

The Effect of Branding on Consumer Choice

Original Research Report

Dr Jane Leighton - Mountainview Learning

Dr Geoff Bird - University College London

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Executive Summary

Branding on packaging acts as an important cue to guide consumer choice in the retail environment. From a psychological perspective, branding on packaging serves two important purposes, crucial to decision making:

- 1) It guides consumers' attention, drawing attention to certain brands.
- 2) It allows consumers to recognise and find familiar brands.

The purpose of the present study was to investigate the impact branding has on these processes, and therefore consumer choice. The role of branding was examined in three specific areas:

- i. The impact of reduced branding on consumer choice. When branding on packaging is reduced, how does this influence decision making?
- ii. The impact of increased non-branded information on consumer choice. What effect does non-branded information, such as nutritional information, have on decisions?
- iii. The impact of copycat branding on consumer choice. When a brand is perceptually similar to another, well established brand, how does this effect decision making?

In order to answer these questions, eye tracking and visual search tasks were employed to measure attention and recognition, in a scientifically validated and rigorous manner. Key findings are described below:

- i. The impact of reduced branding on consumer choice

The results demonstrated that reducing the branding on packaging can influence consumer behaviour, by reducing attention to and recognition of certain brands. Strong evidence from the recognition data suggested that reducing the size of a logo on packaging impairs consumers' ability to recognise and find a brand they are looking for. This effect was particularly pronounced when the changes to the logo size are large.

- ii. The impact of increased non-branded information on consumer choice.

Both the eye tracking and recognition data provided some tentative evidence that increasing the size of nutritional labels displayed on packaging may influence consumer behaviour, by increasing attention to but reducing recognition of certain brands. However, the observed effects were not statistically reliable, indicating that the impact of nutritional information may not be significant.

- iii. The impact of copycat branding on consumer choice.

Strong evidence from the recognition data suggested that copycat branding can influence consumer choice; the results demonstrated the impact of perceptually similar (copycat) brands on an established brand. In cases where an established brand was displayed alongside a copycat supermarket brand, participants were slower and more inaccurate in identifying the established brand. This was compared to cases where the established brand was displayed alongside a non-copy supermarket brand. These robust results suggest that the presence of a copycat brand may distract or confuse consumers, impairing their ability to find the brand they are looking for, and in some cases causing them to choose the wrong brand.

The findings from this study have wide implications, since they provide both evidence for the important role of branding on decision making as well as a robust scientific method for measuring these effects.

Full Report

Background

In today's cluttered retail environment, consumers are overwhelmed with choice. The average UK supermarket carries approximately 45 000 SKUs. The average shopper buys around 50 items in 50 minutes. Consumers must therefore weigh up around 900 items each minute. However, consumers aren't even able to attend to all of the items on display, let alone weigh up all of the available options; they must decide what to buy in the blink of an eye.

In order to make such fast decisions, consumers need to use mental shortcuts, or heuristics, to guide their choices. Certain cues present in the environment guide shoppers' attention and aid their decision making in store. Often consumers are not conscious of the cues or the mental shortcuts they have used to arrive at a decision.

Perhaps the most powerful mental shortcut available to the consumer is branding. Branding on packaging allows us to quickly and efficiently select from a huge array of products. Specifically, branding draws consumers' attention to certain products; it allows them to recognise familiar products and serves as a cue for retrieving stored information from memory about those products. Understanding this important role of branding in decision making is the broad aim of the current research. This research is particularly timely for two reasons.

First, recent developments in the brain and behavioural sciences have expanded our understanding of how the brain takes in and stores information, and how we make decisions. We now understand just how much information processing and decision making takes place below consciousness. We also have the means by which to examine these unconscious processes. While in the past, researchers relied on asking consumers' opinions, we can now make the deep dive to examine the decision making processes, that consumers are not even aware of. This scientific knowledge and the rigorous methodologies have only just begun to be applied in the consumer context. However, they have a great deal to offer in understanding how consumers choose between brands.

Second, a greater understanding of the effects of branding on consumer choice is particularly pertinent in light of current public policy and legal considerations. With restrictions on cigarette branding imminent and stricter regulations in other categories likely, brand owners are keen to understand how these changes will impact consumer choice and ultimately sales. Aside from this legislation, brand owners face a further threat, that is, copycat branding. By using branding that is similar to another well established brand, it is possible that copycat brands enjoy an unfair advantage. However, it is not yet understood whether and how copycat branding works to influence consumer choice.

This research aims to investigate the role of branding using rigorous scientific techniques, underpinned by an understanding of human decision making. The research was undertaken in the context of branding on packaged goods in the retail context.

Aims

The aims of the current research are to examine the role of branding on decision making in three specific areas. These three areas form the three parts of this study.

- i. The impact of reduced branding on consumer choice. When branding on packaging is reduced, how does this influence decision making?
- ii. The impact of increased non-branded information on consumer choice. What effect does non-branded information, such as nutritional information, have on decision making?
- iii. The impact of copycat branding on consumer choice. When a brand is perceptually similar to another, well established brand, how does this effect decision making?

In order to fully understand consumer choice, it is necessary to understand the underlying psychological mechanisms that guide those choices, that is the conscious and unconscious factors that influence decision making. Different types of branding practices can effect consumers choices in a number of different ways. First, branding can influence whether consumers notice a product or not, that is, how much attention is paid to a product. Second, branding can influence whether and how quickly consumers recognise a product. This recognition and subsequent memory retrieval then have a knock-on effect on how consumers feel about that product. These areas, attention and recognition, are crucial predictors of decision making. By understanding the impact branding has on these processes, we will be able to reveal how branding works to guide purchase decisions.

Attention

The role of attention in guiding consumer decisions is often overlooked. However, it is arguably one of the best predictors of consumer choice. If a product does not receive at least some attention, it is very unlikely to be chosen - the old adage is true - unseen is unsold.

It is estimated that we do not pay any attention to nearly half of the available brands during purchase consideration (Russo et al, 1994). Most products only get a quick cursory glance, and only a privileged few really hold our attention. Research shows that the more attention a product receives, the more likely it is to be chosen (Chandon et al, 2002). Given the importance of attention on consumer choice, it is important to understand how branding influences attention. Attention can be measured very accurately using eye tracking technology. Eye tracking provides a measurement of which elements in an array receive attention and for how long. Because it is a measure of actual behaviour, which is not subject to conscious control, it is very accurate at establishing attention towards, and preference for, brands.

