



Price salience in opinion polls and observed behavior: The case of Spanish cinema



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ABSTRACT

In the market system, a necessary condition for equilibrium is that prices convey all relevant information. However, apparently biased responses about prices in survey polls may cast doubt on the way consumers understand prices. It has been argued that survey answers, based on salient aspects of products, are mostly driven by intuition and may be inaccurate. To investigate this, we take advantage of a VAT rise on cultural products that took place in Spain in 2012. Cinema prices were expected to increase substantially, but the tax was eventually absorbed by exhibitors, keeping average prices unchanged. Using the Spanish Survey on Cultural Habits and Practices (2010–2011 and 2014–2015), we find that, as price salience increased, declared concern with prices rose. However, average prices did not change and cinema attendance, which involves more deliberation, remained stable. Therefore, expenditure decisions, grounded on reflective thinking, rule out potentially biased elements of price perceptions.

1. Introduction

Opinion polls have been an extensively used source of information and new data for researchers. However, the utility of the data gathered through opinion polls relies on multiple characteristics of the questionnaires and the respondents. Numerous sources of response bias can be listed. Some of these come from the questionnaire itself, such as framing effects or default options, while others correspond to the respondents who, intentionally or not, misreport information by adapting their answers to their interests (as in protest responses) or due to heuristics, biases and external factors. In any case, given that responses can voluntarily and/or unintentionally deviate from the truth, consumers' behavior is not necessarily in line with their survey responses. As a consequence, survey outcomes should be interpreted with caution.

The market system has often been described as an efficient mechanism for transferring relevant information between sellers and buyers. Prices are the essential mechanism that conveys all the necessary economic information in markets. However, since the earliest research on consumers' price perceptions, questions have been raised about consumers' ability to appropriately perceive prices. Indeed, consumers have enormous difficulties recalling prices properly and they are also limited when it comes to noticing and weighing price changes (Dickson and Sawyer, 1990). Perceptions on price changes are frequently based on

feelings and general knowledge rather than on solid facts (Christandl et al., 2011). The simple act of thinking about specific price changes makes individuals report higher inflation expectations (Bruine de Bruin et al., 2011). Also, memory shapes valuations since events trigger the recall of similar past experiences (Kahneman and Miller, 1986). In sum, consumer attention is usually drawn to the most salient aspects of products (Bordalo et al., 2013) and individuals are more likely to recall information which is consistent with their initial preferences, expectations, or beliefs (Lightle, 2016).

Price, as the main information mechanism, can be considered the most salient attribute of any product. However, consumers' perceptions of prices may be tainted if price salience is affected by misleading factors. In this research, we analyze responses to an opinion poll on cultural consumption conducted before and after a high increase in cinema value added tax (VAT). Although cinema prices were expected to increase substantially, and hence the salience of price, the tax rise was not shifted to consumers. In fact, the impact of the VAT increase was absorbed by exhibitors, with average prices remaining almost unchanged.

This increase in the VAT for cultural products took place in 2012 in Spain; just between two waves of the Spanish Survey of Cultural Habits and Practices (SSCHP 2010–11 and 2014–15). Using this survey, we analyze how consumers reacted to questions on the new prices and compare these responses with their declared consumption. The tax

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change received a hostile reaction in the mass media and was followed by several price discount campaigns from the supply side to offset the decline in demand. In this context, price salience increased while average prices remained stable. As a result, in the 2014–15 wave of the SSCHP, far more people stated that prices were the main limit to cinema consumption. This illustrated that individuals centred their focus on prices due to the new tax, the new price menus and the media campaign, all of which sharpened price salience. These events may have led to a negative opinion about prices, but observed cinema demand remained stable. These results are in line with [Wichman \(2014\)](#), who found that people react to average prices, regardless of their price perceptions.

Hence, answers to questions evaluating the importance of prices are probably (un)intentionally biased. Following [Kahneman et al. \(2011\)](#), immediate perception of prices, being intuitive, is linked to the use of heuristics and influenced by cognitive biases. These heuristics are conditioned by the most salient traits of products, which can also explain people's perceptions of prices ([Bordalo et al., 2013](#)). However, answers about behavior do not necessarily deviate from the truth. When making economic decisions, deliberative reflection emerges ([Kahneman et al., 2011](#)), which explains why individuals' behavior is more consistent with the expected demand of classical economic models.

In line with these arguments, we find that increases in price salience following the tax change led to greater declared concern about prices. However, since average prices did not change, cinema attendance, as expected, remained stable. Therefore, expenditure decisions, mainly based on reflective thinking, were not affected by potentially biased elements of price perceptions.

The remainder of this paper is structured as follows. Section 2 provides an overview of the literature. Section 3 focuses on the contextual framework of our analysis. The methods: data base and methodology are described in Section 4 and the results are presented in Section 5. In Section 6 we discuss the main results and conclude.

2. Literature review

Human behavior is often driven by multiple heuristics which can cause individuals' behavior to deviate from the rationality expected in theoretical models. The use of heuristics depends on the mode of thinking, which in turn is related to the type of choice. Depending on the mode of thinking, [Kahneman et al. \(2011\)](#) studied two different ways in which people process decisions: reflective and intuitive. The reflective mode of thinking is slower, effortful, and deliberative, and requires conscious focus on the issue. This mode is habitually activated when the risks associated with the decision are high, when the decision is important, or when deep reasoning is required. In the intuitive mode of thinking, on the other hand, impressions, associations, feelings, intentions and preparations for action flow naturally, allowing us to do things simultaneously without paying special attention to each action separately and without consciously focusing on how to do them. It develops a simplified understanding of reality that suppresses alternative complex options, and this can lead us astray. Most of the time, people use intuitive thinking in daily choices, using numerous heuristics to simplify decision making. However, the potential inaccuracy of this type of reasoning leads to cognitive biases, i.e., imprecise ways of perceiving reality.

