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Decoy Effect In Luxury Hotel Booking

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Abstract:This paper aims to test the decoy effect in the context of luxury hotel booking by conducting a survey experiment. By adding a strong decoy or a weak decoy to the treatment group's choice set and calculating the shift of participants' preferences, the paper came with two main findings. First, adding a strong decoy to the choice set will significantly change participants' preferences towards the target rate. Second, adding an unsuccessfully designed weak decoy will cause an undesirable preference shift and attenuate the decoy effect.

Key words:Decoy effect, Participants' preferences

1. Introduction

One of the fundamental theories economists make about consumer choice is the theory of rational choice. However, Huber, Payne, and Puto (1982) stated that the rational choice theory could be violated by introducing a third, asymmetrically dominated item. They called this phenomenon the "decoy effect" (DE). The presence of the dominated option (the decoy) increases the attractiveness to the consumer of the dominating alternative (the target) and thus changes the consumer's decision from the competitor option to the target option.

In reality, the prosperous development of the American Express Fine Hotels & Resorts (FHR) Booking and other similar programs are perfect examples to illustrate this. Though booking at FHR does not give travelers any monetary savings, by deliberately presenting certain information and designing specific bundles of products, travel agencies sometimes could convince travelers to book at this kind of more expensive rate.

This paper aims to test DE in the context of booking a luxury hotel by conducting a laboratory experiment. Specially, the paper intends to answer the following two questions. First, given travelers are indifferent to the competitor rate and the target rate, whether a strong decoy rate's existence could change their decision to book a hotel from the competitor rate to a targeted, more expensive rate?[1] Second, when providing a weak decoy to the choice set, would DE attenuate under such circumstances?

2. Literature Review

Following the step of Huber et al., economists conducted various forms of field experiments to test the robustness of the theory. Josiam and Hobson (1995), for instance, instead of testing the effect in a laboratory experiment setting, designed a between-subject field-study experiment and proved that statistically speaking, DE still existed. To give researchers a better understanding of the effect and answer oppositions raised by economists like Yang and Lynn (2014), Huber et al. (2014) refined their theory by underlining that the DE occurs only if the consumer is close to indifferent between the target and the competitor. Besides, they also identified five characteristics that inhibit the DE: (1) strong prior trade-offs, (2) the inability to identify the dominance relationship quickly and easily, (3) cross-respondent value heterogeneity, and either (4) a strong dislike of the decoy or (5) a strong liking for the decoy (Huber et al., 522). One of the most recent studies done by Wu and Cosguner (2020) proved the revised proposal of Huber et al. Besides, they empirically test and quantify the DE in the diamond sales of a leading online jewelry retailer[2].

3. Experimental Design

3.1It tests the following hypotheses:

H1: Introducing a strong decoy into the choice set will shift the selection to favor the more expensive rate (the target) from the relatively cheap rate (the competitor).

H2: When a weak decoy is introduced (a decoy very close to the target), DE will attenuate under such a condition.

3.2Description and Methodology

I ask the participants to suppose they are going to book a luxury hotel for their holiday. And they have found the following rates on a travel agency's website. Based on their first impression, in each of the situations, which rate would they choose. Anonymous participants are randomly assigned into two treatment groups (Treatment 1 and Treatment 2) to fill out questionnaires. Using the split-half design, each treatment group's questionnaire contains two questions, 1 and 2. For Treatment 1, question 1 contained two rates (competitor and target rate). Question 2 presents three rates (competitor rate, weak decoy rate, and target rate). For Treatment 2, its questionnaire looks like the reversal of Treatment 1. Question 1 contained two rates (the competitor rate and the target rate). In question 2, a choice set with three rates (competitor rate, strong decoy rate, target rate). By using such an overlapping design, the questionnaire could test both hypotheses at the same time[3].

