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Consumers and climate change: Can the presence of others promote more sustainable consumer choice?

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Abstract

The IPCC have identified aspects of human activity that contribute to greenhouse gas emissions and thereby affect climate change. These include ‘lifestyle’, the behavioural choices we make as consumers in our everyday lives. One important issue is how the presence of others affects consumer choice. Here, we compared the product choices of a set of participants when shopping alone or with friends. We found that people are more likely to select well-known brands, luxury products and organic or eco brands when shopping with friends. Costly signalling theory can explain these findings by suggesting that we display our ‘economic success’ or ‘pro-social orientation’ through our patterns of consumption. However, our participants were significantly more likely to choose low-carbon items when shopping alone. This raises significant concerns about whether carbon labelling can genuinely work as an enabling

factor. We suggest how we might raise the social and communicational value of carbon labels.

Key words: consumer choice, climate change, carbon labelling, costly signalling theory.

Introduction

The evidence for climate change is now unambiguous and there is a striking scientific consensus on this issue (IPCC 2013; 2014). In addition, according to the Intergovernmental Panel on Climate Change (IPCC), the role of human activity in causing climate change is also ‘clear and growing’ (according to the foreword to the IPCC Synthesis report, p.v). The Synthesis Report (SYR) says that ‘the IPCC is now 95 percent certain that humans are the main cause of current global warming’ (IPCC 2015, p.v). However, these extremely pessimistic conclusions are then followed by one much more optimistic assertion, namely that ‘the SYR highlights that we have the means to limit climate change and its risks, with many solutions that allow for continued economic and human development’ (IPCC 2015, p.v). A search for the means to limit climate change must be a number one global priority.

The IPCC identifies a number of aspects of human activity that contribute to greenhouse gas emissions (GHG), and thereby affect climate change. These include such things as population size, economic activity, energy use, land use patterns, technology, and climate change policy. However, they also include another major factor that they identify as ‘lifestyle’ where ‘lifestyle’ reflects aspects of the behavioural choices that we make in our everyday lives that have an effect on GHG. Of course, the reason that ‘lifestyle’ could be particularly important in this context is that it is something that could potentially change

(and potentially change faster and more dramatically than many of the other factors like ‘population size’ or ‘land use patterns’). Indeed, ‘lifestyle’ is identified as one of the common enabling factors that underpin adaptation and mitigation responses, according to the IPCC. Clearly, we need a much better understanding of the variables that influence lifestyle choices, and particularly those choices with a direct bearing on GHG, if we are to prevent further changes in our climate. This is the focus of the present study. We empirically investigate one very simple but extremely important question: How does the presence of others, while we are shopping, influence our choices of more sustainable products? The IPCC highlights a number of policy instruments for changing behaviour, including the labelling of fuel or other products and the clear identification of vehicle efficiency. However, when products are labelled (either in terms of their environmental consequences for example, ‘eco’/‘organic’ etc. or in terms of their carbon footprint) how does the presence of others affect whether they are selected or not? This important question has not yet been answered in terms of systematic empirical research.

There are two broad hypotheses that one might develop to predict the likely effects. One hypothesis is that the presence of others should lead consumers to focus more on the environmental labels (either organic/eco or carbon label) because of the growing awareness about climate change among the public and their belief that climate change is ‘real’ (Leiserowitz 2006). The public also say in numerous surveys that they are prepared to adapt their

behaviour to help reduce climate change (Downing and Ballantyne 2007; Park et al. 2012) and that they want more information about the associated environmental impacts of their purchases (Berry, Crossley and Jewel 2008; but see also Beattie 2010; Beattie and Sale 2009; 2011). Selecting environmentally friendly options or low-carbon products, while in the presence of others, allows people to present their very public concerns about the environment and climate change, and indeed potentially elevate their social status in the group through this public display of environmental awareness (Griskevicius, Tybur and Van den Bergh 2010). The second broad hypothesis is that there are more pressing concerns when shopping than the environmental features of the products. Such things as brand reputation, price, and the value for money of the products are likely to be more significant variables in guiding consumer choice. The environmental features of such products could well be significantly less important than any of these other features. Furthermore, features like ‘brand reputation’ and ‘value for money’ are also highly likely to be influenced by the presence of others as consumers wish to display that they can afford luxury items or branded goods, or that they are keen to get value for money from their purchases. Both of these broad hypotheses now need to be elaborated and shown not just to be plausible but highly credible in the light of both theory and the existing empirical evidence.

Social status and consumer choice

The starting assumption for both hypotheses is the observation reported in a number of academic disciplines that consumer choice and social status are connected (see Hopkins and Kornienko 2004; Han, Nunes and Dreze 2013; Kim and Jang 2014). Indeed, the public display of status through purchased goods has been defined as ‘conspicuous consumption.’ The economist Thorstein Veblen first coined the term ‘conspicuous consumption’ in 1899 in his classic book ‘The Theory of the Leisure Class’, where he used it to define ‘the advertisement of one’s income and wealth through lavish spending on visible items’ (Heffetz 2011, p.1101). Here consumption is understood as a communicational act, which occurs in a social context and which interlocutors can interpret. Implicit in this theory is that shopping with others may well influence consumer choice.

There are many different theoretical perspectives on conspicuous consumption, including one that derives from evolutionary biology, namely ‘costly signalling theory.’ The basic premise behind this theory is that certain animals (including humans) use conspicuous display as a form of communication that signals inclusiveness fitness. However, these displays must come at a cost, in that they need to take a considerable amount of ‘effort, risk, economic resources and time’ to work in this respect (see Griskevicius et al.

2007). Take, for example, the peacock, displaying its tail to attract attention during courtship in order to signal the quality of its genetic makeup by the sheer elegance and spread of its feathers. This is obviously a costly signal in that this elaborate signal makes the peacock more vulnerable to predators.

For an action to qualify as ‘costly signalling’ it needs to meet the following four criteria. Firstly, it ‘must be costly to the signaller in terms of economic resources, time, energy, risk or some other significant domain...Second, it must be easily observable by others. Third, the display must ultimately increase the odds that the signaller will gain some fitness advantage through the display, such as increased ability to attract desirable mates. Finally, the signal must be an indicator to potential mates of some important trait or characteristic, such as access to resources, pro-social orientation, courage, health, or intelligence’ (Griskevicius et al. 2007, p. 86).

Expensive or luxury purchases (Veblen 1899) obviously meet these criteria (and commercial advertising, of course, is based upon this fundamental idea). The ostentatious purchase of luxury goods (the adverts tell us) will lead us to attract more friends and sexual partners through our ability to signal that we have access to the appropriate financial resources (Black and Morton 2015). The question is whether the purchase of more environmentally friendly or more sustainable products could potentially follow similar principles. Some environmentally friendly products are more expensive (Ling 2013; Rödiger and Hamm 2015), so purchase of these products is a rather straightforward (but

important) way in which inclusive fitness can be signalled (more access to financial resources). However, what happens if the environmentally friendly or low-carbon products are not more expensive? Can they still signal inclusive fitness as defined by costly signalling theory? After all, they can still be configured to meet the four criteria (from Griskevicius et al. 2007, p. 86). Firstly, they are costly to the signaller in that the consumer choosing the products needs to have spent the time in learning about and understanding environmental issues or carbon footprint (and to have spent the time in situ interpreting the label on the product itself). Secondly, the selection of the environmentally friendly or low-carbon products is potentially observable by others (because of the presence of labels on the products). Thirdly, caring about our environment/planet could perhaps make you more desirable to others, and, fourthly, the behaviour in question could be an indicator to possible mates of an important trait or characteristic, namely pro-social orientation.

Griskevicius, Tybur, and Van den Bergh (2010, p. 392) suggested that there are indeed links between pro-environmental consumer choice and elevated status and ‘that activating status motives can lead people to shy away from luxury and instead choose self-sacrifice.’ They argued that people are indeed willing to act pro-environmentally because it enhances their social status.

