The Information Content of Geographical Indications, Expert Reviews, and Brands

Marco Costanigro[a], Magalie Dubois[b], Azucena Gracia[c], Jean-Marie Cardebat[d]

[a] Department of Agricultural and Resource Economics, Colorado State University, United States
marco.costanigro@colostate.edu (corresponding author). Postal address: 200 W. Lake Street, Fort Collins, CO 80523-1172

[b]Burgundy School of Business, CEREN, EA 7477, Université de Bourgogne, France
magalie.dubois@bsb-education.com

[c]Unidad de Economía Agroalimentaria, Centro de Investigación y Tecnología Agroalimentaria de Aragón (CITA) and Instituto Agroalimentario de Aragón (CITA-Universidad de Zaragoza), Spain
agracia@cita-aragon.es

[d]Université de Bordeaux and INSEEC School of Business and Economics, France
jean-marie.cardebat@u-bordeaux.fr

CRediT author statement

Marco Costanigro: Conceptualization, Methodology, Software, Validation, Formal analysis, Data Curation, Writing - Original Draft, Visualization
Magalie Dubois: Data curation; Formal analysis; Investigation; Resources, Project administration; Writing - review & editing
Azucena Gracia: Data curation; Formal analysis; Investigation; Resources, Project administration; Funding acquisition; Writing - review & editing
Jean-Marie Cardebat: Resources; Funding acquisition; Writing - review & editing

Acknowledgements

The authors wish to thank the participants to the 2023 AAEA Annual Meeting for their insightful comments. We also thank, without implication, Prof Giancarlo Moschini for useful comments.

Declarations of interest

None

Funding

This work was supported by the Gobierno de Aragón under the funding of the "Economía Agroalimentaria y de los Recursos Naturales" (S01_20R) Research Group. Additional funding was provided by the Burgundy School of Business and Chaire Vins et Spiritueux INSEEC U.

Abstract

We study the effectiveness of Geographical Indications in serving as a signal of quality and facilitate consumer choices. We conduct laboratory experiments in Spain (N=148) and France (N=143) simulating a wine shopping experience in which participants choose between four wines in a limited information environment, and GI information, winery names, and expert review scores are "purchased" in multiple price listing elicitation sessions. Data analysis leverages the sequential nature of the rounds, experimental treatments, and a wine knowledge questionnaire to investigate the hierarchical structure and level of redundancy between alternative information sources, the role played by wine prices, and previously acquired expertise. We find that GI labeling generates a consumer surplus between EUR 0.33 (Spain) and EUR 0.37 (France) for each purchasing occasion, and expert reviews provide a similar level of information. These findings are consistent across different price segments (high: €13-€17 vs. low: €4-€7). Firm names have lower average information content but are more useful to high-knowledge consumers. GIs, firm names, and expert reviews are found to be imperfect substitutes, suggesting that GIs capture elements of both horizontal and vertical differentiation. The discussion is structured along three main thematic areas of contribution: the role of GIs as signals of quality, the extant literature studying how consumers interpret quality signals, and the contrast between our findings and the modeling assumption adopted in the GI theoretical literature.

Keywords: Geographical indications, quality signaling, experimental auction, wine consumers

1. Introduction and motivation

Geographical Indications (GIs) are designations of origin identifying value added food products that, in virtue of *where* and/or *how* they are produced, can stake a claim of both uniqueness and superior quality. The GI strategy constitutes a long-standing centerpiece of the European Union (EU) agricultural policy, and European policy makers invested heavily[1] to certify, regulate, promote, and protect designation of origins, emphasizing the instrumental role of GIs in pursuing three fundamental objectives: 1) foster rural development by leveraging cultural heritage; 2) facilitate trade and prevent imitation and fraud, and; 3) support the provision of high quality products and inform consumer choices (*e.g.* see regulations EC No479/2008 and EU No1151/2012 for agricultural products and foodstuff and 1308/2013 for wine). If one takes adoption and product sales as a measure of success, then the EU GI policies have triumphed. A recent study by the European Commission (2021) lists over 3,200 approved GIs[2] and sales totaling EUR 74.8 billion in 2017, which grew at a rate of 42% between 2010 and 2017.

