Inflation Perception as a Product of Experience and Information

A Pilot Investigation

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Abstract

Inflation-related processes are largely studied under the prism of self-reported data which lacks rigour in a myriad of ways. Inflation perception especially is insufficiently researched, despite being an intuitively important determinant of economic behaviours and beliefs. Following scarce existing literature on the topic, an experiment is devised to study the frequency bias – a behavioural regularity generating biased beliefs about the aggregate rate of inflation in the direction of more frequently purchased items' inflation rates – and the influence of institutionally-provided and socially-provided information thereon. Being a pilot study, an insufficiently sized sample constitutes the data. Consequently, although a full analysis is conducted and then discussed, no conclusive comments can be made about the results. Speculative discussions point to the potential influence of a here unaccounted-for and yet unidentified variable on inflation perception, conjectured to be either bias-awareness and consequent over-adjustment or prior narrative information. More research is needed to rigorously characterise the relationship between inflation perception, frequency bias, and source-specific information.

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1 Introduction

Inflation can be defined as a loss of a currency's purchasing power which results in a general and durable increase of prices. After recording low yearly inflation rates during the 2010s with oscillations between 0% and 2.1%, the French economy experienced inflation surges in 2022 and 2023 largely exceeding economists' forecasts, and is now back to mild levels. Preliminary reports suggest significant disinflation for the year 2024, seemingly indicating a return to what had become a "business as usual" situation. Most European economies report similar-fashioned trends in recent years. Intuitive explanations for such an intense and punctual episode lie in the substantial expansionary policy shocks propelled by European governments as well as energy prices' hike partly consequential to the Russo-Ukrainian conflict.

Economists, along with central banks, have traditionally been interested in measuring, managing, and predicting inflation and inflation expectations to ensure price stability, guide monetary policy, and promote sustainable economic growth. Extensive literature covers these topics. In recent years, however, a timid trend has emerged questioning some of the foundations on which the relationship between inflation, expectations thereof, and economic outcomes rely. These discussions are of two natures.

The first concerns the role of a typically unaccounted-for variable on economic decision-making and beliefs, namely *inflation perception*. This follows the intuition that economic behaviours and beliefs are driven more by what agents perceive the inflation rate to be rather than by what actual inflation rates actually are. Indeed, individuals are neither rational utility-maximisers nor irrational beings defined by a list of biases and heuristics. To date, the most cutting-edge and convincing theorisation of economic agents is offered by Bordalo et al. (2024) who consider them to be coherent wholes whose decisions and beliefs are products of selective attention and problem categorisation. Complementarily, Madsen et al. (2024) propose to consider economic agents as *reasonable* creatures, defined as implying that "people with knowledge of [a] situation (including social pressures) would be able to see [a] behaviour as a satisfactory way to achieve a particular goal". Using these approaches, economic agents are considered as cognitively bounded individuals who use what they perceive as situation-defining attributes to take the best decision they can, without assuming their perception as being correct or incorrect, but rather as being context-dependent.

The second discussion is methodological. It raises questions surrounding the way inflation expectations are measured and the subsequent data used. The typical procedure is to ask respondents in a questionnaire – usually online – to state their beliefs. This subjugates the responses to a plethora of biases which influence the way people answer, such as cognitive fatigue, priming, inattention, survey design (Dillman et al., 2009), guessing due to lack of knowledge, and even question wording (de Bruin et al., 2012). Stated preference survey data is thus strongly limited. de Bruin et al. (2017) further identify that survey administration mode influences the nature of responses. In such a context, the extent to which the data represents real beliefs, assuming they exist, are defined, and are comparable between sources, is a critical issue which can affect the validity of the decisions taken by policy-makers.

A way forward to investigate and reconcile these two issues is to uncover the determinants of perceived inflation and examine its influence on beliefs and behaviours, while striving for methodologically sound and comparable measures of the relevant phenomena. Naturally, this research agenda is considerable, and the present paper does not pretend to provide a complete solution or a comprehensive framework for the study of inflation perception, but is rather a preliminary attempt at disentangling its determinants.

Relevant literature in support of the research question is first explored in section 2. The study's methods are then presented in section 3 and are followed by the associated results in section 4. A discussion is then offered in section 5, after which some concluding remarks and future research prospects are proposed in section 6.

2 Theoretical Background

2.1 Inflation Perception

Individuals typically do not perceive inflation perfectly. They instead tend to overestimate the rate of inflation with respect to the observed inflation rate (Abildgren & Kuchler, 2021), leading to a distorted perception of price changes (Bates et Gabor, 1986, Duffy & Lunn, 2009). Specifically, there is evidence for asymmetric perception of price variations, with increases perceived more strongly than decreases (Fluch & Stix, 2005). Consequent reactions are accordingly faster for increases with respect to decreases, while small inflation variations are ignored (Stanisławska, 2019). Following an intuition derived from prospect theory (Kahneman & Tversky, 1979) and its extended application under complexity (Oprea, 2024), a central characteristic of inflation perception is reference price dependence (Ranyard et al., 2017). This means that decisions are taken by comparing a good or service's current observed price and an expected – reference – price (Mazumdar et al., 2005, Gärling et al., 2013). This expected price reflects a combination of the true historical price and contextual as well as cognitive influences (Ranyard et al., 2008, Gao et al., 2013). This can be explained by limited storage and recalling abilities and a resulting susceptibility to biases and heuristics. These include, without being limited to, the availability heuristic (Tversky & Kahneman, 1973), anchoring (Pfajfar et Zakelj., 2014), purchase saliency (Angelico & Di Giacomo, 2019), expectation-based (Sharot et al., 2011) or motivated (Gesiarz et al., 2019) belief updating, information neglect (Enke, 2020), and information characteristics (Graeber et al., 2024). Jungermann et al. (2007) identify additional determinants of inflation perception. Firstly, expensiveness plays through cheaper prices being perceived as exhibiting higher inflation rates than expensive goods. Secondly, product category is influential, as demonstrated by food products' prices being perceived as rising more sharply than non-food products and services. In comparison, Stanisławska (2019) finds that clothing and footwear's inflation perception is overweighted by consumers relatively to their expenditure share. Interestingly, D'Acunto et al. (2021) find that inflation perception is unaffected by price variations of available goods which are not purchased. This hints that the act of purchase is a necessary condition for inflation to be perceived.
The study of inflation perception is of interest to traditional economists as high levels thereof are associated with high levels of expected inflation (Axelrod et al., 2018). These findings hold when controlling for socio-demographic characteristics (Detmeister et al., 2016). The relationship seems to work both ways, as how inflation is perceived is in part determined by inflation expectations (Blanchflower & MacCoille, 2009). As is often the case in human behaviour, when perception is made into an easy and straightforward process, individuals become better at reporting accurate perceived inflation rates and extrapolating them (Christandl et Gärling, 2015). However, the authors show that introducing even slight complexities reduces the accuracy of reports. This highlights that traditional conceptualisations of economic agents are insufficient to properly understand and predict human behaviour in economic settings. Cognitive approaches need to be imbedded in economists' models to achieve that end. Supporting that argument is the evidence presented by Antonides (2008) indicating that the perceptive process of economic phenomena follows that of physical stimuli. Indeed, correlations between inflation perception and observed inflation rate are uncovered to be congruent with Fechner's law, a psychophysical law describing the perception of physical stimuli.

2.2 Frequency Bias

One explanation which has emerged to explain the tendency to overestimate the inflation rate is the existence of a frequency bias. In the context of inflation, it is defined as the tendency to perceive aggregate inflation rates as being closer than they really are to the inflation rates of

frequently purchased items. In other words, it is the tendency to use frequency weights instead of expenditure weights to compute the inflation rate (Georganas et al., 2014).
Several publications present converging results in favour of the frequency bias. Fluch & Stix (2005) present empirical evidence showing that price changes of frequently purchased goods are more likely to be perceived than that of those purchased less frequently. This finding is substantiated by Jungermann et al. (2007). Congruently, Huber (2011) demonstrates that individuals who experience a higher frequency of price increases report higher levels of perceived inflation compared to those who encounter fewer price increases. Georganas et al. (2014) present experimental data in which participants clearly exhibit the frequency bias in a shopping simulation setting.
Finally, there is evidence suggesting that the frequency bias does not only apply to inflation perception, but also extends to inflation expectations (D'Acunto et al., 2021).