Griskevicius, Tybur, and Van den Bergh (2010) used the example of the Toyota Prius (a ‘green’ hybrid car that costs more than a conventional equivalent) and compared it with the Honda Civic (a cheaper but highly efficient equivalent

standard car). In a survey conducted in 2007 among customers who had purchased the Toyota Prius, advertised as ‘the planet’s favourite hybrid,’ over half of the people in the survey said that the main reason for buying the Prius was that it ‘makes a statement about me.’ Only a quarter of the customers bought the car because it actually had lower emissions (Maynard 2007). One owner openly admitted ‘I want people to know that I care for the environment.’ In other words, the main reason for buying a Prius may be social identity, and elevating social status through consumer choice.

Griskevicius, Tybur and Van den Bergh (2010) then empirically investigated the connection between pro-environmental behaviour and elevated status. Participants in their study were given a ‘motivational prime’ in the form of a short story that was aimed to prime high status motivation. The short story required them to imagine that they were ‘graduating from college, looking for a job, and deciding to go work for a large company because it offers the greatest chance of moving up’ (2010, p. 395). The story went on to describe the upmarket place of work with its ‘upscale lobby and nice furniture.’ As the readers came to the end of the story, they ‘learn that they will have an opportunity to receive a desirable promotion. The story ends as the reader ponders moving up in status relative to his or her same-sex peers’ (2010, p.395). In a control condition, participants were also asked to read a story of a similar length that was not designed to prime social status. Instead, the participants ‘read about losing a ticket to an upcoming concert and searching through the

house. After the person finds the ticket, he or she heads off to the concert with a same-sex peer' (2010, p.395). There was also a second control condition where participants did not read a story, but simply had to make their product choices. After the various manipulations, participants had to imagine that they were out shopping for three different products: a car, a household cleaner, and a dishwasher. For each product, there was a luxury option and an environmentally friendly option. Both options were similar in price, made by the same manufacturer and had three key features describing the product. So for example, in the case of the dishwasher, the luxury option was describes as follows: 'Sub-zero ED40 Elite Dishwasher (\$1,100). Comes in choice of stainless steel or white exterior with black chrome trim. Features a revolutionary heated drying system that eliminates water spots. Has powerful water sprays but produces no sound' (2010, 404). The pro-environmental version was described as: 'Sub-zero Eco-trend Dishwasher (\$1,100). Has a standard 40-minute running cycle. Uses a recirculating water system to save water. Is made with recycled components' (2010, p.404). Participants saw the products on a computer screen in random order and were asked: 'If you were out shopping for a car/dishwasher/household cleaner, which of these two products would you buy?'

The study revealed that in the control condition, participants were more likely to choose the luxury options than the pro-environmental options, whereas, in the experimental group, where participants had been primed with the status motivation story, they were more likely to choose the pro-environmental option.

The authors concluded that ‘activating status motives led people to increase the likelihood of choosing pro-environmental green products over more luxurious non-green products’ (2010, p.396).

This study tells us that pro-environmental consumer choice can relate to status and that it is possible to prime this form of behaviour. Griskevicius, Tybur and Van den Bergh (2010) then considered the effects of social context on this, by investigating the choice of ‘luxurious non-green products’ and ‘green products’ in a private setting (shopping online) versus a public setting (shopping in a supermarket). Participants again read the same story designed to prime status motivation, with a control group reading a story unrelated to status motivation. For the private setting condition, participants were told to ‘imagine that you are shopping online by yourself at home’ and in the public setting, participants were told to ‘imagine that you are out shopping at a store.’ Participants then had to ‘indicate their preferences between three green versus three non-green products.’ The items were a backpack, some batteries, and a table lamp. Again, each product had a ‘green’ and a ‘non-green’ alternative that were similar in price and manufactured by the same company. The results revealed that when participants in the priming condition had to imagine that they were shopping in public, they showed an increased preference for green products compared to the control condition. However, when shopping in the private condition, participants in the priming condition actually showed a decrease in the preference for green products. The authors conclude that ‘when

purchases are being made in private - when reputational costs were not salient - activating status motives appears to somewhat increase the attractiveness of luxurious (non-green) products... status motives increased attractiveness of pro-environmental products specifically when people were shopping in public. When people were shopping in private, however, status motives increased desire for luxurious, self-indulgent non-green products' (2010, p.397). In other words, when people were aware that their choices could be observed by others, and had the possibility of influencing other peoples' perception of them, they were more likely to choose pro-environmental products.

In the next study of this series, Griskevicius, Tybur and Van den Bergh (2010) investigated what happens to behavioural choice when the green and non-green items are priced differently. They found that the experimental participants were more likely to choose green products when they were more expensive than the non-green products. However, when the non-green products were more expensive, and, in addition, status motivation was activated, the green items were selected less often than their more expensive non-green counterparts. In other words, price is more effective than environmental features in signalling status.

The research by Griskevicius and his colleagues suggests that costly signalling theory may well underpin pro-environmental behavioural choice, particularly in the presence of others. However, at the same time, the results of their final study highlights the plausibility of the second broad hypothesis

outlined earlier. Environmental features may drive more sustainable choices in the presence of others (because of the relationship between apparent pro-social behaviour and status), but other features like cost may be equally or more important (because of the relationship between resource and status). In other words, both broad hypotheses are plausible in the light of the existing empirical evidence.

When we consider environmental choice at a more specific level (for example, organic/eco versus carbon footprint), there are a number of other important considerations. Some environmental labels, like ‘organic,’ have been around for a considerable time and are well recognized. Organic farming began in the early part of the 20th century (Padel 2001), pioneered by Sir Albert Howard, who encouraged ‘natural farming techniques.’ However, it was not until 1940 that the label ‘organic’ was applied to this form of natural farming when Lord Northbourne (1940) coined the term in his book ‘Look to the Land’. The early 1990s saw an increase in the popularity of organic products, which coincided with the encouragement of organic farming by the European Union. Since then the popularity of organic food has risen and its total sales in the last decade have quadrupled globally (Czarnezki 2011). In 2002, the official label was introduced in the US by the Department of Agriculture (Heckman 2006) and is now used in over eighty countries worldwide (USDA 2015). As well as carrying an organic label certifying that the particular item has been farmed without the use of chemicals, organic food is usually packaged in such a way

that the design will ‘carry graphic design work characteristic of organic produce for effective advertising’ (ITC 2012, p.4). Typically, the word ‘organic’ is displayed in large lettering on the front of the packaging so it is obvious to the consumer that the product is indeed organic.

Similar to organic products, the packaging of ‘eco’ products, or products that are ‘ecologically friendly’ are usually designed with large lettering and graphics that make it obvious to the consumer that the particular item is better for the environment describing the item as ‘eco’ or ‘ecologically friendly.’ Eco products have less impact on the environment than their standard equivalent. Although products labelled as ‘eco’ do have to meet certain standards, they are not regulated by the government so the standards are likely to be less stringent than they are for organic labelling (Loureiro, McCluskey and Mittelhammer 2001).

We might select ‘organic’ or ‘eco’ labels more often when shopping with friends because the labels are culturally familiar and thus will have high signalling value. Other environmental labels, however, may have much less of an impact. For example, Gadema and Oglethorpe (2011) asked 428 participants to rank order the attributes displayed on packaging that they felt would benefit them most when shopping. The three most important attributes were information about quality and taste, nutritional information and price. The three least important attributes were information about food miles, information about the carbon footprint of the product, and the attractiveness of the packaging.

Obviously, information about food miles and carbon footprint are critical if individuals are going to prioritise more sustainable forms of shopping, but they appear not to be seen as important.