Despite the impressive statistics, empirical evidence demonstrating that GIs are actually delivering the expected results remains scant, mixed (Chilla et al. 2020; Török et al. 2020) and largely confined to case studies and qualitative measures[3], fueling a heated debate on theoretical and/or ideological grounds. Since the adoption of Trade-Related Intellectual Property Rights

[1] According to a proposal of the European Parliament and of the Council on EU GIs to amend Regulations (EU) No 1308/2013, (EU) 2017/1001 and (EU) 2019/787 and repealing Regulation (EU) No 1151/2012, the administrative cost of the GI public institution is €89.6 million, and the European Commission invested € 185.9 million in activities promoting high-quality, sustainable agri-food products in 2023.

[2] 1,634 for wine alone, according to eAmbrosia, the official register of GIs approved in the EU (https://ec.europa.eu/info/e-ambrosia-database)

[3] Empirical studies on the effect of GIs on high-end agricultural products encompass economic, social and environmental impacts. A number of case studies have been published on a variety of agricultural products (Vandecandelaere et al. 2020). For a review of the economic impact of GIs see Josling (2006); Cei, Defrancesco and Stefani (2018) and; Török et al. (2020). Recent studies review environmental sustainability (Milano and Cazella 2021) barriers and benefits of GI for producers (Cardoso et al. 2022), the effectiveness of GIs in increasing product quality (López-Bayón, Fernández-Barcala and González-Díaz 2020) and impact of GIs on consumer behavior (Glogoveţan et al. 2022).

(TRIPS) Agreement by the World Trade Organisation (WTO) in 1994, the "Old World" vs. "New World" struggle has generated a decade of discussion over the desirability of GI protection (Ilbert and Petit 2009; Monten 2005; Agdomar 2007; Frantz 2016; Goebel and Groeschl 2014; Song and Wang 2022; Addor and Grazioli 2002), with some authors even questioning whether GIs actually diminish consumer confusion (Raustiala and Munzer 2007).

Obvious challenges to quantifying generalizable and causal effects of GI policies include endogeneity of the adoption process, limited within data variation (once approved, GI status is never lost), and the difficulty of finding believable controls (GI designations are, by definition, unique). Exceptions include a few difference-in-difference studies such as Cei et al. (2018), who find a positive effect of GI adoption on agricultural value added, and Haeck et al. (2019), who show that wines prices increased in Champagne in the early nineteenth century after GI adoption, but observe no similar impact in other wine regions. Curzi and Huysmans (2022) use a structural gravity model with fixed effects and find no evidence of trade boosting effects. This study provides a first assessment of the effectiveness of GIs as a quality signal, presenting empirical estimates of the consumer surplus generated by the certification system for the wine market. Based on laboratory experiments with EU consumers, we find that GI information generates a consumer surplus between EUR 0.33 (Spain) and EUR 0.37 (France) for each wine purchasing choice.

To say that no previous work evaluated the effectiveness of GIs at informing consumer choices may sound absurd. In fact, a vast hedonic literature (see Deselnicu et al., 2013 for an early meta-analysis) has long-established that many agricultural products from GI-protected areas extract a price premium, a finding that originated a literature on the role of GIs as vehicle for collective reputations (Winfree and McCluskey 2005; Costanigro, McCluskey and Goemans 2010; Castriota and Delmastro 2015). Evidence from demand studies, choice and laboratory experiments

similarly find that GI labels shift demand outward for several food products (e.g. Stasi et al. 2011; Menapace et al. 2011; Gustafson, Lybbert and Sumner 2016; Costanigro, Scozzafava and Casini 2019; Slade, Michler and Josephson 2019; Ferreira, Costa Pinto and Lourenço-Gomes 2021). However, while consumers' reaction to GI labeling implies that designations of origin do matter, hedonic or WTP premia merely measure the value that the market or consumers assign to perceived quality differences (between a given GI and non-GI product, or two GIs).