Recognition

Branding ultimately works as a signal. It allows consumers to quickly recognise a product as one they are familiar with or one they like. It acts as a memory cue, allowing consumers to retrieve relevant information from memory. This information may be about past experience of the brand, brand perceptions or brand associations. The information we

have stored about brands is crucial in guiding our decisions. Brands that are recognised more quickly and easily are liked more and ultimately chosen more (Reber et al, 1998, Winkielman et al, 2000).

Branding on packaging facilitates these memory processes, giving consumers the information they need quickly and efficiently. The speed with which consumers can find and recognise products is crucial in determining their decisions. A wealth of research on 'processing fluency' suggests items that come to mind quickly and easily are liked more and perceived to be of higher value (Reber et al, 1998, Winkielman et al, 2000).

Brand memory, or recognition can be measured with a high degree of accuracy using speeded response, visual search procedures. This test requires participants to search for an item within a display and make a physical response as fast as possible. By recording both accuracy and response time, the technique is a highly sensitive measure of recognition; it measures automatic behaviour, which is not likely to be under conscious control and thus avoids many of the pitfalls of traditional consumer research. In short, this method, and the one described to measure attention, are able to measure what consumers actually do, rather than what they say they do.

Methodology

We investigated the impact of branding on packaging within the retail context by using lab-based, computerised tasks. The experiments, designed and run to academic standards, were conducted in the Multimodal Laboratory in The Department of Cognitive, Perceptual and Brain Sciences at University College London, in collaboration with Dr. Geoff Bird.

In order to measure the effects of branding for parts i and ii, we manipulated certain elements displayed on packaging. Branding can encompass a wide range of features, such as colour, logo and type face. Similarly, the non-branded information displayed on packaging can take a number of forms. However, in order to reduce the number of variables that were manipulated and therefore make the results more interpretable and reliable, we manipulated the size of the logo for part i and the size of the nutritional label for part ii.

Participants

Data were collected from 35 participants (18 female, mean age 36 years). Research has shown that sample sizes of 20-30 are sufficient for robust results in eye tracking (Think Eyetracking research, 2008) and visual search experiments (Zaltman, 2011).

Stimuli

Stimuli comprised high resolution photographs of product packaging. In order to answer our specific questions, some of the photographs were manipulated to change the size of the logos or nutritional information displayed on the packaging. Further details of the stimuli are provided in Appendix 2. Products from eight categories were included in this study. Each category contained a test product and five control products. Participants

observed the product photographs displayed in an array, displayed around the central fixation point on the screen. The position of the products in the display was rotated across trials to eliminate possible location effects.

Apparatus

Participants were seated facing an LCD screen. For eye movement measurement, a Bobax3000 remote eye tracker was mounted at the base of the display, consisting of a camera focusing on the participant's eye and a set of LED illuminators. Gaze position was calculated approximately 200 times a second. For response time measurement, participants responded by using a mouse-click to select the key product.

This study employed two main techniques to measure attention and recognition. The experimental procedures for each of the techniques will be outlined below.

Procedure - attention

Eye tracking was employed to measure attention in a passive observation task. In this task, participants observed a sequence of images, each displaying an array of products. Images were displayed for 200 milliseconds and each image was followed by a blank screen, with a central fixation point, which was shown for 50 milliseconds. Each image was displayed ten times and the images were displayed in a random order. During this time eye movements were recorded to calculate participants' fixation latency. This is a measure of how long the participants spends looking at each element in the display.

Procedure - recognition

Recognition was measured using a visual search task. In this task, participants were shown the same array of products as in the procedure above but they were asked to identify a key brand from the array. Specifically, participants were shown a screen which displayed the name of the key brand in the centre on the screen. They were asked to click on this central point when they were ready. At this point they were shown the array of products from which they had to identify the key brand. Participants were instructed to use the mouse to point to and click on the key brand as quickly as possible. Each image was displayed ten times and the images were displayed in a random order. Both speed and accuracy of recognition were recorded.

Results

There were three main areas of interest in this study:

- i. The impact of reduced branding on consumer choice.
- ii. The impact of increased non-branded information on consumer choice.
- iii. The impact of copycat branding on consumer choice.

The results from each of these areas will be summarised below.

i. What is the impact of reduced branding on packaging?

In order to understand the impact of reduced branding on packaging, we manipulated the size of branded elements displayed on packaging. We then investigated the impact of those manipulations on attention and recognition. Specifically, the size of the logo (or logotype) was reduced by 75% and 50%. Examples of the stimuli used in this study can be found in Appendix 2.

Products from five categories were included in the study: biscuits, gravy, crisps, fizzy drinks and butter. Five products from each category were included.

Table 1 below shows the brands used in this experiment

Category	Key Brand	Filler brands
Crisps	Walkers	Brannigans, Hula Hoops, French Fries
Butter	I can't believe it's not butter	Clover, Anchor, Benecol, Flora
Gravy	Bisto	Maggi, Knorr, Sainsbury's gravy, Paxo
Biscuits	Jaffa Cakes	Kit Kat, Rocky, Fox's, Hobnobs
Drinks	Coca Cola	Pepsi, 7up, Dr Pepper, R Whites

In this experiment, there were three conditions:

Condition 1: Size of logo – 100% (original image)

Condition 2: Size of logo – 75%

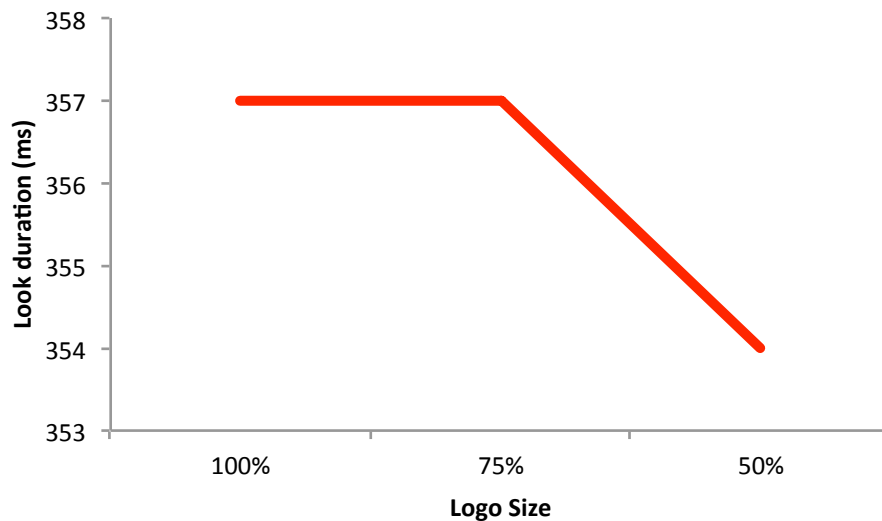
Condition 3: Size of logo – 50%

Attention

The aim of this part of study was to investigate the impact of logo size on attention. We therefore analysed how look duration varied as a function of logo size.

