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Article

Unit-price anchoring affects consumer purchasing behavior

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SUMMARY

Anchoring is a method of influencing consumers' purchasing decisions by providing numerical suggestions. This study aims to determine if order-effect anchoring works in stores to increase revenue. We hypothesized that a unit-price anchor ("2 for $4") would lead to the most sales and therefore the most revenue, followed by the price-unit ("$4 for 2") and single-price ($2 each) anchors. Previous research suggests consumers rely on external information like anchors found in advertisements, to help them make the shopping experience more efficient. While prior research has demonstrated order-effect anchors can increase sales, few studies have established this pattern among adolescent shoppers. We conducted an experiment using 29 high school students in grades 11-12, who shopped in a pretend store three different times, each time with a different anchor imposed on them. We found that unit-price anchoring produced more revenue than the single-price anchor when applied to all items in a store, not just individual categories such as chips or just drinks. Our data suggests that unit-price anchoring works best when applied across multiple categories of items, compared to individual categories, and is an effective revenue-generating anchor.

INTRODUCTION

When consumers go to a store, they are faced with a lot of information. To make shopping easier, consumers rely on anchors, or numbers that guide their thinking, to help them make decisions (1). A commonly used type of anchor in stores is a unit-price anchor such as "buy 4 candy bars for 2 dollars" (1, 2). Research suggests that consumers buy 32% more when exposed to unit-price anchors compared to single-price anchors (e.g. "50 cents per candy bar") (2). Research suggests that brand loyalty, pricing strategies, order effects, and ease of computation all impact how both internal and external anchors influence consumer decisions (1-4). The effect of these price anchors is important to understand for both the seller looking to make a profit, and the consumer seeking to maximize their spending power.

An anchor is an assumption people use to make decisions easier (3). There are two main anchors, internal and external. Internal anchors are pre-existing notions of customers' intended purchase decisions. In this study, we focused on consumers and shopping and how external information affects these internal anchors. Stores provide external anchors, which are pre-existing suggestions for customers to base their purchase decisions on. Stores provide these anchors to influence a shopper's internal anchor, so they buy more.

There are many different ways to use external anchors in stores, but the pricing strategies are crucial to the effect that the anchors have on consumers (2). Wansink et al. found that unit-price anchoring strategies sold 32% more than single-price anchoring across all 13 products they used (2). The authors also gave customers limits on what they could buy and found that the group that participated in the "Limit 12 per person" produced the most sales; those customers bought twice as much as the group containing limits of 4 per person (2). The researchers tested suggested selling messages with no anchor ("buy for your freezer") and suggestive selling with an anchor ("buy 18 for your freezer"). They found that suggestive selling with the anchor promotions produced the highest sales. Overall, Wansink et al.'s research suggests multiple types of external anchors may increase sales (2).

In another prior study on pricing strategies, researchers considered the ease of computation, numerosity 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).

Customers are susceptible to many pricing strategies and anchors, but customer's purchase intentions may play a role in how they respond to the anchor (4). 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. Researchers found that purchase intentions and anchor-consistent knowledge are moderated by intended consumption volume (4). When a consumer anticipated needing more of an item, they responded more positively to unit-price anchors (4). Overall, research shows that consumers are susceptible to anchoring, and in particular, one of the most effective methods of anchoring is a unit-price anchor whenever the numbers are large and the math is hard (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 categories of items: a drink and a snack, and over the course of 3 weeks, we studied single-price effects, unit-price effects, and price-unit effects. We hypothesized that the unit-price anchor would lead to the most sales and therefore the most revenue, followed by

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Single Price	
Gatorade $1.50 each	Chips 75 cents each
Caprisun $1.25 each	Hot chips $1 each
Unit-price	
Gatorade 2 for $3	Chips 3 for $2.25
Caprisun 4 for $5	Hot chips 3 for $3
Price-unit	
Gatorade $3 for 2	Chips $2.25 for 3
Caprisun $5 for 4	Hot chips $3 for 3

Table 1: Product price across anchors.

the price-unit and single-price anchors. To fully investigate this, we looked at the sales and revenue for all items (chips and drinks combined) as well as separately (chips only or drinks only). We found that the unit-price anchor produced more revenue and items sold when compared to the single-price conditions, but there was no difference between single-price and price-unit anchors. There were also no differences in revenue and items sold when considering each product type separately. This might suggest that unit-price anchors are most effective when used across product categories and not just one type.

RESULTS

To test the effect of anchoring on sales (items sold per shopper) and revenue (total money per shopper), we collected sales data for chips and drinks. We investigated this by having 29 students (11th and 12th grade) shop at a fake store using 10 pretend dollars each time. Each student shopped three different times under each of the 3 different anchor conditions: unit-price, price-unit, and single-price.

We hypothesized that the unit-price anchor would lead to the most sales per shopper and therefore the most revenue, followed by the price-unit and single-price 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 (**Table 1**), with the price-per-item the same in all anchors but presented differently. A one-way ANOVA for correlated samples found a significant difference in total items sold across the anchor conditions ($F= 4.32$, $p=0.018$). A Tukey HSD post-hoc test found the single-price anchor (5.2 ± 2.1 items) sold fewer items than the unit-price anchor (6.4 ± 2.1 items, $p<0.05$). The price-unit (5.9 ± 2.2 items) anchor did sell more than the single-price, but this difference was not statistically significant ($p>0.05$). For revenue, a one-way ANOVA for correlated samples found a significant difference in revenue ($F=3.69$, $p=0.031$, **Figure 1**). A Tukey HSD post-hoc test found the unit-price anchor (6.4 ± 2.03 dollars) brought in the most money compared to the single-price (5.4 ± 2.2 dollars, $p<0.05$), but there was no difference in price-unit (6.4 ± 2.1 dollars) and single-price anchors ($p>0.05$).