The *value* of an information source on the other hand is much harder to capture from observational data, and can be conceptualized as how much a consumer would be willing to spend (or search, which is costly, see Stigler 1961) to obtain the information before purchasing a product of uncertain quality. As first pointed out in Klain et al. (2013) in a US study on country of origin labeling for beef, the value of information is an ex-ante concept that can be measured directly with experimental methods. Other recently proposed measures center on the idea of *terroir* (Ay, 2021), equating the information content of GIs to their ability to reveal differences in pedoclimatic conditions; however, we argue that ultimately any assessment of the value of this information needs to be filtered through the consumer judgement. Livat et al. (2019) analyzed the level of cointegration in prices across designation of origin in Bordeaux to assess whether GIs really drive product differentiation, but the challenge here is separating demand-driven effects from correlated supply shocks. To eliminate these confounding factors, we designed a laboratory experiment simulating a wine shopping experience in which participants choose between four red wines in a limited information environment, and GI information could be "purchased" through the multiple price listing (MPL, Andersen et al. 2006) method to elicit willingness to pay (WTP) before choosing the wines. In a pre-purchase scenario, the value of an information source is proportional

to its ability to accurately reveal quality differences relevant for consumer choice, and provides a direct measure of how much GIs facilitate consumer choices.

Our experiments were conducted with balanced panels of wine consumers in Spain (N=148) and France (N=143), two major wine producing/consuming EU countries. The wine market is an extremely relevant context for studying GIs for both historical (GIs originated with wine, see Meloni and Swinnen (2018)) and economic reasons (wine accounts for 51% of the value of the GI sales, European Commission (2021)). At the same time, wine is an extremely complex product, with prices ranging from the cost of a cup of coffee to the price of an airline ticket. In addition to GIs, quality cues driving consumer choices include the vintage, the winery, the grape variety, the presence of awards and/or expert reviews scores (Sáenz-Navajas et al. 2013; Lockshin et al. 2006; Stanco, Lerro and Marotta 2020), implying that the role of GIs as an information vehicle cannot be studied in isolation from other factors. Accordingly, our experiments measure the relative information content of GIs, winery names, and expert reviews, examining the hierarchical structure or level of redundancy between alternative information sources; and the role played by wine prices and consumer wine knowledge and expertise.

The theoretical literature studying the welfare implication of GIs largely focuses on how designations of origin may incentivize the provision of high quality products (e.g. Zago and Pick 2004; Moschini, Menapace and Pick 2008; Menapace and Moschini 2012), avoiding the lemons outcomes typical of markets with asymmetric information (Akerlof 1970), or the intra-region producer dynamics induced by GIs or other reputation dynamics (Costanigro, Bond and McCluskey 2012; Yu, Bouamra-Mechemache and Zago 2018). Our experiments deliberately abstract from consumers' valuation of quality and its provision to focus on the value of the information signal of GIs as a labeling scheme. As such, we are not interested in testing the

predictions of these models. Rather, our results provide an assessment of the behavioral assumptions at the foundation of this literature, especially as it pertains to consumers' interpretation of GIs as quality cues. Our experiments show that GIs, firm names, and expert reviews are imperfect substitutes, providing suggestive evidence that quality is a multidimensional concept, and GIs capture elements of both horizontal and vertical differentiation. The implication is that theory models based on the Mussa and Rosen framework (1978) and treating the GI signal as exclusively vertical may be overly simplistic.

In the following section we provide a summary of the relevant literature in industrial organization and wine economics, and present the hypotheses tested.

2. Conceptual framework and research hypotheses

The conceptual framework for our experiments (see figure 1) lays its foundations in the broader literature on producer reputations.

