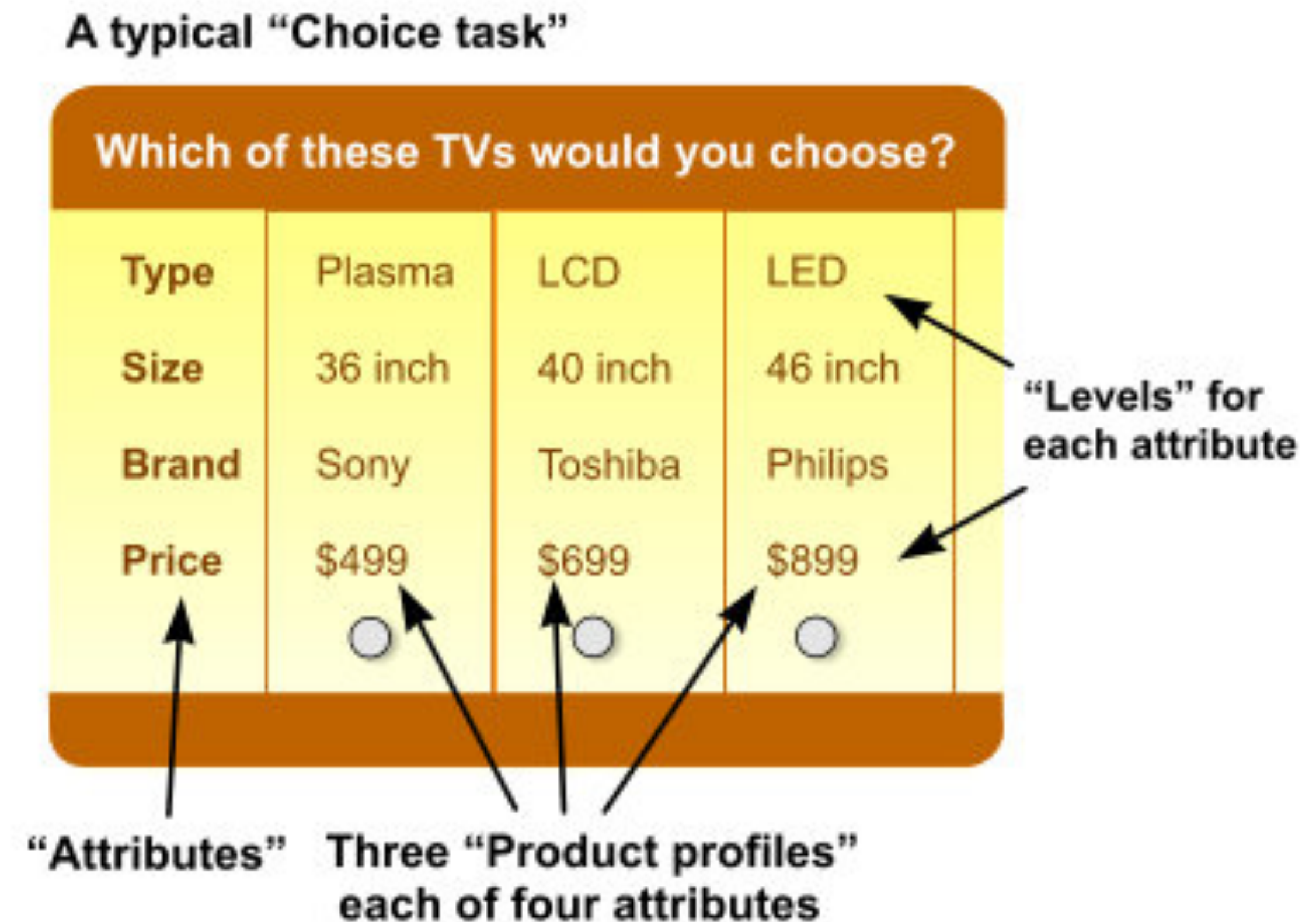# Conjoint Analysis

A brief introduction

What is Conjoint Analysis?

