# Money illusion: a replication of the "money illusion" effect in a sample of Brazilian volunteers*

Replication of the "money illusion" effect in a Brazilian sample

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**Abstract**

This study aimed to replicate the replication of the money illusion effect within a Brazilian sample(Moraes Ferreira et al. 2023), following the methodology of Shafir, Diamond, and Tversky (Shafir, Diamond, and Tversky 1997). It assessed the phenomenon across four scenarios involving financial decisions, with a sample of 372 participants via online platforms. This paper focus on the first two scenarios. The findings closely mirrored the original study's results, showing varying responses based on the framing of financial opportunities (real, or nominal). This replication suggests that the money illusion effect may be culturally uniform, highlighting the importance of further cross-cultural research to deepen our understanding of this cognitive bias.

## 1 Introduction

The motivation for replicating the "money illusion" (Moraes Ferreira et al. 2023)effect study in a Brazilian sample includes exploring the phenomenon's applicability and validity across different cultural contexts. By adapting Shafir and colleagues' original research(Shafir, Diamond, and Tversky 1997) to the Brazilian environment, the study aims to examine whether the money illusion—where individuals focus on nominal rather than real values of money, ignoring inflation—persists outside its initial setting. This could provide evidence for or against the cultural independence of the money illusion effect.

Our findings reveal a striking resemblance to the original study, suggesting a potentially universal aspect of the money illusion effect across varying contexts. This replication not only fills a crucial gap in the literature by providing empirical evidence from a non-Western context but also underscores the significance of cultural considerations in economic psychology.

The importance of this study lies in its contribution to a more nuanced understanding of economic behaviors across cultural boundaries, offering implications for policymakers, economists, and psychologists alike. It invites a reevaluation of economic models that neglect the cognitive biases influencing financial decisions.

We hypothesise that the money illusion effect will be present in all four problems, as follows: In Problem 1, individuals may perceive workers as less content with a job and more inclined to resign when offered a larger wage increase in real terms, despite it being smaller in nominal terms; in Problem 2, individuals would rank the best deals among three house sellers based on nominal gains, rather than real gains; in Problem 3, participants may be less likely to buy the armchair and more likely to sell it, even when the price increase is only nominal; and in Problem

For R(R Core Team 2020), this paper uses these packages below: osfr(Names Year), tidyverse(Wickham et al. Year),readxl(Wickham et al. Year),foreign(Team Year), DescTool[DescTools],summarytools(Comtois Year), ggplots2(Wickham Year),gplots(Warnes et al. Year)

*Code and data are available at: https://github.com/scottyuan6/sta302-term-papaer2.git. A replication of various aspects in this paper are available at: https://doi.org/10.17605/OSF.IO/YRQ75.

# 2 Data

## 2.1 Data Source and Methodology

The data is collected from a study conducted in Brazil. Researchers distributed questionnaires through online social networking platforms. The inclusion criteria were as follows: 18 years of age or older and consent to participate in the study. Participants did not receive financial compensation throughout the study. When answering the questionnaires, completion of all questions was not mandatory; those data with only one question completed were also included in the analysis.

The data collection process took place over 8 months from December 2021 through July 2022. A total of 446 people participated in the survey. Removing participants who completed only one question, the sample size was reduced to 372. The mean age of the sample was 31.6 years (SD = 15.1). Of the participants who responded to the demographic section (n = 382), 258(67% ) were female, and 333(87% ) were from São Paulo.

The questionnaire included socio-demographic information such as age, gender, city of residence, education, and household income, as well as four questions designed to assess the effects of money illusion. The four questions illustrate the money illusion in different situations: I) salary increases; II) real estate transaction; III) purchasing and selling decisions; and IV) susceptibility to risk.

## 2.2 Attributes

In our paper, we focus on problem 1 and 2 from the original paper. We used the same dataset as the original paper. However, we applied other methods to generate graphs and tables. Our goal is to check if we could get the same result compared to the original paper by using different functions.