Moreover, Upham, Dendler and Bleda (2011) showed that there was little understanding of the concept of the carbon label. They found that, although all of their participants in the focus groups were aware of carbon footprint labels, the vast majority of their participants were confused about the carbon emission measurement included on the label. Participants showed their lack of understanding of the contents of the carbon footprint labels with comments such as ‘when you see stuff like 12 kg and 55 kg, how much is that, what does that actually mean? I can’t quantify it in any way’ and ‘I’ve no idea what 260 g of carbon looks like...I have no idea what the impact of 260 g is like’ (Upham, Dendler and Bleda 2011, p.352). Upham, Dendler and Bleda (2011, p.348) concluded that ‘The public found it very difficult to make sense of labelled emissions values without additional information.’

Beattie, McGuire and Sale (2011) investigated visual attention to carbon labels on actual products in an eye-tracking study, where they analyzed individual gaze fixations at images of various products (a light bulb, orange juice, and detergent) presented on a computer screen. Each product had a carbon label clearly displayed on the front or back. The study revealed that the carbon label was the focus of the first fixation in only 7% of overall cases. This suggests that the carbon label was not of immediate concern to most of the

experimental participants. It also found that the participants showed little visual attention to the carbon label in the first five seconds of viewing (roughly the time taken to make a selection in a supermarket, see Louw and Kimber 2007; Young 2004). For example, only 5.2 frames of the forty-millisecond gaze were directed to the carbon label in the case of the detergent product, which is only 4% of the total five-second period (see also Beattie 2012; Beattie and McGuire 2015).

Thus, there is empirical evidence that organic or eco products may have labels that are familiar to people, and generally understood (Loureiro, McCluskey and Mittelhammer 2001), and therefore could potentially signal social status in the way that luxury or branded items do (albeit on an added dimension). However, the social signalling value of carbon footprint information is likely to be currently much less potent because the concept appears to be poorly understood (Upham, Dendler and Bleda 2011) and because it elicits only limited visual attention (see Beattie 2010; Beattie, McGuire and Sale 2011; Beattie 2012; Beattie and McGuire 2015).

Our experimental hypotheses are, thus, as follows:

H1: Participants will be more likely to choose both well-known brands and luxury brands when shopping with friends than when shopping alone in comparison to value brands.

H2: Given that organic/eco products are widely recognised and, in addition, signal pro-social status and increased resource, participants will be more likely to choose them when shopping with friends compared to value brands.

H3: Organic/eco brands should behave in a similar fashion to well-known brands and luxury brands given their associative links with social status. We, therefore, predict that there should be no difference in the choice of organic/eco brands versus popular/luxury brands when shopping with friends compared to shopping alone.

H4: The choice of high/low-carbon footprint products will not be affected by whether a consumer is shopping alone or with friends. This is because most participants could reasonably doubt that their friends will recognize and understand the carbon label and therefore its choice will have little value in signalling social status.

Method

Participants

We recruited fifty participants to take part in this experiment (nineteen male and thirty-one female). They were required to make ten product choices under two conditions (resulting in 1000 product selections to be analysed). The mean age of participants was 27.7 ranging from eighteen to sixty-seven. Participants

included staff and students from Edge Hill University (n= 34), and members of the public (n=16), recruited using opportunity sampling. Each participant received £5.00 for taking part in the experiment. Edge Hill University Research Ethics Committee (UREC) granted ethical approval for this research.

Participants were informed about the test procedure, told that they could withdraw at any point during the experiment, and told that their data could be removed and destroyed at any point up to three weeks after they had taken part in the experiment (no participant asked for their data to be removed and destroyed).

Stimuli

Ten products were selected for this study (see also Beattie and McGuire, forthcoming). These were everyday products, which would be central to any family weekly shop. The products chosen were breakfast cereal (bran flakes), bread, cheese, coffee, fabric conditioner, ice cream, orange juice, soup, toilet roll, and washing up liquid. These products have a variety of information labels on the front of the products. The number of these informational labels varies from product to product, and depends to a certain extent on the price and brand of the product, with the more expensive products having either more information labels or more of their surface area covered by image, logo, or icon. For example, the Sharpham Park Morning Multi Flakes (as sold in the UK) is an expensive brand of cereal (a 'luxury' brand in our jargon). It retails at £2.99

(compared with £1.38 for a supermarket's own brand, in other words, more than double the price). It contains the following information:

1. Name of product ('Morning Multi Flakes').
2. Image of product.
3. Name of brand ('Sharpham Park').
4. Source of product ('British Grown Grains').
5. Health relevant information ('naturally high in fibre').
6. Product description ('Deliciously crispy, light multigrain rice flakes').
7. More product description ('No wheat grains').
8. Nutritional information.
9. Size/weight of product ('375 grams').



Figure 1: Sharpham Park Morning Multi Flakes.

On the other hand, the cheapest (bran flakes) breakfast cereal – the Asda ‘chosen by you’ brand (retailing at £1.38) contained the following information:

1. Name of product (‘Bran Flakes’)
2. Image of product
3. Name of brand (‘Asda Chosen by you’)
4. Health relevant information (‘Bran enriched wheat flakes, fortified with vitamins....’).

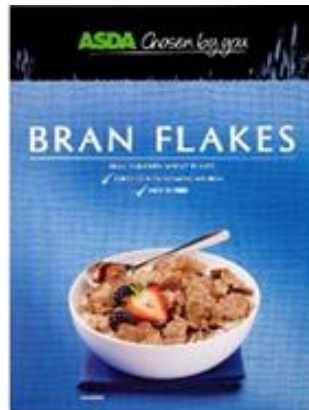


Figure 2: Asda ‘chosen by you’ Bran Flakes.

In the case of the washing up liquid, ‘Town Talk Polish Co ltd’ is a luxury brand that retails in the UK at £4.15, which compares with 80p for the supermarket’s own brand. It contained the following information, which covered a significant surface area of the product:

1. Name of product (‘Washing up liquid’)
2. Name of brand (‘Town Talk 1895 Polish Co ltd’)
3. Image of a man with a top hat doing the dishes

4. Product description (‘ Superior’)
5. Scent of product (‘basil and lime’)



Figure 3: Town Talk Polish Co ltd washing up liquid.

The cheapest washing up liquid used in this study, the ‘Tesco’ own brand contained the following information:

1. Product description (‘Original’)
2. Name of brand (‘Tesco’)
3. Name of product (‘Washing up liquid’)
4. Image of a white casserole dish surrounded by bubbles



Figure 4: Tesco's own brand washing up liquid.

For each product we selected four variations - luxury (the most expensive), well-known brand (brands like Heinz, Kellogg's, Hovis etc.), value (the cheapest alternative, invariably the supermarket's own brand), and organic/eco (identified as either 'organic' or 'eco' on the product itself). So, for example, in the case of the bread, the luxury brand selected was Burgen, the well-known brand was Hovis, the value brand selected was Tesco, and the organic/eco brand was Cranks (see Figure 5).

	Luxury	Well-known brand	Value	Organic/eco
Bread				

Figure 5: An example of the images selected for bread.

The price of each product was then superimposed onto the image of the product; price was always represented in white numbers on a black circular background. The positioning of the price sticker was always in the same location across the four individual products in that set (but did vary from set to set). So for example, in the case of cheese, the price sticker was superimposed on the bottom left-hand corner of the product. When it came to bread, in each case the sticker was superimposed on the top right-hand corner. The prices superimposed on the images of the products were always the actual prices. The luxury brands were always the highest in price, then organic/eco, then the well-known brands followed by the value brands. All of the original details on the product remained the same and were not altered in any way, rather information was merely added to them.