- Conjoint analysis is a survey-based statistical technique used in market research that helps determine how people value different attributes (feature, function, benefits) that make up an individual product or service.
  - also known as
    - *Discrete Choice Estimation*
    - *Stated Preference Research*
- The objective of conjoint analysis is to determine what combination of a limited number of attributes is most influential on respondent choice or decision making.

Conjoint Analysis: Principles

- Start with breaking a product or service down into it's constituent parts (called **attributes** and **levels**)

  - then to test combinations of these parts in order to find out what customers prefer.

- By designing the study appropriately using carefully chosen statistical designs (also known as experimental designs) it is then possible to use statistical analysis to work out the value, or **utility** score, of each part of the product or service in terms of its contribution to the customer's decision.

A typical "Choice task"

Which of these TVs would you choose?

Type	Plasma	LCD	LED
Size	36 inch	40 inch	46 inch
Brand	Sony	Toshiba	Philips
Price	$499	$699	$899

"Levels" for each attribute

"Attributes"   Three "Product profiles" each of four attributes

Stages for Conjoint Analysis

1. Identification of attributes and levels using the results of explorative questionnaire.

2. Definition of profiles and conjoint analysis method

3. Estimates of parti-worth utilities and relative importance

4. Segmentation analysis

5. Results

Conjoint Analysis: An example

$2.90
Frosty Vanilla
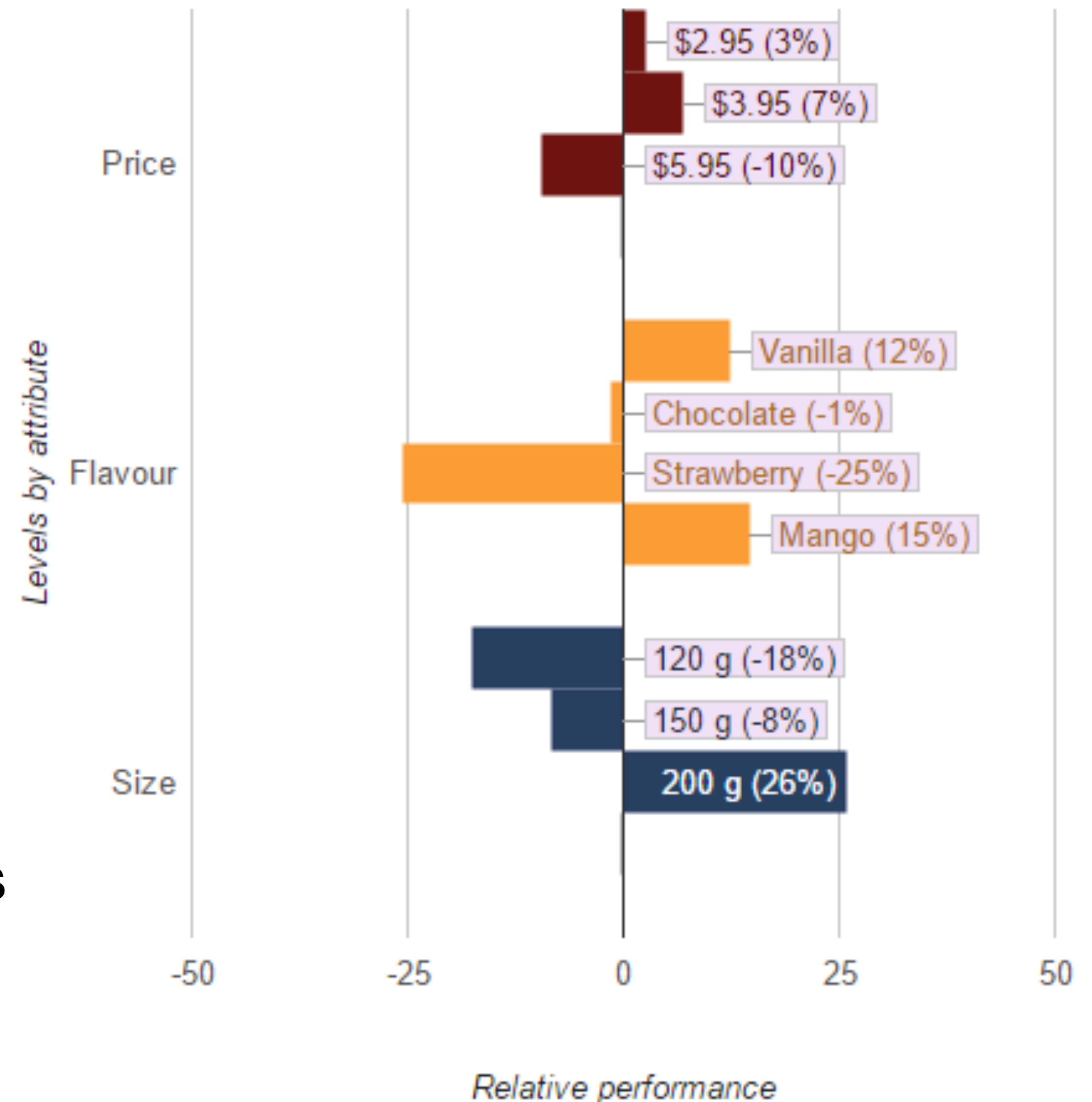200g

$2.90
Strawberry Galore
200g

$3.50
Mango Ice
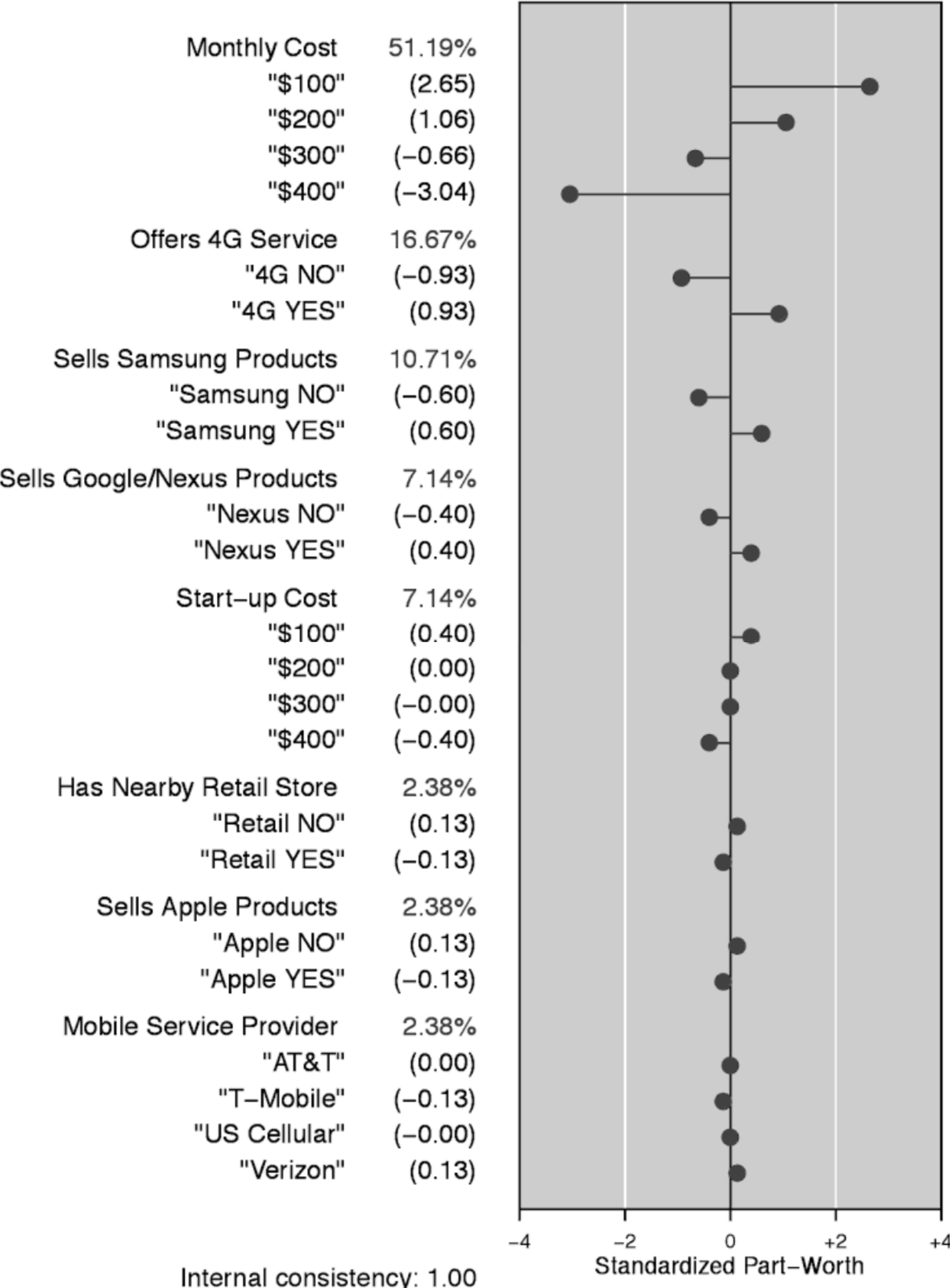150g

$5.95
Choco Star
120g

Relative performance of attribute levels

Spine chart

- Part-worths can be displayed on a common, standardised scale across attributes.

- The vertical line in the centre (the spine) is anchored at zero.

- The part-worth of each level of each attribute is displayed as a horizontal bar, extending from the spine.

- Preferred product or service characteristics have positive part-worths and fall to the right of the spine.

Price
- $2.95 (3%)
- $3.95 (7%)
- $5.95 (-10%)

Flavour
- Vanilla (12%)
- Chocolate (-1%)
- Strawberry (-25%)
- Mango (15%)

Size
- 120 g (-18%)
- 150 g (-8%)
- 200 g (26%)

Levels by attribute

Relative performance

-50   -25   0   25   50

Relative performance of attribute levels

Monthly Cost	51.19%	
"$100"	(2.65)	
"$200"	(1.06)	
"$300"	(−0.66)	
"$400"	(−3.04)	
Offers 4G Service	16.67%	
"4G NO"	(−0.93)	
"4G YES"	(0.93)	
Sells Samsung Products	10.71%	
"Samsung NO"	(−0.60)	
"Samsung YES"	(0.60)	
Sells Google/Nexus Products	7.14%	
"Nexus NO"	(−0.40)	
"Nexus YES"	(0.40)	
Start−up Cost	7.14%	
"$100"	(0.40)	
"$200"	(0.00)	
