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## Research Article

# A Different Perspective on Rationality: Rational Econs or Rational Humans?

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## Abstract

**Background and Objective:** Do people always behave as expected in the study of economics? There is considerable variation in behaviour, preferences and choices among people/economic agents. Perhaps more importantly, this variation is visible under different circumstances for the same person. This paper shows how people's preferences differ when the same options are presented in different ways. **Materials and Methods:** Analyzing three different studies based on concepts of heuristics, discounted pricing and sunk cost fallacy, this paper shows that people's choices deviate from the strict axioms or assumptions of rationality. The experiments chosen are adopted from different experiments conducted by influential behavioural economists. However, all experiments have been adapted to fit the socio-cultural norms of urban Bangladesh. **Results:** The first study concludes that individuals tend to make irrational decisions by considering how much an event represents a particular cluster where they overlook the base rates. The second and third studies show that when it comes to making choices about future purchases, individuals behave in a more rational way comparing to when they are faced with a challenge of sunk cost. **Conclusion:** It was concluded from the study, that when applied to reality, the assumptions of rationality as understood in the economic theories may hold under certain circumstances but are also violated under others.

**Key words:** Rationality, cognitive bias, heuristics, representativeness heuristics, mental accounting, sunk-cost fallacy, discounts, stated preference

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**Data Availability:** All relevant data are within the paper and its supporting information files.

## INTRODUCTION

'People are rational agents' is perhaps one of the oldest standing assumptions of traditional economics. The neo-classical rational choice theory assumes that, when an individual faces a set of alternative options to choose from, 'homo economicus', the rational and self-interested being will opt for the choice that maximizes his or her utility<sup>1</sup>. As economic modelling often relies upon "well-behaved" consumers, the theory of rational choice intentionally reduces people to a narrow/fixed set of individual characteristics. But a person's decision-making process is a complex phenomenon influenced by a wide range of factors. Economic approaches do not aim to explain actual human behaviour but it is interested in the behaviour of a large group of people<sup>1</sup>.

Behavioural economics aims to critically analyze and explain the economic models and provide a sound psychological foundation<sup>1</sup>. It deals with how and why an economic agent takes certain decisions and it is concerned with why people's actions and intentions are not always similar or consistent. It also questions the idea of perfect rationality.

From time to time, many behavioural economists have criticized the assumption that people are rational. They proved by many experiments and research that human behaviour deviated from the strict axioms of rationality under various conditions. Research along this line identifies several instances that explain human behaviour deviating from the strict axioms of a rational consumer.

The first evidence found in literature is based on the idea of heuristics. In the book "Thinking Fast and Slow", Kahneman<sup>2</sup> came up with two systems of human thinking- system 1 and system 2. System 1 makes decisions based on heuristics<sup>3</sup>; promptly and automatically, without giving any effort and thus sometimes leads to systematic errors or biases. System 2 activates when a person makes a decision that did not come to him naturally that is he had put some conscious mental exertion to make the decision. One of the most common biases of heuristics is 'representativeness bias'. This means to determine the probability of an event by associating it to a similar event that already exists in the person's mind. In more recent work, Islam<sup>3</sup> in his paper surveyed stock market investors and found that the factor that had the most dominating impact on the decision-making process of investors was the psychological factor and it manipulates

cognitive dissonance. Based on representativeness bias they take their next investment decision. Similarly, AlKhars *et al.*<sup>4</sup> in their research on whether operation managers make decisions that are subject to cognitive biases, showed that almost 50% of the managers take decisions that are influenced by heuristics like representativeness bias, availability bias and anchoring bias.

Lee *et al.*<sup>5</sup>, in their research titled 'Try It, You Will Like It: The Influence of Expectation, Consumption and Revelation on Preference of Beer', focused on the interaction between two bases of reference-knowledge and experience. Their results suggest that information influences preferences more when received before consumption than when received after consumption.

A second explanation for deviation in behaviour comes from mental accounting. This idea was coined by American Economist, Richard Thaler (in 1999). The main idea of this term is that individuals consider the value in relative terms, not in absolute terms i.e., they derive satisfaction not only from the value of the product but also by how the deal was made<sup>6</sup>. Similar to other cognitive biases, this mental accounting process results in biases and deviations from rationality. For example, Shampaneir *et al.*<sup>7</sup> in their 'Zero as a Special Price: The true value of free products', showed that in the case of free products, people do not only calculate the difference between cost and benefit but consider the higher benefits of free products. People behave in such a way that zero pricing not only reduces the cost but adds more utility to the product. When comparing 'A free chocolate and a chocolate priced \$4' with 'a \$1 chocolate and a \$5 chocolate', people are more attracted towards the first option. Note that the monetary difference in value for the two options is the same and thus a 'rational' consumer should be indifferent between the two options. Ariely *et al.*<sup>8</sup> pointed out two impacts of switching to a price of zero from a low price, on the consumer's behaviour- the first one is that more customers will demand the product and the second one is that now the buyers will take only one unit of the product which may lead to a net decrease in the total quantity demanded.

On the other hand, Shiv *et al.*<sup>9</sup> showed in their study "Placebo effects of marketing actions" where consumers perceive prices as a reflection of product quality. By three experiments, they showed people paying discounted or lower price for a product derives less satisfaction than the people paying a higher price for the same product. Once again, this contradicts the idea of rationality. Likewise, while examining

<sup>3</sup>Heuristic is a method or approach which is used or applied by people to solve problems. This is a practical method which helps to reach the immediate goal i.e., to solve the problem but this method does not give assurance that the solution will be an optimal or rational one. These are mental shortcuts to ease the cognitive load of making a decision

the relationship between price and quality, Verma *et al.*<sup>10</sup> found that for all durable, semi-durable and non-durable goods dropping the price too low sends a signal to the consumer that the quality of the product is not satisfactory. Keeping the price reasonably high gives a high-quality image for the product.