# 3 Results

## 3.1 Problem 1

Problem 1: Participants' Choices Between Maria or Carolina
Across Different Conditions

| | Maria | | Carolina | | Statistical Analysis | |
|---|---|---|---|---|---|---|
| Condition | Maria n | Maria % | Carolina n | Carolina % | Chi-Square | P-value |
| Economic Terms | 87 | 78% | 25 | 22% | 34.32 | $< 0.001$ |
| Happiness | 58 | 49% | 60 | 51% | 0.03 | 0.854 |
| Job Attractiveness | 69 | 62% | 43 | 38% | 6.04 | 0.014 |

### 3.1.1 Description:

Figure 1 in the original paper shows the frequency of the choices made by participants considering different conditions for problem 1. The purpose is to determine participants' ' responses to different types of job promotion. Generally, there are two kinds of job preferences based on wage changes —-based on nominal wage increases or real wage increases considering inflation.

The results show that the money illusion highly occurs when it comes to job attractiveness. A significant proportion of participants chose the option that was nominally more attractive than it actually was. This illustrates that people are more likely to be influenced by money illusion. The chart shows that even though Maria was the one who actually received the salary increase, participants still tended to choose her as the one who was more likely to leave the job. This suggests that the participants valued the nominal raise more than the actual salary. In contrast, when the question came to economic terms, the majority correctly chose Maria as the one to be better off financially, which suggests that they were less influenced by money illusions.


Figure 1: Choices in Problem 1: Economic Terms, Happiness, and Job Attractiveness

## 3.2 Problem 2

Replication Results for Problem 2: House Sellers Ranking
Participants' Preferences and Statistical Analysis

| | Choice Preferences | | | Statistical Analysis | |
|---|---|---|---|---|---|
| Seller | 1st Choice (%) | 2nd Choice (%) | 3rd Choice (%) | Chi-Square | P-Value |
| André | 35% | 16% | 49% | 45.64 | $< 0.001$ |
| Bento | 21% | 68% | 11% | 153.55 | $< 0.001$ |
| Marcelo | 43% | 16% | 41% | 36.79 | $< 0.001$ |

### 3.2.1 Description

Figure 2 in the original article shows the frequency of participants' choices when ranking each seller in Problem 2. The figure shows the distribution of participants' preferences for André, Bento, and Marcelo. This reflects how participants viewed their prices in terms of nominal and real returns.

The graph shows how participants ranked sellers, highlighting whether they were more influenced by nominal gains than real gains. The result suggests that they are susceptible to money illusions. For example, if more participants prefer sellers with higher nominal returns but lower real returns, this would be evidence of money illusion.

Thus, Marcelo, who had a higher nominal gain but the largest real loss, may have been selected as the first choice by a significant percentage of participants. Such choices indicate the existence of money illusion —- i.e. higher nominal values can influence judgment and lead to non-economically optimal decisions.

