Multi-sensory features of packaging and influence on consumer perceptions

Pauline Foster MSc. M.Phil. Foster and Brown Research with Split Second Research.

Using neurodesign packaging to influence consumer choices
OVERVIEW

• What do we know?
• Congruence and multi-sensory effects
• Exploiting multisensory effects through packaging
• Implicit responses
• Case study
• Summary & further reading

Using neurodesign packaging to influence consumer choices
~80% of all new consumer products fail within the first year of launch. Billions are wasted every year.

(C. Christensen, Harvard Business School, May 2017)

What assumptions have we traditionally made about consumers that seem to be fundamentally wrong?
3 Things We Do Know About People

People don’t always tell the truth.
People don’t think how they feel.
People don’t do what they say.
Model of taste reception in the anterior insula (cortical taste area)

Quality, intensity, texture & temperature
=> Orbital frontal – food “value”

Sensory perception integrated => multi-sensory perception
Acceptance is determined by a multi-sensory response & congruence is key to this process
Congruence - “agreement, harmony, compatibility”

f-MRI & congruence

Correlation with ratings of pleasantness and consonance across all stimuli

With thanks to Prof Edmund T Rolls (Warwick)
Congruence - “agreement, harmony, compatibility”

This is a multi-sensory effect
Congruence - “agreement, harmony, compatibility”

Congruence increases activity where as dissonance depresses

This is a multi-sensory effect
Multisensory effects: Eat more healthily through packaging

- Consumers complained that Coke in the white can didn't taste as sweet. Even though the formula was identical, they were right it didn’t taste as sweet because of multi sensory effects.
- Strawberry-flavoured mousse tastes 10% sweeter when served from a white container rather than a black one.
- Similarly Popcorn in red bowls also tasted sweeter.

Only half of how our food tastes is influenced by the ingredients. It all comes down to the packaging. *Charles Spence*
Multisensory effects

Stronger flavours perceived in curved glasses compared to straight edged, plastic bottles fizzier than glass, but glass bottles perceived as sweeter.

Shoppers are twice as willing to choose a juice whose label features a concave, smile-like line rather than a convex, frown-like one.

Congruent 3-d surface patterns increase liking & product attributes

“See me, feel me”: Effects of 3D-printed surface patterns on beverage evaluation

*Fd Qual & Pref* Vol 52 Dec 2017

Thomas J.L. van Rompay Friederike Finger Daniel Saakes Anna Fenko
Pringles taste 15% fresher and crisper when the high frequency sounds were boosted in real time.

The crispiness (feel & look) of the packaging enhances perception of crispness and freshness of crisps significantly.
Sight is our most important sense - we are visually dominated animals
How do we make our beer fizzier on a **low** budget without changing the flavour profile?
Pack redesign, based on “change blindness”

**Change blindness** is a perceptual phenomenon that occurs when a **change** in a visual stimulus is introduced and the observer does not notice it. For example, observers often fail to notice major differences introduced into an image while it flickers off and on again.
Pack Redesign
As much as 90% of brain activity is conducted in the subconscious.

Conscious (system 2)

Sub-conscious (system 1)
Implicit (system 1) and explicit (system 2)

System 1
Unconscious Emotion

Very Fast
Involuntary
Associative

Implicit responses

System 2
Conscious Thinking

Slow
Controlled
Rule following

Explicit responses

2018
System 2 – New Brain

Will Power

Focus groups
Traditional surveys
Interviews

Logical thinking

Critical Evaluation

As much as 90% of brain activity is conducted in the subconscious

System 1 – Old Brain

Habits

Dr. Melanie Barrett
Emeritus Professor and Lead Researcher

ECG

Habits

Recording shows the usage of engagement trends

Habits

Recording shows the usage of engagement trends

Hand

Recording shows the usage of engagement trends

Eye

Recording shows the usage of engagement trends

Head

Recording shows the usage of engagement trends
People store concepts associatively

*IMPLICIT* tests exploit the fact that neural networks in the brain are connected through associations.

*IMPLICIT* tests basically measure the strength of these mental associations.
Neurological testing measures here

**IMPLICIT**
Often referenced as:
- Non-Conscious
- Non-articulated
- Pre-Cognitive

Traditional research measures here and beyond

**EXPLICIT**
Often referenced as:
- Conscious
- Articulated
- Post-Cognitive
- Expressed
Get a BESPOKE Research Solution
Whatever your market research question...
...we have the solution

Implicit Market Research
Measure consumers’ inner feelings and attitudes towards products and services. Dig deeper than traditional methods. Our tests are easy to integrate into projects, quick to develop and results come back quickly.

