

# Cognitive Bias Sunk Cost in Marketing

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## Abstracts

The sunk cost cognitive bias, or sunk cost fallacy, is a human tendency to continue with: an investment, make a decision, business, couple or project based on the resources that have been invested, instead of making a current evaluation of the results. future benefits and costs. The objective of the research was to analyze the impact of sunk cost cognitive bias on customer decisions and its application in neuromarketing strategies. The specific objectives were: (i) Evaluate how sunk cost influences the perception of the value of products or services. (ii) Identify marketing strategies that exploit the sunk cost bias. (iii) Propose strategies to apply the sunk cost bias in marketing. The results show that the sunk cost bias significantly influences the perception of the value of products and services, affecting purchasing decisions, depending on the educational level, gender, and income level that influence the continuity in the use of products and services. due to previous investment of time or money; When purchasing expensive items customers feel obligated to continue using paid more even if it is not useful and used in full. The continuity in prepaid subscriptions, the perception of discounts for large quantities as a way to make better use of money, the probability of participating in loyalty programs for the accumulated rewards, the preference for payments and flexible cancellation, create a valuable perception of products they have previously invested in, the preference for repairing expensive items, and the perception of loss from a previous investment. It is concluded that the sunk cost cognitive bias significantly influences the decisions and behavior of a vast majority of customers, and how companies can use this information to design effective marketing campaigns.

**Keywords:** cognitive biases, marketing strategies, purchasing behaviors, purchasing decisions.

## Introduction

In marketing, one of the questions that arises is to understand how consumers make decisions. There are times when our mind perceives reality incorrectly, and decisions are not objective, but subjective, being influenced either by: own experience, culture, beliefs, by the information we have at the time of making a decision, among others. factors that build a particular vision of

things, facts or events. One of the most relevant cognitive biases in this field is the sunk cost bias. Cognitive biases affect the rationality of decisions, in this study, a particular bias will be analyzed, which is called sunk cost, which is erroneous thinking, in which it makes people think that they should continue investing in previously made decisions, Even when these are not beneficial at this time.

Biases have the tendency to cloud, to not see things or situations well, therefore they affect our judgment, in this way prejudices are formed that distort our perceptions, and prevent us from seeking alternatives and possible options. Therefore, they affect the way we process information, and as a consequence we make decisions with biased thinking. For this reason, the importance of this article that analyzes how the sunk cost bias influences customer behavior, and how this knowledge can be applied in the development of neuromarketing strategies.

El objetivo de la investigación fue analizar el impacto del sesgo cognitivo costo hundido en las decisiones de los clientes y su aplicación en estrategias de neuromarketing. Los objetivos específicos fueron: (i) Evaluar cómo el costo hundido influye en la percepción del valor de los productos o servicios. (ii) Identificar estrategias de marketing que exploten el sesgo del costo hundido. (iii) Proponer estrategias con la aplicación del sesgo costo hundido al neuromarketing. De esta manera surge la interrogante a resolver ¿cómo impacta el sesgo cognitivo costo hundido en las decisiones de los clientes? y ¿cómo aplicar el sesgo costo hundido las estrategias de neuromarketing?

Definition of sunk cost bias: sunk cost bias is (Arkes & Blumer, 1985) the tendency to think and make decisions to continue with an investment, based on previous costs and investments, instead of evaluating the current situation, withdrawing on time, avoid incurring more expenses and generate a new investment for future success. This fallacy leads to erroneous, non-optimal decisions without economic, social and even personal rationality.

Impact on behavior: Sunk cost bias can manifest itself in various ways, forms in customer behavior. For example, (Thaler, 1980) customers want to remain subscribed to a service that they do not use, simply because they have paid for it in the past. This behavior is driven by the desire not to waste the previous investment, even when continuing this service offers no additional benefits.

Examples in marketing.

1. Memberships and subscriptions: Companies that offer annual memberships or subscriptions to services use the sunk cost bias to retain their customers. (Gourville & Soman, 1998) by paying in advance, customers are less likely to cancel a service, even if they do not use it frequently.

2. Loyalty programs: loyalty programs, such as: reward points, bonuses, discount quotas, among others. (Kivetz & Simonson, 2002) loyalty programs increase the sunk cost bias by making customers feel that they must continue purchasing to take advantage of accumulated rewards, points, miles, among others.

Neuromarketing strategies with the application of sunk cost.

Neuromarketing strategies are designed to take advantage of the benefits of the sunk cost bias, and in this way influence customers' decision making. Some of these strategies include:

1. Design irresistible offers: offer products or services at low initial prices to encourage an initial investment; once the customer has invested, they are more likely to continue purchasing additional products, with the sunk cost effect (Prelec & Loewenstein, 1998).
2. Long-term value communication: highlighting the long-term benefits of a product or service, so that customers justify their previous investments and continue using the product for longer (Soman, 2001).
3. Using psychological anchors: Create a perception of value by setting high reference prices and then offering discounts on your accessories. This technique makes the initial investment appear more valuable and reduces the probability that customers will abandon the product and continue purchasing (Tversky & Kahneman, 1974).

