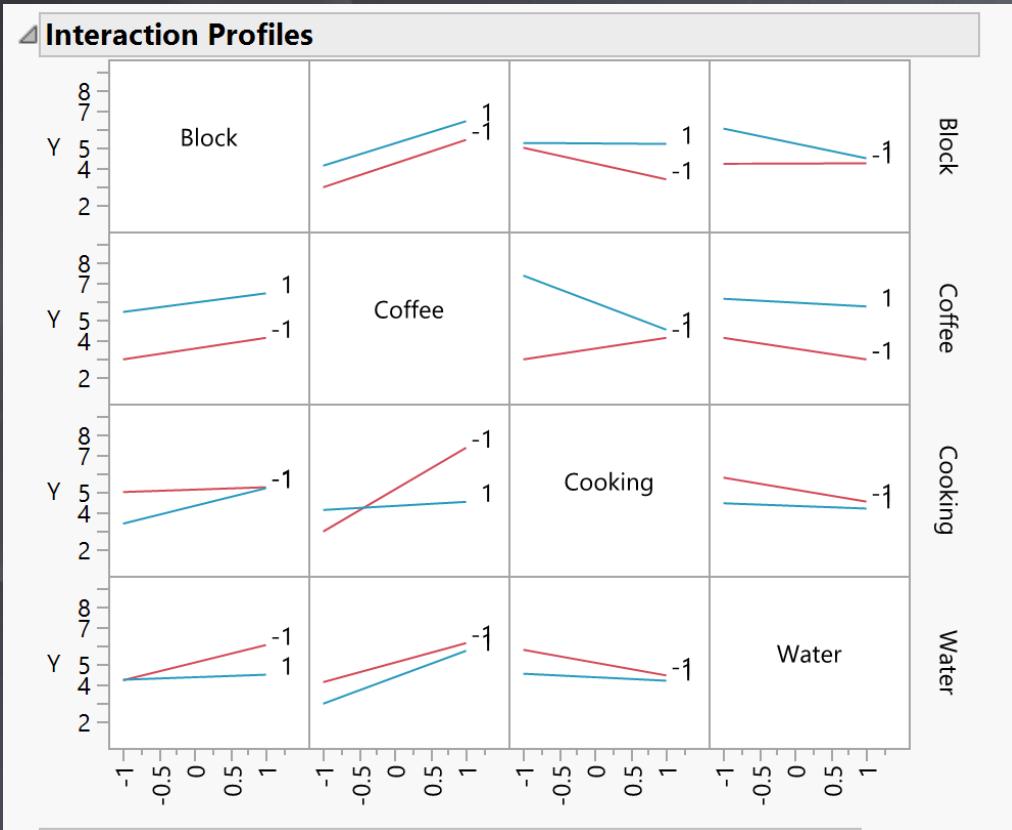
Interaction Profiles



Take Block as another factor

	Pattern	Block	Coffee	Cooking	Water	Y
1	-++-	-1	1	1	-1	2.65
2	++--	1	1	-1	-1	8
3	+-+-	1	-1	1	-1	5.5
4	+++-	1	1	1	-1	6
5	-+++	-1	1	1	1	3.75
6	---+	-1	-1	-1	1	2.25
7	----	1	-1	-1	-1	4.75
8	+--+	1	-1	-1	1	2.5
9	--+-	-1	-1	1	-1	3.75
10	-+++	-1	1	-1	1	7.5
11	++++	1	1	1	1	5.8
12	+++-	1	-1	1	1	3.75
13	-+--	-1	1	-1	-1	8
14	+-+-	1	1	-1	1	6
15	--++	-1	-1	1	1	3.5
16	-----	-1	-1	-1	-1	2.5

Interaction Profiles



Comparing the Results

Survey

Source	LogWorth	PValue
Coffee	3.971	0.00011
Cooking	1.783	0.01649
Water	1.513	0.03066
Cooking*Water	0.645	0.22660
Block	0.465	0.34315
Coffee*Cooking	0.408	0.39099
Coffee*Water	0.035	0.92222

Experiment

Source	LogWorth	PValue
Coffee	2.516	0.00305
Coffee*Cooking	2.241	0.00574
Block	0.923	0.11948
Cooking	0.675	0.21144
Water	0.578	0.26454
Cooking*Water	0.497	0.31840
Coffee*Water	0.199	0.63187

Comparing the Results

- **For Individual Customers:**
 - Basic choices (Coffee grounds)
- **For Business:**
 - Progress from basics...
 - Showcase is important!

Thanks for listening!

Questions?