Answering opinion polls could be perceived as a low-risk decision where intuitive reasoning may be preferred, with responses often being subject to biases ([Bruine de Bruin et al., 2011](#); [Caputo et al., 2018](#)). In this regard, we study potential response bias in polls that include questions on prices. Economists have long tried to understand the influence that price sensations - the feeling that a product is cheap or expensive - have on consumers' decisions. In a context of price changes, price salience may be exaggerated. Consumers make choices not only according to effective daily prices but also by taking into consideration their subjective beliefs on inflation ([Armantier et al., 2015](#)). Similarly, price trend perceptions are affected by expectations, even if real prices remain stable

([Greitemeyer et al., 2005](#)). In sum, several events influence peoples' perception of changes in prices, such as experiences of previous price changes, expectations with regard to inflation, social amplification of price changes and personal and social attitudes towards inflation ([Ranyard et al., 2008](#)).

2.1. The use of intuitive thinking

If individuals are ruled by intuitive thinking when evaluating prices, their declarations will likely be influenced by several biases. In our case, anchoring bias, conservatism bias, recency effect, bandwagon effect and illusory truth effect, which are discussed below, seem to be the most relevant ones.

Anchoring bias ([Tversky and Kahnemann, 1974](#)) explains that people solve problems by setting a starting point and then adjusting from it to generate the final decision. There is a human tendency to anchor first-sight information, and once the anchor is set, the remaining judgments are made by adjusting away from that anchor. Additional information around the anchor is usually inaccurately evaluated, which results in insufficient adjustments ([Laibson and Zeckhauser, 1998](#)).

The bandwagon effect refers to a phenomenon where the rate of approval of some belief increases as a function of its acceptance by others, so that the probability of individual adoption increases with the proportion of the relevant population who have already adopted ([Colman, 2003](#)). As a result, some individual choices have their roots in information gathered by others. Such behavior explains why some people ignore their personal preferences and adopt those of other people, so that individual preference for a product increases as its purchases rise ([Leibenstein, 1950](#)).

Another important issue is when price changes come from a rise in taxation. Although people dislike paying taxes, [Chetty et al. \(2009\)](#) argue that consumers tend to underreact to taxes that are not salient. Tax aversion behavior with the sole purpose of reducing tax payments could even imply making choices that reduce individuals' overall wealth ([Blaufuss and Möhlman, 2014](#)), and individuals show a stronger preference for avoiding tax-related costs than costs of a similar magnitude not related to taxation ([Sussman and Olivola, 2011](#)). In addition, price sensitivity is higher for price changes above the price of reference ([Caputo et al., 2018](#)). When people take standard prices before the tax change as their reference and compare them to prices after changes, not considering discounts, they react more adversely. Moreover, mass media campaigns against tax rises in the news have a strong effect given that mass media tend to pay special attention to bad economic news. Additionally, media and word of mouth also affect peoples' price perceptions ([Ranyard et al., 2008](#)).

2.2. Response bias

Opinion poll responses often contain some specific biases since surveys are not conducted in a vacuum ([Caputo et al., 2018](#)). One source of unintentional response bias is the inaccuracy of memory. People are supposed to recall prices based on previous experiences or knowledge, but this recall is imprecise because of both the limited capacity of memory and the complexity of price ticket tariffs. Reported information is also affected by the mood of the respondent or by the level of satisfaction, as in hedonic recall bias ([Prati, 2017](#)), so dissatisfaction with current pricing could lead to over-estimation of prices. Also, how individuals link the price rise to their previous experiences of inflation can deviate responses both upwards or downwards. Another source of bias is framing, since, for instance, question wording produces relevant biases in consumer's reported inflation ([Bruine de Bruin et al., 2011](#)). There is an attractiveness to the default option, as has been found for electricity products by [Kaenzig et al. \(2013\)](#). Similarly, individuals tend to take the path of least resistance (see, for example, [Baker et al., 2007](#)).

Furthermore, the memory-attention model ([Bordalo et al., 2020](#)) explains that memory shapes valuations in two ways. First, events trigger

Table 1
Cinema prices in Spain, 2010–2014.

Year	Weekday	Spectators' day	Weekends
2010	6.35 €	5.14 €	6.50 €
2012	7.08 €	5.74 €	7.24 €
2014	6.96 €	4.72 €	7.22 €

Source: FACUA Consumers in Action

the recall of similar past experiences which are consolidated into norms and the evaluation of similar events is anchored to these norms (Kahneman and Miller, 1986). Second, consumer attention is drawn to the most salient aspects in the choice context, which can also explain people's perceptions on prices (Bordalo et al., 2013).

3. Case study

To shed light on the effect of price changes on price salience and its impact on behavior, we focus on the cinema market in Spain. In 2012, between the two Spanish Surveys of Cultural Habits and Practices (SSCHP) conducted in periods 2010–11 and 2014–15, the VAT for cultural products rose by 13 percentage points from 8 to 21 percent. This VAT increase generated a huge mass media coverage and public attention, and led to an increase in weekend cinema ticket prices of about 11 percent. However, cinema theatres introduced incentives to attend low demand sessions, reducing, for example, the so called “Spectators’ day” price by more than 8 percent between both surveys (see Table 1).

In this context, the fiscal adjustment could be the major factor determining why individuals declared prices as the main reason they did not attend the cinema more frequently in the 2014–15 wave of the survey, which was conducted after the VAT change. However, declared cinema attendance in both waves of the SSCHP remained virtually stable (1.10 vs 1.09 times every 3 months). From inspection of Table 2, we can see that the drop between the years in which the SSCHP was conducted was only about 5 percent, despite the medium-term falling trend in cinema attendance. Moreover, the average real price of cinema tickets (a weighted average of regular and promotion prices) has declined steadily since 2010, with the consequence that, even after the VAT rise, individuals managed to pay less than before.