Look duration

The graph below shows the average look duration across the three conditions. When the size of the logo was decreased, participants payed less attention to the brand. However, this was only the case for the larger reduction in size.



Statistical analyses of the look duration data showed that there were no significant effects of condition. This suggests that the relationship between the size of the logo and attention is only weak.

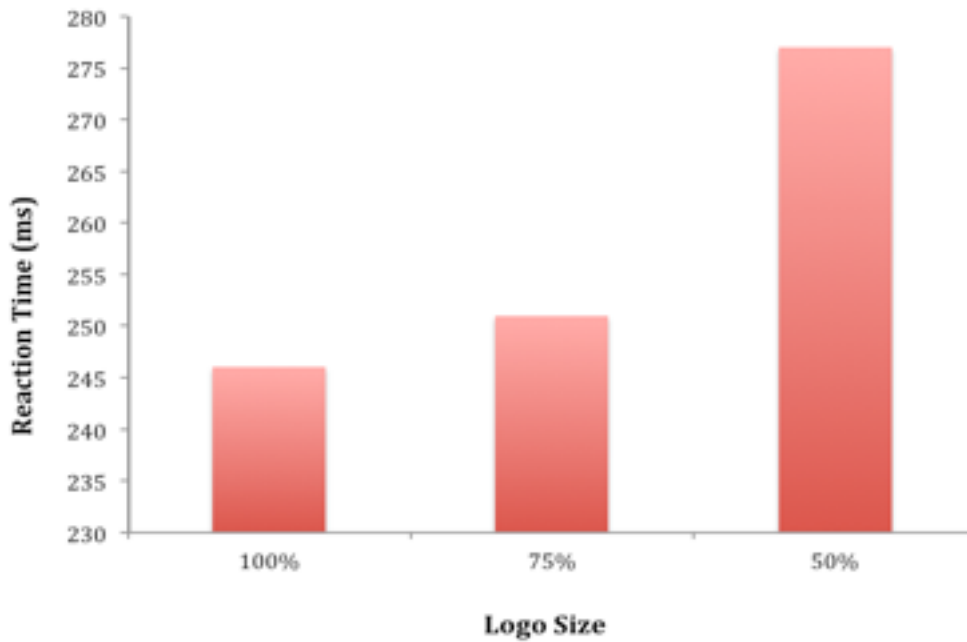
Recognition

The aim of this part of study was to investigate the impact of logo size on recognition. We therefore analysed how response time¹ varied as a function of logo size.

Response time

The graph below shows the average reaction times across the three conditions. When the size of the logo was decreased, participants were slower to recognise the key brand.

¹ Participants did not make enough errors to allow any meaningful analysis of accuracy



Statistical analyses of the reaction time data showed a significant main effect of condition ($p > 0.001$), suggesting a strong impact of logo size on brand recognition. Simple effects analyses reveal that only condition 3, the 50% reduction in logo size, differs significantly from the original image (condition 1), suggesting that it is only when the logo is reduced by a significant amount that brand recognition is effected.

Summary

These data suggest that reducing branding on packaging could have a detrimental effect on consumers' attention towards and ability to recognise brands. The robust and highly statistically significant findings in the recognition data suggest that this detrimental effect has a particularly strong effect on consumers' ability to recognise and find brands they are looking for.

Both the attention data and recognition data suggest that this effect is particularly pronounced when there is a large reduction in logo size. Small changes in logo size may not influence consumer behaviour significantly.

ii. What is the impact of increased non-branded information on packaging?

In order to understand the impact of increased non-branded information on packaging, we manipulated the size of the nutritional information displayed on packaging. We then investigated the impact of those manipulations on attention and recognition. Specifically, the size of the nutritional label was increased by 150% and 200%. Examples of the stimuli used in this study can be found in Appendix 2.

Products from five categories were included in the study: biscuits, gravy, crisps, fizzy drinks and butter. Five products from each category were included. Table 1, above, shows the brands used in this experiment.

In this experiment, there were three conditions:

Condition 1: Size of nutritional information – 100% (original image)

Condition 2: Size of nutritional information – 150%

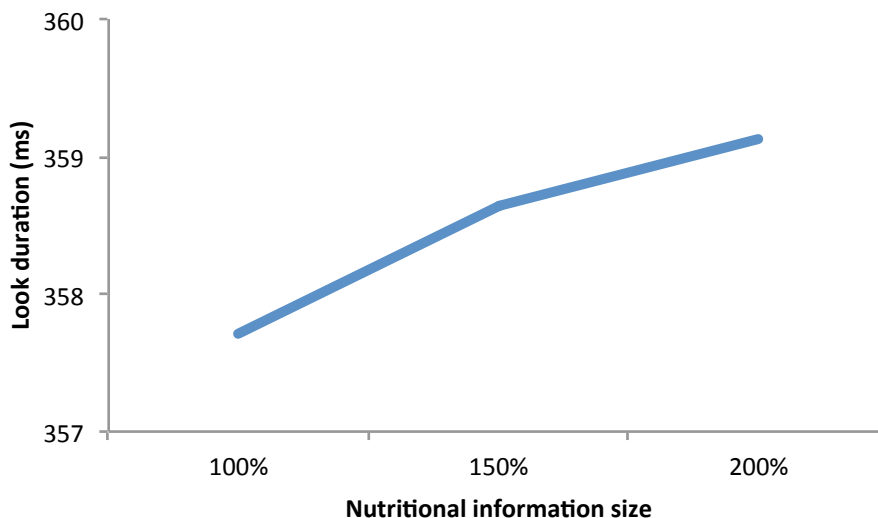
Condition 3: Size of nutritional information – 200%

Attention

The aim of this part of study was to investigate the impact of nutritional label on attention. We therefore analysed how look duration varied as a function of the size of the nutritional label.

Look duration

The graph below shows the average look duration across the three conditions. When the size of the nutritional information was increased, participants paid more attention to the brand.



