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Using the Decoy Effect on Telephone Packages: A Study on Consumer Behavior

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ABSTRACT

The decoy effect is a type of nudge found in behavioral economics that suggests that the introduction of a high-priced, low-value 'decoy' good into a choice set will prompt consumers to shift their preference from a lower-priced, option good to a higher-priced, target good. The theory has proven to become a recognized marketing tool used by firms following the coining of the term in 1982. However, despite the various applications of the theory to different industries, the implications of the theory have not been explored in the context of telephone packages provided by telecommunications firms. Therefore, in this paper, we will explore the impacts of the decoy effect in the context of telephone packages in the United Arab Emirates through means of surveys which will explore shifts in consumer preferences when presented with decoy packages for the two largest telecommunications firms in the country. The paper also assesses the extent of the success of the decoy, as well as the demographics in which the introduction of a decoy package proved to be most effective and the wider-reaching implications for telecommunications firms.

Keywords: *Telephone Package; Decoy; Option; Target*

INTRODUCTION

Behavioral economics is a field that combines elements of economics and psychology to understand how and why people behave the way they do in the real world [1]. It goes against proposed neoclassical economic models which assume that economic agents will always make well-informed decisions based on what will benefit them the most. This is known as 'rational' behavior. Alternatively, behavioral economics' empirically grounded approach demonstrates that economic agents do not always make the 'rational' decision, even when provided with adequate information to do so. Contrasting traditional economic models' assumptions in which economic agents are treated as individuals who are always in perfect control of their decision-making, behavioral economics proposes individuals' decisions are influenced by, and are often a result of their surroundings.

Expanding in breadth since the 1980s, the foundational principles of the field can be dated back to 18th-century Scottish economist Adam Smith. Smith proposed the idea of an "invisible hand," in which self-interested individuals unintentionally promote the general welfare of society by pursuing their own economic interests – a foundational concept in neoclassical economics. But he also recognized that individuals are subject to cognitive biases and limitations in their decision-making processes, highlighted in his book "The Theory of Moral Sentiments [2]." He discussed the idea of 'self-deception,' where individuals perceive themselves in a more favorable manner than others, which is the precursor of the concept of 'overconfidence' which gained its prominence in the expansion of behavioral economics.

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A key member in the founding and popularization of behavioral economics is Richard Thaler, who introduced the traditional assumptions of rationality in economic decision-making and brought in concepts from psychology to explore the cognitive biases that cause deviation from rationality in economic choices. In his groundbreaking work "Nudge: Improving Decisions About Health, Wealth, and Happiness [3]," Thaler emphasizes the importance of choice architecture in influencing consumers' purchasing decisions by presenting goods in certain ways. Since publishing his novel in 2008, Thaler's idea of 'nudge' has become popular jargon in all fields of economics and has helped highlight other key behavioral economic theories, all under the umbrella of 'nudge economics.'

However, for 'nudge' to work effectively in a lifelike setting, marketers must consider how many goods and what goods to present to the consumer in the 'information search stage [4].' By presenting consumers with too many choices, they become overwhelmed and because of information overload, are susceptible to poor decision-making [5]. Therefore, consumers should be presented with a limited set of choices. Furthermore, marketers must further consider the types of goods included in the limited choice set.

A well-known model in consumer behavior is the proportionality model, first documented in [6]. The model assumes that consumers will defect from their original choices given the addition of new options in the market as any new option in the market will attract consumers due to it expanding the range of available options in the market.
The similarity hypothesis is another model in consumer behavior which proposes that customers defect to items similar to current options so companies should design unique items, dissimilar to current options to avoid 'cannibalization' [7].

According to [6], introducing a new alternative to a choice set cannot increase the probability of choosing an option from the original set. This is seen in the regularity assumption, which both the proportionality model and the similarity hypothesis share. That said, Huber, Payne, and Puto found in [8] that under certain conditions, the proportionality model and the similarity hypothesis can be violated by adding an asymmetrically dominant option known as the decoy. This model is the 'decoy effect.'

The theory falls under the bracket of 'nudge economics' and explains how adding a third high-price, low-value choice (the decoy) to a decision between a low-price, low-value choice (the option) and a high-price, high-value choice (the target) changes the preference between two options [9]. By presenting the decoy, consumers are often less hesitant in choosing the target good over the option good as the asymmetric dominance of the decoy good leads to the target presenting itself as a cheaper alternative to the decoy but with better features. Fig. 1 represents the graphical price/quality relationship of the target, decoy, and option [4].

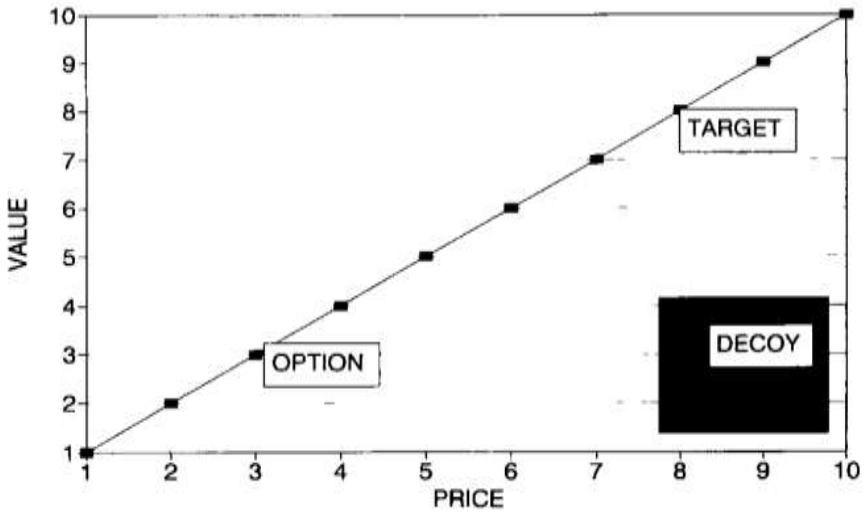

Fig. 1. Graph depicting price-to-value relationship for target, decoy, and option [4]

Through empirical means of data gathering such as a quantitative survey, we will be examining the effect of the decoy effect in the telecommunications industry in the United Arab Emirates; more specifically, telephone packages. This study aims to assess the impact of introducing decoy telephone packages when consumers are presented with two distinctly different telephone packages, differentiated by factors such as price, data options, value for money, minutes, and network coverage.

Section II discusses the related works, and Section III describes the implementation of the survey, the contents of the survey, and the demographic chosen to answer the survey. Section IV discusses the overall results of the survey, the results represented by different subgroups, and in which subgroup the decoy effect was most effective. Section V presents the conclusions of the study, and Section VI discusses future works and the changes to make in future studies.

RELATED WORK

A. *Consumer Choice in Context: The Decoy Effect in Travel and Tourism* [4]

This study investigates the impact of the decoy effect in Travel and Tourism. The researchers worked alongside a midwestern travel agency to distribute two surveys to assess the shift in consumer preferences when presented with a decoy package to the following two destinations; Walt Disney World and Las Vegas. They formulated three packages for each destination in accordance with pre-existing prices offered by the travel agent and distributed the packages through surveys to 136 existing customers of the travel agency, making it a field experiment. They developed and used a split-half model to avoid prior sensitization to a choice set, negating the influence of bias. We have adapted the split-half model from the study, implementing it in our study on the decoy effect in telephone packages by distributing two separate surveys, ensuring each person is limited to completing only one survey.