The reduction in average prices paid can only be explained by the number of customers who benefited from price reductions. In the years following 2012, exhibitors and distributors extended their price discrimination policies in order to cope with the new taxes and the successive drop in attendance.¹ In order to evade the new regular price, cinema consumers engaged in a time-consuming search for price reductions, since discounts often require planning in advance (purchase, download and the printing of a coupon from the Internet, registration on some platform, and so on) or attending low demand sessions, such as the “Spectators’ day” or other even cheaper promotion days.

Table 3 reports the ticket type of the last cinema attendance, distinguishing between weekday/weekend sessions and discounted/full-price tickets, as declared by respondents of the SSCHP.

The figures in this table show that people took advantage of discounts more intensively in 2014 than in 2010. This implied significant changes in cinema attendance habits, inducing people to attend the weekdays sessions relatively more often than before. This *hunt for bargains* manifests heightened consciousness of the new high regular ticket prices, entailing increasing price salience in a context where average prices actually fell. Given that searching for discounts involves the use of time, perceptions on the total costs of attending cinema will include the internalization of these search costs.

¹ In fact, the initial impact of the Cultural VAT increase was in terms of participation. Although attendance had gradually fallen since 2010, it suffered a sharp decrease between 2012 and 2013 that was mostly reverted by 2016.

Table 2
Cinema trends in Spain, 2010–2019.

Year	Box office (M€)	Spectators (M)	Nominal price	CPI	Real price	Cinema releases
2010	662.30	101.60	6.52 €	94.08	6.93 €	472
2011	635.80	98.30	6.47 €	97.08	6.66 €	511
2012	614.20	94.20	6.52 €	99.46	6.56 €	472
2013	506.30	78.70	6.43 €	100.86	6.38 €	542
2014	518.20	88.00	5.89 €	100.71	5.85 €	565
2015	575.20	96.10	5.99 €	100.20	5.97 €	565
2016	602.00	101.80	5.91 €	100.00	5.91 €	627
2017	591.30	99.80	5.92 €	101.96	5.81 €	587
2018	585.70	98.90	5.92 €	103.66	5.71 €	616
2019	614.70	104.90	5.86 €	104.39	5.61 €	655

Note: Price is calculated dividing the total box-office revenue by the number of spectators. It is, therefore, a weighted average of each type of ticket and their prices.

Source: Spanish Institute of Statistics.

Table 3
Ticket type of last cinema attendance, 2010–2014.

	2010	2014
Weekday tickets	30,7%	42,8%
Weekend tickets	69,3%	57,2%
Discounted price tickets	13,2%	27,2%
Regular price tickets	86,8%	72,8%

Note: According to the standard *t*-test, the average number of discounted tickets in 2010 is significantly lower than in 2014. The same applies to weekdays tickets.

Source: SSCHP

4. Materials and methods

4.1. Data base

The database chosen is the Spanish Survey of Cultural Habits and Practices (SSCHP) conducted by the Education and Culture Ministry of Spain, which covers the most relevant areas of cultural consumption such as cinema, concerts, theatre, or museums. We use two successive waves from periods 2010–2011 and 2014–2015. During both periods, in each trimester of the two years a random population sample was interviewed, which resulted in a total of 14,486 and 15,154 respondents, respectively. The final sample is representative of the Spanish population in terms of education level, employment status, family responsibilities and region of residence. This database is the most suitable for our purpose as it includes information regarding participation and intensity of cinema consumption.

Individuals were asked how many times they had attended the cinema over the previous three months and asked about the main reason why they had not attended more frequently. From the choice set, individuals could select prices.² Choosing this category might be motivated by different reasons. While it is true that referring to high prices may sound more convincing to the interviewees, or that other categories sound even less plausible to them, the fact is that the proportion of people declaring prices as their reason more than doubled between waves. Given that the declared interest on cinema, time availability and economic resources barely changed between 2010 and 2015, identifying price as the main reason for not attending cinema more frequently is not just a question of mere plausibility. We assume that declaring prices is a proxy for the higher salience of the new cinema ticket prices. Hence, price

² All possible answers are: (1) price; (2) it is difficult to get tickets; (3) scarcity of supply; (4) little information; (5) preference for television; (6) video or the internet; (7) difficult to understand; (8) lack of time; (9) lack of interest; (10) lack of company.

salience would explain the large change in the proportion of people declaring prices as the main problem for cinema attendance.

Table 4 presents the summary of descriptive statistics of the two samples. The socioeconomic characteristics are broadly similar across the surveys, though it is worth noting that there was a slight decrease in the average age and that individuals in the second sample had a higher educational level.

4.2. Methods

To perform our empirical analysis, we estimate a model divided into two stages. In the first stage, two probit models - one for each of the two SSCHP waves - are estimated to analyze the probability of declaring price as the main constraint for cinema participation. This will allow us to identify how price salience varies among people within each wave. In the second stage, pooling both samples, and controlling for the changes in price salience forecasted in the first stage, a zero inflated negative binomial model (ZINB) is estimated to analyze cinema attendance. The analysis is implemented as follows.

4.2.1. First stage: analyzing differences in price problems declarations

To analyze the differences between the probability of declaring price as the reason for not attending more to the cinema in 2010–11 and 2014–15, our proxy for subjective salience of prices, we estimate two probit models:

$$Price\ Declaration_t = f(Csoc_t, Clab_t, Cedu_t, Cgeo_t, i_{cine_t}, PriceOthers_t) \quad (1)$$

where t takes two values to represent both samples. Our dependent variable, $PricePerception_t$, takes value 1 if the individual declared price as

Table 4
Descriptive statistics.