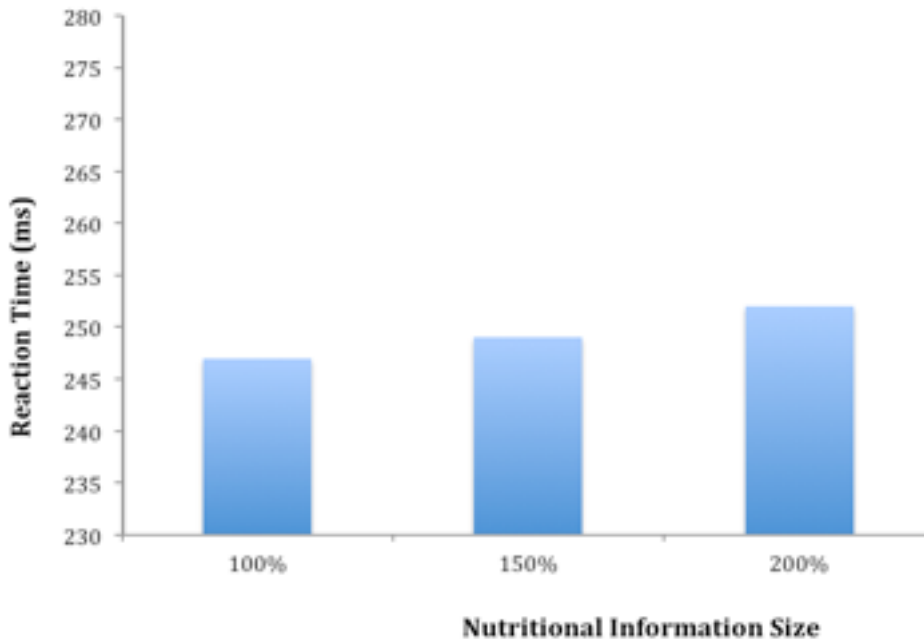
Statistical analyses of the look duration data showed that there were no significant effects of condition. This suggests that the relationship between the size of the nutritional information and attention is only weak.

Recognition

The aim of this study was to investigate the impact of the size of the nutritional information on recognition. We therefore analysed how response time² varied as a function of nutritional information size.

Response time

The graph below shows the average reaction times across the three conditions. When the size of the logo was increased, participants were slower to recognise the key brand.



Statistical analyses of the rt data showed that there were no significant effects of condition. This suggests that the relationship between the size of the nutritional information and recognition is only weak.

Summary

These results suggest that altering the amount of non-branded information included on packaging may only have a small effect on consumers' recognition of brands. Some tentative evidence suggests that they may pay more attention to brands when the nutritional labels are larger, but that this may then impair their ability to recognise the brand. This could be because they are focusing on the nutritional information rather than the brand elements used to identify and recognise brand. However, the results from this study are not conclusive due to the weak statistical effect.

² Participants did not make enough errors to allow any meaningful analysis of accuracy

iii. What is the impact of copycat branding?

In order to understand the impact of copycat branding, we investigated the impact of perceptually similar (copycat) brands on established brands.

This was in order to answer some of the following questions: Do established brands suffer as a result of copycat brands? Does the presence of a copycat brand draw attention away from the established brand (and towards the copycat brand). Does the presence of a copycat brand impair people's ability to find the established brand they're looking for? Does the presence of a copycat brand result in people mistakenly selecting the wrong brand?

We compared cases where an established brand was displayed alongside a copycat supermarket brand with cases where the established brand was displayed alongside brands that were not perceptually similar. The goal of this study was to measure the impact of a copycat brand on consumers' attention towards and ability to recognise the established brand.

Stimuli

Products from five categories were included in the study: shampoo, toothpaste, dishwasher tablets, energy drinks and butter. Each category included the key brand, a copycat brand, a supermarket own brand that was not a copycat and four filler brands from within the category. Specifically, in one third of trials, participants saw the key (established) brand, a private label brand that is perceptually similar to the key brand and three filler brands. In one third of trials participants saw the key brand, a private label brand that is not perceptually similar to the key brand and three filler brands. In the remaining trials, participants saw the key brand and four filler brands, from within the category. Examples of the stimuli used in this study can be found in Appendix 2.

In this experiment, there were three conditions:

Condition 1: Key brand and four filler brands

Condition 2: Key brand plus copycat brand, and three filler brands

Condition 3: Key brand plus non copy brand, and three filler brands

Table 2 below shows the brands used in this experiment

Category	Key Brand	Copycat supermarket brand	Non copy supermarket brand	Filler brands
Toothpaste	Sensodyne	Tesco Pro-tech	Superdrug Sensitive	Colgate, Macleans, Oral B, Arm & Hammer
Butter	I can't believe it's not butter	Asda "You'd butter believe it"	Sainsbury's Butterlicious	Clover, Anchor, Benecol, Flora
Shampoo	Head & Shoulders	Boots anti dandruff	Waitrose Protect	Pantene, VO5, Herbal Essenses, Tresemme
Dishwasher tablets	Finish	Clean & Fresh	Waitrose 5 in 1	Fairy, Daisy, Ecover, Planet Clean
Energy drinks	Red Bull	Asda Blue Charge	Emerge	Alibi, Monster, Mountain Dew, Lucozade

Attention

The goal of this part of the study was to investigate whether the presence of a copycat brand influenced participants' attention towards the key brand. We therefore analysed differences in looking duration across each of the three conditions. The eye tracking data yielded no meaningful patterns and no significant findings. This suggests that the presence of a copycat brand does not influence attention towards an established brand.