B. *Integration of the Decoy Effect in an Agent-Based-Model Simulation of Insurance Consumer Behavior* [10]

This paper observes the decoy effect's impact on insurance options in the competitive industry using an Agent-Based Model Simulation. The study aims to observe the decoy effect only and does so by keeping all parameters besides the price and quality of the decoy constant. Using real-life car insurance data from a local car rental company, the researchers characterize the price-quality trade-off of each option as the premium paid for the service. The findings highlight the influence of the price-quality balance on consumer behavior, with an emphasis on the increased reliance on financial computing in the insurance sector.

C. *Adding Asymmetrically Dominated Alternatives: Violations of Regularity and the Similarity Hypothesis* [8]

This paper is the first to explore the effects of asymmetric dominance by demonstrating violations of a well-known assumption in the consumer behavior literature, the regularity assumption, through the proportionality model and the similarity hypothesis. The study was conducted over two weeks and used 153 university-going business students to make choices between a choice set of six products, with participants made to decide between two alternatives in a straightforward environment, with the introduction of the decoy hypothesized to increase the target's share. The study showcases the increase in preference reversals, emphasizing the importance of distortion effects with the introduction of an asymmetrically dominated alternative.

IMPLEMENTATION

Taking inspiration from [10]'s use of Agent-Based-Modelling for insurance service products due to the increasingly competitive nature of the insurance market, we have chosen to study the impact of the decoy effect on telephone packages in the United Arab Emirates due to the present competition between telecommunications companies in providing telephone packages, coupled with the application of the theory not being tested in the telecommunications industry.

We used a convenience sample of residents from the United Arab Emirates and distributed the two online surveys by sending them through means of communication like messages and Email. Each survey was different, so they were shared alternately with participants who were willing to cooperate to partake in the survey. A total of 294 serviceable responses were collected over a 2-week period.

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Participants were made aware at the start of the survey that their responses would be used for academic research in order to maintain transparency as well as give participants the opportunity to provide informed consent. Participants were also made aware of the confidentiality of their responses to maintain privacy and encourage honest responses from participants for more personal questions such as those pertaining to age and estimated annual household income. They were presented with the following disclaimer:

"Disclaimer: Your participation in this anonymous survey is voluntary, and your responses will be kept confidential and used solely for academic research purposes."

Before the participants were asked to answer questions in regard to telephone packages and their preferences, we asked them to answer personal questions in regard to gender, age, and estimated household income in US Dollars in that order. This allowed for greater analysis of our data and enabled us to compare the difference in the impact of our decoy amongst different subgroups and determine which group was most/least influenced following the introduction of the decoy.

Fig. 2 shows the proportion of male and female respondents for both surveys.

FIG. 2: PROPORTIONS OF MALES AND FEMALES

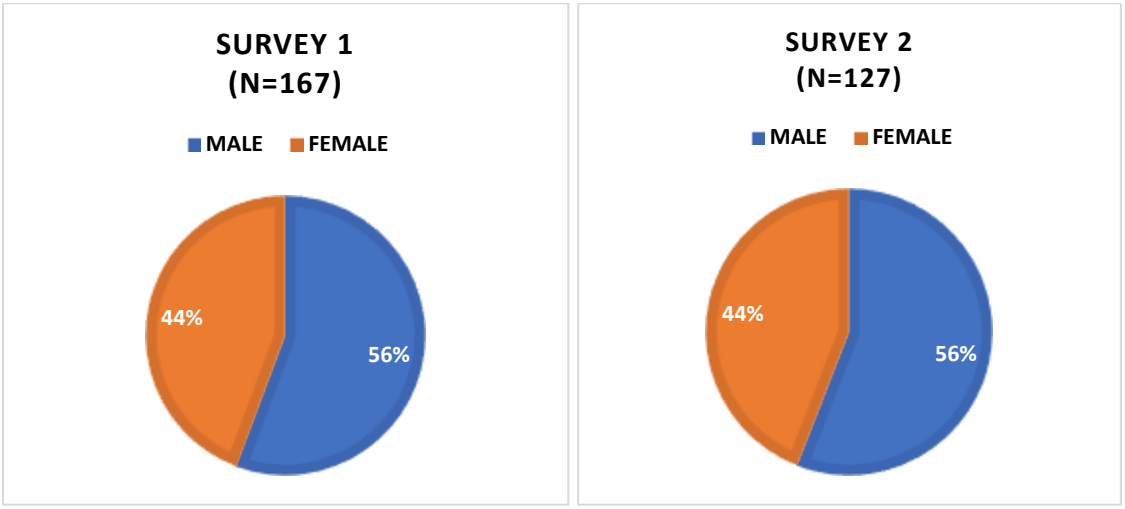
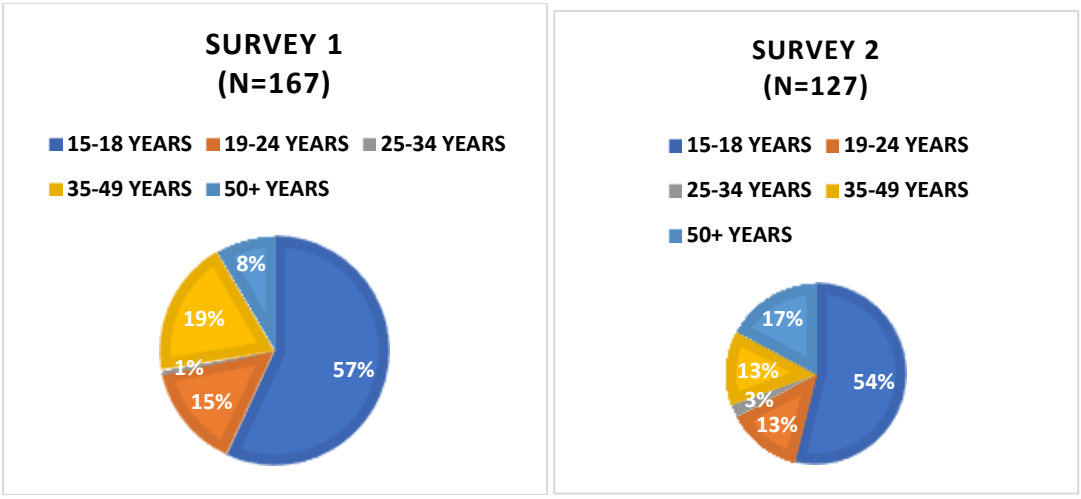


Fig. 3 shows what proportion of participants fall under each age bracket for both surveys.