Third, Thaler (in 1980) also noted that people often fail to consider opportunity cost properly and are vulnerable to the sunk cost fallacy<sup>6</sup>. People tend to make different decisions in the present being influenced by past expenditures-though according to the theory of sunk cost it should not influence as the cost is already forgone. Olivola<sup>11</sup> in 2018, stated that the sunk cost effect is not only an intra personal phenomenon but also an interpersonal phenomenon. That is the effect is not only driven by one's past spending but also people change his or her decisions based on another person's past expenditures<sup>11</sup>.

It, therefore, becomes interesting to test these anomalies in different markets/situations to see whether economic agents do indeed frequently deviate from the assumptions of rationality. Most of the literature that was found, was done based on the framework of developed countries and mostly on the postgraduate students. But the cultural or traditional background, various socio-economic indices and the mind set of the people of Bangladesh are very different from those of the developed countries. This is verily the reason that drove us to conduct this study.

The objective of this paper is to show in the context of Bangladesh that people do not always follow the basic assumptions of rationality that are given in rational choice theory. Individual behaviour may deviate from the axioms of rationality. Behaviour also changes in response to the way the options are presented to them. However, this does not make the person irrational. Rather his actions or decisions can be termed as a myopic approach.

## MATERIALS AND METHODS

To conduct our analysis, three studies were performed each from a different approach of testing rationality. They are:

- Heuristic biases
- Pricing and quality effect
- Sunk cost fallacy

### Study area

**Data collection:** Information on behavioural economics on responses of consumers in the context of Bangladesh are rare in literature. This made it difficult to say anything meaningful about the behaviour of Bangladeshi agents in these contexts.

This called for a need to conduct a pilot survey. So at the very beginning, a questionnaire was developed, which was based on few experiments done by Dan Ariely<sup>12</sup> in his book "Predictably Irrational" and Daniel Kahneman<sup>2</sup> in his book "Thinking Fast and Slow" for conducting the pilot survey. The sample for this pilot survey consisted of 50 respondents from East West University, a leading private University in the Capital of the country. There were 5 questions in the questionnaire. Even though the questions were adapted from the works of Ariely and Kahneman, they were modified to match the socio-demographic setup of Urban Bangladesh. The result of the pilot matched our hypothesis. We then proceeded to formulate the main questionnaire for our research.

As mentioned earlier, the main survey questionnaire was developed with three questions inspired by the books "Thinking Fast and Slow" by Daniel Kahneman<sup>2</sup> and "Misbehaving-The Making of Behavioral Economics" by Richard H. Thaler<sup>6</sup>. It was prepared in both English and Bangla languages to avoid any language or interpretation problems. Different scenarios were given in different sets so that the same respondent did not face more than one scenario. This was done because if one respondent was exposed to all the scenarios then that could have made his responses biased. The main survey had a sample size of 437 respondents from different backgrounds. The survey was conducted with the help of google forms. A summary of the demographic characteristics of the respondents is given in Table 1. The respondents were categorized into two groups according to their age-"The Experienced" of age between 25-55 years and the "The Young" of age between 17-24 years. Out of the total 437 respondents, 40.73% were from the "The Young" group and 59.27% were from the "The Experienced" group. 56.98% of the respondents were male and 43.02% were females. Respondents were again categorized into 5 categories according to their monthly income. 46.19% were from the income group "0-10,000 Taka", 12.18% from "10,001-30,000 Taka" group, 12.69% from "30,001-50,000 Taka" group and 28.94% from "50,001 Taka and above".

Table 1: Demographic characteristics of the respondents

<b>Age</b>	
17-24 years	40.73%
25-55 years	59.27%
<b>Gender</b>	
Male	56.98%
Female	43.02%
<b>Income</b>	
Taka 0-10,000	46.19%
Taka 10,001-30,000	12.18%
Taka 30,001-50,000	12.69%
Taka 50,001 and above	28.94%

**Testing the phenomenon:** This section describes the three studies that were developed to test the rationality of individuals. The individual responses are compared with the pre-set notion of a "Rational Response". If responses deviate from the assumptions of rationality, it is concluded that the choice/individual is irrational.

**Experiment 1:** Daniel Kahneman and Amos Tversky's research on judgment shows that people depend on a limited number of cognitive shortcuts or judgmental heuristics that simplify the difficult task of evaluating probabilities in an uncertain world<sup>13</sup>. Heuristics is any methodology for problem-solving and it uses a practical way. This approach does not guarantee that the solution will be optimal, logical or rational but it is adequate to reach the immediate goal. This method speeds up the process to find a satisfactory solution when finding an optimal solution is impractical. There are three most important and frequently used heuristics-representativeness, availability and anchoring and adjustment. Though these heuristics are often economical and useful, they ignore information about probabilities and it sometimes leads to systematic errors<sup>13</sup>.

The first study of this paper is based on representativeness heuristics. When a person believes that an event belongs to a particular category of events and his/her belief is based on the rate of similarity of that event to the other events in that category, then this belief/ judgment is called representativeness heuristics. His judgement is influenced by how much the properties of the event represents the properties of other events in that particular category<sup>2</sup>. However, this approach often neglects the relevant base rates or leads to other cognitive biases.

Daniel Kahneman performed an experiment<sup>2</sup> showing how base rates are overlooked when people as a part of a particular cluster, reply to questions associated with the probability of an event. Our paper conducts a similar test but the effect of location bias is also introduced here.

