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I like what I know: Is recognition a non-compensatory determiner of consumer choice?

Onvara Oeusoonthornwattana* and David R. Shanks
University College London

Abstract

What is the role of recognition in consumer choice? The recognition heuristic (RH) proposes that in situations where recognition is correlated with a decision criterion, recognized objects will be chosen more often than unrecognized ones, regardless of any other relevant information available about the recognized object. Past research has investigated this non-compensatory decision heuristic in inference. Here we report two experiments on preference using a naturalistic consumer choice task. Results revealed that, although recognition was a powerful driver of preferences, it was used in a compensatory rather than a non-compensatory way. Specifically, additional information learned about recognized brand objects significantly affected choices. It appears that recognition is processed in a compensatory manner and combined with other attributes in preferential choice.

Keywords: brand, consumer choice, heuristic, preference, recognition.

1 Introduction

We tend to like what we know. Studies of the mere exposure effect (Bornstein, 1989), and decades of experience of product manufacturers and advertisers, confirm that our preferences for products and other objects tend to be related to their familiarity, or to brand awareness (Hoyer & Brown, 1990). But what precisely is the mechanism by which familiarity or recognition guides choice? This article asks whether choice is sometimes guided by a non-compensatory mechanism, the recognition heuristic (RH).

The RH has been primarily investigated in inferential choice domains ("which is the larger city, Frankfurt or Koblenz?") and is a simple tool from the "adaptive tool-box" of human judgment and decision making proposed by Gigerenzer, Todd and the ABC Research Group (1999). These researchers have shown that unlike classical decision strategies (e.g., linear regression and Bayesian models) that aim to maximize integration of relevant knowledge to gain a statistically optimal prediction of a decision criterion, efficient inferences can be drawn from minimal knowledge, in this case, mere recognition. Additionally, the RH was proposed to be most applicable in situations where knowledge is limited, that is, not all entities in the choice set are recognized (Gigerenzer & Goldstein, 1996; Goldstein & Gigerenzer, 2002).

There are various other domains in which recognition knowledge is limited and where choices depend on preferences rather than inferences. One obvious example is consumer choice. As everyone knows, firms invest huge sums of money in advertising. Although many advertisements are informative, often their purpose is simply to increase brand awareness. Firms attempt to repeatedly expose consumers to brand names in the hope of achieving a positive brand image and customer loyalty. The present study aims to investigate the exact role of brand recognition in consumer choice. More specifically, it aims to see whether under certain circumstances participants will rely on recognition as a choice strategy regardless of any other information they may have about the recognized/well-known brand. For instance, when choosing between two brands of chocolate in which only one brand is recognized, participants may employ a simple heuristic and choose the recognized brand. Alternatively, they may combine recognition with other information known about the brand, such as whether the manufacturer has a good or poor environmental record.

The present research therefore extends past studies of the recognition heuristic into a new domain, preferential choice. Goldstein and Gigerenzer (2002, p.86) themselves considered brand awareness and consumer choice as a likely domain where the RH might apply.

1.1 The Recognition Heuristic and Ecological Rationality

The recognition heuristic (RH) was proposed as the simplest form of fast and frugal heuristic for inferential decision-making (Goldstein & Gigerenzer, 2002). It

*This work was supported by the United Kingdom Economic and Social Research Council. We thank Ben Newell for his helpful comments. Address: David R. Shanks, Division of Psychology and Language Sciences, University College London, 26 Bedford Way, London WC1H 0AP, England. Email: d.shanks@ucl.ac.uk.

works on the principle that *"If one of the two objects is recognized and the other is not, then infer that the recognized object has the higher value"* (p. 76). The RH is domain-specific as it is assumed to operate only in environments where recognition is correlated with an external criterion. Importantly, the RH is postulated to be fast and frugal as a consequence of its non-compensatory property: "*no other information about the recognized object is searched for and, therefore no other information can reverse the choice determined by recognition*" (p. 82). This is an important claim as it challenges the traditional compensation-by-integration idea of rationality. Non-compensatory decision heuristics ignore some of the relevant information. Compensatory ones, in contrast, allow a low value of one cue to be compensated by a high value on another. Despite its simplicity, Goldstein and Gigerenzer (1996) demonstrated by computer simulation that higher accuracy could be achieved when recognition was used in a non-compensatory way than when it was integrated with other cues.

The definition of the RH assumes that it is limited to situations where recognition is incomplete. If both choice options are recognized then the RH cannot be employed and instead a more complex heuristic (such as Take-the-Best; Gigerenzer et al., 1999) must be used. Also, for recognition to be a useful decision cue, it must be correlated with the decision criterion. According to Goldstein and Gigerenzer's (2002) ecological rationality framework, there are mediators in the environment which reflect the criterion and allow it to be indirectly accessible to the individual. Thus, an inaccessible criterion (such as the quality of a consumer product) will be reflected by a mediator variable (such as the number of times it is mentioned in magazines), while the mediator in turn influences the probability of recognition.

Because of their simple nature, heuristics are often referred to as mental short-cuts that allow cognitive cost to be minimised. The RH is considered as the simplest form of heuristic, as it merely involves recognition memory and is based on one-reason decision making. Indeed, Pachur and Hertwig (2006) have argued that retrieval of subjective recognition is faster and more automatic than that of objective cue information. The non-compensatory property of the recognition heuristic is the key feature that permits fast and frugal processing, as only one cue (recognition) is used to determine a decision. Thus, evidence for such non-compensatory processing is crucial for the effectiveness and applicability of the RH.

1.2 Empirical evidence for recognition as a non-compensatory cue

The RH's assumption that recognition is used in a non-compensatory way was tested empirically by Goldstein and Gigerenzer (2002). Their study involved the task of inferring which of two (German) cities is more populous. Prior to the inferential task, participants were taught additional useful knowledge, particularly, knowledge about which cities have a major league soccer team. The presence of soccer teams provides a good indication of city population size; German cities with major league soccer teams tend to be quite large. This knowledge provides a relevant and valid cue one could utilize in addition to the RH when making inferences about the cities' populations. Non-compensatory usage of recognition was tested by examining whether participants would choose an unrecognized city or a recognized city known to have no soccer team. The absence of a soccer team in the recognized city suggests that it is not a large city and could therefore be smaller than the unrecognized city. This knowledge contradicts the choice dictated by recognition. Thus, if recognition is used in a non-compensatory way, participants should still choose the recognized city regardless of any conflicting information they may know about it.

Consistent with the recognition heuristic, participants chose the recognized city 92% of the time even when they had learned that the recognized city had no soccer team. This suggests that the contradicting additional knowledge was not integrated into inferential decision making. Indeed, the RH has been shown to be a valid predictor in various other domains, including the endowments of American colleges (Hertwig & Todd, 2003), prediction of success in sports (Pachur & Biele, 2007; Serwe & Frings, 2006), and deciding which of two diseases has a higher incidence rate (Pachur & Hertwig, 2006).

