

THE EFFECTS OF ONLINE DISCLOSURE ABOUT PERSONALISED PRICING ON CONSUMERS

RESULTS FROM A LAB EXPERIMENT
IN IRELAND AND CHILE

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Foreword

In October 2019 and March 2020, the Economic and Social Research Institute (ESRI) conducted, on behalf of the Committee on Consumer Policy (CCP), experiments in Ireland and Chile to test the consumer impact of online disclosures regarding personalised pricing. The attached report was prepared by ESRI in consultation with the CCP's advisory group (AG) on personalised pricing to provide a summary of the results from both experiments.

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Executive Summary

The 2010 Consumer Policy Toolkit and the 2014 OECD Council Recommendation on Consumer Policy Decision Making continue to provide the foundation for the OECD's work on improving the evidence base for consumer policy making. Recent work has featured a strong emphasis on applying behavioural insights to consumer policy making, with a focus on online disclosures and online advertising (e.g. (OECD, 2018^[1]), (OECD, 2019^[2])). In November 2018, the OECD further organised a roundtable focusing specifically on personalised pricing from a competition and consumer protection angle (OECD, 2018^[3]).

Following these discussions, the OECD commissioned a laboratory experiment to better understand the impact of online disclosures about personalised pricing on consumers. The experiment was carried out by the Behavioural Research Unit of the Economic and Social Research Institute (ESRI) in Ireland in October 2019 and in Chile in March 2020.

Research questions and experimental design

The experiments were designed to answer the following questions:

- Can disclosure enable consumers to identify and comprehend online personalised pricing?
- What impact does disclosure about online personalised pricing have on consumer behaviour and decisions making?
- How do consumers feel about online personalised pricing in general?

The experimental design consisted of three stages. In *Stage 1*, participants engaged in a task that revealed information about themselves that could be related to their willingness to pay. In *Stage 2*, participants made both real and hypothetical purchases on simulated online retail websites, some of which were using personalised pricing. At that stage, disclosure about personalised pricing was manipulated between participants. Finally, in *Stage 3*, participants responded to a questionnaire designed to gauge their awareness and comprehension of personalised pricing, as well as their feelings towards the practice.

Key findings

Online disclosures had limited effects on consumer recognition of personalised pricing

The results of the experiment suggest only limited effects of online disclosures on the ability of consumers to identify and comprehend online personalised pricing. In particular, the disclosures had no statistically significant effect on the share of consumers noting price differences between the different online retailers, which varied from 33-42% in Ireland and 45-55% in Chile. A statistically significant difference between stated awareness of personalised pricing between consumers seeing a stronger disclosure statement and those seeing no disclosure statement was only found in Ireland and after respondents were given a definition of personalised pricing. In all scenarios, stated awareness remained overall low, with a median rating of 2 on a Likert scale ranging from 1 (no awareness at all) to 7 (complete awareness).

Online disclosures had no significant effect on participants' purchasing behaviour

The study further failed to provide evidence of a significant impact of the disclosures on participants' purchasing behaviour. While some effects were observed in regard to, for example, the number of switches between different seller websites or the use of the "sort by" option, a majority of participants did not recall seeing a disclosure (between 62% and 94% in Ireland and 85% and 96% in Chile, depending on the formulation of the disclosure and the recall criteria).

Personalised pricing was considered unfair by a majority of respondents

Results from a questionnaire handed out to participants further suggest that on average personalised pricing was regarded as an unfair practice that should not be allowed. Perceived unfairness was higher with regard to situations where price personalisation led to price hikes rather than discounts. Whether the subject of personalised pricing in a variety of presented hypothetical scenarios was aware of the use of personalised pricing had no significant impact on the perception of fairness in Ireland and only a marginal effect in Chile. However, the experiment also suggests some variability in the fairness perception depending on the grounds for personalisation. In particular, personalisation based on a subject's search history was perceived fairer compared to other types of personalisation, e.g. based on socio-economic status or dependence on the purchased good.

Putting the results of the experiment into context

The main findings of the experiment confirm earlier results from a European Commission-led experiment on disclaimer awareness in different contexts of personalisation, including with regard to prices and the ranking of search results (EC, 2018). The present experiment however extends the findings to a more realistic online shopping environment, including real purchases in the case of the Dublin experiment, and focuses specifically on personalised pricing in isolation from other personalisation practices.

The results are further consistent with low recall rates of online disclosures in other contexts, such as the recognition of native advertising (e.g. Amazeen and Wojdyski, 2018; Wojdyski and Evance, 2016) as well as with broader research indicating that disclosures may not always be successful in raising consumer awareness and protecting consumer interests (Seizov, Wulf and Luzak, 2019[4]). It should be noted however, that the benchmark of what might constitute a successful disclosure with regards to raising awareness is open to discussion and likely to vary according to context. Considering only a subset of possible disclosure variations, the results are further mute with regard to additional factors determining disclosure success, such as visual salience, positioning or timing, an area that would benefit from further research.

1. Introduction

1.1. Background

The Behavioural Research Unit (BRU) at the Economic and Social Research Institute (ESRI) was commissioned by the OECD's Committee on Consumer Policy to undertake a laboratory experiment to investigate the impact of disclosure about online personalised pricing on consumer awareness and behaviour.

The experiment was first run in Dublin, Ireland, in September/October 2019, and then in Santiago, Chile, in March 2020, to verify the results in a second, culturally different country.

1.2. Research questions

The primary research questions the experiment was designed to answer are as follows:

1. Can disclosures enable consumers to identify and comprehend online personalised pricing?
2. What impact do disclosures about online personalised pricing have on consumer behaviour and decision-making?
3. How do consumers feel about online personalised pricing in general?

1.3. Personalised pricing and the role of disclosure

Online personalised pricing is a form of price discrimination that involves charging different prices to different consumers according to their willingness to pay, where this is estimated from a consumer's personal data (e.g. personal information, search history, or the location, device, or browser from which they access a retailer's website). The natural consequence of personalised pricing is that different consumers are charged different prices for the same item.

Evidence of the prevalence of online personalised pricing remains sparse, with the majority of studies detecting only a low incidence of the practice, mostly based on location or browser, and resulting in only small variations in price (European Commission, 2018^[4]) (UK Competition and Markets Authority (CMA), 2018^[5]) (Berg, 2019^[6]). However, the quantity of personal data held on online consumers, combined with the increasing prevalence of personalisation in other domains (e.g. advertisement), means there is at least potential for online personalised pricing to become more commonplace and more sophisticated. Policymakers may therefore explore how they can protect consumers from any potential adverse effects of personalised pricing.

One candidate for a policy intervention in this domain is the display of disclosures on the websites of retailers that use personalised pricing, to empower consumers to make informed decisions over whether or not to pay a price that has been personalised. A move towards such a policy is reflected, for example, in a recent EU directive, which notably amends the Directive on Consumer Rights (2011/83/EU), inserting a requirement for consumers to be clearly informed when a price presented to them is "personalised, on the basis of automated decision-making" ¹. However, it cannot be taken for granted that transparency will be successful in raising consumer awareness and protecting consumer interests (Seizov, Wulf and Luzak, 2019^[7]).

Experimental behavioural research is increasingly being recognised as a powerful tool for pre-testing policy to ensure it is effective and worthwhile (Lunn and Robertson, 2018^[8]). London Economics has previously been commissioned by the European Commission to undertake a behavioural experiment in the area of transparency about various personalisation practices, including personalised pricing (European

Commission, 2018^[41]). The results of the London Economics experiment suggested that increasing transparency about such practices might not lead to altered purchasing behaviour by consumers.

Although informative, the aim of the European Commission led experiment was slightly different to this one. In particular, it did not test the impacts of personalised pricing and disclosure in isolation, only alongside the personalised ranking of offers. Furthermore, there were a number of ways in which that experiment differed from real-life purchasing contexts:

- Participants were not led to believe that personalisation was based on their own personal data, having instead been randomly allocated and shown a search history “profile”.
- The purchases they made were hypothetical.
- The experimental set up had participants using only one website at a time. They had the option to switch to a different platform if they wished, but were unable to return to the first one after they had done so.
- The statement intended to increase transparency about personalised pricing read, “the prices of some of [the cars] were recommended for you”, which does not make it clear that prices had been changed. This would make it difficult for participants to understand what personalised pricing is as distinct from personalised rankings. It therefore makes it difficult to isolate the effects of disclosure about personalised pricing in particular.

An attempt was made to address these potential limitations in the experimental design outlined below.

2. Method

2.1. Participants

In both the original and the replication experiment, a sample of 210 participants aged over 18 was used. A sociodemographic breakdown of participants for both experiments can be found in Table 1 (Annex C). These samples were generally representative of the populations in Dublin and Santiago, as explained below.

The experiment took place face-to-face, with participants completing the study on individual laptops, typically in groups of 8-10 people. The total duration was just under an hour, with some variation between participants.

Dublin

Participants were recruited by a market research company. The only screening criterion was the requirement that participants be able to use a mouse and keyboard, which naturally excludes some older people or other groups who may have difficulties using a computer.

34% of participants were aged over 45, which is comparable to the age distribution in Dublin City, where 34% of the population aged 18-69 is over 45.² 60% of participants were educated to diploma/degree level or higher. This is slightly higher than the broader Dublin population, where just under 50% of people hold third level qualifications. 54% of participants were in full-time employment, and 13% were students. This is again similar to the broader Dublin population, of which 56% are at work and 11% are students. 94% of participants said that they shopped online, with 59% shopping online at least every month. All participants reported using the internet, with only two using it less than once a week.

The participants were paid a baseline fee of €30 for their participation and received an additional €25 credit to make a real purchase. Any remaining change from the credit (to the nearest 5c) was given to them in cash at the end of the experiment, along with their baseline incentive, and the product they had purchased was delivered to them at a later date.

Santiago

Participants were recruited by a local market research company. A screening question was added to recruit only participants who had previously made at least one purchase online. This was to avoid recruiting a sample mostly unfamiliar with online shopping, which would have led to issues for comparison with the Dublin experiment.³

45% of participants were aged over 45, which is comparable to Santiago generally, where 43% of the population over 15 is aged over 45.⁴ This also makes the sample slightly older than that in Dublin. There were slightly more women than men, in line with the wider Santiago population. 70% of participants stated that they had received university education. This figure is high compared with the 31% of people in Santiago who hold third-level degrees. It is possible that participants with non-university technical diplomas answered affirmatively to the question and also that the screening question increased the level of educational attainment of the sample relative to the general population. All participants had shopped online before, with 69% shopping online at least every month, a slightly higher proportion than the 59% of participants who reported doing so in Dublin. All but 7 participants reported using the internet at least once a week.

Instructions were given in Spanish by a member of SERNAC⁵, Chile's national consumer protection agency, who provided on-the-ground assistance in setting up the experiment. Two members of the ESRI's Behavioural Research Unit were also present to oversee the running of the experiment.

Participants were paid a fee of either 15,000 CLP or 20,000 CLP by the market research company, depending on their socioeconomic group.

2.2. Experimental design & procedures

The design described below pertains to the original experiment conducted in Dublin. Section 2.2.4. details minor modifications made for the replication in Santiago.

The experimental design consisted of three main stages.

- Stage 1: Participants engaged in a task that revealed information about themselves that could be related to their willingness to pay (WTP).
- Stage 2: Participants made both real and hypothetical purchases on simulated online retail websites, some of which were using personalised pricing. At this stage, disclosure about personalised pricing was manipulated between participants.
- Stage 3: Participants responded to a questionnaire designed to gauge their awareness and comprehension of personalised pricing, as well as their feelings towards the practice.

At the end of the experiment, participants were fully debriefed and informed that any price differences were in fact random and not based on their personal information.

2.2.4. Stage 1 – collection of personal information

Participants were first asked to create an “ESRI account” on a simulation of the ESRI intranet. This involved inputting their personal data (gender, age, education and employment status), as well as information about their internet use and online shopping habits (i.e. information that could potentially be used for personalisation).

Participants were then told that they would be making online purchases in the second part of the experiment and that they first had a few minutes to browse through all available products. They were directed to a homepage listing eight product categories to choose from. Each category contained 16 products. Participants could sort the products by price or rating on the “listing page”, move between pages (since only five products were shown per page) and get detailed information about each product by clicking into a specific “product page”. At this stage, none of the prices were personalised and the products could not be bought. Participants were given up to 4 minutes for this task (based on the time participants spent on the task in a pilot experiment).

Following the browsing task, there was a short demonstration of the subsequent purchase tasks to ensure that all participants understood and were fully able to engage with it.

