Intelligems: Pricing in the Online World

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Colin McIntosh, the founder and CEO of Sheets & Giggles,[4] was reviewing the results of a pricing experiment his company ran using the Intelligems' experimentation platform. The experiment ran for one month and was set up to test three candidate price points—Lower, Regular, and Higher Price groups—for all core bed sheet products. The results were intriguing. The Lower Price group had a 40% higher conversion rate (fraction of the customers visiting the website who actually purchased) than the Regular Price group. At the same time, the Higher Price group had no significant difference in conversion rate relative to the Regular Price group.

Experimentation has been a central tenet of Sheets & Giggles since its founding in 2018. Sheets & Giggles is part of the recent surge in direct-to-consumer (DTC) e-commerce businesses, which sell to customers mostly through their own website. It offers sustainable bedding products, including bed sheets, pillow cases, blankets, and comforters, and specializes in high-quality moisture wicking fabric while being inexpensive relative to its competitors. Its manufacturing process uses 95% less water than cotton production and 30% less energy. It uses no petrochemical synthetics, micro plastics, or insecticides in the production process, resulting in an environment-friendly product that takes only nine weeks to decompose. Experimentation is built into its core, from using comedy as an essential part of branding to testing various marketing techniques and exploring patterns and blends for their products. Colin summarized, *"Broadly, everything we do is an experiment. [...] Experimentation for me is everything because the rule is generally that if it's been done before, I don't wanna do it. I usually tell that to the team for everything from photography to videography to our copy. So we do a lot of testing. [...] Experimentation is super crucial to us and now we do price testing constantly across our products. And the best part about price testing is that a lot of times when you launch a new product, it's a little bit finger to the wind. You're doing competitive analysis, you're looking at your competitors, and then you're seeing what you can charge. Experimentation will be more important as we're coming out with a bunch of new product lines this year."*

Sheets & Giggles is a customer of Intelligems,[5] a startup offering experimentation solutions to e-commerce businesses. Intelligems was founded in 2021 by Adam Kitain and

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Drew Marconi to help e-commerce brands be better at pricing, so that they can ultimately increase profits (more details on Intelligems are discussed below). For e-commerce brands, pricing their product is a critical decision. If the price is too high, they risk losing potential customers who are more price sensitive, whereas if the price is too low, they will generate more sales but with a low profit margin (and the brand reputation may be adversely affected). Intelligems aims to help retailers find the "sweet spot" by providing a systematic way to rigorously experiment with prices. They sum up the offering on their website by saying, "Stop Guessing. Test your Pricing."

Price experimentation has gained in prominence as a tool to help e-commerce businesses optimally price their products using objective criteria as opposed to subjective gut feelings. Such data-driven business decisions are crucial to remain competitive in the ultra-competitive e-commerce world. In this context, how should Sheets & Giggles incorporate experimentation (in pricing and otherwise) into its business decision making? What types of decisions is experimentation most suited for? How frequently should it run these experiments, and how costly are they?

Industry Background

E-commerce has been a growing part of the economy for the last 30 years and has seen great acceleration as of late. In 2021, e-commerce sales accounted for 13.2% of U.S. retail sales, amounting to $870 billion and growing at 14.2% relative to 2021. Many sectors saw impressive growth: 201.4% for furniture, building materials, and electronics. Other sectors, such as clothing, saw a growth of 38.5% (see **Exhibit 1**).[6] As retailers and consumers have gained confidence in the benefits of buying and selling goods online, e-commerce is projected to continue growing. The rise of e-commerce has made it possible for small retailers and brands to expand beyond what was previously possible and certainly far beyond the narrower reach of their brick-and-mortar counterparts.

Being digital-first allows retailers to move faster. They can constantly test new versions of their storefronts, advertisement strategies, discounts, and prices. They have data on every customer who lands on their website, and they can use tools such as email campaigns and push notifications to present personalized offers and promotions to people who browse the website. On the flip side, the market has become much more competitive—customers can easily search for competitive products, and hundreds of companies may be "bidding" on the right to show an ad on each browser.

[6] https://www.forbes.com/sites/jasongoldberg/2022/02/18/e-commerce-sales-grew-50-to-870-billion-during-the-pandemic

To make informed strategic decisions, e-commerce retailers frequently use A/B testing (or field experimentation) to optimize their businesses instead of solely relying on experience and intuition. A/B testing refers to a formal way of statistically comparing two variants of a single variable or a business decision to determine which variant performs better. It is common to A/B test advertising copies and creatives, email messaging, site layouts and images, and targeted discounts.[7] The digital infrastructure of these stores (often running on a platform like Shopify) makes it easy to segment traffic and offer different experiences to different groups of customers.