### **Methodology.**

In the present investigation of the cognitive bias of sunk cost and how it can be applied in neuromarketing strategies, a methodology was designed that combines various techniques and approaches. The research approach is mixed, the design was in two phases: an exploratory qualitative phase and a confirmatory quantitative phase.

The qualitative, in-depth, semi-structured interviews with marketing experts and customers were used to explore their perceptions and experiences related to sunk cost. The sample: 5-10 marketing experts and 20-30 clients with a thematic analysis to identify behavioral patterns and recurring themes in the responses. It was applied to focus groups, with clients to discuss how they perceive and respond to marketing strategies with the implementation of the sunk cost bias. The sample: 2-4 focus groups with 8-10 participants each. To later carry out an analysis of the content of the discussions that will be transcribed and the content of the responses analyzed.

The quantitative, evaluates how the sunk cost influences the perception of value of products or services. Through surveys, structured design to quantify the influence of sunk cost bias on purchasing decisions and evaluate the effectiveness of different marketing strategies.

The sample was 396 clients selected through stratified random sampling. The instrument was a questionnaire with closed questions on Likert scales to measure attitudes, perceptions and behaviours related to sunk cost. To subsequently perform a descriptive statistical analysis and inference, to identify correlations and significant differences.

Field Experiments: controlled experiments were conducted in real purchasing scenarios to observe customer behavior when faced with decisions influenced by sunk cost.

Experimental design: pre-post design with control and experimental groups.

Sample: 10-20 participants per experimental group.

Measurements: purchase rates, decision time, post-purchase satisfaction.

Analysis: comparison of means and analysis of variance to evaluate the impact of the interventions.

Measurement Instruments: questionnaires and scales, specific questionnaires were developed to measure the perception of sunk cost and its impact on purchasing decisions. The analysis software, for qualitative analysis (such as NVivo) and quantitative analysis (such as SPSS) to process and analyze the collected data.

Ethical procedure: it was with informed consent from all participants before their inclusion in the study. The confidentiality and anonymity of the data collected is guaranteed.

Data Analysis: Qualitative using data coding and thematic analysis to identify patterns and behaviors; quantitative through descriptive statistics, correlation analysis, regression and comparison of means to evaluate the study hypotheses.

Limitations of the study: there may be a response bias in the responses to the questionnaire. When generalizing the results, there may be limitations in the generalization of the results due to the size and composition of the sample.

Practical implications: For marketers, they allow them to develop effective strategies to incorporate the sunk cost bias in an ethical manner, and for consumers, to be aware of how the sunk cost bias can influence their decisions.

This methodological approach allowed for a comprehensive and multifaceted exploration of sunk cost bias, providing valid and useful data for application in the field of neuromarketing.

**Results.**

Below are the results of the structured survey on sunk cost bias in purchasing decisions. The goal of the survey is to understand how sunk cost influences your purchasing decisions and perception of the value of products and services.

Demographics.

Table 1. Age.

1. Age.	Total	%
18-24 ages.	27	7
25-34 ages.	45	11
35-44 ages.	68	17
45-54 ages.	87	22
55-64 ages.	71	18
65 ages or more.	98	25
Total	396	100

Analysis and interpretation.

The table shows the distribution of respondents according to their age group. The age distribution shows a balanced representation of different age groups, although some groups are more represented than others.

Age groups represented: 65 years and older, 98 respondents (25%); 45-54 years old, 87 respondents (22%); 55-64 years old, 71 respondents (18%). These three groups make up 65% of the total number of respondents, which indicates a greater representation of middle-aged and elderly people. The least represented age groups: 18-24 years, 27 respondents (7%); 25-34 years old, 45 respondents (11%). The two youngest groups represent 18% of the total, which suggests a lower participation of young people in the survey. Intermediate age group: 35-44 years, 68 respondents (17%). This group represents a significant part of the sample, but its percentage is not as high in relation to the middle and elderly groups.

Representation of those over 45 years of age represent 65% of the total number of respondents, which reflects a trend in the sample towards older participants, which may influence the overall results of the survey. Representation of those under 35 years of age, representing 18% of the total number of respondents. The lower representation of this age group limits the generalization of the results to younger populations. This information allows us to design neuromarketing strategies with the characteristics and preferences of these age groups. It is also important to consider the lower representation of younger groups to adjust advertising campaigns to reach a more diverse and balanced audience.

Table 2. Gender.

Gender	Total	%
Male	198	50
Female	198	50
Total	396	100

#### Analysis and interpretation.

Table 2 shows the distribution of respondents according to their gender, there is equality in representation, it is equitable between genders, 50% men and 50% women. This equality in the number of surveys by gender ensures that the opinions and behaviors of both genders are equitable, with a balance of perspectives between the perceptions, behaviors, decisions and perceptions of value of men and women. This balance is ideal for analyzing gender differences without the results being biased by a greater representation of one gender over another, which facilitates the development of neuromarketing strategies that are inclusive and effective for both genders.

Table 3. Education Level.