However, the non-compensatory utilization of recognition has been challenged by studies which showed significant effects of additional cue knowledge (Bröder & Eichler, 2006; Hilbig & Pohl, 2008; Newell & Fernandez, 2006; Newell & Shanks, 2004; Oppenheimer, 2003; Pohl, 2006; Richter & Späth, 2006; for a thorough review, see Pachur, Bröder, & Marewski, 2008). For instance, Newell and Shanks (2004) showed that, rather than having any special status, recognition was treated just like other cues. It was relied on most of the time when it had high predictive validity, but was ignored when other cues in the environment had higher validity. Specifically, participants had to decide which of two companies to invest in. On each trial, participants could purchase investment advice from 3 financial advisors. The results revealed that, when recognition (company name cue) had the highest validity, the recognized company was chosen 88% of the time. However, when the recognition validity was manipulated to render it the least valid of all cues, this percentage dropped to 62%. Additionally, participants appeared to purchase more advice when recognition had low predictive validity than when it had

high validity. Even when recognition had high validity, choice of the recognized company was substantially reduced when the experts' advice favored the unrecognized company. Newell and Shanks (2004) interpreted these findings as evidence against the non-compensatory character of recognition. On this view, and in contrast to Goldstein and Gigerenzer's (2002) proposal, recognition does not have an elevated status over other probabilistic cues; people do not treat recognition in a qualitatively different way than they treat other cues in the environment.

Recall that participants in Goldstein and Gigerenzer's (2002) study chose the recognized city 92% of the time even when they had learned that the recognized city has no soccer team. This was interpreted as indicating that the soccer team cue was ignored and participants merely relied on recognition when making their inferences. However, Newell and Fernandez (2006) pointed out that Goldstein and Gigerenzer (2002) analysed only the "critical pairs". That is, they analysed only those pairs in which the recognized city has an additional cue that contradicted recognition (absence of a soccer team) while ignoring pairs in which the recognized city has an additional cue that corresponded to recognition ("corresponding-cue pairs" in which the presence of a soccer team pointed to the same city as the recognition cue). If the soccer team cue was ignored then the proportion of choices of the recognized city should be equal in both the critical and the corresponding-cue pairs. Without such a comparison, one cannot conclude that recognition was used in a non-compensatory manner; it is possible that the soccer team cue was considered, but did not outweigh the influence of recognition. Analysis of corresponding-cue pairs by Newell and Fernandez (2006) revealed that participants chose the recognized city significantly more often when it was known to have a soccer team than when it was known *not* to have a soccer team. This poses a considerable challenge to Goldstein and Gigerenzer's (2002) original evidence for the non-compensatory assumption of the RH.

Pachur et al. (2008) recently raised several objections to these results and argued that an ideal test of the RH uses natural (pre-experimental) recognition and cue knowledge, rather than teaching them in the same laboratory setting in which choices are elicited. Pachur et al. argued, for example, that recognition derived in the laboratory may be used less reliably to infer a criterion than equivalent recognition derived naturally (see Marewski, Gaissmaier, Schooler, Goldstein, & Gigerenzer, 2009, for some corroborating evidence). In Pachur et al.'s (2008) study, around 85% of inferences were consistent with recognition even in the presence of cues that contradicted recognition and had higher predictive validity. Pachur et al.'s (2008) findings illustrate that, when the RH is tested in a more naturalistic environment consistent with that originally proposed by Goldstein and Gigerenzer (2002), recognition appears to be a dominant cue and is used by many participants in a non-compensatory way. Nonetheless, Pachur et al. also obtained clear evidence that about half of their participants combined recognition with other cue information, in violation of the RH.

The evidence reviewed in this section comes entirely from studies that sought to test a specific and quite strong qualitative prediction, namely that recognition is used in a non-compensatory fashion. Any evidence of recognition being used instead in a compensatory way is, of course, a challenge to the RH. However a quite different approach is to construct formalized models of choice that either adopt or reject the RH and to compare such models against one another in terms of their ability to fit entire patterns of behavior (e.g., Bröder & Schiffer, 2003; Marewski, Gaissmaier, Schooler, Goldstein, & Gigerenzer, 2010). We return to this approach, which has so far been adopted in only a small number of studies, in the final discussion.

1.3 The recognition heuristic and consumer choice

The fast and frugal heuristics programme was initiated in the context of inference. What is the role of recognition in preference as opposed to inference? The vast amounts of money spent by manufacturing companies and advertisers to establish brand names — in the hope of increasing customers' loyalty and sales — strongly imply a link between recognition (brand awareness) and consumer choice. As with inferential choice, we can ask whether preferences are driven in a non-compensatory way by recognition. Whereas inferential choices such as the decision about which of two cities is larger are based on reasons and can be objectively evaluated against some criterion, preferential choices depend on affect and feeling and are subjective (Zajonc, 1980). To date there have only been a few attempts to extend the fast and frugal heuristics programme to preference, most notably in the domain of risky choice (Brandstätter, Gigerenzer, & Hertwig, 2006).

There are at least three reasons why consumer choice is an interesting domain for testing the role of recognition: (a) consumer choice involves real objects, many of which are familiar from purchasing experience, thus avoiding the need to artificially induce recognition (Pachur et al., 2008); (b) there is evidence for correlations between recognition and consumer choice — for instance, the famous Benetton advertising campaign, which involved presenting their brand name with shocking images, resulted in a huge increase in sales (Gigerenzer, 2007); and (c) in some domains, consumers are very poor at dis-

tinguishing brands without labels and show marked increases in their rated liking of a familiar brand when it is identified (e.g., Allison & Uhl, 1964), implying that recognition dominates other characteristics such as objective quality. For these reasons, it seems plausible to speculate that recognition may sometimes be used in a non-compensatory fashion in consumer choice.

1.4 Evidence for the correlation between recognition and consumer choice

One piece of evidence that recognition correlates with consumer choice comes from consumer research (e.g., Hoyer and Brown, 1990; Macdonald & Sharp, 2000) showing that brand awareness is a dominant choice heuristic. In Hoyer and Brown's (1990) classic study, participants were presented with three brands of peanut butter. On each trial participants selected one of the brands and were allowed to taste the peanut butter they selected. In one group, one of the three brands was known to participants (brand-aware group), while in a second group none of the brands was known (no-awareness group). On average, participants in the brand-aware group showed a strong tendency (compared to the no-awareness group) to select the recognized brand, even when they had tasted a higher-quality peanut butter that was placed in an unknown brand jar. This result clearly illustrates that recognition can act to influence consumer choice. Presumably, purchasing familiar brands is ecologically rational in that familiarity is a signal for brand quality. Put differently, high-quality brands are the ones most likely to become familiar.

1.5 Overview of the experiments

The present study investigated non-compensatory processing in two consumer choice experiments. We used an experimental design modeled on that of Pachur et al. (2008, Experiments 1 & 2). Experiment 1 asked whether additional information (positive or negative) about the target recognized brands influences choice of consumer products. If participants follow the RH when choosing between different brands and if recognition is accordingly utilized in a non-compensatory way, then they should choose the well-known/recognized brands regardless of any additional information (whether positive or negative) they may have learned about those brands. Experiment 2 sought to replicate the first experiment and provide a more direct test of the effect of additional knowledge by eliminating price information.

2 Experiment 1

The experiment was comprised of 4 phases: a learning phase, a recall phase, a choice task, and a recognition test. The experiment began with a learning task where participants were presented with positive and negative information about target recognized brands. The positive and negative information is equivalent to the corresponding-cue (presence of a soccer team) and the contradicting cue (absence of a soccer team) used in Newell and Fernandez's (2006) study, respectively. Retention of the information was tested in a recall phase.

In the choice task, participants were presented with pairs of brand products and their task was to choose the one they were likely to purchase in each pair. A two-alternative forced choice paradigm was used to measure choice. The experiment ended with a recognition test in which participants selected the brands they recognized before participating in the experiment. This allowed us to eliminate choice pairs from the analysis if they did not comprise an appropriate recognized/unrecognized pair.