**Method:** A hypothetical character Karim was introduced and a few of his traits were given to respondents. Based on that information, respondents were asked to form an educated guess regarding Karim's profession. The choice given to respondents was that Karim could either be a farmer or a librarian. As mentioned earlier, Kahneman's test was altered slightly to accommodate the socio-demographic features of the area of our study-Urban Bangladesh. The study was implemented in four versions. In each version, respondents were given different hints about the area or place

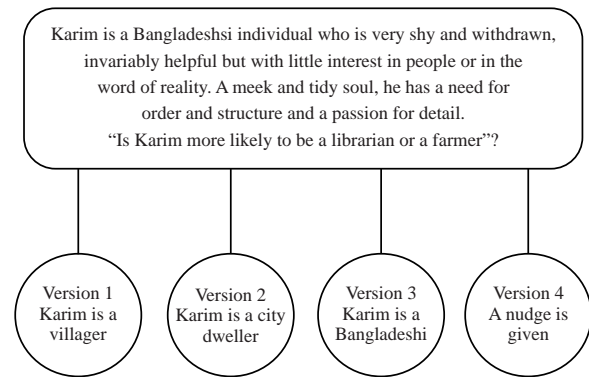


Fig. 1: Four versions of the experiment

where Karim lived. The idea was to evaluate if their answers varied on the basis (of Karim's residence) of the different nudges provided.

A simple illustration of the question is shown in Fig. 1. The four distinct nudges were:

- Karim is a city dweller
- Karim is a villager
- To nudge that his area of residence might influence his profession, it was mentioned that though Karim is a Bangladeshi it is not known whether he lives in the city or the village
- Karim is a Bangladeshi (with no connotation of urban/rural residence)

**Experiment 2:** The word 'discount' has a notable impact on consumers purchasing decisions. There is seen discrepancy in the stated preference and actual preference when they are offered a discount on the item they are choosing to buy. A rational consumer should have consistency between what they stated and what they choose. Shampneir *etal.*<sup>7</sup>, said that, when two choices are given to a person, one of which is free or has a discount in price, he overreacts to the free product in such a way that zero price means not only low cost but also increases the valuation. With this, the discrepancy is seen between his choices. People's preference for good quality products is always high. But when they are given a choice between two similar products one with a lower or discounted price and the other with a relatively higher price, they always tend to lean towards the lower or the discounted price one. While making that decision, quality is not taken into consideration. Instead, the lower or the discounted price acts as a virtue in itself. Again when asked directly about quality, they choose the option with the higher price considering it

has a better quality. Their preference varies in terms of quality and price, which shows irrationality. This can be interpreted by Ariely and Kreisler's statement—"discounts, it seems are a potion for stupidity. They dumb down our decision-making process when an item is 'on sale'" -Dan Ariely and Jeff Kreisler<sup>14</sup>. Hence, it can be assumed that the respondents opt differently because they are blinded by the prospect of getting a lower price i.e. 'discount'.

The goal of the second experiment was to find whether people select discounted products even when they must forgo an option that 'they should find the preferable one'.

**Method:** The question had two different versions and each respondent got either one of the versions. In the first version, two burgers (having the same name and of similar size) were offered. One burger was offered at the original price of Taka 180. The other burger was offered at a discounted price of Taka 100. Respondents were asked to pick either one of the two burgers.

In the second version again, two burgers having the same name and of similar size were offered. But this time, one burger had a higher price than Taka 180 while the other one had a lower price than Taka 100 it was mentioned that both prices were original prices and no discount was given on any of them.

In addition to the choice of burger, all respondents were asked two further questions. The first one was whether in case of buying food, do they give more importance to its price or its quality. The second question had two statements and the respondents had to choose the one they believed. The statements were:

- Higher the quality of a product is, the more expensive it
- Price of a product does not reflect its quality

**Experiment 3:** The third study is based on sunk cost fallacy. According to this theory, people derive satisfaction not only from the value of the product but also by how the deal was made. As a result, it leads to biases and deviations from rationality. They fail to consider the opportunity cost properly and are vulnerable to sunk cost fallacy.

**Method:** Here a situation was given that the respondent had bought a ticket for a concert of their favourite band but could not attend it as he/she fell sick on the day of the concert. The respondents were asked to rate their level of unhappiness on this situation on a scale of 1-5 (where 1 = least unhappy, 5 = unhappiest). This question had 3 versions; in the first one,

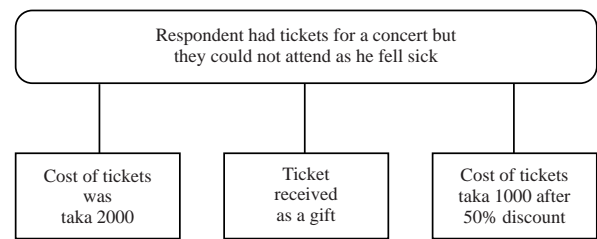


Fig. 2: Three versions of the experiment

it was mentioned that the respondents had bought the ticket worth Taka 2000 with their own money. In the second version, it was mentioned that the respondents received the ticket as a gift i.e., free of cost. And in the third version, the respondents got a ticket worth Taka 2000 with a 50% discount; that is, he had to spend Taka 1000 for the ticket. All the participants received a questionnaire that contained all of the three above-mentioned situations. The average was calculated for each of the versions and was compared with one another.

The expected rational answer is that in all three situations the rate of the respondent's unhappiness should be the same. This is because, people should not consider the opportunity cost of the money they spent on buying the ticket (which is a sunk cost), rather they should consider the opportunity cost of going to the concert. They already have forgone the cost as they chose to buy the ticket, now their main concern should be about the opportunity cost of attending the concert. As a rational agent (according to the strict assumptions of economics), their level of satisfaction should depend on what they can do by not going and if that other activity gives them more satisfaction or not comparing it with going to the concert. Their decision should not be influenced by how they managed their tickets. The question is illustrated in Fig. 2.