2.2.5. Stage 2 – purchase tasks

The main stage of the experiment consisted of eight consecutive purchase tasks, each focused on a different product type, the order of which was randomised. For each purchase, the participants were redirected to the websites of two online retailers on separate tabs. The two sites displayed a similar but non-identical range of eight items for each product type (for any given item on one site, there was an equivalent item on the other site). One of the two sites used “personalised pricing” (price hikes or price discounts) on half of its items. A random jitter of 0-1% was added to default prices for all other items on both websites, to avoid it being overly obvious to participants that items were paired across retailers. Depending on the experimental condition, the personalised site may have displayed disclosure statements.

The retailers were named by Greek letters, and their website designs differed according to four visual features (blue vs. green colour, vertical vs. horizontal listing, ads on left vs. right, use of lines vs. boxes to separate items). These features were combined to create eight pairs of complementary website designs, which were randomly assigned to each purchase task. This was done so that participants saw new, distinguishable retailers for each purchase, and did not begin to associate higher or lower prices with one particular retailer over time. Varying the designs in a systematic way allowed the features to be counterbalanced across experimental conditions and fully controlled for in the regression models.

On each website, five of the eight products were displayed on the first listing page, requiring participants to click “next page” to view more items. It was also possible to sort items by price or by rating. Participants could easily switch between the two retailers using the tabs at the top of the screen. They could see more information about an item by clicking in to the product page, where they then also had the opportunity to buy the item. Example screenshots of the listing page and product page for one retailer can be seen in Figure 3.1 and Figure 3.2 respectively.

Figure 3.1. Example of a listing page in the stronger disclosure condition, with available credit shown for a real purchase

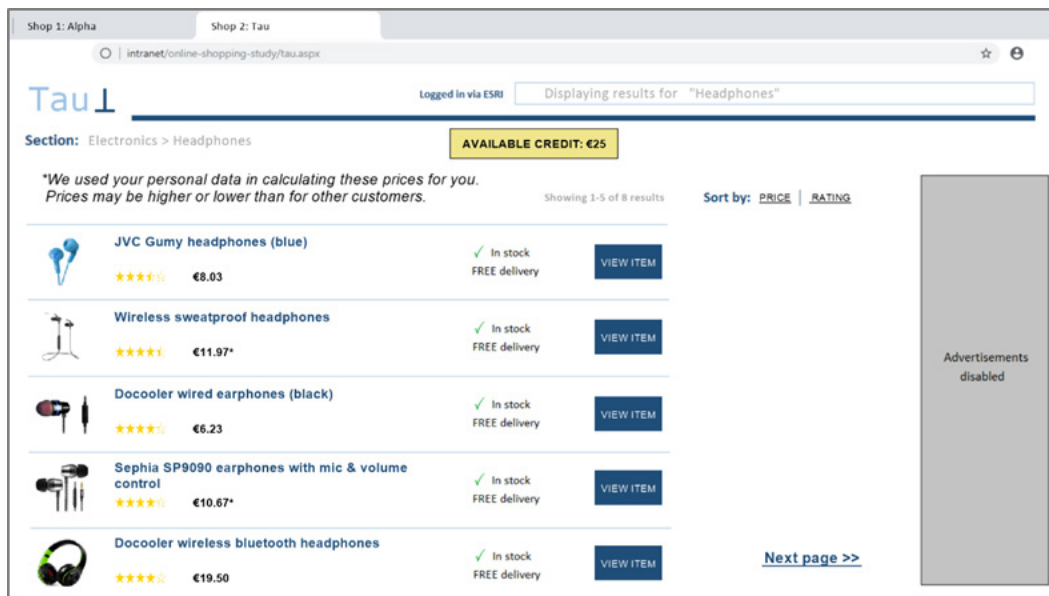
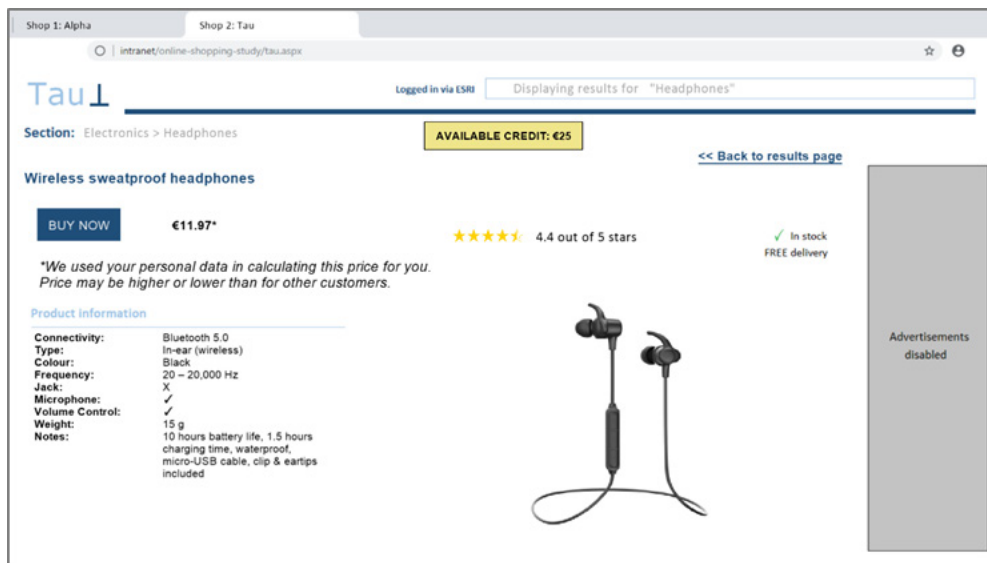


Figure 3.2. Example of a product page in the stronger disclosure condition, with available credit shown for a real purchase



Participants were free to spend as much time as needed on the purchase tasks. After making each purchase, they were asked to rate both retailers on a scale from 1 (“Did not like at all”) to 7 (“Liked very much”).

A number of experimental manipulations were applied in Stage 2, which are outlined in Box 2.1.

2.2.6. Stage 3 - questionnaire

Following the main task, participants completed a questionnaire aimed at measuring how they felt about their shopping experience, their recall of the disclosures, their awareness of personalised pricing and their feelings towards the practice. The full questionnaire can be found in Annex A.

The questionnaire also included a series of four “vignettes” or short scenarios about personalised pricing and related pricing strategies (see Annex B for examples).⁶ In each case, participants had to rate the fairness of the scenario. These vignettes were changed according to several features:

1. Type of pricing strategy described:
 - Online personalised pricing based on **(a)** socioeconomic status, **(b)** dependency on product or **(c)** search history [within-subject].
 - Other pricing strategies: **(d)** car salesman, **(e)** dynamic pricing [between-subjects].
2. Direction of personalisation (price hike/discount) [within-subject].
3. Whether the subject in the scenario belongs to a “higher-sympathy” or “lower-sympathy” group [between-subjects].⁷
4. Whether the subject in the scenario is aware/unaware that the pricing strategy is being used [within-subject].

Box 3.1. Experimental manipulations

Primary manipulation (between subjects)

- Level of disclosure (1. no disclosure; 2. weaker; 3. stronger)

Participants were randomly assigned to one experimental condition for the entire experiment. Participants in the “no disclosure” condition did not see any disclosure statements. Participants in both the “weaker” and “stronger” conditions saw asterisks beside any price that was personalised. Participants in the weaker disclosure condition saw a disclosure statement at the top of the listing page, as well as the product page for any item with a personalised price, that read “We used your personal data in calculating this/these price(s) for you.” For participants in the stronger disclosure condition, these statements were supplemented with a line that read “This price/Prices may be higher or lower than for other customers”.

Secondary manipulations (within subject)

The following within-subject manipulations were included to ensure results held across a variety of scenarios. The assignment/order of these conditions was randomised. However, for any given participant in the “no disclosure” group, the same randomisations were applied for one participant in each of the weaker disclosure and stronger disclosure groups, in order to maximise comparability.

- Direction of personalisation (1. price hike; 2. price discount)

Participants experienced both price hikes and price discounts across purchase tasks. In “hike” tasks, personalised prices were increased from baseline, while in “discount” tasks, personalised prices were lowered from baseline. All participants experienced an equal number of “price hike” and “price discount” tasks. No participant saw more than two hike or discount tasks in a row.

Price “personalisation” was therefore, in fact, random. However, participants were aware that information was held about them and their search history, and therefore may have believed it was used to personalise prices.

- Type of purchase (1. low-value real; 2. low-value hypothetical; 3. medium-value hypothetical; 4. high-value hypothetical)

Participants engaged in both real and hypothetical purchase tasks. Of the two real purchases (headphones and water bottles), one was chosen at random to be delivered to the participant. Participants were reminded of this before each task.

The remaining six purchases were hypothetical. There were two with products of a similar low value to the real purchases (portable speakers and coffee cups), two with medium-value products (toasters and power banks) and two with high-value products (barbecues and TVs).

For each type of purchase, one product was associated with price hikes and the other with price discounts (randomly assigned).

- Extent of price changes (1. 1-7%; 2. 7-13%; 3. 13-19%; 4. 19-25%)

In all purchase tasks, half of the items (chosen at random) on the personalised tab had personalised prices that were changed from the baseline price. The extent of these price changes (whether positive or negative) was pseudo-randomly drawn from an interval of 1-25%. To ensure each participant experienced a spread of price changes, this interval was subdivided into four parts (1-7%, 7-13%, 13-19%, 19-25%), with each of these subintervals being used for one price hike and one price discount task.

2.2.4. *Modifications to the experimental design for the replication experiment*

The experimental design was exactly the same as that of the experiment run in Dublin, except:

1. The experiment was translated into Spanish and all prices were converted to Chilean Pesos. The disclosure was translated to “Utilizamos su información personal para calcular este/estos precio(s) para usted. El/Los precio(s) puede(n) ser más alto(s) o más bajo(s) que para otros clientes.”
2. No real purchases were used – all purchases were hypothetical. This was due to logistical constraints as well as the failure to detect major differential effects of disclosure in real as opposed to hypothetical tasks in the original experiment.

2.3. Analysis

2.3.4. *Exclusion criteria*

For analysis relating to the shopping task, data were excluded from participants who *never* switched between the two tabs (n=12 in Dublin, n=8 in Santiago), as these could not be thought of as having properly engaged with the task.

2.3.5. *Coding of open-text answers*

Open-text answers were coded independently by two researchers, blind to experimental condition. Where disagreements arose, these were discussed by both researchers until a decision was reached.

2.3.6. *Graphs*

Unless stated otherwise, all graphs denote mean responses with error bars signifying the standard error of the mean.

Statistical significance p-values are sometimes denoted in graphs as follows:

*p < .05, **p < .01; ***p < .001.

Graphs of results from Ireland and Chile are presented alongside each other to facilitate informal comparison. However, analyses were run separately on the two experiments. The second experiment was intended as a replication of the first, with the aim of verifying the primary results.

2.3.7. *Regression models*

Data were analysed using appropriate regression models, depending on the outcome variable being examined. Where there was a significant effect of the direction of personalisation, regressions were also run separately on hike and discount tasks. Models referred to are reported in Annex D, to maintain flow in the main text.

All reported statistically significant results have also been verified in models that include the following sociodemographic variables:

- Gender (Male/Female);
- Age (Under 45/45 and over);
- Education (Third level or not);
- Employment status (Employed or not);

- Online shopping habits (Regular shopper or not)⁸.

For dependent variables relating to the shopping task, the following explanatory variables were also included in the model, where relevant:

- The order in which purchase task appeared;
- Which tab the personalised website was on;
- Features of the website design.

For simplicity, models including these additional independent variables are only reported where deemed relevant to the study's primary research questions.

3. Results

3.1. Impact of disclosure on consumer awareness

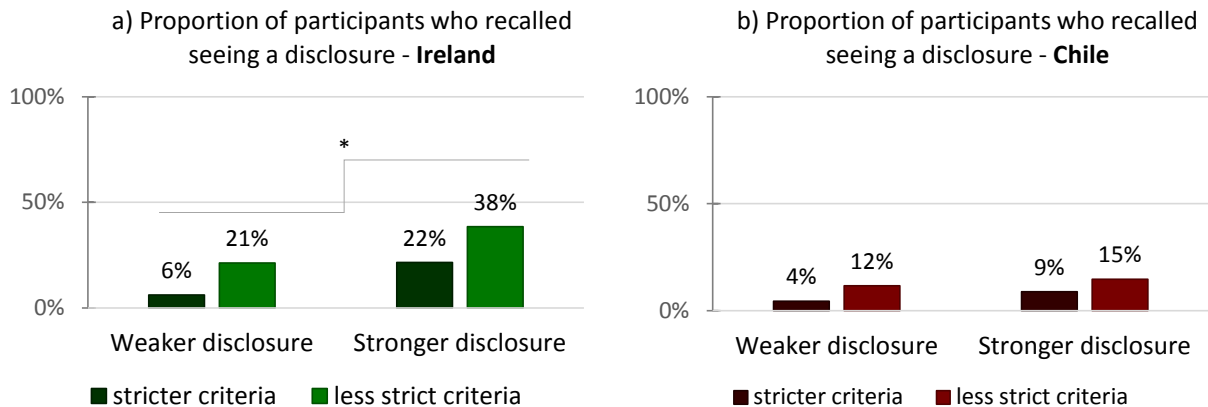
3.1.4. Recall of the disclosures

Two different criteria were used to classify participants as recalling having seen a disclosure.