Non-compensatory processing was tested by contrasting pairs of consumer products, one recognized and the other unrecognized, either when there was no additional information (control) about the recognized object or when positive or negative information (positive and negative pairs) had been learned. There should be no significant difference between the positive and the negative pairs if recognition is used in a non-compensatory manner. The RH predicts that there will be no significant difference in the proportion of recognized brands chosen across all pair types. That is, participants' choice should follow recognition regardless of whether they had learned positive or negative information about the recognized brand. Alternatively, participants could integrate compensatory information in their choice strategy and may therefore have the tendency to choose (avoid) the recognized brand more often when they have learned positive (negative) information about that brand.

2.1 Method

2.1.1 Participants

A total of 32 undergraduate university students (mean age = 19.6 years, SD = 3.62), 27 of whom were female, were tested individually. All participants undertook the experiment for course credit. The experiment was written in Visual Basic 2005 and ran on a desktop computer. The results from the recognition test revealed that 2 participants recognized very few target brands and they were consequently excluded from the analysis.

2.1.2 Design and measures

The study used a within-subjects design with types of pairs as the independent variable and participants' choice responses as the dependent variable. A two-alternative forced choice procedure was used to measure choice.

2.1.3 Materials and procedure

There were three types of critical pairs: control, positive, and negative. The critical pairs of consumer products pitted an unrecognized product against a recognized one with no additional information (control) or with positive or negative information. In total, there were 30 critical pairs (10 of each type). These pairs were pre-selected and each comprised a well known brand, such as Mars chocolate, and a less well known brand, such as Theo chocolate. The products are listed in Appendix 1. Images of the products were collected for presentation in the experiment.

For the control pairs no additional information was presented to participants, while positive and negative information concerning the well-known brands was presented in the learning stage for the positive and negative pairs, respectively. This information was drawn from corporate website and press releases (see Appendix 2).

The products were selected from 5 different consumer categories: chocolate, crisps (chips), shower gels, headphones, and tennis racquets. Thus 6 well-known brands were selected from each product category. The products were randomly divided into three sets of 10 and each set was randomly and alternately presented as a control, positive, or negative set.

The first three phases (learning, recall, and choice tasks) were presented via computer, while the recognition test was a pen and paper task given after the participant completed the first three phases.

2.1.4 Learning phase

In the learning phase, 20 statements about well-known brands were presented one at a time for an unlimited time. Before the statements were presented, participants were told that they would be asked to recall these statements later in the experiment. Half of the statements were positive and half were negative. An example of positive information is "*Ferrero Rocher's "Share Something Sweet" campaign helps raise awareness of the critical problem of childhood hunger in the U.S while raising funds to solve it"*. An example of negative information is "*Mars has come under criticism by People for the Ethical Treatment of Animals for funding animal tests which the group alleges are inhumane.*" The additional information was mainly concerned with the companies that manufacture the product rather than the specific product itself in order to reduce demand effects in the subsequent choice task, and most of the additional information was concerned with health and ethical issues likely to be salient for typical participants. Thus, the information provided relevant cues which participants could utilize (in addition to brand recognition) when choosing between products. Many real examples concerning publicity surrounding popular consumer brands (e.g., Nike, Starbucks) corroborate the finding that the majority of consumers report considering a firm's ethical, social, and environmental record when making purchases. For instance, consumers are willing to pay a premium for Fair Trade products (Arnot, Boxall, & Cash, 2006).

2.1.5 Recall phase

This phase served to reinforce the statements presented in the learning phase. Participants were presented with 20 multiple choice questions and their task was to select the correct statement for each brand previously presented in the learning phase. Participants were given feedback on whether their answers were correct. If their answers were incorrect, participants were also shown the correct statement to provide further reinforcement of the information. Participants were required to answer at least 75% of the questions correctly before moving on to the next stage. If the percentage was below that level, they had to repeat the recall test.

2.1.6 Choice task

In the choice task participants were presented with pairs of images of consumer products and were instructed to decide which product in each pair they were most likely to purchase. On each trial, participants were presented with a pair of consumer products side by side together with a price for each.

A total of 90 pairs were presented, a third (30 pairs) of which were the critical pairs. These were pairs where one brand is well-known and therefore likely to be recognized, while the other is less well-known and likely to be unrecognized. The critical pairs were pre-specified and were comprised of the 30 well-known brands used in the learning phase, which were paired with less well-known, supposedly unrecognized brands. In Appendix 1, asterisks mark the brands presented as the recognizable items in critical pairs. The prices of the target unrecognized brands were set to be slightly lower than those of the recognized brands (on average by 21%; range 3%-53% across pairs). This was done with the assumption that people do rely on recognition to a certain extent and may tend to choose the brand they recognized; setting the recognized brands with a slightly higher price should keep the choice of the recognized brand below 100%.

The rest of the pairs (filler items) comprised pairs of two well-known brands (30 pairs) and pairs of two less well-known brands (30 pairs). The different types of pairs were presented in a different random order for each participant. Participants responded with the left and right mouse clicks corresponding to a choice of the product on the left- and right-hand side of the screen, respectively.

2.1.7 Recognition Test

In the recognition test, participants were presented with a list of all the brands of consumer products presented in the choice task. Their task was to select the brands that were familiar to them prior to participating in the experiment. This information allowed us to identify which critical pairs to include in the analysis.

2.2 Results

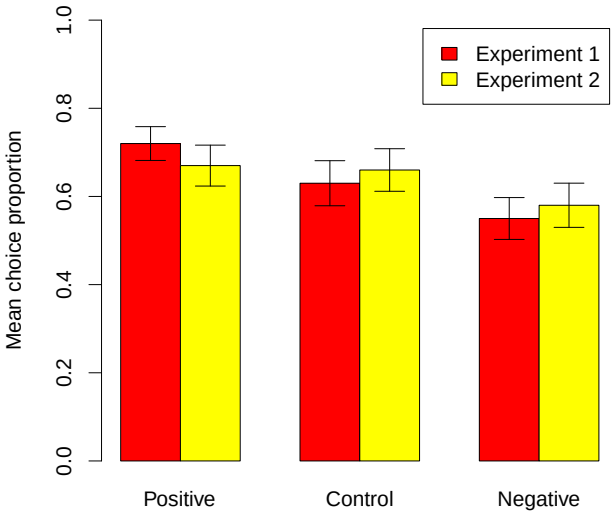
2.2.1 Correction for Recognition

In those cases in which a participant's product recognition was not consistent with the design, items were eliminated. In the critical pairs, the target product had to be recognized, and the other pair member had to be unrecognized. The recognition test revealed that 2 of the participants recognized very few of the target brands, such that more than 50% of the critical pairs had to be eliminated for these participants. Consequently, their choice responses were excluded, leaving 30 participants in the final analysis. On average, 30% of the critical pairs were lost due to this correction. The mean number of pairs left after correction were 7.40 (*SD*=1.54) for positive pairs, 6.77 (*SD*=1.43) for control pairs, and 6.93 (*SD*=1.31) for negative pairs. (Note that the statistical inferences drawn below hold when all data were included in the analyses).