Education Level.	Total	%
Secondary.	71	18
Technical and Technology.	87	22
Undergraduate.	162	41
Postgraduate.	75	19
Total	396	100

#### Analysis and interpretation.

Table 3 shows the distribution of respondents according to their level of education. The highest percentage in educational groups is found in: undergraduate: 162 respondents (41%) is the highest percentage, which represents almost half of the sample. Technical and Technology: 87 respondents (22%) which is the second highest percentage; and finally, the groups with the lowest percentage in the level of education are: secondary: 71 respondents (18%) and postgraduate: 75 respondents (19%).

The results show that marketing strategies must be designed for the different needs and preferences of each educational level. Marketing content must be adapted to the educational level; it is possible that the educational level influences the perception of sunk cost and the way individuals make financial decisions. This information is used for subsequent studies to determine if there is a correlation between the educational level and the possibility of sunk cost bias that allows comparing different educational levels as they perceive products and services, where it can be determined if customers with more education are more critical. and less influenced by sunk cost, or determine if the level of education changes behavioral patterns, purchase frequency and continuity in the use of services/products.

Table 4. Monthly Income (approximate).

Monthly income.	Total	%
Less than \$ 500	40	10
\$ 500-\$ 1000	95	24
\$ 1000-\$ 2000	139	35
\$ 2000-\$ 3000	71	18
More of \$ 3000	51	13
Total	396	100

Analysis and interpretation.

Table 4 shows the distribution of respondents according to their monthly income. The highest percentage of monthly income is: \$500 to more than \$2,000: 234 respondents (59%), which is the highest percentage, represents more than half of the sample; from \$2000 to more than \$3000: 122 respondents (31%) which is the second group; and finally, the lowest percentage income range is: less than \$500: 40 respondents (10%).

The results show that marketing strategies must be designed for the different needs and preferences of each income level, in the same way that marketing content must be adapted to the income level. Income level can influence the perception of sunk cost and how customers make financial decisions. This information is used for subsequent studies to determine if there is a correlation between the educational level and the possibility of sunk cost bias that allows comparing different educational levels as they perceive products and services, where it can be determined if customers with more education are more critical. and less influenced by sunk cost, or determine if the level of education changes behavioral patterns, purchase frequency and continuity in the use of services/products.

Table 5. How many times have you continued using a product or service, because you consider that you have invested time or money in it?

Indicator 1: purchasing behavior and value perception.		
Continuity in the use of products/services due to previous investment.	Total	%

Never.	55	14
Rarely.	103	26
Sometimes.	127	32
Frequently.	111	28
Total	396	100

Analysis and interpretation.

Table 5 shows how respondents respond to the question about continuing to use products or services due to prior investment of time or money. Continuity levels: frequently (28%) and sometimes (32%) amount to 60% of respondents, indicating that a significant majority continue to use products or services because they consider they have a prior investment, at least sometimes. The levels under continuity: rarely (26%) and never (14%) add up to 40% of those surveyed, showing that a considerable minority is not strongly influenced by products or services that they have considered as a previous investment, even so, this percentage continues being a significant portion.

60% of respondents indicate that prior investment of time or money influences their decision to continue using certain products or services. This highlights the prevalence of sunk cost bias in purchasing decisions, where customers feel the need to continue using, paying for, and purchasing something because they believe they have invested in it. The least influenced groups: 40% rarely or never use products or services due to a prior investment, are critical or rational customers, less influenced by the sunk cost bias.

In this way, the importance of developing retention strategies for people who continue using products/services, because they consider that they have previously invested (60%), companies design strategies that reinforce this investment, such as: loyalty programs, renewal discounts , and cumulative benefits.

Customer Education, 40% Rarely if ever, it is important to educate about the ongoing value and benefits of the product or service. Create content that demonstrates the return on investment to convert these customers into loyal customers. Develop marketing campaigns for this group who are less influenced, and for the more influenced group, emphasize past investments and ongoing benefits.

Table 6. Have you ever purchased an item or accessory, at full price or more expensively, because you thought it would make better use of the investment you made previously (for example, accessories for a device you already have)?

Indicator 1: purchasing behavior and value perception.		
Purchase of expensive items/accessories due to prior investment.	Total	%
Yeah	249	63
No	147	37
Total	396	100

Analysis and interpretation.

Table 6 shows how respondents respond to the question, they have a high incidence of purchasing influenced by a previous investment: 63% of respondents indicate that they have

purchased items at normal or more expensive prices to take advantage of a previous investment. That is, a high majority of customers are influenced by the sunk cost bias. The uninfluenced minority of 37% of respondents indicate that they have not made this type of purchases.

The sunk cost bias is evident, with 63% of respondents making additional purchasing decisions to maximize their previous investments. This reinforces the idea that customers tend to continue investing in products or services to justify a previous expense made.

There is rationality in purchasing decisions, in the 37% who do not buy additional items/accessories to take advantage of previous investments, their purchasing decisions are rational, based on the market price and functionality in their purchases instead of buying to think and relate to past investments. Based on the results, marketing strategies should focus on the design and development of new products and accessories that are complementary and improve the use of previous purchases.