In this context, a promising tactic for e-commerce brands is price testing. Selecting prices is one of the most important decisions made by retailers. The proliferation of new products and the rapidly changing competitive landscape make it difficult to set prices based only on intuition and past experience. Thus, retailers are now resorting to systematic testing of different pricing strategies to boost sales and profits. Intelligems provides e-commerce businesses with the ability to keep up with the competition by enabling data-driven pricing for their products. They do so by designing and running experiments where they expose various groups of customers to different prices and identify the best-performing strategies based on statistical analyses.

The DTC E-Commerce Business Model

In this case study, we focus on DTC e-commerce businesses. Although it can be a difficult definition to pin down, there are a few unifying factors to DTC businesses:

1. The company owns and distributes its own brand and is not selling other brands.
2. E-commerce is the main sales channel for the products.
3. The plurality of e-commerce sales come through the company's own website.

There are massive variations in how these businesses work—both technologically and financially. In the U.S., the DTC market was worth $100 billion in 2021 and is further gaining customers' attention.[8] Platforms such as Shopify earn considerable credit for the growth of DTC businesses, as such platforms made it easier than ever to create a web store, receive payments, and operate the store. Some notable DTC businesses include Warby Parker, GymShark, Fitbit, Kylie Cosmetics, and Bombas.

DTC companies are not only performing traditional functions of brands (e.g., product design and manufacturing) but also taking on traditional functions of a retailer (customer

[7] https://www.bain.com/insights/successful-a-b-tests-in-retail-hinge-on-these-design-considerations/
[8] https://www.retaildive.com/news/roughly-75-of-dtc-brands-bring-in-under-1m-in-online-sales-report/620007/

acquisition, pricing, assortment planning, etc.). Companies such as Intelligems provide the analytical tools to help these companies make informed, data-driven decisions.

At a high level, the core economic engine of a DTC business looks as follows:

1. The company pays for ad space on social media platforms such as Meta, Google, and TikTok. They are typically charged per ad impression.
2. A portion of people who see the ad will click and land on the site.
3. A portion of these visitors will make a purchase (this is the "conversion rate"—often in the range of 1%–5%).
4. The customer acquisition cost (CAC) captures how much the firm paid for a new customer; namely, it equals [total spent on ads]/[# of new customers from ads].
5. Purchases have different values, so companies usually look at the average order value (AOV).
6. Over time, the brand hopes that it can convince customers to purchase again. These orders will be more profitable because the customer has already been acquired. DTC brands often look at lifetime value (LTV) in terms of revenue on a 30, 60, and 90 day basis.
7. The LTV to CAC ratio is a common metric in the DTC industry. It helps firms (and investors) understand the return-on-investment from the customer acquisition.

Companies have to account for payback periods and various costs, such as cost of goods (COGs), shipping costs, inventory costs, customer acquisition costs, cost of operating websites, and last-mile delivery costs.

With the growth of the internet and social media, different channels have emerged to acquire customers, including email marketing, paid advertising, search engine optimization, and social media channels. Companies need to decide how to promote their content and on which channel, as some channels may prove to be more effective. Ideally, a company would like to reduce their CAC as much as possible. To assess profitability, companies use metrics such as LTV and CAC as well as the LTV to CAC ratio to figure out whether they have a good product-market fit and how scalable their strategies are.

Overview of Intelligems

Adam Kitain and Drew Marconi met at an NYC-based ridesharing company, where they built the pricing team together. They worked on dynamic pricing ("surge") algorithms, discount engines, competitive price tracking, subscription programs, and unit economic measurement. No matter how advanced the tools were, A/B testing was the core approach

to understand customers' price elasticity and which changes were effective. They used these tests to understand when they could raise prices while having the least possible impact on growth metrics and when they could lower prices to generate a strong increase in growth.

When they decided to start a company, there was a clear opportunity to bring this approach and expertise to e-commerce DTC brands. Whereas major players such as Amazon were leveraging dynamic data-driven pricing, small and medium brands did not have great tools to do so. Many would simply work backward from a target margin, check out competitors' prices, pick a price, and not look at it for at least a year. Adam and Drew saw this as a major opportunity and were convinced that these companies were leaving money on the table by being slow and imprecise with their pricing strategies.