The first few questions of the questionnaire include open-text answers about participants' shopping experience and any differences they noticed between retailers. Later, they are explicitly asked (i) if they saw a disclaimer, and if so (ii) to identify its content from a list. According to the *stricter criteria*, a participant is classified as recalling seeing the disclosure if they mention it in those open-text answers (unaided recall), or correctly identify the disclosure from the list (recognition).

Later in the questionnaire, participants are given a definition of personalised pricing, are asked if they thought it was being used, and if so what made them aware of it. Here, after being prompted, some additional participants mentioned the disclosure, and these are included according to the *less strict criteria*.

Figure 4.1. Participants' recall of seeing a disclosure according to both the stricter and less strict criteria for defining recall



In Dublin, less than half of participants recalled seeing the disclosure, even when using the less strict criteria for recall, and focusing only on the stronger disclosure condition (Figure 4.1(a)). Significantly more participants recalled seeing the stronger disclosure than the weaker disclosure ($p < 0.05$ Table 2, Models 1 & 3).

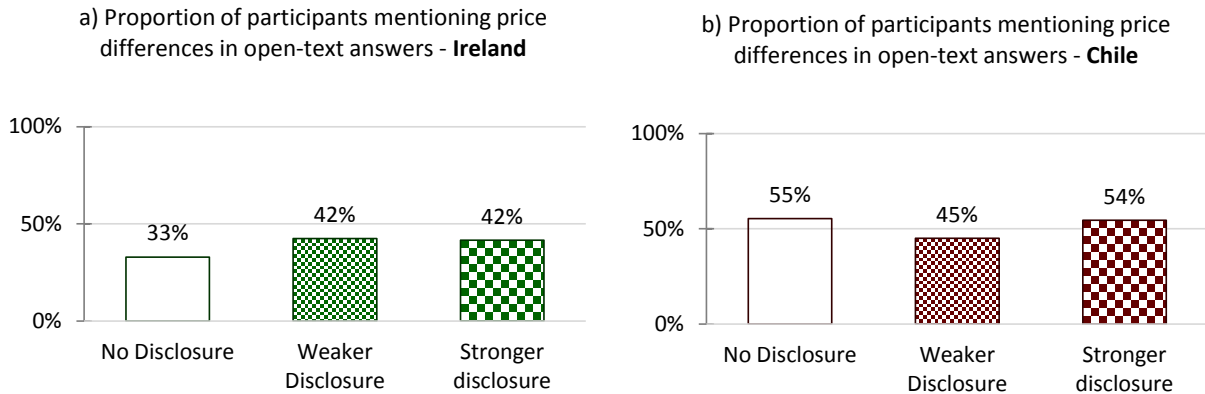
In Santiago, recall was even lower; only 15% of participants recalled having seen the stronger disclosure (Figure 4.1(b)). Again, recall appeared to be better for the stronger disclosure than the weaker disclosure, although this difference is not statistically significant (Table 2, Models 2 & 4).

3.1.5. Awareness of price differences and personalised pricing

In Dublin, slightly more participants mentioned price differences in their open-text answers in the disclosure conditions compared with the no disclosure condition, but the increase was not statistically significant (Figure 4.2(a), Table 3, Model 1).

Participants in Santiago appeared to be more likely to mention price differences overall (51% of total participants vs. 39% in Dublin), but there were no significant differences between conditions (Figure 4.2(b), Table 3, Model 2).

Figure 4.2. Proportion of participants mentioning price differences unprompted in open-text answers

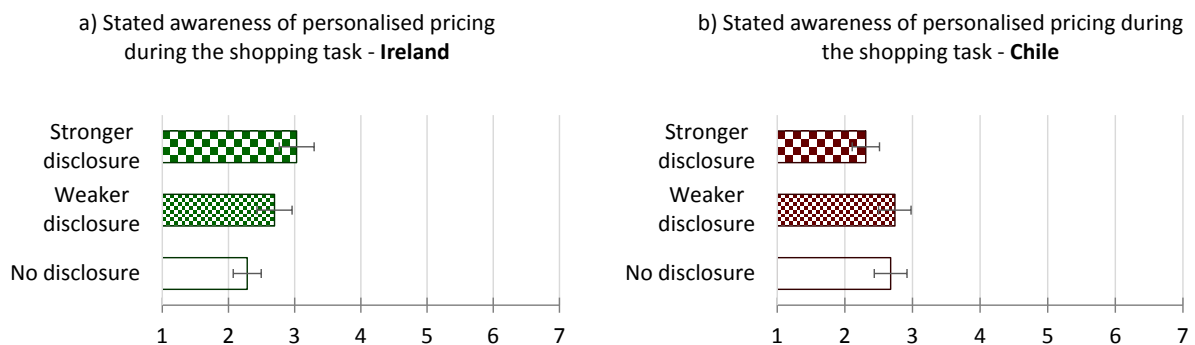


In Dublin, participants’ stated awareness of personalised pricing (after being given a definition of the term) appeared to increase slightly with strengthening disclosure, with a statistically significant difference seen between the stronger disclosure and no disclosure condition ($p < 0.05$) (Figure 4.3(a), Table 4 Model 1). However, stated levels of awareness remained low overall, with a median rating of 2 on the 7-point scale.⁹

Stated awareness was even lower in Santiago (median rating of 1), and there was no effect seen of either disclosure (Figure 4.3(b), Table 4, Model 2).

Figure 4.3. Participants' stated awareness of personalised pricing during the shopping task, as recorded on a Likert scale from 1 (“Completely unaware”) to 7 (“Completely aware”)

Participants who stated in a previous question that they did not think personalised pricing had been used were assigned a rating of 1

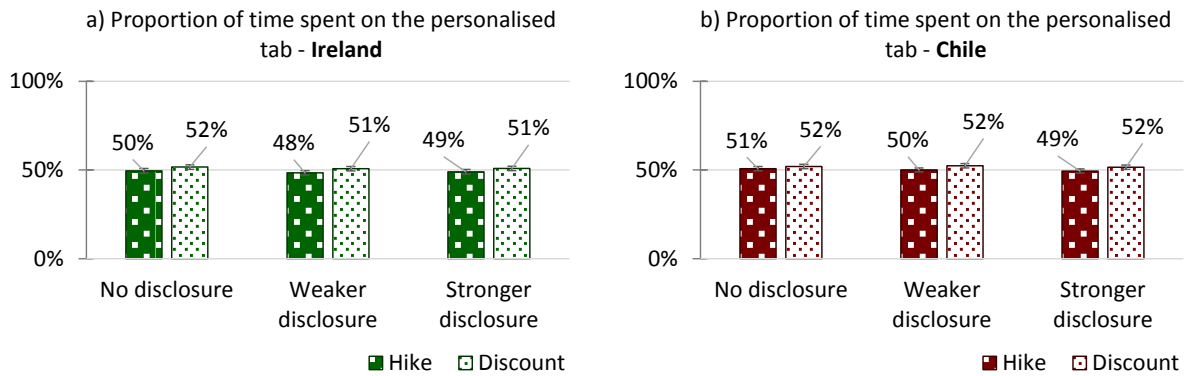


3.2. Impact of disclosure on consumer behaviour

3.2.4. Impact of disclosure on consumer website preferences

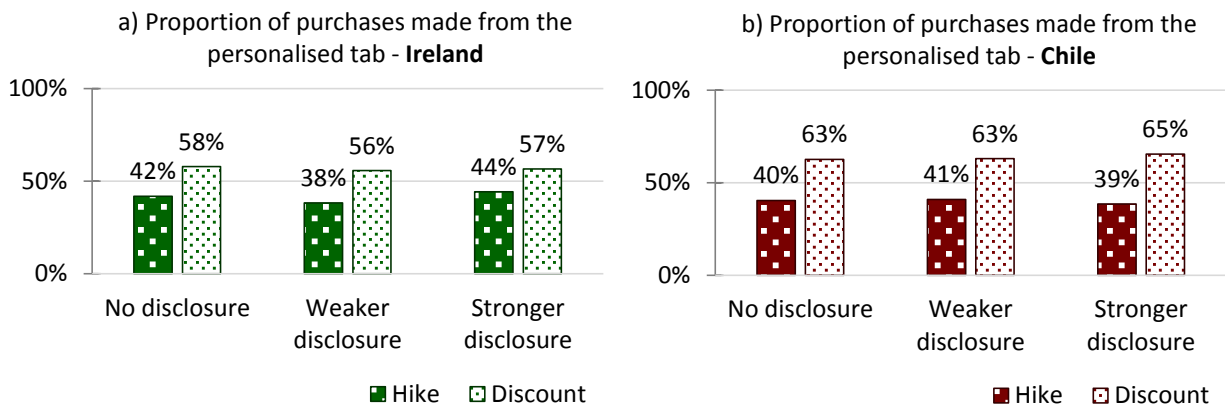
In both the original and replication experiment, participants split their time roughly evenly between the personalised and non-personalised tabs (Figure 3.4). They were more likely to spend more time (over 50%) on the personalised tab when it had discounts rather than price hikes ($p < 0.05$), and when the first tab was personalised rather than the second ($p < 0.001$), as more time was generally spent on the first tab (Table 5). There were no significant differences between disclosure conditions.

Figure 4.4. Proportion of time spent on the personalised tab in a given task



In both experiments, participants were also more likely to actually buy from the personalised tab when it applied discounts rather than price hikes ($p < 0.001$, Table 6), with participants in Santiago appearing to be more likely than those in Dublin to purchase from the personalised tab in discount tasks (64% vs. 57% of tasks across all disclosure conditions) (Figure 3.5). However, again, there was no significant effect of the disclosures in either experiment.

Figure 4.5. Proportion of purchases made from the personalised tab, as opposed to the non-personalised tab

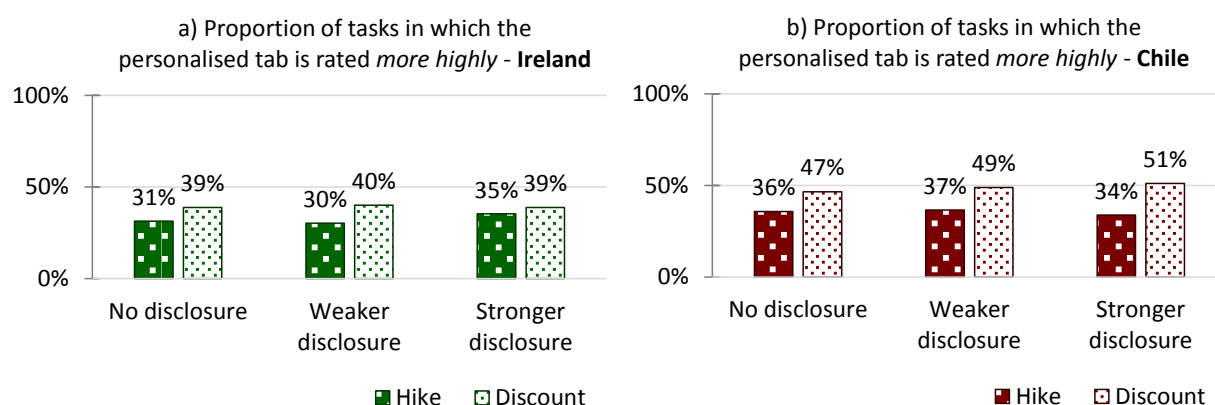


A similar pattern is seen in the ratings participants gave to the websites after each task; in particular, in the proportion of tasks after which participants gave the personalised tab a higher (non-equal) rating than the non-personalised tab (Figure 4.6). Again, there was a significant difference between the hike and discount

tasks ($p < 0.01$ in Dublin, $p < 0.001$ in Santiago, Table 7), and participants in Santiago appeared to be more likely than those in Dublin to give a higher rating to the personalised tab in discount tasks (49% vs. 39% of tasks across all disclosure conditions). Nonetheless, there was no statistically significant effect of the disclosures in either the original or replication experiment.