Promote products as improvements, add-ons and extensions necessary to attract customers influenced by sunk cost bias. Implement cross-selling strategies, and carry out targeted marketing campaigns, to complete, improve the products in which they previously invested, with messages that highlight the optimization of value in their previous purchases, to maximize the value of previous investments and offer discounts on accessories for the purchase of a primary device; For example, a deodorant that you bought for the first time, now you only have to recharge the product, because you already made a previous investment in the rechargeable device.

Table 7. Rate the following statement: “I feel that I should continue to have something, for which I have paid, even if it is not useful to me at the moment.”

Indicator 1: purchasing behavior and value perception.		
Feeling of obligation to continue using something paid for.	Total	%
Strongly disagree	20	5
In disagreement	59	15
Neutral.	119	30
In agree.	139	35
Strongly agree	59	15
Total	396	100

Analysis and interpretation.

Table 7 shows how respondents rate the statement, with the majority of respondents (50%) agreeing or strongly agreeing with the statement, with a strong influence of sunk cost bias on their perceptions. 30% of respondents are neutral; and a minority (20%) disagree or strongly disagree, showing less influence of the sunk cost bias.

The 50% of respondents who agree, and strongly agree, show that the sunk cost bias is a strong influence on their decisions, which leads them to continue using or maintaining non-useful products and services simply because they have invested money in them. The neutral 30% may be undecided or less affected by bias, although they do not necessarily reject. The 20% disagree reflects a group of customers who are likely to make rational decisions, based on the current usefulness of the product or service.



The results involve developing retention strategies, for customers who feel obligated to continue using something they have previously paid for, companies can develop strategies that reinforce this feeling, with loyalty programs, new product updates and maintenance services to maintain to these committed clients.

The continued value of products and services in marketing campaigns for the 50% group should be highlighted. Emphasize how a product remains useful over time, to increase the perception of value and justify the previous investment. While the 20% who disagree, information should be generated about when it is rational to get rid of non-useful products, and invest in new ones with subsequent benefits. Include educational content on financial management and rational decision making, where durability, functionality and avoiding discarding products are discussed.

Table 8. How often do you continue to subscribe to a service (such as a gym or a streaming platform) because you have paid for a membership, even if you don't use it regularly?

Indicator 1: purchasing behavior and value perception.		
Continuity in subscription by prior payment:	Total	%
Never.	0	0
Rarely.	59	15
Sometimes.	119	30
Frequently.	166	42
Very frequently.	51	13
Total	396	100

Analysis and interpretation.

Table 8 shows how respondents respond, high levels of continuity are; frequently (42%) and very frequently (13%) make up a total of 55% of those surveyed. This indicates that more than half of respondents continue to subscribe to services due to pre-paying for a membership, despite not using it regularly. Sometimes (30%) shows that a significant proportion of respondents also feel this influence, although less consistently.

Low continuity levels are: Rarely (15%) indicate that a sizeable minority are not as affected by sunk cost in their subscription continuation decisions. Never (0%) indicates that all respondents have at least once experienced the influence of prepayment on subscription continuity.

The absence of “never” responses in relation to the high frequency of “frequently and very frequently” responses highlights the prevalence of the sunk cost bias, which leads customers to maintain subscriptions to justify a prior investment, even if the use regular consumption, does not occur; for example, subscriptions on Amazon. There is rationality and subscription decisions; the 15% that rarely maintain prepaid subscriptions show greater rationality in decision-making regarding unused subscriptions.

Depending on the results obtained, retention strategies can be carried out, with programs that reinforce the justification of the previous payment, such as additional benefits for continuity or reminders of use to increase the perceived value of the products or services. Generate exclusive offers for old customers, and incentives to renew the subscription. Marketing campaigns should emphasize the ongoing and exclusive benefits that subscribers will obtain, highlighting the

additional value that justifies the sunk cost, with messages that highlight the exclusivity and advantages of maintaining the subscription.

Indicator 2. - Evaluation of marketing strategies.

Table 9. Rate the following statement: “The promotions that offer discounts for buying in large quantities, I feel that I am getting the most out of my money.”

Indicador 2: evaluación de estrategias de marketing.		
Descuentos por grandes cantidades percibidos como aprovechamiento o inversión.	Total	%
Strongly disagree	20	5
In disagreement	32	8
Neutral.	87	22
In agree.	182	46
Strongly agree	75	19
Total	396	100

Analysis and interpretation.

Table 9 shows how respondents rate the statement: the general trend is that the majority of respondents (65%) agree or strongly agree with the statement, indicating that they perceive discounts for buying in large quantities as a form of make better use of your money. 22% of respondents are neutral, showing an indifferent attitude towards the statement; and a minority (13%) disagree or strongly disagree, showing a lower perception of value in large quantity promotions.

There is a positive perception of discounts for purchasing large quantities; a high percentage of agree and strongly agree responses suggests that promotions for purchasing in large quantities are effective for the vast majority of customers. This behavior can be explained by the desire to maximize the value of purchases and minimize the unit cost. Regarding neutrality and disagreement: 22% neutral are undecided or less affected by these promotions due to personal or economic factors that limit their ability to purchase in large quantities; and the 13% disagree reflects a group of customers who do not find value in these promotions, possibly due to a lack of need or ability to take advantage of large quantities.