Variables	2010–11 (1)	2014–15 (2)
Male	0.48 (0.500)	0.49 (0.500)
Age	52.22 (19.102)	49.14 (18.827)
Primary education or less	0.25 (0.432)	0.18 (0.388)
Secondary education	0.45 (0.497)	0.47 (0.499)
Vocational training	0.14 (0.342)	0.15 (0.356)
University	0.17 (0.376)	0.19 (0.395)
Employed	0.45 (0.498)	0.45 (0.497)
Unemployed	0.13 (0.331)	0.14 (0.350)
Retired	0.20 (0.399)	0.21 (0.406)
Disabled	0.01 (0.078)	0.01 (0.093)
Student	0.09 (0.292)	0.09 (0.290)
Housework	0.12 (0.322)	0.09 (0.288)
Other employment status	0.01 (0.091)	0.01 (0.091)
# Family members	3.12 (1.340)	3.06 (1.354)
Living with parents	0.21 (0.406)	0.19 (0.394)
No children on charge	0.47 (0.499)	0.48 (0.499)
# Children 10-14	0.34 (0.713)	0.35 (0.729)
# Children <10	0.24 (0.592)	0.25 (0.607)

Note: standard deviation in parentheses.

the main reason he did not attend the cinema more often in period t , and 0 otherwise. The underlying assumption is that it captures salience of movie prices.

Price salience is assumed to depend on a set of independent variables. First, $Csoc$ includes gender and age and its square to account for a possible non-linear effect. Concerning household features, we consider the number of members that live at home ($\# Family\ members$), whether the individuals are still living with their family ($Living\ with\ parents$), individuals not in charge of children ($No\ children\ on\ charge$), individuals in charge of children between 10 and 14 ($\# Children\ 10-14$) and individuals in charge of children under 10 ($\# Children < 10$), other family situations as reference category. $Clab$ includes dummies for labor status: *Employed*, *Unemployed*, *Retired*, *Disabled*, *Student* and *Housework*, with other situations as the reference category. $Cedu$, comprises dummy variables capturing education levels including *Secondary education*, *Vocational training*, *University*, with *Primary education or lower* being the reference category. $Cgeo$ stands for geographical control variables, including a set regional dummies and a group of city size controls.

To enhance the predictive capacity of the model, we take advantage of price perceptions regarding other cultural activities. We therefore include $PriceOthers$, which captures declarations of price as the main reason for not attending theatre, popular music and classic music concerts more often. Lastly, i_{cine} is the individual's self-declared interest in cinema, on a scale from 10 (great interest) to 0 (not interested at all).

After the estimation of the probit models, we get predictions of the probability of declaring price as the main problem for each wave. By evaluating the 2010–11 and 2014–15 predictions, we can compare changes in price salience between the pre- and post-VAT scenarios. This allows us to identify the effect that the VAT increase and the implementation of price promotion policies and other events that took place between the two surveys had upon consumers' subjective opinion of the price as the main problem for cinema attendance.

4.2.2. Second stage: analyzing differences in cinema attendance

In the second stage, we study how changes in price salience, measured as the difference between the predictions obtained in the first stage, are linked to self-declared cinema participation. In order to do so, we estimate a demand model pooling both SSCHP samples.

As is common in cultural participation, the data is characterized by over-dispersion and excess of zeros (around 50 percent of the sample declared not having attended cinema in the previous trimester) due to the unobserved heterogeneity of individuals' preferences. Following [Ateca-Amestoy and Prieto-Rodríguez \(2013\)](#), and bearing in mind the suitability of the estimation method with respect to the behavioral assumptions of cultural participation, we use a zero-inflated negative binomial model (ZINB). Furthermore, we use likelihood ratio tests (LR tests for nested models) and Bayesian information criteria (Akaike and BIC statistics for non-nested models) to assess the appropriateness of our specification.

In ZINB models, an individual first decides whether to participate or not, and then, after deciding to participate, optimally determines the intensity of participation, i.e., the number of attendances. This implies that zero observations could belong to two different subpopulations: potential consumers (those who did not attend but could have attended under other circumstances) and never-goers (those who did not attend and would not do so in any case). Consequently, this model allows for the fact that variation in price salience may affect effective and potential consumers in a different way to never-goers. For example, alterations in taxes and price promotions might lead effective and potential consumers to adjust their intensity of consumption, while never-goers might vary their probability of remaining as non-attendants or to start participating.

Therefore, this model allows us to separate two different data-generating processes. One determines the probability of attending a positive number of times, whereas the other describes the probability of being a never-goer, considering that some zeros have a non-zero probability of being attendants. Belonging to either group is determined by a

latent binary process and the behavior of the zeros and of the positive counts is ruled by a negative binomial process. The first process, the zero-inflation regression, estimates the effect that each covariate has on the probability of being a never-goer. The second process, the count regression, estimates the effect of each explanatory variable on the intensity of participation, conditional on not being a never-goer.