## RESULTS

**Experiment 1:** Being a city dweller, the probability of being a farmer is much less than being a librarian and the contrary if he is a villager. A rational answer, following Bayes's law<sup>b</sup>, would consider both the prior probabilities (based on the relative percentage of farmers and librarians) and current information (based on the description), leading to different estimates in the four different conditions as prior probabilities are different. For example: When Karim was a villager the rational answer should have been that Karim is a farmer. Again when he is a city dweller the rational answer should have been that Karim is a librarian (as the percentage of librarians in the city is higher relative to that of farmers). And in the other two

<sup>b</sup>Bayes' theorem describes the probability of an event to be true by incorporating or considering the prior probability distributions that are related to the event

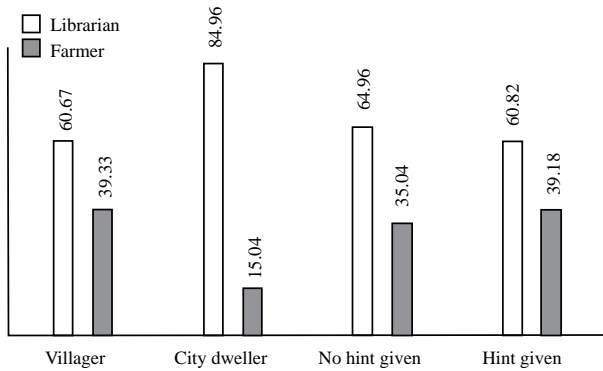


Fig. 3: Proportion of respondents choosing between the two professions in four different experiments conditions  
 Hint given: Karim is a Bangladeshi and the choice of urban rural residence may affect the type of his profession, No hint given: Karim is a Bangladeshi

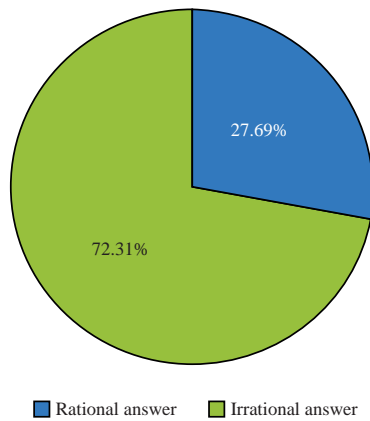


Fig. 4: Percentage of respondents giving rational and irrational answer

versions, the rational answer should have been that Karim is a farmer (as the percentage of farmers in Bangladesh is higher relative to that of librarians). But in all four versions, more than half of the respondents predicted Karim to be a librarian-based on his personality traits.

In violation of Bayes’s rule, the respondents in every condition gave the same probability judgments. The respondents were convinced that the description was more likely to match a librarian rather than a farmer because they evaluated it by the degree that the description is representative of the two stereotypes (farmer and librarian). That means, they overlooked the base rates.

Figure 3 illustrates the findings of experiment 1. It is seen that in the version where Karim was presented as a villager, 60.67% of the respondents answered that Karim was a librarian. And only 39.33% thought Karim was a farmer. Again, in the version where Karim’s locality was not mentioned, 64.96% thought Karim was a librarian. Similarly, when a hint was given that Karim’s locality may affect the type of his profession, 60.82% chose Karim as a librarian. But a huge change in the percentage was seen when Karim was described as a city dweller. 84.96% of the participants thought of Karim as a librarian.

Overall it was seen that only 27.69% of the respondents answered Karim as a farmer, which is considered as a rational answer in the three versions (except the version where he was a city dweller). The figures are shown in Fig. 4.

By introducing the information or hint about the habitat, it is seen that the percentages have changed from the version where no information of the habitat was given (version: No hint). This tells us that respondent’s decision was slightly influenced by the nudges given about the residence or location of the subject. But nudge was not strong enough to make them consider the base rates.

Further investigation was done to observe if responses vary according to variations in respondents’ socio-demographic backgrounds. This was done using a t-test-results of which are summarized in Table 2. First, the impact of respondents age on their responses were looked at. Respondents were accordingly grouped as the young ‘17-24 years’ and the experienced ‘25-55 years’. In the city

Table 2: Results of t-tests across gender and age groups

	City dweller version		Villager version		Hint given version		Number hint given version	
	Librarian	Farmer	Librarian	Farmer	Librarian	Farmer	Librarian	Farmer
<b>Across age groups</b>								
17-24 years	0.791	0.209	0.607	0.392	0.75	0.25	0.69	0.30
25-55 years	0.886	0.114	0.605	0.394	0.55	0.45	0.61	0.38
Difference in the mean values	0.095	0.095	0.002	0.002	0.199*	0.199*	0.08	0.08
<b>Across gender</b>								
Male	0.856	0.145	0.64	0.36	0.577	0.423	0.635	0.364
Female	0.843	0.157	0.564	0.436	0.644	0.356	0.673	0.327
Difference in the mean values	0.011	0.011	0.076	0.076	0.068	0.068	0.0377	0.0377

Statistical significance is shown by asterisk. \* Significant at 10%, \*\*Significant at 5%, \*\*\*Significant at 1%. The null hypothesis, Ho is that there are no differences on the mean values

dweller version, the mean value for age group '17-24 years' choosing librarian was 0.791 and that of age group '25-55 years' choosing the same was 0.886. That means 79.1% of young respondents and 88.6% of the experienced group of respondents chose Karim as a librarian. But no significant differences were found in responses over these two categories. However, when a nudge was provided stating that Karim's profession might depend on his area of residence, it was found that there was a significant difference (at a 10% level of significance) between the responses of the two age groups. It was seen that more respondents of the experienced group that is '25-55 years' group chose the rational answer (i.e., farmer). 45% of participants from the '25-55 years' group (mean value 0.45) and 25% from the '17-24 years' group chose Karim as a librarian.

When conducted the same analysis based on gender, no statistically significant difference in response for any of the versions presented were found.

**Experiment 2:** In response to the first question, respondents went for the burger with the lower price no matter which version of the question they faced. That is whether they were offered a burger at a discounted price or whether the burger was originally cheaper, respondents always opted for the cheaper option. Figure 5 it is seen that 85.82% chose the burger of Taka 100 when the discount was offered and 77.05% chose the burger of Taka 100 when no discount was offered i.e., when this was the original price. This shows in every situation, people tend to go for the product that is offered at lower prices in Fig. 5.

