

**THE EFFECTS OF ANCHORING, PRICE ORDER
AND REDUCED PRICE ON CONSUMER DECISION-MAKING**

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Yours Sincerely and Psychologically,

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2.0 Abstract:

This study explored whether anchoring and reduced price would influence consumers' decision-making in real world and online scenarios. In Study 1, participants partook in a true experiment where they blind tasted several wines and made a subsequent hypothetically purchase. Participants were assigned to four groups under two conditions: low anchor, high anchor, low anchor reduced, high anchor reduced. Statistical analyses of the mean price hypothetically purchased showed no significant difference between the groups. In Study 2, participants read tasting descriptions of the same wines in an online survey and made a subsequent hypothetically purchase. Participants were assigned to groups identical to Study 1. Statistical analyses of the mean price hypothetically purchased showed a significant difference between the high anchor and low anchor group, and low anchor reduced group. Results indicated anchoring occurred when participants made decisions under uncertainty but not with product knowledge. Reduced price did not significantly influence decisions.

KEYWORDS: anchoring, reduced price, decision-making, consumer behaviour.

3.0 Introduction:

Consumer behaviour was initially studied from the perspective of economics under the assumption that individuals are rational beings with regard to their decision-making and therefore would seek the best price and greatest value in relation their purchases in line with expected utility theory (Von Neumann & Morgenstern, 1944). However, with developments in the field of behavioural economics and economic psychology, views on consumer decision-making have shifted and are now observed from a perspective of real human behaviour, human emotion and with the limitations of human information processing in mind (Tversky & Kahneman, 1974, 1979, Kahneman, 2011). Financial and consumer decisions are seldom made that ensure maximum gain but are influenced by feelings and sentiment, motives, attitudes and most importantly for this paper heuristics in information processing (Kirchler & Hoelzl, 2011). Heuristics are typically unknown to the decision-maker and can have substantial influence on their decisions. Seminal research (Tversky & Kahneman, 1974; 1979, Kahneman, 2011) on decision-making posits two systems of thinking: automatic System 1 and effortful System 2.

System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control. System 2 allocates attention to the effortful mental activities that demand it, including complex computations. The operations of System 2 are often associated with the subjective experience of agency, choice, and concentration. (Kahneman, 2011, pp. 20-21, para. 4)

System 1 thinking is automatic, intuitive, instinctive, quick, biased, inaccurate, intuitive and irrational while System 2 is effortful, thoughtful, reflective, calculated, slow, rational, logical and critical. Mostly in our daily lives our thinking operates using

System 1, which typically works effectively but sometimes we come across a complex problem where there are judgments to be made under uncertain terms. This is when System 1 is prone to heuristic errors of which we are unaware (Kahneman, 2011, pp. 20-24). System 2 may be capable of solving these problems but its operations are effortful and mentally strenuous and hence “one of its main characteristics is laziness and reluctance to invest more effort than is necessary.” (Kahneman, 2011, p. 32). System 1 is fast and intuitive, and able to do many things at the same time and does it all consuming little energy. The effortful System 2 is exactly the opposite. It is slow, can only take on one process at any time and requires a lot of effort. System 2 is too slow and requires too much effort to handle even a fraction of the daily decisions we make. However, System 1 handles the thousands of daily problems, judgments and choices we are faced with although it is prone to heuristic error (Kahneman, 2011, pp. 20-24). One such heuristic error is the anchoring effect whereby individuals

consider a particular value for an unknown quantity before estimating that quantity. What happens is one of the most reliable and robust results of experimental psychology: the estimates stay close to the number that people considered – hence the image of an anchor. (Kahneman, 2011, p. 119, para. 3)

Seminal research (Tversky & Kahneman, 1974) demonstrated the anchoring effect when researchers asked participants whether the percentage of African nations in the UN was higher or lower than a random number obtained from a wheel of fortune that was rigged to only land on either 10 or 65. Subsequently, participants were asked to estimate the actual percentage. The average estimates of participants who saw 10 and 65 were 25% and 45% respectively. Building upon this evidence the same researchers (Tversky & Kahneman, 1974) studying intuitive numerical estimation showed that subjects’ multiplication estimates of descending numbers ($8 \times 7 \times \dots \times 2 \times 1$) were

significantly higher than multiplication estimates of ascending numbers (1 x 2 x x 7 x 8) when only given only 5 seconds to complete the computation. In both of these experiments the researchers demonstrated that the subjects made their estimations based on an initial value and then adjusted that value for their final answer. Information regarding consumer products has been presented with the use of an anchor in a number of studies (Ariely, Loewenstein & Prelec, 2003; Ariely, Loewenstein & Prelec, 2006) and has had an effect on subsequent consumer decision purchases. Research (Ariely et al., 2003) showed that by anchoring subjects with an arbitrary number, in this case the last two digits of their social security number, had a significant effect on their willingness to pay for a range of consumer products (computer keyboard, computer mouse, bottles of wine – average and rare, chocolates, books) ranging from ten dollars to one hundred dollars without prior knowledge of their market value. The items were auctioned one by one and

the price the highest bidder paid for an item was based not on his own bid, but on that of the second highest bidder. This is called a second price auction. William Vickrey received the Nobel Prize in economics for demonstrating that this type of auction creates the conditions where it is in peoples' best interest to bid the maximum amount they are willing to pay for each item (this is also the general logic behind the auction system on eBay).

(Ariely, 2008, p. 28, para. 5)

The results showed a positive correlation between subjects' valuations in each quintile of social security number distribution and their willingness to pay for each item. Remarkably each item was also valued in the correct order relative to its market value. Ariely labeled this phenomenon 'coherent arbitrariness' as it contains an arbitrary component, the social security number and a coherent component, the way in which the items were valued suitably in relation to the first valuation (Ariely et al., 2006).

While many researchers have been able to observe the anchoring phenomenon which demonstrates its robustness in a variety of areas that include general knowledge (Epley & Gilovich, 2001; McIlroy & Dowd, 2007; Mussweiler & Strack, 1999, 2001a, 2001b), self efficacy (Cervone & Peake, 1986), probability estimates (Chapman & Johnson, 1994), judges' perception on whether someone is lying (Zuckerman, Koestner, Colella, & Alton, 1984) and even the likelihood of a nuclear war (Plous, 1989) there are competing theories on precisely why it occurs.