As well as the addition of price information, the carbon footprint value for each item was superimposed onto the front of each product. Our intention was to manipulate carbon footprint information in order to test experimentally its effects on consumer choice. The question was whether carbon footprint information could influence consumer decision making. This is a very important theoretical and practical issue for many businesses concerned about climate change. A core consideration was to vary carbon footprint in a systematic way by beginning with the actual carbon footprint of the product (derived from a variety of sources from both government and commercial databases) and then

recalculating three additional values using this as the baseline in order to generate two high and two low-carbon footprint values. For example, in the case of soup, we started with 186 grams CO₂ for a standard can of generic soup. This was represented with a '186g' on a black footprint and assigned arbitrarily to the value version of the product. This figure was then halved to generate a lower carbon footprint value (93g CO₂). This was represented with a '93g' on a green carbon footprint and assigned arbitrarily to the well-known brand version of the soup. Then we subtracted 10% from this value to generate the lowest carbon footprint value. We represented this with '84g,' also on a green background. Finally, 10% was added to the starting value which generated the highest carbon footprint value (here represented by '205g' on a black background). This was arbitrarily assigned to the organic/eco brand of the soup. In the case of the other products the high and low values were assigned arbitrarily to the different versions of the products (luxury, well-known brand, value and organic/eco). The only constraint was that each of the ten products had to have an equal number of high and low-carbon footprint labels attached (five of each in the final tally). The images of the various products complete with the added carbon footprints and price stickers were then placed on a white background and laminated, creating a series of flash cards. There were forty flash cards in total.



Figure 6: An example of the 'Heinz Classic Cream of Tomato Soup' with a price sticker at the bottom right corner and a low carbon footprint in the top left corner.

It is important to emphasise that these stimuli were very different to those used by Beattie and McGuire (2015). In this previous study the products had only rudimentary information and did not really approximate the richness of real, heavily branded and marketed consumer products. Here, we have a very different scenario in that we have used images of *real* products where the items have much more detailed information to compete with carbon footprint, which is much more typical of items found in the supermarket. The question is, in this study, would carbon footprint information impact significantly on the actual choice of products in competition with these other features like luxury, well-known, value, and organic/eco?

Shopping task

Forty flash cards were laid out on a table. There were ten different products (bran flakes, bread, cheese, coffee, fabric conditioner, ice cream, orange juice, soup, toilet roll, and washing up liquid) with four different brand variations of each (luxury brand, well-known brand, value brand, and organic/eco brand). The four different brands for each product were laid out in a row. The particular order within the row was changed for each new participant. Each participant was asked to select a choice of items under a number of shopping conditions that included shopping alone ('imagine yourself shopping alone in a supermarket') and shopping with friends ('imagine yourself shopping in a supermarket you are shopping with friends'). There was no time pressure. We randomised each condition between participants to control for possible order effects. Participants had to select ten products in total. Once they had chosen their first product, we asked them to select the next and so on. The order in which they had to choose the products was randomised across both conditions. Each participant was asked to complete the shopping task for all products under one condition before moving on to the next condition.

Results

(1) Consumer choice whilst shopping alone: descriptive statistics.

The first analysis focused on the relationship between brand and consumer choice while shopping alone (see Figure 7). It was immediately apparent that

the brand chosen most frequently when shopping alone was the well-known brand (38.0% of all selections) followed by the value brand (32.4%), followed by the organic/eco brand with 17.0%, and lastly the luxury brand at 12.6%.

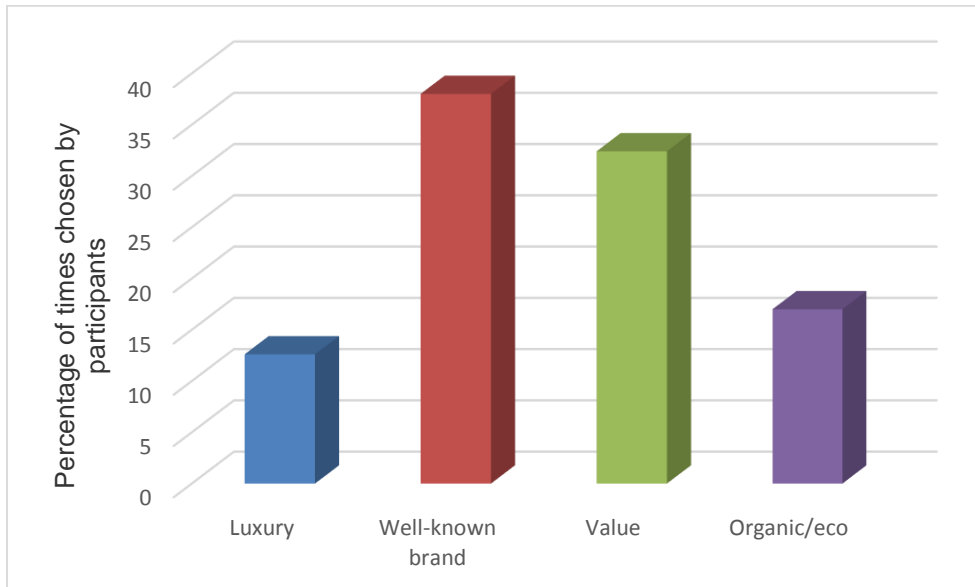


Figure 7: Consumer choice whilst shopping alone.

There was, however, considerable variation from product to product. So for example, when it came to products like soup (Heinz), toilet roll (Andrex), and conditioner (Lenor) the well-known brands were chosen in over 50% of all occasions, and these well-known brands dominated consumer choice. However, in other cases the well-known brands were not chosen so frequently. For example, in the case of coffee, the well-known brand (Lavazza) was chosen only in 18% of cases; in the case of orange juice the well-known brand (Princes) was chosen in only 24% of cases. Value brands seemed to be selected more frequently when it came to washing-up liquid (62%) and bran flakes (52%). Organic/eco brands were selected most frequently when it came to coffee (32%)

and ice cream (24%), but note that the well-known and value brands are still selected more frequently in the case of these products. Luxury brands were selected most frequently when it came to orange juice (32%) and ice cream (28%). In both cases these were the top selection.

Table 1: Brand choice across all products shopping alone (percentage choice).

	Luxury	Well-known brand	Value	Organic/eco
Bran Flakes	0%	26%	52%	22%
Bread	10%	44%	28%	18%
Cheese	2%	44%	36%	18%
Coffee	14%	18%	36%	32%
Fabric Conditioner	20%	56%	12%	12%
Ice cream	28%	26%	22%	24%
Orange Juice	32%	24%	30%	14%
Soup	16%	58%	14%	12%
Toilet roll	4%	58%	32%	6%
Washing up liquid	0%	26%	62%	12%
Mean	12.6%	38.0%	32.4%	17.0%

(2) Consumer choice whilst shopping with friends: descriptive statistics.

Interestingly, when shopping with friends, the well-known brands became even more popular. Well-known brands were now selected in 41.0% of all cases compared to 38.0% when shopping alone. Value brands, however, were selected much less frequently when shopping with friends - 20.4% compared to 32.4% when shopping alone. Organic/eco and luxury brands were both selected more frequently when shopping with friends (19.4% versus 17.0% for organic/eco; 19.2% versus 12.6% for luxury). See Figure 8.