Further, for the question about giving importance to price or quality while buying food 83.27% responded that they give more importance to the quality of the food item more than its price. For the last question with the two statements, 60% chose the first statement that "The higher the quality of a product is, the more expensive it is". Results are shown in Fig. 6.

There are two possible caveats for inconsistency in consumer behaviour. First, when a respondent chooses quality over price while buying food and also chooses the burger worth Taka 100 and then believes the statement that the quality of a product is reflected in higher prices, he/she is contradicting him/herself. Second, if a respondent chooses price over quality while buying food and then chooses the burger worth Taka 180 then he/she also displays inconsistency irrespective of his choice of the last statement. It was found that 61.42% of the respondents revealed consistency in their choices (Fig. 7).

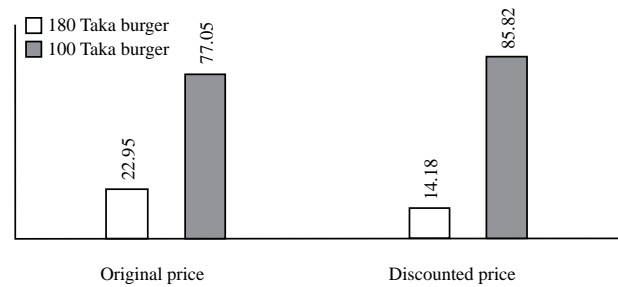


Fig. 5: Proportion of respondents choosing two different options of burgers in two different experiments conditions

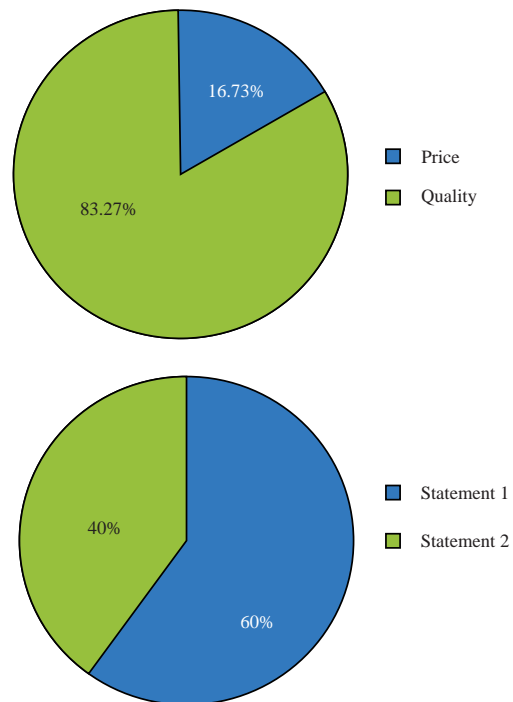


Fig. 6: Proportion of respondents choosing two different options

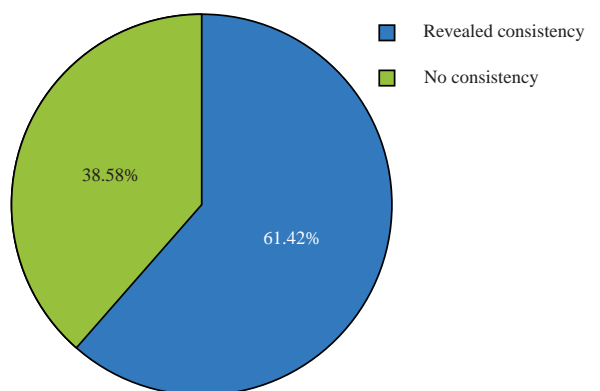


Fig. 7: Percentage of respondents showing consistency in their choices



Table 3: Results of t-tests across gender, age groups and income groups

	Version with a discounted price		Version where no discounted was given	
	Burger with price Taka 180	Burger with price Taka 100	Burger with price Taka 180	Burger with price Taka 100
<b>Across age groups</b>				
Below 25 years	0.08	0.92	0.218	0.782
25 years or more	0.18	0.82	0.238	0.762
Difference in the mean values	0.10	0.10	0.020	0.020
<b>Across gender</b>				
Male	0.108	0.892	0.235	0.765
Female	0.196	0.803	0.222	0.778
Difference in the mean values	0.088	0.087	0.013	0.013
<b>Across income groups</b>				
0-10,000	0.115	0.885	0.154	0.846
50,001 and above	0.208	0.792	0.242	0.757
Difference	0.093	0.093	0.088	0.088
30,000-50,000	4	0.6	0.267	0.733
50,100 and above	0.242	0.758	0.208	0.792
Difference	0.158	0.158	0.058	0.058
10,001-50,000	0.166	0.833	0.28	0.72
50,001 and above	0.208	0.791	0.242	0.757
Difference	0.041	0.042	0.037	0.037

Statistical significance is shown by asterisk. \*Significant at 10%, \*\*Significant at 5%, \*\*\*Significant at 1%. The null hypothesis, Ho is that there are no difference in the mean values

Table 4: Results of t-tests across gender, age groups and income groups

	Question with the two statements		Preferring price or quality while purchasing food	
	Price determines quality	No relation of price and quality	Price	Quality
<b>Across age groups</b>				
Below 25 years	0.515	0.484	0.230	0.769
25 years or more	0.676	0.323	0.102	0.897
Difference in the mean values	0.161**	0.161**	0.128***	0.128***
<b>Across gender</b>				
Male	0.628	0.372	0.220	0.779
Female	0.552	0.447	0.087	0.912
Difference in the mean values	0.075	0.075	0.133***	0.133***
<b>Across income groups</b>				
0-10,000 (91)	0.516	0.483	0.209	0.791
50,001 and above (57)	0.736	0.263	0.087	0.912
Difference	0.220***	0.220***	0.121**	0.121**
30,000-50,000 (25)	0.52	0.48	0.2	0.8
50,001 and above (57)	0.736	0.263	0.0877	0.912
Difference	0.216**	0.216**	0.112	0.112

Statistical significance is shown by asterisk. \*Significant at 10%, \*\*Significant at 5%, \*\*\*Significant at 1%. The null hypothesis, Ho is that there are no difference in the mean values, in case of across income groups, only the groups for which the test results come significant

Similar to the first study, again we conducted further analysis to observe for behaviour change based on socio-demographic characteristics of respondents. The analysis was conducted based on gender, age and income results of which are presented in Table 3 and 4.

