




Lab-grown diamonds are the new best friend?


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Team NATURAL



Natural Diamonds are 2-3x more expensive




Mined diamonds produce more than 125 pounds of carbon for every single carat




Natural Diamonds are not good investments as they do not hold value over time


Team LAB GROWN



Lab grown diamonds have the exact same chemical composition



These are a lot more cost effective and hence are considered value for money



Lab grown diamonds can be grown using 100% renewable energy

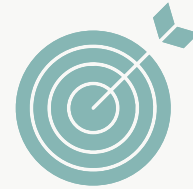
Before we dive into our hypothesis, let's set the scene. On one side, we have 'Team Natural'—advocates for diamonds that are mined from the earth, celebrated for their tradition and historical value. On the other, 'Team Lab-Grown,' proponents of diamonds created in a lab, which boast environmental sustainability and ethical sourcing. This dichotomy represents the core of our investigation, reflecting the modern consumer's dilemma in choosing between tradition and sustainability.

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Page 2 of 12

Purpose

This study examines how different framings of ad stimuli influence consumers' preferences for lab-grown versus natural diamonds.



Hypothesis

1. We expect that individuals exposed to information emphasising the environmental benefits of lab-grown diamonds will be more inclined to purchase them compared to those exposed to information highlighting the chemical similarities between lab-grown and natural diamonds.
2. We expect that individuals who are environmentally conscious will be more inclined to purchase lab-grown diamonds.

Purpose

Let's start by outlining the purpose of our study. Our primary aim was to examine how different advertising messages impact consumer preferences between lab-grown and natural diamonds. In the rapidly evolving diamond market, understanding these dynamics can provide valuable insights for marketers and policymakers alike, especially in an era where environmental considerations are becoming increasingly important.

Hypothesis

Building on our purpose, our hypothesis posits that the framing of advertisement messages—whether highlighting the scientific integrity of lab-grown diamonds or emphasizing their environmental benefits—significantly influences consumer choices. Specifically, we expected that messages emphasizing the environmental advantages of lab-grown diamonds would resonate more strongly with consumers, particularly those who are environmentally conscious.

Experiment Design - IV

Environmental vs Scientific framing of 'did you know' section

	Treatment (Environmental)	Control (Scientific)
		

To give you a brief overview, our survey consists of four main questions: one question measures the dependent variable, two questions measure the moderators, and one is an attention check question.

IV

In our methodology, participants were randomly assigned to two groups. The Control group received ads packed with scientific data about lab-grown diamonds, highlighting their identical chemical compositions to natural diamonds. The Treatment group was shown ads emphasizing the environmental benefits of lab-grown diamonds, such as reduced environmental impact.

Experiment Design

DV

Preference for lab-grown diamond

Which diamond would you purchase?

Definitely the lab-
grown diamond

☐

Probably the lab-
grown diamond

☐

Unsure

☐

Probably the natural
diamond

☐

Definitely the natural
diamond

☐

Moderator

Environmental consciousness: 1st & 3rd questions

How much do you agree with these statements?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am environmentally conscious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please select 'Disagree'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am worried about climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2nd question:
attention check

DV

The dependent variable in our experiment was the preference for lab-grown diamonds. This was measured based on the participants' responses to a question asking about their purchase preference, to gauge their inclination towards either lab-grown or natural diamonds after being exposed to the ad stimuli. Our aim was to quantify this preference and observe how it varied under different conditions of our experimental design.

Moderator

We assessed each participant's level of environmental consciousness through specific survey questions administered after exposure to the ad stimuli. This variable was hypothesized to interact with the type of advertisement—scientific or environmental—to influence the participants' preferences for lab-grown diamonds.

For the response options we adopted a 5-point Likert scale to help us measure the intensity of the participants' reactions in a structured and consistent manner. For the preference question, we reverse coded the responses, meaning scores were assigned from 5 to 1 instead of 1 to 5. This reverse coding was implemented to ensure that higher numerical values consistently reflect stronger preference for lab-grown diamonds.