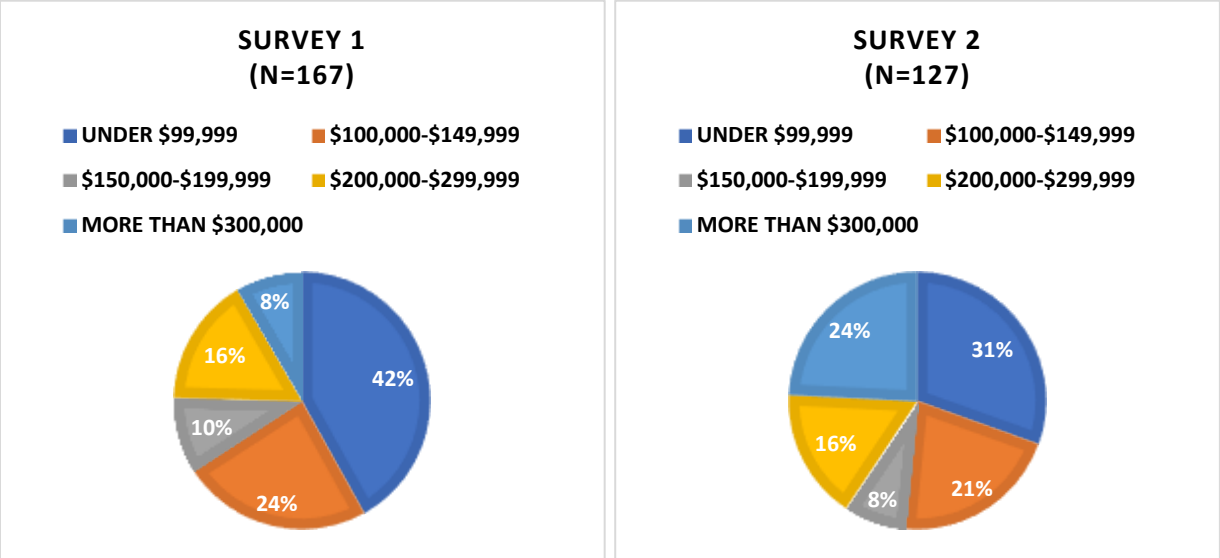
FIG. 3: PROPORTIONS OF PARTICIPANTS IN EACH AGE GROUP



As we can see from both pie charts, majority of respondents for both surveys were aged between 35-49 years, making this the modal group. The median age group was also 35-49 years, with ages ranging from 15 years all the way up to over 50 years of age.

Fig. 4 shows what proportion of participants fall under each bracket for their household annual income for both surveys.

FIG. 4 : PROPORTIONS OF PARTICIPANTS IN EACH ANNUAL HOUSEHOLD INCOME GROUP



From the data above, we can see that the majority group of respondents earn a household income of under $99,999 annually and both groups having a median income earning bracket of $100,000-$149,999 annually. The major difference in the two pie charts is the greater proportion of respondents earning over $300,000 annually in Survey 2 at 24% in comparison to the 8% in Survey 1.

The two largest telecommunications corporations in the United Arab Emirates, Etisalat and Du, were used to ensure participants' familiarity with the companies to imitate a sense of realism in choosing between the telephone packages. Furthermore, three different telephone packages were developed for each corporation with the assistance of their respective websites to match certain elements of our packages with pre-existing, offered packages. The three packages we formulated for each firm consisted of an option package, a target package, and a decoy package.

In formulating the distinct packages, we referred to Simonson and Tversky's idea of extreme options explored in [11]. Their findings suggested that consumers had the inclination to stay away from extreme options and the introduction of the decoy package as a low-price, low-value option would make it the extreme option and encourage consumers to shift towards the high-price, high-value option as it is no longer deemed as extreme. As a result, with reference to Fig. 1, we have ensured that in our packages for both respective corporations, the decoy package is priced high enough and considered of substantially low value, so it is considered extreme.

To avoid bias in the study results through issues of familiarity caused by order effects, an independent groups design was used, similar to that of the split-half model in [4]. This helped us avoid changes in participant behavior based on previously experienced conditions (given they were to take part in both surveys) which would confound the results of the study, as well as reduce demand characteristics participants may have been susceptible to by picking up hints on the purpose of the study, influencing their behavior and/or responses.

Using the independent groups design, the questionnaires were distributed by means of two separate surveys. The first survey (Fig. 5) contained two telephone packages for Du (the option and the target) and three telephone packages for

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Etisalat (the option, the target, and the decoy). The second survey (Fig. 6) contained two telephone packages for Etisalat (the option and the target) and three telephone packages for Du (the option, the target, and the decoy). Regardless of whether participants were shown two or three packages, they were made to select one package in both conditions.

FIG. 5: SURVEY 1

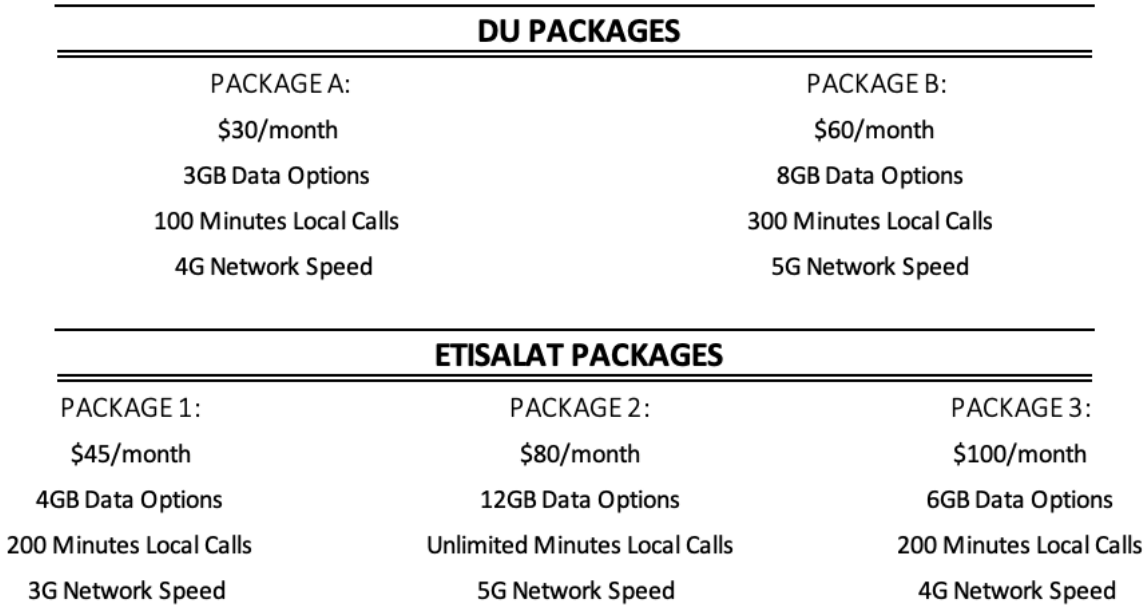
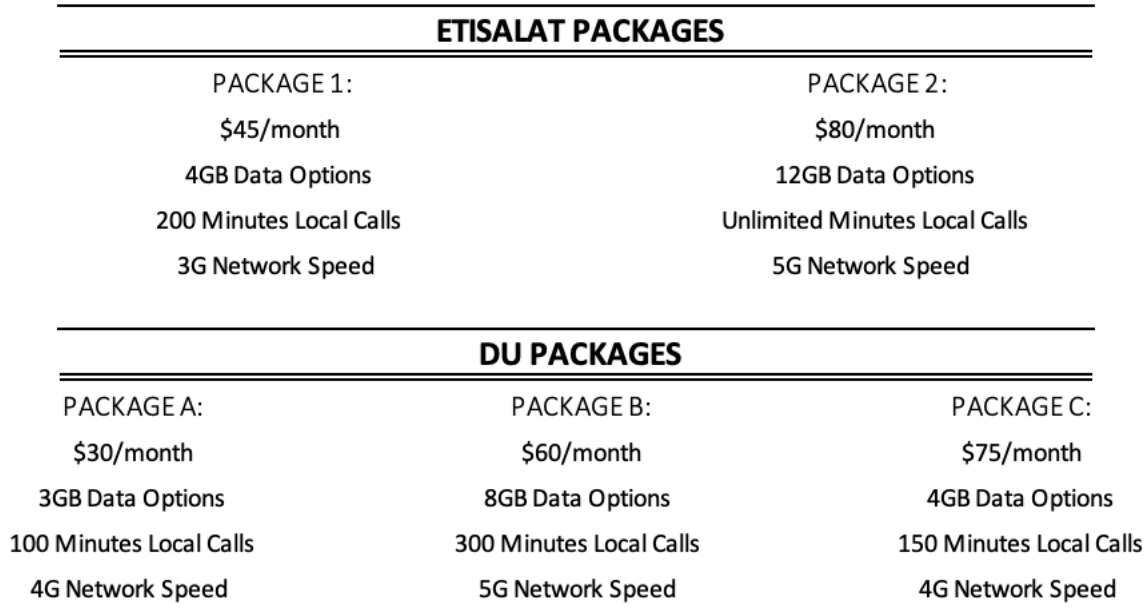