Figure 4.6. Stated preference of the personalised tab as measured by participants' ratings of the two websites after each tab

Proportions shown are those of tasks in which the personalised website was given a higher rating than the non-personalised website



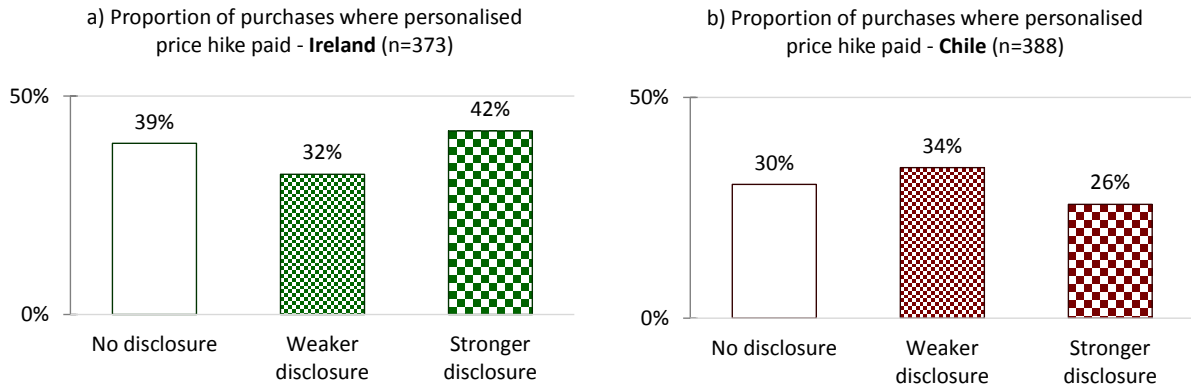
3.2.5. Impact of disclosure on consumer purchases and expenditure

Given two equivalent items, where one has a personalised price and the other does not, the expected rational behaviour (assuming they have no inherent distaste for personalisation) would be for participants to buy the cheaper item, regardless of whether the price is personalised or not. It is therefore informative to look for instances where participants did not adhere to this behaviour, and bought the more expensive item.

In the price hike tasks, buying the more expensive of two equivalent items (where one has a personalised price) equates to paying a personalised price hike. Of course, for any given participant the choice to pay a higher price may be a reflection of a true preference for the more expensive item. However, any significant differences between disclosure conditions in the overall rate of this behaviour would indicate a change in the propensity to “fall victim” to personalisation. Yet, no significant differences were found between disclosure conditions in either the Dublin or Santiago experiments (Figure 4.7, Table 8). Participants in Dublin appeared to be slightly more likely to pay a personalised price hike than participants in Chile (38% vs. 30% of relevant purchases on average, across all disclosure conditions).

Figure 4.7. Proportion of price hike tasks in which an item with a personalised price was bought, where a cheaper equivalent item was available on the non-personalised tab

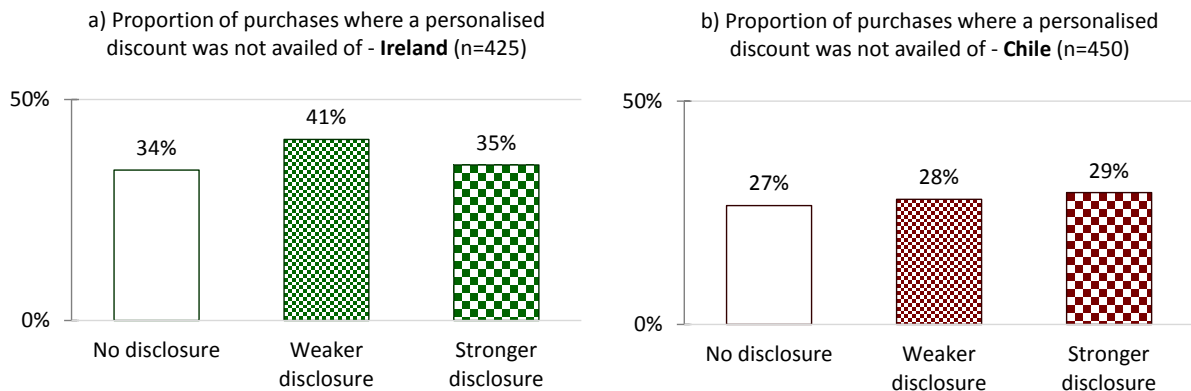
Note that if no attention was paid to price or personalisation the proportion would be expected to approach 50%



In the price discount tasks, choosing to buy the more expensive item equates to not availing of a personalised discount. A significant increase in the rate of this behaviour might indicate a distaste of the use of personalised pricing, and a willingness to pay to avoid it. However, no significant increase was associated with the presence of a disclosure in either the original or replication experiment (Figure 4.8, Table 9). Participants in Dublin appeared to be more likely to fail to avail of a personalised discount than those in Santiago (37% vs. 28% of relevant tasks, across all disclosure conditions).

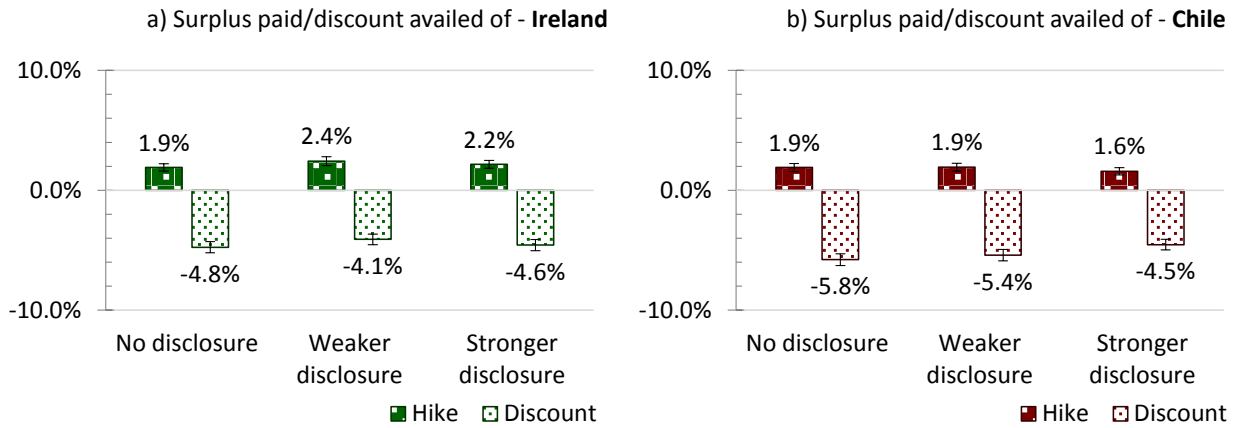
Figure 4.8. Proportion of price discount tasks in which an item on the non-personalised tab was bought at a baseline price, where a discount was available on the personalised tab

Note that if no attention was paid to price or personalisation the proportion would be expected to approach 50%



The financial effects of personalisation on consumers can be seen in Figure 4.9. On the whole, participants paid an average of 2% on top of baseline prices for items in “hike” tasks, in both the Dublin and Santiago experiments. Given that only half of the items on the personalised tab had personalised prices, it is probable that the average surplus paid would have been double this had all prices been personalised. In discount tasks, participants availed of a 4% or 5% discount, in Dublin and Santiago respectively, on average.

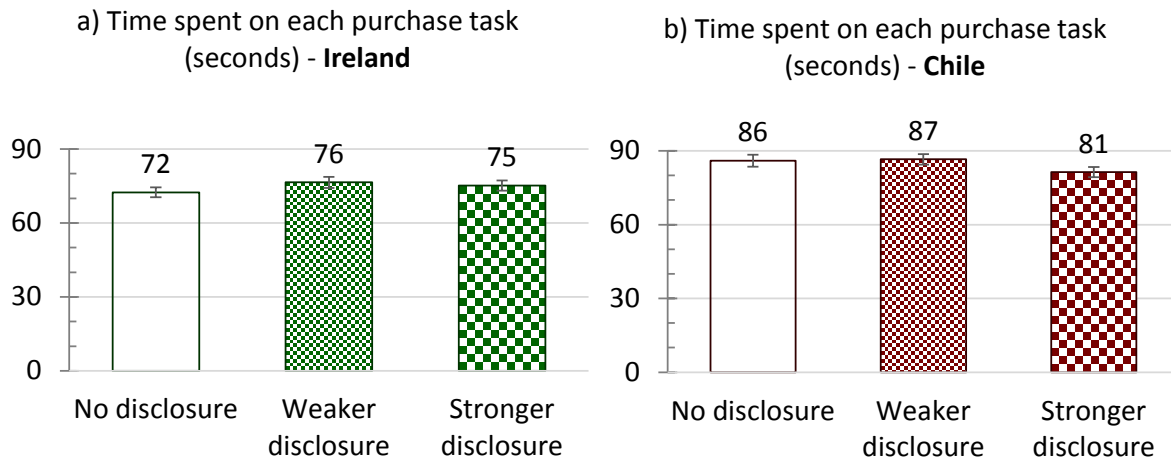
Figure 4.9. Financial effect of personalisation on consumers: average surplus paid compared with baseline prices in price hike tasks, and average discount from baseline prices availed of in discount tasks



3.2.6. Impact of disclosure on search behaviour

Participants spent a little over one minute on each purchase task, on average (Figure 4.10). In Dublin, participants spent significantly longer on real purchase tasks (94 s vs. 68 s on average) ($p < 0.001$, Table 10). Participants in Santiago spent 10 s longer on each task than participants in Dublin, on average, despite only undertaking hypothetical purchases. There was no effect of the level of disclosure in either experiment.

Figure 4.10. Time in seconds spent on each purchase task



In Dublin, there was no significant effect of disclosure on the number of times a participant switched between retailers’ websites in a given task (Figure 4.11(a), Table 11, Model 1). Participants did switch significantly more in real purchase tasks, however ($p < 0.001$).

In Santiago, participants who saw a disclosure switched more between the websites than those who did not (Figure 4.11 (b), Table 11, Models 2 & 3). This increase was statically significant in the case of the weaker disclosure ($p < 0.01$). In the case of the stronger disclosure, the increase was not significant when controlling for the age of participants – participants under 45 switched significantly more ($p < 0.001$), and

the random allocation resulted in a higher proportion of under 45s in the stronger disclosure condition (68% compared with 51% in the no disclosure condition, and 53% in the weaker disclosure condition). Interestingly, the increase in switching with the weaker disclosure remained statistically significant even when including only data from those participants that did *not* recall seeing a disclosure ($p < 0.05$, Table 11, Model 4).

Figure 4.11. Number of switches between the two retail websites in a given purchase task