2.3 Socio-Demographic Influences

Inflation perceptions and expectations are influenced by several demographic variables (Bryan & Ventaku, 2001b). Age influences these processes as older individuals tend to have more reserved and optimistic beliefs about inflation (Blanchflower & MacCoille, 2009). A complementary analysis reveals that subjective inflation expectations are strongly and significantly predicted by differences in life-time experiences (Malmendier & Nagel, 2016), hinting that mere age is not sufficient to generate the observed heterogeneity. Another source of heterogeneity in inflation perception is gender, with females typically perceiving inflation as being higher with respect to males' perception (Corduas, 2022). This finding is consistent with research by Bryan & Ventaku (2001a) who show that women have higher perceptions and expectations of inflation. Income also contributes to heterogeneity in perceptions of inflation (Ranyard et al., 2008), with individuals facing financial difficulties congruently reporting higher inflation expectations (Ehrmann et al., 2018). Relatedly, individuals demonstrating higher educational attainments and higher incomes tend to believe in more moderate future inflation paths (Blanchflower & MacCoille, 2009). In essence, the socio-demographic characteristics which tend to lead to overestimations of inflation are being female, young, having low levels of education, and displaying low income levels (Reiche & Meyler, 2022).
Finally, and as reported by Burke & Manz (2014), economic literacy is associated with more accurate perceptions and predictions of inflations, through better selection and processing of information. They further propose that most demographic influences can be explained by differences in economic literacy. This finding is especially interesting when considering that the general population exhibits low levels of inflation literacy (Blanchflower & MacCoille, 2009).

2.4 Information and Social Interactions

As for most processes involving cognition, inflation perceptions and expectations can be biased. One way this can occur is through exposition to information. For instance, Enke (2020) reports a human tendency to neglect information that is not readily and immediately available, *i.e.* information to which individuals are not directly exposed. Alongside this phenomenon, individuals typically undervalue high-quality information and disproportionately prefer certainty-yielding information (Ambuehl & Li, 2018), such that even if there is no neglect, information may not be utilised in an optimal manner. Moreover, belief-updating is shown to be biased in favour of better-than-expected information (Sharot et al., 2011), as compared to worse-than-expected information. Building on these findings, Gesiarz et al. (2019) show that individuals tend to have self-serving beliefs and require less evidence to conclude from information signals which support these beliefs. This phenomenon translates into motivated selection, retention, and usage of information.

Not only are perceptions and beliefs influenced by internal cognitive characteristics, as seen above, but also by the manner in which external information is presented. For instance, stories are typically better retained in memory than statistics, and their effects on beliefs thus fade at a slower pace (Graeber et al., 2024). Crucially, Gärling et al. (2013) show that perception is highly dependent on the narrative, *i.e.* the way information is explained and understood.
One way these narratives are constructed and conveyed is through media coverage (Ehrmann et al., 2018) and exposure (Ranyard et al., 2008). Specifically, the tone adopted by media as well as a given media's type both lead to biased perceptions and expectations. Notably, this media bias is only at play during periods of rising (Lamla & Lein, 2014), high, and volatile inflation (Dräger, 2015).
Armantier et al. (2016) demonstrate that exposing individuals to expert information leads to a revision in inflation expectations. This revision occurs in the direction of the signal, is proportional to its strength, and is more pronounced when the priors are less precise. This is consistent with findings by Carroll (2003) and Lamla & Lein (2014), which respectively show that household inflation forecasts are better when there is more news coverage, and that more media coverage is associated with more and better updating from individuals. Menz & Poppitz (2013) argue that socioeconomic group-specific media consumption, alongside group-specific inflation rates, accounts for the heterogeneity in inflation expectations attributed to age, income, and education.
Cavallo et al. (2017) propose that both experiential information and media information influence individuals in forming their inflation expectations. One interesting conclusion they draw from their study is that information that is costly to understand holds less influence. Though Conrad et al. (2022) support that media type is important in determining perceived and expected inflation, they argue that experiences, rather than media information, influence individual's internal economic model.
Ranyard et al. (2008) propose a conceptual framework for inflation perceptions and expectations. One key factor at play in this framework is social amplification, which is interestingly conceptualised as not only representing the effect of media, but also that of word of mouth. This suggests that social interactions are also determinants of inflation perceptions and expectations, such that mere exposure to information and narratives only partially accounts for the heterogeneity in perceptions. This insight, to the best of the author's knowledge, remains poorly studied.

2.5 Methodological Considerations

Most studies rely on self-reported data. As argued in section 1, these methods are associated with a myriad of limitations which strongly impede the quality of drawn conclusions. A non-exhaustive selection of these limitations follows. This selection does not include the habitual criticism of these methods, but rather some topic-specific findings in the literature.
Blanchflower & MacCoille (2009) report a significant non-response bias in surveys, with the socio-demographic groups most prone to inflation overestimation, as defined above, being most likely not to provide an answer. Additionally, there exists a memory bias (de Bruin et al., 2011) through which respondents' specific thoughts at the time of reporting influence their statements, leading to sizeable heterogeneity. Reported estimates are also affected by how inflation-related questions are worded (de Bruin et al., 2012). Other biasing factors include survey administration mode and the presence or absence of an explicit opportunity to revise one's responses (de Bruin et al., 2017). Measurement tools of inflation perception which do not take into account the psychology of consumers fail to accurately capture the phenomenon (Brachinger et al., 2008), leading to significant inaccuracies in consumer-reported perceptions with respect to their true perceptions.
Despite these limitations, experiment-based literature remains limited on this topic. Huber

(2011), Gärling et al (2013), Burke & Manz (2014), Pfajfar & Zakelj (2014), and Christandl & Gärling (2015) are amongst the few relevant examples.

2.6 Research Question and Hypotheses

In light of the above review of the literature, the present paper will investigate the influences of exposure to inflation-related institutional information and social information on the frequency bias in inflation perception.
Five hypotheses are thus proposed:

- Hypothesis 1: Participants exhibit the frequency bias, in that their reported perception of the aggregate inflation rate are biased towards that of more frequently purchased items.
- Hypothesis 2: Participants exhibit the frequency bias, in that their reported perception of the good-specific inflation rates are biased towards that of more frequently purchased items.
- Hypothesis 3: Institutional information is successful in pushing reported estimates towards the displayed inflation level.
- Hypothesis 4: Social information is successful in pushing reported estimates towards the displayed inflation level, to a larger extent than institutional information.
- Hypothesis 5: When both institutional information and social information are available, social information prevails over institutional information.

The proposed experimental study has two aims. The first is to strengthen the existing experimental evidence for a frequency bias in inflation perception by replicating part of the results from Georganas et al. (2014) which, to the best of the authors' knowledge, hasn't been attempted in the literature yet. The second is to provide new robust experimental evidence for the influence of institutional information on the one hand, and of social amplification on the other, on inflation perception. This second aim is relevant in that it will attempt to provide clean evidence for the factors influencing perception distortions in the context of inflation.

3 Method

3.1 Participants

Thirty-five French adults were invited to participate in person at the Paris experimental economics laboratory (*Laboratoire d'Économie Expérimentale de Paris*). The experiment took place in May 2024 over two sessions. All participants received monetary compensation (*Mean* ≈ 12.19€, *Median* $= 12.06$€, *SD* ≈ 1.56€) comprising a performance-dependent fee on top of a fixed seven *euro* show-up fee.
The sample consists of approximately 48.57% females. The mean age is 43.97 (*Median* $= 41$, *SD* ≈ 18.83). Participants having acquired a degree requiring at least five years of post-high school education constitute 31.43% of the sample, while those having accomplished a degree requiring three or four years of post-high-school education represent 25.71% of the sample, and those having achieved a lesser education to the latter represent 42.86%. The better part (74.29%) of participants reported living in an urban environment, the others either reported living in a suburban or rural environment. Regarding occupational status, the sample is mainly composed of students ($\approx 28.57\%$), employees ($\approx 25.71\%$), and retired participants ($\approx 17.14\%$). Other occupational categories are represented but their proportions are too small to be reported. Approximately 11,43% of participants reported their annual household income to be more than fifty thousand *euros*, 40% reported figures between twenty thousand and forty thousand *euros*, and 48.57% reported figures below twenty thousand *euros*.

3.2 Material

The study was constructed using the oTree framework (Chen et al., 2016).

3.2.1 Framework

The main task of the experiment is a repeated shopping task. The implemented framework is adapted from Georganas et al. (2014). Rounds are framed as a succession of fictitious days i, of which sixteen constitute one fictitious month j. There are sixty-four days i, corresponding to a tetrad of months j. At all times, participants are informed of which experimental day i of which experimental month j they are currently in. Combinations of i and j are hereafter denoted $t \in \{1, 2, \ldots, 64\}$.
Participants are exposed to four types of goods $x \in \{A, B, C, D\}$. This amount allows to introduce some complexity in perception, while not overwhelming the participants. Each good is associated with a different starting price. Good A is the cheapest with a starting mean price in $t = 1$ of 1€, good B is the second cheapest option with a starting mean price of 7€, good C is the second most expensive option with a starting mean price of 125€, and good D is the most expensive option with a starting mean price of 475€. Participants are not explicitly informed of these differentiated amounts.
For each good type, three brands are available $b \in \{1, 2, 3\}$. Brands vary in price on a daily basis. Denote $p^{\text{ref}}_{x,j}$ the reference price described above of a given good x during a given month j and $p_{x,b,t}$ the displayed price for good x and brand b at period t. We have :

$$p_{x,b,t} \in \left[0.9 \cdot p^{\text{ref}}_{x,j}, 1.1 \cdot p^{\text{ref}}_{x,j}\right]$$

No brand dominates another as price variations are such that on average, all brands are equally desirable. Brands are merely a way to introduce variation in price options for each good, and are designed not to capture notions of preference or quality. The present amount of options is introduced to capture the typical empirical availability of multiple options while not overwhelming participants. Instructions for the task include information about the existence of brands and

the price-variability thereof, but neither the exact mechanism nor its parameters are described. Unbeknownst to participants, the prices displayed to participants are subject to inflation. Inflation occurs monthly, which means that the mean price of the monthly basket of goods is stationary within a given month j.
Also cloaked from participants is the fact that the monthly inflation rates are different for each good (though these differentiated rates are the same across experimental conditions). Good A is associated with a 10% inflation rate, good B with a 9% inflation rate, good C with a 7% inflation rate, and good D with a 1% inflation rate. Brands' price variations are introduced to conceal the fact that prices increase throughout the task. Denote π_x the monthly inflation rate for good x. We have :

$$p^{\text{ref}}_{x,j} = \pi_x \cdot p^{\text{ref}}_{x,j-1}$$

Note that goods purchased more frequently are associated with higher inflation rates, though other specifications have been investigated by Georganas et al. (2014).
The final element which is hidden from participants is the fact that the frequency with which each good x must be purchased during a given experimental month is differentiated between goods but constant throughout the task. During the sixteen-day period characterising each month, good A must be purchased seven times, good B must be purchased six times, good C must be purchased twice, and good D must be purchased once. Participants are free not to follow the daily instructions and choose the good x and brand b they please.