Table 3 represents the t-test results for the first question of experiment 2, that is whether the respondent will purchase the higher-priced burger or the lower-priced one. These tests were done across age, gender and income groups. In the version 'with a discounted price,' the mean of age group '17-24 years' for the burger of Taka 180 was 0.08 and that for

the burger of Taka 100 was 0.92. That is 92% of respondents in this group opted for the burger of Taka 100, which is the lower-priced one. Again, for the age group, '25-55 years' these values are 0.18 and 0.82, respectively. That is 82% of respondents in this group opted for the burger of Taka 100, which is the lower-priced one. Though a little difference can be seen in the percentages between the two age groups but this difference was not statistically significant.

Likewise, in the version 'no discount was given' the mean of gender group 'male for the burger of Taka 180 was 0.235 and that for the burger of Taka 100 was 0.765. That is 76.5% of

the male respondents opted for the burger of Taka 100, which is the lower-priced one. Again, for the age group 'Female', these values are 0.222 and 0.778, respectively. That is 77.8% of the female respondents opted for the burger of Taka 100, which is the lower-priced one. Again, there was no statistical significance between the differences in the percentage values. Similar results were found across income groups. That means, for this question, there was found no statistically significant differences in the responses of the respondents coming from different socio-demographic backgrounds.

Table 4 contains the t-test results for the second and third questions of experiment 2. The questions were:

- Whether the respondents believe that the product with a better quality has a higher price or not, i.e., whether price determines the quality or not
- Whether they give more priority to price or quality while buying food items

When investigating whether the better quality is reflected in higher prices across age groups, it was found that there is a significant difference (at a 5% significance level) between the responses of the two age groups. For the statement that price determines quality it was seen the mean value of the participants of age group '25-55 years' was 0.676 and that of age group '17-24 years' the mean was 0.515. That means 67.6% of the respondents in the age group '25-55 years' believes that price determines quality. Significant differences (at a 1% significance level) were also found across income groups for the same question. In the case of the participants of income, 'Taka 50,000 or more the mean value was 0.736 and that of the participants of income group 'Taka 0-10,000' the mean was 0.516. That is 73.6% of the participants in the income group 'Taka 50,000 or more' believes that price determines quality.

For the question regarding whether respondents give a higher priority to price or quality when purchasing food, again similar statistically significant differences were observed among different socio-demographic groups. In case of giving priority to quality, the mean value for the age group '17-24 years' was 0.769 and that of the age group '25-55 years' was 0.897. That means 89.7% of the respondents from the older age group prioritizes quality compared to price. In the same way, 77.9% of the male respondents (mean value 0.779) and 91.2% of female respondents (mean value 0.912) prioritizes quality over price. Likewise, 79.1% of the respondents in the income group 'Taka 0-10,000' (mean value 0.791) and 91.2% of respondents of the income group 'Taka 50,000 and above' (mean value 0.912) prioritizes quality over price.

So it can be concluded that relatively older adults and people in the higher income group were seen to give more importance to quality over price. And females were found to have more tendency of giving importance to quality than males do in case of buying food items. Interestingly, here significant difference (at a 1% significance level) was observed across gender differences.

**Experiment 3:** The results of experiment 3 are described in Table 5. It contains the average values of the rate of the unhappiness of the respondents under different circumstances. It was seen that the rate of the unhappiness of the respondent's for not being able to attend the concert varied with the way they acquired the ticket. According to the average values, when they acquire the ticket free of cost their average level of unhappiness of 2.70 when they get a 50% discount on the tickets, their average level of unhappiness increases to 3.36 and lastly when they spend a total of Taka 2000 their level of unhappiness is the highest which is 4.20. So, people are unhappiest when they spend Taka 2000 or the actual price of the ticket and they are least unhappy when they get the ticket for free.

People are considering the opportunity cost of the money they spent for buying the ticket, not the opportunity cost of going to the concert. They already have forgone the cost as they chose to buy the ticket, now their main concern should be about the opportunity cost of attending the concert. As a rational agent, their level of satisfaction should depend on what they can do by not going to the concert and if that other activity gives them more satisfaction or not compared to going to a concert. Their decision should not be influenced by how they managed their tickets. So the person's level of

Table 5: Average values of the ratings

Versions	Free cost	Taka 1000 was paid (after a 50% discount)	Taka 2000 was spent
Average values	2.70	3.36	4.20

