Anchoring Order Effects and Consumer Purchasing Behavior

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Math Senior Seminar
May 2024

Abstract

The purpose of this study was to determine if anchoring works in stores to increase revenue, specifically in this study we looked at order effect anchors. Anchoring is a method of influencing consumers' purchasing decisions by providing suggestions. We hypothesized that a unit-price anchor ("2 for $4") leads to the most sales and therefore the most revenue, followed by the price-unit ("$4 for 2") and single-unit ($2 each) anchors. We conducted an experiment using 29 high school students in grades 11-12, who shopped in a pretend store 3 different times, each time being a different anchor imposed on them. We found that unit-price anchoring produced more revenue than the single-price anchor when involving all items in a store but this effect was not found for just chips or just drinks. Our data suggests that unit-price anchoring works amongst a whole store compared to individual categories of items.

When consumers go to a store they are faced with lots of information. To make shopping easier, consumers rely on anchors, which are numbers to guide their thinking, to help them make decisions (1). A commonly used type of anchor in stores is unit-price anchors such as “buy 4 candy bars for 2 dollars” (1, 2). For example, research suggests that consumers buy 32% more when exposed to multiple-unit price anchors compared to single-priced unit anchors (1). Consumers need to realize how much these anchors affect them since it can help them save money. Research suggests that brand loyalty, pricing strategies, order effects, and ease of computation all impact how both internal and external anchors influence consumer decisions (1, 2, 3, 4, 5, 6). Investigating this is important because business owners may be able to get more money from consumers or consumers will have more knowledge on ways they can save money. In this study, we had adolescent shoppers shop at a pretend food store at TNA. For multiple weeks, shoppers were exposed to unit-price and price-unit anchors and a control single-item anchor to see which type produced the highest sales.

An anchor is an assumption people use to make decisions easier (6). There are two main anchors, internal and external. Internal anchors are pre-existing notions of what people want to do. In this study, the focus is on consumers and shopping and how external information affects these internal anchors. Stores provide external anchors, which are pre-existing notions people put on others. Stores provide these anchors to change a shopper’s internal anchor so they buy more. According to Epley and Gilovich, there are 4 different types of anchors: Intuitive approximation anchors, best and worst-case scenario anchors, incidental, and environmental anchors (6).

Intuitive anchors are self-generated anchors where people rely on existing knowledge, the more a person knows about a field or subject the more intuitive anchoring effects work on a person. Best and worst case scenario anchors are internal anchors used when the outcome has a strong positive or negative, for example, best case a person only uses 3 soap bars in a month so they need only so much. Incidental anchors are external anchors that are placed on consumers in an environment unintentionally. Environmental anchors are anchors within an environment, suggestions encountered in a store like an advertisement. These anchors are external and can come in many different forms such as unit-price sales (10 candy bars for 5$), price-unit (5$ for 10 candy bars), single-priced anchors (Now only 2$), and suggestive anchors (buy 10 candy bars for your kids). Mainly every source focuses on environmental anchors dealing with grocery stores and online stores. While all anchors affect a person’s decisions in a store, environmental anchors are the ones retailers have the most control over.

There are lots of different ways to use environmental anchors in stores, but the pricing strategies are crucial to the effect that the anchors have on consumers. Wansink, Kent, and Hoch conducted 4 studies based on 4 different pricing strategies: unit-price, limit conditions, suggestive selling, and expansion anchoring (2). In study 1, the researchers used 43 stores using single unit-price and 43 stores using multiple unit-pricing strategies, they used a total of 13 products to test these strategies. They found that multiple unit pricing strategies sold 32% more in sales than single unit pricing over all 13 products they used. In study 2 they researched limits.

Wansink, Kent, and Hoch also gave customers limit conditions on what they can get, they used 3 different limit conditions in 3 different stores. For example, a limit of 12 per person,

a limit of 4 per person, and no limit conditions. They found that the group that participated in the “Limit 12 per person” produced the most sales, and also those customers brought twice as much as the group containing limits of 4 per person. In the 3rd study, they tested suggestive selling in 2 different ways: suggestive selling with no anchor (buy for your freezer) and suggestive selling with an anchor (buy 18 for your freezer). The study was based on which method of suggested selling would generate more sales, and they found that suggestive selling with multiple unit-price promotions increased more sales than single unit-price promotions. Overall they found that people are susceptible to unit-price, limits, suggested quantities, and expansion anchoring (2). Noting this finding, the process of exposing people to anchors begins with pricing strategies.