3.2.2 Purchasing decisions

The objective of participants in the shopping task is to buy, at each repetition, a given good x at the cheapest available price. Goods x and brands b are displayed in a four-by-three price table in which goods x are displayed along rows and brands b are displayed along columns. At each repetition, participants are instructed to procure a designated good and to opt for the most economical option available. The relevant good x is made salient through a dark red colouring of the letter in the instruction sentence and on the row it is displayed on. Participants are informed that this directive is to be executed within a time constraint of thirty seconds for each period, excluding the initial day for which there is no time constraint in order for participants to familiarise themselves with the interface. After a good and a brand are selected, participants are authorised to move on to the next repetition. If no or incomplete choices have been made before the time constraint expires, then the experiment automatically moves on to the next day. The thirty second time limit is appropriate given the relative simplicity of the task. A new table with different prices is presented daily, and participants are shown which day of which month they are currently in. The sum of each month's purchases are referred to as a "basket". No notion of budget is introduced so as not to render the task a trivial one of value recall and evolution tracking. Figure 1 shows the visual framework of these decisions.

3.2.3 Belief elicitation

Beliefs are elicited at two times in the experiment. The first elicitation occurs after period $t = 32$, *i.e.* when half the repetitions are completed. Participants are asked what they think the total percentage price change of the basket of goods between the first and second month regarding the goods for which they received a purchase recommendation is. The instructions (see *Appendix 2*) read at the beginning of the experiment priorly provided a definition for what a basket is, without informing participants that each month, they are to purchase an identical basket of goods. The amount of detail in the question is necessary to reduce as much as possible the potential differentiated interpretations of what inflation can mean. This question is essentially included to provide a basis for the *social* treatment described in section 3.2.5.
The second elicitation intervenes after all participants have completed period $t = 64$, *i.e.* have

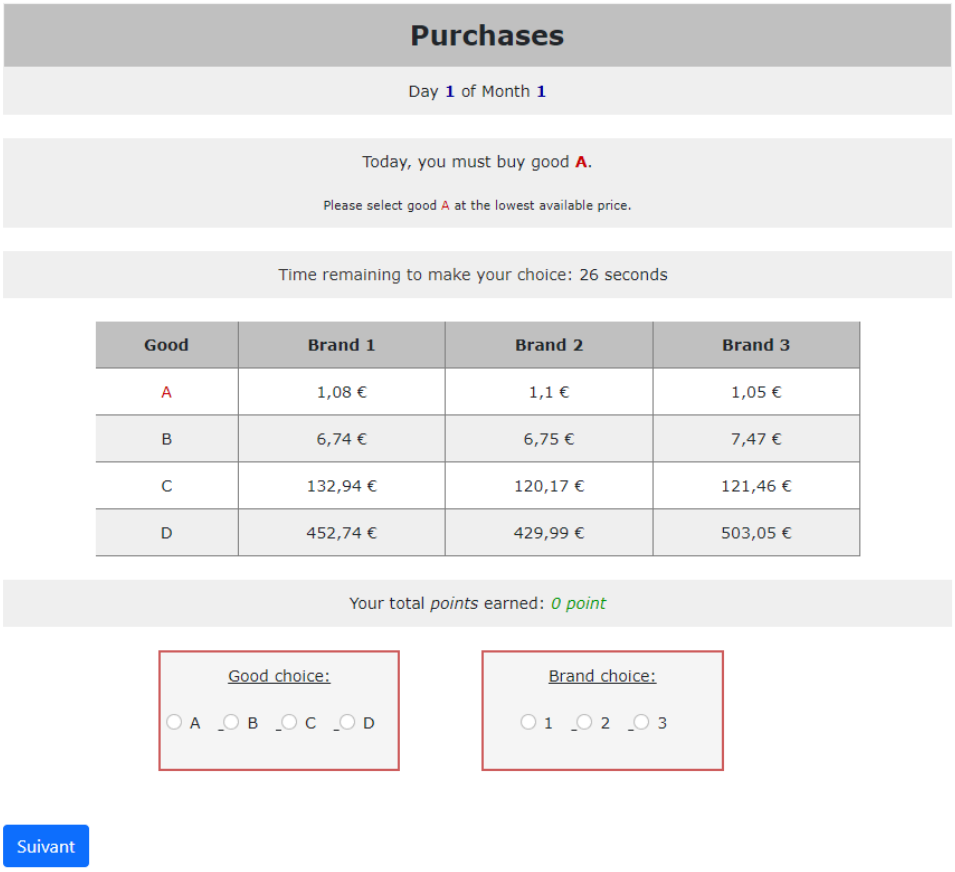

Figure 1: Shopping task visual framework (translated from French).

finished the main task. In a similar fashion to the previous elicitation, they are asked to first report what they think the total percentage price change of the basket of goods between the first and fourth month regarding the goods for which they received a purchase recommendation is. Once they have answered, they are asked to report what they think the total percentage price change of each individual good between the first and fourth month is, and to consider, to that end, the goods for which they received a purchase recommendation.

3.2.4 Incentives

Participants receive a fixed seven *euro* show-up fee. On top of that, their performance is incentivised. Participants have several ways of earning points during the experiment, which are converted to real money at the end of the session at the rate of one *euro* cent per point.

Shopping task
Denote P_t^{shop} the point-payoff associated with repetition t, x_t^{correct} the good selected in accordance with repetition t's instruction, and $x_t^{\text{incorrect}}$ the good selected in discordance with repetition t's instruction. Further denote b_t^{cheap} the cheapest brand at repetition t, $b_t^{\text{intermediate}}$ the intermediately priced brand at repetition t, and $b_t^{\text{expensive}}$ the dearest brand at repetition t. We have:

$$P_t^{\text{shop}} = \begin{cases} 5 & \text{if } x_t^{\text{correct}} \wedge b_t^{\text{cheap}} \\ 3 & \text{if } x_t^{\text{correct}} \wedge b_t^{\text{intermediate}} \\ 1 & \text{if } x_t^{\text{correct}} \wedge b_t^{\text{expensive}} \\ 0 & \text{if } x_t^{\text{incorrect}} \; \forall \; b_t \end{cases}$$

Participants' accumulated points are displayed at all times and updated in real time. The total point-payoff for this part of the experiment is denoted as:

$$P^{\text{shop}} = \sum_{t=1}^{64} P_t^{\text{shop}}$$

Interim beliefs about the basket of goods
Beliefs are rewarded for proximity of the reported inflation rate to the true realised inflation rate for a given participant. Consider P^{interim} the point-payoff associated to the belief about the inflation rate of the basket of goods at month two, B^{interim} a given participant's guess of the two-month basket inflation rate, and π^{interim} the realised inflation rate for that participant after month two. We have:

$$P^{\text{interim}} = 100 - 1000 \left| B^{\text{interim}} - \pi^{\text{interim}} \right|$$

Participants receive one hundred points for a perfectly correct belief and lose ten points from the initial hundred for each percentage point of error, *i.e.* they lose ten cents from the maximum payoff of one *euro* for each percentage point of error.

Beliefs about the basket of goods
Consider P^{basket} the point-payoff associated to the belief about the four-month inflation rate of the basket of goods, B^{basket} the subject's guess of the four-month basket inflation rate and π^{basket} the realised inflation rate for the basket of goods after month four. We have:

$$P^{\text{basket}} = 400 - 1000 \left| B^{\text{basket}} - \pi^{\text{basket}} \right|$$

Participants receive four hundred points for a perfectly correct belief and lose ten points from the initial four hundred for each percentage point of error, *i.e.* they lose ten cents from the maximum payoff of four *euros* for each percentage point of error.