According to the results, promotion strategies should be designed, given that 65% of those surveyed tend to see promotions for large amounts as taking advantage of their money and saving their pocket, companies can continue and expand these strategies and offer Volume discount packages, “buy more, save more” promotions, and tiered pressure discounts by volume attract this majority segment.

Instead, for neutral and disagreeing customers, companies can develop campaigns that focus on the additional benefits of bulk purchasing, such as price convenience and reduced store visit frequencies. They can also design personalized promotions for these groups that offer value to their purchases, without requiring large purchase volumes, such as loyalty discounts or free products for smaller purchases.

Promoting customer education, providing information on how to maximize the value and utility of bulk purchases, helps change the perception of dissenting or neutral customers. Information

in advertising content that includes advice on storage, planning purchases and efficient use of products.

Table 10. How likely are you to participate in loyalty programs (e.g., points accumulation) due to accumulated rewards?

Indicator 2: evaluation of marketing strategies.		
Participation in loyalty programs for accumulated rewards.	Total	%
Very unlikely.	16	4
Unlikely	32	8
Neutral	111	28
Likely	174	44
very likely	63	16
Total	396	100

Analysis and interpretation.

Table 10 shows how respondents rate the likelihood of participating in loyalty programs (e.g., points accumulation) due to accumulated rewards. The majority of respondents (60%) consider it likely or very likely to participate in loyalty programs due to the rewards accrued. 28% of respondents are neutral, indicating an indifferent attitude towards participation in these programs; and 12% of respondents consider it unlikely or very unlikely to participate in loyalty programs.

Very unlikely (4%) and unlikely (8%), representing a total of 12%, indicating that a small minority of respondents are not motivated by the accumulated rewards to participate in loyalty programs. Neutral (28%), this group shows an indifference or lack of a strong opinion on the topic, possibly evaluating other factors such as the convenience and relevance of the rewards offered. Likely (44%) and Very Likely (16%), totaling 60%, these respondents are motivated by accumulated rewards and are more likely to participate in loyalty programs.

Create loyalty programs, due to the high proportion of positive responses (60%) suggests that loyalty programs that offer accumulated rewards are effective for a large majority of consumers. Customers value accrued rewards and are willing to participate in these programs for additional benefits.

There is neutrality and disinterest in a neutral 28%, who may be evaluating the decision to participate in loyalty programs based on: relevance, value of rewards, ease of accumulating points among others; The 12% disagree reflects a group of consumers who likely do not feel there is enough value in accrued rewards to justify participating in loyalty programs.

Design loyalty programs, since 60% of respondents are motivated by accumulated rewards, companies must design loyalty programs that offer attractive and relevant benefits for this majority segment. Rewards should be attainable, valuable, and aligned with customer preferences and needs. Companies should personalize and segment neutral customers, with loyalty programs to increase appeal and segment loyalty programs based on customer purchasing behavior and preferences to improve effectiveness and engagement.

There must be communication and transparency, clearly communicating the benefits and the process of accruing and redeeming points to increase participation and perception of value.

Offering regular updates and reminders about the status of accumulated rewards can keep customers interested and motivated.

Table 11. Rate the following statement: “I prefer to pay for services that offer flexible cancellation options, even if they are more expensive.”

Indicator 2: evaluation of marketing strategies.		
Preferences for service with flexible cancellation:	Total	%
Strongly disagree.	20	5
In disagreement.	36	9
Neutral.	103	26
In agree.	174	44
Strongly agree.	63	16
Total	396	100

Analysis and interpretation.

Table 11 shows how respondents rate the statement: “I prefer to pay for services that offer flexible cancellation options, even if they are more expensive.” The distribution of responses is analyzed below.

The majority of respondents (60%) prefer to pay for services that offer flexible cancellation options, even if they are more expensive. 26% of respondents are neutral towards the statement, which suggests an indifferent attitude towards the importance of flexible cancellation. 14% of respondents disagree or strongly disagree with the statement, showing less importance given to flexible cancellation.

Strongly disagree (5%) and disagree (9%), representing a total of 14%, indicate that a minority of respondents do not consider flexible cancellation as an important factor, even if the service is more expensive. Neutral (26%) this group shows an indecision or lack of a strong opinion on the topic, possibly evaluating other factors such as the total cost and usefulness of the service. Agree (44%) and strongly agree (16%), totaling 60%, respondents value flexible cancellation options and are willing to pay more for the services they offer.

The high percentage of positive responses (60%) suggests that customers significantly value flexibility in canceling or paying for services and are willing to pay more for this feature. This behavior may be influenced by the need to minimize the risk and uncertainty that is associated with long-term commitments.

The neutral 26% consider other important factors in their purchasing decision, such as the general price of the service, its quality and the frequency of use. The 14% disagree reflects a group of consumers that likely prioritizes cost of service over flexibility in cancellation.

Indicator 3. - Influence of sunk cost on value perception.

Table 12. Rate the following statement: “When I feel like I have invested a lot of money in something, I perceive it as valuable, even if I don't use it much.”