Following the standard specification in the literature, individuals' socioeconomic characteristics are the main determinants of cultural participation in general (Fernandez-Blanco et al., 2009; Falk and Katz-Gerro, 2016; Ateca-Amestoy and Prieto-Rodríguez, 2013) and cinema attendance in particular (Fernandez-Blanco and Baños, 1997; Sisto and Zanola, 2010).³ Consequently, we specify a model where the dependent variable is the number of times the individual went to the cinema in the previous term - *Cinema Attendances* - as follows:

$$\text{Cinema Attendances} = f(\text{Csoc}, \text{Clab}, \text{Cedu}, \text{Cgeo}, \text{Equipment}, \text{Reading}, \text{Predicted } I_{\text{Cine}}, \text{Price Declaration}_{2011}, \text{Declaration Change}) \quad (2)$$

where *Csoc*, *Clab*, *Cedu* and *Cgeo* are socioeconomic features, educational level, labor status and geographical controls. All of these are defined as in the first stage. Consumption of cultural goods is usually positively related to income (Prieto-Rodríguez et al., 2005). Unfortunately, however, we lack household or individual earnings. To overcome this absence, two independent Principal Component Analyses (PCA) were conducted to proxy cultural equipment (*Equipment*). We consider that the quantity of cultural equipment is highly correlated with household income and also with the propensity to spend such earnings on cultural activities. Hence, we conducted a first PCA with variables such as TV, DVDs, number of music albums, video player, camera or video camera. In order to complement physical cultural capital, a second PCA was carried out for information technology equipment, such as computers, tablets, or access to the internet. Finally, a third PCA was carried out gathering variables related with reading habits (*Reading*), given that preferences for reading are strongly related with cultural interests in general (Fernandez-Blanco et al., 2017).

Predicted I_{Cine} are the predictions obtained from an auxiliary regression where the interest in cinema (*I_{Cine}*) variable is explained by the rest of the independent variables and individual's interest in other cultural activities (see Annex). This variable is included to control for the effect that interest in cinema may have on cinema attendance, while acknowledging its potential endogeneity.

Since we are interested in the role of price salience and how it changed from 2010 to 11 to 2014–15, we included forecasted variables concerning price salience derived from the first stage. On the one hand, using the coefficients obtained from the estimation of the probit model with data from the 2010–11 sample, we forecast for both samples the probability of declaring prices as the main reason of non-attendance, labelled *PriceDeclaration₂₀₁₁* (forecasted price declaration for 2011). This variable proxies the salience of movie prices if the scenario of 2010–11 (before VAT rise, the mass media campaign and other price policies) had remained stable, thereby capturing individuals' baseline propensity to declare price as the main reason why not to attend to the cinema more regularly. On the other hand, for individuals in the 2014–15 sample, the variable *Declaration Change* is constructed as the difference between the predictions coming from both probits (2014–15 minus 2010–11 predictions), being 0 for individuals in the 2010–11 sample. Thus, this variable allows us to proxy the differential effect of the VAT rise, the mass media campaign and any other change that affected cinema

prices and their salience for the 2014–15 sample.

5. Results

Given that average prices slightly decreased between the periods analyzed, we would expect a similar proportion of individuals declaring prices as the main reason for not attending the cinema more often. However, the number of people declaring prices more than doubled in 2014–15. In this section we analyze the factors behind this divergence.

First, we test whether the differences in the replies between the two periods are due to distinct features of the people surveyed in both waves. We calculate the nearest neighbor matching estimator (Abadie and Imbens, 2006), which allows us to compare the value of the variable *Price Declaration* by matching individuals who have similar characteristics in

both periods.⁴ Having controlled for the characteristics of the respondents, we find that the likelihood of declaring price as the main reason for not attending the cinema more often is 22.5 points higher in 2014–15 than in 2010–11, with a standard deviation of 0.6. Therefore, most of the observable differences in our proxy of the price salience between the two periods are attributable to changes in contextual factors rather than sampling.

5.1. Changes in price declarations over time

Given that the average price of cinema was lower by the time of the second wave of the SSCHP, any increase in the average declaration of price as the main attendance restriction would suggest an increase in price salience. To analyze differences in price valuations, we estimate a probit model for each period. The results are displayed in Table 5.

Comparing the coefficients of both probits, the main results can be summarized as follows. First, as in Del Missier et al. (2016), there is no gender effect in 2010–11. However, in 2014–15, men are more likely to declare price as the main constraint for cinema participation. Second, in 2010–11 the effect of age is negative and linear, whereas in 2014–15 it is quadratic. Third, in line with Oechssler et al. (2009), in both periods it is less likely that highly-educated individuals declare price constraints, since they tend to present lower biases. Also, they usually have higher incomes, with other restrictions being more relevant. Fourth, unemployed individuals are more prone to declare price in both periods, as would be expected. Additionally, in 2014–15, students also declare price. These two groups are often the beneficiaries of special promotions, but profiting from promotions or attending low-demand sessions could be considered costly, thereby increasing price salience (Casey and Owen, 2013). Fifth, the larger the household size, the lower the propensity to declare price barriers, although this is only significant in the second period. Sixth, given that living with children generates cinema demand, it is interesting to distinguish households with children under 10 and those with children between 10 and 14 years old. For the first group, the main restriction is probably related to time availability rather than prices. For families with children between 10 and 14, on the other hand, time restrictions become less relevant, and prices start to play a more important role. Seventh, both *interest in cinema* and *price sensitivity*,

³ Films' characteristics and releasing conditions are also relevant to explain movie demand (Gutiérrez-Navratil et al., 2014) but we are concerned about the determinants of the cinema demand, as a whole, and not about a particular film.

⁴ We define the matching estimator requesting an exact match for gender, educational level, being employed, unemployed or retired. Matching over age, household members, cinema interest, price declaration propensity, civil status, disabled, housework and geographical variables was carried out using the nearest neighbor matching.

Table 5
Probit estimations.