Beliefs about the individual goods
Consider P_x^{good} the point-payoff associated to the belief about the four-month inflation rate of good x, B_x^{good} the subject's guess of the four-month inflation rate of good x and π_x^{good} the realised inflation rate for good x after month four. We have:

$$P_x^{\text{good}} = 100 - 1000 \left| B_x^{\text{good}} - \pi_x^{\text{good}} \right|$$

For each good, participants receive one hundred points for a perfectly correct belief and lose ten points from the initial hundred for each percentage point of error. The total point-payoff for these beliefs are denoted as

$$P^{\text{good}} = \sum_{x \in \{A,B,C,D\}} P_x^{\text{good}}$$

Final payoff
The total payoff of a given participant in this experiment is based on a random draw. Participants are randomly assigned to receive total payoff P_1 or P_2, which are respectively defined as:

$$P_1 = P^{\text{shop}} + P^{\text{interim}} + P^{\text{basket}}$$

$$P_2 = P^{\text{shop}} + P^{\text{interim}} + P^{\text{good}}$$

3.2.5 Treatment conditions

The experiment follows a 2x2 between-subject factorial design. After the shopping task, participants are randomly exposed to one of four treatment conditions for thirty seconds, after which they have to tick a box saying "I have taken note of this information", in order to certify they have taken note of the treatment information. It is assumed that the length of exposure to the information is sufficient to ensure that participants consider it.
The treatment interventions take the form of a textual message. All the treatment interventions are designed to maximise participants' understanding of the information they are given, as any statistical information is difficult to efficiently convey, and especially so for inflation-related information, which could be understood in various different ways depending on media exposure, economic literacy, personal norms, contextual biases, *et cetera*. That is why a special emphasis is put on the characteristics of the information they are given.
The *control* condition exposes participants to the following decoy information: "You have just participated in a shopping simulation which lasted sixty-four days. You have had the occasion to choose products amongst three different brands" (translated from French). This information is irrelevant in that it constitutes a provision of priorly available information and has no *a priori* influence on the subsequent elicitation tasks. It is included to match the cognitive effort related to the other treatment conditions.
In what is called the *institutional* condition, participants are exposed to the following message: "The inflation measurement agency estimates the TOTAL inflation rate from month one to month four to be z. Please note that this signal may or may not be accurate.". Unbeknownst to participants, this figure z is drawn at random from the uniform distribution $[z \times 0.95, z \times 1.05]$ with z the realised inflation rate based on the participant's realised choices during the shopping task. This treatment intervention is made to mimic expert information and assumes that this information is typically accurate, with some margin of error.
In what is called the *social* condition, participants are exposed to the following sentence: "An estimation of the TOTAL inflation rate from month one to month four based on other participants' responses is y. Please note that this signal may or may not be accurate." The figure y is, unbeknownst to participants, based on the responses to the belief elicitation question that took place in the middle of the shopping task. Specifically, using data from all participants regardless of assigned treatment, the average of deviations from the realised inflation rate at month two is computed into an average percentage deviation from the true inflation rate at month two. This percentage deviation is then applied to the realised inflation rate at month four, constituting figure y. One's own estimation is excluded from the computation.
Finally, the so-called *interaction* condition includes information from both *institutional* and *social* treatments.

3.3 Procedure

Participants are read the experiment's instructions (available in *Appendix 2*) aloud by the experimenter while having access to a written copy. They are given an opportunity to privately ask any questions they may have.
The experiment then starts and participants complete the first thirty-two repetitions – two experimental months – of the shopping task, after which they are asked to report their estimation of the two-month inflation rate of the basket of goods. Once this is done, they resume the shopping task where they left off and complete the remaining thirty-two repetitions – experimental months three and four.
When all participants have finished the shopping task, they are randomly exposed to one of the four possible treatment messages. After thirty seconds have elapsed and the box with the "I have taken note of this information" message has been ticked, participants are authorised to

move forward.
Participants proceed to sequentially state their beliefs regarding the realised inflation rate of the basket of goods that they were instructed to purchase during the shopping task and that of each individual good.
Finally, participants are asked to provide demographic information, after which they are shown a breakdown of their performance and their associated gains. Gains are rounded up and privately paid to participants.

4 Results

4.1 Descriptive Analysis

The shopping task appears to have been well understood and its associated purchase recommendations well followed. Indeed, the mean proportion of correct choices, *i.e.* purchases of the recommended good at the lowest available price, throughout the task is 94.1% with only slight noise. Increased variability at the start of the task and after the first mid-task elicitation is observed but remains moderate and short-lived, as show in *Appendix 1*.
Regarding the estimation of the total realised inflation rate between months one and four, despite similar realised inflation rates throughout experimental conditions ($Mean \approx 12.90\%$, $SD \approx 2.53$), substantial heterogeneity is observed in reported inflation estimates (see *Figure 2*). Specifically, the control and institutional groups display respective mean estimates of approx-

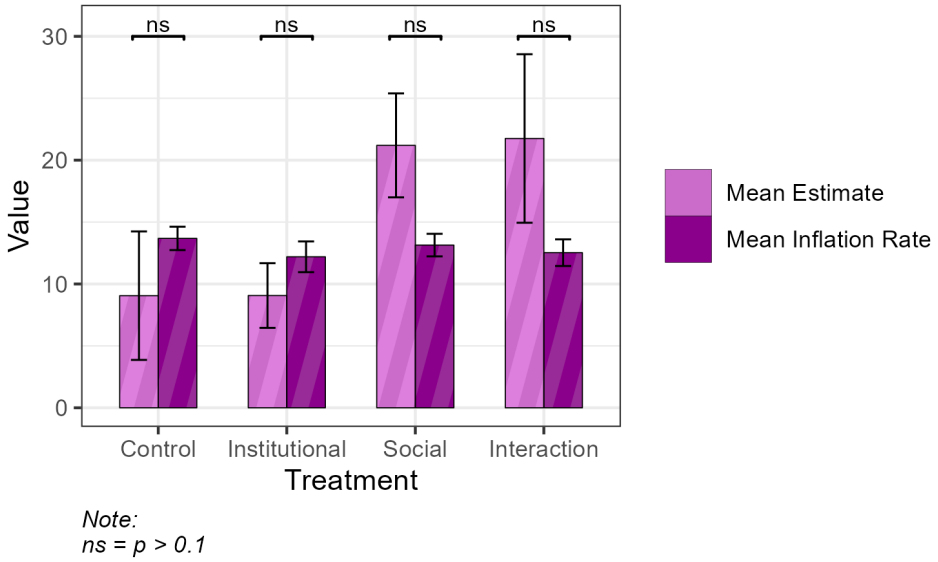

Figure 2: Mean Inflation Estimate and Inflation Rate by Treatment Group.

imately 9.06% ($SD \approx 5.19$) and 9.07% ($SD \approx 2.61$), while that of the social and interaction groups are respectively 21.19% ($SD \approx 4.20$) and 21.75% ($SD \approx 6.81$). Due to the small size of the sample and the paired nature of the data, a set of Wilcoxon Signed-Rank tests are conducted to establish whether the reported inflation estimates of each condition are statistically different from the associated realised inflation rates. The tests are not statistically significant for the control ($V = 9$, $p\text{-}value \approx 0.129$), institutional ($V = 11$, $p\text{-}value \approx 0.203$), social ($V = 37$, $p\text{-}value \approx 0.098$), and interaction ($V = 21$, $p\text{-}value \approx 0.742$) conditions, indicating reported estimates in the general belief elicitation task are not statistically different from the realised inflation rates.
The same analyses are conducted for each good-specific elicitation task. The good-specific realised inflation rates follow the same pattern as those of the total realised inflation rates in that they are stable between experimental conditions, though their level differs between goods (see *Figure 3*). Good A's realised inflation rate between month one and month four is approximately 33.45% ($SD \approx 0.37$). The control group's average reported perceived inflation rate for good A is approximately 6.61% ($SD \approx 1.52$), that of the institutional group is approximately 8.07% ($SD \approx 2.43$), that of the social group is approximately 18.78% ($SD \approx 5.82$), and that of the interaction group is 19% ($SD \approx 10.48$). Wilcoxon Signed-Rank tests reveal that the difference between realised inflation rate and reported estimate thereof is statistically significant at the 1% level for the control ($V = 0$, $p\text{-}value \approx 0.004$) and institutional ($V = 0$, $p\text{-}value \approx 0.004$)

