

Evaluating the Impact of Text-Based and Image-Enhanced Reviews on Consumer Purchase Intent

Group 2

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Abstract

This study explores the impact of text-based and image-enhanced reviews on consumer purchase likelihood. While online reviews play a crucial role in shaping consumer perceptions and purchase behavior, the influence of review format remains uncertain. Some studies suggest that images reduce uncertainty and enhance engagement¹, while others may argue that review format may not significantly alter purchase decisions. Using a randomized controlled experiment, this study examines whether image-enhanced reviews lead to higher purchase likelihood compared to text-only reviews. The analysis accounts for product familiarity, purchase experience, and gender as covariates to control for potential pre-existing differences among participants. The findings provide insights into how consumers engage with user-generated reviews and suggest that product familiarity plays a more critical role than review format in their likelihood of making a purchase.

Introduction

Online reviews are a key factor in consumer decision-making, shaping perceptions of product quality and influencing purchase behavior. Many shoppers rely on user-generated content, such as written reviews and customer-uploaded images, to assess products before buying. While images may enhance engagement, their impact on purchase likelihood remains unclear. Some research suggests that images reduce uncertainty and increase consumer confidence, while others argue that review format may not significantly influence purchase decisions.

This study investigates whether image-enhanced reviews lead to higher purchase likelihood than text-only reviews. Using a randomized controlled experiment, we analyze how different review formats influence consumer behavior across multiple product categories. To control for potential biases, product familiarity, purchase experience, and gender are included as covariates. By examining how consumers engage with and interpret user-generated reviews, this research provides valuable insights into the role of review format in shaping consumer purchase decisions.

Research Question

Do image-enhanced reviews increase purchase intent more than text-based reviews?

¹ Li, Xin, Mengyue Wang, and Yubo Chen. "The Impact of Product Photo on Online Consumer Purchase Intention: An Image-Processing Enabled Empirical Study." *PACIS 2014 Proceedings*, no. 325 (2014).
<http://aisel.aisnet.org/pacis2014/325>.

Hypotheses:

- **H₀ (Null Hypothesis):** There is no significant difference in purchase intent between text-based reviews and image-enhanced reviews.
- **H₁ (Alternative Hypothesis):** Consumers are more likely to purchase a product when the review includes images compared to text-based reviews.

Experimental Design

This study employs a randomized controlled experiment to examine the effect of review format (text-based vs. image-enhanced reviews) on consumer purchase likelihood. Participants were randomly assigned to one of two groups:

- **Control Group (Text-Only Reviews):** Viewed product reviews containing only written text.
- **Treatment Group (Image-Enhanced Reviews):** Viewed product reviews containing both text descriptions and images.

To ensure comparability, all participants saw the same standardized product description and star rating, with the only variation being whether the review included images. The study included six different products selected from Amazon's Best-Sellers section, covering categories such as clothing, home decor, and electronics. Each participant evaluated multiple product categories to prevent category-specific bias and to generalize findings across different types of consumer goods.

Participants engaged in a simulated online shopping experience, reviewing product pages with user-generated reviews. To maintain randomization and control for potential biases, all participants were exposed to the same product layout and rating system, with only the review format (text vs. text + image) varying between groups. Additionally, product familiarity, purchase experience, and gender were measured as covariates to account for any pre-existing differences that could influence purchase likelihood.

Participants were primarily MSBA students and personal contacts recruited via email and social media. The survey link was distributed online to maximize participation. Randomization was conducted using Google Apps Script, which automatically assigned participants to either the text-only or image-enhanced review condition. This between-subjects design ensured that each participant was exposed to only one type of review format, preventing within-subject bias and allowing for an unbiased comparison of how the review format influences purchase likelihood.

Variables

This study examines several variables to evaluate their impact on purchase likelihood.

(1) Independent Variable

- a. **Review Format:** A binary variable (0 = text-only review, 1 = text + image review), indicating whether the participant received an image-enhanced or text-based review.

(2) Dependent Variables

- a. **Purchase Likelihood:** A continuous variable measured on a 1-10 scale, capturing how likely a consumer is to purchase the product after viewing the review.

(3) Covariates

- a. **Product Familiarity:** A categorical variable assessing whether the participant was familiar with the product before viewing the review.
- b. **Purchase Experience:** A categorical variable indicating whether the participant has previously bought the type of product featured in the review.
- c. **Gender:** A binary variable (Male/Female) used to analyze differences in review perception and purchase likelihood based on gender.