	2010–2011 (1)	2014–2015 (2)
Man	−0.007 (0.026)	0.049** (0.025)
Age	−0.019*** (0.005)	0.004 (0.005)
Sq Age	−0.004 (0.005)	−0.026*** (0.005)
Secondary education	0.071* (0.037)	0.048 (0.035)
Vocational training	0.045 (0.048)	0.123*** (0.045)
University	−0.133*** (0.049)	−0.082* (0.043)
Employed	−0.0628 (0.135)	0.084 (0.129)
Unemployed	0.256* (0.137)	0.428*** (0.131)
Retired	0.108 (0.142)	0.096 (0.133)
Disabled	0.116 (0.210)	−0.227 (0.177)
Student	0.037 (0.142)	0.376*** (0.138)
Housework	−0.018 (0.141)	0.141 (0.134)
# Family members	0.008 (0.011)	−0.026** (0.011)
No children on charge	−0.011 (0.034)	0.007 (0.032)
# Children 10–14	0.111*** (0.037)	0.072** (0.036)
# Children <10	−0.267*** (0.041)	−0.170*** (0.039)
Interest in Cinema	0.047*** (0.005)	0.054*** (0.005)
Price sensitivity	0.227*** (0.008)	0.253*** (0.006)
PCA Cultural equipment	−0.002 (0.024)	−0.011 (0.022)
Sq PCA Cultural equipment	−0.006 (0.006)	0.006 (0.005)
PCA Physical cultural capital	0.009 (0.020)	−0.009 (0.017)
Sq PCA Physical cultural capital	−0.025 (0.017)	0.006 (0.015)
PCA Interest in reading	0.027 (0.018)	0.010 (0.015)
Sq PCA Interest in reading	0.002 (0.006)	−0.005 (0.005)
Constant	−0.493** (0.210)	−0.455** (0.180)
Regional Dummies	YES	YES
N	14,486	15,154
LR (41)	3030.00	5089.27
AIC	14083.46	15748.94
BIC	14401.86	16069.24

Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1.

present a positive effect that is larger in 2014–15. Finally, none of the PCA shows a significant coefficient, either separately or together. This result is coherent insofar as individuals' perceptions do not depend on physical capital.

To assess the extent to which the changes between periods affected groups of individuals differently, we forecast the probabilities of

⁵ Additionally, we run a bootstrap analysis to assess whether a particular individual's characteristic, independently of others, is linked to changes in the reported probability of declaring prices as the main reason for not attending to the cinema more often, i.e., if the observed changes in declarations fulfill the ceteris paribus condition. Effectively, bootstrap analysis is consistent with our previous results. Bootstrap results are available upon request.

Table 6
Predicted change in the self-declared price constraint.

Educative level	Woman	Man	Age group	Woman	Man
Primary	12.7%	15.0%	Under 25	14.4%	16.8%
Secondary	16.9%	18.6%	25–44	19.9%	22.2%
Vocational	21.0%	22.8%	45–64	20.5%	21.8%
University	20.3%	21.8%	Over 64	10.9%	11.5%
Total	17.4%	19.2%	Total	17.4%	19.2%

reporting price as the main reason for non-attendance for different socio-economic groups. Thus, in Table 6 we display the average increase in the predictions from 2010 to 11 to 2014–15 conditional on gender, age and educational level.⁵ Since all values are positive, in 2014–15 all groups show a higher probability of stating price as the main restriction in comparison to what they would have declared in 2010–11.⁶

Regarding gender, in 2014–15 the increase in the probability of declaring price is higher for males than for females. Education presents increasing increments on the percentual price perception change for both genders, with a decline at the upper level compared to the previous level. In line with these results, age groups display an inverted U-shaped effect, since the youngest and the oldest present lower education levels. Furthermore, the lowest increases were associated with people over the age of 64, which reflects their low cinema demand. In sum, groups defined by these three basic socio-economic variables (gender, education level and age) exhibit a significant increase in cinema price salience.

5.2. Cinema participation

Between the two SSCHP waves, average demand and average prices remained relatively stable. To understand the role of price salience and its change, we set our reference group as those people for whom price remained the main salient problem for cinema attendance. Following the new tax, the new price menus and the media campaign against the VAT rise, other people experienced an increase in the price salience large enough to lead them to report prices as the main limit for their cinema consumption. The distinction between these two groups of individuals relies on the observed differences in their price declarations and their cinema attendance between periods.

To distinguish this differential effect, we employ a ZINB model. On the one hand, the inflation equation determines the probability of an individual being a never-goer or a potential attendee. On the other hand, the count equation explains the number of times the individual attended the cinema conditional on being a potential spectator. The two equations cannot be estimated separately, as indicated by the high significance of the alpha coefficient. To identify the effect of price perceptions on cinema demand, we estimate two different specifications of the ZINB model. Model A does not account for price salience, while Model B includes price perceptions and their changes. If price salience had a significant impact on cinema demand, Model B would be preferred. Using the AIC and BIC information criteria, it turns out that Model B is statistically superior. The results are reported in Table 7.

Columns (1) and (3) display the count equation coefficients, i.e., the equation determining the probability of attending a positive number of times, whereas columns (2) and (4) show inflation equation coefficients, i.e., the equation determining the probability being a non-goer. Positive coefficients in the inflation equation indicate a higher probability of belonging to the certain zero attendance group.

According to the results in columns (3) and (4), and given the estimated coefficients for the dummy *Year 2014*, there is a higher probability of nonattendance in the second wave (column 4), and those attending have a larger probability of attending less frequently (column 3). These

⁶ According to t-tests, the differences among groups are statistically significant.

Table 7
ZINB estimations.