There are lots of different pricing strategies to utilize. In Bagchi and Davis’ study, they focus on 3 strategies: ease of computation, numerosity (large numeric size) of offers, and order effects (unit-price vs. price-unit) (1). They found that the price-unit order effect does not exist when package offers are small and the math is simple. But, when offers are large and the math is difficult, customers rely on order effects and are turned off by the price-unit order and respond more positively to the unit-price order effect. For example, if a product was listed as 4 for $2, it does not matter if the 4 is first or the $2 is first. But, if the offer was 17 for $43, people respond to the 17 first more positively than the $43 first (1). Therefore in our study, we will consider quantities and prices that are moderate in size: not too hard, and not too easy to calculate. This way we can explore the order effect on its own. The effect of quantity impacts consumer decisions to purchase items as well.

Customers are susceptible to many pricing strategies and anchors, but in some cases whenever it meets a customer's purchase intentions (5). A customer who only needs 2 pitchers of iced tea for their fridge most likely won’t be susceptible to buy 6 iced teas for 10$. Manning and Sprott tested this with 3 studies using 2 fake stores and a confirmation study. The first study uses a fake store comparing the quantity effect of products on unit-price sales. They found that high quantities of products with unit-price promotions generate more sales, and additionally, they found that lower quantities of products with unit-price sales do not differ between multiple unit-price sales and single unit-price sales. For the second study, they used a fake store as well, but they tested customers' willingness to buy products based on purchase intentions. They found that purchase intentions and anchor-consistent knowledge are moderated with consumption volume For example,20 ice teas for 5$ compared to 20 fruit snacks for 5$, what would a shopperone do with 20 ice teas? The purchase intention matters.

For Manning and Sprott’s 3rd study, they tested multiple unit price promotions, and they found that high quantity anchors in multiple unit price promotions can influence consumers’ decisions on purchase quantities. Overall they found that high-quantity unit price promotions influence/generate more sales, but can lower consumer interest when it comes to purchase intentions on certain products can lessen this effect. This suggests that we should include products people are generally likely to buy a lot of (5). Customers could also be more susceptible to these anchors based on the brand influence.

Among consumers most will be willing to pay more for brands they prefer (3). Jackson compared the difference between brand-loyal consumers' willingness to pay for toothpaste they preferred to non-brand-loyal consumers' willingness to pay for whatever they could find.

Seventy-one college students were surveyed on what toothpaste they preferred, how loyal to that brand of toothpaste they were, and how much they would pay. Results show that Jacksons' hypothesis that brand-loyal consumers are willing to pay more than non brand-loyal consumers was supported. Brand loyal consumers pay 10.3% more on average than non-brand loyal consumers. This suggests that brand loyal consumers are less budget concerned about consumer products in general compared to non brand loyal consumers (3)..

When consumers observe sales it has been shown that most don't like to calculate math unless it's easy or mental math. Kwong, Soman, and Ho help support this claim. They conducted two studies involving spending points. In the first study, they compared spending points and saving by inviting people to spend reward points for a discount on a combo meal. Some discounts were easy to find in one's head, others were harder. They found that when the math was easy to do people spent their reward points, when it was hard they kept their price. The second study replicated the 1st except all participants but one group were told the percentage of the discounts, and their findings stated people given the percentages spent points more no matter the complexity of the computation, but the group without info given only spent points when computation was easy. This experiment implies that people spend more when the math is easy(4).

Overall the research shows that consumers are susceptible to anchoring, and in particular the best method of anchoring is a unit-price anchor whenever the numbers are small and the math is hard (4,2). This study contributes to an understanding of unit-price anchoring effects on younger consumers shopping in informal markets. Our study included an informal market that sells products students prefer. We picked 2 items: a drink and a snack and over the course of 3 weeks, we studied single unit-price effects one week, unit-price effects another week, and price-unit effects the third week.

Our main hypothesis was that the unit-price anchor leads to the most sales and therefore the most revenue, followed by the price-unit and single-unit anchors. To fully investigate this, we looked at the sales and revenue for all items (H1a), chips (H1b), and drinks (H1c) separately.

Materials and Methods

Twenty-nine students participated in the study from The Neighborhood Academy. All students were African American and the group was composed of males (52%) and females (48%), in grades of 11th to 12th, and between the ages of 16 and 18.