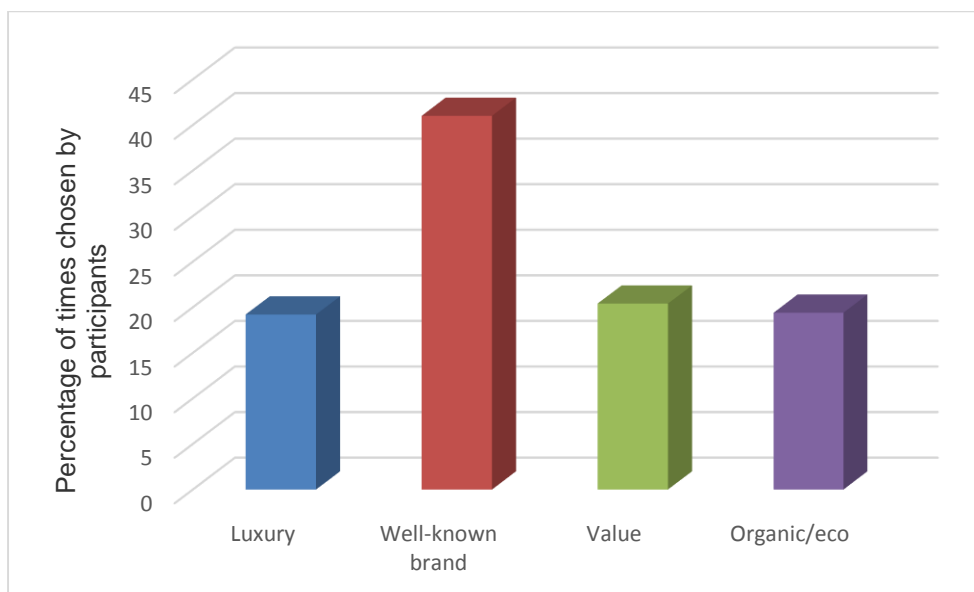


Figure 8: Consumer choice whilst shopping with friends.

These results reveal a number of things. Firstly, it emphasises the power of advertising for well-known brands (Hovis, Kellogg's, Heinz, etc.), in that these brands are immediately recognisable and accessible under both conditions - shopping alone and shopping with friends. The well-known brand of soup was

selected most frequently of all products (74%) and the same for toilet roll (58%) (see Table 2). Secondly, it demonstrates that value brands are selected much less frequently when shopping with friends (20.4%). However, the luxury, the well-known and the organic/eco brands are all selected more frequently when shopping with friends than when shopping alone. This would seem to suggest that when we change the social context of consumer choice, it does influence consumer behaviour and some brands become more popular and one, the value brand, becomes much less so.

Table 2: Brand choice across all products whilst shopping with friends (percentage choice).

	Luxury	Well-known brand	Value	Organic/eco
Bran Flakes	6%	44%	34%	16%
Bread	12%	54%	12%	22%
Cheese	8%	60%	16%	16%
Coffee	30%	12%	28%	30%
Fabric Conditioner	22%	48%	12%	18%
Ice cream	48%	18%	8%	26%
Orange Juice	36%	18%	16%	30%
Soup	14%	64%	8%	14%
Toilet roll	10%	62%	22%	6%
Washing up liquid	6%	30%	48%	16%
Mean	19.2%	41.0%	20.4%	19.4%

(3) Consumer choice: inferential statistics.

The first comparison (see hypothesis 1) considers the choice of well-known brands versus value brands when shopping alone and when shopping with friends, as shown in Figure 9. This difference was significant ($X^2 = 11.2$, d.f. = 1, $p < 0.001$, two tailed test) - in other words, when shopping with friends compared with shopping alone, consumers were significantly more likely to choose well-known brands and significantly less likely to choose value brands.

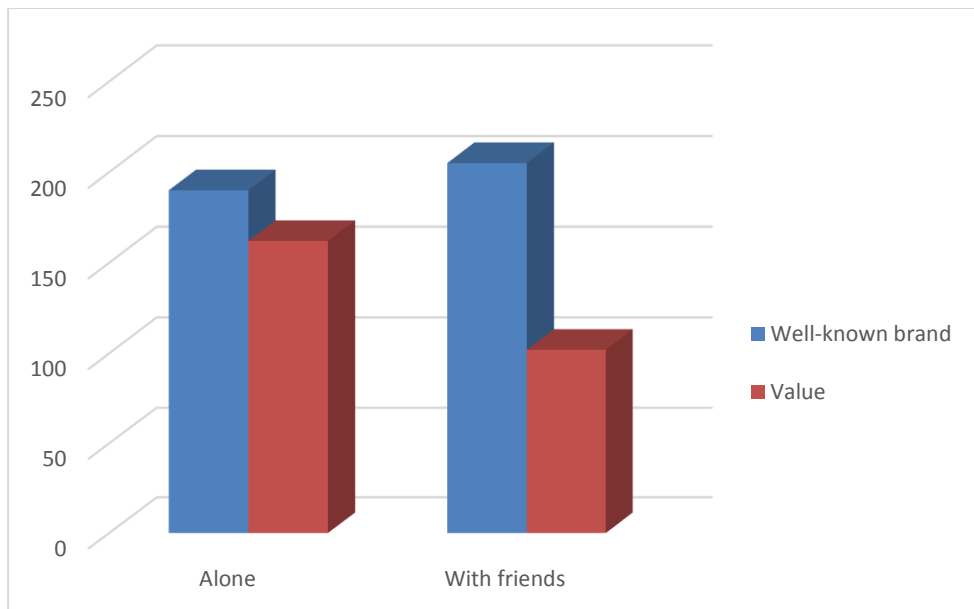


Figure 9: The relationship between choice of well-known brands versus value brands when shopping alone or shopping with friends.

Next, we compare value brand versus the luxury brand when shopping alone and when shopping with friends (see Figure 10). Again, the comparison was highly significant ($X^2 = 19.1$, d.f. = 1, $p < 0.001$, two tailed test). What is

very striking about Figure 10 is that when shopping with friends, value products and luxury products (which, of course, differ enormously on price) were chosen (approximately) equally often. This was not the case when shopping alone, where the choice of value products predominates.

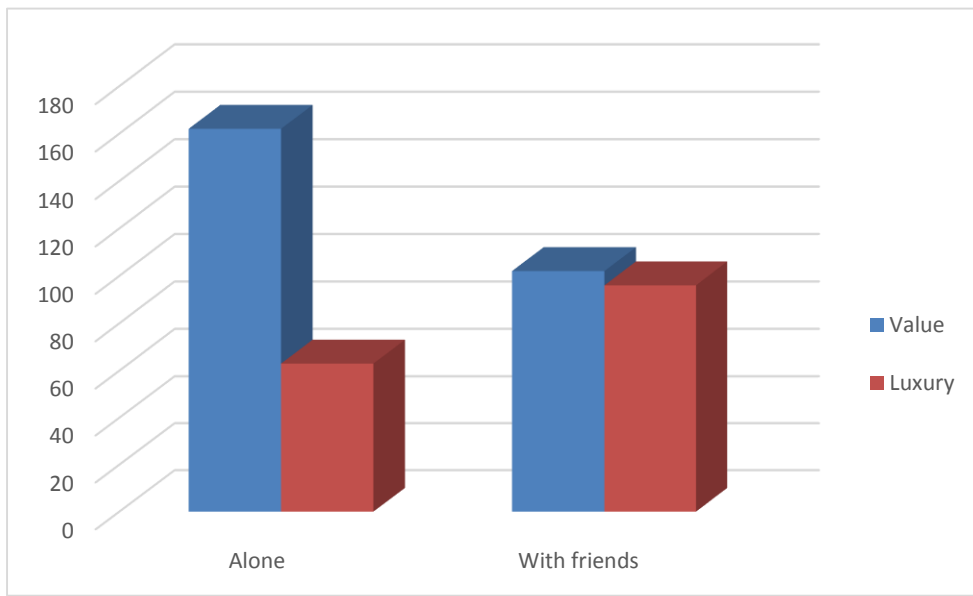


Figure 10: The relationship between the choice of value brands versus luxury brands when shopping alone or shopping with friends.

The next analysis considers the choice of organic/eco versus value brand when shopping alone and when shopping with friends (see hypothesis 2). This comparison was again significant ($X^2 = 9.44$, d.f. = 1, $p < 0.01$, 2-tailed test). It is clear from Figure 11 that this was largely attributable to the marked drop in the selection of value brands when shopping with friends. There was little difference in the selection of organic/eco products, although they were selected slightly more frequently when people were shopping with friends.