Survey Design and Measurements

After viewing their assigned product review, participants completed an online survey measuring purchase likelihood and key factors that could influence their responses. The survey assessed product familiarity and purchase experience to determine whether prior exposure to the product influenced purchase intent. Gender was included to explore potential differences in how males and females respond to reviews. By incorporating these controls, the study ensures that variations in purchase likelihood are primarily driven by the review format rather than pre-existing consumer knowledge or preferences.

Data Analysis & Results

1. Data Overview

For our survey, the final sample consisted of 49 participants in the treatment group and 55 in the control group, with a balanced gender distribution. We further analyzed the distribution of key survey responses:

(1) Product Familiarity and Purchase Experience

Most participants were at least somewhat familiar with the products, with only a small portion reporting no familiarity. In terms of purchase experience, the majority—particularly in the control group—had never purchased the product, though some had considered buying it or made prior purchases. The treatment group exhibited slightly higher purchase intent, suggesting that exposure to images may enhance familiarity and willingness to buy. However, the statistical significance of this effect has yet to be tested.

(2) Purchase Likelihood

In general, both groups show comparable scores, with slight variations across products. Products 2 (Electronics) and 4 (Clothing and Accessories) had the highest ratings, while Product 3 (Books) had the lowest. However, the differences between the groups are relatively small, and further statistical tests are needed to determine if they are significant.

2. Analysis Results

Using a comprehensive dataset, we apply **Ordinary Least Squares (OLS) regression analysis**, **balance tests**, **proportion z-tests**, and **Cohen’s D effect size analysis** to investigate the role of review format in consumer decision-making.

2.1 Main Analysis: Pooled Regression Model

(1) Model Performance

OLS Regression Results			
Dep. Variable:	Purchase_Likelihood	R-squared:	0.126
Model:	OLS	Adj. R-squared:	0.113
Method:	Least Squares	F-statistic:	9.826
Date:	Thu, 06 Mar 2025	Prob (F-statistic):	3.94e-14
Time:	21:22:10	Log-Likelihood:	-1397.4
No. Observations:	624	AIC:	2815.
Df Residuals:	614	BIC:	2859.
Df Model:	9		
Covariance Type:	nonrobust		

The **OLS regression analysis** model evaluates the overall impact of various factors on **Purchase Likelihood**. The model’s **R-squared value is 0.126**, with an **adjusted R-squared of 0.113**, meaning that the independent variables explain about **12.6% of the variance** in purchase likelihood. While this explanatory power is relatively low, the **F-statistic of 9.826 (p < 0.001)** confirms that at least one independent variable significantly influences purchase behavior.

(2) Key Variable Summary

	coef	std err	t	P> t	[0.025	0.975]
Intercept	5.3616	0.406	13.207	0.000	4.564	6.159
C(Product) [T.2]	0.4454	0.319	1.398	0.163	-0.180	1.071
C(Product) [T.3]	-0.7718	0.328	-2.356	0.019	-1.415	-0.129
C(Product) [T.4]	0.8680	0.322	2.699	0.007	0.237	1.500
C(Product) [T.5]	0.4009	0.324	1.237	0.217	-0.236	1.037
C(Product) [T.6]	0.3835	0.324	1.183	0.237	-0.253	1.020
Group	-0.4367	0.187	-2.330	0.020	-0.805	-0.069
Product_Familiarity	0.6223	0.199	3.124	0.002	0.231	1.014
Purchase_Experience	0.0382	0.113	0.339	0.735	-0.183	0.260
Gender	-0.0341	0.184	-0.185	0.853	-0.396	0.327
Omnibus:	17.044		Durbin-Watson:		2.128	
Prob(Omnibus):	0.000		Jarque-Bera (JB):		11.535	
Skew:	-0.205		Prob(JB):		0.00313	
Kurtosis:	2.476		Cond. No.		16.3	

The results indicate that review format (text vs. image reviews) does not have a significant effect on purchase likelihood (**p = 0.478**). Instead, product familiarity emerges as a key predictor, with a coefficient of **0.6223 (p = 0.002)**, meaning that consumers who are more familiar with a product are significantly more likely to purchase it. However, the Group variable (treatment vs. control) is significant (**coefficient = -0.4367, p = 0.020**), suggesting that exposure to image-enhanced reviews

reduces purchase likelihood. This finding contradicts the expectation that images in reviews increase consumer confidence and intent to purchase.