In 2021, they founded Intelligems, with the goal of helping e-commerce brands be better and more rigorous at pricing, so that they could ultimately increase profits. They joined the Techstars Accelerator Program in Boulder, CO, to launch the company[9] and raised a few million dollars of venture capital to build the product and the team.[10]

Intelligems has a team across the U.S. and Canada, and works with more than hundred brands that sell their goods via Shopify stores. Brands can test product prices, shipping rates and fees (e.g., get free delivery for purchases over a certain amount), discounts, and subscription prices using the platform. Their traffic gets split in real time, and Intelligems tracks the entire funnel of customers from landing on the site through purchase and returning customers, showing how different groups perform under various pricing strategies. In this case study, we focus on one client of Intelligems, Sheets & Giggles.

The Pricing Problem at Sheets & Giggles

Sheets & Giggles achieved its initial product-market fit by pricing luxury-branded products at a lower price than its competitors. They had spent significant efforts in the first few years perfecting their product, optimizing their website, and finding marketing strategies that worked well. Colin raised a new round of funding in 2021 and wanted it to be the last one. He knew it needed to dial in the economics of the business; namely, what kind of CAC was consistently achievable, how often could he get his customers to make recurring purchases, and ultimately what kind of margins could be sustainable. The team

[9] https://www.techstars.com/newsroom/meet-the-11-startups-of-techstars-boulders-2021-class
[10] https://pitchbook.com/profiles/company/454518-37#overview

had not spent much time optimizing pricing, but they knew it could be a very powerful lever. This is how the collaboration with Intelligems was born.

Pricing decisions are becoming increasingly important to businesses across all verticals. It has become ubiquitous to constantly test prices, and it is now the norm to see the selling price of many products fluctuate over time (see **Exhibit 2** for an example). For a growing startup like Sheets & Giggles, pricing was of paramount importance. As mentioned, the main challenge was the trade-off between pricing too high (loss of market share and demand) and pricing too low (low margin and brand reputation). The optimal pricing strategy highly depends on the key performance indicator (KPI) of interest. To maximize sales (e.g., to liquidate perishable inventory at the end of the season), one needs to price aggressively low. To maximize profit margins, however, one needs to set higher prices. Balancing the different KPIs by finding the right pricing strategy is intricate. Several pricing models and frameworks have been developed in the past decades. One important limitation of such models is that they often rely on having access to large amounts of historical data. How can we price a new product for which limited data is available? Similarly, how often shall we alter the pricing strategy for each product and each type of customer? A good way to answer these questions is to test several candidate price points via A/B testing. It ultimately allows the firm to know the real market reaction under different pricing strategies. In addition, if done properly, A/B testing allows quick identification (often in a matter of days or weeks) of the best pricing strategies with statistical confidence.

Two Price Experiments

In the Fall of 2021, Sheets & Giggles started conducting several price experiments using the Intelligems platform. There was not a single hypothesis that the team was testing—the main question was rather "are we priced correctly?" They had a feeling that pricing higher would be better but wanted to explore all possibilities. We next discuss two specific price experiments run by Sheets & Giggles on the Intelligems platform.

First Experiment: Varying Prices Across the Board

Experiment Design. The first experiment was broad-based, covering all core sheets products: duvet covers, fitted sheets, pillow cases, and complete sets (the complete list of products included in this experiment can be found in **Exhibit 3**). This was done to (a) get as much signal as quickly as possible and (b) limit hard-to-measure cannibalization effects from only changing prices on specific products. Three uniform relative price points were tested: lower and higher prices in addition to the regular price. Comparing

three price points instead of two would yield a "curve" of price elasticity, and comparing both lower and higher prices was expected to provide recommendations for next tests. After several discussions and analyses, a 15% price change in either direction was tested. This is a reasonably aggressive change but was chosen to hopefully generate signals much faster than a small price change. If these price points turned out to be too extreme, the idea was to test smaller price changes in future experiments. But for now the goal was to gather useful information as quickly as possible.

Experiment Setup on Intelligems Platform. Once the set of products to test and the candidate price points were decided, the experiment was set up on the Intelligems platform. The team ran statistical significance tests to figure out how long to run the experiment so as to discern a statistically detectable difference. This was done by looking at historical trends such as website traffic and sales. The decision was to run the experiment for one month. They also selected the month with the minimum number of interferences (e.g., avoiding holidays). Intelligems set up the experiment on the Sheets & Giggles website. They first ensured proper website integration. The users were randomly shown one of the three prices, and data were being collected from the experiment. The experiment ran for one month, allowing to collect 45,000 samples.