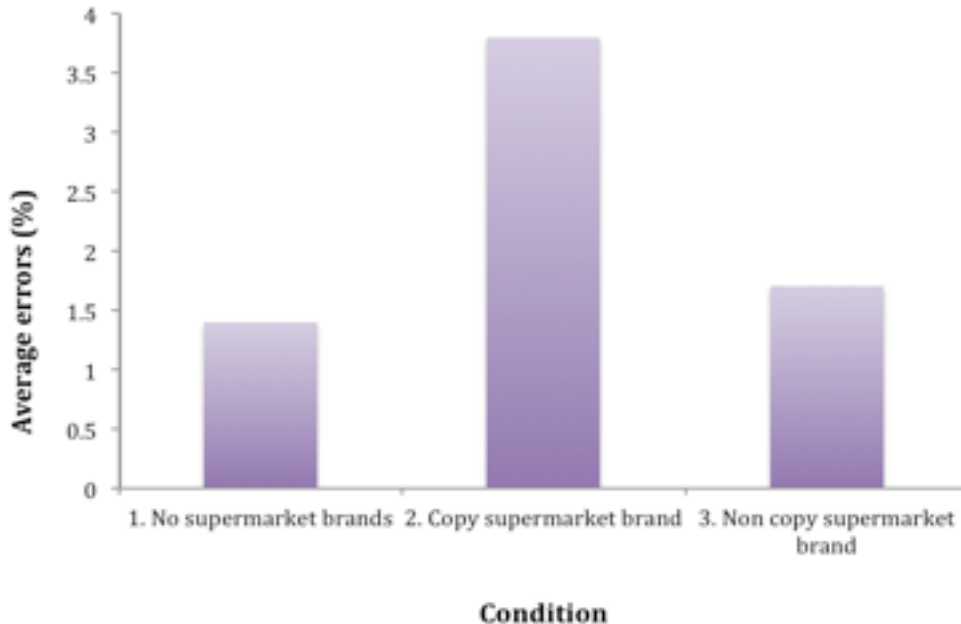
Recognition

The goal of this study was to investigate whether the presence of a copycat brand influenced participants' recognition of the key brand. For example, if they were asked to find 'Red Bull', were they slower to do so when the Asda copycat brand, 'Blue Charge', was present (condition 2), than when brands that were not perceptually similar were present (conditions 1 and 3).

We therefore analysed differences in response times (rt) and accuracy (errors) across each of the three conditions.

Accuracy

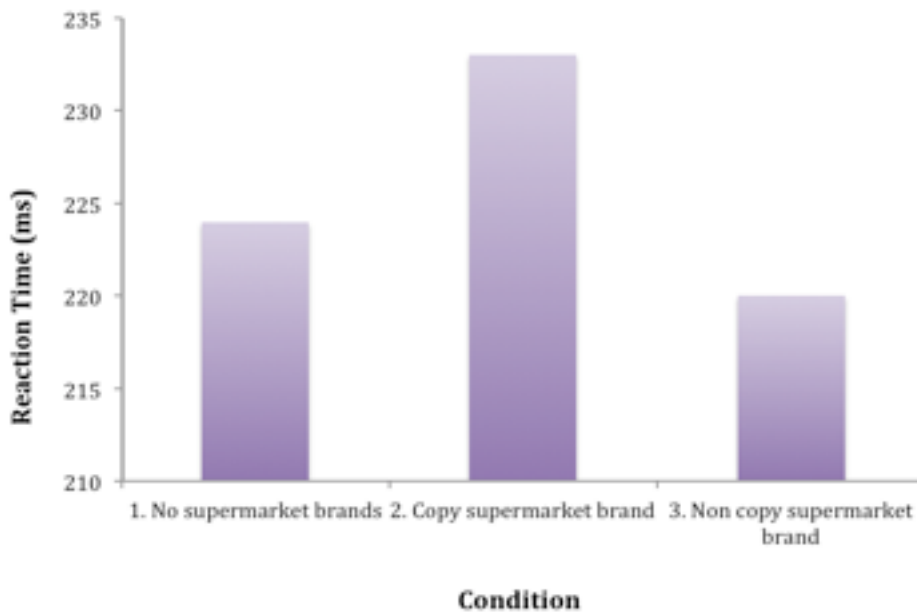
The graph below shows the average percentage of errors made by participants across the three conditions. Participants were more likely to make an error when a copycat brand was present, than in either of the other two conditions.



These results suggest that in some cases, participants were choosing the copycat brand because they had mistaken it for the key brand.

Response time

The graph below shows the average reaction times across the three conditions. Participants were slower to identify the key brand when a copycat brand was present, than in either of the other two conditions.



Statistical analyses of the rt data showed a significant main effect of condition ($p > 0.001$). This suggests that reaction times vary depending on the presence of a copycat brand.

Further analyses revealed that this effect was driven by significant differences between conditions 1 and 2, and 2 and 3, but no significant difference between 1 and 3. Therefore, when a copycat supermarket brand is present, participants are slower to recognise the key brand. However, there is no difference in brand recognition when a non copy supermarket brand is present. This suggests that the effect is driven by the perceptual similarity of the copycat brand to the established brand.

These results suggest that, in general, the presence of a copycat brand acts as a distractor, which hinders participants' ability to recognise the key brand.

Summary

The results from this study provide strong evidence that copycat brands, that is, brands that are perceptually similar to other established brands, influence brand recognition. They can cause consumers to make errors, mistakenly selecting the copycat brand in place of the established brands. Furthermore, they slow down recognition of key brands. It is possible that this slowing of recognition is indicative of confusion between the perceptually similar brands. What these results do indicate is that the presence of a copycat brand, has a detrimental effect on the established brand that it has copied.

Conclusions

The key findings from this research demonstrate the important effects branding has on consumer attention and memory. Given the significance of these psychological processes in decision making and consumer behaviour, the results from this study could have far reaching implications for brand owners, policy makers and legal professionals.

The most reliable findings concern the amount of branding on packaging and the impact of copycat branding. The findings on nutritional labelling are less conclusive and should be subject to further investigation before firm conclusions are drawn.

Strong evidence suggests that reducing the branded elements displayed on packaging has a detrimental effect on consumers' ability to find and choose the brands they are looking for. The effect is particularly pronounced for large changes in logo size. This suggests that small branding changes may not be too much of a problem for consumers and brand owners; however, large reductions in logo size, or complete elimination of a logo from the packaging is likely to have important negative consequences. Future research, looking at cases where the logo has been completely removed is necessary to quantify these consequences.

In many ways, the findings from this part of the study are not surprising, since it is likely that consumers use branded elements, such as logos, to find the brand they are looking for. What this study demonstrates, for the first time, is that this effect is reliably measurable and quantifiable.

Further robust evidence suggests that copycat branding has a strong detrimental effect on consumers' ability to find and choose the brands they are looking for. Copycat brands slow down brand recognition and can even cause consumers to make errors, mistakenly selecting the copycat brand in place of the brand they are looking for. It is possible that these effects are indicative of confusion between perceptually similar brands.

These findings have important implications for brand owners. First, they demonstrate and quantify the negative effect that copycat brands could have on their brands. By slowing down consumers and causing them to choose the wrong brand, copycat brands reduce the likelihood of an established brand being found and ultimately chosen, thus potentially impacting sales. Second, this study demonstrates, for the first time, a way to reliably measure the effect a copycat brand is having on the established brand.