Analysis

Data cleaning

- Merged diamond preference responses into one column
- Checked for duplicate respondents
- Checked for failed attention checks

Feature engineering

- Environmental consciousness variable

Descriptive statistics

- Count, mean, standard deviation
- Data visualization

Inferential statistics

- Two-way factorial ANOVA with interaction
- Post-hoc Tukey test and power analysis



Now, we will outline the key steps of our analysis.

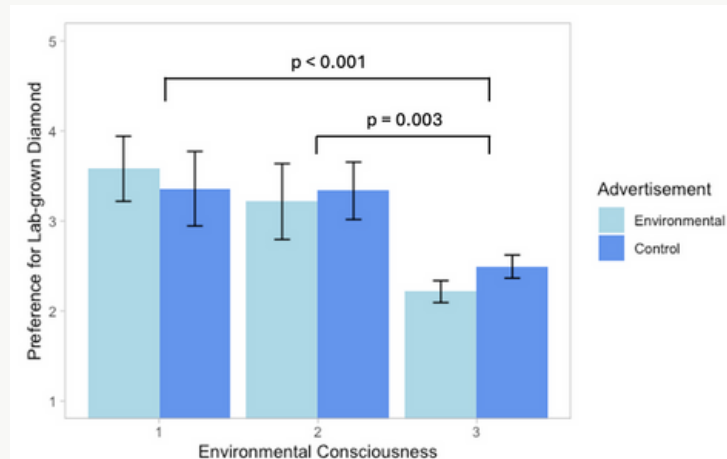
We began with data cleaning, which included merging responses about diamond preferences into a single column, checking for duplicate respondents, as well as respondents who failed the attention check.

We then developed a variable for environmental consciousness from survey responses by finding the average between the two questions described before.

For our descriptive statistics, we computed basic metrics such as counts, means, and standard deviations. We also created a data visualization to illustrate our main findings.

Our inferential statistics involved conducting a two-way factorial ANOVA to assess the effects of ad type and environmental consciousness. We followed this with a post-hoc Tukey test to compare mean differences between groups. A subsequent post-hoc power analysis was also performed to confirm the statistical power of our results.

Results



MAIN EFFECTS

No significant effect of advertisement type on preference ($F(1,295) = 1.19$, $p = 0.277$, $\alpha = 0.05$, power = 1).

Significant effect of environmental consciousness on preference ($F(2,295) = 13.79$, $p < 0.001$, $\alpha = 0.05$, power = 1). Respondents who were less conscious preferred lab-grown diamonds more (3 vs 1 $p < 0.001$; 3 vs 2 $p = 0.003$)

Environmental Consciousness	n	Mean	SD
Not conscious	33	3.48	1.54
Neutral	29	3.28	1.39
Conscious	239	2.36	1.38

INTERACTION

No significant interaction between advertisement and environmental consciousness ($F(2,295) = 0.47$, $p = 0.626$, $\alpha = 0.05$, power = 1).

Here are our key findings.

Our analysis revealed no significant main effect of advertisement type on preference for lab-grown diamonds.

We did find a significant effect of environmental consciousness on preference, with a p-value of less than 0.001. A post-hoc Tukey test revealed a significant difference in preference between those who were environmentally conscious and those who were neutral or not environmentally conscious.

The interaction effect between advertisement type and environmental consciousness was not significant.

Discussion

There was no significant effect of advertisement type on preference for lab-grown diamonds

The framing of lab-grown diamond benefits might have been insufficient, potentially leading other factors such as purchase intent to exert a greater influence on preference.

Less environmentally conscious people have a greater preference for lab-grown diamonds

Less environmentally conscious individuals might exhibit a greater inclination to follow the latest trends, which may extend to their preference for lab-grown diamonds.

Lab-grown diamond retailers should prioritize advertisements that resonate with their core values, whether it's promoting environmental consciousness or embracing the latest trends.

There are some possible mechanisms behind the findings we uncovered.

First, there was no significant effect of advertisement type on preference for lab-grown diamonds. This may have been due to the framing of the eco-friendly benefits of lab-grown diamonds. It is possible that the framing was not strong enough, letting other factors such as purchase intent (e.g., buying a diamond for oneself or for a loved one) to exert a greater influence on preference.