We created a fake store using fake money and real food. There were 2 categories of food: drinks, and chips. The drinks included Gatorade and Caprisuns and chips, hot and regular. These items were chosen based on personal experience knowing students often buy these snack items in high quantities at local stores.

Participants visited the store 3 times once for each anchor. The first anchor used was single-price where each item was priced per single unit. The second anchor was unit-price where multiple units are offered at one price (for example 2 for 3$). The third anchor was Price-unit where the previous anchors of unit-price were reversed in order (3$ for 2). The prices for each anchor are summarized in **Table 1**.

Single Price

Gatorade $1.50 each	Chips 75 cents each
Caprisuns $1.25 each	Hot chips $1 each

Unit-price

Gatorade 2 for $3	Chips 3 for $2.25
Caprisuns 4 for $5	Hot chips 3 for $3

Price-unit

Gatorade $3 for 2	Chips $2.25 for 3
Caprisuns $5 for 4	Hot chips $3 for 3

Table 1. Product price across anchors.

The single-price items were chosen to be a moderate mental math difficulty, participants had 10$ to spend, and we wanted some thinking but not so much that a calculator was needed. The quantities were chosen for the other anchors in hopes they might buy more but not so much more they couldn't, also in hopes it made computation easier. We kept the price per item the same across all anchors.

Participants were asked to come and choose products and were invited to spend up to $10, although they were not required to use it all. They were asked to behave how they would at a normal store. The same people we asked back for each anchor, with several days in between. As a reward, participants were allowed to keep one item from the store as a snack.

Differences in revenue and quantity sold were analyzed using a one-way ANOVA test for correlated samples. Individual differences were found using a Tukey post-hoc test. The abbreviation M is the mean, and SD is the standard deviation. All tests were calculated using vassarstats.net with a 0.05 significant threshold.

Results

We expected the unit-price anchor to excel in sales and revenue, and we looked for the trend through all items, drinks, and chip revenue as well as sales for each. We investigated this by having 29 students shop at a fake store. From grade 11th-12th, each student shopped three different times for each of the 3 different anchors; unit-price, price-unit, and single-price.

Our main hypothesis was that the unit-price anchor leads to the most sales and therefore the most revenue, followed by the price-unit and single-unit anchors. We added the total number of chips and drinks for each shopper across all three trials. The total revenue for each shopper for each anchor was found by adding the chip and drink revenues based on the prices in each condition, with the price-per-item the same in all anchors, but presented differently. A one-way ANOVA for correlated samples found a difference in total items sold across the anchor conditions ($F(2,56)= 4.32$, $p=0.018$, Figure 1). A Tukey HSD post-hoc test found the single-unit anchor ($M=5.2$, $SD= 2.1$) sold fewer items than the unit-price anchor ($M=6.4$, $SD= 2.1$). The price-unit ($M=5.9$, $SD= 2.2$) anchor did sell more than the single-price, but this difference was not statistically significant. When it comes to revenue, a one-way ANOVA for correlated samples found a difference in revenue ($F(2,56)=3.69$, $p=0.031$). A Tukey HSD post-hoc test found the unit-price anchor ($M=6.4$, $SD=2.03$) brought in the most money compared to the single-price ($M=5.4$, $SD=2.2$), but there was no difference in price-unit ($M=6.4$ $SD=2.1$) and single-price anchors.