	Model A		Model B	
	Count (1)	Inflation (2)	Count (3)	Inflation (4)
Year 2014	-0.193*** (0.030)	-0.394*** (0.065)	-0.307*** (0.061)	0.275** (0.127)
Man	0.035 (0.026)	-0.180*** (0.065)	0.047* (0.026)	-0.189*** (0.066)
Age	-0.018** (0.007)	0.035** (0.016)	-0.020*** (0.007)	0.034** (0.016)
Sq Age	0.025*** (0.007)	0.022* (0.013)	0.029*** (0.008)	0.012 (0.013)
Secondary education	0.163*** (0.057)	-0.464*** (0.088)	0.151*** (0.057)	-0.456*** (0.088)
Vocational training	0.162** (0.065)	-0.940*** (0.120)	0.148** (0.065)	-0.884*** (0.121)
University	0.282*** (0.062)	-1.565*** (0.115)	0.302*** (0.062)	-1.607*** (0.117)
Employed	0.225* (0.131)	0.140 (0.428)	0.251* (0.134)	0.239 (0.454)
Unemployed	0.116 (0.134)	0.654 (0.432)	0.079 (0.137)	0.979** (0.461)
Retired	0.277* (0.145)	0.259 (0.433)	0.290** (0.148)	0.370 (0.460)
Disabled	0.157 (0.269)	1.005* (0.579)	0.199 (0.275)	0.878 (0.612)
Student	0.108 (0.135)	-1.776** (0.795)	0.096 (0.139)	-1.376* (0.712)
Housework	0.057 (0.148)	0.337 (0.434)	0.080 (0.151)	0.488 (0.461)
# Family members	-0.023* (0.013)	0.096*** (0.029)	-0.021 (0.013)	0.095*** (0.029)
Living with parents	0.344*** (0.063)	-0.134 (0.169)	0.327*** (0.062)	-0.197 (0.170)
No children on charge	0.127*** (0.047)	0.126 (0.089)	0.119** (0.046)	0.112 (0.089)
# Children 10–14	0.037 (0.045)	-0.167* (0.097)	0.022 (0.046)	-0.165* (0.098)
# Children <10	-0.218*** (0.047)	0.019 (0.114)	-0.180*** (0.048)	-0.030 (0.114)
PCA Cultural equipment	0.034* (0.018)	-0.065 (0.042)	0.033* (0.018)	-0.095** (0.043)
Sq PCA Cultural equipment	0.021 (0.016)	-0.014 (0.039)	0.021 (0.016)	-0.013 (0.040)
PCA Physical cultural capital	0.013 (0.021)	-0.132** (0.053)	0.012 (0.021)	-0.164*** (0.054)
Sq PCA Physical cultural capital	0.003 (0.002)	0.006 (0.007)	0.003 (0.002)	0.011** (0.006)
PCA Interest in reading	0.012 (0.017)	-0.097** (0.040)	0.009 (0.016)	-0.094** (0.039)
Sq PCA Interest in reading	0.007* (0.004)	0.008 (0.014)	0.007** (0.004)	0.008 (0.009)
Predicted Interest in cinema	0.113*** (0.011)	-0.412*** (0.021)	0.104*** (0.011)	-0.369*** (0.021)
Price Declaration 2011			0.392*** (0.093)	-1.507*** (0.258)
Declaration Change			0.319 (0.269)	-3.104*** (0.616)
Constant	-0.455* (0.242)	1.168* (0.676)	-0.488** (0.247)	1.303* (0.693)
Regional Dummies	YES	YES	YES	YES
Observations		29,640	29,640	
Alpha		1.139*** (0.037)	1.130*** (0.037)	
AIC		70688.45	70515.05	
BIC		71460.06	71319.85	

Standard errors in parentheses.

***p < 0.01, **p < 0.05, *p < 0.1.

results are consistent with the downward trend observed for the total number of spectators, as reported in Table 2. These results are also in line with those of [Ateca-Amestoy et al. \(2020\)](#), who use the Spanish Household Budget survey and take advantage of the 2012 VAT rise to evaluate its effects as a natural experiment.

The coefficients on *Price Declaration*₂₀₁₁ imply that those who already

had a high price salience in 2011 (the reference group) have a higher likelihood of being cinema-goers. First, due to the significant negative coefficient on the inflation equation in column (4), it is less likely that these individuals do not attend at all. Second, as the positive and statistically significant coefficient in column (3) shows, if they decide to attend, they will do so more regularly. Furthermore, the negative and significant coefficient of *Declaration Change* in the inflation equation, in column (4), indicates that increases in price declarations led to a drop in the probability of never attending cinema. Hence, while certain non-goers and low-demand individuals are characterized by a higher probability of declaring other reasons than price as their obstacle to participation, those going to the movies have a larger likelihood of complaining about prices. Moreover, the larger the attendance, the higher the increase in this complaint in the second wave. Since these people attend cinema, for them the increase in the regular price was more salient. Moreover, the costs they must assume to attend less attractive sessions or to be eligible for price promotions are more evident, in line with [Bordalo et al. \(2020\)](#).

The remaining variables are included as controls. In general, these controls show the expected results. Starting with sociodemographic features, age has a negative effect since older individuals are more likely to be non-goers. Moreover, the older people are, the lower their frequency of participation. In accordance with the fact that cultural participation is typically higher for women ([Ateca-Amestoy, 2008](#)), the probability of being a certain non-attendant is higher for men. However, if they decide to attend, men participate more frequently than women. Concerning educational level, in line with [Ateca-Amestoy and Prieto-Rodriguez \(2013\)](#) and [Suárez-Fernandez et al. \(2020\)](#) we find that the higher the qualification, the greater the likelihood to be a cinema spectator and the greater the degree of participation. With respect to labor status, unemployed individuals show a higher probability of being non-attendants, as in [Falk and Katz-Gerro \(2016\)](#). On the contrary, students have more chances to participate. Both employed and retired individuals have a higher rate of cinema attendance. Regarding household features, larger families have a higher probability of belonging to the certain zero group ([Muñiz et al., 2014](#)). Individuals living with their parents and people without children display a higher level of attendance, whereas individuals with children between 10 and 14 have less chances to participate and those with children under 10 attend less regularly. In line with [Fernandez-Blanco et al. \(2017\)](#), reading is positively related to the likelihood of going to the cinema. Concerning cultural equipment and physical cultural capital, our findings are similar to those of [Sisto and Zanola \(2010\)](#) and [Suárez-Fernández and Boto-García \(2019\)](#) in that both are negatively related to the probability of being a never-goer, i.e., cultural equipment positively affects cinema participation.