The strongest evidence from this study arose from the recognition task. The visual search task employed in this research is a relatively simple and cheap procedure to implement. It is therefore possible that this measure could be used in the future to examine specific cases of copycat branding and the impact of that branding on established brands.

The results from this study highlights the need for further research that is underpinned by an understanding of human decision making processes. This approach has a wide range of potential applications; it could be used to understand the impact of packaging changes or re-branding; it could be used to understand *which* branded elements are most crucial in guiding consumer attention and recognition; it could also be used to examine where

products should be placed in store or what point of sale material should be included. Using techniques that tap into actual behaviour unlocks a huge potential to learn about consumer decision making; it is hoped that this research will encourage many further studies in this area.

The results gathered in this original research will now be considered within the broader legal and policy context. This research therefore represents an important step in demonstrating and safeguarding the crucial role that branding plays in guiding consumer behaviour.

Appendix 1 - Questionnaire Data

Questionnaire data were collected alongside the attention and recognition data. This step was mostly exploratory, since it was expected that explicit questions would not be sensitive enough to capture consumers' reactions to branding changes or copycat branding (see Appendix 4 for further discussion). We believe that branding cues work on consumer attention and memory, processes which are not usually subject to conscious control or awareness. Therefore self report or questionnaire measures are not the most appropriate measures in this case.

Data were collected from the same participants as the main study. The questionnaires were administered at the end of the experiment. The questionnaires focused on two areas, purchase intent and brand liking. These were measured using the following questions:

How likely would you be to purchase Brand A?

Very Likely
Likely
Neutral
Unlikely
Very Unlikely

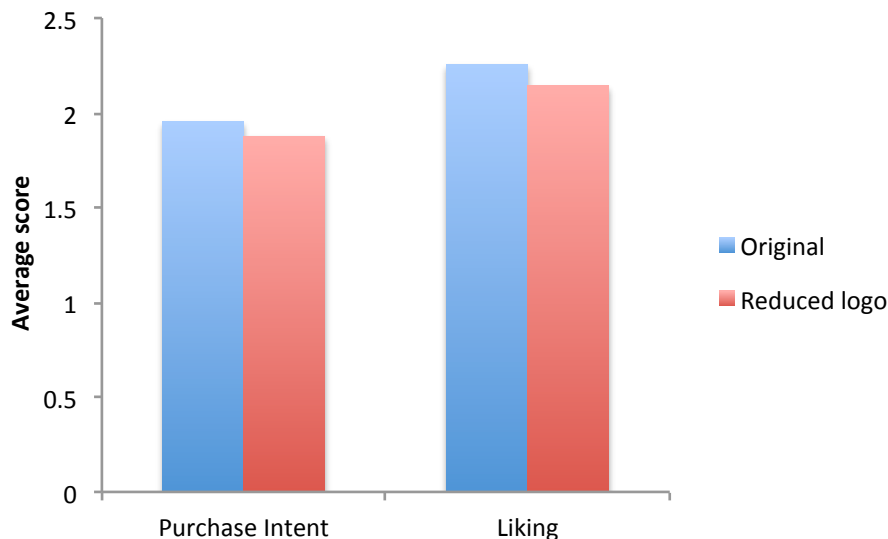
How do you feel about Brand A?

Strongly Like
Like
Neutral
Dislike
Strongly Dislike

Results for each part of the study are summarised below.

i. What is the impact of reduced branding on packaging?

In order to assess the impact of reduced branding on consumer attitude, consumers were asked to rate the key brands whilst being shown images of the original packaging, and then whilst shown images of the packaging with reduced logos. In the reduced logo condition, they were shown the image of the logos at 50% or the original size. The graph below shows the purchase intent and liking scores for the original images compared to the reduced logo size images, averaged across all the key brands. The data show a small decrease in purchase intent and liking when the images had smaller logos. This difference was not statistically significant.



These results provide tentative support for the earlier findings that reducing the size of the branding on packaging has a detrimental effect on consumer choice.

ii. What is the impact of increased non-branded information on packaging?

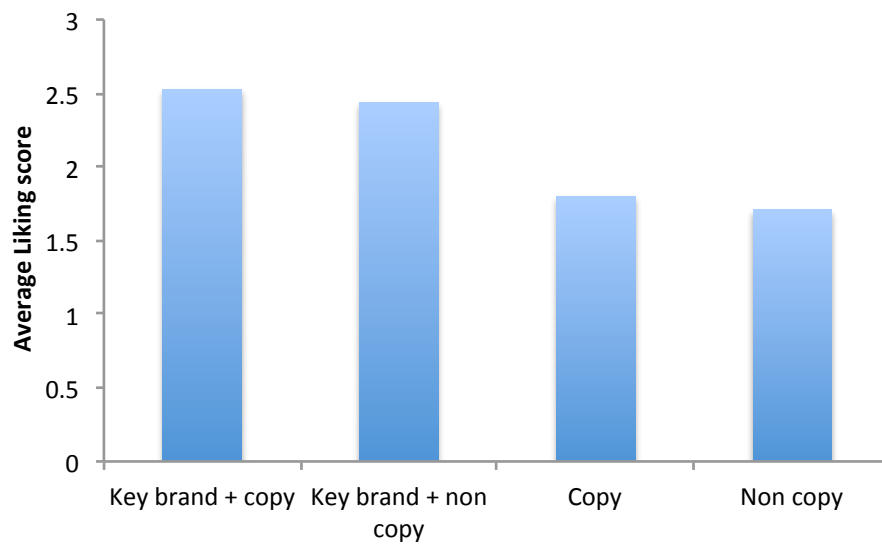
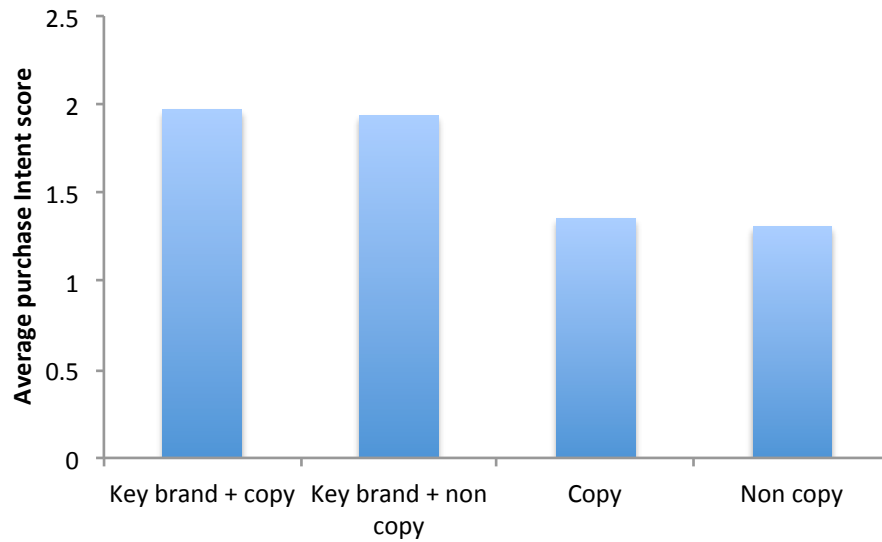
In order to assess the impact of increased non-branded information on consumer attitude, consumers were asked to rate the key brands whilst being shown images of the original packaging, and then whilst seeing images of the packaging with increased nutritional labels. In the increased label condition, they were shown the image of the logos at 200% of the original size.