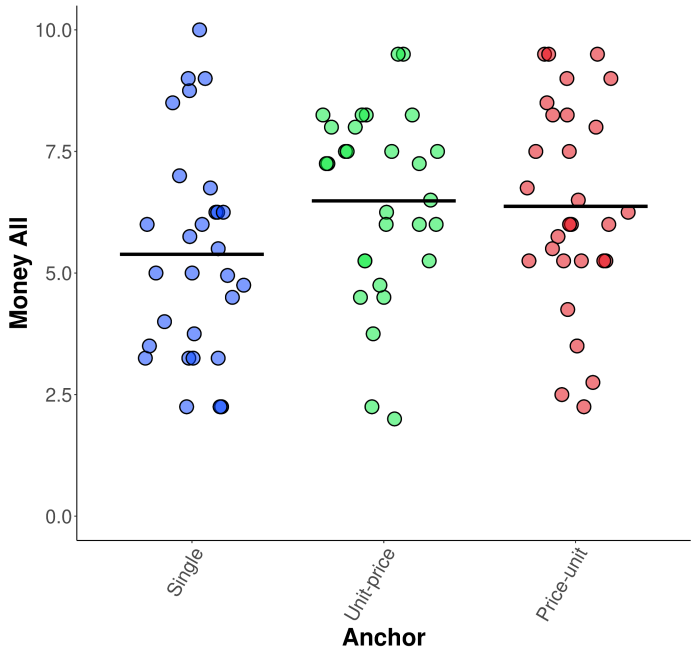

Figure 1. All money revenue across all anchors. *Dot plot showing the means of revenue between each anchor. A pretend store was created and each student of 30 visited three times, once for each anchor. One-way ANOVA for correlated samples with Tukey post-hoc test, $p<0.05$.*

To further investigate our main hypothesis, we'll break it down into the type of food item. First, we looked at just chips. In this category, there were two different varieties of chips, hot chips and regular chips. Consumers were more interested in the hot chips as well as bought hot chips in higher quantities rather than regular chips. A one-way ANOVA for correlated samples did not find a total difference in total chip items across the different anchors($F(2,56)=2.5$, $p=0.09$). The most chips were sold with the unit-price anchor ($M=4.2$ $SD=1.8$), followed by price-unit ($M=3.7$ $SD=1.9$), and then the least selling being the single-price ($M=3.3$ $SD=1.6$). However, all data did not have a statistically significant difference. When it comes to chip revenue, a one-way ANOVA test for correlated samples was also used and found no difference in revenue ($F(2,56)=1.19$, $p=0.3$). The anchor that brought in the most revenue was the unit-price anchor ($M=3.4$ $SD=1.5$) followed by price-unit($M=3.2$ $SD=1.8$), then selling the least revenue single-price ($M=2.9$ $SD=1.3$). While single-price sold less, the difference across all anchors was not significant.

Additionally, we will do the same breakdown of our main hypothesis, but for drink revenue and drink items. In the drink category, there were two different drinks, Gatorade and Caprisun. Consumers were more interested in Caprisuns than Gatorades. A one-way ANOVA test for correlated samples found no significant difference in drink items across all anchors ($F=(2,56)$, $p=0.50$). Even though there was no significant difference, the unit-price anchor sold the highest quantity of drinks ($M=2.3$ $SD=.996$) followed by price-unit ($M=2.1$ $SD= 1.6$), and selling the smallest quantity single price ($M=1.9$ $SD=1.2$). For drink revenue, a one-way ANOVA test for correlated samples was also used to calculate the difference between drink revenue across all anchors ($F=(2,56)$, $p=0.2$). There were no significant differences between drink revenue however the price-unit ($M=3.2$ $SD=2.0$) sold the most, followed by unit-price ($M=3.1$ $SD=1.3$), and the least amount of sales being single-price ($M=2.5$ $SD=1.6$). While single-price sold the least, the difference across all anchors was not significant.