In summary, increases in price declarations are associated to lower probabilities of never attending cinema. Movie aficionados are more aware of the VAT increase and the rise in weekend ticket prices, with these being the most salient features when answering the survey ([Christandl et al., 2011](#); [Lightle, 2016](#); [Bordalo et al., 2020](#)). In the case of never-goers, they might not be aware of prices so their responses would be influenced by other channels, such as mass media ([Del Missier et al., 2016](#)).

6. Conclusions

In this paper, we take advantage of a tax change that took place between the last two waves of the Spanish Survey of Cultural Habits and Practices (SSCHP 2010–11 and 2014–15). In particular, in 2012, the VAT for cultural products rose from 8 to 21 percent, generating a negative mass media campaign that amplified public awareness and raised discontent among cultural agents. However, following the VAT rise, several price differentiation policies implemented from the supply side resulted in a decline in average prices between 2010 and 2015. Therefore, although cinema prices were expected to increase, the VAT rise was absorbed by the exhibitors. Despite the small observed drop in the average ticket prices, most people nevertheless declared prices as the

main reason for not attending the cinema more frequently in the 2014–15 wave, whereas prices were not seen as the major problem in 2010–11.

People became more aware that regular prices were higher. In reaction, they took advantage of new promotions and a more complex price menu, which meant that average prices remained stable. As a result, declared cinema attendance did not change significantly. However, all these changes increased the price salience of cinema tickets and declarations of prices as the main reason not to attend.

Numerous factors could be pointed to as explanations for the increase in the salience of cinema prices between the two waves of the SSCHP. First, price increases associated with taxes could be perceived as larger than they actually are (Blaufus and Möhlmann, 2014). Second, the coverage of the VAT rise in the media may be a determinant, since people tend to believe information stated repeatedly and individuals probably anchored the impression of ‘expensiveness’. Third, we can point to the mental accounting framework (Thaler, 1985), which refers to the different values people place on money, based on subjective criteria. Fourth, the inconvenience of searching for discounts and attending low-demand sessions makes it easier to recall regular prices, and, as a consequence, individuals might focus on prices as the most salient element in their decision of attending cinema (Bordalo et al., 2020). This is especially the case for frequent cinema consumers, who might be more aware of regular prices and the costs associated with price promotions or attending less attractive sessions. On the contrary, non-goers and low-demand individuals exhibit a higher probability of declaring reasons other than price for not attending.

While a significant drop in cinema attendance was expected following the VAT increase, self-declared attendance barely decreased between the two waves of the SSCHP. Several reasons may explain this small change in cinema attendance, despite the price declarations. First, new promotions let people adapt their demand to the trade-off between prices and time slots. Price discrimination policies affected the rate of atten-

dance of some moviegoers as well as the likelihood of participating of others, and changes in the composition of attendants might offset each other. Second, the price of the complementary activities (transport costs, parking, pop-corn and restaurants, etc.) remained stable, so the effect of the tax rise on the price of the activity as a whole was quite small. Thus, when making economic decisions, reflective thinking gets involved, which may explain why individual's behavior is in line with the evolution of average prices.

To summarize, when asked about a product in opinion polls, people tend to reply bearing in mind its most salient attribute, whatever that may be in that particular moment. Subjective opinions tend to be instinctive and subject to numerous response bias. Also, they might reflect the internalization of closely-related factors, such as search costs in our case, that people do not disclose. After an important tax increase, prices are likely to be the most salient characteristic of any product subject to this rise. However, if, as in our case, average prices do not change after the tax change, demand, grounded on reflective thinking, will remain stable. Therefore, in decision making, people rule out potentially biased elements of price perceptions.

Declaration of competing interest

None.

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Annex.

Table Annex
OLS Interest in cinema

Variables	Coef. (sd)
Year 2014	0.187*** (0.024)
Man	0.130*** (0.025)
Age	-0.044*** (0.005)
Age (Square)	0.019*** (0.004)
# Family members	-0.020** (0.010)
Living with parents	-0.037 (0.053)
No children on charge	-0.129*** (0.036)
# Children 10-14	-0.036 (0.039)
# Children <10	-0.014 (0.041)
Secondary	0.085** (0.034)
Vocational	0.041 (0.045)
University	0.006 (0.045)

(continued on next page)

Table Annex (continued)

Variables	Coef. (sd)
Employed	0.241* (0.129)
Unemployed	0.215 (0.132)
Retired	0.017 (0.133)
Disabled	-0.112 (0.186)
Student	-0.047 (0.137)
Housework	0.011 (0.134)
PCA Interest in reading	0.037** (0.016)
Sq PCA Interest in reading	-0.010* (0.006)
PCA Physical cultural capital	0.022 (0.021)
Sq PCA Physical cultural capital	0.001 (0.004)
PCA Cultural equipment	0.013 (0.017)
Sq PCA Cultural equipment	-0.005 (0.016)
Interest in theatre	0.338*** (0.005)
Interest in music concerts	0.134*** (0.009)
Interest in museums	0.068*** (0.005)
Interest in listening to music	0.092*** (0.009)
Interest in performing arts	0.105*** (0.006)
Constant	3.448*** (0.202)
Observations	29,640
R-squared	0.507

Standard errors in parentheses.

***p < 0.01, **p < 0.05, *p < 0.1.

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