Post-Experiment Analysis and Results. After running the experiment, the team validated that the data collection was properly done. The first step was to check that the randomization of users was executed as intended. Because users were randomly assigned to each of the three conditions—Lower Price, Regular Price, and Higher Price—it was expected that the proportion of users exposed to each price group would be uniform. The team used simple statistical tests to verify the balancedness of several important features across groups. They found that the number of users was uniform across various dimensions, such as mobile vs. desktop users, type of operating system, and day of the week, hence providing reassurance that the randomization was well executed and unbiased. The team also tested the robustness of the balancedness by removing outliers, defined as the highest and lowest spenders in each group. Because outliers are often unrepresentative of the general customer pool, one can decide to omit them. After verifying that the randomization was sound, hypothesis tests were run and the results from the experiment were synthesized.

The results showed a significant difference in conversion rate between the Regular Price group and the other prices (see **Exhibit 4** for the dashboard summarizing the results). The 15% Lower Price group had an increase in conversion rate of over 40% relative to the

Regular Price group. What was even more surprising was that the Higher Price group had no significant difference relative to the Regular Price group. In other words, Colin realized that the customers were still willing to buy the products after the 15% price increase. This would mean a higher profit margin per order while maintaining the premium brand image. Colin wondered if he should increase the prices further. Is there something that he is missing? Should he run a new test that includes even higher prices, or should he focus on driving higher sales through testing lower product prices? Is it possible that specific price changes are more effective for specific types of products, specific time periods, and specific segments of customers?

Second Experiment: Charm Pricing

In addition to the above A/B test, Sheets & Giggles has run a second experiment related to testing the effect of "charm pricing." Like many companies, Sheets & Giggles opted to use prices that ended up by 5 cents or by 9 cents to avoid using round numbers. This pricing strategy is referred to as charm pricing and has been widely used for several decades. It relies on the simple, yet powerful, intuition that it creates the perception that products are cheaper than they really are. More precisely, since people read from left to right, they are more likely to register the first number and conclude that the price is reasonable. The team was curious to investigate to what extent this practice was effective. To do so, Sheets & Giggles ran an experiment to test prices for queen-size sheets. The current price was $149.95 (charm price), and they decided to test what would happen if the price was set to $150. This test was run for only one day and a shocking 40% drop in conversion rate was observed! It is striking that a 5-cent increase can be responsible for such a drastic drop in conversion. It confirms that prices indeed have a strong psychological effect on consumers, which makes pricing decisions even more intricate.

Conclusion

A/B testing provides a data-driven way to investigate which strategy performs best and when. The main advantage is that it allows getting fast answers along with statistical support. One great business decision that can benefit from A/B testing is pricing.

Sheets & Giggles is a startup that aims to disrupt the luxury bedding industry with its sustainable offerings. To compete with well-established competitors, they faced a challenge in terms of pricing their products. They teamed up with Intelligems to adopt an experimentation approach to pricing. The results of two price experiments led to concrete actionable insights, shaping their business decisions and fostering a culture of data-driven decision making.