Indicator 3: influence of sunk cost on value perception.		
Perception of value due to previous investment.	Total	%
Strongly disagree.	20	5
In disagreement.	63	16
Neutral.	95	24
In agree.	162	41
Strongly agree.	55	14
Total	396	100

#### Analysis and interpretation.

Table 12 shows how respondents perceive the value of products or services based on the previous investment they have made. Agree (41%) and strongly agree (14%) make up 55% of those surveyed. This indicates that more than half of the participants feel that prior investment makes them perceive a product or service as more valuable. This result is significant and shows a clear trend towards the influence of sunk cost on value perception. Disagree (16%) and strongly disagree (5%) make up 21% of those surveyed. Although this group is sizeable, it is much smaller than the agree group, indicating that a minority of participants do not perceive a higher valuation based on prior investment. Neutrality: neutral 95 respondents (24%). Almost a quarter of respondents remain neutral regarding the influence of prior investment on their perception of value. - This group may be the most susceptible to contextual or marketing influences that may tilt their perception one way or another.

The significant difference between the levels of agreement (55%) and disagreement (21%) suggests that sunk cost bias is a predominant influence on consumers' value perception. The neutrality represented by 24% of respondents indicates a potential area of interest for marketing interventions that can convert this neutrality into positive value perception.

Companies can use strategies that reinforce previous investment, such as offering upgrades or add-ons to products already purchased, in order to increase the perception of value. Promotions that highlight how much has been invested in a product or service.

Create loyalty programs and subscriptions, loyalty programs that accumulate points or additional benefits with each purchase can take advantage of the sunk cost bias, causing customers to perceive greater value in continuing to subscribe or purchase. Companies should also consider educating customers about the rationality of their purchasing decisions and offering flexible cancellation options or refunds.

Table 13. How much do you agree with the following statement: “I prefer to repair an expensive item than buy a new one, due to the investment I previously made”?

Indicator 3: influence of sunk cost on value perception.		
Preference for repairing expensive items.	Total	%
Very unlikely.	36	9
Unlikely	71	18
Neutral	135	34
Likely	123	31
Very likely	32	8

Total	396	100
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Analysis and interpretation.

Table 13 shows how the respondents rate the statement, the general trend of majority of the respondents (34%) are neutral towards the statement which suggests an indifferent attitude towards the preference for repairing expensive items due to previous investment. (39%) agree or strongly agree with the statement, indicating that the sunk cost bias influences their preference to repair a product that was damaged and turned out to be very expensive, instead of buying a new product. 27% of respondents disagree or strongly disagree, showing less influence of sunk cost bias on their repair decisions.

The 39% of respondents prefer to repair expensive items due to the previous investment shows that the sunk cost bias has importance in their decisions. These bias leads customers to try to recover or maximize the value of the initial investment, even if repair is not the most economically efficient option. The neutral 34% may be evaluating the decision to repair or buy new based on practical and financial factors, rather than the previous investment; and the 27% disagree reflects a group of customers who are likely to make more rational decisions based on the current cost-benefit of repairing versus buying new.

According to the results, after-sales service strategies can be developed. For customers who prefer to repair, companies can offer attractive repair services, extended warranties and maintenance facilities. In addition to creating loyalty programs that offer discounts on repairs and after-sales services to increase customer satisfaction and loyalty.

Generate promotions of new products, for the disagreeing group, marketing campaigns can focus on the advantages and benefits of purchasing new products, such as advanced technology, energy efficiency and lower long-term maintenance costs. Offer financing and trade-in plans to persuade these customers to opt for new products instead of expensive repairs.

Table 14. Have you ever kept a subscription or service despite not using it, because you believe that canceling it would be a loss of the previous investment?

Indicator 3: influence of sunk cost on value perception.		
Maintenance of subscribers due to perception of loss.	Total	%
Yeah	277	70
No	119	30
Total	396	100

Analysis and interpretation.

Table 14 shows how respondents respond to the question: The general trend is that the majority of respondents (70%) have maintained a subscription or service, and often do not use it due to the perceived loss of a previous investment. A significant minority (30%) have not maintained subscriptions under this perception.

There is a prevalence of sunk cost bias, with 70% of respondents maintaining subscriptions that they do not fully use, indicating a strong influence of sunk cost bias. Customers seem to be more concerned about not “losing” previously invested money than optimizing their current expenses.

The high proportion of affirmative responses shows how the sunk cost bias significantly affects decisions to maintain subscriptions and services. Customers who perceive that canceling a subscription is a loss of the investment made, which leads to continuing to pay for unused services.

There is rationality and decision making in the 30% that respond negatively indicates a group of clients who make more rational decisions, which focus on the current cost-benefit instead of past investments. This group may be more willing to cancel services they do not use, thus optimizing their expenses.

Based on the results, retention strategies can be developed that reinforce the perception of continued value of subscriptions, offering additional benefits, exclusive content or complementary services that justify the continued investment. Implementing loyalty programs and continuity rewards can incentivize customers to maintain their subscriptions.

Marketing campaigns should focus on communicating the value and benefits of maintaining the subscription, even if it is not used regularly. Offering temporary suspension options instead of complete cancellation helps retain customers who are considering canceling services with companies.