The heuristics and biases model (Tversky & Kahneman, 1974) suggests that the initial anchor value would first be considered as a possible standard or benchmark when assessing an unknown quantity, decided whether it is too high or low and gradually would be adjusted either up or down until a more probable value was reached. The researchers propose that these adjustments are typically insufficient and are biased toward the initial anchor value as individuals stop adjusting, as they are not certain whether to adjust further. Usually under this model a comparative anchoring question is posed and individuals must indicate whether the value is greater or less than the arbitrary anchor value presented, followed by an absolute value question (Kahneman, 2011). It is however, important to note the limitations of this theory and it has been heavily criticized (Cohen, 1981; Einhorn & Hogarth, 1981) as its emphasis is entirely based on the judgmental effects of anchoring and does not explain the fundamental cognitive process that underpins it. The selective accessibility model of anchoring (Mussweiler, 1997) attempts to explain the cognitive process underlying the anchoring phenomenon and proposes that anchoring effects may be based on a process that combines two elements of social cognition research: hypothesis-consistent testing and semantic priming (Mussweiler & Strack, 1999). The model proposes that, as in the heuristics and biases model, individuals must perform two successive tasks: answer the comparative anchoring question and answer the absolute value question. The tasks are completed by

selectively generating semantic knowledge that is consistent with the notion that the target's value is equal to the anchor (the selectivity hypothesis). Generating such knowledge increases its subsequent accessibility, so that it is used to form the final absolute judgment (the accessibility hypothesis). (Mussweiler & Strack, 1999, p. 138)

There is evidence to support this theory (Mussweiler & Strack, 1998 as cited in Mussweiler & Strack, 1999, p. 140) whereby an anchoring question was combined with a lexical decision task. The results showed that participants were quicker to recognize anchor-consistent words than anchor-inconsistent words. The participants who had assessed that the average price of a German car was higher or lower than 40000 German marks (high anchor) were quicker to recognise words related to expensive cars (BMW or Mercedes) than words related to cheaper cars (Volkswagen or Golf). The opposite was true for an average priced car of 20000 marks (low anchor). This evidence “suggests that solving the comparative anchoring task selectively increases the accessibility of anchor-consistent knowledge.” (Mussweiler & Strack, 1999, p. 141).

There is an abundance of literature (Tversky & Kahneman, 1974; Zuckerman et al., 1984; Cervone & Peake, 1986; Chapman & Johnson, 1994; Mussweiler & Strack, 1997, 1998, 1999, 2001a, 2001b, 2002; Ariely et al., 2003; Ariely et al., 2006) that demonstrates the robustness and reliability of the anchoring phenomenon that employs an initial arbitrary number value selected by the experimenter to compare against the target question. The current study intends to build on research (Wilson, Houston, Etling, & Brekke, 1996) that investigates whether the anchoring phenomenon will occur without the use of an arbitrary number value and the conditions under which the anchoring process is initiated. Wilson et al. (1996) states that nearly all previous research has concentrated on the latter stages of the anchoring process, after the initial anchor value has been compared to the target question and has largely ignored the issue

of when a particular arbitrary number is used as a benchmark to compare against. Wilson et al. (1996) refers to this part of the anchoring process as integration and adjustment, as the anchor and target values are integrated together, then the answer is found from adjusting away from the anchor. They argue that without an initial anchor value to adjust from, neither integration nor adjustment can occur and that in the case of Tversky & Kahneman's (1974) wheel of fortune study and similar studies that by asking the original comparative question that the experimenters actually initiate the anchoring process. Had the question not been asked perhaps the participants may not have compared the anchor value to the target question. Further research (Northcraft & Neale, 1987) where participants were not asked to compare the anchor value to the target question still observed the anchoring effect however, in this case an informative anchor rather than an arbitrary anchor was used. Real estate agents were given an information pack about a house for sale with low and high anchors as a list price and unsurprisingly the agents' estimates of the appraised value of the house were relative to the anchors. Research previously mentioned (Wilson et al., 1996) poses an important question: Will anchoring effects occur if an individual is presented with an uninformative anchor value and are not asked to compare this number to the target value? Results showed that remarkably anchoring did occur when an uninformative number was used as an anchor however not to the extent that when an informative number was used. In the same study the experimenters measured the level of knowledge the participants had in relation to the target question that they were answering. It was found that the more knowledgeable the participants were, the less susceptible they were to anchoring. There is evidence (Kahneman & Knetsch, 1993 as cited in Wilson et al., 1996) that anchoring can occur when the anchor is uninformative and individuals are not asked to compare a target value to it. The backward priming hypothesis may account for anchoring in this case whereby the need to answer a question about the target makes individuals consider any

number in their short-term memory as a possible answer, regardless of its source. Once the search for the answer begins, any reasonable value in short-term memory may be considered hence prompting the anchoring process.

The rationale behind the current research is to investigate whether anchoring effects will occur without the use of an initial arbitrary number value to use as benchmark (informative or uninformative) selected by the experimenter or a comparative question to which it can be related. The research will explore whether anchoring will occur from the order in which a list of numbers is presented, ascending (from lowest to highest) or descending (from highest to lowest), in a real world scenario. Participants will be invited to a blind wine tasting under the impression the study is examining taste preference and decision-making with the true nature disguised until after the experimentation. Psychologist Richard Wiseman in a double blind experiment demonstrated the perceptual ambiguity of wine where five hundred and seventy-eight participants tasted a variety of wines ranging from five dollars to fifty dollars. The results showed that the expensive wines could only be identified fifty-three per cent of the time that demonstrates the arbitrary nature of tasting wine (Lehrer, 2012). Similar research (Goldstein, Almenberg, Dreber, Emerson, Herschkowitsch & Katz, 2008) in a study of six thousand blind tastings found a slight negative correlation between price and happiness that suggests that individuals on average enjoy more expensive wines slightly less. In the current research participants will blindly taste red wines of varying quality and price range (7 euro to 23 euro) selected by a professional sommelier (only red wines will be selected to control for temperature, as they are served at room temperature and would not need to be chilled in they way white wine would). Participants will assign each wine a rating, nominate their favourite and be asked to hypothetically purchase a single bottle of wine from a list of different prices. All participants will be under two conditions: (i) low or high anchor condition (ii) reduced

or not reduced condition. Participants in the low anchor condition will receive a price list in ascending order (cheapest to most expensive) and participants in the high anchor condition will receive a price list in descending order (most expensive to cheapest). There has been some research from a marketing perspective on price order and consumer behaviour but in psychological research it is relatively scarce. It has been shown that descending price order has affected consumers' willingness to pay higher prices (Monroe, 1990; Bennett, Brennan & Kearns, 2003), increased perceptions of value (Garbarino & Slonim, 1995) and increased purchase probability (Brennan, 1995). The rationale behind the current research and key element of this study is whether participants will use the top number on the price list as an initial anchor value and whether it will influence their hypothetical purchase. It has been suggested that when prices are presented in descending order, the initial higher price serves as an anchor value which results in an increase in the average price consumers are willing to pay in comparison to if the list was presented in ascending order (Kreul, 1982; Monroe, 1990, Smith & Nagle, 1995). The second condition is offering a single wine for a reduced price or regular price. There is an abundance of literature in consumer behaviour that has shown that a reduced price increases consumers likelihood of purchasing that particular product in a variety of domains including supermarkets (Gottschalk & Leistner, 2013), restaurants (Isabella, Pozzani, Chen & Perfi Gomes, 2012), retail stores (Ghafran Ashraf, 2012), online travel agents (Chen & Yuan, 2014) but to name a few. The research consistently demonstrates that price discounts have a positive impact on consumers buying behaviour.

The current research will investigate whether anchoring effects will occur without the use of an informative or uninformative arbitrary number value or target comparative question but with a range of ordered lists, ascending and descending in real world and online scenarios within a consumer context. The effects of offering a reduced

price will also be examined and the following hypotheses will be tested:

The first research hypothesis states that there will be a significant difference between the *low anchor* condition and the *high anchor* condition in relation to the mean price of wine hypothetically purchased.

The second research hypothesis states that there will be a significant difference between the *low anchor reduced* condition and the *high anchor reduced* condition in relation to the mean price of wine hypothetically purchased.