FIG. 6: SURVEY 2



Finally, we used a Chi-Square Test of Independence to see if there was a difference in participants' responses following the introduction of the decoy package, in favor of the target package; we used this test for the overall results as well as each sub-group. We tested the results at 2 degrees of freedom at the 5% significance level, using a two-tailed test to test the significance of our results. We used the formula below to calculate the p-value for our Chi-Square tests using the Stata Software Program [12].

$$p=1-CHI2.DIST(\chi 2,degrees\ of\ freedom)$$

RESULTS

H_0: There is no difference in the participants' telephone package choice (in favor of the target package) following the introduction of the decoy package.

H_1: There is a difference in the participants' telephone package choice (in favor of the target package) following the introduction of the decoy package.

Given our use of an independent groups design, we established a baseline condition in our surveys by presenting participants with either the Du or Etisalat packages (dependent on what survey they completed) without the introduction of the decoy package prior to presenting them with the choice of packages including the decoy. This ensured that we could empirically compare the shift in consumer preferences towards the target before and after being presented with the decoy.

Furthermore, to combat the issue of prior sensitization to the telephone package in question and the participants' potential inclination to revert to the question without the decoy package and change their initial choice, we presented the participants with two questions consisting of telephone packages from two, completely unrelated telecommunications firms to ensure their decision making was not influenced by any of their prior choices.

We will use the findings of Huber, Payne, and Puto in [8] on the decoy effect within their respective choice sets of cars, beer, restaurants, lotteries, films, and TV as a benchmark of comparison for the results of our study.

A. Overall Results

Table 1 shows the two different survey choice sets and the price and nature of the packages within them. Table 2 shows the preferences of the survey participants in both survey choice sets. Table 3 shows the shift in consumer preferences when introducing the decoy package in the context of each telecommunications firm separately. Fig. 7 represents the preferences of consumers before and after being presented with the decoy for Du packages and Fig. 8 represents the preferences of consumers before and after being presented with the decoy for Etisalat packages.

TABLE 1: TYPE AND PRICE OF TELEPHONE PACKAGES

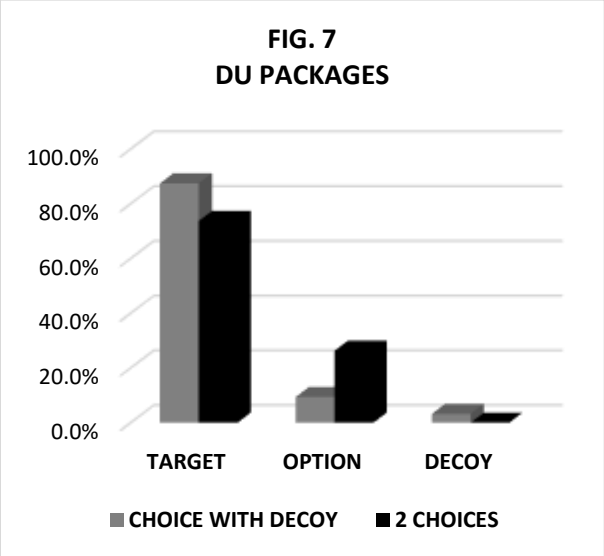
Survey 1			Survey 2		
Firm	Package	Price	Firm	Package	Price
Du	A (Option)	$30/mth	Etisalat	1 (Option)	$45/mth
	B (Target)	$60/mth		2 (Target)	$80/mth
Etisalat	1 (Option)	$45/mth	Du	A (Option)	$30/mth
	2 (Target)	$80/mth		B (Target)	$60/mth
	3 (Decoy)	$100/mth		C (Decoy)	$75/mth

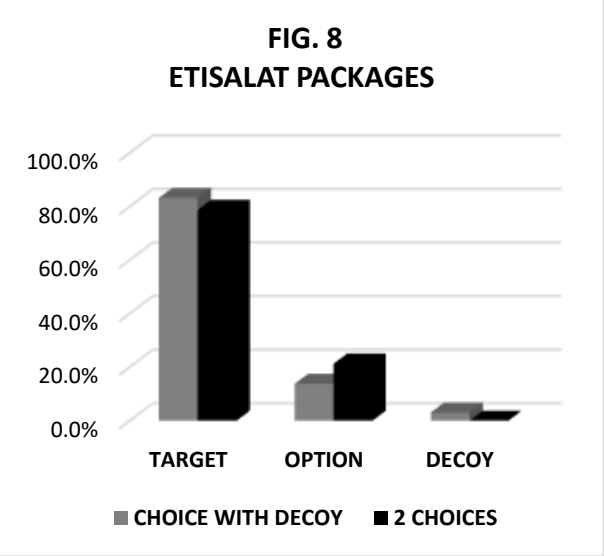
TABLE 2: PARTICIPANTS' PREFERENCES

Survey 1 (N=167)				Survey 2 (N=127)			
Firm	Package	No.	Pct.	Firm	Package	No.	Pct.
Du	A (Option)	44	26.3%	Etisalat	1 (Option)	27	21.3%
	B (Target)	123	73.7%		2 (Target)	100	78.7%
Etisalat	1 (Option)	23	13.8%	Du	A (Option)	12	9.4%
	2 (Target)	139	83.2%		B (Target)	111	87.4%
	3 (Decoy)	5	3.0%		C (Decoy)	4	3.1%