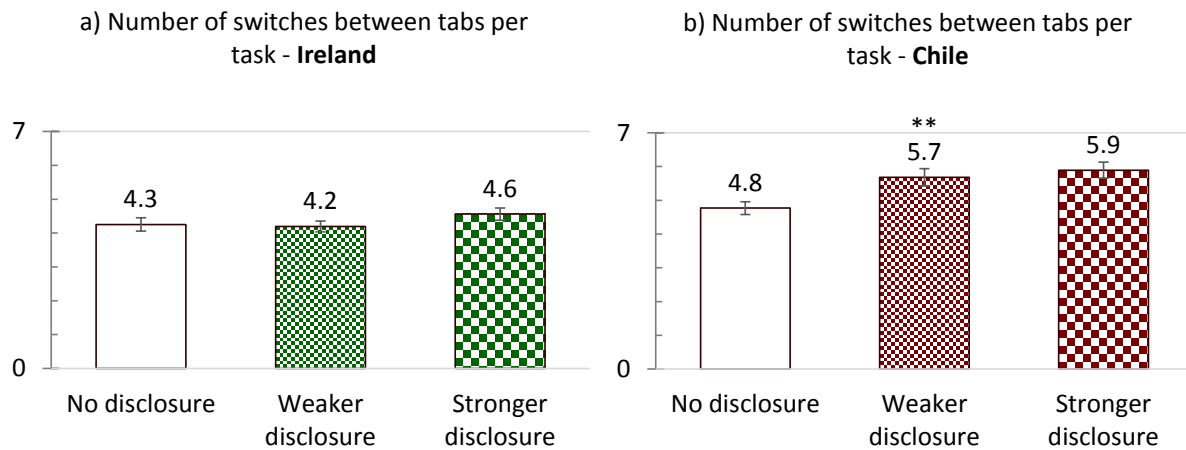
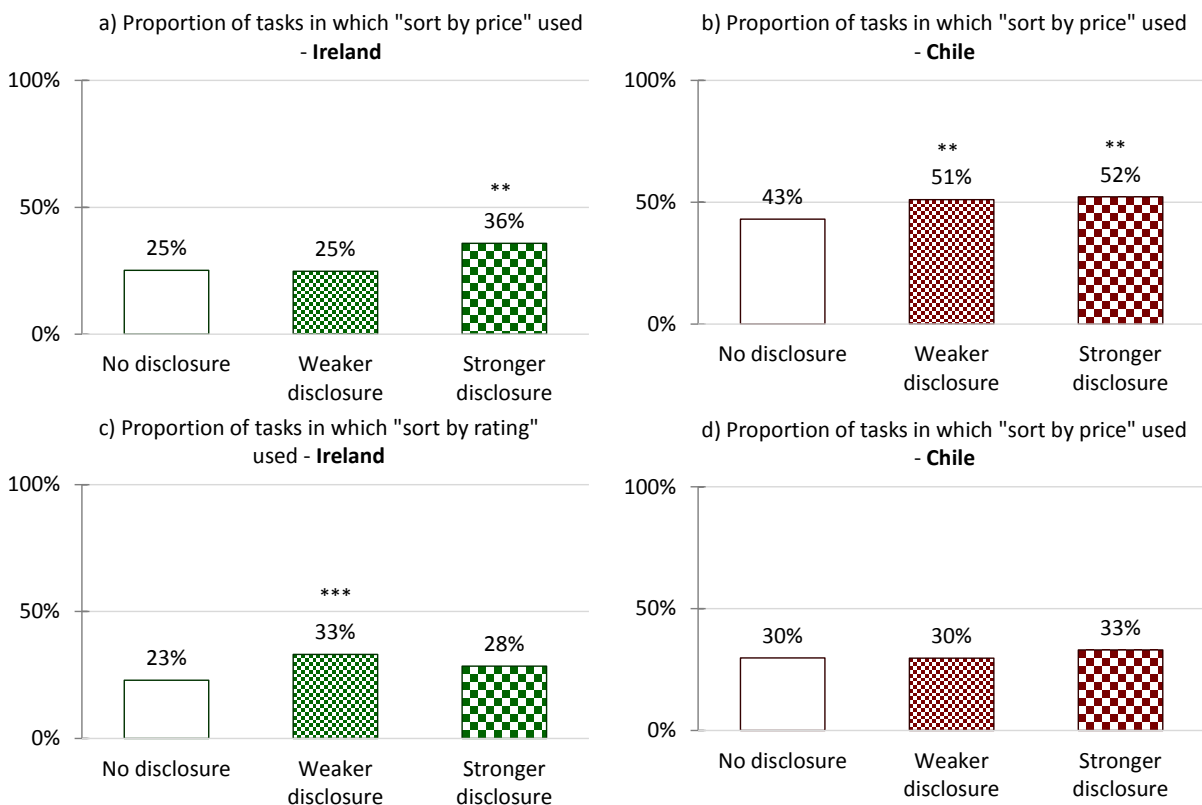


Figure 4.12. Use of "sort by" options during the shopping tasks



In Dublin, there was a significant increase in the use of the “sort by price” option in the stronger disclosure condition ($p < 0.01$ when controlling for relevant sociodemographic characteristics), but not the weaker disclosure condition (Figure 4.12(a), Table 12, Model 2). On the other hand, there was a significant increase in the use of the “sort by rating” option in the weaker disclosure condition ($p < 0.001$) and, to a lesser extent, the stronger disclosure condition ($p < 0.1$ when controlling for whether a participant had a degree or not) (Figure 4.12(c), Table 13, Model 2).

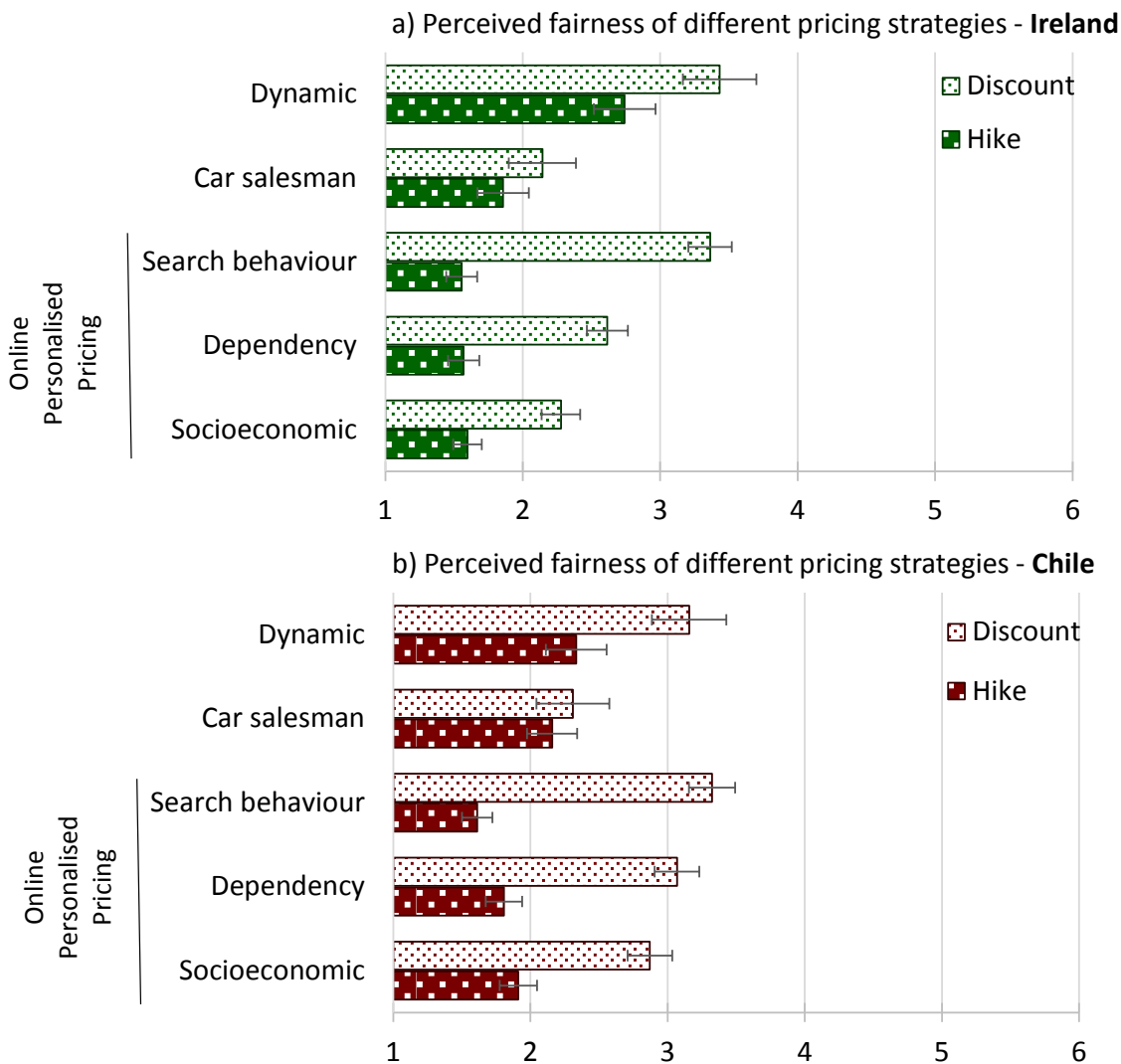
In the replication experiment in Santiago, there was a significant increase in the use of the “sort by price” option, with both the weaker and stronger disclosure ($p < 0.01$) (Figure 4.12(b); Table 12, Model 4). Participants also generally sorted by price more often than they did in Dublin (49% vs. 29% of tasks across all disclosure conditions). There was, however, no significant effect of either disclosure on the use of the “sort by rating” option (Figure 4.12(d), Table 13, Model 4).

In the case of the effects seen of disclosure on the use of the “sort by price” option, significant differences persisted even when using only data from participants that did *not* recall seeing a disclosure (Table 12, Models 3 & 5).

3.3. Consumer attitudes towards personalised pricing

3.3.1. Perceived fairness of pricing strategies

Figure 4.13. Perceived fairness of vignettes describing different pricing strategies, as rated by participants on a scale from 1 (“Completely unfair”) to 6 (“Completely fair”)



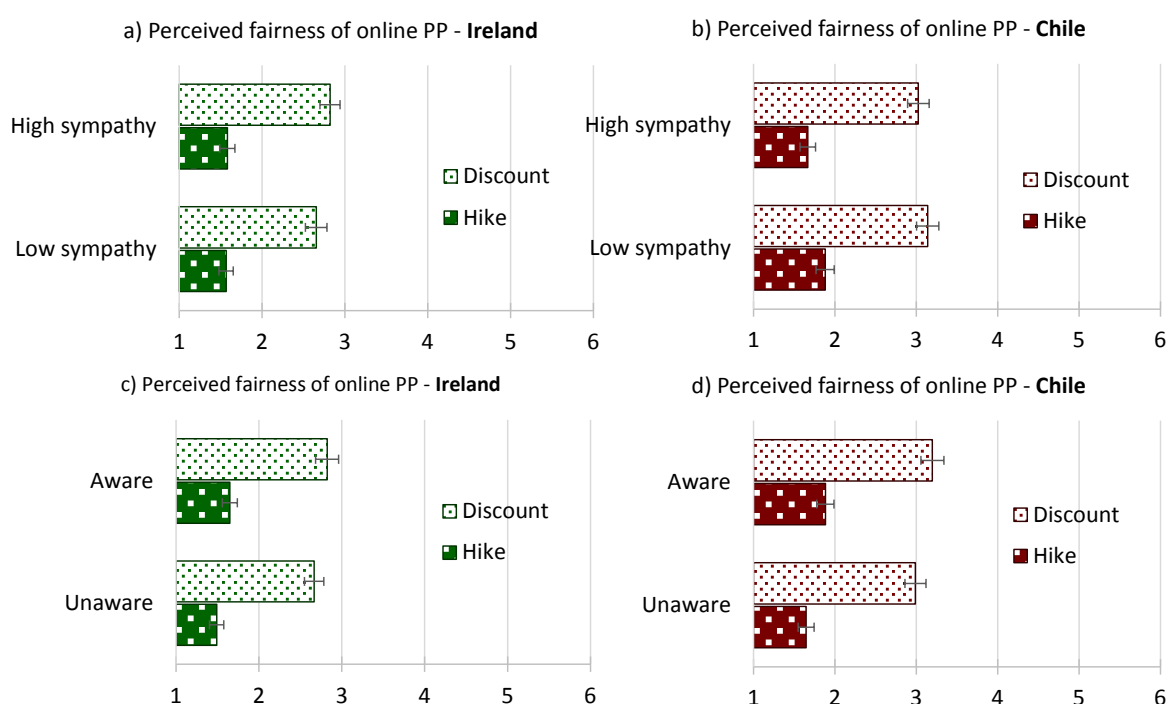
Participants’ fairness ratings for vignettes, separated into the different pricing strategies they describe, can be seen in Figure 4.13. Participants generally perceived the pricing strategies as being *unfair*, on a numeric scale from 1 (*completely unfair*) to 6 (*completely fair*). In Dublin, the median rating was 1 for the online personalised pricing scenarios combined, 1 for the car salesman scenario, and 3 for the dynamic pricing scenario. In Santiago, there wasn’t as clear a distinction between dynamic pricing and the other scenarios, and all pricing strategies received a median rating of 2.

In both experiments, pricing strategies were given higher fairness ratings when they led to the subject in the scenario receiving a discount rather than a price hike ($p < 0.001$, Table 14, Models 1 & 4). The magnitude of the difference varied depending on the type of pricing strategy described.

In Dublin, when vignettes were framed in terms of discounts, personalisation based on the subject's past search behaviour was seen as being fairer than personalisation based on their socioeconomic status or their dependence on the item being bought ($p < 0.001$ in both cases, Table 14, Model 3). This result was somewhat replicated in Santiago, although the differences were smaller and did not quite reach statistical significance ($p = 0.06$ and $p = 0.26$, respectively, Table 14, Model 6).

There were no significant differences found between different personalised pricing scenarios in vignettes framed in terms of price hikes (Table 14, Models 2 & 4), although this may have been the result of a floor effect, as fairness ratings were very low (median=1 in both Ireland and Chile).