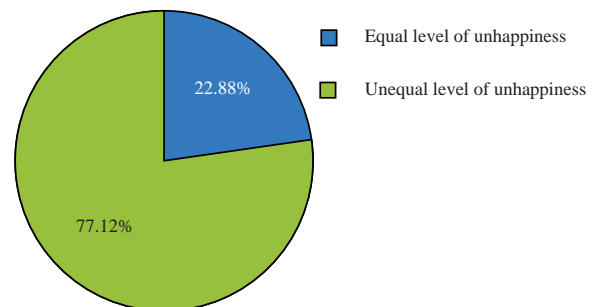


Fig. 8: Percentage of respondents giving equal and unequal level of unhappiness

Table 6: Results of t-tests across gender, age groups and income groups

	Tickets price is 2000	After 50% discount	Free of cost
<b>Across age groups</b>			
Below 17-24 years	4.23	3.47	2.76
25-55 years or more	4.18	3.27	2.64
Difference in the mean values	0.049	0.20*	0.12
<b>Across gender</b>			
Male (249)	4.12	3.319	2.703
Female (188)	4.31	3.404	2.686
Difference in the mean values	0.188*	0.086	0.017
<b>Across income groups</b>			
Taka 0-10,000	4.022	3.766	3.165
Taka 50,001 and above	3.474	3.070	2.614
Difference	0.542**	0.696***	0.551**
Taka 30,000-50,000	3.92	3.84	3.16
Taka 50,001 and above	3.473	3.070	2.613
Difference	0.446	0.77***	0.546*
Taka 10,001-50,000	4.122	3.898	3.285
Taka 50,001 and above	3.474	3.070	2.614
Difference	0.649***	0.828***	0.672***

Statistical significance is shown by asterisk. \*Significant at 10%, \*\*Significant at 5%, \*\*\*Significant at 1%. The null hypothesis,  $H_0$  is that there are no difference in the mean values, in case of across income groups, only the groups for which the test results come significant

unhappiness should have been the same for all of the three circumstances. But only 22.88% of the respondents gave answers which are considered rational according to the rationality assumptions that are these respondents were equally unhappy in all three conditions (Fig. 8).

T-tests were performed to observe whether there were any differences in the responses of the people having different demographic backgrounds. The results are presented in Table 6. According to the t-test results, it was seen that there is a huge impact of income in the ratings as there were observed significant differences in the rating of the participants of different income groups. In the case of the situation where the respondents bought the ticket spending Taka 2000, the mean value of the level of the unhappiness of a respondent from the income group 'Taka 0-10,000' was 4.022 and that from the income group 'Taka 50,001 and above' was 3.474. Again, in the case of the situation where the respondents bought the ticket spending Taka 1000, the mean value of the level of the unhappiness of a respondent from the income group 'Taka 30,000-50,000' was 3.84 and that from the income group 'Taka 50,001 and above' was 3.070. That is respondents under all three circumstances the higher income groups were observed to be less affected by the sunk cost. Similar results were seen when comparison was done between other income groups.

The tests were also performed to see if there were any significant differences of respondents from different age groups and across gender. In the case of the situation when a 50% discount was given on the tickets, a difference was seen at a 10% significance level between the responses of the participants of the two age groups. Again, when the

participants had to buy the ticket with the full amount that is Taka 2000, there was seen a difference was seen at a 10% significance level between the responses of the male and female participants.

## DISCUSSION

The paper wanted to show that people do not always behave as per the basic assumptions of rational choice theory. Their behaviour may deviate from those axioms and either heuristics or mental accounting or the sunk cost fallacy can explain the deviation.

From the results of experiment 1, it can be concluded that people's choices are influenced by representativeness and availability bias, whereas rational persons would consider base rates. When asked about Karim's profession, only 27.69% of the respondents chose him as a farmer. The experiment thus demonstrates that people often make decisions based on information immediately available to them rather than relying on rational calculations. Evidence of similar behaviour can be seen in other contexts in literature. For example, in Islam<sup>3</sup> it is seen that psychological factors play a dominant role when the investors in the Dhaka Stock Market make investment decisions. Based on representativeness bias they take their next investment decision.

It was also observed from experiment 1 that information about location influences their decisions slightly but this nudge was not strong enough to influence them to consider the base rates. Therefore, how and when the problem is presented to an individual also influences his/her decision making. Even though this result is not strongly established in

our experiment, we find evidence of this behaviour in the literature. For example, in Lee *et al.*<sup>5</sup> we find information influences preferences more when presented to agents before consumption than after it.

It was observed from the findings of experiment 2 that there is a mismatch between stated preference and revealed preference. It is almost a foregone conclusion that people make serious consideration about quality when buying things. But in reality, discounts and drastically low prices dominate preferences. That is, we found that despite believing that higher prices reveal better quality and despite stating that quality is preferred to prices, there is still evidence that customers opt for lower-priced options when buying food. This can be interpreted by Ariely and Kreisler's assumptions. "Discounts, it seems are a potion for stupidity. They dumb down our decision-making process when an item is 'on sale'" - Dan Ariely and Jeff Kreisler<sup>14</sup>. Hence, it can be assumed that the respondents opt differently because they are blinded by the prospect of getting a lower price i.e., 'discount'.

Females, relatively older adults and people in the higher income group were found to be more concerned about the quality while purchasing food items. That the perception that higher prices are representative of higher quality can be found in many instances in the literature. For example, Shiv *et al.*<sup>9</sup> conclude that consumers perceive prices as a representation of product quality. Likewise, while examining the relationship between price and quality, Verma *et al.*<sup>10</sup> found that for all durable, semi-durable and non-durable goods dropping the price too low sends a signal to the consumer that the quality of the product is not satisfactory. Keeping the price reasonably high gives a high-quality image for the product.

Results of experiment 3 showed that people are affected by sunk cost fallacy. The opportunity cost for going to the concert should not depend on how the ticket was obtained if people are rational. But humans try to justify the opportunity cost of means as much as the ends. Only 22.88% of the participants revealed that they will be equally unhappy if they would not be able to attend the concert despite the amount they had already spent on the tickets. The other 77.12% of the respondent's responses were influenced by the amount of money they had already spent on the tickets. This point is also confirmed in another study in the literature. Shampaneir *et al.*<sup>7</sup> proved that consumers also consider the higher benefits of free products along with calculating the cost and benefit. People behave in such a way that zero pricing not only reduces the cost but adds more utility to the product. We see in our experiment that when the ticket was free of cost, missing the concert made the respondents less unhappy compared to the situations where they had to pay for the tickets.