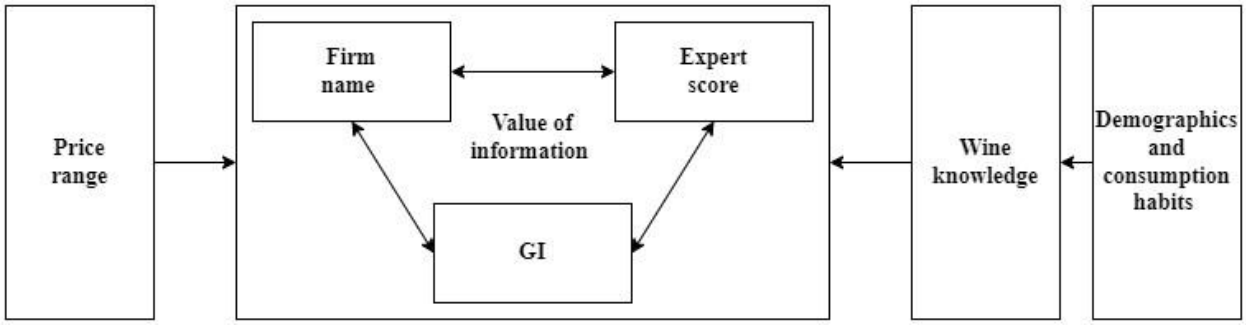

Figure 1: Conceptual framework

Reputations play an essential role in markets for experience goods, such as wine, where quality is unknown to the consumer until after purchase, and can be modeled as subjective quality expectations (Shapiro 1983) formed by consumers based on past product experiences, word of mouth/advertisement, or other third party sources of quality information. In the case of wine and many other food products nested reputations can arise (Costanigro et al. 2010), as consumers

associate quality expectations with brand names (winery reputation, private), but also with the region of production (collective reputation, shared by many wineries see Winfree and McCluskey (2005)). Costanigro et al. (2010) noted how reputations could be categorized based on the accuracy of a quality expectation, which they refer to as the level of specificity, and the search costs necessary to form them. Quality expectations associated with regions of production can be formed with a relatively low search cost, but they tend to have low specificity because of product variability within a region of production. The reputation one associates with a winery is much more specific and will predict quality more accurately, but requires greater search costs and expertise to form and use. Indeed, Gustafson et al. (2016) present experimental evidence of how wine knowledge moderates bid-updating in response to the provision of new wine label information.

Further complicating matters, technology is changing the ways in which consumers search for information. In addition to reputations, experts scores provide a source of quality information accessible from printed/online sources (Wine Spectator, Decanter) or mobile apps (e.g. CellarTracker, WineRatings+ by Wine Spectator, Robert Parker), and are often displayed at the store alongside with price and other product information. Expert scores represent a source of quality information alternative to the classical reputation mechanisms, and have been shown to shift demand (Villas-Boas, Bonnet and Hilger 2021; Hilger, Rafert and Villas-Boas 2010; Friberg and Grönqvist 2012). If a consumer trusts and conforms to the quality criteria of the reviewer, scoring systems can provide extremely specific quality information (up to the vintage of a particular wine from a particular winery). With the ubiquitous spread of mobile phones, the cost of acquiring information via expert reviews has decreased substantially, but it is not clear whether expert scores substitute or complement more traditional sources of information. If, at least for some

consumers, expert reviews supersede the usefulness of the GI signal, the effectiveness of a marketing strategy based on GI may be diminished.

In addition to reputations and experts' reviews, product prices can play a pivotal role by modulating the incentive to search, in two fundamental ways: 1) as the price of an experience good grows larger, the incentive to collect information grows larger and; 2) the cost of learning by direct experience increases, encouraging the collection of quality information via third-party expert opinions. Reputation dynamics will therefore differ across products in different price ranges. For example, cheaper agricultural products tend to develop only collective reputations linked to GIs, but no firm-specific brand reputations (Deselnicu et al. 2013).

The intuition we presented so far can be distilled in three broad sets of hypotheses, which were pre-registered before data collection[4] as a general line of inquiry.

I. On average, more specific information (expert scores) is valued more than less specific information (GIs).

II. On average, valuation of a given source of information decreases as more information is available. The magnitude of this decrease depends on the order of information. We expect more specific information (e.g. expert scores) to trump less specific information (GIs).