The third research hypothesis states that there will be a significant difference between the *low anchor* condition and the *high anchor reduced* condition in relation to the mean price of wine hypothetically purchased.

The fourth research hypothesis states that there will be a significant difference between the *low anchor* condition and the *low anchor reduced* condition in relation to the mean price of wine hypothetically purchased.

The fifth research hypothesis states that there will be a significant difference between the *low anchor reduced* condition and the *high anchor* condition in relation to the mean price of wine hypothetically purchased.

4.0 Method – Study 1:

4.1 Participants:

Sixty-eight participants (m=36, f=32, mean age=31.26, SD=7.48, age range=46) were drawn from restaurant industry professionals using an opportunistic sampling method to participate in a true experiment. Participants were invited to partake in a “Psychological Experiment Exploring Taste Preference and Decision-Making” and invitations (see Appendix A) were distributed to employees of twenty-five restaurants across Dublin city centre, as wine drinkers were the required sample. The exclusion criteria used was all participants were over the age of eighteen, not teetotallers, not alcoholics, not recovering alcoholics and not pregnant. The participants did not receive any financial reward or other reward for their participation. All other ethical concerns regarding participation were addressed in the information sheet (see Appendix C).

4.2 Design:

A between groups design was used. The first independent variable was whether the participants were in a low or high anchor condition. The second independent variable was whether the participants were in a reduced or not reduced condition. The dependent variable was the mean price of the bottle of wine hypothetically purchased. Participants were randomly assigned to four groups under two conditions: high or low anchor and reduced or not reduced. The first participant to arrive was assigned to the (L) low anchor group (n=16, m=9, f=7, mean age=35.44, SD=12.42, age range=44), the second to the (H) high anchor group (n=16, m=9, f=7, mean age=29.94, SD=5, age range=17), the third to the (LR) low anchor reduced group (n=16, m=8, f=8, mean age=27.81, SD=4.1, age range=16), the fourth to the (HR) high anchor reduced group (n=20, m=10, f=10,

mean age=31.75, SD=4.01, age range=16) and so forth to ensure an approximate even number of participants in each group.

4.3 Materials/ Apparatus:

The materials used in the experiment were four bottles of Vina Real Crianza Tempranillo red wine, four bottles of Palacios Redoma ‘Vendimia’ Roble red wine, four bottles of Castillio di Montero red wine, four bottles of Finca la Emperatriz Crianza red wine, four bottles of Campo Nuevo Tempranillo red wine, seventy wine glasses were used for tasting the wine, two wine glass polish cloths were used to ensure the wine glasses were clean and polished, a corkscrew was used to open the wine bottles, twenty brown paper wine bags were used to cover each wine bottle to ensure participants could not see the wine label or have any information about the wine they were tasting, twenty elastic bands were used to secure the top of the brown paper bags to the wine bottles, a black marker was used to label each wine bottle with its corresponding letter, two spittoons were used so participants could spit out the wine after tasting, a 15ml wine tasting measure was used to ensure equal wine tasting measures, four jugs were used for water to cleanse the palate between tasting wines, a dice was used to randomly assign a letter to each wine and to select the tasting sequence so that the participants tasted the wines in a quasi-random order and a variety of scoring sheets and forms were used to inform participants and to collect participant data (see Appendices A-K).

4.4 Procedure:

In preparation for the experiment a Wine & Spirit Education Trust [WSET] (WSET, 2015) Level 3 qualified sommelier chose five red wines of varying quality and price to use for the tasting. All of the wines were of the Tempranillo grape varietal to somewhat control for taste preference and were randomly assigned a letter using a dice

(1=A, 2=B, 3=C, 4=D, 5=E). Wine A was a Vina Real Crianza Tempranillo (2013), wine B was a Palacios Redoma 'Vendimia' Roble (2013), wine C was a Castillio di Montero (2013), wine D was a Finca la Emperatriz Crianza (2010) and wine E was a Campo Nuevo Tempranillo (2013). For the purposes of the experiment the wines were assigned prices increasing in equal increments but which were relative to their actual retail price. (Wine C: experiment price (EP) = €6.99, actual retail price (ARP) = €8; Wine E: EP = €10.99, ARP = €11; Wine A: EP = €14.99, ARP = €15; Wine B: EP = €18.99, ARP = €18; Wine D: EP = €22.99, ARP = €21). All of the wine bottles were placed in brown paper wine bags secured at the top with an elastic band and labelled according to their corresponding letter with a black marker to ensure that participants would be tasting the wines blindly. Three stations were set up in the venue: (i) Information Station (ii) Wine Tasting Station (iii) Wine Debrief Station. All the stations were as far apart from each other as possible so to minimise the chance of contamination between participants who had participated in the experiment and had been debriefed and those who were yet to participate. Prior to the experiment informed consent was obtained from all participants (see Appendix B) and participants were asked to read an information sheet (see Appendix C) regarding the nature of the study. This took place at the information station. Following this, participants approached the tasting station and tasted a 15ml measure of each of the five wines in a quasi-random order. This was achieved by rolling a dice (1=A, 2=B, 3=C etc.) to account for ordering effects. After tasting each wine participants were instructed to spit it out and between each wine participants drank water to cleanse their palate. Participants were instructed not to confer with other participants at any stage of the tasting and scoring process. Participants were asked to give a rating to each wine out of 5 and nominate their preferred wine (see Appendix D). Participants were then presented with a list of prices under four conditions: (L) low anchor, (H) high anchor, (LR) low anchored reduced and (HR) high

anchor reduced (see Appendices E, F, G, H). The (L) condition was presented with a price list in ascending order of price starting with the least expensive and the (H) condition in descending order of price starting with the most expensive. The (LR) condition was presented with a price list in ascending order of price starting with the least expensive and with a reduced price for one bottle and the (HR) condition was presented with the price list in descending order of price starting with the most expensive with a reduced price for one bottle. The participants were then asked to hypothetically purchase a single bottle of wine based on those prices. After the hypothetical purchase participants were asked to complete a short questionnaire (see Appendix I) to obtain some additional demographical information. On completion of the experiment all participants were fully debriefed (see Appendix J) on the true nature of the study. Participants then moved to the wine debrief station where they received information on the wines they had tasted (see Appendix K). Participants were thanked for their participation and afforded the opportunity to ask any questions.

5.0 Results and Discussion – Study 1:

After conducting tests of normality, equal variance between groups was observed and the distribution was skewed but due to the nature of the data this was accepted. When the mean price of bottles of wine hypothetically purchased in each group was examined. A one-way analysis of variance showed that there was no significant difference between the four groups ($F(3, 64) = .37, p = .773$). The results confirmed that the anchoring phenomenon did not occur in any of the groups, which does not support any of the hypotheses. When self-reported wine knowledge and frequency of purchase was examined it showed that 65% of participants considered themselves having average wine knowledge or above and 95% of participants reported that they would purchase wine on a regular basis which would suggest that the sample obtained was representative of the target population. When the descriptive statistics of wine hypothetically purchased was examined (*see Table. 1*) it was seen that the mean price of wine purchased in each condition was remarkably similar. Interestingly, when the frequency of wine purchased was examined (*see Figure. 1*) in both reduced conditions, where a single bottle of wine was offered at a reduced price, no participants hypothetically purchased the reduced wine. It could be speculated that this was due to suspicion on part of the participants, as they were aware that it was a psychological experiment but were naïve to the exact research question. Results also showed that 65% of participants did not think that the order in which the prices were listed had an effect on their hypothetical purchase while 26% did think it had an effect with the remaining 9% reporting not to know. Results also showed that 76.5% of participants hypothetically purchased the same bottle of wine as their nominated favourite which would suggest that participants' decisions on which bottle of wine to hypothetically were led primarily by their taste preference regardless of the price. This can be further evidenced when the ratings of each wine was examined

which showed that 75% the participants who did not hypothetically purchased the same bottle of wine as their nominated favourite selected their second rated favourite. It could be argued that as the purchase was of a hypothetical nature and that participants did not have to make real world financial decisions that they were more inclined to purchase their favourite. Perhaps if real money was involved participants' choices may not have been led by their favourite and hence afforded the anchoring phenomenon an opportunity to occur.