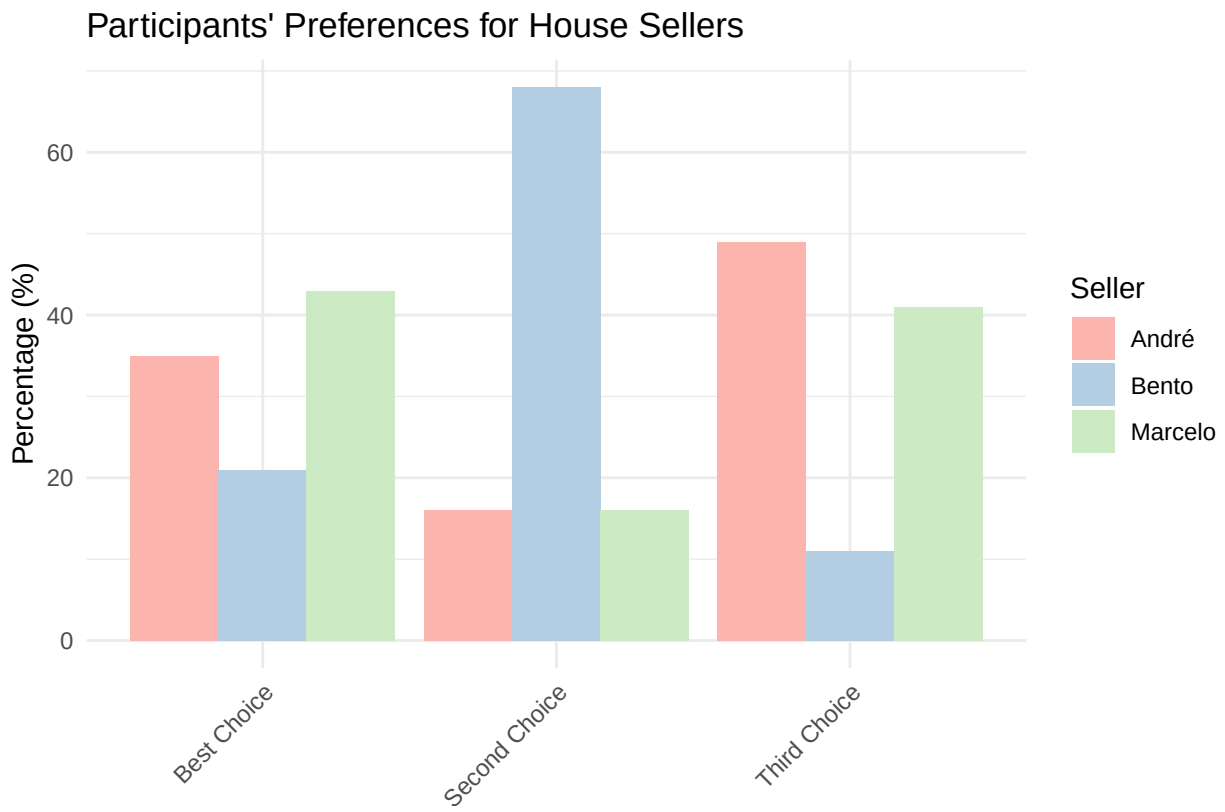


Figure 2: Participants' Preferences for House Sellers

# 4 Discussions

## 4.1 What did we do in this paper?

This paper presents a replication study of the "money illusion" effect in a Brazilian sample. The same dataset was utilized, but with a different analytical approach than the original study. Specifically, the study focuses on questions 1 and 2.The paper analyzes the attractiveness of jobs with different salary increases for participants under inflation (question 1) and the ranking of nominal versus real returns by participants (question 2). The results of this replication confirmed the existence of the monetary illusion, suggesting that individuals tend to prefer nominal increases to real increases, which is consistent with the findings of the initial study. This replication confirms the existence of the monetary illusion effect across cultures, as well as the influence of psychological factors, highlighting the impact of the monetary illusion effect on economic decision-making and thus contributing to the related literature.

## 4.2 Explore

### 4.2.1 Cultural factors

The original article is a study for the Brazilian group only. Considering the economic and social situation in Brazil, it occurs to us that the money illusion effect may have an element of contextualization. Brazil is a developing country, but it is also the seventh largest economy in the world, and it has a unique economic situation. Therefore, while considering the economic effect of the money illusion, we should take into account the economic factors of the country. In Eldar Shafir, Peter Diamond, and Amos Tversky's "Money Illusion," (Shafir, Diamond, and Tversky 1997) the authors explore the concept of money illusion in different contexts, providing foundational evidence and theoretical underpinnings that help to understand how cultural factors affect susceptibility to money illusion. susceptibility to money illusions. With regard to specific evidence of cultural influences, more targeted research comparing different cultures would be beneficial.

### 4.2.2 psychological factors

The replication study highlights the impact of psychological factors on economic decisions, showcasing how the money illusion—where individuals prioritize nominal values over real values—affects choices in scenarios such as job attractiveness and real estate transactions. This effect, consistent across different cultural contexts, underscores the role of cognitive biases in financial decision-making, suggesting that these psychological underpinnings influence perceptions and decisions beyond the logical evaluation of economic benefits.

Some other studies also support the idea about psychological factors on economic decision-making —-"The influence of personality trait and demographics on financial decision making among Generation Y" by Nga, Joyce KH and Ken Yien, Leong (Nga and Ken Yien 2013) examines how personality traits, such as openness and conscientiousness, impact economic decision-making "Decision making under stress: A selective review" by Starcke and Brand (Starcke and Brand 2012) explores the role of stress in economic decisions. It reveals that stress can significantly alter the way individuals evaluate economic scenarios.