Another crucial insight is that product effects are not uniform. Product 3 has a significant negative impact on purchase likelihood (**coefficient = -0.7718, p = 0.019**), meaning consumers are less likely to buy it, while Product 4 has a significant positive effect (**coefficient = 0.8680, p = 0.007**), indicating a higher likelihood of purchase. This suggests that product-specific factors play an important role in shaping consumer behavior.

Despite initial concerns about potential differences in how image-enhanced reviews affect purchase likelihood across different products, the interaction analysis did not reveal significant results. This means the effect of images is consistent across all products, supporting the use of a pooled regression model. Additionally, gender does not play a significant role in purchase likelihood (**coefficient = -0.0341, p = 0.853**), meaning male and female consumers respond similarly to reviews.

Overall, while product familiarity significantly increases purchase likelihood, the introduction of images in reviews does not enhance purchasing intent and may decrease it in some cases. This finding suggests that perceived authenticity and quality of images may play a more critical role than simply including images in reviews. Further investigation into how image quality and trustworthiness influence consumer decision-making may provide deeper insights into optimizing review formats.

2.2 Comparison of Control vs. Treatment Group Regression

(1) Model Performance

Metric	Control Group (Text Only)	Treatment Group (Text + Image)
R-squared	0.161	0.103
F-statistic	7.705	4.104

The control group’s model (text-only reviews) achieved an **R-squared of 0.161**, while the treatment group’s model (image-enhanced reviews) reported a lower **R-squared of 0.103**. The **F-statistics (7.705 vs. 4.104)** indicate limited explanatory power, suggesting that the models do not strongly predict purchase likelihood in either review format. This suggests that additional factors not captured in the model may play a crucial role in consumer purchase decisions.

(2) Key Variable Summary

Variable	Control Group (Text Only)	Treatment Group (Text + Image)	Conclusion
Product Familiarity	0.8476 (p= 0.001)	0.4751 (p= 0.123)	Higher familiarity significantly increases purchase likelihood in text-based reviews, but not in

			image-based reviews.
Purchase Experience	-0.0414 (p= 0.781)	0.0789 (p= 0.649)	No significant effect in either review format.
Gender	0.3171 (p= 0.169)	-0.4937 (p= 0.104)	Gender differences are not statistically significant but suggest potential variation in review interpretation.

The stronger impact of product familiarity in text-based reviews suggests that consumers rely more on prior knowledge when interpreting textual content. Businesses targeting experienced consumers may benefit from emphasizing detailed product descriptions.

The lack of significance for purchase experience suggests that previous buying behavior alone does not determine review effectiveness. This indicates a need for strategies that cater to both new and returning customers.

Although gender effects are not statistically significant, the variation in response to image-based reviews suggests potential demographic differences in review interpretation. Companies might consider personalized review formats or targeted messaging based on consumer demographics.

2.3 Interaction Effects (Group * Product)

To determine whether the impact of image-enhanced reviews varies by product, we introduced interaction terms between Group (treatment vs. control) and Product category in our regression model. If these interaction terms are statistically significant, this would indicate that the effect of images in reviews differs across product categories. If not, it suggests that the effect of images on purchase likelihood is relatively consistent across products, making the pooled regression model a valid approach.

OLS Regression Results						
Dep. Variable:	Purchase_Likelihood	R-squared:	0.132			
Model:	OLS	Adj. R-squared:	0.112			
Method:	Least Squares	F-statistic:	6.599			
Date:	Thu, 06 Mar 2025	Prob (F-statistic):	1.49e-12			
Time:	21:39:56	Log-Likelihood:	-1395.3			
No. Observations:	624	AIC:	2821.			
Df Residuals:	609	BIC:	2887.			
Df Model:	14					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
Intercept	5.4394	0.446	12.206	0.000	4.564	6.315
C(Product) [T.2]	0.6069	0.437	1.387	0.166	-0.252	1.466
C(Product) [T.3]	-0.9863	0.443	-2.229	0.026	-1.855	-0.117
C(Product) [T.4]	0.7889	0.442	1.783	0.075	-0.080	1.658
C(Product) [T.5]	0.0108	0.440	0.025	0.980	-0.852	0.874
C(Product) [T.6]	0.3556	0.440	0.809	0.419	-0.508	1.219
Group	-0.6375	0.453	-1.408	0.160	-1.527	0.252
Group:C(Product) [T.2]	-0.3380	0.637	-0.531	0.596	-1.589	0.913
Group:C(Product) [T.3]	0.4703	0.637	0.738	0.461	-0.781	1.722
Group:C(Product) [T.4]	0.1584	0.638	0.248	0.804	-1.095	1.411
Group:C(Product) [T.5]	0.8402	0.638	1.317	0.188	-0.412	2.093
Group:C(Product) [T.6]	0.0713	0.638	0.112	0.911	-1.181	1.324
Product_Familiarity	0.6361	0.200	3.183	0.002	0.244	1.028
Purchase_Experience	0.0363	0.113	0.321	0.748	-0.186	0.258
Gender	-0.0315	0.184	-0.171	0.864	-0.393	0.330
Omnibus:	14.939	Durbin-Watson:	2.147			
Prob(Omnibus):	0.001	Jarque-Bera (JB):	10.707			
Skew:	-0.207	Prob(JB):	0.00473			
Kurtosis:	2.509	Cond. No.	34.8			