TABLE 3: SHIFT IN CONSUMER PREFERENCES

Du (N=127)			Etisalat (N=167)		
Firm	Package	Pct.	Firm	Package	Pct.
Du	1 (O1)	26.3%	Etisalat	A (Option 1)	21.3%
	2 (T1)	73.7%		B (Target 1)	78.7%
Du	1 (O2)	9.4%	Etisalat	A (Option 2)	13.8%
	2 (T2)	87.4%		B (Target 2)	83.2%
	3 (D2)	3.1%		C (Decoy 2)	3.0%
Shift = (O1)- (O2) = 16.9%			Shift = (O1)- (O2) = 7.5%		
Shift to Target = (T2) - (T1) = 13.7%			Shift to Target = (T2) - (T1) = 4.5%		
Chi Square = 12.36			Chi Square = 4.73		
p = 0.00207			p = 0.093949		





As shown by the tables and graphs, there is a significant shift in favor of the target package in the case of Du following the introduction of the decoy package, with a positive shift of 13.7%. This exceeds the findings of Huber, Payne, and Puto in [8] who reported an average 9.2% shift towards the target in their given choice sets.

As for Etisalat, there is also an observed shift in favor of the target package once the decoy has been introduced, with a slightly less pronounced positive shift of 4.5% towards the target package for Etisalat. Despite the shift, this falls well below the previously mentioned average of 9.2% found in [8]. This significantly smaller shift in comparison to that of Du can be attributed to the fact that the option package for Etisalat was perceived to be of higher value than we initially considered. Despite it being priced higher than the option package for Du, it trumped Du's option package in terms of data offered and local call minutes. As a result, participants were less inclined to shift their preference towards the target package once the decoy was introduced in comparison to when it was introduced for Du. This can be seen by the 7.5% decrease in participants selecting Etisalat's option package following the introduction of the decoy in comparison to the much greater 16.9% decrease in participants selecting Du's option package following the introduction of the decoy.

As seen by our Chi-Square tests, the results for Du are significant at $p \leq 0.05$ as we get a calculated p-value of 0.00207 and therefore, we can accept H_1 and conclude that there is a difference in the participants' telephone package choice (in favor of the target package) following the introduction of the decoy package. As for Etisalat, the results are insignificant at $p \leq 0.05$ as we get a calculated p-value of 0.093949 and therefore, we can reject H_1 and conclude that there is no difference in the participants' telephone package choice following the introduction of the decoy package.

As for the decoy in both conditions, only 3.1% and 3% of participants chose the decoy package for Du and Etisalat respectively. These findings were consistent with the findings in [8], where they found that only 2% of participants selected the decoy. This can be attributed to both surveys' use of 'extreme options' explored in [11], using obviously high-priced, low-value choices to prompt participants against choosing the decoy.

B. Results Dependent on Gender

Male

Table 4 shows the preferences of the male survey participants in both survey choice sets. Table 5 shows the shift in male preferences when introducing the decoy package in the context of each telecommunications firm separately. Fig. 9 represents the preferences of male participants before and after being presented with the decoy for Du packages and Fig. 10 represents the preferences of male participants before and after being presented with the decoy for Etisalat packages.

TABLE 4: MALE PARTICIPANTS' PREFERENCES

Survey 1 (N=93)				Survey 2 (N=71)			
Firm	Package	No.	Pct.	Firm	Package	No.	Pct.
Du	A (Option)	21	22.6%	Etisalat	1 (Option)	11	15.5%
	B (Target)	72	77.4%		2 (Target)	61	84.5%
Etisalat	1 (Option)	13	14.0%	Du	A (Option)	6	8.5%
	2 (Target)	79	84.9%		B (Target)	64	90.1%
	3 (Decoy)	1	1.1%		C (Decoy)	1	1.4%

TABLE 5: SHIFT IN MALE CONSUMER PREFERENCES

Du (N=71)			Etisalat (N=93)		
Firm	Package	Pct.	Firm	Package	Pct.
Du	1 (O1)	22.6%	Etisalat	A (Option 1)	15.5%
	2 (T1)	77.4%		B (Target 1)	84.5%
Du	1 (O2)	8.5%	Etisalat	A (Option 2)	14.0%
	2 (T2)	90.1%		B (Target 2)	84.9%
	3 (D2)	1.4%		C (Decoy 2)	1.1%
Shift = (O1)- (O2) = 14.1%			Shift = (O1)- (O2) = 1.5%		
Shift to Target = (T2) - (T1) = 12.7%			Shift to Target = (T2) - (T1) = 0.4%		
Chi Square = 8.76			Chi Square = 3.08		
p = 0.012525			p = 0.214381		

FIG. 9
DU PACKAGES (MALE)

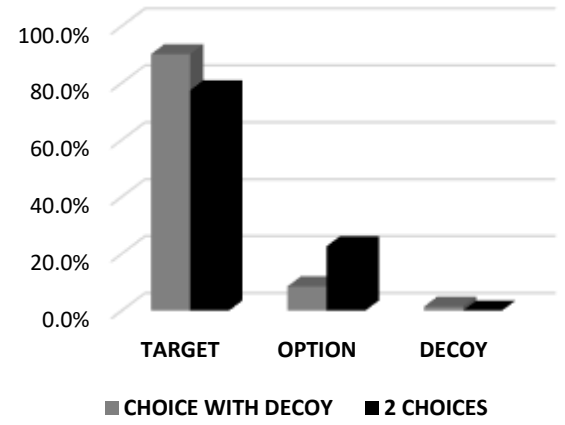
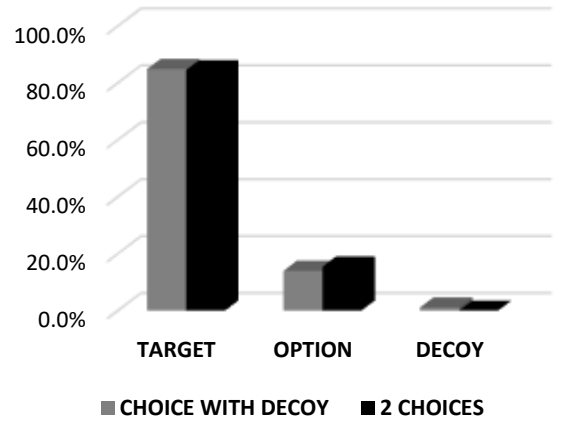


FIG. 10
ETISALAT PACKAGES (MALE)



Similar to the overall results, there is a significant shift in male choices in favor of the target package for Du following the introduction of the decoy package, with a positive shift of 12.7% towards the target package. This exceeds the average 9.2% shift towards the target in [8], previously aforementioned.

Contrastingly, the observed shift in favor of the target package is much more minuscule when observing male choices following the introduction of the decoy package, with a positive shift of only 0.4%. Considering the previously mentioned average shift towards the target in [8], this falls well below the average shift found in Huber, Payne, and Puto's study. This is again attributed to higher data and local minutes offered in the Etisalat option package compared to the Du option package, which we have previously mentioned.