When previous literature (Tversky & Kahneman, 1974) was reviewed on judgement under uncertainty and related to the current study it could be speculated that by allowing participants to taste each wine brings an amount of certainty into the decision-making process. Research has shown (Wilson et al., 1996) that with increased relevant knowledge that anchoring can be less effective. Perhaps if participants did not have knowledge of the taste of the wine, their judgement would be back under uncertain terms. After considering the results of Study 1, a second similar study was undertaken to assess if the anchoring phenomenon would occur without the use of an arbitrary number value or a comparative question and by an ordered list, ascending and descending, but without the knowledge of the taste of the wine.

Table 1. *Descriptive Statistics of Price of Wine Hypothetically Purchased*

Group	N	Mean	SD	95% Confidence Intervals	
				Lower Bound	Upper Bound
Low	16	13.99	6.77	10.38	17.60
High	16	13.99	6.77	10.38	17.60
Low reduced	16	13.39	4.59	11.04	15.94
High reduced	20	15.39	4.84	12.91	15.66

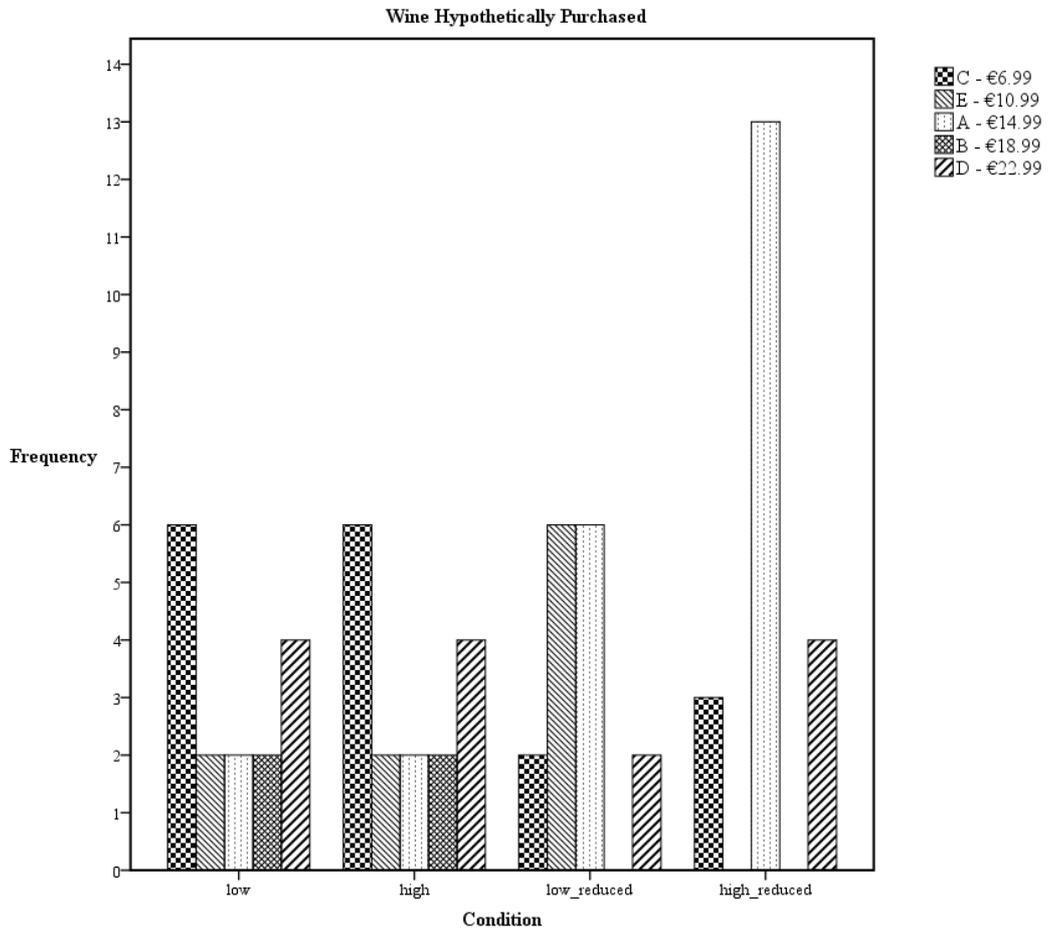


Figure 1. *Frequency of Wine Hypothetically Purchased*
**note that wine B was at a reduced price in the low reduced and high reduced condition*

6.0 Method – Study 2:

6.1 Participants:

Eighty-five participants (m=44, f=40, undisclosed=1, age range=56) were drawn using an opportunistic sampling method through a Facebook post to participate in an online survey regarding “Psychology Research on Consumer Decision-Making”. The participants did not receive any financial reward or other reward for their participation.

6.2 Design:

A between groups design was used. The first independent variable was whether the participants were in a low or high anchor condition. The second independent variable was whether the participants were in a reduced or not reduced condition. The dependent variable was the mean price of the bottle of wine hypothetically purchased. Participants were randomly assigned to four groups under two conditions: high or low anchor and reduced or not reduced. The low anchor group (L) (n=22, m=9, f=13, age range=26), the high anchor group (H) (n=20, m=9, f=11, age range=36), low anchor reduced group (LR) (n=19, m=12, f=7, age range=56) and the high anchor reduced group (HR) (n=24, m=14, f=9, undisclosed=1, age range=49).

6.3 Materials/ Apparatus:

A battery of four online Survey Monkey questionnaires was used with the only alteration being Question 1 as it was different for each condition. The (L) condition (see Appendix L) was presented with a price list in ascending order of price starting with the least expensive and the (H) condition (see Appendix M) in descending order of price starting with the most expensive. The (LR) condition (see Appendix N) was presented with a price list in ascending order of price starting with the least expensive and with a

reduced price for one bottle and the (HR) condition (see Appendix O) was presented with the price list in descending order of price starting with the most expensive with a reduced price for one bottle. Questions 2 through 7 were identical (see Appendix P).

6.4 Procedure:

Participants were instructed to read the wine tasting notes description of each wine and then asked to choose which bottle of wine they would hypothetically purchase from a wine shop. Participants were then instructed to fill out the remaining questions to obtain some additional demographical information.