III. Moderating variables: Wine Knowledge and Price Range

- Consumer wine knowledge moderates the value of information for GIs, brands, and expert reviews. We expect that more knowledgeable consumers will value brand information more, while less experienced consumers may rely more on GIs or expert scores.
- For a given source of information, the value of information increases when product prices are high.
- Consumers will tend to prefer more specific information when buying expensive wines.

[4] The experiments were pre-registered on 2/28/22 on the aspredicted.org platform before starting experiments in Spain (#89414). The experimental framework was modified for France, after we observed a null result for the effect of price in Spain. "No plan survives first contact with the enemy" (Helmut Von Moltke)

3. Experimental procedures

The experiments simulated a wine shopping experience in a limited information environment, where important quality cues (GI, expert reviews, winery) were made available only through the multiple price listing (MPL) process. The MPL mechanism is very simple: for each quality cue, participants respond to a series of questions asking whether they would be willing to pay an increasing amount of money to receive the information (see figure 2).

Study I: Spain

PRECIO (céntimos de €)	**Estoy dispuesto a pagar**	**No estoy dispuesto a pagar**
5		
10		
15		
20		
25		
30		
35		
40		
45		
50		

Study II: France

PRIX (centimes d'€)	**Je suis disposé/e à payer**	**Je ne suis pas disposé/e à payer**
5		
10		
15		
20		
25		
30		
35		
40		
45		
50		

Figure 2: Multiple Price Listing examples for Study I (Spain) and Study II (France)

At the end of each elicitation round, a market price is randomly drawn, and those who stated a maximum WTP at least as large as the market price receive the information and pay for it, while the other participants do not. The object of interest is obviously not the market price, but rather the

maximum amount a participant would be willing to pay for the information, which we loosely refer to as "bid". All participants received a €20 endowment and were required to purchase one of four red wines for sale, all in a similar price range.

3.1 Experimental treatments

The two studies were comprised of 12 sessions of 12-15 participants, following the experimental design outlined in table 1. In Study I (Spain), two experimental treatments were administered in a between subject design: 1) the order in which the information was presented (all 6 permutations), and 2) the price range of the wine for sale (high: €13-€17 vs. low: €4-€75). While these price ranges obviously do not cover the full spectrum of market prices (as in the hedonic study by Costanigro et al., 2010 with observational data), they allow to investigate the information dynamics in the price range where most consumer choices are made, while maintaining the total cost under €20 per participant.

[5] According to Euromonitor, in Spain, 68% of the volume sold off trade is priced under €4.2 (and 85% under €7.2). Only 5.8% of the volumes sold are priced above €12.

Location	Sess. #	Endowed Information	Price Level	First (Practice)	Second	Third	Fourth
Spain	1	Alc. %, Variety, Price	Low (<€8)	Juice	Firm	GI	Score
	2	Alc. %, Variety, Price	High (>€12)	Juice	Firm	GI	Score
	3	Alc. %, Variety, Price	Low (<€8)	Juice	Firm	Score	GI
	4	Alc. %, Variety, Price	High (>€12)	Juice	Firm	Score	GI
	5	Alc. %, Variety, Price	Low (<€8)	Juice	GI	Firm	Score
	6	Alc. %, Variety, Price	High (>€12)	Juice	GI	Firm	Score
	7	Alc. %, Variety, Price	Low (<€8)	Juice	Score	Firm	GI
	8	Alc. %, Variety, Price	High (>€12)	Juice	Score	Firm	GI
	9	Alc. %, Variety, Price	Low (<€8)	Juice	GI	Score	Firm
	10	Alc. %, Variety, Price	High (>€12)	Juice	GI	Score	Firm
	11	Alc. %, Variety, Price	Low (<€8)	Juice	Score	GI	Firm
	12	Alc. %, Variety, Price	High (>€12)	Juice	Score	GI	Firm
France	1	Alc. %, Variety, Price	High (>€12)	Juice	Firm	GI	Score
	2	Alc. %, Variety, Price, **Firm**	High (>€12)	Juice	-	GI	Score
	3	Alc. %, Variety, Price	High (>€12)	Juice	Firm	Score	GI
	4	Alc. %, Variety, Price, **Firm**	High (>€12)	Juice	-	Score	GI
	5	Alc. %, Variety, Price	High (>€12)	Juice	GI	Firm	Score
	6	Alc. %, Variety, Price, **GI**	High (>€12)	Juice	-	Firm	Score
	7	Alc. %, Variety, Price	High (>€12)	Juice	Score	Firm	GI
	8	Alc. %, Variety, Price, **Score**	High (>€12)	Juice	-	Firm	GI
	9	Alc. %, Variety, Price	High (>€12)	Juice	GI	Score	Firm
	10	Alc. %, Variety, Price, **GI**	High (>€12)	Juice	-	Score	Firm
	11	Alc. %, Variety, Price	High (>€12)	Juice	Score	GI	Firm
	12	Alc. %, Varitey, Price, **Score**	High (>€12)	Juice	-	GI	Firm