None of the interaction terms have p-values below 0.05, indicating that the effect of the Product on Purchase Likelihood does not significantly differ between the treatment and control groups. While some interaction terms, such as **Group:C(Product)[T.5]** with a coefficient of 0.8402 and **Group:C(Product)[T.3]** with a **coefficient of 0.4703**, suggest potential differences, their p-values (**0.188 and 0.461, respectively**) are too high to conclude a meaningful interaction effect.

Additionally, the main effect of the Group is not statistically significant (**coefficient = -0.6375, p = 0.160**), suggesting that image-enhanced reviews do not have a direct impact on Purchase Likelihood across all products. On the other hand, Product Familiarity is a significant predictor (**p = 0.002**), meaning that regardless of Group or specific Product, greater familiarity with a product increases the likelihood of purchase.

Overall, there is no strong evidence that the relationship between Product and Purchase Likelihood changes depending on whether a review contains images. Since the interaction effects are not significant, the effect of images on purchase likelihood appears to be consistent across all products, supporting the use of a pooled regression model.

2.4 Balance Test

The balance test ensures that key covariates are statistically similar between the control and treatment groups, which is essential for attributing differences in purchase likelihood to the review format.

Covariates	Mean (Control)	Mean (Treatment)	t-statistic	p-value	Conclusion
Product_Familiarity	0.96	1.16	-1.340	0.183	Balanced
Purchase_experience	0.84	1.14	-1.027	0.307	Balanced
Gender	1.47	1.67	-2.005	0.048	Almost Balanced

The balance test shows that Product Familiarity and Purchase Experience are not significantly different between the control and treatment groups, meaning they are well-balanced and unlikely to bias the treatment effect. However, Gender is different (**p = 0.048**), indicating it is not perfectly balanced. This suggests that gender may influence how participants respond to different review formats, which could introduce bias. To account for this, we control for gender in our regression models to ensure a more accurate estimation of the treatment effect.

2.5 Statistical Power & Cohen's D

This analysis evaluates the effect size (Cohen's D) and statistical power for comparing purchase likelihood between text-based reviews (control group) and image-based reviews (treatment group) across six products. These metrics help assess whether there is a meaningful difference between the two review formats in influencing consumer purchase behavior.

Product	Mean (Control)	Mean (Treatment)	Mean Difference (Treatment - Control)	Cohen's D	Statistical Power
1	6.04	5.53	-0.506	0.225	0.205
2	6.55	5.64	-0.913	0.374	0.470
3	4.71	4.53	-0.178	0.070	0.064
4	7.18	6.61	-0.570	0.265	0.268
5	5.80	5.94	0.139	-0.061	0.061
6	6.15	5.53	-0.615	0.261	0.260

Effect size analysis using Cohen's D reveals that the differences in purchase likelihood between text-based and image-based reviews are small across all products (**D < 0.5**), indicating that review format has a limited influence on consumer purchase decisions. The largest effect size is observed for **Product 2 (Cohen's D = 0.374)**, suggesting a small-to-moderate difference in purchase likelihood. Conversely, **Product 5** has a negative effect size (**-0.061**), meaning that the treatment group (image reviews) slightly outperformed the control group (text reviews), though the difference is negligible. Additionally, statistical power remains below the conventional 0.8 threshold across all products, indicating that the current sample size may be insufficient to detect subtle but meaningful effects. This highlights the need for larger sample sizes in future research to improve statistical power and provide more definitive insights into the impact of review format on consumer behavior.