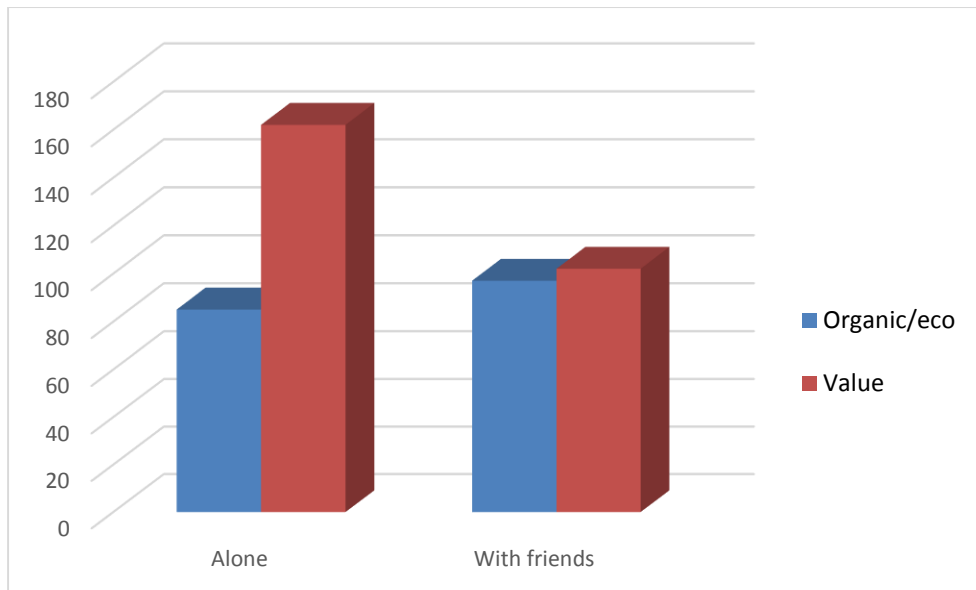


Figure 11: The relationship between the choice of organic/eco brands versus value brands alone or shopping with friends.

A number of additional statistical comparisons, however, revealed no significant differences in terms of the comparisons made. So, for example, in the case of organic/eco brands versus well-known brands (see hypothesis 3) there was no significant difference in underlying distribution ($X^2 = 0.09$, d.f.=1, n.s.) (see Figure 12).

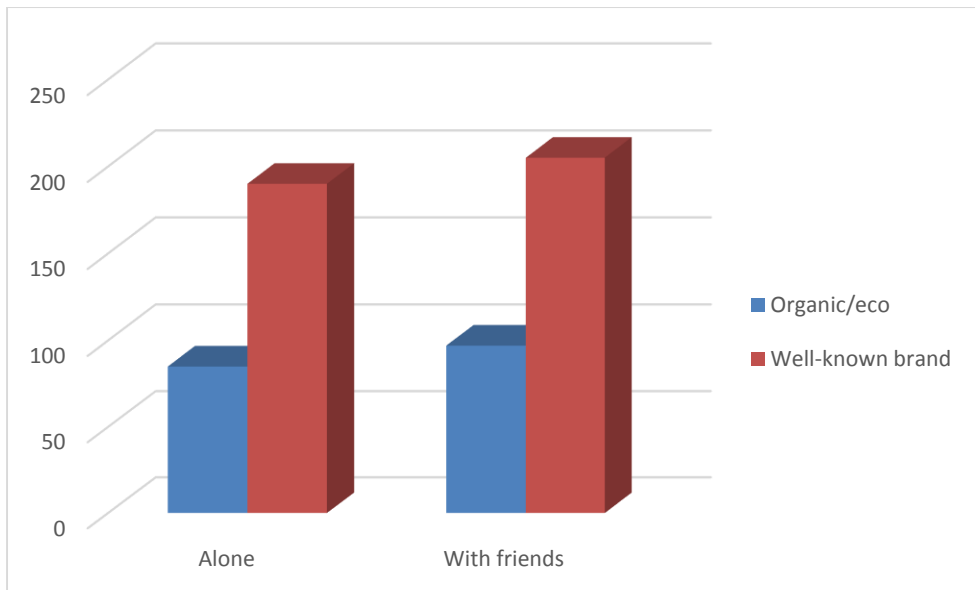


Figure 12: The relationship between the choice of organic/eco brands versus well-known brands when shopping alone or shopping with friends.

Similarly, with organic/eco brands versus luxury brands there was no significant difference ($X^2 = 1.73$, d.f. = 1, n.s.) (see Figure 13).

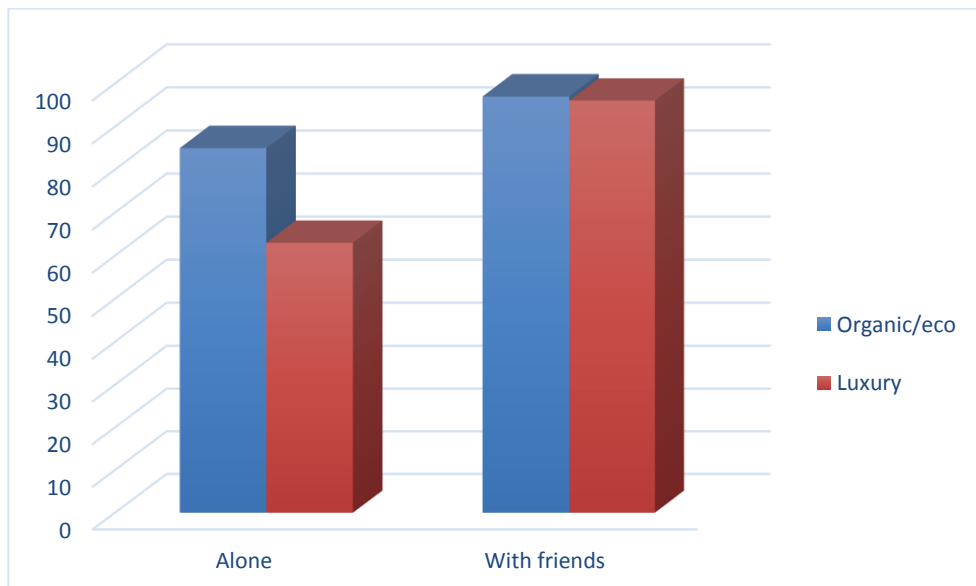


Figure 13: The relationship between choice of organic /eco brands versus luxury brands shopping alone or shopping with friends.

A similar pattern emerged when we looked at the relationship between well-known and luxury brands when shopping alone and when shopping with friends. In both cases, participants were more likely to choose these brands when shopping with friends ($X^2 = 3.4$, d.f. = 1, n.s.).

(4) Does the social context of shopping influence the choice of high carbon or low carbon footprint products?

The carbon footprint values of each consumer choice are laid out in Table 3. ‘HH’ represents the product with the highest carbon footprint assigned (actual carbon footprint value plus 10%), ‘H’ represents the product with a high carbon footprint (the actual value), ‘L’ represents the low-carbon footprint product (half the actual value), and ‘LL’ represents the lowest carbon footprint (0.5 of the actual value minus 10%).

Table 3: Number of high and low carbon items chosen by each participant when shopping alone or with friends.

	Alone				With Friends			
	HH	H	L	LL	HH	H	L	LL
Total	99	110	155	136	113	129	147	110

From Table 3 and 4 (below) it is clear that the carbon footprint of the products did have some effect on consumer choice, but not in the way that organic/eco

labels did. Table 4 shows that our experimental participants chose low-carbon items (L) a mean of 3.10 times when shopping alone and a mean of 2.94 times when shopping with friends. They chose very low-carbon items (LL) a mean of 2.72 times when shopping alone and a mean of 2.20 times when shopping with friends. The choice of low-carbon items showed the reverse pattern to that shown by organic/eco products in that low-carbon items were selected more often when shopping alone; organic/eco products were chosen more frequently when shopping with friends.