We also found that less environmentally conscious people have a greater preference for lab-grown diamonds. Our team suggests this may be due to their greater inclination to follow the latest trends and buy the latest items on the market. This tendency may have extended to their preference for lab-grown diamonds as well, which we told them was growing in popularity.

Overall, our results suggest that the type of advertisement may not have an effect on preference of lab-grown diamonds, especially if the framing of their benefits is not particularly strong. Thus, lab-grown diamond retailers should prioritize advertisements that resonate with their core values, whether it's promoting environmental consciousness or embracing the latest trends.

Limitations & Future Directions

Awareness

Natural diamonds have been advertised for over a century while lab-grown diamonds have only been available since the early 2000s. Respondents who are more familiar with lab-grown diamonds may have other reasons for choosing one over the other.

In the future, we would ask respondents for their prior familiarity with lab-grown diamonds.

Independent Variable Framing

Our framing approach of using a 'Did You Know' fact may not have been strong enough to invoke concerns for the environment.

In the future, we could consider making our independent variable stronger (e.g., using videos or images to create a stronger impact on respondents).

Motivations

Our conclusions were limited by a lack of information on why respondents chose one diamond over the other.

In the future, we could collect open-ended data on why respondents preferred one diamond over the other. This qualitative data can be coded and analyzed.

After doing the experiment, we found there were some limitations and we came up with corresponding future directions for the experiment.

First, we found respondents could not be fully aware of lab-grown diamonds as lab-grown diamonds have only been available since the early 2000s while natural diamonds have been advertised for over a century

In the future, we would ask respondents for their prior familiarity with lab-grown diamonds.

Second, our independent variable framing, using a 'Did You Know' fact, may not have been strong enough to invoke concerns for the environment.

In the future, we could consider making our independent variable stronger. For example, using videos or images to create a stronger impact on respondents.

Third, our conclusions were limited by a lack of information on why respondents chose one diamond over the other.

In the future, we could collect open-ended data on why respondents preferred one diamond over the other. This qualitative data can be also coded and analyzed.



Thank you!

LET US KNOW IF YOU HAVE
QUESTIONS

Post-hoc Tukey HSD Test

Comparison	Difference	p-value
Neutral vs Not conscious	-0.225	0.802
Conscious vs Not conscious	-1.144	< 0.001
Conscious vs Neutral	-0.919	0.003

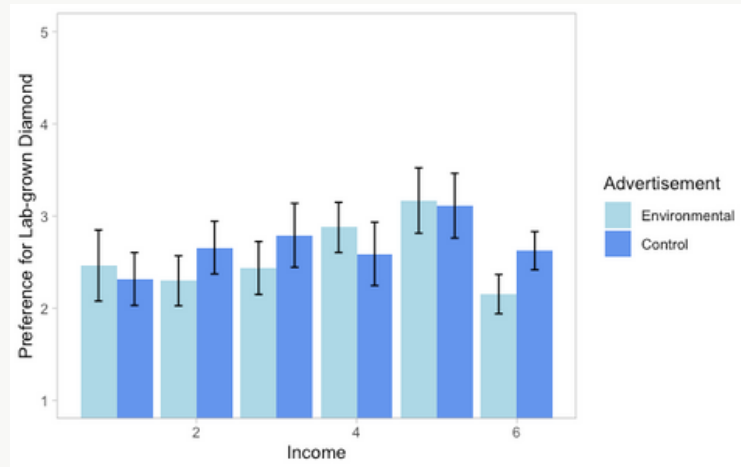
These are the results of the post-hoc Tukey test.

The difference in preference for lab-grown diamonds between those who were not environmentally conscious and those who were neutral was not significant ($p = 0.802$).

The difference in preference between those who were not environmentally conscious and those who were was significant ($p < 0.001$).

The difference in preference between those who were neutral and those who were environmentally conscious was also significant ($p = 0.003$).

Income



MAIN EFFECTS

No significant effect of income on preference ($F(1,295) = 0.20, p = 0.654$).

INTERACTION

No significant interaction between advertisement type and income ($F(1,295) = 0.26, p = 0.608$).

We performed an exploratory analysis by building 2-way ANOVA with interaction to examine the effect of income and advertisement type on preference for lab-grown diamonds.

The results revealed no significant main effect of income and no significant interaction effect.