2.2.2 The effect of additional information

The mean proportion of choices of the recognized brand was calculated for each type of critical pair (see Figure 1). A repeated measures analysis of variance (ANOVA) yielded a significant linear trend in the mean proportions across the three types, $F(1,29) = 10.96$, $p = 0.002$. The quadratic trend was not significant, $F(1,29)=0.00$. Paired-samples *t*-tests (one-tailed) revealed that the mean proportion of choices of recognized items was significantly higher in the positive (M=0.72) than in the negative (M=0.55) pairs, $t(29) = 3.31$, $p = 0.001$. Similarly, the difference between the positive and control (M=0.63) pairs, $t(29) = 1.74$, $p = 0.046$, was also significant. However, the difference between the control and negative pairs was not reliable, $t(29) = 1.44$, $p = 0.081$. Furthermore, a one-sample *t*-test on the control pairs indicated that participants' choices tended to follow recognition: the recognized brand was selected more often than chance (50%), $t(29) = 2.54$, $p = 0.017$. The same pattern of results was found when all 32 participants were included in the analysis.

Figure 1: Mean (SE) proportion of choices of the recognized brand in each type of critical pair in Experiments 1 and 2. Each pair comprised a recognized and an unrecognized product. Participants had previously learned positive, negative, or no (Control) additional information about the recognized brand.



This pattern suggests that participants chose the target recognized brands significantly more often when they had learned positive information about these brands than when they had learned negative information or were not taught any additional information. Thus, contrary to the RH, recognition of consumer products is a compensatory rather than a non-compensatory cue.

2.2.3 Effect of price differences

The results show that participants appeared to take compensatory information into account, particularly positive information, about the recognized brand when choosing between pairs comprising a recognized and an unrecognized product. As noted previously, each pair of consumer products was presented in the choice task together with the price of each product. In the domain of consumer choice, product price is one of the external attributes that are most readily apparent to customers. Thus, it is interesting to ask whether there is any effect of price differences of the products in each pair on participants' choices. Note that, because each pair served equally often in the experiment as a positive, control, or negative pair, the effect of additional information revealed above is independent of price information.

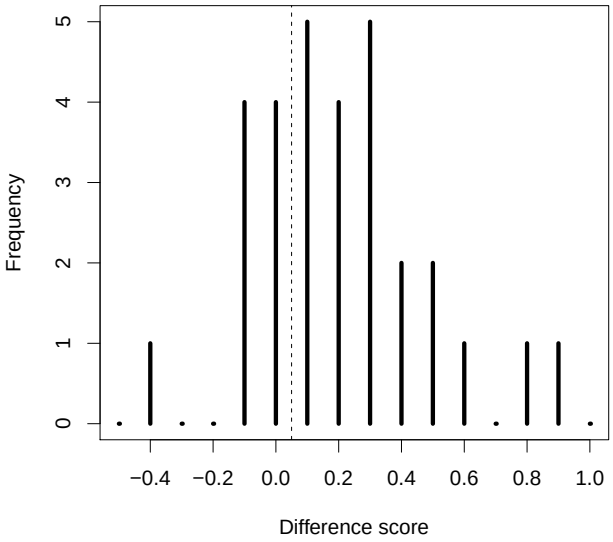
The following analysis seeks to determine whether price had an effect on choice. All other things being equal, participants should have a greater tendency to select the lower priced product in each pair when the price difference is large than when the difference is small. To examine this prediction independently of recognition, we examined pairs where both products were unknown to participants. Recall that a third of the pairs were comprised of two unknown brands. The proportion of choices of the lower-priced product was 0.55 (SD = 0.17). A one-sample t-test revealed that this figure was marginally greater than chance (50%), $t(28) = 1.69$, $p = 0.05$. Thus, as expected, we have some weak evidence that participants also took the price of the products into account when making their choices. This price influence would presumably have been stronger if the price differences had been larger. Recall that we used small price differences, as our primary aim was to avoid ceiling effects in choice of the recognized brands, not to demonstrate an influence of price.

2.2.4 Individual differences

As Gigerenzer and Brighton (2009), Pachur et al. (2008) and others have noted, it is important to examine individual differences in participants' behaviour in tests of the RH because systematic individual differences may render the average meaningless. Gigerenzer and Brighton (2009) illustrated this point by reanalysing Richter and Späth's (2006) data at an individual level and showing that the majority of participants consistently followed the RH in all conditions, despite the reported lower mean adherence to the RH in the critical condition (conflicting evidence).

In order to analyse the data at the individual level, the difference in the proportion of choices of the recognized brand between the positive and negative pairs was calculated for each participant, creating a difference score ranging between –1 to 1 for each participant. In effect, this measures the size of the compensatory effect of additional information over and above recognition for each participant. These data are shown in Figure 2. If participants follow the RH and recognition is deployed in a non-compensatory manner, then the majority of participants should show no difference in their proportion of choices of the recognized brand between the positive and negative pairs. That is, the majority of participants should have difference scores equal or close to zero. In fact Figure 2 shows that the majority (21/30) of participants had difference scores above zero and only 9/30 participants had scores less than or equal to zero. By a sign test, the difference between the number of positive and negative scores was different from chance (p=0.003) confirming that the group level effect reported above does not arise because of the behaviour of a small number of participants who are disproportionately influenced by positive and negative information. Thus, more than half of the participants did not appear to use the RH, which is inconsistent with the pattern found in Gigerenzer and Brighton's (2009) reanalysis of Richter and Spath's (2006) data. That is, the majority of the participants in the present study did not consistently use recognition in a non-compensatory manner. Such a result coheres well with the significant effect of additional information found at the group level.

Figure 2: Histogram of difference scores in Experiment 1. Scores were calculated for each participant as the difference in the proportion of choices of the recognized brand in the positive versus negative pairs. Each bin represents the frequency of difference scores between the value of that bin and the next lower bin. Thus bin 0.0 represents difference scores greater than -0.1 and less than or equal to 0.0. Scores greater than zero (dotted line) indicate that additional information influenced choice and 'compensated' for recognition.



2.3 Discussion

The results of Experiment 1 revealed that participants do rely on recognition as their choice strategy in consumer choice. However, inconsistent with Goldstein and Gigerenzer's (2002) proposal, recognition was used in a compensatory rather than non-compensatory way; learning additional information, particularly positive information, was found to significantly increase the proportion of choices of the recognized brand. The results are consistent with previous studies, such as that of Newell and Shanks (2004), which showed that valid compensatory cues were taken into account and used in addition to recognition when participants make inferences about

which of two companies to invest in. Thus, the present results add to the converging evidence against the RH but extend that evidence to preferential choice.

Interestingly, although there was a highly significant overall effect of the additional knowledge about the target recognized brands, negative information did not significantly suppress or decrease the proportion of recognized brands being chosen compared to the control condition, although the effect was in the right direction. One possible explanation for this is that participants did not perceive the negative statements as truly negative about the brands concerned. Indeed, some participants reported as much at the end of the experiment. However, the positive and negative statements were selected in the same manner and concerned similar themes (e.g., health and ethical considerations). Moreover, the magnitude of the negative effect in comparison to the control pairs was almost as large as that of the positive pairs.

3 Experiment 2

Although the results of Experiment 1 show that the additional information significantly affected participants' choice responses, other external attributes (specifically, price) also had some influence on choice. Therefore, it is important to generalize the findings and to test the effect of additional information independent of other external attributes. This is the aim of Experiment 2, which sought to replicate the first experiment and provide a more direct test of the effect of additional knowledge by eliminating price information about the products.

3.1 Method

3.1.1 Participants

A total of 32 participants (mean age = 26.8 years, SD = 9.29) were tested individually, 21 of whom were female. Participants were drawn from a subject pool and each participant was reimbursed UK£3 for their participation.