To make the question understandable to participants, I only gave the rates two attributes: cost performance and benefits associated with this rate. Two attributes have an inverse relationship: the higher the cost performance a rate has, the fewer benefits it will have, and vice versa. In addition, using the same hotel brand and the exact wording for all the questions in the entire questionnaire could cause participants to be aware of the choice they made earlier. Hence, I selected two luxury hotel brands of a similar rank (Park Hyatt (PH) and Waldorf Astoria (WA)) and paraphrased the two questions. Table 1 below shows the nature of rates in the choice set[4].

Question Number	Treatment 1	Treament 2
1	Rate A: Competitor (PH, ¥1400)	Rate A: Competitor (WA, ¥1400)
	Rate B: Target (PH, ¥2300)	Rate B: Target (WA, ¥2300)
2	Rate A: Competitor (WA, ¥1400)	Rate A: Competitor (PH, ¥1400)
	Rate B: Weak Decoy (WA, ¥1900)	Rate B: Strong Decoy (PH, ¥2200)
	Rate C: Target (WA, ¥2300)	Rate C: Target (PH, ¥2300)

Table 1 Nature of Rates in the Choice Set

In short, H1 can be proved by comparing the number of people who opted for the target rate in Treatment 2 Question 2 and the number of people who opted for the target rate in Treatment 1 Question 1—then using logistic regression to test the significance.

H1: N (T2, Q2) - N (T1, Q1)

H2 can be proved by first calculating the difference between people who opted for the target rate in Treatment 1 Question 2 and the number of people who opted for the target rate in Treatment 2 Question 1. Then I compare this shift with the shift of preference in the strong decoy context.

H2: N (T1, Q2) - N (T2, Q1)

4. Findings and Data Analysis

I obtained 66 responses for each treatment group and a total of 132 responses. Table 2 gives the shift of preferences before and after introducing the strong and weak decoy.

Table 2 Shift of Preferences in Each Context

Chocie in Context Park Hyatt (Strong Decoy)		
N = 66		
	Rate	Percentage
Before Adding Decoy	Competitor	60.61%
	Target	39.39%
After Adding Decoy	Competitor	33.33%
	Decoy	6.06%
	Target	60.61%
Shift	60.61% - 39.39% = 21.22%	
Choice in Context Waldorf Astoria (Weak Decoy)		
N =66		
	Rate	Percentage
Before Adding Decoy	Competitor	54.55%
	Target	45.45%
After Adding Decoy	Competitor	33.33%
	Decoy	27.27%
	Target	39.39%
Shift	39.39% - 45.45% = -6.06%	

From Table 2, it is easy to see that before introducing a strong decoy to the choice set, over 60 percent of participants chose the cheap competitor rate. But after adding the strong decoy, 60.61% of the participants selected the target rate, with a net shift of 21.22%. The result is consistent with the findings in the original proposal of Huber et al. (1982), where on average, 9.2% of participants shifted their choices across different contexts. Thus, DE exists when we add a strong decoy to the choice set. However, if a weak decoy (a decoy very close to the target rate in both attributes) is added, the results look drastically different. The net shift is -6.06% which suggested there is no reliable DE in this scenario. More importantly, the weak decoy attracted many participants who should have chosen the target rate to choose it, though the theory suggests it should not be selected[5].

Table 3 Logistic Regression Result

Strong Decoy			Weak Decoy	
	(1)			(1)
VARIABLES	ChooseT		VARIABLES	ChooseT
ChooseT			ChooseT	
1.Decoy	0.862**		1.Decoy	-0.248
	(2.418)			(-0.704)
Constant	-0.431*		Constant	-0.182
	(-1.710)			(-0.738)
Observations	132		Observations	132
chi2	5.985		chi2	0.497
ll	-88.50		ll	-89.73
z-statistics in parentheses			z-statistics in parentheses	
*** p<0.01, ** p<0.05, * p<0.1			*** p<0.01, ** p<0.05, * p<0.1	

I also conducted a logistic regression to test the statistical significance of DE, where table 3 summarizes the results. Decoy is a binary predictor variable; it equals one if there is a decoy rate in the participants' choice set and zero if

there is no such rate. ChooseT is a binary response variable; it equals one if the participant chooses the target rate, zero otherwise.