7.0 Results and Discussion – Study 2:

After conducting tests of normality, equal variance between groups was observed and the distribution was skewed but due to the nature of the data this was accepted. When the mean price of bottles of wine hypothetically purchased in each group was examined. A one-way analysis of variance showed that there was a significant difference between the four groups ($F(3, 81) = 4.77, p = .004$). Post hoc analysis confirmed that the differences were significant in nature between the high anchor group ($M = 17.59, SD = 3.95$) and the low anchor group ($M = 13.71, SD = 3.93, p = .029$) and with the low anchor reduced group ($M = 12.88, SD = 4.29, p = .007$). Post hoc analysis also confirmed that there was a notable but non-significant trend between the high anchor reduced group ($M = 15.99, SD = 5.18$) and the low anchor reduced group ($M = 12.88, SD = 4.29, p = .108$). The results supported the first and fifth hypotheses and tentatively supported the second hypothesis although they did not support the remaining hypotheses. The results suggest that in line with marketing research (Kreul, 1982; Monroe, 1990, Smith & Nagle, 1995) that participants were anchored by the initial number value that was the top of each price list and based their hypothetical purchase around that number. It would seem that with only the knowledge of the tasting notes available and without the knowledge of the taste of the wine that participants were more susceptible to the anchoring phenomenon. This would also support research (Wilson et al., 1996) that with increased relevant knowledge of the subject in question i.e. the taste of the wine, that anchoring can be less effective. This also supports research (Tversky & Kahneman, 1974) on judgement under uncertainty where it was speculated in the results section of Study 1 that by allowing participants to taste each wine brings an element of certainty into the decision-making process. It would appear in Study 2, participants are making decisions under uncertain terms, as they were less knowledgeable about the

question they were being asked. When self-reported wine knowledge and frequency of purchase was studied it was observed that 70% of participants considered themselves having average wine knowledge or above and 96% of participants stated that they would purchase wine on a regular basis which would imply that the sample obtained was representative of the target population. Results also showed that 51% of participants did not think that the order in which the prices were listed had an effect on their hypothetical purchase while 29% did think it had an effect with the remaining 18 % reporting not to know. When the descriptive statistics of wine hypothetically purchased was examined (*see Table. 2; Figure 3*) it was observed that the mean price of wine purchased in both the reduced groups were lower than those in the non-reduced groups. It could be tentatively speculated that in line with the selective accessibility model (Mussweiler & Strack, 1999) that semantic priming may play a role. By having the word ‘reduced’ in the price list it may prime participants to select less expensive wines even if they did not actually select the reduced wine. There was no significant difference between both reduced conditions but when the frequency of hypothetical purchase was examined the reduced bottle was notably higher in comparison to Study 1.

Table 2. *Descriptive Statistics of Price of Wine Hypothetically Purchased*

Group	N	Mean	SD	95% Confidence Intervals	
				Lower Bound	Upper Bound
Low	22	13.71	3.93	11.95	15.48
High	20	17.59	3.95	15.74	19.44
Low reduced	19	12.88	4.29	10.82	14.95
High reduced	24	15.99	5.18	13.80	18.18