### 4.2.3 possible archivements

The study underscores the importance of thinking about culture in the area of economic psychology. Researchers aren't the only ones who need to be aware of and understand cultural differences in how people make decisions. Businesses that operate in diverse markets, policymakers who are making global economic strategies, and international organizations working for sustainable economic development also need to do the same (Lioui and Tarelli 2023). In a bigger picture sense, the study shows how important it is to learn about money and be financially literate. Figuring out how people might be affected by the money illusion effect can help with creating training programs that aim to teach people more about money (Darriet et al. 2020). In order for people to make better financial choices, societies need to give people the tools they need to recognize and deal with cognitive biases.

### 4.3 weakness

There are some limitations in the research methodology and interpretation of results in the study. First, the use of an online simulation methodology does not show a good representation of the participants. It raises concerns about whether the results can be applied to a larger group of people (Garbinsky, Mead, and Gregg 2021). The study's methodology may also add factors that make the results less clear. It's possible that cultural differences and differences in how the scenarios were interpreted were not properly handled or controlled for, which could have affected the responses. It brings to question the study's internal validity since the effects could have been caused by things that weren't controlled. Second, the study may not be true in real life because it relied on made-up decision-making situations. The external validity of the study could be affected by the fact that participants might react differently to hypothetical events than to real-life ones. In the real world, financial choices are complicated and depend on many things that might not be fully reflected in hypothetical situations.

The study focuses on whether or not the money illusion effect is present without going into detail about how it works or what might change it. It could be more useful for explaining factors that affect the money illusion in different cultural settings (Darriet et al. 2020). Therefore, the study doesn't look into other possible explanations or ideas that could explain the results. A more thorough analysis that takes into account other cognitive biases or outside factors that affect decision-making would improve the general validity of the study and help understand the phenomenon being studied in a more complex way.

### 4.4 future benefits

The study revealed some useful information and presented elements to explore in the future. First, there needs to be more research that is done across cultures. A deeper understanding can be gained by looking into how differences in culture affect the size or form of the money myth in different societies. Multiple cultural groups could be used in comparative studies to find similarities and differences in how people make decisions (Lioui and Tarelli 2023). It would help people learn more about how culture and cognitive errors affect each other. Second, a longitudinal study could follow people over time, which could show whether the money illusion effect stays strong or weakens over time. It would be helpful to have a better understanding of how decisions are made if there was knowledge on how people's vulnerability to cognitive biases changes over time, especially as the economy changes (Dimand 2023). Third, combining neuroscientific techniques, like neuroimaging or physiological data, could help figure out how the money illusion effect works in the brain. Looking at how cultural context changes neural reactions when making financial decisions might help understand how people think about these things better (Ziano et al. 2021). This multidisciplinary method might help connect what we see in behavior with how our brains work on a deeper level.

Future research should explore factors that lessen the effect of the money illusion. Looking into differences between people, like their financial knowledge, cognitive styles, or cultural backgrounds, might help explain why some people have a bigger money illusion than others. Finding these moderating factors can help with tailored interventions and educational programs that aim to lessen the effects of cognitive biases (Dimand 2023). Lastly, it is very important to apply the study in the real world instead of using hypothetical situations. Findings can be more ecologically valid if they look at how the money illusion effect works in real-life economic transactions, business decisions, or policy responses (Lioui and Tarelli 2023). These kinds of studies could help lawmakers and practitioners come up with interventions that take cognitive biases into account in the real world.

## 5 Conclusion

In the study, figure 1 shows that in the first problem, a higher prevalence of money illusion was observed when the problem framed the issue in terms of job attractiveness, as most participants selected Maria as the most likely to leave her job instead of Carolina, despite Maria being the worker with a real salary increase. When the question was framed in economic terms, the illusion was not present in the majority of participants. When the question emphasized happiness, there were no statistically significant differences

among the characters. In Figure 2, which represents the second case, the money illusion changed how people answered as they thought André made the worst deal, then Bento, and finally Marcelo.

Comparing our Figures 1 and 2 with graphs from the original article, we can conclude that this replication study succeeded in demonstrating the existence of the money illusion effect in the Brazilian sample. The similar results from our findings with those in the original study suggest that individuals may prefer nominal values over real ones. Since the original study is conducted in Brazil, we could conclude that the culture factor plays a role in the influence of the money illusion effect. The study also reinforces the importance of considering psychological factors in economic theory.

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