Figure 4.14. Perceived fairness of online personalised pricing vignettes according to (a) (b) whether the subject belongs to a “high” or “low” sympathy group, and (c) (d) whether the subject is aware of the pricing strategy being used

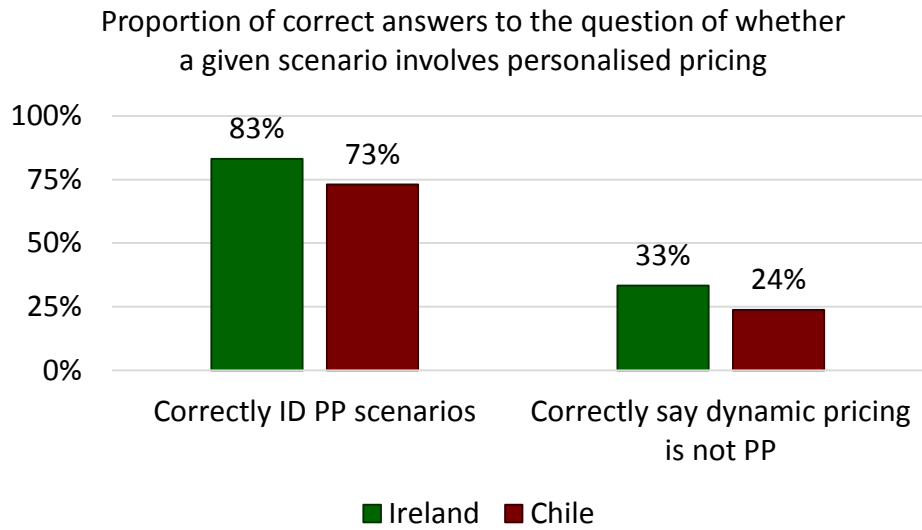


Data specifically relating to the online personalised pricing vignettes can be seen in Figure 4.14. Whether the subject of a scenario belonged to a “high” or “low” sympathy group had no effect on fairness ratings in either experiment (Table 15). Fairness ratings were slightly higher when the subject in the scenario was aware of the pricing strategy being used, but this difference was not statistically significant in the Dublin experiment, and only marginally so in the Santiago experiment ($p < 0.1$, Table 15, Model 4).

3.3.2. Participants' ability to recognise online personalised pricing

After rating each vignette, participants were asked whether they judged the pricing strategy described to be personalised pricing. Their answers to these questions can be used to get some measure of comprehension, as shown in Figure 4.15. Although participants correctly identified personalised pricing as such most of the time, more often than not they mistook dynamic pricing (prices fluctuating according to overall demand) for personalised pricing. Comprehension was slightly better in the Dublin experiment than the Santiago experiment.

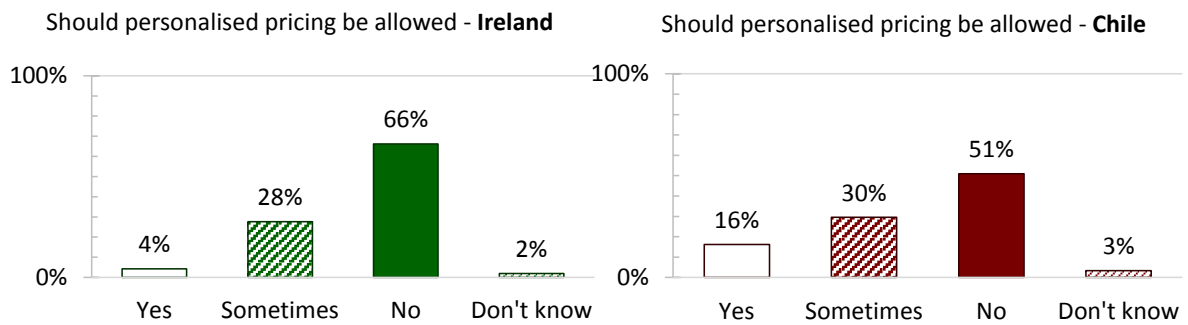
Figure 4.15. Comprehension of what constitutes personalised pricing, as measured by judgements of whether the pricing strategy described in a vignette is personalised pricing or not



3.3.3. Participants’ feelings about online personalised pricing

In one of the final questions of the questionnaire, participants were asked if they thought online personalised pricing should be allowed. In Dublin, two thirds of participants answered “no”, with a further 28% answering “sometimes” and only 4% saying “yes” (Figure 4.16). Acceptance was higher in Santiago, where 16% answered “yes”, but still a slight majority thought it should not be allowed.

Figure 4.16. Responses to: “Should online personalised pricing be allowed?”



4. Discussion

This experimental study failed to find evidence that displaying a disclosure about online personalised pricing has an impact on consumer decision-making. This main finding is consistent with previous research indicating that disclosures may not always be successful in raising consumer awareness and protecting consumer interests (Seizov, Wulf and Luzak, 2019^[7]).

The majority of participants did not recall seeing a disclosure, and remained unaware of any personalised pricing, despite the strength of the disclosure and its appearance on all webpages where prices had been personalised. While the stronger disclosure tested had a statistically significant effect on participants' stated awareness of personalised pricing in the original Dublin experiment, the size of the effect was limited, with participants still reporting low awareness of personalised pricing on average (a median of 2 on a 7 point scale). No effects on stated awareness were found for the weaker disclosure in the Dublin experiment, or for either disclosure in the replication of the experiment in Santiago.

Any increase in awareness that may have been triggered by the disclosures was not sufficient to induce a significant change in participants' purchasing preferences. In the price hike tasks, simply increasing the prices of half the items on the personalised tab at random led to participants paying 2% extra overall. If prices had actually been based on some estimated willingness to pay, this surplus could have been even greater. Neither disclosure was effective in protecting participants from paying more than they needed to. Only minor effects were detected on some measures of search behaviour, such as the number of switches between tabs and use of the "sort by" options.

These results are in line with those of the previous European Commission-led experiment mentioned above (European Commission, 2018^[4]). The present experiment however extends the findings to a more realistic online shopping environment, including to real purchases in the case of the Dublin experiment, and focuses specifically on personalised pricing in isolation from other personalisation practices, such as the personalised rankings of search results.

One potential limitation of this study is that price "personalisation" was not actually based on the participants' personal data and was in fact random. The experiment was designed in this way because there is currently very little known about how retailers calculate willingness to pay from customers' personal information, so any attempt to do so would be guesswork. Participants were nevertheless led to believe true personalisation was being used, as they had engaged in tasks that could divulge personal information at the start of the experiment. Indeed, a majority of participants indicated that they did believe personalised pricing had been used, when asked in the questionnaire (69% of participants in Dublin, 54% in Santiago).

It is possible that a more salient disclosure would have been more successful at raising awareness, and therefore at changing behaviour. Increased visual salience of online disclosures has been associated with significant, if modest, increases in recall in other domains (Amazeen and Wojdyski, 2018^[9]). However, it should be noted that the website designs used in the experiment were relatively simple, making the disclosures more salient than they would be in a more complex environment with other disclaimers, messages and advertising likely to be present. Other studies have also found that visually salient disclosures do not necessarily result in behavioural change (Seira, Elizondo and Laguna-Müggenburg, 2017^[10]). Further, the disclosure in this experiment was succinct, substantial in size, seen repeatedly, and accompanied every single personalised price, fulfilling numerous recommendations for designing effective online disclosures (OECD, 2018^[1]). The use of emotive messaging may have further enhanced the effect of the disclosure, as it has succeeded in doing elsewhere, but this would arguably change the goal of the disclosure from that of simply informing consumers and bring it closer to being a "nudge", which may not be desirable in this context (Esposito et al., 2017^[11]).

There were differences seen in the effects of the two alternative disclosures, with more participants recalling having seen the stronger disclosure than the weaker disclosure. These two disclosures varied only in their wording, so differences in recall or awareness are not attributable to visual salience but rather to the meaning the disclosure had for participants. It is possible that most participants did see the disclosure but, not being familiar with the concept of online personalised pricing, did not understand what it meant. Participants did report some prior familiarity with the concept of personalised pricing (a median of 3 and 4 on a 7-point scale in Dublin and Santiago, respectively), after having been provided with a definition of this in the questionnaire. However, responses to comprehension checks regarding pricing strategies in the vignettes reveal that participants in fact have a poor understanding of what constitutes personalised pricing as distinct from dynamic pricing, especially in Chile. Further support for the hypothesis that participants saw but did not fully understand the disclosures comes from the fact that some effects on search behaviour (increased switching between tabs and sorting by price) were present even among those participants who did *not* recall seeing a disclosure, as measured by their responses in the questionnaire.

It is also possible that participants failed to recognise the disclosure as a regulatory device, perhaps mistaking it instead for a piece of marketing coming from the retailer. This may explain why recall of the disclosure was poorer in Chile, despite participants otherwise seeming better engaged (more time spent on shopping tasks, availing more of discounts). The Chilean participants are likely to be less familiar with the concept of regulatory disclosures concerning the use of personal data online, whereas in Ireland these are now ubiquitous.

Of course, it remains possible that participants did not pay heed to the disclosures because they were not bothered by personalised pricing. However, responses to the vignettes make it clear that participants find personalised pricing practices to be unfair, even when they lead to personalised discounts. Moreover, most participants do not think personalised pricing should be allowed. Whether the subject of a scenario was aware that price personalisation was being used or not did not appear to have any large effect on how fair participants perceived that scenario to be, which has clear implications in the context of disclosure.

Interestingly, participants did distinguish between different grounds for personalisation, particularly when it led to discounts: personalisation based on a subject's search history was seen, relatively, to be fairer than other types. They also rated all scenarios as being fairer if personalisation led to discounts for the subject involved. This variability in the perception of personalised pricing has important implications for the wording of surveys designed to gauge consumer sentiment regarding this issue. Indeed, another recent study found that the framing of disclosure statements about personalised pricing can alter people's stated intention to purchase, further highlighting the need for caution in selecting wording, and the value of pre-testing interventions (van Boom et al., 2020_[12]).

In conclusion, the results from this experiment, in line with previous studies (e.g. European Commission, 2018_[1]), fail to provide evidence that disclosures about online personalised pricing can meaningfully change consumer behaviour, or protect them from paying more than they otherwise might in cases where different personalised prices are offered.

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Annex A. Questionnaire

A1.1. English version

Thank you for completing the purchase tasks. In the next section you will be asked some questions about your shopping experience and the different online retailers you saw.

- Q: Overall, how would you rate your shopping experience today?
A: 1 (very negative) – 7 (very positive) scale
- Q: Please give a reason for your rating
A: Free text

- Q: What are the main differences you noticed between online retailers?
A: Free text
- Q: In general, what were the main factors that drove your choice of product in each of the purchase tasks? Please list these in order of importance.
A: Brand/rating/quality/price/functionality/design/other

- Q: Were there any systematic price differences between websites for similar items?
A: Yes/No
- Q: Why do you think there might have been price differences between websites?
A: Free text

- Q: Did any of the retailers display a warning statement, disclaimer or disclosure?
A: Yes/No
[IF YES]
 - Q: Over the course of this study, you made 8 purchases. That means you saw 16 retailers' websites in total. How many of these retailers displayed a disclaimer?
A: Free text
 - Q: Can you recall what the disclaimer was about?
A: [Multiple choice answer, including "distractor" options that mention prices but not personalisation specifically - randomised order]
 - The retailer's use of my personal data to calculate the prices I see
 - The retailer's use of my personal data to show me advertisements for products I might be interested in
 - The requirement for cookies to be switched on in order for the retailer's website to function properly
 - The fluctuation of some prices based on current demand
 - The retailer's use of my personal data to improve my customer experience
 - The retailer's guarantee to match any price found on another retailer's website
 - Q: Did seeing one of these disclaimers affect how much you trusted the retailer on average?
A: 1 (trusted a lot less) – 7 (trusted a lot more) scale
 - Q: Did seeing one of these disclaimers affect your decision to purchase from that retailer on average?

A: 1 (made me much less likely to purchase) – 7 (made me much more likely to purchase) scale

When you're looking online for goods and services, online retailers can access data on your online behaviour (searches, clicks etc.), as well as personal information (e.g. age bracket, gender etc.), tracked by themselves or by other websites you visited. Online retailers could potentially use this data to adapt the prices charged to you for specific goods and services you are looking for online. This is known as online "personalised pricing" (different consumers seeing a different price for the same product).

- Q: Do you think any of the online retailers you saw in this study were using personalised pricing on some of their items?
A: Yes/No
[IF YES]
 - Q: Over the course of this study, you made 8 purchases. That means you saw 16 retailers' websites in total. How many of these retailers do you think used personalised pricing?
A: Free text
 - Q: While you were shopping, how aware were you that personalised pricing was being used?
A: 1 (completely unaware) – 7 (completely aware) scale
[IF ANSWER>=2]
 - Q: What, if anything, made you aware of the use of personalised pricing while you were shopping?
A: Free text
 - Q: What kind of information do you think was used to personalise the prices you saw?
A: Free text
 - Q: Do you think you were shown higher or lower prices than other customers?
A: Mostly higher prices/Mostly lower prices/Always the same prices/Sometimes higher, sometimes lower
- Q: Before taking part in this study, how familiar were you with the concept of online personalised pricing?
A: 1 (had never heard of it) – 7 (was familiar with it and understood how it works) scale
- Q: How widespread do you think online personalised pricing is?
A: 1 (not used at all) – 7 (extremely widespread) scale

In the following section you will be asked for your opinion on a series of four short scenarios, each describing a different pricing strategy.