"$300"	(−0.00)	
"$400"	(−0.40)	
Has Nearby Retail Store	2.38%	
"Retail NO"	(0.13)	
"Retail YES"	(−0.13)	
Sells Apple Products	2.38%	
"Apple NO"	(0.13)	
"Apple YES"	(−0.13)	
Mobile Service Provider	2.38%	
"AT&T"	(0.00)	
"T−Mobile"	(−0.13)	
"US Cellular"	(−0.00)	
"Verizon"	(0.13)	

Standardized Part−Worth

Internal consistency: 1.00

Key terms

- **Conjoint Analysis**

  - a term given to a multi-variate analytical tool that CONsiders JOINTly the effect of the individual attributes of a product or a brand. This helps the marketer to analyse the utility that each varied combinations of the attributes of the product is providing to the customer.

- **Utility**

  - The subjective preference judgement of an individual that represent the total value or worth that s/he is putting on the product having a combination of certain attributes.

- **Part-worth**

  - The values of the individual attributes that sum up or produce the total utility for the product.

Useful References

- http://connor-johnson.com/2014/07/31/building-an-agent-based-simulation-for-conjoint-analysis/

- https://www.qualtrics.com/wp-content/uploads/2012/09/ConjointAnalysisExp.pdf

- https://www.pragmaticmarketing.com/resources/articles/conjoint-analysis-101

- R package **support.CEs**: Basic Functions for Supporting an Implementation of Choice Experiments https://cran.r-project.org/web/packages/support.CEs/index.html