Table 4: Mean number of high and low carbon items chosen by each of the 50 participants when shopping alone or with friends.

	Alone				With friends			
	HH	H	L	LL	HH	H	L	LL
Mean	1.98	2.20	3.10	2.72	2.26	2.58	2.94	2.20

The first statistical comparison here considers the choice of high-carbon footprint products (H) versus low-carbon footprint products (L) when shopping alone and when shopping with friends (see Figure 14). When shopping alone, the low-carbon footprint products were chosen more frequently than when shopping with friends, whereas the high-carbon footprint products were chosen less frequently than when shopping with friends. However this difference was not significant ($X^2 = 1.50$, d.f. =1, n.s.).

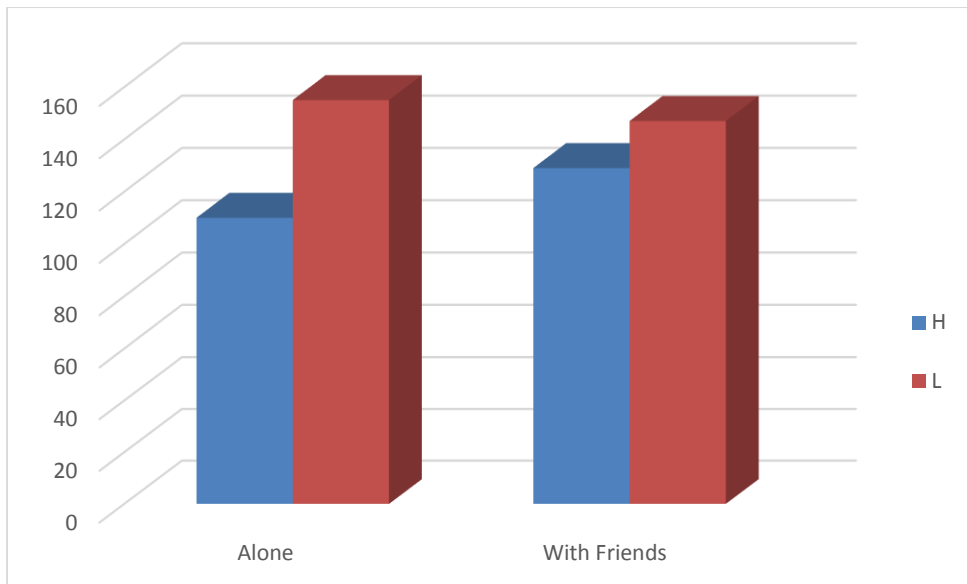


Figure 14: The relationship between the choice of high carbon products (H) versus low carbon products (L) when shopping alone or shopping with friends.

Next, we compare the very high-carbon footprint products (HH) and the very low-carbon footprint products (LL) when shopping alone and when shopping with friends. Figure 15 reveals that when shopping with friends very high and very low-carbon products were chosen equally often, but our participants were more likely to select the very low-carbon products when shopping alone. This difference, however, failed to reach significance ($X^2 = 3.36$, d.f. = 1, n.s).

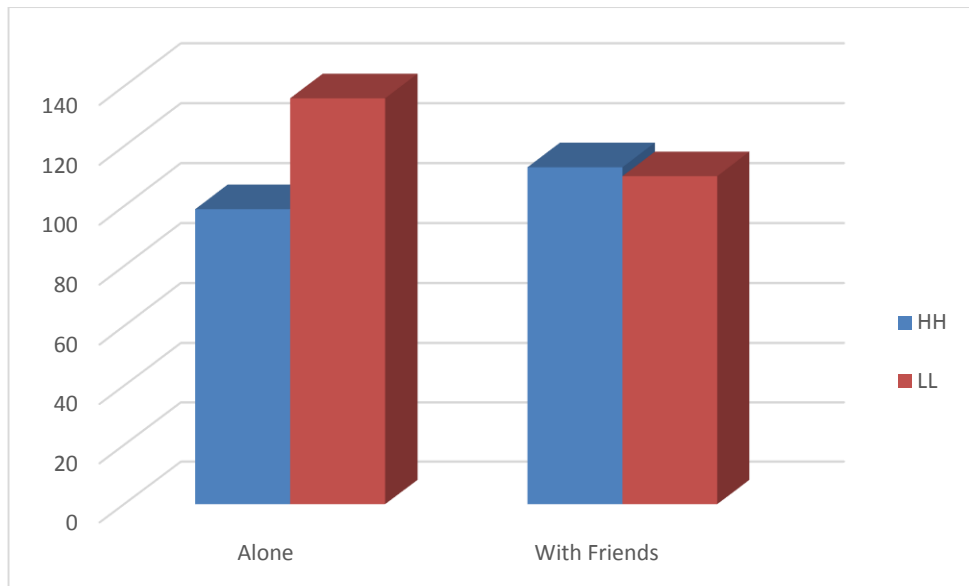


Figure 15: The relationship between the choice of very high carbon products (HH) versus very low carbon products (LL) when shopping alone or shopping with friends.

The next analysis focused on a comparison of any high-carbon footprint products (H+HH) with any low-carbon footprint products (L+LL), in other words the full set of products (thus increasing the N). See Figure 16. Here, the results did reach significant ($X^2 = 4.52$, d.f. = 1, $p < 0.05$, 2-tailed), suggesting that low-carbon products were significantly more likely to be chosen when shopping alone than with friends (contrary to hypothesis 4).

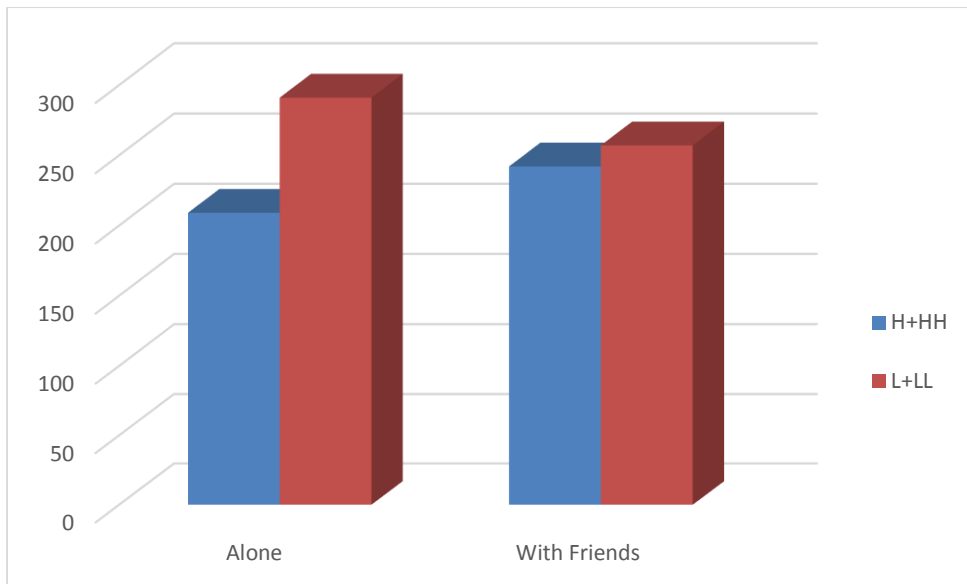


Figure 16: The relationship between the choice of any high carbon products (H+HH) versus any low carbon products (L+LL) when shopping alone or shopping with friends.