The data did not show any difference between the conditions for either purchase intent or liking.

iii. What is the impact of copycat branding?

In order to assess the impact of copy branding, participants were asked to rate a key brand both when it was placed next to a copycat supermarket brand and when placed next to a non-copy supermarket brand. This was to measure whether the presence of a perceptually similar could impact consumer attitudes towards an established brand. Participants were also asked to rate the supermarket brands.

The graphs below show the purchase intent and liking data. There is no difference between the scores for the key brand when it is placed next to a copycat and when it is placed next to a non copycat product. Interestingly, there is a difference between the key brand and the copycat brand on both metrics, suggesting that participants do not confuse the two at this explicit level, where they have time to make a decision.



The results from this part of the study are not able to shed much light on the issues addressed in this report. It is likely that explicit questionnaires are not sensitive enough to pick up on influences on decision making, especially when these influence are largely below the level of conscious awareness.

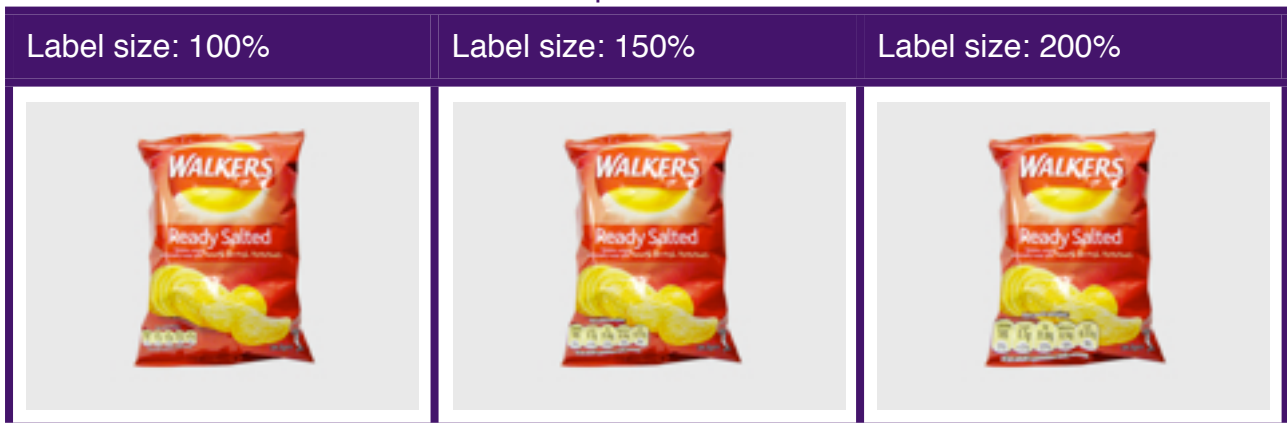
Appendix 2 - Stimuli

Example stimuli for each part of this study are depicted below.

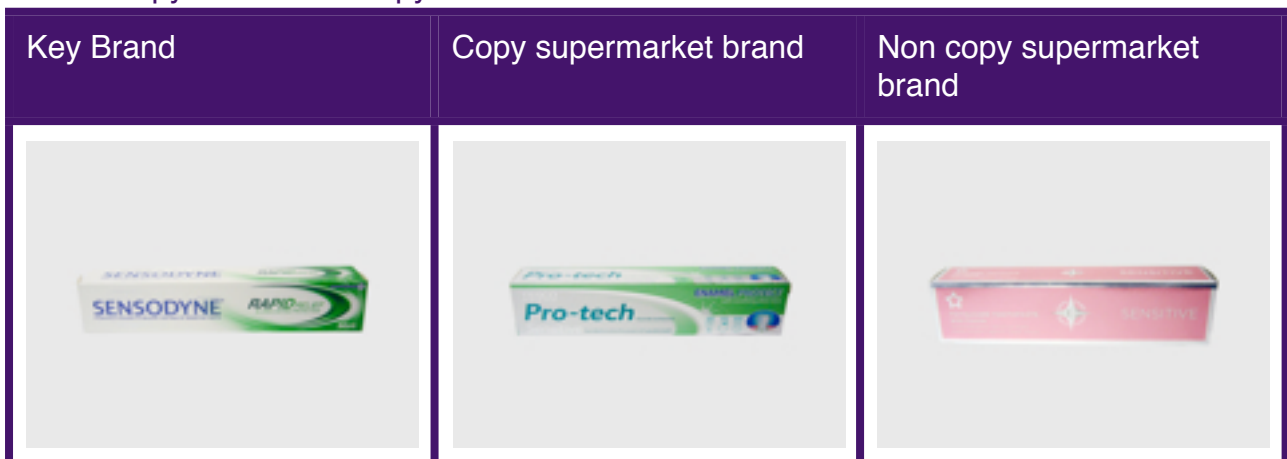
Part i. Size of logo manipulations



Part ii. Size of nutritional information manipulations



Part iii. Copycat and non copycat brands



Appendix 3 - Methodological details

Attention - Eye tracking

Eye movements can be divided into fixations, during which the eye remains relatively still for about 200-300 ms, and saccades, rapid movements that cover on average 3-5° (degrees of visual angle) in distance and last about 40-50 ms. Very little processing occurs during saccades, while fixations are associated with perceptual and cognitive processing of the fixated stimuli. The eye and brain mainly process information that is located in the centre of the visual field (Wedel and Pieters, 2007). This information is firstly picked up by photoreceptors (called “cones”) located in the fovea, the central and most sensitive part of the retina. Stimuli that fall outside this central area are processed by different photoreceptors (called “rhodes”) in far less details. Therefore, eye movements can be considered a real-time index of visual attention and cognition (Rayner, 1998), and in particular the latency, length, and frequency of fixations can tell us a lot about how quickly attention was engaged and how extensively the fixated stimulus has been processed.