Bruin *et al.*<sup>15</sup> found that the older adults were less vulnerable to the effect of sunk cost in their daily life compared to younger adults. That means older adults can make more rational decisions ignoring the past irrecoverable costs and failing commitments. In our paper, we found deviations insensitivity to sunk cost based on income. We found that higher income groups were less sensitive to the sunk cost than their lower counterparts were.

Some discourse in literature argues that adherence to the sunk cost may not necessary deem an agent as irrational. For example, Ryan Doody<sup>16</sup> in his research work titled "The Sunk Cost 'Fallacy' is not a Fallacy" argued that it is quite obvious and not irrational to make choices considering the unrecoverable past investments. As stated by him, it is reasonable to honour the sunk cost which helps a person to maintain plausible deniability about the fact that he had suffered from diachronic misfortune. Similarly, according to Walton<sup>17</sup>, making choices based on previous irretrievable spending can sometimes be termed as rational pre-commitment strategy and practical reasoning can be established to identify which sunk cost arguments can be labelled fallacious and which cannot be.

From an aggregated overview of the three experiments together, we identify an interesting observation. We find that people's behaviour tends to be relatively more rational when they are faced with a situation where they are about to make a financial commitment when compared to a situation where the commitment has already been made. For instance, in the three experiments we conducted, experiment 2 involved a situation where people require to make a financial commitment, whereas experiment 3 depicted a situation where the financial commitment has already been made and how agents will respond to a change of their plan. In our analysis we found responses to be comparatively more rational in experiment 2 than in experiment 3.

Survey of the paper was conducted during the prevalence of COVID-19 Pandemic for which all survey was conducted using Google Forms. This limited the survey to urban dwellers only. For the same reason, the sample size of the survey is limited to 437 only. Perhaps with a larger more representative sample, more significant results would emerge when comparing across different socio-demographic groups.

## **CONCLUSION**

Behavioural economics shows that people often behave in ways that are inconsistent with assumptions of rationality and that these deviations occur in critical situations. People do not always calculate the cost-benefit correctly when making

decisions. Their decisions are influenced by the context and the way it is presented. As a result, their choices either vary or are not optimal in the long run. At the time of decision making, their utility is maximized by the choices they make which may not be a rational choice in the future or a statistically correct answer. But they are satisfied with the preferences that they chose.

So, the above studies and their results show that we cannot idealize people's dimension of rationality. Everyone makes their choices optimizing things that might not be considered as "textbook approach". With predictable deviations from textbook rationality, we should strive to look for better models to explain how humans make economic decisions, rather than continuing with an approach that is fast becoming alien to the human psyche.

### **SIGNIFICANCE STATEMENT**

The paper analyses human behaviour under different circumstances. It highlights that some responses of individuals do not always match with the definition of 'rational agent'. Although similar works have been done in developed countries, such studies are absent in the context of developing countries such as Bangladesh. Adding the perspective of the developing country will surely add to the robustness of this discourse in behavioural economics.

### **REFERENCES**

1. Mathis, K. and A.D. Steffen, 2015. From Rational Choice to Behavioural Economics. In: *European Perspectives on Behavioural Law and Economics*. Mathis, K. (Ed.), Springer, ISBN: 978-3-319-11634-1, pp: 31-48.
2. Kahneman, D., 2011. *Thinking Fast and Slow*. Farrar, Straus and Giroux, United States, ISBN: 9780374533557, Pages: 512.
3. Islam, S., 2012. Behavioral finance of an inefficient market. *Global J. Manage. Bus.*, 12: 74-95.
4. AlKhars, M., N. Evangelopoulos, R. Pavur and S. Kulkarni, 2019. Cognitive biases resulting from the representativeness heuristic in operations management: an experimental investigation. *Psychol. Res. Behav. Manage.*, 12: 263-276.
5. Lee, L., S. Frederick and D. Ariely, 2006. Try it, you'll like it: The influence of expectation, consumption and revelation on preferences for beer. *Psychol. Sci.*, 17: 1054-1058.
6. Thaler, R.H., 2015. *Misbehaving: The Making of Behavioral Economics*. W.W. Norton and Company, United States, ISBN: 978-0-393-08094-0, Pages: 432.
7. Shampanier, K., N. Mazar and D. Ariely, 2007. Zero as a special price: The true value of free products. *Marketing Sci.*, 26: 742-757.
8. Ariely, D., U. Gneezy and E. Haruvy, 2018. Social norms and the price of zero. *J. Consumer Psychol.*, 28: 180-191.
9. Shiv, B., Z. Carmon and D. Ariely, 2005. Placebo Effects of Marketing Actions: Consumers may get what they pay for. *J. Marketing Res.*, 42: 383-393.
10. Verma, D.P.S. and S.S. Gupta, 2004. Does higher price signal better quality? *Vikalpa J. Decis. Makers*, 29: 67-78.
11. Olivola, C.Y., 2018. The interpersonal sunk-cost effect. *Psychol. Sci.*, 29: 1072-1083.
12. Ariely, D., 2008. *Predictably Irrational*. HarperCollins, Hauppauge, New York, United States, ISBN: 9780061353239, Pages: 304.
13. Levy, J.S., 2002. Daniel Kahneman: Judgment, decision and rationality. *Political Sci. Politics*, 35: 271-273.
14. Ariely, D. and J. Kreisler, 2017. *Dollars and Sense: How We Misthink Money and How to Spend Smarter*. HarperCollins, United States, Pages: 288.
15. de Bruin, W.B., J. Strough and A.M. Parker, 2014. Getting older isn't all that bad: Better decisions and coping when facing "sunk costs". *Psychol. Aging*, 29: 642-647.
16. Doody, R., 2019. The sunk cost fallacy is not a fallacy. *Ergo Open Access J. Philosophy*, 6: 1153-1190.
17. Walton, D., 2002. The sunk cost fallacy or argument from waste. *Argumentation*, 16: 473-503.