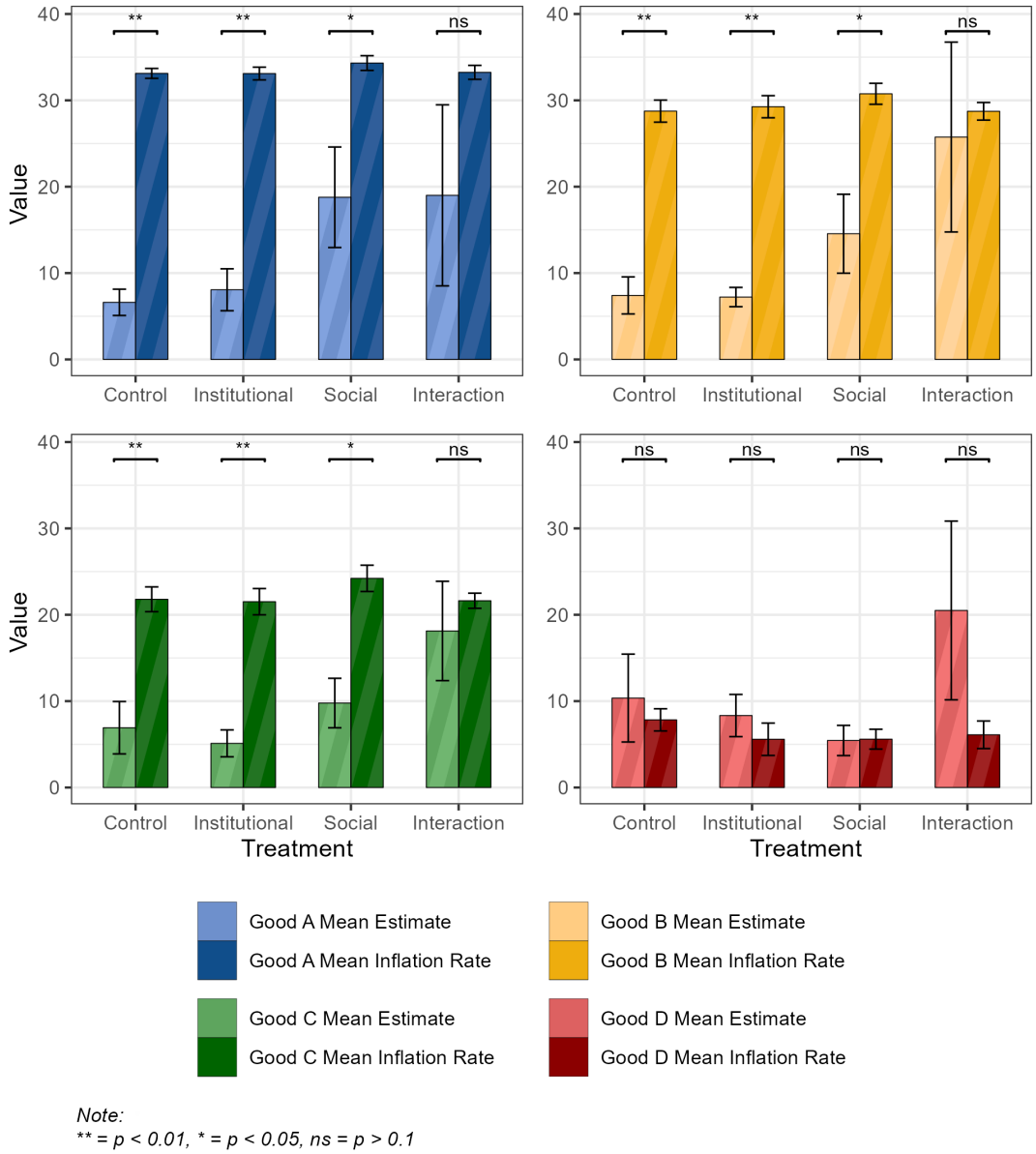

Figure 3: Mean Inflation Estimate and Inflation Rate by Treatment Group and per Good.

conditions, at the 5% level for the social condition ($V = 4$, *p-value* ≈ 0.027), but not for the interaction condition ($V = 8$, *p-value* ≈ 0.195).

Good B's realised inflation rate between month one and month four is approximately 29.39% ($SD \approx 0.60$). The control, institutional, social, and interaction groups' respective average reported perceived inflation rate for good B are approximately 7.41% ($SD \approx 2.14$), 7.22% ($SD \approx 1.12$), 14.55% ($SD \approx 4.57$), and 25.75% ($SD \approx 10.99$). The set of Wilcoxon Signed-Rank tests show that the difference between realised inflation rate and reported estimate thereof is statistically significant at the 1% level for the control ($V = 0$, *p-value* ≈ 0.004) and institutional ($V = 0$, *p-value* ≈ 0.004) conditions, at the 5% level for the social condition ($V = 2$, *p-value* ≈ 0.012), but not for the interaction condition ($V = 15$, *p-value* ≈ 0.742).

Good C's realised inflation rate between month one and month four is approximately 22.31% ($SD \approx 0.69$). The control, institutional, social, and interaction groups' respective average reported perceived inflation rate for good C are approximately 6.92% ($SD \approx 3.03$), 5.11% ($SD \approx 1.56$), 9.78% ($SD \approx 2.87$), and 18.13% ($SD \approx 5.75$). The conducted Wilcoxon Signed-Rank

tests expose that the difference between realised inflation rate and reported estimate thereof is statistically significant at the 1% level for the control ($V = 1$, *p-value* ≈ 0.008) and institutional ($V = 0$, *p-value* ≈ 0.004) conditions, at the 5% level for the social condition ($V = 3$, *p-value* ≈ 0.020), but not for the interaction condition ($V = 14$, *p-value* ≈ 0.641).
Finally, good D's realised inflation rate between month one and month four is approximately 6.28% ($SD \approx 0.73$). The control, institutional, social, and interaction groups' respective average reported perceived inflation rate for good C are approximately 10.36% ($SD \approx 5.09$), 8.33% ($SD \approx 2.44$), 5.44% ($SD \approx 1.75$), and 20.50% ($SD \approx 10.35$). Wilcoxon Signed-Rank tests are not statistically significant for the control ($V = 18$, *p-value* ≈ 0.652), institutional ($V = 29$, *p-value* ≈ 0.496), social ($V = 22$, *p-value* $= 1$), and interaction ($V = 30$, *p-value* ≈ 0.109) conditions.
The treatment information which was presented to participants in the treatment conditions exhibits heterogeneity. The average *institutional* inflation rate is 12.92% ($SD \approx 0.52$) while the average *social* inflation rate is 28.56% ($SD \approx 0.80$).

4.2 Regression Analysis

4.2.1 Frequency Bias

As in Georganas et al. (2014), the frequency bias is computed as the extent to which consumers – here participants – rely on frequency versus expenditure weights for their internal computation of inflation. *Expenditure weights* assign value proportionally to total spending allocated to each expense item, while *frequency weights* assign value based on the purchase frequency of each expense item.
Thus, in this context, the expenditure-weighted inflation rate corresponds to the realised inflation rate between months one and four. The frequency weights are computed using the realised purchase frequencies of each good. For each experimental group, a non-linear least square regression is fitted in which reported – perceived – inflation is modelled as an α-weighted combination of expenditure-weighted and frequency-weighted inflation rates. Thus, the α parameter represents the frequency bias. An α-value of zero is therefore associated with the absence of a frequency bias. Denoting for participant i, π_i^{percep} the reported perceived inflation rate, π_i^{freq} the frequency-weighted inflation rate, and π_i^{exp} the expenditure-weighted inflation rate, the regression models can be expressed as :

$$\pi_i^{\text{percep}} = \alpha \cdot \pi_i^{\text{freq}} + (1 - \alpha) \cdot \pi_i^{\text{exp}}$$

Parameter α is initially assumed to attribute equal weights to both computation methods, before being adjusted by the model's algorithm. The obtained values are available in table 1 and discussed in section 5.

	Experimental Condition			
	Control	Institutional	Social	Interaction
α	-0.271	-0.157	0.548	0.570

Table 1: α Parameter Estimates across Experimental Conditions

4.2.2 Treatment Effects

The analysis hereby conducted consists of linearly regressing the difference – denoted Dif – between the estimation of the inflation rate between months one and four and the realised inflation rate on a factorial variable indicating treatment condition – $Treatment$ – as well as a set of demographic control variables regrouped under ω. Denoting ϵ the error term, we have the

following model for participant i and k demographic variables :

$$Dif_i = \beta_0 + \beta_1 \cdot Treatment_i + \sum_{r=2}^{k+1} \beta_r \cdot \omega_{ir} + \epsilon_i$$

Five regressions are run. The first model is concerned with the difference between the basket of goods' estimated inflation rate and the associated realised inflation rate. The second to fifth models are concerned with the difference between the individual goods' estimated inflation rates and the associated realised inflation rates. The results are presented in table 2.
Due to the restricted sample's constraints, most demographic variables suffer from a lack of variability and representativeness. In an effort to avoid the risk of overfitting associated with the small sample of the study, variables deemed unnecessary are not included in the regressions. In particular, although data relating place of residence, occupational category, and yearly income bracket of participants' households is available, it is highly biased in favour of certain values and is therefore not included as it would introduce significant bias. The remaining variables display sufficient variability and are thus included.
With the exception of good B in the interaction condition, the treatment information was not successful in significantly influencing the difference between the estimation of the inflation rates between months one and four and the associated realised inflation rates. Moreover, the demographic variables are not statistically significant (at relevant levels) predictors of the dependent variable of interest. Tentative explanations and implications for these results are discussed in section 5.