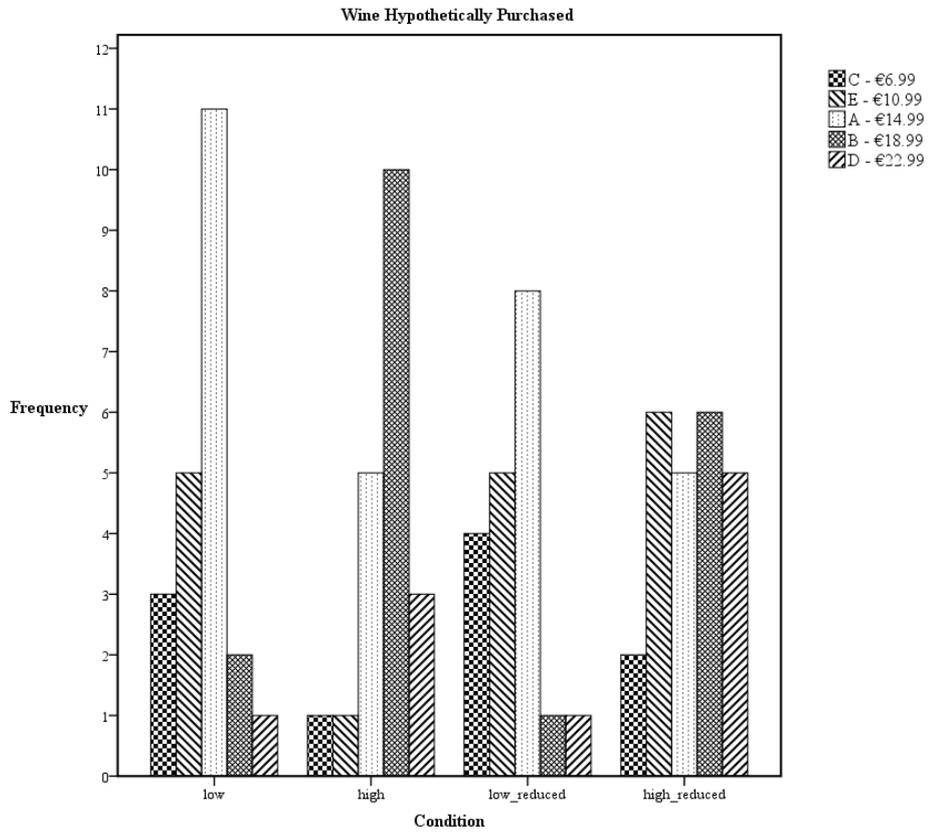


Figure 2. Bar chart of Frequency of Wine Hypothetically Purchased

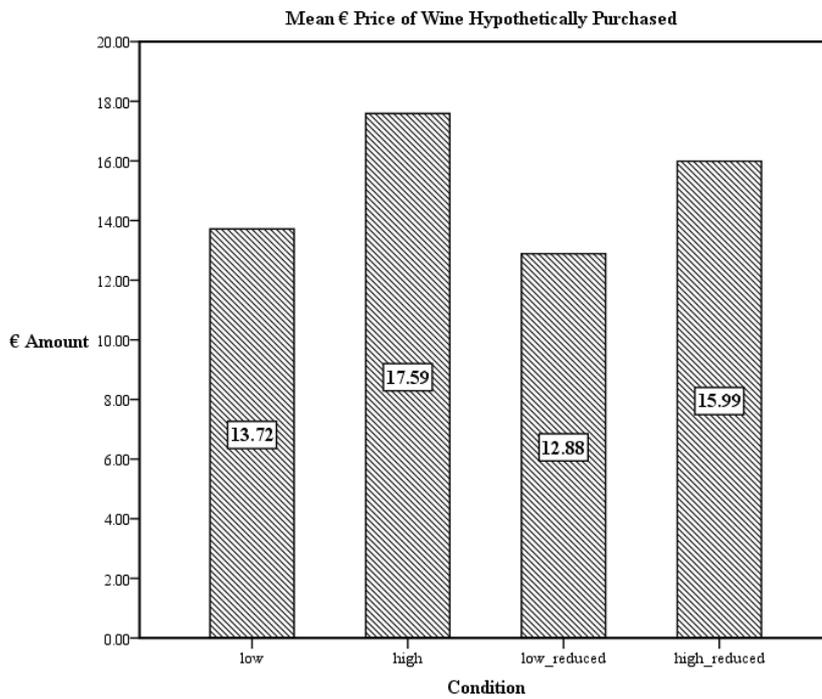


Figure 3 Bar Chart of Mean € Price of Wine Hypothetically Purchased

8.0 General Discussion:

The aim of this study was to investigate whether anchoring effects and reduced price would influence participants' decision-making using a range of ordered lists, ascending and descending within a consumer context. The majority of previous literature has used an arbitrary number value and comparative target question (Tversky & Kahneman, 1974; Zuckerman et al., 1984; Cervone & Peake, 1986; Chapman & Johnson, 1994; Mussweiler & Strack, 1997, 1998, 1999, 2001a, 2001b, 2002; Ariely et al., 2003; Ariely et al., 2006), or informative anchors (Northcraft & Neale, 1987) or uninformative anchors (Wilson et al., 1996) which observed the anchoring phenomenon and demonstrated its robustness and reliability. When the results of both current studies were taken into account it would seem that the more or less knowledge that participants had available to them about the wine that they were hypothetically purchasing (the taste of the wine in Study 1 and the tasting description in Study 2) decreased or increased their susceptibility to anchoring. This is supported by previous research (Wilson et al., 1996) that demonstrated that with increased relevant knowledge of the subject in question that anchoring can be less effective. It also supports research (Tversky & Kahneman, 1974) that when judgements are made under uncertain term that individuals are more susceptible to anchoring.

The limitations of Study 1 are that participants were not making actual financial decisions with real money and therefore may have hypothetically purchased their favourite wine not taking into account its price. Further limitations of the study are that environment was not entirely controlled for as the experiment took place at two different locations as the required sample size was not met after the initial experiment. Great care was taken to recreate the exact conditions of the original experiment but they were not identical, although the procedure and wines used were identical. An additional limitation

was the procedure used in the experiment. By instructing participants to rate each individual wine and then nominate their favourite, inadvertently they were directed to a wine to hypothetically purchase. If the experiment were to be recreated, it could be argued that by slightly altering the procedure so that participants were instructed to hypothetically purchase a wine from the price list directly after tasting the wines without nominating their favourite or assigning it a rating, may afford the opportunity for the anchoring process to be initiated. A further limitation is the small sample size of only sixty-eight participants. The strengths of Study 1 are that unlike the majority of psychology experiments that occur under a laboratory setting it was conducted as per a regular wine tasting and hence captured naturally occurring behaviour. Further strengths are due to the way in which the wines labels were hidden using the brown paper bags participants did not have any knowledge of the wines they were tasting and hence tasted all wines blindly. Another strength is that the sample was representative of the target population as the descriptive statistics of self-reported wine knowledge and frequency of purchase mentioned in the results section of Study 1 show.

The limitations of Study 2, similarly to Study 1, are that participants were not making real world financial decisions and results may have differed if real money were involved. Further limitations are that as it was an online survey it could be argued that some participants did not obey the instructions to read each tasting note and simply just selected the top wine in each price list to navigate the survey as quickly as possible which would lead to obtaining a significant result. A further limitation is the small sample size of only eighty-five participants. The strengths of Study 2 are that the sample obtained was representative of the target population as shown by the descriptive statistics of self-reported wine knowledge and frequency of purchase in the results section of Study 2. Further strengths are that the tasting descriptions of wines in the

online survey were accurate relative to the wines used in Study 1 as they were obtained from the wine suppliers.

The findings of this study could be of benefit to the hospitality industry in particular in the design of restaurant wine menus. Restaurants may be able to increase their revenue from wine sales if their wine lists were organized so that the wines were listed in descending order of price rather than ascending order of price, which is the case for the majority of restaurants. The findings do not just have relevance to wine menus but indeed any consumer context especially in online sales where there are a variety of products available at different prices. Businesses may be able to increase revenue simply by the way in which they present their price lists. A direction for future research in this area is that the procedure could be slightly altered so that participants do not nominate a favourite wine as this directs them to a hypothetical purchase as mentioned in the limitations of Study 1. Another possibility for future research would be to have participants taste the same wine but have them believe they are tasting a variety of wines and present price lists using the same approach. Also it may be interesting to use a variety of beverage items such as beers or soft drinks to blind taste and present price lists in a similar fashion. Future research could also benefit from the use of larger sample sizes.

In conclusion, this study explored whether anchoring effects would occur without the use of an informative or uninformative arbitrary number value or a target comparative question but with a range of ordered lists in ascending and descending order and if reduced price would have influence on consumer decision-making using a wine tasting and online wine menu. The results showed that when participants had knowledge available to them of the taste of the wine in the wine tasting study that they were not susceptible to anchoring effects which supports formative research (Wilson et al., 1996) but when participants had less knowledge available to them, just the tasting

description, in the online survey that they were significantly influenced by anchoring which supports previous research (Tversky & Kahneman, 1974; Zuckerman et al., 1984; Cervone & Peake, 1986; Chapman & Johnson, 1994; Mussweiler & Strack, 1997, 1998, 1999, 2001a, 2001b, 2002; Ariely et al., 2003; Ariely et al., 2006) on the reliability and robustness of the anchoring phenomenon.

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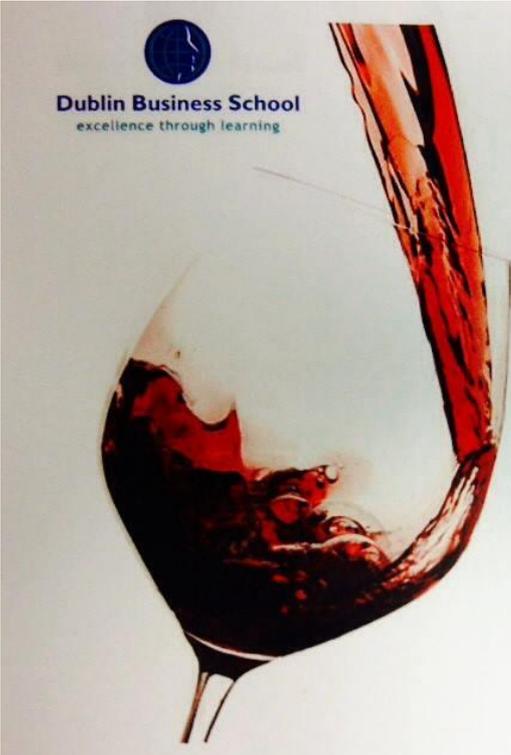
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10.0 Appendices:

Appendix A:




Dublin Business School
excellence through learning

Ben O'Loughlin as part of his Undergraduate Thesis in Psychology would like to cordially invite you to partake in a *Psychological Experiment Exploring Taste Preference and Decision-Making* which involves a

Free Red Wine Tasting

which takes place on *Sunday 25th January @ 3pm-9pm*
at Temple Lane Studios, Cecilia Street, Temple Bar (wooden door opposite Claddagh Records)

RSVP: thebenoloughlin@gmail.com
or 0879572556



Consent form for Psychological Study on Taste Preference and Decision-Making

I have read and understood the attached Information Sheet regarding this study. I have had the opportunity to ask questions and discuss the study with the researcher and I have received satisfactory answers to all my questions.

I understand that I am free to withdraw from the study at any time without giving a reason.

I agree to take part in the study.