Table 1: Experimental design

Study II (France) differed from study I in that the price level treatment was replaced by an exogenous (rather than bid-dependent) information treatment. Namely, in half of the sessions (6/12), the first session was not conducted, and the corresponding information was awarded for free to all participants. This difference in design was driven by finding that the price treatment in Study I produced a null result. Rather than replicating this result, we deemed more useful to use one of the experimental treatments in Study II to generate broader insight. As explained in detail in the methods section, awarding the first quality cue for free (i.e. exogenously) to a subset of participants allows comparing the effect of information for those who purchased it vs. those who received it for free, who may represent more closely the general population of consumers. While the modification is a deviation from the original protocol, it is generally understood (Banerjee et al. 2020) that the role of pre-registration is not to force researchers to predict all possible contingencies and coerce them to always stick to the original plan; but rather creating a clear separation between the a-priori hypotheses and what was learned over the course of the experiments.

As for the wines offered for sale, we note that the specific wine purchased by each participant is not relevant *per se* to our study objectives, but nevertheless the choice environment created by the wines for sale is an important factor of the experimental design. In the real-world, consumers can choose among thousands of wines, with many options and possible combinations, creating a "dense" attribute space. The constraints of an experimental MPL session on the other hand create a "lumpy" space, and a poor choice of attributes could lead participants to a corner solution, where no wine is acceptable, or one of the wines is surely preferred regardless of any additional information. To make the available choices more easily comparable, all wines offered for sale are red (see table A1 in appendix) and the choice of the specific wines balanced logistical

needs (availability in sufficient quantity, existence of expert review scores) with an attempt to make our results as general as possible. Our wine selection aimed at creating an environment in which no wine is obviously superior, and participants would engage in an evaluation of the tradeoffs implied by the characteristics of each wine, so that the information offered for purchase remained salient.

3.2 Experimental protocol

Study I (Spain) received approval from the ethics committee of the Agrifood Center of Aragon (Zaragoza, Spain, reference CEISH_2022_1); while Study II (France) received approval from the Burgundy School of Business (Dijon, France) Research Ethics Committee (reference: CERBSB2022-31). The participants were informed of the conditions for participating and validated an informed consent form.

Figure 3 details the major steps and sequencing of the experimental protocol for Study I and II.