In the context of strong decoy, the likelihood ratio chi-square of 5.985 with a p-value less than 0.0144 tells us that our model as a whole fits better than an empty model. Besides, a p-value less than 0.05 further indicates that decoy is statistically significant; having a decoy rate in the choice set increases the log odds of choosing the target rate by 0.862. In the context of weak decoy, as the experimental data suggested, DE is very weak: the model does not fit better than an empty model. A very large p-value also indicates that decoy is statistically insignificant to explain the difference in the number of people who choose the target rate.

Though the theory predicts that decoy is not expected to be purchased, four participants still opted for it when having a strong decoy. The complex nature of choice may explain this. In the classic Economist magazine subscription example (Dan, 2009), it is effortless for participants to identify the decoy is dominated by the target. But in my experiment, the nature of each rate is a lot more complex. When facing so many details, I agree that if a participant does not know the meaning of all those components, it is difficult to identify that the target rate dominates the decoy.

5. Discussions

The existence of DE in booking luxury hotels can have crucial marketing implications. For travel agents, through DE, they could switch their customers' preferences towards the more expensive packages and generate extra revenue per booking. Similarly, luxury hotel employees could upsell some premium rooms by deliberately applying DE. Nevertheless, to let the DE work, sellers also need to choose an optimal decoy. Research done by Kaptein et al. (2016) has shown that under multiple scenarios, the effect will be limited once the decoy is in a suboptimal position (Kaptein et al., 2016)[6].

I also admit that sometimes participants choose the target rate may not be entirely attributed to DE; effects like anchoring may also be factors. For instance, specific phrases like "holiday" in my question may be an anchor for some participants. According to Tversky and Kahneman (1992), once an anchor is set, people adjust away from it to get to their final answer; however, they adjust insufficiently, resulting in their final guess being closer to the anchor than it would be otherwise.

In addition, in my experiment, I ask the participants not to consider themselves being high-tier elite members of a frequent traveler program. Still, in reality, frequent travelers can enjoy the benefits of a high-tier elite member and expensive rates at the same time. In other words, the utility gained by frequent travelers from booking the expensive rate can be segregated into different parts. According to the prospect theory, people are risk-averse when facing decisions leading to gains (Kahneman and Tversky, 1979)[7], and their utility function in the gain domain should be concave. Based on that; we have the mathematical formula that maximizes the utility:

$$Value(X) + Value(Y) > Value(X+Y)$$

Hence, frequent travelers eventually switch to the target rate may also because the segregated utility gained from booking the target rate is greater than the utility gained from merely money saving.

6. Limitations of the Study

Most of the choices in the questionnaire are either simplified or intentionally designed for the experiment, which does not fully represent reality. Firstly, to keep the questions in the questionnaire comprehensible to participants, I only assigned two attributes with the rates in the questionnaire, but booking a luxury hotel in real life involves considering a much larger number of details. In addition, to make the participants initially indifferent about two rates, I designed the price difference between the targeted rate and the competitor to be very large (around 140 dollars, roughly 900 Chinese yuan after exchange rate)[8]. But in reality, the price difference is very small for some hotels. Under such circumstances, the targeted rate could look a lot more appealing than the competitor, and introducing the decoy could have very little effect. Thirdly, the benefits associated with booking at the target rate do not entirely mirror reality. Lastly, compared to

the many renowned studies in the field, my sample size is relatively small, increasing the likelihood of a Type II error skewing the results and decreasing the study's power[9].

7. Conclusion

To sum up, the decoy effect exists in luxury hotel booking under laboratory conditions. Adding a strong decoy to a set of rates will shift participants' preference towards the more expensive target rate. However, a poorly designed weak decoy will cause undesirable shifts in preference, resulting in an attenuated DE and replication issues. All these experimental results further support the propositions of Huber et al. that DE is a well-documented but also sensitive effect.

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