Traditional Surveys
We also offer full traditional surveys and some information can only be gathered by asking directly. We have all types of question styles. From multiple-choice to drag and drop, to slider controls.

Biometric Recording
Neuromarketing is our specialism, and we often biometric tests at central locations worldwide. We can measure eye-tracking with mobile glasses, EEG, heart rate, breathing rate, and electrodermal recordings.

Implicit Attention Tracking
We have developed implicit visual attention tracking online tests. These are used to assess the attentional capture of packaging, slogans, logos, CRM messages, and so on.
So what’s so good about implicit?

- Are difficult to fake
- Able to detect unobservable attitudes & feelings
- High levels of predictive validity
- Are easy to administer both online or offline.
- Eliminates errors caused by ‘social desirability’ or the need to be consistent
- But not a replacement...
Extending a leading brand into a new category sector is always a difficult decision. So how can we know, with more certainty, whether to proceed or not?
Volunteers were scanned using fMRI as they viewed images of the current brand, and 2 planned brand extensions.

They then answered a market research questionnaire about their preferences and completed an implicit online test.

Conventional MR hall tests also run by Unilever in UK & US
fMRI Scan - Positive Emotions

- B: Original Brand Pack
- B1: Brand Extension 1 Pack
- B2: Brand Extension 2 Pack

fMRI Scan - Negative Emotions

- B: Original Brand Pack
- B1: Brand Extension 1 Pack
- B2: Brand Extension 2 Pack
<table>
<thead>
<tr>
<th></th>
<th>EXISTING BRAND (PERSONAL CARE)</th>
<th>BRAND EXTENSION 1 (SECTOR A)</th>
<th>BRAND EXTENSION 2 (SECTOR B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSCIOUS EXPLICIT RESPONSE (&amp; MR QUESTIONNAIRES)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUBCONSCIOUS IMPLICIT RESPONSE (BRAIN SCAN)</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>SUBCONSCIOUS IMPLICIT RESPONSE (ONLINE IMPLICIT TEST)</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

UK extension 1 only launched, but US launched both
“If we had run this study before the launch of this brand extension in the US, we would have saved several million US dollars...”

Head of CREFT
Exploratory Research Group, Unilever (UK)
packaging research tools

**IMPRESS™ Pack Test [FEEL]**
Identify the strengths and weaknesses of each pack design and how they deliver the brand proposition

**Findability Test [SEARCH]**
Discover how easy your pack is to find on the shelf
Find out if your product range or your brand name is easy to find

**IMPACT™ (Implicit Attention Capture Test) [GRAB]**
Does your pack or brand name “grab” attention?

**Online Eye-Tracker [FIXATE]**
What do eyes look at, on your pack, website, advert?
Use of built-in webcam (no needed specialist equipment required)

Research questions

Does our new packaging have more visual appeal?

Will it attract prospective customers?

Which features of the pack grab most attention and appeal?

What increase in sales might we expect with our new pack?
Summary

• Our perception and acceptance of a product is multi-sensory integrated effect. Congruence is key.

• Congruent mixtures enhance perceptions, incongruent depress. This is a multisensory effect.

• Implicit methods measure hidden or subtle differences in attitudes and emotions towards products.

• Implicit testing yields more accurate predictive data, i.e. You validate ideas before committing to an expensive launch.
Some further reading:

- The Role of Auditory Cues in Modulating the Perceived Crispness and Staleness of Potato Chips.” Massimiliano Zampini & Charles Spence *Journal of Sensory Studies*, October 2004
- Constructing flavour perception: from destruction to creation and back again Charles Spence & Jozef Youssef *Flavour* October 2016
- Brand Sense: Sensory Secrets Behind the Stuff We Buy Martin Linstrom 2010 (not academic)

Some further contacts:

- Prof Gemma Calvert
  [www.gemmacalvert.com](http://www.gemmacalvert.com)

- Dr Eamon Fulcher
  [www.splitsecondresearch.co.uk](http://www.splitsecondresearch.co.uk)

- Simon Harrop
  [www.simonharrop.com](http://www.simonharrop.com)

- Prof Charles Spence
  [charles.spence@psy.ox.ac.uk](mailto:charles.spence@psy.ox.ac.uk)

- Pauline Foster MSc. M.Phil. Foster and Brown Research Ltd.
  paule@fabresearch.com
  Foster and Brown Research, 01285 700759