Exhibits

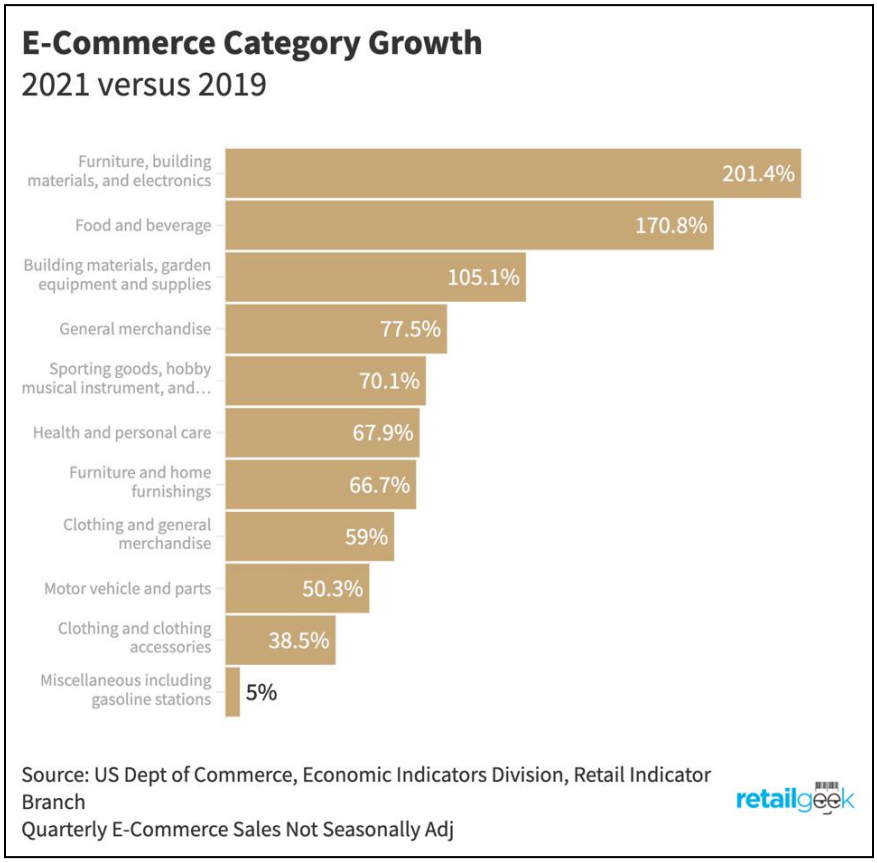


Exhibit 1: Growth of e-commerce U.S. retail sales (2019–2021)

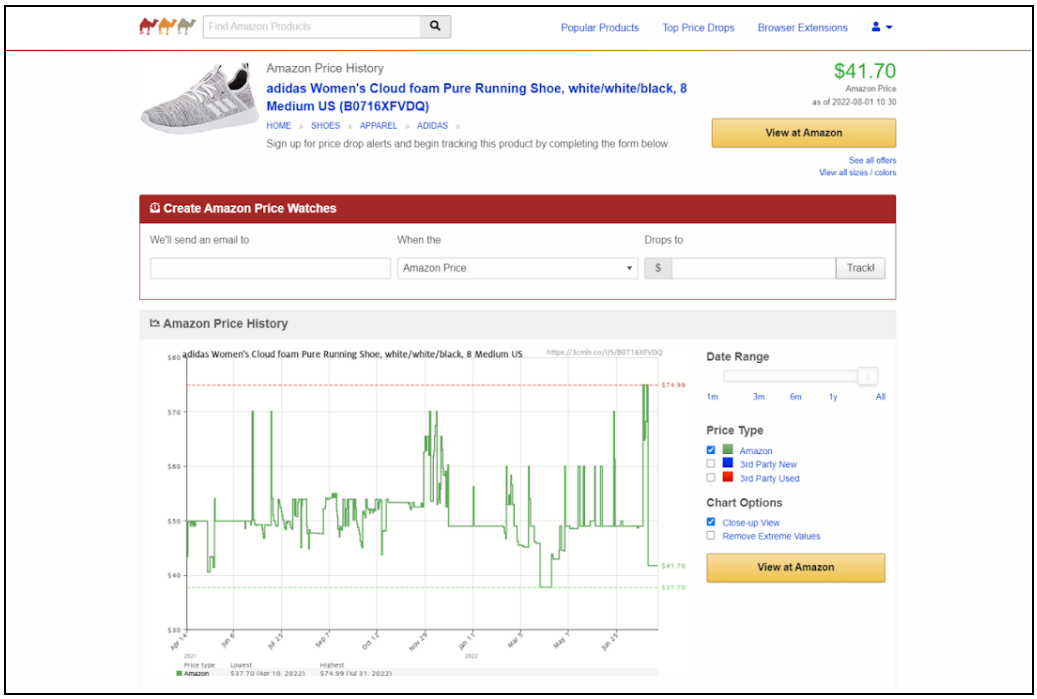
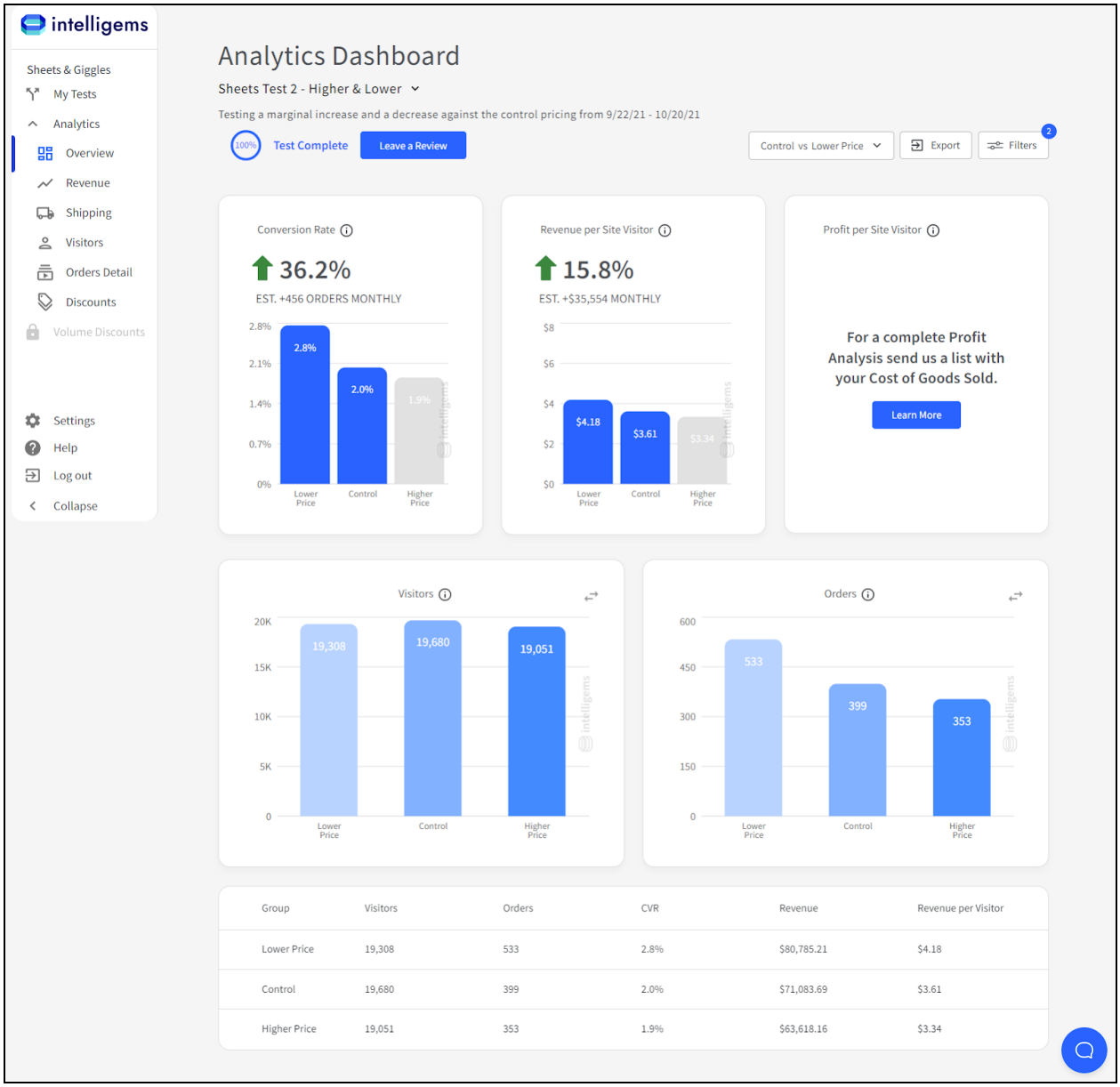