As seen by our Chi-Square tests, the results for Du male choices are significant at $p \leq 0.05$ as we get a calculated p-value of 0.012525 and therefore, we can accept H_1 and conclude that there is a difference in the participants' telephone package choice (in favor of the target package) following the introduction of the decoy package. As for Etisalat male

choices, the results are insignificant at $p \leq 0.05$ as we get a calculated p-value of 0.214381 and therefore, we can reject H_1 and conclude that there is no difference in the participants' telephone package choice following the introduction of the decoy package.

As for the decoy in both conditions, only 1.4% and 1.1% of participants chose the decoy package for Du and Etisalat respectively. These findings were consistent with the findings in [8], once again, where they found that only 2% of participants selected the decoy, due to previously mentioned reasons of 'extreme options [11].'

Female

Table 6 shows the preferences of the female survey participants in both survey choice sets. Table 7 shows the shift in female preferences when introducing the decoy package in the context of each telecommunications firm separately. Fig. 11 represents the preferences of female participants before and after being presented with the decoy for Du packages and Fig. 12 represents the preferences of female participants before and after being presented with the decoy for Etisalat packages.

TABLE 6: FEMALE PARTICIPANTS' PREFERENCES

Survey 1 (N=74)				Survey 2 (N=56)			
Firm	Package	No.	Pct.	Firm	Package	No.	Pct.
Du	A (Option)	23	31.1%	Etisalat	1 (Option)	16	28.6%
	B (Target)	51	68.9%		2 (Target)	40	71.4%
Etisalat	1 (Option)	10	13.5%	Du	A (Option)	6	10.7%
	2 (Target)	60	81.1%		B (Target)	47	83.9%
	3 (Decoy)	4	5.4%		C (Decoy)	3	5.4%

TABLE 7: SHIFT IN FEMALE CONSUMER PREFERENCES

Du (N=56)			Etisalat (N=74)		
Firm	Package	Pct.	Firm	Package	Pct.
Du	1 (O1)	31.1%	Etisalat	A (Option 1)	28.6%
	2 (T1)	68.9%		B (Target 1)	71.4%
Du	1 (O2)	10.7%	Etisalat	A (Option 2)	13.5%
	2 (T2)	83.9%		B (Target 2)	81.1%
	3 (D2)	5.4%		C (Decoy 2)	5.4%
Shift = (O1)- (O2) = 20.4%			Shift = (O1)- (O2) = 15.1%		
Shift to Target = (T2) - (T1) = 15.0%			Shift to Target = (T2) - (T1) = 9.7%		
Chi Square = 16.84			Chi Square = 11.44		
p = 0.00022			p = 0.00328		

FIG. 11
DU PACKAGES (FEMALE)

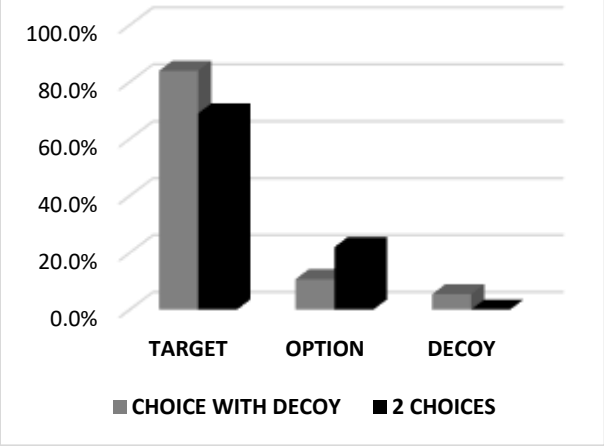
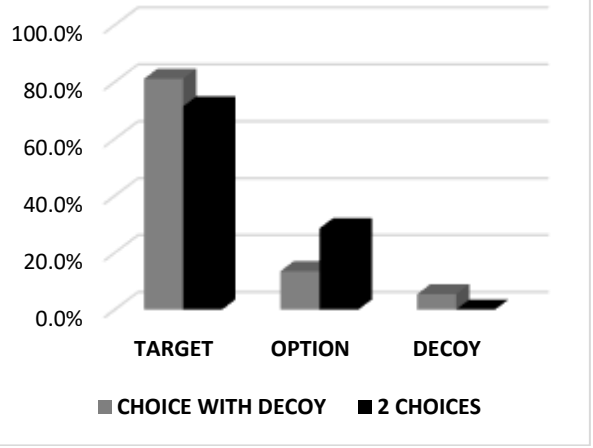


FIG. 12
ETISALAT PACKAGES (FEMALE)



Similar to previous results, there is a significant shift in female choices in favor of the target package for Du following the introduction of the decoy package, with a positive shift of 15.0% towards the target package. This considerably exceeds the average 9.2% shift towards the target in [8], previously aforementioned.

However, in contrast to previous results, the observed female shift in favor of the target package for Etisalat was much higher at 9.7%, slightly exceeding the average shift in [8] and exceeding any shifts for Etisalat previously found. This is relatively in line with previous results with the decoy working for both conditions but differs by the shift to the target Etisalat package being far higher than previously observed for the overall results.

Furthermore, female participants also tended to choose the decoy option to a greater extent than previous data suggests, with 5.4% of participants choosing the decoy package for both Du and Etisalat. This is well above the average shift of 2% in the direction of the decoy and requires further explanation given the distribution of the same choice sets to both males and females, under the same circumstances (through an online survey, administered to be completed at participants' convenience).

As seen by our Chi-Square tests, the results for Du female choices are significant at $p \leq 0.05$ as we get a calculated p-value of 0.00022 and therefore, we can accept H_1 and conclude that there is a difference in the participants' telephone package choice (in favor of the target package) following the introduction of the decoy package. As for Etisalat female choices, the results are also significant at $p \leq 0.05$ as we get a calculated p-value of 0.00382 and therefore, we can accept H_1 and conclude that there is a difference in the participants' telephone package choice (in favor of the target package) following the introduction of the decoy package.

Overall, the decoy has seemed to be more influential among females as compared to males as the introduction of a decoy in both conditions has prompted a greater than expected shift towards the target package in relation to the average shift found in [8]. Furthermore, the observed shifts for both firms seem to greatly exceed Huber, Payne, and Puto's average, indicating a greater influence of introducing a decoy on women in comparison to men.

C. Results Dependent on Age

This subsection explores the shift in participant preferences following the introduction of the decoy package in the largest answering age group (35-49 years) in comparison to the shift explored in the overall results of the study.

Table 8 shows the preferences of the participants in both survey choice sets. Table 9 shows the shift in participants' preferences when introducing the decoy package in the context of each telecommunications firm separately. Fig. 13

represents the preferences of participants before and after being presented with the decoy for Du packages and Fig. 14 represents the preferences of participants before and after being presented with the decoy for Etisalat packages.