Table 2: Regression Results (Adjusted for Heteroskedasticity)

	Difference between Estimated and Realised Inflation Rate				
	Basket	Good A	Good B	Good C	Good D
	(1)	(2)	(3)	(4)	(5)
Intercept	5.799	−31.599**	−32.443**	−13.650	19.827
	(18.190)	(12.440)	(14.060)	(13.889)	(15.616)
Institutional Treatment	1.671	8.276	5.837	−1.684	−2.595
	(7.927)	(6.762)	(6.975)	(5.919)	(7.417)
Interaction Treatment	14.208	16.186	24.010**	12.032*	10.220
	(8.401)	(12.471)	(10.541)	(6.085)	(9.556)
Social Treatment	7.311	10.267	4.797	−1.833	−9.494
	(8.955)	(6.602)	(7.193)	(6.551)	(7.438)
Age	−0.251	−0.068	0.010	−0.039	−0.317
	(0.220)	(0.142)	(0.172)	(0.180)	(0.202)
Gender	−1.511	−2.187	−2.525	−3.987	−0.748
	(4.402)	(4.995)	(4.892)	(3.820)	(4.343)
Undergraduate Education	−0.736	15.891	16.046	1.362	−8.351
	(10.534)	(13.736)	(9.733)	(7.391)	(8.584)
Master's Education	8.899	8.212	15.504*	8.173	6.435
	(5.860)	(6.293)	(7.609)	(6.092)	(8.041)
Observations	35	35	35	35	35
R^2	0.385	0.266	0.375	0.303	0.310
Adjusted R^2	0.225	0.076	0.214	0.123	0.131
Residual Std. Error (df = 27)	13.158	16.576	15.228	11.471	15.045
F Statistic (df = 7; 27)	2.410**	1.399	2.319*	1.681	1.732
Note:					*p<0.1; **p<0.05; ***p<0.01

5 Discussion

The present paper describes a pilot experimental study, aimed at investigating the frequency bias in inflation perception under exposure to institutional information and to social information. To that end, an experimental framework is derived from Georganas et al. (2014), with additional incorporated elements relating to the provision of information.
Before discussing the findings and commenting on the experimental design and its limitations, one sizeable remark must be made about the results. As the reported experiment is a pilot study, the sample size is quite inadequate to derive any meaningful conclusions about either the uncovered effects, trends, or their statistical significance. Nevertheless, a discussion about the findings is offered below, alongside a preliminary exploration of potential findings under proper sampling circumstances and implications thereof.

5.1 On Descriptive Findings

The observed aggregate inflation rates, as well as those of each specific good, are not only very close in absolute terms, but also statistically identical across experimental conditions. This comes logically from the treatment intervention occurring after the shopping task. More interestingly, some heterogeneity is observed in reported inflation estimates across conditions. Regarding the estimates of the aggregate inflation rates, no statistical differences emerge, and thus all hypotheses are rejected for this category. The trends seem to indicate that the results may be different under a properly sized sample, with some under-estimation of the inflation rate when no additional information is provided, as well as when institutional information is provided. This would be a surprising finding going against existing literature. Should this effect prove to exist, one explanation may lie in some awareness of this frequency effect by participants resulting in downwards over-adjustment to report what may seem to be a more realistic inflation rate. An alternative explanation to explore could be related to narratives. This supposition finds its source in that, at the time the study was being conducted, the high rate of inflation, had been – and continued to be – a predominant topic covered regularly in most media. For two years prior to the experiment, reports (INSEE-sourced) conveyed figures revolving around a 5% to 7% aggregate inflation rate. Although these rates were now on a downward trend, oscillating above 2%, the high inflation narrative was still very much being put forward. In this experimental specification, the inflation rate was quite high for a French sample, such that a downwards adjustment may have occurred towards the priorly-known narrative-coherent information of a high 5% to 7% aggregate inflation rate, congruently with Cavallo et al. (2017). Further speculations include that, conditional on a statistical significance emerging from a properly sized sample, it seems that participants may have adjusted their reports in the direction of the provided social information, even though this led them away from the realised inflation rate. This may indicate a susceptibility to social information, with partial or absent regard towards its veracity. Complementarily, or perhaps contradictorily, the observed trend may indicate the occurrence, or absence, of the frequency bias occurring under this treatment condition. If this was to be the case, it would be necessary to determine the statistical relationship between the group's estimates and those of the control group, in an effort to disentangle whether this is merely the usual frequency bias at play, or if the social dimension amplifies or diminishes the effect. Additionally, the interaction group displays a similar trend to the social group, but with more variability. Again, if this were to be confirmed, an investigation into whether the multiplicity of information increases uncertainty and thus variability in reports, or if perhaps the estimates are drawn towards either the real inflation rate, the institutional information, or the social information.
Regarding the individual goods' estimates, the data indicates significant heterogeneity across

experimental conditions. In the control condition, all goods exhibit reported estimates that are statistically significantly lower than the corresponding realised inflation rates, with the exception of good D for which there is no difference. This points towards participants not being subject to the frequency bias. However, for these goods, the reported estimates of the inflation rate are all quite close and overall rather similar, in terms both of absolute value and data variability. This may indicate that another phenomenon is at play. It may be that, given the limited cognitive abilities of participants and a conjectured lack of attention given to the evolution of prices throughout the shopping task, participants struggled to accurately form their beliefs, and instead found anchoring in prior exposition to narratively coherent information associated with values between 5% and 7%. Should this prove to be the case, it would suggest the existence of context-dependent switching among biases and heuristics. This would come in support of the cognitive theory proposed by Bordalo et al. (2024). The reason behind the lack of a significant difference for good D may lie in the lower inflation rate associated with this good, leading to coincidental proximity between realised and estimated inflation rates. Alternatively, it may be that expensive goods' prices and their associated variations were not perceived the same way by participants (Jungermann et al., 2007), perhaps due to their lower purchase frequency.

The data for the institutional treatment condition exhibits values, trends, and significance levels extremely close to those of the control condition, indicating that either institutional information has intrinsically no effect on inflation perception-related beliefs, which would be surprising, or rather that the experimental treatment was not successful in replicating the attributes and thus influence of real-life expert information. In any case, an analysis similar to the one conducted for the control condition can be performed for this experimental condition.

The social experimental condition is associated with significant differences between realised inflation rates and reported estimates for all goods but good D. This last good's estimate is instead in line with the realised rate, which may be due to correct perception by participants of the inflation rate for this expensive good, which implies an insensitivity to the biasing effect of the social information. This finding, should it be confirmed, would enrich the understanding of the differences in perception and biasing influences thereon between cheap and expensive items. However, as for all the results presented here, there is currently not enough evidence to convincingly reject or not any explanation. For the other three goods, as for the control and institutional conditions, the estimates are systematically lower than the realised rates, indicating the absence of a frequency bias. The above-mentioned tentative explanations for this observation hold here. Some further speculations can be added. The trends seem to indicate that, especially for goods A and B which are quite markedly cheaper than the others, the estimates for this experimental condition are higher than those of the control group, such that even though the frequency bias was not observed, there was still some adjustment towards the provided treatment information. As in the aggregate analysis, this may hint at an influence of social information and amplification on perceptions and beliefs.

The interaction experimental condition lacks significance in differences between realised and estimated inflation rates for all goods. This is in part due to very high levels of variability of the estimates, both in absolute terms and relatively to the other groups' estimates. This variability most likely follows from the inconsistency between the provided institutional and social information, and the resulting struggle to reconcile one's perception and contradictory information. Depending on what data a proper sample may yield, a persistent high variability of the data may indicate that different people prefer to rely on different sources of information. Should this phenomenon be confirmed, an investigation aimed at understanding the determinants of this reliance on different sources of information could be conducted.

5.2 On the Frequency Bias

The α-values describing the magnitude of the frequency bias (table 1) stem from a segregated analysis based on the nature of the information exposed to participants. The social and interaction α-estimates show that participants' perceived inflation evaluations attribute nearly equal weights to frequency-weighted and expenditure-weighted inflation, with a slight bias towards the use of frequency-weights. As these estimates capture the influence of treatment-dependent exposure to information, they only make sense in relative terms compared to other conditions, and especially to the control condition. The control and institutional α-estimates are both negative, with that of the former being double that of the latter. This is explained by participants' reported inflation rates not lying in-between the expenditure-weighted (lower bound) and the frequency-weighted (higher bound) inflation rates, but instead lying below those. In fact, these results support the tentative explanations for the low estimates of participants as compared to the observed inflation rates described in section 5.1. Indeed, they suggest that another phenomenon pulls the estimates towards values lower than those of the expenditure-weighted inflation rate, instead of being pushed up towards the frequency-weighted inflation rate. Consequently, it is difficult to disentangle the effect of the frequency bias from that of information, as the reference groups are clearly influenced by an unaccounted-for phenomenon. Nevertheless, it can be preliminarily observed that being exposed to social information may yield more frequency weight use. This may come from an amplification effect in that social information may itself be based on frequency weights rather than on expenditure ones.
The authors recognise that they did not expect this yet unidentified third variable to come into play, and thus further work is needed to establish a suitable analysis protocol on this topic.