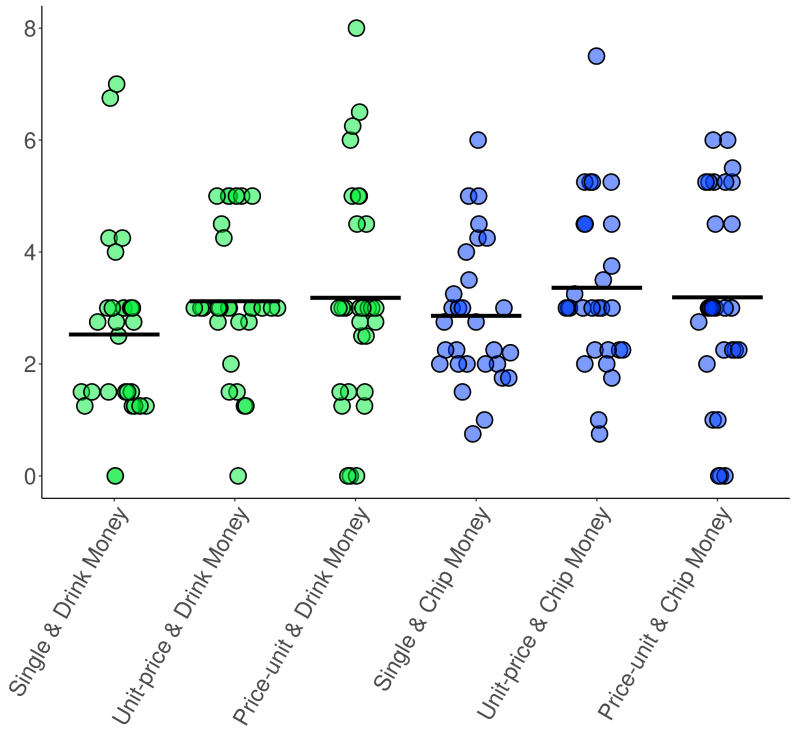

Figure 2. Revenue of drinks and chips across all anchors. *Dot plot showing mean revenues of each anchor relating to drinks and chips. There were no significant differences in revenue for either product type across the three anchors, ANOVA test, p>0.05.*

Discussion

In this study, we determined which anchor prevailed the most in sales and revenue. Our hypothesis that anchors would prevail over single-price items was partially supported because the unit-price anchor did produce the most money and most items sold when looking at all items in the store, but there was not a difference between single-price and price-unit anchors (Figure 1). For chips only, there was no significant difference across all anchors (Figure 2). This was also true for just drinks (Figure 2). This suggests that unit-price anchoring is effective when used across an entire store.

Prior research on unit-price anchoring found that anchoring generated the most revenue across 43 real stories involving 13 products (2). Unit-price sales produced 32% more sales than single-price, and this research was across all of the 13 products. In our study, we found that unit-price produced the most sales and revenue dealing with all the items in our store, but when it came to a specific product category like chips only or drinks only, there was no significant difference. The drink category failed to support our hypothesis not only due to the non-significant difference but also due to the price-unit anchor producing the most sales compared to our hypothesized assumption of unit-price producing the most sales. Based on our findings we can infer that unit-price anchoring works amongst a whole store, involving all products, not just particular products because different people are interested in different products and possess different intuitive anchors (6).

Looking at numerical complexity, prior research found that people spend more when numerical complexity is less, people do not like to do math when making decisions (4). This prior study used reward points and they invited people to spend their points on discount meals, some discounts were easy to compute mentally, while some were harder. This study is consistent with our research because like them, we also took into consideration the mental math complexity of the deals made, and we found that our price-unit anchor caused our participants to think more because the math was harder, so our participants chose not to spend as much similar to how their participants chose not to spend. This pattern of price-unit anchors being more difficult to compute was something we observed while watching them struggle to make their purchase sum add up to 10$, this pattern was not intentional or designed that way. Therefore it is crucial to take into consideration the numerical complexity of the deals when offering them during the anchor, because the harder the numerical complexity the fewer customers will buy, but if complexity is easy they will tend to buy more.

Research on numerosity or large orders is consistent with our findings. Bagchi and Davis found that anchoring worked better when the offer was larger in quantity. We found something similar, the Caprisuns offer was larger (4 for $5 or $5 for 4) and generated the most sales under the anchoring conditions: unit-price anchoring sold 23% more Caprisuns than the single-price, and price-unit sold 30% more Caprisuns than the single-price. Therefore this suggests that anchoring is more effective with larger quantities because it makes it seem as though consumers will gain more items.

The limitations in our experiment consisted of the fact it was a fake store and the limited amount of supplies we had. The fake store was a limitation because we weren't sure that our participants would actually buy these products, however, people generally did not spend all 10$, this suggests that participants were making intelligent choices as if it was real money, so we wouldn't consider it a problem because almost all participants had money left over. Participants would likely not have done so unless they treated it like a real store with real money.

Also for our incentive of this fake store, we let participants keep one thing each time, which may have influenced them to buy different items based on what they wanted to have at that moment. In addition, the fake store was beneficial because the same participants were used in all three conditions, which allowed us to keep this consistent. The limited amount of supplies was also a limitation because not all participants preferred those products, however, it was not practical to purchase more than four types of food. Following up, we recommend future researchers survey participants about the food they would like, so the store could be seen as more desirable.

According to our research, anchoring works in stores. From our three different anchor conditions (single-price, unit-price, price-unit), our studies show that the most effective condition is the unit-price anchor. Our research shows that unit-price anchoring is the most effective when used across a whole store. As a recommendation to those wishing to incorporate anchoring into their store, specifically unit-price anchoring, business owners should apply anchoring to the whole store, not just specific products, because not all people will respond the same way due to their varying desires towards products.

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