TABLE 8
PARTICIPANTS' PREFERENCES (35-49 YEARS)

Survey 1 (N=95)				Survey 2 (N=69)			
Firm	Package	No.	Pct.	Firm	Package	No.	Pct.
Du	A (Option)	26	27.4%	Etisalat	1 (Option)	10	14.5%
	B (Target)	69	72.6%		2 (Target)	59	85.5%
Etisalat	1 (Option)	10	10.5%	Du	A (Option)	2	2.9%
	2 (Target)	81	85.3%		B (Target)	65	94.2%
	3 (Decoy)	4	4.2%		C (Decoy)	2	2.9%

TABLE 9: SHIFT IN CONSUMER PREFERENCES (35-49 YEARS)

Du (N=69)			Etisalat (N=95)		
Firm	Package	Pct.	Firm	Package	Pct.
Du	1 (O1)	27.4%	Etisalat	A (Option 1)	14.5%
	2 (T1)	72.6%		B (Target 1)	85.5%
Du	1 (O2)	2.9%	Etisalat	A (Option 2)	10.5%
	2 (T2)	94.2%		B (Target 2)	85.3%
	3 (D2)	2.9%		C (Decoy 2)	4.2%
Shift = (O1)- (O2) = 24.5%			Shift = (O1)- (O2) = 4.0%		
Shift to Target = (T2) - (T1) = 21.6%			Shift to Target = (T2) - (T1) = -0.2%		
Chi Square = 25.52			Chi Square = 4.84		
p = <0.00001			p = 0.088922		

FIG. 13
DU PACKAGES (AGE)

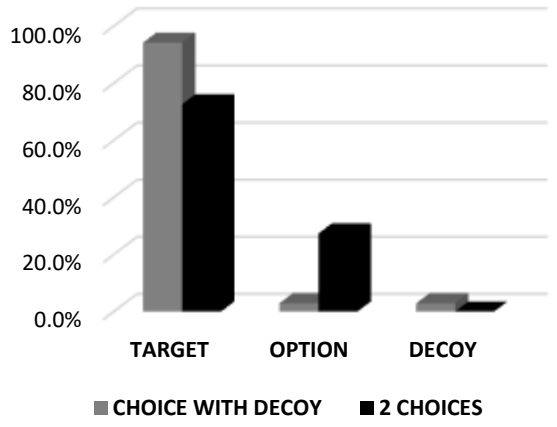
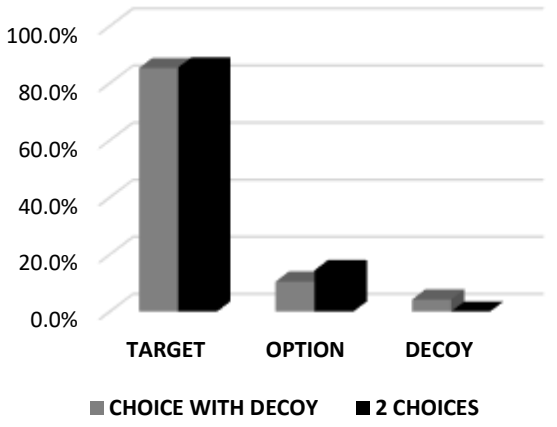


FIG. 14
ETISALAT PACKAGES (AGE)



Analogous to previous results, there is a significant shift in participants' choices for the 35–49-year age group following the introduction of the decoy package for Du, with a positive shift of 21.6% towards the target package, the highest shift observed amongst any subgroup and exceeding the reported average shift in [8] by over double.

As for the Etisalat packages, we actually observe a shift in the negative direction following the introduction of the decoy package, with a decrease in participants' selection of the target package of 0.2%. This goes against the trend of previous findings, which have all displayed a slight shift in participants' preference towards the target package following the introduction of the decoy. Despite the decoy package fulfilling its function of discouraging participants from selecting the option package, as evidenced by a 4% decrease, it had the unintended effect of prompting participants to choose it as opposed to the target package. This is characterized as the repulsion effect amongst the 35–49-year group, where "the presence of an inferior option (the decoy) decreases the attractiveness of the option that dominates it (the target) [13]."

Moreover, participants chose the decoy packages at rates of 2.9% and 4.2% for Du and Etisalat packages. The result for Du is in line with the overall results as well as the 2% decoy selection observed in [8]. As for Etisalat, the slightly higher selection of the decoy package is caused by the unintended effect of the package prompting participants to select it, as previously discussed.

As seen by our Chi-Square tests, the results for Du choices for participants aged 35-49 years are significant at $p \leq 0.05$ as we get a calculated p-value of <0.00001 and therefore, we can accept H_1 and conclude that there is a difference in the participants' telephone package choice (in favor of the target package) following the introduction of the decoy package dependent on participants' age. As for Etisalat choices for participants aged 35-49 years, the results are insignificant at $p \leq 0.05$ as we get a calculated p-value of 0.088922 and therefore, we can reject H_1 and conclude that there is no difference in the participants' telephone package choice following the introduction of the decoy package dependent on participants' age.

Overall, the results observed amongst 35-49-year-old survey respondents are much more variable, as evidenced by the extremely high shift for Du packages in comparison to the negative shift seen for Etisalat packages. Furthermore, the results introduce a new concept of repulsion, as seen by the high selection of the Etisalat decoy package.

D. Results Dependent on Annual Household Income

To find the true impact of different annual household incomes on the shift caused by the introduction of the decoy, we decided to exclude all non-working participants. From the 294 serviceable results we received for both surveys, 216 of the participants were actively working and were included in our dataset on the impact of annual household income on the decoy effect. In this dataset, we found the majority of participants earned less than $99,999 USD annually. This section will compare the results of this subgroup of people to the overall results to see the difference in influence caused by the introduction of the decoy packages.

Table 10 shows the preferences of the participants in both survey choice sets. Table 11 shows the shift in participants' preferences when introducing the decoy package in the context of each telecommunications firm separately. Fig. 15 represents the preferences of participants before and after being presented with the decoy for Du packages and Fig. 16 represents the preferences of participants before and after being presented with the decoy for Etisalat packages.

TABLE 10: PARTICIPANTS' PREFERENCES (UNDER $99,999)

Survey 1 (N=54)				Survey 2 (N=31)			
Firm	Package	No.	Pct.	Firm	Package	No.	Pct.
Du	A (Option)	15	27.8%	Etisalat	1 (Option)	7	22.6%
	B (Target)	39	72.2%		2 (Target)	24	77.4%
Etisalat	1 (Option)	10	18.5%	Du	A (Option)	5	16.1%
	2 (Target)	44	81.5%		B (Target)	25	80.6%
	3 (Decoy)	0	0.0%		C (Decoy)	1	3.2%

TABLE 11: SHIFT IN CONSUMER PREFERENCES (UNDER $99,999)

Du (N=31)			Etisalat (N=54)		
Firm	Package	Pct.	Firm	Package	Pct.
Du	1 (O1)	27.8%	Etisalat	A (Option 1)	22.6%
	2 (T1)	72.2%		B (Target 1)	77.4%
Du	1 (O2)	18.5%	Etisalat	A (Option 2)	16.1%
	2 (T2)	81.5%		B (Target 2)	80.6%
	3 (D2)	0.0%		C (Decoy 2)	3.2%
Shift = (O1)- (O2) = 9.3%			Shift = (O1)- (O2) = 6.5%		
Shift to Target = (T2) - (T1) = 8.4%			Shift to Target = (T2) - (T1) = 4.1%		
Chi Square = 2.42			Chi Square = 4.94		
p = 0.298197			p = 0.084585		

FIG. 15
DU PACKAGES (INCOME)