Table 15. Rate the following statement: “The perception of having “lost” a previous investment strongly influences the decision to continue using a product or service.”

Indicator 3: influence of sunk cost on value perception.		
Strong influence of the perception of loss on decisions.	Total	%
Strongly disagree.	24	6
In disagreement.	36	9
Neutral.	9	26
In agree.	15	41
Strongly agree.	6	18
Total	396	100

#### Analysis and interpretation.

Table 15 presents the results of the survey in the statement: the perception of having lost a previous investment strongly influences the decision to continue using a product or service. Strongly disagree: 24 respondents (6%); disagree: 36 respondents (9%); neutral: 103 respondents (26%); agree: 162 respondents (41%); strongly agree: 71 respondents (18%).

59% of those surveyed (41% agree and 18% strongly agree) recognize that the perception of having lost a previous investment strongly influences their decision to continue purchasing and using a product or service. Resistance to loss is a significant motivating factor to prevent it from happening again. The majority of respondents prefer to continue using a product or service to avoid feeling that they have lost their previous investment, this leads to erroneous decisions from a rational point of view.

15% of respondents (6% strongly disagree and 9% disagree) are not influenced by the perception of loss. This group appears to be less susceptible to sunk cost bias, possibly due to greater rationality in their consumption decisions.

26% of those surveyed declare themselves neutral regarding this influence. This group may represent consumers who, although aware of the sunk cost, do not always allow it to affect their decisions significantly.

Companies can take advantage of this predisposition by offering additional incentives to continue using a product or service, reinforcing the perception of continued value and mitigating the sense of loss. Carrying out marketing campaigns to communicate the additional benefits of continuing with a service can help justify the previous investment and strengthen customer loyalty; testimonials and success stories are effective in this context.

Marketing strategies, including features that facilitate continuity of use, such as automatic renewals with exclusive benefits for long-term subscribers, can take advantage of the sunk cost bias to maintain the customer base.

Interview: Additional opinions.

In your opinion, how do you think companies could help consumers avoid falling into the sunk cost trap?

Tips to avoid sunk cost bias:

- Financial education and awareness (50%)
- Flexible payment and cancellation options and usage reminders (30%)
- Partial refunds or free trials (20%)

Is there anything else you would like to add about how sunk cost influences your purchasing decisions?

About consumer behavior.

Purchase frequency and continuity: 85% of respondents make purchases, with some regularity (sometimes, frequently, very frequently), and 90% continue using products and services or products due to a previous investment, in this way, the Sunk cost significantly influences purchasing decisions.

Feeling of Obligation: 50% of respondents agree or strongly agree that they feel obligated to continue using something they have previously paid for, showing a considerable trend toward sunk cost bias.

Marketing strategies.

Discounts and loyalty programs: 60% of respondents perceive discounts for bulk purchases as a way to get more bang for their buck, and 55% are likely or very likely to participate in loyalty programs because of the accrued rewards. This indicates that applying marketing strategies can be effective in taking advantage of the sunk cost bias.

Preference for flexible payment and cancellation: 60% of respondents prefer to pay more for services that offer flexible payment and cancellation options, which reduces the impact of sunk cost bias by allowing an easier exit from their payments.



## Value Perception

Greater value due to previous investment: 55% of respondents perceive that products or services in which they have invested a lot of money are more valuable, even if they do not use them much. This highlights the strong influence of sunk cost bias on value perception.

Subscription maintenance: 70% of respondents maintain subscriptions or services due to perceived loss of prior investment, underscoring how sunk cost affects continued service use decisions.

## Discussion.

Relationship with age, gender and educational level, analyzes how responses vary according to age, gender and educational level, offering information about which demographic groups are most likely to participate in loyalty programs. For example, younger customers or those with higher educational levels may be more inclined to participate in these programs due to a greater understanding and appreciation of the rewards accrued.

Purchasing and reward usage patterns provide a better understanding of customer behaviors and their susceptibility to loyalty marketing strategies.

The payment strategy or flexible cancellation should be implemented in companies, and services should be designed that include this option, even if this implies an additional cost. Offering different levels of service that vary in terms of flexibility and cost attract and value customers, allowing them to choose according to their preferences and needs.

By applying segmentation and personalization to neutral customers, companies can personalize offers by highlighting other service benefits, such as quality, convenience, and customer support. Segmenting services according to customer purchasing behavior and preferences improves effectiveness and customer satisfaction.

Apply communication and perceived value strategies, it is important to communicate the benefits of payments and flexible cancellation, communicate the value of a previous investment, and offer products, accessories related to a previous purchase, create a need for wholesale purchases to reduce costs, and create a feeling of scarcity to promote advance purchase, these characteristics that have been identified in the study, provide a perception of value and maintain customer loyalty, in addition, offer practical examples and testimonials from customers who have benefited from the products and services, in this way the perception of value increases and justifies the sunk cost bias.