3.1.2 Design and Measures

The only difference between Experiments 1 and 2 was in the choice task. Instead of deciding which product they are likely to purchase, participants were instructed to imagine that they had won a gift voucher and were given a choice between a pair of consumer products. Their task was to decide which item they would exchange the gift voucher for on each trial. This allowed all the products to have equal implied value and price information to be removed. Additionally, response times were measured.

3.2 Results

3.2.1 Correction for recognition

As with Experiment 1, items were eliminated when the assumptions about which brands participants will recognize were not valid. The recognition test revealed that 3 participants recognized very few of the target brands, such that more than 50% of the critical pairs had to be eliminated for these participants. Consequently their choice responses were excluded, leaving 29 participants in the final analysis. On average, 32% of the critical pairs were lost due to this correction. The mean number of pairs left after correction were 6.73 (SD=1.70) for positive pairs, 6.10 (SD=1.65) for control pairs, and 7.27 (SD=1.39) for negative pairs.

3.2.2 The effect of additional information

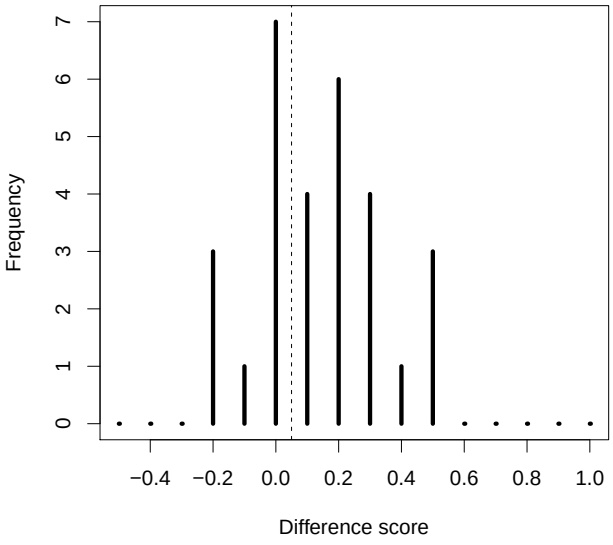
The mean proportion of choices of recognized brands was calculated for each critical pair and is shown in Figure 1. The mean response time was 2.99 seconds per trial. Results from a repeated measures ANOVA revealed an overall significant linear trend across the three types of critical pairs, $F(1,28) = 7.00$, $p = 0.013$. The quadratic trend was not significant, $F(1,28) = 1.51$, $p = 0.229$. Additionally, paired samples t-tests (one-tailed) yielded a significant difference between positive (M=0.67) and negative (M=0.58) pairs, $t(28) = 2.65$, $p = 0.007$, replicating the results of Experiment 1. Unlike Experiment 1, however, in this experiment the major influence seems to be in the negative pairs: the mean proportion of choices of recognized brands was significantly lower for the negative than the control (M=0.66) pairs, $t(28) = 2.31$, $p = 0.015$, whereas no significant difference was found between the positive and control pairs, $t(28) = 0.26$, $p = 0.399$, although the effect was in the expected direction. Lastly, a one-sample t-test of the control pairs revealed that participants' choices followed recognition at a level well above chance (50%), $t(28) = 3.42$, $p = 0.002$.

3.2.3 Individual differences

The difference between the proportion of choices of the recognized brand for the positive and negative pairs were calculated for each participant (see Figure 3). Recall that, if participants follow the RH and if the RH is used in a non-compensatory manner, then – notwithstanding the group-level effect — the majority of participants should have a difference score equal or close to zero. In contrast, positive scores indicate that participants use recognition in a compensatory manner, taking into account other brand information.

As seen in Figure 3, the majority (18/29) of participants had difference scores above zero and only 11/29

Figure 3: Histogram of difference scores in Experiment 2. Scores were calculated for each participant as the difference in the proportion of choices of the recognized brand in the positive versus negative pairs. Each bin represents the frequency of difference scores between the value of that bin and the next lower bin. Thus bin 0.0 represents difference scores greater than -0.1 and less than or equal to 0.0. Scores greater than zero (dotted line) indicate that additional information influenced choice and "compensated" for recognition.



participants had scores less than or equal to zero. As with Experiment 1, the difference between the number of positive and negative scores was different from chance (sign test p=0.04). This is similar to the pattern found in Experiment 1.

3.3 Discussion

The results of Experiment 2 revealed an overall significant effect of the additional information in the absence of the price information. This supports the results obtained in Experiment 1. However, further comparison of the proportion of choices of the recognized brand between the 3 types of critical pairs revealed a slightly different pattern to that found in Experiment 1: positive information no longer significantly increased participants' choice of recognized brands compared to the control condition. Negative information, on the other hand, appeared to reduce the frequency with which the recognized brand was chosen compared to the control condition.

The finding that positive information did not affect participants' choices is rather surprising, especially when a robust effect was obtained in Experiment 1. One possible explanation is that on average, participants in Experiment 2 already chose the recognized brand well above chance level for the control pairs (where they had not learned any additional information about the target recognized brand) and thus learning of positive information may not have been able to significantly increase their choice of the recognized brand. However, participants' proportion of choices of recognized brands for the control pairs (66%) was still far below 100%. Therefore, there appears to still be room for positive information to exert its influence on participants' choice response. Alternatively, the failure to find an effect may simply be due to sampling variability. Whatever the basis of this somewhat different pattern, the crucial finding is that positive information, in contrast to negative information, had a substantial effect on choices in both experiments.

4 General discussion

The role of recognition in inferential choice (e.g., "Which city is larger; Frankfurt or Koblenz?") has been the subject of much recent research. The present article has sought to understand the role of recognition in a different but related domain, that of preferential choice. Although the recognition heuristic was primarily developed in relation to inference, consumer choice based on preferences is another obvious area in which recognition might sometimes be employed in a non-compensatory manner.

The experiments reported here confirm that the familiarity (recognition) of brand products is an important determiner of consumer choice, and that this influence is present whether or not price information is available. However, familiarity is not used in a non-compensatory manner. The recognition heuristic proposes that *"If one of the two objects is recognized and the other is not, then infer that the recognized object has the higher value"* and that "*no other information about the recognized object is searched for and, therefore no other information can reverse the choice determined by recognition*" (Goldstein & Gigerenzer, 2002). In violation of this principle, participants in the present experiments combined product recognition with other brand information, such as whether the manufacturer employed ethical practices. The results are therefore less consistent with the recognition heuristic than they are with a cue integration framework in which all cues are taken into consideration and combined according to their usefulness in pointing to one choice alternative over another. On this account, there is nothing special about recognition other than the fact that it is a highly accessible cue, one that can be contradicted or compensated for by other information. We emphasize that the present experiments were set up to maximize the chances that recognition might be employed in a non-compensatory way, not to test the obviously incorrect suggestion that consumers invariably ignore additional product information.

Pachur et al. (2008) have provided some suggestive evidence that individuals are more likely to use recognition in inferential choice in a non-compensatory fashion when recognition is naturally-occurring rather than experimentally-induced (see also Marewski et al., 2009). For example, studies employing experimentally-induced recognition (e.g., of company names; Newell & Shanks, 2004) typically show more substantial violations of the RH than do ones employing natural recognition (e.g., of city names; Pachur et al., 2008). It is important to note therefore that the current studies examined naturally-occurring brand awareness (e.g., familiarity with the brand Sony), thus making the evidence for the compensatory use of recognition even more compelling. On the other hand, the positive/negative brand information which influenced choices was learned within the experimental setting, and it is possible that this feature of our experiments might have artificially enhanced usage of that information. Indeed, the fact that we tested retention of the additional information after the learning phase and before the choice task may have created a further task demand for participants to consider that information in making their choices. Clearly, future research will need to examine choice tasks in which additional information is presented in a more covert and/or extra-experimental manner.