Participant's Signature: _____ Date: _____

Participant's Name in print: _____



Information Sheet for Psychological Study on Taste Preference and Decision-Making

My name is Ben O'Loughlin and I am conducting research in the Department of Psychology in Dublin Business School that explores taste preference and decision-making. This research is being conducted as part of my studies and will be submitted for grading. You are invited to participate in this study but participation is voluntary so you are not obliged to take part. Please read the following information before deciding whether or not to participate.

What are the objectives of the study?

The nature of the study requires that participants be naïve to the precise research question, as information about the research question may influence your subsequent behaviour and responses. For this reason I can only inform you that I am conducting research on taste preference and decision making.

What does participation involve?

Participation involves a blind wine tasting of five different red wines and subsequent questions about your preference. As there is alcohol involved you are instructed to *spit out the wine after tasting* as per a regular wine tasting. Should you not do this, please be aware that each tasting measure will be 15ml, which after tasting all five wines you will consume 75ml. This equates to .75 of a standard drink (standard drinks calculator/drinkaware.ie). The maximum recommended consumption in one sitting is 5 standard drinks and the maximum weekly allowance is 17 standard drinks for men and 11 for women (drinkaware.ie). It takes roughly one hour for the alcohol to pass through your system per standard drink (drinkaware.ie). If you have to drive immediately after taking part, *spit out the wine!*

Why have I been asked to participate?

As the study involves tasting wine, I would like to collect information from people that are wine drinkers.

Do I have the right to withdraw?

Participants have the right to withdraw from the research at any time for whatever reason. Participants can also request to have their response data removed from record at any stage of the experiment. After the experiment, all participant responses on scoring sheets will be anonymous.

Are there any benefits from my participation?

While there will be no direct benefit from participation, studies such as this can make important contributions to the understanding of taste preference and decision making. The findings from this study may be presented at psychology conferences and may be submitted for publication in peer-reviewed journals. No individual participant will be identified or individual responses presented in any publication or presentation. Individuals will not be offered any financial reward or other reward for their participation.

Are there any risks involved?

There are no risks involved in participation. Any inconvenience involved in participation will be minimal.

Confidentiality

All information collected as part of the study will be used solely for experimental purposes. They will be stored safely and not be publicly displayed or published without prior consent. All responses are anonymous.

Contact

Should you require any additional information about the research please contact: Ben O'Loughlin at either XXXX@gmail.com or 087XXXXX. My supervisor can be contacted at XXXXX@dbs.ie

Have you any questions before we begin?

Appendix D:

Please rate each wine out of 5.

Wine A	_____
Wine B	_____
Wine C	_____
Wine D	_____
Wine E	_____

Please tick the box to indicate your preferred wine. (Choose only one)

Wine A	<input type="checkbox"/>
Wine B	<input type="checkbox"/>
Wine C	<input type="checkbox"/>
Wine D	<input type="checkbox"/>
Wine E	<input type="checkbox"/>

Appendix E:

Please tick the box to indicate which wine you would hypothetically purchase from a wine shop. (Choose only one)

Wine C	-	€6.99	<input type="checkbox"/>
Wine E	-	€10.99	<input type="checkbox"/>
Wine A	-	€14.99	<input type="checkbox"/>
Wine B	-	€18.99	<input type="checkbox"/>
Wine D	-	€22.99	<input type="checkbox"/>

Appendix F:

Please tick the box to indicate which wine you would hypothetically purchase from a wine shop. (Choose only one)

Wine D	-	€22.99	<input type="checkbox"/>
Wine B	-	€18.99	<input type="checkbox"/>
Wine A	-	€14.99	<input type="checkbox"/>
Wine E	-	€10.99	<input type="checkbox"/>
Wine C	-	€6.99	<input type="checkbox"/>

Appendix G:

Please tick the box to indicate which wine you would hypothetically purchase from a wine shop. (Choose only one)

Wine C	-	€6.99	<input type="checkbox"/>
Wine E	-	€10.99	<input type="checkbox"/>
Wine A	-	€14.99	<input type="checkbox"/>
Wine B	-	€22.99 reduced! €18.99	<input type="checkbox"/>
Wine D	-	€22.99	<input type="checkbox"/>

Appendix H:

Please tick the box to indicate which wine you would hypothetically purchase from a wine shop. (Choose only one)

Wine D	-	€22.99	<input type="checkbox"/>
Wine B	-	€22.99 reduced! €18.99	<input type="checkbox"/>
Wine A	-	€14.99	<input type="checkbox"/>
Wine E	-	€10.99	<input type="checkbox"/>
Wine C	-	€6.99	<input type="checkbox"/>

Appendix I:

1. What age are you? _____

2. What gender are you? Male Female

3. How often would you purchase a bottle of wine from a shop or off licence?

- Never
- 1 – 3 times per month
- 4 - 6 times per month
- 7 - 9 times per month
- 10 - 12 times per month
- 13 - 15 times per month
- Over 15 times per month

4. On average how much would you spend on a bottle of wine from a shop or off licence?

- €0-€5
- €6-€10
- €11-€15
- €16-€20
- €21-€25
- €26-€30
- Over €30

5. How would you rate your wine knowledge?

- Excellent
- Above average
- Average
- Below Average
- Poor

6. Do you think the order in which the prices of the wine were listed had an effect on your hypothetical purchase?

- Yes
- No
- Don't know



Debrief Sheet

Firstly, I would like to thank you for your participation in this study. Without voluntary participation from people like you, many student psychology research projects would not be possible. In the information sheet you were given before the study I mentioned that due to the nature of the study it required that participants be naïve to the precise research question, as information about the research question may influence your subsequent behaviour and responses. You were informed that the research was regarding taste preference and decision-making. This was not entirely true. I apologise for the deception but it was necessary to capture naturally occurring behaviour. The precise research question was whether anchoring, price order and sale price have an influence on consumer decision-making. What does this mean? Anchoring is a cognitive bias that describes the tendency to rely too much on the first piece of information offered, i.e. the anchor, when making decisions. Subsequent judgements and decisions are then based around this initial piece of information, a benchmark as such.

For example, if I asked one group of people two questions:
Do you think the population of Russia is more or less than 65 million people?
Then I asked them what do you think the population of Russia is?

Then, if I asked another group of people a very similar question:
Do you think the population of Russia is more or less than 200 million people?
Then I asked them what do you think the population of Russia is?

The average of the first groups answer would be a lot lower than the average of the second group. Their guess for the second question would be influenced by the information in the first question. If you're wondering, the population of Russia is, it is approximately 145 million people! Anchoring effects have been shown to occur consistently when an arbitrary number is presented e.g. 65 or 200.

My study was designed to investigate whether anchoring would occur without an arbitrary number but instead with numbers ordered either from lowest to highest or highest to lowest. Would the top number on the list act as an anchor? Again, what does this mean? Not everyone that took part in the study received the same wine price list. There were actually four different ones that you can see on the back of this page. An extra component of the study was adding a sale price for one wine for some people to see if that influenced some peoples' choice.

But really, I'm sure all you really want to know is what wine was what. So here you are!

All of the wines were a tempranillo grape varietal from 3 regions of Spain. Below also is there actual retail price.