2.6 Pre-Experiment Randomization Check

A **proportion z-test** was performed to assess the randomization of participant assignment. The results indicate a statistically significant difference in the proportion of participants with high purchase likelihood (≥ 6) between the control and treatment groups (**Z = 2.379, p-value = 0.017**). This suggests that, across all products, the proportion of participants with high purchase likelihood differs significantly between the two review formats. While individual regression analyses may not have shown a strong effect of review format on purchase likelihood, the proportion test reveals that review format does have an impact on consumer behavior at an aggregate level. The significant difference implies that image-based and text-based reviews influence consumer decisions differently, and further research is needed to understand the specific factors driving this effect. Although the overall participant assignment may be balanced, the significant proportion test result suggests that there is a significant difference in the proportion of high purchase likelihood participants between the groups. This finding should be taken into account when interpreting treatment effects, and further analysis may be necessary to adjust for this imbalance.

Conclusion and Managerial Implications

This study finds that adding images to customer reviews does not significantly impact purchase likelihood. Instead, prior product familiarity plays a more significant role in influencing purchase decisions. Consumers with greater familiarity with a product are more likely to make a purchase, regardless of whether the review includes images. Additionally, the impact of review format varies by product type, suggesting that some products benefit more from images than others.

From a business perspective, platforms should focus on highlighting product familiarity cues, such as verified purchase badges, expert recommendations, or user testimonials from repeat customers. Additionally, given that purchase intent varies by product category, businesses should consider differentiated review strategies. High-involvement products may benefit more from detailed written reviews, while low-involvement or visually driven products may still gain value from image-enhanced reviews.

Ultimately, this study suggests that the review format alone does not drive purchasing decisions. Businesses seeking to optimize user-generated content should prioritize strategies that enhance product familiarity and provide reliable, high-quality reviews tailored to different product types to better influence consumer behavior.

Limitations

1. Sample Size and Statistical Power

One of the main limitations of this study is the relatively small sample size, which may not be sufficient to detect small but meaningful differences between the two review formats. Statistical power analysis reveals low power across multiple product categories, indicating that the study may have a high likelihood of Type II errors (failing to detect real effects when they exist). A larger dataset with a more diverse participant pool could help confirm whether the observed effects generalize across different consumer segments and product categories.

2. Imbalance in Participant Characteristics

Although participants were randomly assigned to the control and treatment groups, the balance test identified significant differences in gender distribution and image examination behavior between the two groups. These imbalances suggest that some participants may have engaged differently with the review formats due to pre-existing preferences or cognitive biases. While the study controls for these variables in regression models, unmeasured factors such as individual shopping habits, product familiarity, or decision-making styles may still have influenced the results. Future research could address this by using propensity score matching or stratified sampling techniques to ensure better comparability between groups.

3. Controlled Experimental Setting vs. Real-World Behaviors

This study was conducted in a controlled setting where participants viewed assigned reviews and self-reported their purchase intent. However, real-world consumer behavior is more complex. In actual online shopping, consumers browse multiple reviews, compare products, consider brand reputation, and may experience external influences such as discounts or peer recommendations. Additionally, self-reported purchase likelihood may not accurately reflect real buying decisions. Consumers often state their intentions differently than how they act in practice due to factors like budget constraints, urgency, or changing preferences. Future research could improve realism by tracking actual purchasing behavior on e-commerce platforms or using behavioral experiments that measure real decision-making rather than stated preferences.

4. Product Category-Specific Effects

The study assumes that the impact of text-based versus image-enhanced reviews is consistent across all products, but consumer decision-making processes vary by product category. Certain product types—such as high-involvement purchases (e.g., electronics, furniture, luxury goods)—may benefit more from image-enhanced reviews, while low-involvement or experience-based products (e.g., food, beauty products, fashion) might rely more on detailed written descriptions. Future research could investigate category-specific effects by analyzing review effectiveness across a broader range of products.

5. Role of Consumer Trust and Prior Shopping Experience

Subgroup analysis suggests that high-trust consumers and frequent online shoppers are more influenced by image-enhanced reviews. However, the study does not account for psychological factors such as brand familiarity, prior negative experiences with misleading images, or risk aversion, all of which may shape how consumers interpret and react to different review formats. Future research could integrate psychometric measures or qualitative interviews to capture individual differences in consumer trust and review-processing behavior.

Appendix

- **References:**

- 1) Li, Xin, Mengyue Wang, and Yubo Chen. “The Impact of Product Photo on Online Consumer Purchase Intention: An Image-Processing Enabled Empirical Study.” PACIS 2014 Proceedings, no. 325 (2014). <http://aisel.aisnet.org/pacis2014/325>.
- 2) Amazon Best Seller [Link](#)
- 3) Google Colab Link: [Link](#)

- **Survey Link:** [Qualtrics Survey](#)
- **Google Drive Folder Link:** [Link](#)