Discussion

The IPCC have clearly identified a number of aspects of human activity that impact climate change. These include such things as population size and land use patterns that will be either difficult or impossible to change in the time available, and ‘lifestyle’ that could potentially change. ‘Lifestyle’ involves many of the behavioural choices that we make in our everyday lives. Of course, ‘lifestyles’ can be changed (although anything that is an ingrained habit requires careful consideration, see Beattie and McGuire 2014), but only if we understand them. This essentially provided the rationale for the present study. This study was an attempt to understand more about consumer choice and how it links to issues to do with the environmental characteristics of products in the context of all of the other relevant features that differentiate products from one another

(like brand, value, price, etc.). ‘Lifestyle’ has also been identified as one of the common enabling factors that can underpin both adaptation and mitigation responses to climate change, according to the IPCC. But for this to be true, it is argued that we need a much better understanding of the variables that influence lifestyle choices, and particularly those choices with a direct bearing on GHG. In the present study, we empirically investigated one simple question, namely how does the presence of others while we are shopping influence our choice of more sustainable products? The IPCC have repeatedly highlighted a number of policy instruments for changing behaviour, including product labelling. However, when products are labelled (either in terms of their environmental consequences for example, ‘eco’/‘organic’ etc. or in terms of their carbon footprint) how does the presence of others people affect whether the ‘good’ products are selected or not?

Our basic hypothesis was that patterns of consumption are linked to social status (and that the choice of pro-social goods, just as with expensive goods, can reflect our social status), and we drew upon ‘costly signalling theory’ to allow us to consider how consumer choice can reflect and reify social status. Our statistical comparisons were in terms of consumer choices made while shopping alone or while shopping with friends.

This study found that shopping with friends in a simulated shopping task has a significant effect on consumer choice. We are more likely to select well-

known brands and luxury products when shopping with friends. This, of course, makes perfect sense from a costly signalling theory perspective - by purchasing these well-known and luxury brands we signal to our friends that we have the resource to purchase these kinds of items. Similarly, we are more likely to purchase organic or eco brands when shopping with friends. Again, this is interpretable in terms of costly signalling theory, which would posit that we can signal here both our pro-social orientation and our financial resource (given that they are more expensive than both popular brands and value) through our consumer selections. Organic/eco products seem to have some of the same social properties that well-known brands and luxury brands have in terms of status, and the organic/eco labels seem to communicate this effectively. However, carbon footprint labels did not seem to work in this way. Our experimental participants were significantly more likely to choose low-carbon items (signalled using various carbon labels) when shopping alone than when shopping with friends, indeed exactly the opposite of the other better-known environmental labels. This is an important and potentially worrying finding given the emphasis placed on features like carbon labels to guide more sustainable consumer behaviour by the IPCC and others. Perhaps these labels are not obvious enough to allow social signalling, or perhaps people think that others around them will not be able to evaluate properly carbon footprint (Upham, Dendler and Bleda 2011). For these reasons, the consumer who

chooses low-carbon products while shopping with friends, therefore, will not acquire any elevation in social status.

These results of the present study could potentially have a number of important implications. It is pointless for the IPCC or anyone else to identify enabling factors like product labelling as a driver of lifestyle change in the fight against climate change, if we do not understand how these labels actually work. We already know that carbon labels attract little visual attention (Beattie, McGuire and Sale 2011; Beattie 2012; Beattie and McGuire 2015) and that they are poorly understood (Upham, Dendler and Bleda 2011; Zhao and Zhong 2015), but now we know that carbon labels do not appear to work socially. There is no social cachet, no elevation in social status, no drive to select these items more frequently while shopping with friends. To put it crudely, carbon labels do not operate like peacock feathers but we would like to tentatively suggest that they should, and this issue of the social signalling value of these labels needs careful attention.

Of course, this study was, in reality, a simulation of actual consumer behaviour. However, it is the kind of simulation used many times in the past to identify successfully some core factors that affect patterns of consumption (see, for example, Wang and Lang 2015). Perhaps in the future we could design an intervention to promote carbon labels and then use this particular kind of experimental approach to test for any effects (and follow it up with more

ecologically sound ethnographic approaches). Nevertheless, the goal of future research in this area should be clear. If there is little social signalling value of carbon labels (even when these labels are colour-coded to make them more obvious, see Beattie 2010; 2012), then we need to focus on this social dimension to make carbon labelling a success. We need to change either the labelling scheme so it is more salient to consumers generally and/or rethink the whole packaging design of low-carbon products, as well as work on the values attached to it. After all, if social signalling is one major influence on consumer choice, then we need to persuade people that low carbon is recognisable by others in order for it to have the social cachet that is currently missing.

Perhaps supermarkets could introduce their own 'low carbon' range in the same way that they have their own organic, luxury and healthy ranges. This would enable the consumer to signal to others, through the obvious packaging, that they are buying low carbon, hinting to others of their effort and commitment in reducing their own personal carbon footprint. Alternatively, perhaps supermarkets should introduce low carbon aisles where they only shelve low-carbon footprint products - this would enable consumers to display (again, very publically) their interests in the long-term future of our planet through the aisles they inhabit and the choices they make. Supermarkets could even give priority to those who have bought low-carbon items, and introduce an express low carbon checkout. After all, they already have checkouts for ten

items or less. By introducing an express checkout for low-carbon customers, it would not only make buying low carbon more convenient, it would allow the consumer to be publically viewed by others as being 'green.' Giving priority to consumers in this way could slowly make buying low-carbon products more appealing.

Conclusions and Recommendations

This study found that individuals were more likely to choose low-carbon items (signalled using carbon labels) when shopping alone than when shopping with friends in a simulated shopping task. This is the opposite of what occurs with other better-known environmental labels, or with luxury or well-known brands - all of which signal social status through either pro-social orientation, resource, or a combination of the two. This new finding is potentially both very significant and worrying, given the emphasis placed on carbon labels to guide more sustainable consumer behaviour by the IPCC and others. We need to make these carbon labels more salient so that people are confident that others will recognise the 'signalling value' of these labels. Only then will low carbon choices (publically) reflect pro-social orientation, and therefore higher social status. Of course, even though a significant number of individual choices were analysed in this study, the number of participants was relatively low throughout and somewhat homogeneous in terms of location (northwest of the UK) and educational background (although age did vary). In research of this type, we

clearly need further research in other locations, on additional sets of participants, to conform or refute our initial conclusions.

This point notwithstanding, there may nevertheless be broader implications to consider regarding behaviour change. The advertising industry, for many decades, has conditioned us to believe, using very sophisticated approaches, that high-status products, such as fast cars and luxury holidays, symbolise wealth and success and that we need them (see Dichter 1960; Packard 1957). However, the ‘high carbon’ lifestyle to which many aspire is the polar opposite of a sustainable lifestyle. Perhaps then, it is the next generation that we need to target while their underlying attitudes are still developing (Beattie 2010; Beattie and McGuire 2012; 2014; Beattie and Sale 2009; 2011). However, it will not be enough just to transmit the basic information about carbon footprint, rather we need to change our underlying emotions and values about it (Beattie 2011; Beattie, McGuire and Sale 2011). We need to make low-carbon lifestyles fashionable. We need the future generation to grow up with aspirations about leading a low-carbon lifestyle in the same way that the current generation were brought up with aspirations of living the ‘luxurious’ and ‘ostentatious’ high-carbon lifestyle.

There is one important final point. There have been many educational programmes targeting schoolchildren in the hope that education could change both attitudes and behaviour. Although knowledge about climate change is a

strong predictor of intention to engage in pro-environmental behaviour (Scannel and Grouzet 2010; Bord, O'Connor and Fisher 2000; Lazo, Kinnel and Fisher 2000), education alone is usually not enough (Schultz 2015). It is the emotional responses of the next generation to aspects of the environment that we need to change if we want them to act appropriately (see Damasio 1994; Power, Beattie and McGuire, forthcoming). Perhaps, children could then take on the role of the educator and educate their parents about climate change and the importance of our 'lifestyle' choices. Instead of children taking on their parent's attitudes, maybe one day it could be the other way around. However, such a solution takes time, and, unfortunately, time, in the context of climate change, is the most precious of all resources.

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