Wine A	Vina Real Crianza 2011 (Rioja)	€15.00
Wine B	Palacios Redoma 'Vendimia' Roble 2013 (Rioja)	€18.00
Wine C	Castillio di Montero 2013 (Valencia)	€8.00
Wine D	Finca la Emperatriz Crianza 2010 (Rioja)	€21.00
Wine E	Campo Nuevo Tempranillo 2013 (Navara)	€11.00

Thank you again for your participation. If you have any questions please ask and should you wish to know anything else about the study, results etc. I can be contacted at thebenoloughlin@gmail.com or 0879572556.

Please tick the box to indicate which wine you would hypothetically purchase from a wine shop. (Choose only one)

- Wine C - €6.99
- Wine E - €10.99
- Wine A - €14.99
- Wine B - €18.99
- Wine D - €22.99

- Wine D - €22.99
- Wine B - €18.99
- Wine A - €14.99
- Wine E - €10.99
- Wine C - €6.99

- Wine C - €6.99
- Wine E - €10.99
- Wine A - €14.99
- Wine B - ~~€22.99~~ reduced! €18.99
- Wine D - €22.99

- Wine D - €22.99
- Wine B - ~~€22.99~~ reduced! €18.99
- Wine A - €14.99
- Wine E - €10.99
- Wine C - €6.99

Appendix K:

* 1.

Please read the description of each wine.

Then choose which red wine you would hypothetically purchase from a wine shop.

- | | |
|---|--------|
| <input type="radio"/> Castillio di Montero Tempranillio 2013 (Valencia) | €6.99 |
| This wine has a beautiful purple hue. The nose typical cherry aromas come forward from the Tempranillo grape, the wine is soft and fruity. | |
| <input type="radio"/> Campo Nuevo Tempranillio 2013 (Navara) | €10.99 |
| Aromas of red fruits & raspberries with a hint of truffles lead to a full bodied palate showing well balanced acidity, good structure & a long finish. | |
| <input type="radio"/> Vina Real Crianza Tempranillio 2011 (Rioja) | €14.99 |
| Full, morello cherry, ruby red, good intensity. Ripe autumn red and purple fruit, raspberries, damsons and sloes over a fine toasty vanilla complexity. Rich, deep and balanced. | |
| <input type="radio"/> Palacios Redoma 'Vendimia' Roble Tempranillio 2013 (Rioja) | €18.99 |
| Soft hedge-row flavours, wild berries and gentle spice to the fore. This cuvée is made by whole-bunch fermentation and then aged only briefly, that is to say for less than six months, in oak barrels. | |
| <input type="radio"/> Finca la Emperatriz Crianza Tempranillio 2010 (Rioja) | €22.99 |
| Clean nasal aromas with a medium intensity. The expressive notes of ripe red fruit stand out along with subtle toasted and spicy notes and intense hints of cocoa. Some mineral notes, which provide this wine with complexity. | |

Next

Appendix M:

* 1.

Please read the description of each wine.

Then choose which red wine you would hypothetically purchase from a wine shop.

- | | |
|---|---------------|
| <input type="radio"/> Finca la Emperatriz Crianza Tempranillio 2010 (Rioja) | €22.99 |
| Clean nasal aromas with a medium intensity. The expressive notes of ripe red fruit stand out along with subtle toasted and spicy notes and intense hints of cocoa. Some mineral notes, which provide this wine with complexity. | |
| <input type="radio"/> Palacios Redoma 'Vendimia' Roble Tempranillio 2013 (Rioja) | €18.99 |
| Soft hedge-row flavours, wild berries and gentle spice to the fore. This cuvée is made by whole-bunch fermentation and then aged only briefly, that is to say for less than six months, in oak barrels. | |
| <input type="radio"/> Vina Real Crianza Tempranillio 2011 (Rioja) | €14.99 |
| Full, morello cherry, ruby red, good intensity. Ripe autumn red and purple fruit, raspberries, damsons and sloes over a fine toasty vanilla complexity. Rich, deep and balanced. | |
| <input type="radio"/> Campo Nuevo Tempranillio 2013 (Navara) | €10.99 |
| Aromas of red fruits & raspberries with a hint of truffles lead to a full bodied palate showing well balanced acidity, good structure & a long finish. | |
| <input type="radio"/> Castillio di Montero Tempranillio 2013 (Valencia) | €6.99 |
| This wine has a beautiful purple hue. The nose typical cherry aromas come forward from the Tempranillo grape, the wine is soft and fruity. | |

Appendix N:

* 1.

Please read the description of each wine.

Then choose which red wine you would hypothetically purchase from a wine shop.

- Castillio di Montero Tempranillio 2013 (Valencia)** €6.99
This wine has a beautiful purple hue. The nose typical cherry aromas come forward from the Tempranillo grape, the wine is soft and fruity.
- Campo Nuevo Tempranillio 2013 (Navara)** €10.99
Aromas of red fruits & raspberries with a hint of truffles lead to a full bodied palate showing well balanced acidity, good structure & a long finish.
- Vina Real Crianza Tempranillio 2011 (Rioja)** €14.99
Full, morello cherry, ruby red, good intensity. Ripe autumn red and purple fruit, raspberries, damsons and sloes over a fine toasty vanilla complexity. Rich, deep and balanced.
- Palacios Redoma 'Vendimia' Roble Tempranillio 2013 (Rioja)** was €22.99 now reduced to €18.99
Soft hedge-row flavours, wild berries and gentle spice to the fore. This cuvée is made by whole-bunch fermentation and then aged only briefly, that is to say for less than six months, in oak barrels.
- Finca la Emperatriz Crianza Tempranillio 2010 (Rioja)** €22.99
Clean nasal aromas with a medium intensity. The expressive notes of ripe red fruit stand out along with subtle toasted and spicy notes and intense hints of cocoa. Some mineral notes, which provide this wine with complexity.

Next

Appendix O:

* 1.

Please read the description of each wine.

Then choose which red wine you would hypothetically purchase from a wine shop.

- Finca la Emperatriz Crianza Tempranillio 2010 (Rioja)** **€22.99**
Clean nasal aromas with a medium intensity. The expressive notes of ripe red fruit stand out along with subtle toasted and spicy notes and intense hints of cocoa. Some mineral notes, which provide this wine with complexity.
- Palacios Redoma 'Vendimia' Roble Tempranillio 2013 (Rioja)** **was €22.99 now reduced to €18.99**
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Aromas of red fruits & raspberries with a hint of truffles lead to a full bodied palate showing well balanced acidity, good structure & a long finish.
- Castillio di Montero Tempranillio 2013 (Valencia)** **€6.99**
This wine has a beautiful purple hue. The nose typical cherry aromas come forward from the Tempranillo grape, the wine is soft and fruity.

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Appendix P:

***2. What is your age?**

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older

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***3. What is your gender?**

- Female
- Male

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***4. How often would you purchase a bottle of wine from a shop or off licence?**

- Never
- 1 - 3 times per month
- 4 - 6 times per month
- 7 - 9 times per month
- 10 - 12 times per month
- 13 - 15 times per month
- Over 15 times per month

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*** 5. On average how much would you spend on a bottle of wine from a shop or off licence?**

- €0-€5
- €6-€10
- €11-€15
- €16-€20
- €21-€25
- €26-€30
- Over €30

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*** 6. How would you rate your wine knowledge?**

- Excellent
- Above average
- Average
- Below average
- Poor

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*** 7. Do you think the order in which the prices of the wine were listed had an effect on your hypothetical purchase?**

- Yes
- No
- Don't know

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