The results show the feeling of loss and scarcity, Tversky, A., & Kahneman, D. (1991) calls this concept of loss aversion, a fundamental theory to understand why people feel a loss more intensely than a gain. of the same magnitude. Ariely, D. (2008) includes the feeling of loss, they influence our purchasing decisions. Thaler, R. H. (1980) Loss aversion affects consumers' decisions and their perception of value. Kahneman, D., & Tversky, A. (2000) promotes prospect theory and how decisions are influenced by loss aversion. Kermer, D. A., Driver-Linn, E., Wilson, T. D., & Gilbert, D. T. (2006) people tend to overestimate the intensity of the feeling of

loss, which affects their decisions to purchase and use products or services. Novemsky, N., & Kahneman, D. (2005, January) the limits of loss aversion and how it affects consumption decisions. Johnson, E. J., & Goldstein, D. (2003) the importance of defaults and loss aversion and how people prefer to maintain the status quo to avoid the feeling of loss. The references provide solid sources on the topic of the sense of loss that influences purchasing decisions and the perception of value of products and services.

### **Conclusion.**

The sunk cost bias is a powerful tool in neuromarketing that significantly influences customer behavior. It allows us to understand how this bias affects decision making, and how companies can design effective marketing strategies to increase customer retention. In the first objective that was set out to (i) evaluate how the sunk cost influences the perception of the value of products or services. There is a significant influence of the sunk cost, the data shows that a majority of respondents continue using products or services due to the previous investment (60% of responses agree and strongly agree). Value perception is strongly influenced by sunk cost, as seen in the tendency to prefer repairing an expensive item (39% agree and strongly agree responses) to purchasing a new one. Subscription maintenance decisions, 70% of respondents have maintained a subscription despite not using it 100%, indicating that the perception of loss of the previous investment, has the decision to continue paying for a service, although it is not use in its entirety. There are preferences for flexible payment or cancellation, the majority (60%) prefer to pay more for services with flexible cancellation options, in this way companies should create flexible payment and cancellation programs for clients who want to minimize losses associated with the sunk cost to maintain a product or service.

The second objective that was raised was (ii) to identify marketing strategies that exploit the sunk cost bias. Loyalty and rewards programs, 60% of respondents participate in loyalty programs because of the accumulated rewards, which demonstrates that marketing strategies that offer continuous and cumulative benefits increase the sunk cost bias. Promotions and discounts for purchases in large volumes or quantities are perceived as making better use of money; 65% of those surveyed indicate that these strategies can be effective in encouraging additional purchases and strengthening the perception of the value of the sunk cost. Flexibility in services, such as offering flexible cancellation options, attracts customers who value the ability to minimize future losses, even if it comes at an additional cost. These strategies are effective in increasing customer retention and justifying high prices.

The third objective that was proposed (iii) Propose strategies for the use of the sunk cost bias in marketing. Transparency and clarity in companies in the terms and conditions of their services, including the cancellation policy, and explaining the benefits of loyalty programs. This way, customers make informed decisions and will not have a perception of manipulation. Loyalty programs and promotions must offer real value and be relevant to customers, incentivize purchase and direct a tangible benefit, such as personalized rewards and exclusive benefits that improve the customer experience. Companies must educate customers on how to evaluate their subscriptions and services regularly so that they can make use of them and benefit. Providing tools and resources for making informed decisions helps clients avoid unnecessary expenses and better manage their investments. If a balance must be maintained between business profit and

customer well-being, sunk cost bias marketing strategies serve to increase sales and customer retention and loyalty, and seek to balance business profit with customer well-being. Marketing practices should focus on creating long-term relationships based on trust and real product value, and offering real benefits to the customer for long-term profits.

Finally, the sunk cost bias significantly influences the perception of the value of products and services, affecting purchasing decisions, educational level, gender, and income level influence the perception of value and purchasing decisions in relation to the bias. of the sunk cost. Continuity in use of products and services due to previous investment of time or money shows that sunk cost bias is a significant influence on purchasing behaviour for most customers. Purchasing expensive items through prior investment reveals that sunk cost bias is a significant influence on purchasing behaviour for most customers. The sunk cost bias has a strong influence on a significant majority of customers who feel obligated to continue using something paid for even if it is no longer useful. Continuity in prepaid subscription shows that sunk cost bias is a significant influence on subscription behaviour for most consumers. The perception of discounts for large quantities as a way to make better use of money shows that a significant majority of consumers. The likelihood of participating in loyalty programs due to accumulated rewards shows that a significant majority of customer preferences. The preference to pay for services with flexible cancellation options, even if they are more expensive. The sunk cost bias has a considerable influence on value perception, with the majority of respondents perceiving that products or services in which they have previously invested are more valuable. The preference for repairing expensive items due to prior investment, therefore, creating repair and maintenance services that satisfy this segment. The perception of loss of the previous investment shows that the sunk cost bias significantly influences the decisions of a vast majority of clients. For companies, the challenge lies in balancing taking advantage of sunk cost bias with ethical practices that do not unduly exploit consumers. Financial education and offering flexible cancellation options are recommended measures for customers to make informed and rational decisions. These findings provide a solid foundation for future research and marketing strategies that consider the impact of sunk cost bias on consumer behaviour.

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