Exhibit 2: Examples of price changes for a pair of women's sneakers

Source: *https://camelcamelcamel.com/product/B0716XFVDQ?context=search*

Products in the first experiment	
Eucalyptus Lyocell Comforter	Eucalyptus Lyocell Sheet Sets - Pearl
Eucalyptus Lyocell Duvet Covers	Eucalyptus Lyocell Sheet Sets - Purple
Eucalyptus Lyocell Sheet Sets - Gray	Eucalyptus Lyocell Sheet Sets - Red
Eucalyptus Lyocell Sheet Sets - Lavender	Eucalyptus Lyocell Sheet Sets - Sage
Eucalyptus Lyocell Sheet Sets - Light Blue	Eucalyptus Lyocell Sheet Sets - White
Eucalyptus Lyocell Sheet Sets - Mint Green	Eucalyptus Lyocell Sheet Sets: 11" Pockets
Eucalyptus Lyocell Sheet Sets - Navy	Fitted Sheet Only – Extra Deep Pockets
Eucalyptus Lyocell Sheet Sets - Oat	Fitted Sheet Only - Fits up to 11" Mattresses
Extra Pillowcases (2)	Flat (Top) Sheet Only

Exhibit 3: List of products included in the first experiment



Group	Visitors	Orders	CVR	Revenue	Revenue per Visitor
Lower Price	19,308	533	2.8%	$80,785.21	$4.18
Control	19,680	399	2.0%	$71,083.69	$3.61
Higher Price	19,051	353	1.9%	$63,618.16	$3.34

Exhibit 4: Results from the experiment on the Intelligems dashboard