5.3 On the Regressed Treatment Effects

The experimental design features four experimental conditions, such that the sample is critically undersized and no robust effect can be uncovered with any precision or rigour. Correspondingly, the regressions were run while omitting some collected demographic variables due to extremely unbalanced distributions of responses and thus high risks of considerable biasing. In this context, it is not surprising that nearly all estimates are not statistically significant. Indeed, none of the treatments nor any of the demographic variables had any significant effect on the difference between the estimated and realised aggregate inflation rate. The same observation can be made regarding the regressions ran for goods A and D. Goods B and C displayed a significant effect on the difference between estimated and realised inflation rate only of the interaction treatment information. While this may hint at a real underlying effect of multiplicity of information and sources thereof, the sample is simply too small to conclude. It may be that there are indeed no overall significant effects of information provision on the differences between estimated and realised inflation rates when controlling for demographic variables, but it cannot be soundly argued that some effects would not emerge given a properly sized sample.

5.4 On Limitations

As insisted upon numerous times, the main limitation of the study is its small-sized sample which prevented the authors from deriving proper rigorous results from the data, such that all discussions are speculative and interim.
As for the experimental design itself, certain intrinsic limitations must be noted. First and perhaps foremost, the external validity of results found under laboratory experimental circumstances may be discussed. Indeed, participants were placed in a simple, controlled, and sterile environment which does not correspond to real-life situations. This is done in order to obtain clean evidence for which no external factor may bias the results. Indeed, while visceral factors,

music, financial situation, and a plethora of other factors may influence one's real life behaviour and decisions, behavioural regularities cannot be rigorously extracted from noisy data, such that the external validity issue is mitigated. Should some statistically significant regularities be observed, further research may be contemplated to study additional influences of external factors on choices.

Second, the way the treatment information is provided is debatable. The institutional information was not successful in replicating the effect of real life *expert* information, as participants seemingly did not believe in the information they were provided with. This may be due to a lack of known stature or social validation of the described institution responsible for providing the institutional information. Future implementations should consider modifying this treatment's design. The social information, though it seems to have had some effect, was not ideally provisioned. In an effort to comply with proper experimental practices such as not deceiving participants with falsified information, a way to provide social information that was not untruthful had to be conceived. Thus, the intermediate belief elicitation was devised and an extrapolation was computed. Although particular efforts were provided to convey the mechanism clearly, it may have led to a detachment with the attributes of real social information and amplification. Future work should consider modifications to this treatment's design as well.

Third, it may be that, because of the interim belief elicitation, participants paid closer attention to the rate of inflation of goods than intended. This was not controlled for ex-post. This is an issue in the sense that it may create differences in perceptive processes at play between the first and second halves of the shopping task. It is however mitigated by the fact that all participants were exposed to the interim belief elicitation task at the same time, such that comparability is maintained, and also by the fact that it does not necessarily constitute a violation of empirical perceptive processes. This issue is an extension of the constraints related to providing truthful social information, thereby reaffirming the need for more work to provide a satisfactory intervention of social information.

6 Conclusion and Avenues for Future Research

A pilot experimental study is here conducted to investigate the frequency bias in inflation perception under exposure to institutional – expert – information and to social information. It includes a repeated shopping task, punctuated and followed by belief elicitation tasks regarding the perceived inflation rates of the basket of selected goods, as well as those of the individual goods. To investigate informational influences, four treatment groups were implemented following a between-subject design, each providing differentiated information.
This pilot study suffers from an inadequately-sized sample, which hinders the authors from reporting any conclusive and clear-cut findings. However, some trends seem to emerge, most crucially about the absence of a frequency bias in the data. It seems that another phenomenon may have been at play in influencing inflation perception and beliefs. Speculations point at either some knowledge of the bias resulting in downwards over-adjustments by participants, or an external influence of prior narrative information.
Further work should start by conducting a similar study with a proper sample size, alongside including some potential adjustments to the experimental design. More generally, future research could include exploring the external validity of experimental findings on inflation perception in real-world settings and its effects on other processes such as budget management. While laboratory experiments are tailored to isolate mechanisms, they fail to capture the full complexity of real-life decision-making. Factors such as media and narrative influences, social interactions, and individual financial literacy can – and should – be accounted for in experimental settings, as they likely significantly shape how inflation is perceived and, consequently, how associated behaviours are carried out. Longitudinal studies could offer deeper insights into how inflation perception evolves over time and how individuals adjust their behavioural strategies accordingly. Furthermore, investigating more deeply the role of cognitive biases in inflation-related perception, beliefs, and decision-making could provide valuable insights which could, in turn, help design interventions aimed at correcting beliefs, reducing behavioural inefficiencies, or improving budget management, particularly during inflationary periods. Finally, the interactions between inflation perception, beliefs, and expectations is to date understudied and deserves more attention. Overall, more experimental research is needed to properly and rigorously investigate inflation-related processes.

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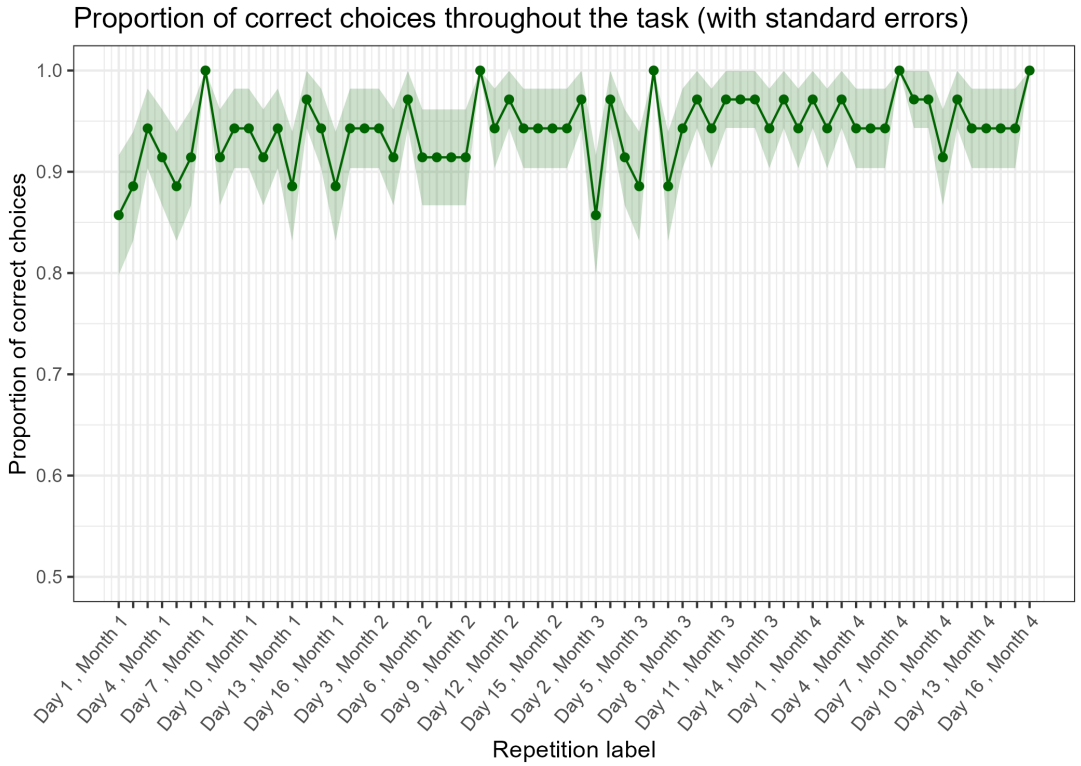
Appendix

Appendix 1: Payoff Evolution Throughout Experimental Rounds



Appendix 2: Instructions (translated from French)

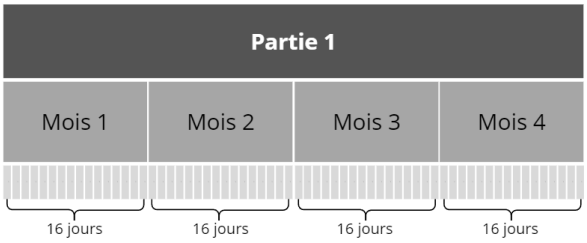
Appendix 2.1: Part 1.1 - Initial Instructions

Welcome to this experiment.
You are currently taking part in a scientific study in which the amount of money you earn is linked to the decisions you make. All your answers will remain confidential and anonymous.

The study consists of three parts.

We will now read the instructions for part 1.
The instructions for parts 2 and 3 will be read in due course.

You will carry out a task, which will be explained to you shortly, over several periods. Each period is called a 'day'. Every sixteen days, a 'month' will pass. This part of the experiment lasts four months, or 64 days. Each day, you will be asked to perform the task.
A visual summary of how the first part works is available below.



Each day, you will be asked to choose one of **four available goods**, called 'A', 'B', 'C' and 'D'. For each good, **three brands** are available, called '1', '2' and '3'. Each day, the prices of each good and each brand will change.

Each day, a message will ask you to select a specific good at the lowest possible price. Your task is to **correctly select the good you are asked** and to **choose the cheapest option**.

The table on which you will have to perform the task will look like the one below.