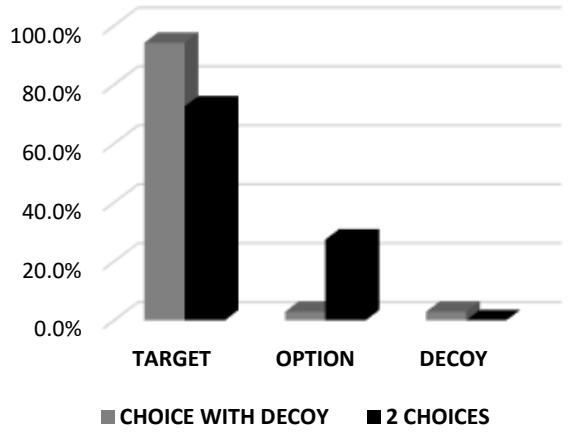
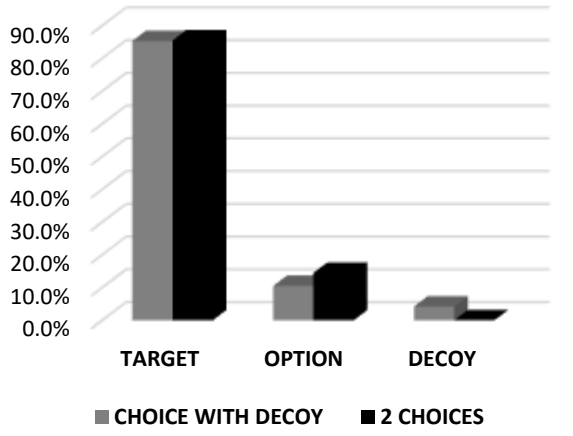


FIG. 16
ETISALAT PACKAGES (INCOME)



Once again, there is a fairly significant observed shift in choices in favor of the target package for Du following the introduction of the decoy package, with a positive shift of 8.4% towards the target package. That said, the result is slightly inferior to the average shift found in [8], falling behind by 0.8%, and is even more inferior to the shift found in the overall results by about 5.3%. Nevertheless, the shift is still in line with these results, just less pronounced.

As for Etisalat, there is also an observed shift in favor of the target package following the introduction of the decoy package of about 4.1% in the positive direction. This result is consistent with the shift observed in Subsection A (overall results), where we observed a less-than-expected shift of 4.5%, due to reasons of perceived value in the option package for Etisalat which we previously discussed.

In regard to the decoy package for Du, only 3.2% of participants chose it. This finding is consistent with the finding of a 2% shift in favor of the decoy found in [8] and is also consistent with our finding of a 3.1% shift in the overall results. As for Etisalat, this was the first subgroup in which we observed no shift in favor of the decoy, with 0% of participants selecting the decoy package. The dissimilarity of the result can be explained by the increased perception of value amongst lower-income groups (in the context of the UAE) discussed in [14], explaining how lower-income groups are more price-sensitive and have more 'product search behavior', making them less susceptible to rash decision-making.

As seen by our Chi-Square tests, the results for Du choices for participants earning under $99,999 are insignificant at $p \leq 0.05$ as we get a calculated p-value of 0.298197 and therefore, we have to reject H_1 and conclude that there is no difference in the participants' telephone package choice (in favor of the target package) following the introduction of the decoy package dependent on participants' income. As for Etisalat choices for participants earning under $99,999, the results are insignificant at $p \leq 0.05$ as we get a calculated p-value of 0.084585 and therefore, we can reject H_1 and conclude that there is no difference in the participants' telephone package choice following the introduction of the decoy package dependent on participants' income.

Overall, the shifts explored in the Du and Etisalat packages are consistent with the shifts observed in our overall results, just less pronounced. The shifts in favor of the decoy packages, or lack thereof, can be explained by the increase in value perception amongst lower-income groups (in the context of the UAE).

DISCUSSION

In conjunction with similar studies conducted in different industries on the decoy effect, the results of our study are in line with previous findings and demonstrate the success of implementing a decoy in the realm of telecommunications in the United Arab Emirates.

The findings of this study have implications for telecommunications companies offering telephone packages with similar characteristics discussed in this paper such as data options, local call minutes, network coverage, and more. By successfully implementing an approach involving a decoy package, which takes into account the discussion of information overload in [5], firms can prompt consumers to spend more simply by influencing their perception of value.

The research also has implications for telecommunications marketers regarding the demographics they should target when implementing their own decoy. As shown, the introduction of the same decoys in our two conditions had significantly different impacts on consumer preferences among different demographics. With this information, firms can target specific demographics more susceptible to shifting their preference in favor of the target good, increasing the success of the decoy.

Furthermore, the successful implementation of a decoy may not only increase a company's revenue but also its profit. Companies can increase revenue by means of two methods: increasing the number of customers or increasing the amount paid by the same number of customers. Considering the results of this study, a decoy would increase the amount paid by a proportion of consumers, thus generating additional revenue. However, when considering the variable costs and the customer acquisition costs associated with increasing the number of consumers, a successful decoy proves to be a more profitable option.

That being said, there are limitations to this assumption. Firstly, the use of a convenience sample curbs our assumption of increased revenue and profit. This sampling method introduces bias given its limited representativeness as it only consists of participants willing to partake in the study, leading to risks of misrepresentation of certain, hard-to-reach segments of the population, not fully representing the influence of the decoy effect within an overall population.

Secondly, the use of extreme options explored in [11] to influence participants into choosing the target option is hypothetical and potentially unrepresentative of marketing techniques firms may be willing to implement. By introducing an obvious high-cost, low-value package to the range of a firm's offerings, consumers will recognize it as a ploy and perceive the company as being coercive and unethical. As a result, if employing a decoy, firms may have to employ less recognizable decoys to avoid issues of ethics, which may not warrant results as successful as found in our study.

FUTURE WORK

This study establishes a foundation for research on the decoy effect in the telecommunications market in the United Arab Emirates but there is more that can be implemented and improved.

Firstly, to provide practical context to the findings of our study, the research could be completed in tandem with the operations of a telecommunications firm, similar to the approach taken by the researchers in [4] who worked alongside a 'midwestern travel agency.' By doing so, we can work out accurate estimates of the monetary benefits of implementing a decoy such as the increase in revenue due to the use of pre-existing packages offered by these firms, thus allowing us to further quantify the success of the decoy.

Secondly, the study is held back by the non-random sample used. To increase the number of respondents to our surveys, we distributed them amongst anyone willing and able to take part. As a result, we were at risk of skewed results given the concentration of participants from limited ethnicities. This resulted in the misrepresentation of many consumer groups in the UAE which we may not have accessed. Working in collaboration with a telecommunications firm will enable a more representative sample given the use of real customers.

Thirdly, in future work, we would like to explore the impacts of the decoy effect in the telecommunications market outside of the United Arab Emirates. Given the duopolistic nature of the telecommunications market in the UAE, coupled with the majority government ownership of both firms, the network providers' primary motivation may not be profit. As a result, firms may not be concerned with employing a decoy as a means of increasing revenue and profit. Thus, the study may be better suited in a market with greater competition between firms.

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