Across the two experiments reported here, the majority of participants appeared to be influenced by additional information (that is to say, they chose the recognized brands more frequently in positive than in negative pairs). Only 14/59 participants showed the reverse pattern, with a further 6/59 showing no influence. It has been pointed out, correctly, that an aggregate-level effect of additional information on choice is not inconsistent with the majority of individuals utilizing recognition in a non-compensatory way (Gigerenzer & Brighton, 2009; Pachur et al., 2008). It could be the case, for instance, that the choices of a small minority of participants, influenced by positive and negative additional information, cause a group-level effect of additional information, even though the majority of participants behave according to the RH. Our results refute this possibility. Nevertheless, it is interesting to speculate about the behavior of those participants not showing the majority pattern. They could reflect a sub-group who genuinely use recognition in a non-compensatory manner. If so, this would have practical significance and would provide impetus to identify the individual difference factors that pick out this sub-group. On the other hand, it may simply be the case that our measure of behavior is too noisy to firmly classify such individuals as RH-users. Certainly, the fact that some participants counterintuitively chose recognized brands more often when they were associated with negative rather than positive information hints at this latter possibility.

Also worth noting is the fact that, in our experiments — in contrast to those of Pachur et al. (2008) which otherwise used a similar design — only one piece of positive or negative information was provided. Pachur et al. report some evidence that the more information that is provided, the greater the overshadowing of recognition. We would therefore predict even stronger violation of the RH if we taught several pieces of information about recognized brands. Another design issue is that the present study required participants to make a decision involving only two brands. This is unlikely to fully capture the complexity of many real world consumer choices where multiple numbers of branded and unbranded products are present in the consumer choice set. Although models of consumer choice often assume that people iteratively reduce the choice set until only two products remain, the final choice is almost certainly influenced by the prior reduction path in a way that cannot be captured in our two-alternative procedure. Moreover, there are undoubtedly other situations in which only a single object is considered (e.g., a house) and the decision is around whether or not it exceeds some aspiration level or threshold. Future research with different experimental tasks will reveal whether the current two-alternative forced choice results generalize to other consumer choice situations.

We have argued that the present results are more consistent with compensatory than with non-compensatory decision rules, and have based this conclusion on a qualitative finding, namely an influence of additional brand information on choice between a recognized and an unrecognized product. Another way to test compensatory and non-compensatory decision rules, however, is by formal model-fitting in which competing rules are applied on an individual participant basis to choice responses (Bröder & Schiffer, 2003; Marewski et al., 2010). It is of course possible that a model of choice that includes the RH might give a better overall account of behavior across a wide range of situations than a model that does not include it, even if the data include instances where recognition is employed in a compensatory fashion. We have not taken this approach here because our design was intended to provide data concerning a specific qualitative prediction rather than a rich set of observations suitable for discriminating between models according to a criterion of fit. We acknowledge however that an important challenge for future research on consumer choice is to test specific models in which recognition is employed in a compensatory manner. Such tests might also shed light on the important question of whether recognition is employed in a similar way in inference and preference.

It was noted in the introduction that the use of recognition in inference is ecologically rational if recognition is correlated with a mediator variable which in turn is correlated with the criterion. For instance, city name recog-

nition might be correlated with frequency of appearances in the media, which in turn is correlated with city size. Of course, to the extent that recognition influences preferential choice, a different ecological explanation must be sought because preferences cannot be judged against an objective criterion. One possibility is that recognition is a proxy for brand quality. Thus there may exist mediators (such as mentions in the press) which reliably correlate with quality, and which hence license preferences for recognized brands. Another rather different possibility is that greater pleasure is derived from purchasing and consuming recognized products. There is evidence that the very same product (e.g., brand of beer) is rated more pleasurable when it is identified than when it is unidentified (Allison & Uhl, 1964). Such hedonic effects might arise from evaluative conditioning (De Houwer, Thomas, & Baeyens, 2001), but whatever their basis, they provide a reason for consumers to use recognition in forming their preferences.

Yet Hoyer and Brown's (1990) study also reveals the potential disadvantages of relying overly on recognition. Recall that they compared individuals' choice of brands of peanut butter when 3 unknown brands were presented or when 2 unknown brands and one known brand were presented. Participants tasted freely the contents of the 3 jars before making a final choice. From independent blind pre-tests, Hoyer and Brown had objective data about the quality of the different brands of peanut butter and were therefore able to ask how reliably individuals ended up choosing the objectively best brand. Their results revealed that 59% of participants selected the highest-quality brand when tasting amongst 3 unfamiliar brands. However, when one brand was familiar and the other two unfamiliar, only 41% of participants selected the brand with the best quality. It seems that excessive reliance on recognition in consumer choice can lead to insufficient sampling of alternative, and possibly better, products.

Interestingly, Hoyer and Brown (1990) noted a reduction across choice trials in their participants' tendency to select a recognized brand of peanut butter. Participants increasingly reported that their choice was based on the taste of the peanut butter rather than on the brand. This illustrates that people also consider external attributes such as taste as the basis of their choice. Hoyer and Brown's results suggest that the influence of recognition might decline when a decision is made repeatedly and where other evidence, such as experienced quality, is available.

Importantly, although the significant effect of compensatory information observed here violates the assumption of the RH, this effect appears to be consistent with the model of consumer choice sets proposed by Shocker, Ben-Akiva, Boccara, and Nedungadi (1991) (for a model of consideration set generation that is consistent with the RH, see Marewski et al., 2010). Shocker et al.'s model comprises hierarchical stages for the derivation of various product sets in consumer decision making. Consumers are assumed to begin their decision making process with a universal set, which refers to all the alternative products that the consumer could purchase at a particular time. Next, items that the consumer is aware of enter what the authors termed the awareness set. Lastly, before the final choice is made the consumer constructs a consideration set of around 2–6 products where salient and accessible alternatives are considered.

Evidence of the retrieval primacy of subjective recognition (Pachur & Hertwig, 2006) suggests that well-recognized brands enter the awareness set and in turn pass on to the consideration set more readily than less well-known brands. Indeed, Coates, Butler, and Berry (2004) have shown that previous exposure of familiar brand names increased the likelihood that these names would enter consumers' consideration set. However, this facilitative effect did not carry over to participants' final choices. The results of the present study cohere with this pattern of findings. The effects of recognition and additional knowledge on consumer choice are consistent with a multi-stage process (Shocker et al., 1991) in which recognition of brand names increases the likelihood that these branded products will enter the consideration set. However, since selection from the consideration set is assumed to be goal-driven, alternatives are selected from that set depending on their goal-satisfying features. This creates room for compensatory information to be integrated into the decision process before the final choice is made. According to this view, although recognition may be the dominant cue used to filter items into the consumer's consideration set, once the consumer progresses onto the consideration stage, recognition becomes just one amongst several cues that are evaluated and combined according to a compensatory decision rule. Recognition alone may not always guarantee that the well-recognized brand will be the consumer's final choice.