To further investigate our hypothesis, we also examined our data by 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. A one-way ANOVA for correlated samples did not find a total difference in total chip items across the different anchors ($F=2.5$, $p=0.09$). The most chips were sold with the unit-price anchor (4.2 ± 1.8 items), followed by price-unit (3.7 ± 1.9 items), and then the least selling being the single-price (3.3 ± 1.6 items). However, there were no statistically significant differences (data not shown). When it comes to chip revenue, a one-way ANOVA test for correlated samples was also used and found no difference in revenue ($F=1.19$, $p=0.3$, **Figure 2**). The anchor that brought in the most revenue was the unit-price anchor (3.4 ± 1.5 dollars) followed by price-unit (3.2 ± 1.8 dollars), then selling the least revenue single-price (2.9 ± 1.3 dollars). While in the single-price condition, fewer items were sold, and the difference across all anchors was not significant.

In the drink category, there were two different drinks, Gatorade and Caprisun. A one-way ANOVA test for correlated samples found no significant difference in the number of drinks sold across all anchors ($F=0.70$ $p=0.50$). Even though there was no significant difference, the unit-price anchor sold the highest quantity of drinks (2.3 ± 1.0 items) followed by price-unit (2.1 ± 1.6 items), and sold the smallest quantity of single-price (1.9 ± 1.2 items). For drink revenue, a one-way ANOVA test for correlated samples was also used to calculate the difference between drink revenue across all anchors ($F=1.67$, $p=0.20$, **Figure 2**). There were no significant differences between drink revenue however the price-unit (3.2 ± 2.0 dollars) sold the most, followed by unit-price (3.1±1.3 dollars), and the least amount of sales being single-price (2.5 ± 1.6 dollars). While single-price sold the least, the difference across all anchors was not significant ($p>0.05$).

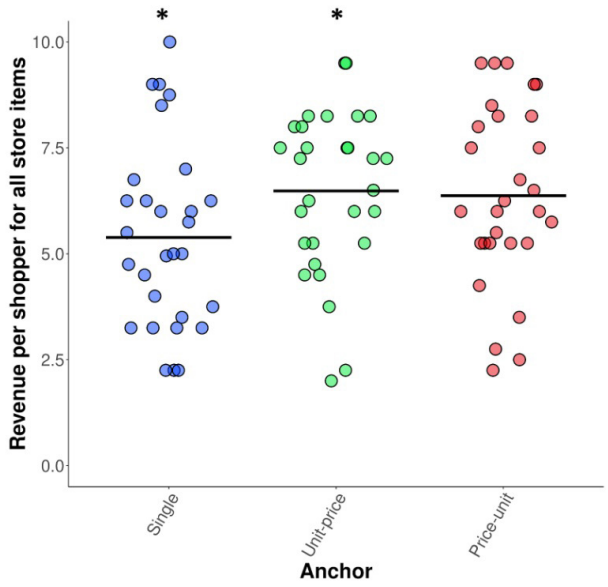

Figure 1: Revenue across all anchors. Dot plot showing the means of revenue between each anchor: single (blue), unit-price (green), price-unit (red). Each dot is a student, and each student appears in all three conditions. An asterisk indicates a significant difference using a one-way ANOVA for correlated samples with Tukey post-hoc test, $p<0.05$, $n = 29$.

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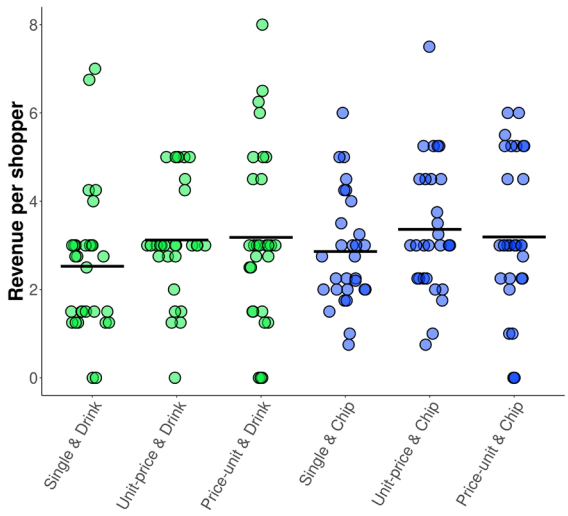

Figure 2: Revenue of drinks and chips across all anchors. Dot plot showing mean revenues of each anchor relating to drinks (green) and chips (blue). One-way ANOVA test, p>0.05, n = 29.

DISCUSSION

In this study, we determined which anchor prevailed the most in sales and revenue. Our hypothesis that both unit-price and price-unit 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 multiple product categories.

Prior research on unit-price anchoring found that anchoring generated the most revenue across 43 real stores 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 may work better across multiple categories of items at once, not just individual products because different people are interested in different products and possess different internal anchors (3).

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 (1). We found something similar, the Caprisun offer was the largest (4 for $5 or $5 for 4) and generated the most sales under the anchoring conditions: unit-price anchoring sold 23% more Caprisun than the single-price, and price-unit sold 30% more Caprisun 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. 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 as also factor in the most desirable products.

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 multiple categories of products at once. 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.

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 Capri suns, and chips included 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**.

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

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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. All participants experienced the conditions in the same order starting with single price first, unit-price next, and lastly price-unit. All 29 participants experienced the first condition before the experimenters moved on to the next condition. All participants visited alone between classes, in the morning before lunch. Participants did not discuss their choices while in the store, but it is possible that participants discussed their choices later as they were aware of who was in the experiment.

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. All tests were calculated using vassarstats.net with a 0.05 significant threshold.

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