For each vignette:

- Q: How would you rate this pricing strategy on a scale from "completely unfair" (1) to "completely fair" (6)?
A: 1 (completely unfair) – 6 (completely fair) scale
- Q: Do you think that this pricing strategy qualifies as personalised pricing?
A: Yes/No/Don't Know
- Q: Do you think that this pricing strategy should be legal?
A: Yes/No/Don't Know]

Please answer some final questions about personalised pricing in general.

- Q: Do you think online personalised pricing should be allowed?
A: Yes/No/Sometimes/Don't know
- Q: If personalised pricing is allowed, should consumers be made aware of this?

A: Yes/No/Don't know

[IF YES]

○ Q: How should consumers be made aware of personalised pricing?

A: Free text

A1.2. Spanish version

Gracias por completar las tareas de compra.

En la siguiente sección, se le harán algunas preguntas sobre su experiencia de compra y las diferentes multitiendas de venta por internet que observó.

- En general, ¿cómo calificaría su experiencia de compra hoy?
 - 1 (Muy negativa) --- 7 (Muy positiva)
- En el cuadro de abajo, indique el motivo de su calificación. Para pasar a la página siguiente, presione "F1".
- ¿Cuáles son las principales diferencias que notó entre las multitiendas de venta por internet? Por favor escriba su respuesta en el cuadro a continuación. Para pasar a la página siguiente, presione "F1".
- En general, ¿cuáles fueron los principales factores que impulsaron su elección de producto en cada una de las tareas de compra? Enumere estos en orden de importancia. Haga clic en la razón más importante primero, y así sucesivamente. Haga clic en "Borrar" para cambiar el orden. Haga clic en "Siguiente" cuando haya seleccionado todas las razones que le importen.
 - Marca
 - Calificación
 - Calidad
 - Precio
 - Funcionalidad
 - Diseño
 - Otro
- ¿Hubo alguna diferencia sistemática de precios entre sitios web para artículos similares?
 - Sí
 - No
- ¿Por qué cree que podría haber diferencias de precios entre los sitios web? Por favor escriba su respuesta en el cuadro a continuación. Para pasar a la página siguiente, presione "F1".
- ¿Alguna de las multitiendas mostró una declaración de advertencia, descargo de responsabilidad o divulgación?
 - Sí
 - No

[if "Sí" selected]

- En el transcurso de este estudio, realizó 8 compras. Eso significa que vio 16 sitios web de multitiendas en total. ¿Cuántas de estas multitiendas mostraron un aviso? Por favor escriba su respuesta en el cuadro a continuación. Para pasar a la página siguiente, presione "F1".

- Creo que de un total de 16 multitiendas mostró un aviso.
- ¿Puede recordar de qué se trataba el descargo de responsabilidad?
 - El uso que hace la multitienda de mi información personal para calcular los precios que veo
 - El uso que hace la multitienda de mi información personal para mostrarme anuncios de productos en los que podría estar interesado
 - El requisito de que las cookies se activen para que el sitio web de la multitienda funcione correctamente
 - La fluctuación de algunos precios en función de la demanda actual
 - El uso que hace la multitienda de mi información personal para mejorar mi experiencia como cliente
 - La garantía de la multitienda de igualar cualquier precio encontrado en el sitio web de otra multitienda
- ¿Ver uno de estos descargos de responsabilidad afectó su confianza en la multitienda en general?
 - 1 (Me dio mucha menos confianza) --- 7 (Me dio mucha más confianza)
- ¿Ver uno de estos descargos de responsabilidad afectó su decisión de comprar a esa multitienda en general?
 - 1 (Me hizo mucho menos propenso a comprar) --- 7 (Me hizo mucho más propenso a comprar)

Cuando busca productos y servicios en internet, las multitiendas de venta por internet pueden acceder a datos sobre su comportamiento en internet (búsquedas, clics, etc.), así como a información personal (por ejemplo, edad, sexo, etc.), rastreados por ellos mismos o por otros sitios web que visitó.

Las multitiendas de venta por internet podrían usar esta información para adaptar los precios que se le cobran por los bienes y servicios específicos que está buscando en internet. Esto se conoce como "precios personalizados" en internet (diferentes consumidores ven un precio diferente para el mismo producto).

- ¿Cree que alguna de las multitiendas de venta por internet que observó en este estudio estaba usando precios personalizados en algunos de sus artículos?
 - Sí
 - No

[if "Sí" selected]

- En el transcurso de este estudio, realizó 8 compras. Eso significa que vio 16 sitios web de multitiendas en total. ¿Cuántas de estas multitiendas cree que utilizó precios personalizados? Por favor escriba su respuesta en el cuadro a continuación. Para pasar a la página siguiente, presione "F1".
 - Creo que de un total de 16 multitiendas utilizó precios personalizados.
- Mientras estaba comprando, ¿qué tan consciente fue de que se estaban utilizando precios personalizados?
 - 1 (Completamente inconsciente) --- 7 (Completamente consciente)

[if selection >1]

- ¿Qué le hizo notar, si fue el caso, el uso de precios personalizados mientras compraba? Por favor escriba su respuesta en el cuadro a continuación. Para pasar a la página siguiente, presione "F1".
- ¿Qué tipo de información cree que se utilizó para personalizar los precios que vio? Para pasar a la página siguiente, presione "F1".
- ¿Cree que le mostraron precios más altos o más bajos que otros clientes?
 - Mayormente precios más altos
 - Mayormente precios más bajos
 - A veces más altos, a veces más bajos
 - Siempre los mismos precios
- Antes de participar en este estudio, ¿qué tan familiarizado estaba con el concepto de precios personalizados en internet?
 - 1 (Nunca había escuchado hablar de eso) --- 7 (Estaba familiarizado con el concepto y entendía cómo funciona)
- ¿Cuán extendido cree que es el uso de precios personalizados en internet?
 - 1 (No se usa en lo absoluto) --- 7 (Extremadamente extendido)

En la siguiente sección se le pedirá su opinión sobre una serie de cuatro escenarios cortos, cada uno de los cuales describe una estrategia de precios diferente.

[VIGNETTES SECTION

4x:

(Vignette text)

- ¿Cómo calificaría esta estrategia de precios en una escala de "completamente injusto" (1) a "completamente justo" (6)?
 - 1 (Completamente injusto) --- 6 (Completamente justo)
- ¿Cree que esta estrategia de precios es una estrategia de precios personalizados?
 - Sí
 - No
 - No sé
- ¿Cree que esta estrategia de precios debería ser legal?
 - Sí
 - No
 - No sé

]

Por favor responda algunas preguntas finales sobre precios personalizados en general.

¿Cree que debería permitirse la fijación de precios personalizada en internet?

- Sí
- No
- A veces
- No sé

Si se permiten los precios personalizados, ¿deberían los consumidores estar al tanto de esto?

- Sí

- No
- No sé

[if "Sí" selected]

¿Cómo se les debería hacer saber a los consumidores acerca de los precios personalizados? Por favor escriba su respuesta en el cuadro de abajo y luego presione "F1" para continuar.

Annex B. Example vignettes

Higher sympathy, Price discounts, Unaware

SOCIOECONOMIC STATUS

Sarah, a single mother, is shopping online for a new TV.

The online retailer Sarah is looking at charges different prices to different people for the same product: some people pay more and some pay less. Sarah is unaware that the retailer sets different prices in this way.

The retailer has personal data about Sarah that suggests she struggles to make ends meet. The retailer therefore charges Sarah less for the TV.

DEPENDENCY

Jane is shopping online for baby clothes.

The online retailer Jane is looking at charges different prices to different people for the same product: some people pay more and some pay less. Jane is unaware that the retailer sets different prices in this way.

The retailer has personal data about Jane that suggests she is a new parent. The retailer therefore charges Jane less because they know she really needs the clothes.

SEARCH HISTORY

Jack, an old-age pensioner, is shopping online for a new microwave oven.

The online retailer Jack is looking at charges different prices to different people for the same product: some people pay more and some pay less. Jack is unaware that the retailer sets different prices in this way.

The retailer has personal data about Jack that suggests he has also been browsing several other websites, and assumes he is waiting for a good deal. The retailer therefore charges Jack less for the microwave.

CAR SALE

Shane is in a showroom buying a new car.

The car salesperson makes a judgement about each customer and how much they think they would be willing to spend. This means that different people are charged different prices for the same car: some people pay more and some people pay less. Shane is unaware that car salespeople set different prices in this way.

During their conversation, the car salesperson realises that Shane is a local fireman. The retailer therefore charges Shane less for the car as a gesture of good will.

DYNAMIC PRICING

Laura, a nurse, is booking a flight online.

The airline Laura has been looking at frequently changes the price of seats depending on current demand for a specific flight. This means that different people are charged different prices for the same flight: some people pay more and some people pay less. Laura is unaware that the airline sets different prices in this way.

When Laura goes to book her flight she finds the price has gone down since the last time she looked.

Lower sympathy, Price discounts, Aware

SOCIOECONOMIC STATUS

Peter, a middle-aged businessman, is shopping online for a new TV.

The online retailer Peter is looking at charges different prices to different people for the same product: some people pay more and some pay less. Peter is aware that the retailer sets different prices in this way.

The retailer has personal data about Pete that suggests he is financially well off. The retailer therefore charges Peter less for the TV to encourage him to shop with them in future.

DEPENDENCY

Jane is shopping online for a rain jacket.

The online retailer Jane is looking at charges different prices to different people for the same product: some people pay more and some pay less. Jane is aware that the retailer sets different prices in this way.

The retailer has personal data about Jane that suggests she lives in a particularly wet part of the country. The retailer therefore charges Jane less because they know she really needs the jacket.

SEARCH HISTORY

Jack, a young tech professional, is shopping online for a new microwave oven.

The online retailer Jack is looking at charges different prices to different people for the same product: some people pay more and some pay less. Jack is aware that the retailer sets different prices in this way.

The retailer has personal data about Jack that suggests he has also been browsing several other websites, and assumes he is waiting for a good deal. The retailer therefore charges Jack less for the microwave.

CAR SALE

Shane is in a showroom buying a new car.

The car salesperson makes a judgement about each customer and how much they think they would be willing to spend. This means that different people are charged different prices for the same car: some people pay more and some people pay less. Shane is aware that car salespeople set different prices in this way.

During their conversation, the car salesperson realises that Shane is a local councillor. The retailer therefore charges Shane less for the car as a gesture of good will.

DYNAMIC PRICING

Laura, a solicitor, is booking a flight online.

The airline Laura has been looking at frequently changes the price of seats depending on current demand for a specific flight. This means that different people are charged different prices for the same flight: some people pay more and some people pay less. Laura is aware that the airline sets different prices in this way.

When Laura goes to book her flight she finds the price has gone down since the last time she looked.

Higher sympathy, Price hikes, Aware

SOCIOECONOMIC STATUS

Sarah, a single mother, is shopping online for a new TV.

The online retailer Sarah is looking at charges different prices to different people for the same product: some people pay more and some pay less. Sarah is aware that the retailer sets different prices in this way.

The retailer has personal data about Sarah that suggests she struggles to make ends meet. The retailer therefore charges Sarah more for the TV because they know she does not have time to shop around.

DEPENDENCY

Jane is shopping online for baby clothes.

The online retailer Jane is looking at charges different prices to different people for the same product: some people pay more and some pay less. Jane is aware that the retailer sets different prices in this way.

The retailer has personal data about Jane that suggests she is a new parent. The retailer therefore charges Jane more because they know she really needs the clothes.

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The online retailer Jack is looking at charges different prices to different people for the same product: some people pay more and some pay less. Jack is aware that the retailer sets different prices in this way.

The retailer has personal data about Jack that suggests he has also been browsing several other websites, and assumes he is ready to buy. The retailer therefore charges Jack more for the microwave.

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During their conversation, the car salesperson realises that Shane is a local fireman. The retailer therefore charges Shane more for the car because they know he can afford it.

DYNAMIC PRICING

Laura, a nurse, is booking a flight online.

The airline Laura has been looking at frequently changes the price of seats depending on current demand for a specific flight. This means that different people are charged different prices for the same flight: some people pay more and some people pay less. Laura is aware that the airline sets different prices in this way.