4.1 Conclusion

The study of the role of recognition in consumer choice is still in its infancy. The two-alternative forced choice paradigm used to investigate participants' choices in the present research is clearly not fully representative of the complexity of real consumer choice; further study with more complex and realistic choice tasks is needed. Moreover, given that the effectiveness of the RH depends on its ecological rationality, construction of more naturalistic choice paradigms is crucial. Nevertheless, the present study suggests that consumer choice is a domain in which recognition is employed in a compensatory rather than non-compensatory way.

References

Allison, R. I., & Uhl, K. P. (1964). Influence of beer brand identification on taste perception. *Journal of Marketing Research, 1*, 36–39.

Arnot, C., Boxall, P. C., & Cash, S. B. (2006). Do ethical consumers care about price? A revealed preference analysis of fair trade coffee purchases. *Canadian Journal of Agricultural Economics, 54*, 555–565.

Bornstein, R. F. (1989). Exposure and affect: Overview and meta-analysis of research, 1968–1987. *Psychological Bulletin, 106*, 265–289.

Brandstätter, E., Gigerenzer, G., & Hertwig, R. (2006). The priority heuristic: Making choices without trade-offs. *Psychological Review, 113*, 409–432.

Bröder, A., & Eichler, A. (2006). The use of recognition information and additional cues in inferences from memory. *Acta Psychologica, 121*, 275–284.

Bröder, A., & Schiffer, S. (2003). Bayesian strategy assessment in multi-attribute decision making. *Journal of Behavioral Decision Making, 16*, 193–213.

Coates, S. L., Butler, L. T., & Berry, D. C. (2004). Implicit memory: A prime example for brand consideration and choice. *Applied Cognitive Psychology, 18*, 1195–1211.

De Houwer, J., Thomas, S., & Baeyens, F. (2001). Associative learning of likes and dislikes: A review of 25 years of research on human evaluative conditioning. *Psychological Bulletin, 127*, 853–869.

Gigerenzer, G. (2007). *Gut feelings*. London, England: Penguin.

Gigerenzer, G., & Brighton, H. (2009). Homo heuristicus: Why biased minds make better inferences. *Topics in Cognitive Science, 1*, 107–143.

Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: Models of bounded rationality. *Psychological Review*, *104*, 650–669.

Gigerenzer, G., Todd, P. M., & The ABC Research Group. (1999). *Simple heuristics that make us smart*. Oxford, England: Oxford University Press.

Goldstein, D. G., & Gigerenzer, G. (2002). Models of ecological rationality: The recognition heuristic. *Psychological Review, 109*, 75–90.

Hertwig, R. & Todd, P. M. (2003). More is not always better: The benefits of cognitive limits. In D. Hardman, & L. Macchi (Eds), *Thinking: Psychological perspectives on reasoning, judgment and decision making* (pp.213–231). Chichester, England: Wiley.

Hilbig, B. E., & Pohl, R. F. (2008). Recognizing users of the recognition heuristic. *Experimental Psychology, 55*, 349–401.

Hoyer, W. D., & Brown, S. P. (1990). Effects of brand awareness on choice for a common, repeat-purchase product. *Journal of Consumer Research, 17*, 141–148.

Macdonald, E. K., & Sharp, B. M. (2000). Brand awareness effects on consumer decision making for a common, repeat purchase product: A replication. *Journal of Business Research, 48*, 5–15.

Marewski, J. N., Gaissmaier, W., Schooler, L. J., Goldstein, D. G., & Gigerenzer, G. (2009). Do voters use episodic knowledge to rely on recognition? In N. Taatgen & H. van Rijn (Eds.), *Proceedings of the Cognitive Science Society* (pp. 2232–2237).

Marewski, J. N., Gaissmaier, W., Schooler, L. J., Goldstein, D. G., & Gigerenzer, G. (2010). From recognition to decisions: Extending and testing recognition-based models for multi-alternative inference. *Psychonomic Bulletin & Review, 17*, 287–309.

Newell, B. R. & Fernandez, D. (2006). On the binary quality of recognition and the inconsequentiality of further knowledge: Two critical tests of the recognition heuristic. *Journal of Behavioural Decision Making, 19,* 333–346.

Newell, B. R., & Shanks, D. R. (2004). On the role of recognition in decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 30*, 923–935.

Oppenheimer, D. M (2003). Not so fast! (and not so frugal!): Rethinking the recognition heuristic. *Cognition, 90*, B1-B9.

Pachur,T., & Biele, G. (2007). Forecasting from ignorance: The use and usefulness of recognition in lay predictions of sport events. *Acta Psychologica, 125,* 99–116.

Pachur, T., Bröder A., & Marewski J. N. (2008). The recognition heuristic in memory-based inference: Is recognition a non-compensatory cue? *Journal of Behavioral Decision Making, 21*, 183–210.

Pachur, T., & Hertwig, R. (2006). On the psychology of the recognition heuristic: Retrieval primacy as a key determinant of its use. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 32*, 983–1002.

Pohl, R. F. (2006). Empirical tests of the recognition heuristic. *Journal of Behavioral Decision Making, 19*, 251–271.

Richter, T., & Späth, P. (2006). Recognition is used as one cue among others in judgment and decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 32*, 150–162.

Serwe, S., & Frings, C. (2006). Who will win Wimbledon 2003? The recognition heuristic in predicting sports events. *Journal of Behavioral Decision Making, 19*, 321–332.

Shocker, A. D., Ben-Akiva, M., Boccara, B., and Nedungadi. P. (1991). Consideration set influences on consumer decision-making and choice: Issues, models and suggestions, *Marketing Letters, 2*, 181–197.

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist, 35*, 151 - 175.

Appendix 1

Products used in Experiments 1 and 2. Brands presented as the recognizable items in the critical pairs are marked with an asterisk.

Chocolate	**Shower gels**	**Crisps**	**Head phones**	**Tennis racquets**
Butlers	All about Body	Burts*	AKG	Avery
Cadbury*	Aubrey	Cape cod	Apple*	Babolat*
Callebaut	Bnatural	Dirty	Audio Technica	Becker
Crave	Bonicca	Discos	Belkin	Bosworth
Ferrero Rocher*	Dove*	Doritos*	Bose*	Donnay
Green and Blacks	Earth Dance	Ecomonti	Creative	DSX
Hachez	Ecover*	Good's	Denon	Dunlop*
Hershey*	Ghost	Hula Hoops	Etymotic	Ergonomic
Kinder Bueno	Ikove	Kettle*	Goldring	Fischer
Kitkat	Imperial Leather	Marks and Spencer	JVC	Fox
Maltesers	Johnson & Johnson*	Mad House Munchies	Klipsch	Gamma
Mars*	Joop	McCoy*	Koss	Greys
Merci	Kiss my Face	Mini Cheddars	Panasonic	Head*
Niederegger	Miessenoe	Penn State	Philips	Kneissl
Nestlé*	Nivea*	Pipers crisps	Pioneer*	Power Angle
Perugina	Olay	Poore Brothers	Plantronics	Prince*
Sarotti	Original Source*	Pringles*	Sennheiser*	Prokennex
Seeds of change	Palmolive*	Seabrook	Shure*	Slazenger
Snickers	Pangea	Sensations	Skull Candy	Snauwaert
Suchard	Pears	Tetra min crisps	Sony*	Technifibre
Theo	Pure and Natural	Tim's	Thomson	Tennica
Toblerone*	Radox	Twiglets	Ultimate	Volkl
Toffee crisp	Sanex	Walkers*	V-moda	Wilson*
Twix	Yujin	Wise	Xtreme	Yonex*

Appendix 2

The positive (+) and the negative (-) statements used in Experiments 1 and 2.