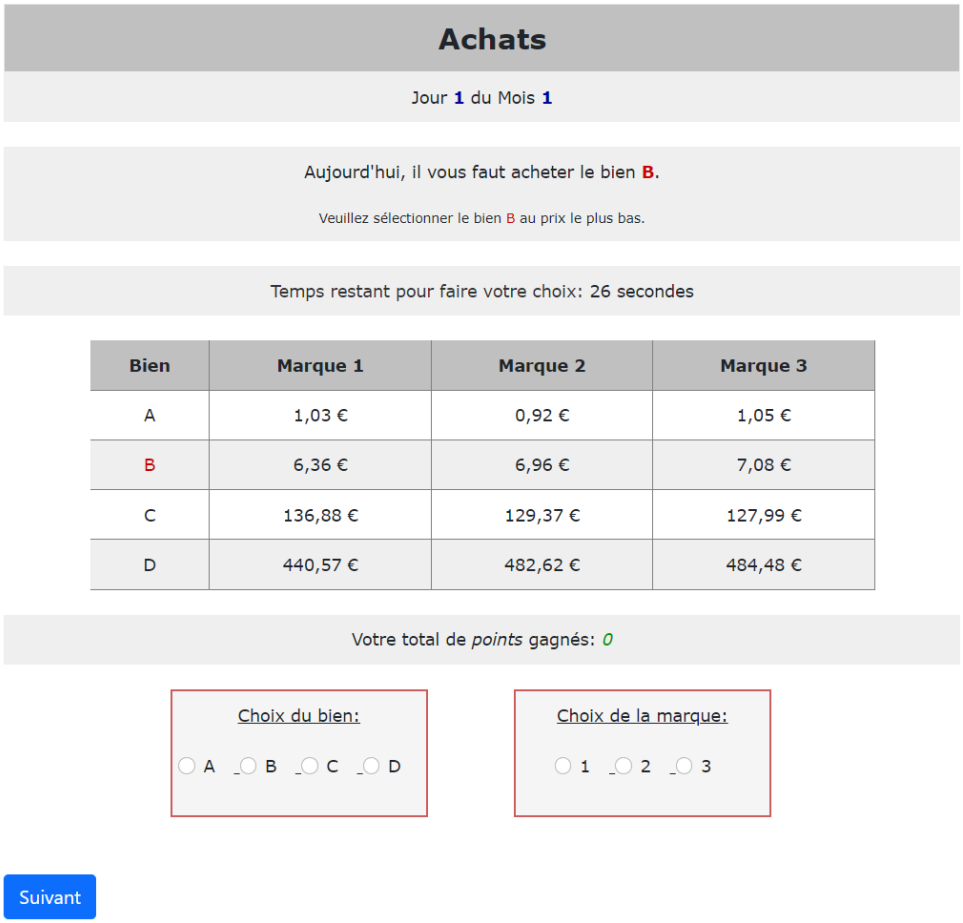
Bien	Marque 1	Marque 2	Marque 3
A	1,03 €	0,92 €	1,05 €
B	6,36 €	6,96 €	7,08 €
C	136,88 €	129,37 €	127,99 €
D	440,57 €	482,62 €	484,48 €

The rows of the table represent goods 'A', 'B', 'C' and 'D'. The columns in the table represent brands '1', '2' and '3'.

Each day, you will have **30 seconds** to select a good. Once you will have clicked on one of the goods, press the 'Next' button for the day to end and the next day to begin. At each point in this part of the experience, you'll know which day of the month you are on.
All the products you buy in the course of a month are called a **basket of goods**.
Be careful! The product you are asked to choose at the lowest price may or may not change from one day to the next.

We'll now look at an example.

Each day, your screen will look like the one below.



In this example, your task is to buy good 'B', which is highlighted in red, at the lowest available price. In this example, the cheapest option is brand '1', with a price of €6.36.
Once you have made your decision, you must click on the buttons corresponding to the brand and price you've chosen.

Once this is done that, click on 'Next' to move on to the next day. Be sure to follow the instructions provided for each day carefully.

After two experimental months, you will be asked to answer a question regarding your experience of the task so far. Further instructions will be given when the time comes.

In this experiment, you will have the opportunity to earn money. During the experiment, you will earn a certain amount of a fictitious currency called *points*, which will be converted into euros automatically at the end of the session. For the conversion, 1 *point* is equal to €0.01, which means that 100 *points* represent a monetary gain of €1. Please note that the amount of money you earn depends on your performance during the experiment.

In the first part of the experiment we have just described, your earnings will be as follows.

- If you choose the **correct good** at the **lowest price**, you will earn 5 *points* for that day.
- If you choose the **correct good** at the **second lowest price**, you will earn 3 *points* for that day.
- If you choose the **correct good** at the **highest price**, you will earn 1 *point* for that day.
- If you choose the **incorrect good**, you will earn 0 *points* for that day, regardless of the price.

Bien	Marque 1	Marque 2	Marque 3
A	1,03 €	0,92 €	1,05 €
B	6,36 €	6,96 €	7,08 €
C	136,88 €	129,37 €	127,99 €
D	440,57 €	482,62 €	484,48 €

In the example above, choosing good 'B' with brand '1', which is the correct answer at the lowest price, will give you 5 *points*. Choosing 'B' with brand '2', which is the correct answer at the second lowest price, will give you 3 *points*. Choosing 'B' with brand '3', which is the correct answer at the most expensive price, will give you 1 point. Choosing another option or not making a choice before the end of the 30 seconds will give you 0 *points*.

For the additional task, you may also earn money, more details will be provided when the time comes.
In addition to your personal earnings, you will receive a fixed amount of €7 for taking part in the experiment. Your personal earnings will be given to you in cash at the end of the experiment.

Finally, during the experiment, it is imperative that you do not communicate with the other participants and that you do not consult any support external to the experiment. If you do not respect this rule, you may be asked to leave the experiment and the money you have won will be withdrawn.

If you have any questions, please raise your hand and someone will come and answer you individually.

Appendix 2.2: Part 1.2 - Interim Belief Elicitation Instructions

In this part, the instructions are displayed on your screen. Please read them carefully.
If you have any questions, please raise your hand.

On the next page, you will be asked a question related to the variation in the price of the basket of goods you were recommended to buy over the first two months. Please indicate your answer as a percentage.
In other words, if you think the price of the basket has risen by 3%, please enter '3' in the provided field. If you think the basket price has decreased by 3%, please enter '-3' in the provided field.

You can earn up to 100 *points* by answering the next question. 100 *points* will be awarded

if your estimate corresponds exactly with the observed variation in the price of the basket of goods.
For each percentage point by which your estimate differs from the observed variation, you will lose 10 *points* of the 100 available. Please note that the minimum gain is 0 *points*, such that you cannot lose any *points*.
For example, if you estimate that the basket price has risen by 15%, but it has actually risen by 17%, you will earn 80 *points*.

Appendix 2.3: Part 2.1 - Treatment Information Instructions

In this part, the instructions are displayed on your screen. Please read them carefully.
If you have any questions, please raise your hand.

In this part of the experiment, you will be shown a message for 30 seconds. Please read it carefully. Once the 30 seconds have elapsed, you may move on to the next part.

Appendix 2.4: Part 2.2 - Aggregate Inflation Belief Elicitation Instructions

In this part of the experiment, you will be asked to answer questions related to the first part of the experiment. You will have two tasks to complete. You will earn *points* for both tasks, but only one of them will be selected for payment at the end of the session.
The first task will be to indicate what you think is the TOTAL percentage change in the price of the basket of goods you have been recommended to buy between the first and fourth month. You should write your estimate directly in percentages. For example, if you think that the TOTAL percentage change in the basket of goods between the first and fourth month was 2%, you should write '2' in the answer field.

You can earn *points* for this task. If your estimate corresponds exactly to the percentage change in the price of the basket of goods from the first to the fourth month, you will earn 400 *points*. For each percentage point by which your estimate differs from the true percentage variation in the price of the basket of goods from the first to the fourth month, you will lose 10 *points* out of the initial 400. Please note that you cannot earn less than 0 *points* in this task.
For example, if you answer with '2'% and the actual variation is 10%, you will earn 320 *points*.

Instructions for the second task will be provided once you have completed the first task. If you have any questions, please raise your hand.

Appendix 2.5: Part 2.3 - Good-Specific Inflation Belief Elicitation Instructions

The second task will be to indicate what you believe to be the TOTAL percentage change in the price of EACH good you were recommended to buy between the first and fourth month. This means that you will have to answer four questions, one for good A, one for good B, one for good C and one for good D. You must write your estimate directly in percentages, as in the previous tasks.
For example, if you think that the TOTAL percentage change in good 'A' between the first and fourth month was 11%, you should enter '11' in the answer field.

You can earn points for this task. As a reminder, either this task or the previous one will be selected for your payment, but not both. If your estimate corresponds exactly to the percentage change in the price of a given good between the first and fourth month, you'll earn 100 points. As there are four goods, you can earn a maximum of 400 points in this task. For each

percentage point by which your estimate differs from the true percentage change in the price of the good from the first to the fourth month, you will lose 10 points out of the initial 100. Please note that you cannot earn less than 0 *points* in this task.

If you have any questions, please raise your hand.