When Laura goes to book her flight she finds the price has gone up since the last time she looked.

Lower sympathy, Price hikes, Unaware

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Peter, a middle-aged businessman, is shopping online for a new TV.

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Jane is shopping online for a rain jacket.

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During their conversation, the car salesperson realises that Shane is a local councillor. The retailer therefore charges Shane more for the car because they know he can afford it.

DYNAMIC PRICING

Laura, a solicitor, is booking a flight online.

The airline Laura has been looking at frequently changes the price of seats depending on current demand for a specific flight. This means that different people are charged different prices for the same flight: some people pay more and some people pay less. Laura is unaware that the airline sets different prices in this way.

When Laura goes to book her flight she finds the price has gone up since the last time she looked.

Annex C. Table of sociodemographic characteristics

Table 1. Participant sociodemographic characteristics. Instances where participants responded “Prefer not to say” are not shown

		Dublin, Ireland		Santiago, Chile	
		<i>n</i>	%	<i>n</i>	%
<i>Gender</i>	Male	106	50	101	48
	Female	102	49	108	51
<i>Age</i>	Under 45 years	138	66	116	55
	45 years +	71	34	94	45
<i>Education</i>	Third-level & higher	125	60	147	70
	Under third-level	85	40	61	29
<i>Employment</i>	Employed	135	64	129	61
	Not employed	72	34	74	35

Annex D. Regression models

Table 2. Logistic regression of whether a participant recalled seeing the disclosure (0=didn't recall vs. 1=recall), where recall is recorded according to stricter (Models 1 & 3) or less strict criteria (Models 2 & 4)

	Ireland		Chile	
	(1)	(2)	(3)	(4)
<i>Condition</i> <i>(Ref: weaker disclosure)</i>				
stronger disclosure	1.45* (0.60)	0.84* (0.39)	0.76 (0.73)	0.27 (0.51)
Observations	131	131	137	137
<i>Note:</i>	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001			

Table 3. Logistic regression of whether a participant mentioned price differences in open-text answers (0= didn't mention vs. 1=mentioned)

	Ireland	Chile
	(1)	(2)
<i>Condition</i> <i>(Ref: no disclosure)</i>		
weaker disclosure	0.41 (0.36)	-0.42 (0.35)
stronger disclosure	0.37 (0.36)	-0.04 (0.35)
Observations	198	202
<i>Note:</i>	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001	

Table 4. Ordered logistic regression of participants' stated awareness of personalised pricing during the shopping task (1-7 Likert scale). Participants who stated they did not think personalised pricing had been used in a previous question were assigned a rating of 1

	Ireland (1)	Chile (2)
<i>Condition (Ref: no disclosure)</i>		
weaker disclosure	0.30 (0.33)	0.07 (0.32)
stronger disclosure	0.68* (0.32)	-0.33 (0.32)
Observations	198	202
<i>Note:</i>	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001	

Table 5. Logistic regression of which tab more time was spent on in a given task (0=non-personalised tab vs. 1=personalised tab)

	Ireland (1)	Chile (2)
<i>Condition (Ref: no disclosure)</i>		
weaker disclosure	-0.15 (0.13)	-0.05 (0.14)
stronger disclosure	-0.07 (0.13)	0.07 (0.14)
<i>Direction of personalisation (Ref: discount)</i>		
hike	-0.23* (0.11)	-0.28* (0.11)
<i>Which tab personalised (Ref: tab 2)</i>		
tab 1	1.71*** (0.11)	1.94*** (0.11)
Observations	1,584	1,616
<i>Note:</i>	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001	

Table 6. Logistic regression of which tab the purchase was made from in a given task (0=non-personalised tab vs. 1=personalised tab)

	Ireland (1)	Chile (2)
<i>Condition (Ref: no disclosure)</i>		
weaker disclosure	-0.12 (0.12)	0.02 (0.13)
stronger disclosure	0.02 (0.12)	0.02 (0.13)
<i>Direction of personalisation (Ref: discount)</i>		
hike	-0.62*** (0.10)	-0.97*** (0.10)
Observations	1,584	1,616
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001	

Table 7. Logistic regression of whether the personalised tab was rated better than the non-personalised tab (0=rated equal or worse vs. 1=rated better)

	Ireland (1)	Chile (2)
<i>Condition (Ref: no disclosure)</i>		
weaker disclosure	0.01 (0.13)	0.07 (0.13)
stronger disclosure	0.09 (0.13)	0.05 (0.13)
<i>Direction of personalisation (Ref: discount)</i>		
hike	-0.30** (0.11)	-0.56*** (0.10)
Observations	1,584	1,616
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001	

Table 8. Logistic regression of whether a personalised price hike was paid (0=not paid, 1=paid)

	Ireland (1)	Chile (2)
<i>Condition (Ref: no disclosure)</i>		
weaker disclosure	-0.31 (0.26)	0.17 (0.26)
stronger disclosure	0.12 (0.26)	-0.22 (0.28)
Observations	373	388
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001	

Table 9. Logistic regression of whether a personalised discount was avoided (0=availed, 1=avoided)

	Ireland (1)	Chile (2)
<i>Condition (Ref: no disclosure)</i>		
weaker disclosure	0.30 (0.25)	0.07 (0.25)
stronger disclosure	0.05 (0.25)	0.14 (0.26)
Observations	425	450
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001	

Table 10. Ordered logistic regression of the amount of time spent on each task, where time has been categorised as follows: under 30 s; 30 – 60 s; 60 – 90 s; 90 – 120 s; 120 – 180 s; over 180 s

	Ireland (1)	Chile (2)
<i>Condition (Ref: no disclosure)</i>		
weaker disclosure	0.13 (0.11)	0.09 (0.11)
stronger disclosure	0.13 (0.11)	-0.14 (0.11)
<i>Type of purchase (Ref: hypothetical)</i>		
real	0.98*** (0.11)	
Observations	1,584	1,616
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001	

Table 11. Negative binomial regression of the number of times a participant switched between tabs in a given task. Models 1 – 3 include data from all participants. Model 4 includes data only from those participants who did not recall seeing a disclosure

	Ireland	Chile		
	(1)	(2)	(3)	(4)
<i>Condition</i> (Ref: no disclosure)				
weaker disclosure	-0.01 (0.05)	0.17** (0.06)	0.15** (0.05)	0.13' (0.06)
stronger disclosure	0.06 (0.05)	0.21*** (0.06)	0.09 (0.05)	0.08 (0.06)
<i>Type of purchase</i> (Ref: hypothetical)				
real	0.22*** (0.05)			
<i>Age</i> (Ref: under 45)				
45 or over			-0.63*** (0.04)	
Observations	1,584	1,616	1,616	1,464
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001			

Table 12. Logistic regression of whether a participant used the "sort by price" option in a given task (0=did not sort, 1=did sort). Models 1, 2 & 4 include data from all participants. Models 3 & 5 include data only from participants that did not recall seeing a disclosure

	Ireland			Chile	
	(1)	(2)	(3)	(4)	(5)
<i>Condition</i> (Ref: no disclosure)					
weaker disclosure	-0.02 (0.14)	-0.04 (0.15)	-0.09 (0.16)	0.32** (0.12)	0.28* (0.13)
stronger disclosure	0.50*** (0.14)	0.38** (0.14)	0.44** (0.16)	0.37** (0.12)	0.28* (0.13)
<i>Age</i> (Ref: under 45)					
45 or over		-0.57*** (0.14)	-0.58*** (0.16)		
<i>Education</i> (Ref: below degree)					
degree or higher		0.99*** (0.13)	1.08*** (0.15)		
<i>Regular shopper</i> (Ref: no)					
yes		0.40** (0.13)	0.39** (0.14)		
Observations	1,584	1,576	1,264	1,616	1,464
<i>Note:</i>	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001				

Table 13. Logistic regression of whether a participant used the "sort by rating" option in a given task (0=did not sort, 1=did sort). Models 1, 2 & 4 include data from all participants. Model 3 includes data only from participants that did not recall seeing a disclosure

	Ireland			Chile
	(1)	(2)	(3)	(4)
<i>Condition</i> (Ref: no disclosure)				
weaker disclosure	0.51*** (0.14)	0.51*** (0.14)	0.26+ (0.15)	-0.005 (0.13)
stronger disclosure	0.29+ (0.14)	0.25+ (0.14)	0.16 (0.16)	0.15 (0.13)
<i>Education</i> (Ref: below degree)				
degree or higher		0.36** (0.12)		
Observations	1,584	1,584	1,272	1,616
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001			

Table 14. Ordered logistic regression of fairness rating given to a vignette (1-6 Likert scale). Models 1 & 4 use data from all vignettes. Models 2 & 5 use data from vignettes framed in terms of price hikes. Models 3 & 6 use data from vignettes framed in terms of price discounts

	Ireland			Chile		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Direction of personalisation</i> (Ref: discount)						
hike	-1.27*** (0.13)			-1.25*** (0.13)		
<i>Type of pricing strategy</i> (Ref: PP based on search)						
PP based on socdems		0.26 (0.29)	-1.15*** (0.25)		0.53+ (0.29)	-0.46+ (0.24)
PP based on dependency		0.08 (0.31)	-0.80*** (0.24)		0.49+ (0.29)	-0.27 (0.24)
Car salesman		0.49 (0.33)	-1.49*** (0.35)		0.96** (0.31)	-1.11** (0.34)
Dynamic pricing		1.75*** (0.33)	0.09 (0.31)		1.08** (0.33)	-0.17 (0.31)
Observations	840	420	420	840	420	420
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001					

Table 15. Ordered logistic regression of fairness rating given to a vignette (1-6 Likert scale), where that vignette describes an online personalised pricing scenario. Models 1 & 4 use data from all online personalised pricing vignettes. Models 2 & 5 use data from vignettes framed in terms of price hikes. Models 3 & 6 use data from vignettes framed in terms of price discounts

	Ireland			Chile		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Direction of personalisation</i> (Ref: discount)						
hike	-1.63***			-1.59***		
	(0.16)			(0.16)		
<i>Type of subject</i> (Ref: lo-sympathy)						
hi-sympathy	0.09	-0.09	0.21	-0.21	-0.30	-0.13
	(0.15)	(0.25)	(0.20)	(0.15)	(0.23)	(0.20)
<i>Awareness of subject</i> (Ref: not aware)						
aware	0.19	0.28	0.11	0.29 ⁺	0.39	0.22
	(0.16)	(0.25)	(0.20)	(0.15)	(0.24)	(0.20)
Observations	630	303	327	630	303	327
Note:	+: p<0.1; *: p<0.05, **: p<0.01, ***: p<0.001					

Notes

¹ <https://data.consilium.europa.eu/doc/document/PE-83-2019-INIT/en/pdf>

² <https://www.cso.ie/en/census/census2016reports/census2016smallareapopulationstatistics/>

³ E-commerce participation tends to be significantly higher in Ireland than in Chile. For example, the last available official statistics indicate a participation rate in Chile of 36% for 2017, compared to 53% for Ireland. By 2019, participation in Ireland had reached 67%. https://stats.oecd.org/Index.aspx?DataSetCode=ICT_HH2

⁴ <https://www.ine.cl/estadisticas/sociales/censos-de-poblacion-y-vivienda/poblacion-y-vivienda>

⁵ <https://www.sernac.cl/>

⁶ This was inspired by a paper that employed a similar strategy to elicit community standards of fairness for the setting of prices and wages (Kahneman, Knetsch and Thaler, 1986^[15]).

⁷ This is based on the assumption that different buyer types may be associated with different levels of “sympathy” from the respondents. For example, personalised pricing in the context of a single mother might lead to different reactions than in the case of a middle-aged business man. The classification of high and low sympathy cases might not be shared by all respondents and should be understood as indicative only.

⁸ “Regular shopper” is defined here as someone who shops online at least every month.

⁹ The benchmark of what might constitute a successful disclosure with regards to raising awareness is open to discussion, and it should be noted that it is likely to vary according to context. For comparison, in the EC study on personalisation, increasing transparency over the incidence of personalisation led to a statistically significant increase in the proportion of respondents believing that the ordering of search results was based on personal information (from 29% to 39%) (European Commission, 2018^[4]). However, there was no significant effect on the proportion of participants reporting awareness of other forms of personalisation, such as personalised price hikes (38%) or targeted advertising (ca 31%). Other research, conducted in the context of native advertising (i.e. paid content mirroring the format of non-paid content), showed that although disclosures significantly increased awareness of paid ads, awareness remained low overall (around 10%) (Amazeen and Wojdyski, 2018^[9]).