Fixation duration

The time the eyes spend dwelling on a specific stimulus corresponds to the amount of time that was spent processing this stimulus. A number of studies have shown that this measure is correlated with liking, preference, consumer brand choice (Chandon et al, 2002) and sales (Treisman and Gregg, 1979).

How it works

The technology that allows for the collection of the above mentioned measures is relatively simple and inexpensive (Wedel and Pieters, 2007). Standard equipment is composed by an infra-red camera that picks up the reflection of the cornea and the centre of the pupil. Once the camera is calibrated (i.e. has “learned” which reflection/pupil pattern corresponds to a fixation in which position of the visual field), it can track with great precision the movements of the eye in the visual field. Different eye trackers have different sampling rates (the current maximum is 2000 Hz, which corresponds to two measurements taken each millisecond), accuracy (an excellent accuracy being around 0.25°) and resolution (an excellent resolution being of 0.05°).

Lab experiments

The most precise measurements are taken in lab situation where the participants sits still in front of a screen. This type of eye tracking is ideal for addressing questions such as “which brand attracts more attention?” or “which packaging attracts consumer’s attention?”.

Real life experiments

Eye trackers can also be mounted on the head of the participants or can be integrated in goggles, so that participants can act in the real environment while their eyes are being tracked. This can provide insights into how shoppers navigate a category and how they

respond to point-of-sale material (Sorensen, 2009) or can be used to investigate how consumers interact with marketing communications in the real world. However, the limitations of this methodology are often overlooked. First, it should be noted that the accuracy of the measurement is extremely low as compared to that obtained in lab experiments. The experimenter does not have any control over the stimuli the participant will be exposed to. A video reproducing the visual field of the participant and an estimation of the point of fixation only provides rough indications about the attentional path of the consumer. Second, consumers can be recruited and asked to behave as they usually would (Sorensen, 2009), however, their behaviour is likely to be influenced by the mere fact of knowing they are being observed. Biases similar to those associated with all other methods (social desirability, to mention just one) can operate in this context as well. Third, because of the extremely high amount of noise contaminating data collected in the store environment, only one third of the participants tested typically provide usable data (Jesper, 2007). This means that collecting this kind of data can be inefficient and costly.

Recognition - Visual Search

Visual search is a type of perceptual task that involves an active scan of the visual environment for a particular object or feature among other objects or features. It provides a measure of how easily and quickly participants can identify or recognise an object.

In visual search tasks, participants are instructed to find a particular object from an array. Visual search tasks are typically conducted as speeded response procedures, where participants are asked to respond as quickly as possible. In this way, it is possible to measure their automatic reactions.

Participants' responses can be measured in a number of different ways. Eye fixation latency can be used to measure how long it takes the eyes to fixate on the correct object. Alternatively, participants are instructed to make a physical response (e.g. clicking a mouse or touching a screen) when they have identified the stimulus. This technique allows measurement of both accuracy and speed of recognition. Because of the ability to measure both accuracy and response latency, visual search tasks can provide a highly sensitive measure of recognition.

In the retail context, visual search can be a very useful tool as it provides an indication of how quickly consumers can identify a particular product. It can be used to investigate product placement and has very important applications when evaluating the impact of packaging changes. Product identification and recognition are very important metrics relating to decision making. A wealth of evidence and research into perceptual fluency suggests that those products that are easy to identify are more likely to be selected (e.g. Zajonc, 1968, Lee, 2001, Tversky & Kahneman, 1973).

Appendix 4 - Why use these methodologies?

The majority of research carried out in the area of consumer decision making has used self report measures. While this method offers some valuable indications about the process that leads to purchase decisions, a number of important limiting factors should be considered.

First, when customers answer the researcher's direct and explicit questions, a number of non-voluntary biases, such as deviant, careless and consistent responding, or acquiescence (tendency to agree), can contaminate their responses. In other words, answers can be contaminated by the consumer's own theories about their behaviour, by their motivation to be original/clever, by their desire to not waste too much time filling in to the questionnaire, by their need to be consistent across different statements and, last but not least, by a tendency to agree with the researcher (Paulhus, 1991).

Second, consumers might voluntarily provide an inaccurate answer with the goal of conforming with their perceived expectations from society (Cialdini and Goldstein, 2004; Fisher, 1993), for instance people might not like to admit that they always go for the cheaper option for fear of appearing poor or mean. This phenomenon is called social desirability bias.

Third, even assuming that a well designed questionnaire was able to extract from the consumer what they actually believe they would feel and think in a specific situation, this information would not be as valuable as it seems; people are often unaware their own feelings and thoughts (Damasio, 2000) and they are not good at predicting their future behaviour (Webb, 2006).

A large body of evidence suggests that consumers have far less control, and awareness, over their decisions than previously assumed. In order to further understand those decision making processes, it is therefore imperative to go further than simply asking consumers what they prefer, what they would choose and why.

In order to overcome the problems highlighted above, the present research focused on the underlying psychological processes that underpin our decisions. Decades of research in the brain and behavioural sciences have provided a window into these processes and we now have tried and tested techniques to measure these processes with a high degree of accuracy.

To overcome the problems with self report, scientists use various implicit response measures such as eye tracking and response latency (response time). These can reveal what consumers actually believe or think and how they actually behave, as they measure unconscious physical reactions.

Eye tracking measures actual behaviour and does therefore not suffer from the self-report bias of questionnaires. Additionally, eye movements are a type of behaviour that is not under strong voluntary control (Munoz & Everling, 2004). This is very important because it protects the measurements from the self-report biases listed above. The gaze is directed in an automatic way to whatever attracted the viewer's attention (Corbetta et al, 1998).

This means that eye tracking can provide an extremely accurate measure of which elements within an array attract attention.

Similarly, response latency measures can also measure automatic behaviour and this type of response is also not likely to be under voluntary control. Speeded response procedures, where participants are under time pressure to respond, force them to make automatic responses, based on instinctive reactions. Furthermore, by measuring both accuracy and response time, we are able to measure consumers' recognition with a high degree of sensitivity.

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