Chocolate

1. **Mars**
   (+) "Mars is committed to the Harkin-Engel Protocol, which outlines a series of date-specific steps to ensure that cocoa is grown free from abusive child labour."

   (-) "Mars has come under criticism by People for the Ethical Treatment of Animals for funding animal tests which the group alleges are inhumane."

2. **Hershey**
   (+) "Hershey strives to be responsible for the environment by using lighter foil in their packaging which reduced aluminum use by 10%."

   (-) "Hershey import cocoa beans from the Ivory Coast, where there is intensive child labour and enslavement."

3. **Ferrero Rocher**
   (+) "Ferrero's "Share Something Sweet" campaign helps raise awareness of the critical problem of childhood hunger in the U.S while raising funds to solve it."

   (-) "Ferrero uses palm oils in their products and claims that it isn't willing to support the moratorium on forest destruction in South East Asia."

4. **Nestlé**
   (+) "Nestlé recently introduced the Nutritional Compass on packages of their products to help consumers quickly and easily understand their nutritional benefits."

   (-) "Nestlé's baby milk marketing campaign, which promoted their milk products as a more healthful option than breast milk, allegedly led babies in developing countries to be exposed to various health problems caused by incorrect use."

5. **Cadbury**
   (+) "Cadbury has a number one confectionary market position in 20 of the world's 50 largest confectionary markets by retail sales value."

   (-) "Cadbury's "Get Active" campaign, which involved the collection of tokens on chocolate bars and redeemed by schools for sports equipment, was ironically criticized as misguided for using chocolate bars to promote sports."

6. **Toblerone**
   (+) "Food manufacturer, Toblerone Kraft, constantly evaluate their products with the aim of reducing calories, sugar and fat."

   (-) "One of Toblerone Kraft's food manufacturing plants was found to produce toxic waste and was consequently fined for violating the Clean Air Act of 1970."

Shower gels

7. **Dove**
   (+) "Dove is the world's number one cleansing brand which outsells all other skin care bars combined in the U.S."

   (-) "Unilever, Dove's parent company, was criticised for launching a controversial campaign, with Dove promising to educate girls on a wider definition of beauty while other Unilever ads, such as Axe, exhort boys to make 'nice girls naughty'."

8. **Nivea**
   (+) "Nivea research centre in Hamburg is one of the most modern in the world."

   (-) "Some of Nivea products do not appear to be recommended by any skin professionals and/or dermatologists."

9. **Johnson and Johnson**
   (+) "Johnson & Johnson continue to assess their products after they reach the market with procedures in place for immediate field action if a problem is found."

   (-) "The Tylenol tampering incident had caused Johnson & Johnson to withdrawn this product from the market."

10. **Ecover**
    (+) "Ecover has won the 2006 Allergy Awards for Best Home Solution Range."

    (-) "Ecover has been engaging in animal testing."

11. **Palmolive**
    (+) "Palmolive was voted as the Best North American Company in UK market."

    (-) "Colgate-Palmolive is one of the companies responsible for hazardous waste at New Jersey, contributing to the contamination of an estimated 18,500 cubic yards of soil."

12. **Original Source**
    (+) "Original Source's products contain 100% pure and natural essential oils as well as a variety of natural extracts from different parts of fruit."

(-) "Original Source shower gels are most often criticized in consumer reviews for their short-lived fragrance and insufficient moisturizers."

Crisps

13. **Walkers**
(+) "Walkers made changes to their production and distribution processes resulting in reduced carbon emissions."

(-) "Walkers crisps has one of the lowest ethicscore (1.5) ratings from Ethical Consumer, the UK's leading alternative consumer organisation."

14. **Kettle**
(+) "Kettle's crisps are made from 100% natural ingredients and have fewer than 100 calories per pack, with less than 10% fat."

(-) "Campaigns were launched on Facebook calling for a boycott of Kettle Foods products following allegations that the company was attempting to prevent workers from joining trade union Unite."

15. **McCoy**
(+) "McCoy is now the 3rd biggest brand in the bagged snacks market with 5 million packs consumed each week."

(-) "McCoy crisps are often viewed as too salty and thus bad for health."

16. **Doritos**
(+) "Doritos' crisps are cooked in Sunseed oil which reduces saturated fat by 75%."

(-) "Frito-Lay, Doritos' manufacturing company, used genetically modified crops."

17. **Burts**
(+) "Burts crisps was voted as Observer food monthly's favourite."

(-) "The production process of Burts crisps has generated large amounts of waste with too many potatoes and crisps being thrown away."

18. **Pringles**
(+) "Pringles crisps are sold in more than 100 countries."

(-) "Pringles crisps were reportedly found to contain elevated levels of a cancer-causing chemical."

Headphones

19. **Sony**
(+) "Their packaging uses recyclable paper to reduce the impact on the environment."

(-) "Sony recently fell from its earlier 11th place ranking on the Greenpeace chart due to Greenpeace's claims that Sony had double standards in their waste policies."

20. **Pioneer**
(+) "Pioneer offers an innovative and extensive product tailored to customers' lifestyle with R&D expenses of 9% of sales revenue."

(-) "Consumer reviews have rated Pioneer's headphones as harsh sounding and as having an unnatural, hollow, unmusical quality to them."

21. **Shure**
(+) "Shure corporate headquarters and all of its North American manufacturing plants are certified to the ISO 9001:2000 standard."

(-) "According to some consumer reviews, although Shure's sound quality is good, the wires are very bad, becoming stiff and even a little brittle very quickly."

22. **Bose**
(+) "Bose was awarded the Aviation Consumer Magazine "Product of the Year"."

(-) "Bose does not publish specific technical specifications on either their packaging or their website and none of Bose's products are THX certified."

23. **Apple**
(+) "Apple produces PVC-free handsets and headphones in the aim to restrict the use of environmentally harmful compounds."

(-) "Apple was criticized for their lackluster response to the reported fault, indicating quality control and customer support problems."

24. **Sennheiser**
(+) "Sennheiser has recently been nominated for outstanding technical achievement accolades, which will be presented at the 24th Annual TEC Awards."

(-) "Customer reports revealed that Sennheiser headphones can give headaches/pains from the pressure put on the head by the headphones."

Tennis racquets

25. **Head**
(+) "Head is a leading global manufacturer and marketer of premium sports equipment."

(-) "Customers reviewed Head racquets as a bit light in weight causing shots to get a little erratic."

26. **Wilson**
(+) "Wilson's sales revenue is used to maintain its ongoing support of Breast Cancer Research Foundation."

(-) "Some customers reviewed Wilson racquets as not having enough power overall."

27. **Dunlop**
(+) "Amelie Mauresmo wins Australian Open and Wimbledon in the same year using Dunlop racquet."

(-) "Some Dunlop racquets are viewed as having no spin and no feel."

28. **Prince**
(+) "Prince is the inventor of O3 Speedport design which is up to 24% faster through the air and has a sweet spot that is up to 59% larger than a traditional racquet."

(-) "Some customers reported dislike of Prince's O3 Speedport design, claiming that they did not find a valuable use of the technology."

29. **Babolat**
(+) "Babolat is the first company to have specialized in racquet sports."

(-) "The combination of stiffness in Babolat racquets as well as some of the string choices could lead to elbow soreness."

30. **Yonex**
(+) "Yonex was awarded "Super Brand" in Hong Kong, Indonesia, Malaysia, and Singapore."

(-) "Yonex racquets are viewed as too unstable and therefore don't give much control."