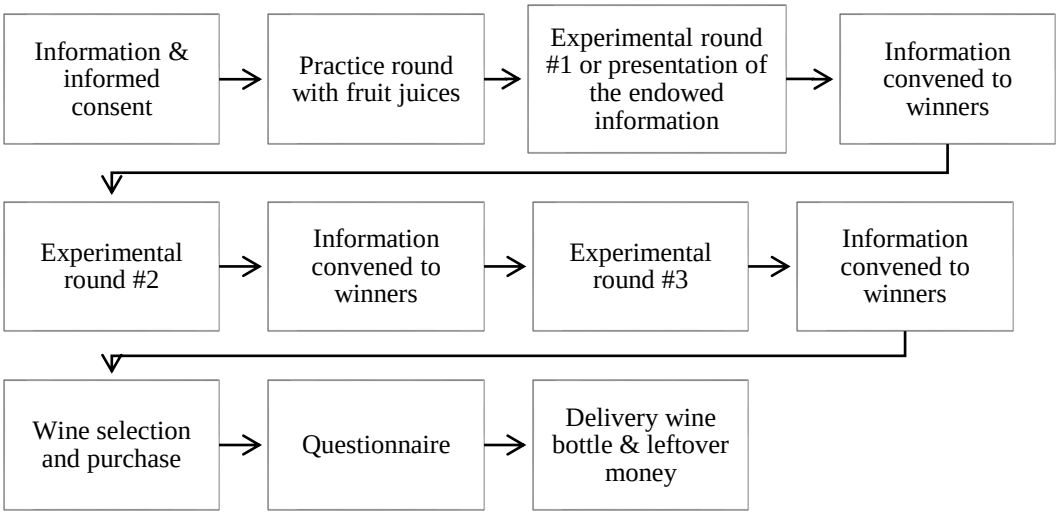

Figure 3: Main steps of the experimental protocol for Study I (Spain) and Study II (France)

All sessions started with a practice round elucidating the MPL mechanism (Andersen et al. 2006). In this practice round participants selected between four fruit juices in a limited information

environment: the nutritional information and price of each juice was made available, but knowledge of the juice flavor (e.g. apple, grape, pineapple, orange) could only be available after "purchasing" through the MPL process (see figure 2). While the 20cl fruit juice was given for free in the practice round, participants had to pay for the juice flavor information obtained via MPL, and it was made clear that in the wine experiments participants would also have to use their own money to pay for the chosen wine, plus any information acquired through the MPL session. No communication between participants was allowed for the duration of the experiment and no identifying data was collected, granting anonymity.

After the practice round, participants received their preferred fruit juice, and the wine information rounds (geographical indication, brand name of the winery, expert reviews) were conducted according to the experimental design in table 1. At the beginning of the first wine information round, participants received a description of the four wines for sale (see figure A2 in appendix) which included market prices, grape varieties, and alcohol content. Then, participants were made aware that additional information would be available for purchase in a series of three rounds. The nature of the information offered was revealed only at the beginning of each round, to avoid any anticipatory effects. The monitor emphasized that all information revealed throughout the experiment was accurate, including wine prices, which reflected how much was paid by the authors to acquire the wines.

In all rounds, including the practice one, WTP questions started from €0 to a maximum of €0.5, in increments of €0.05 (See figure 2). This range was calibrated based on feedback received by participants during piloting. At the end of each round, a market price was randomly drawn, and the monitor identified participants reporting a willingness to pay higher than the market price. The market price was then subtracted from the individual's money sheet, and the purchased

information (for all wines/juices) was delivered in a sealed envelope. At the end of the rounds, participants completed a demographics and objective wine knowledge[6]/shopping behavior questionnaire and received their participation endowment of €20, net of all information and wine purchased.

3.3 Inclusion criteria, recruitment, and logistics

Study I was conducted in Zaragoza, Spain, in March-April 2022, and Study II in Dijon, France in July-September 2022. Both studies used local market research companies to organize the recruitment of the consumer panel and manage some logistics. In both studies, quotas on individual characteristics (e.g. age, gender, and education level) were established to obtain a representative and balanced panel of wine consumers. In Spain, experiments were conducted in multiple locations in Zaragoza including civic centers, consumer associations, and university classrooms (see figure A1 in appendix). In France, experiments were conducted at the sensory lab of the Burgundy School of Business (Dijon, France). Inclusion criteria required participants to (1) be 18 or older and, (2) declare themselves wine consumers. Pregnant women and underage participants were excluded from the study.

The protocol was first developed in Spanish for Study I, and tested in a pilot session to check the experimental procedure, the duration of the sessions, and the appropriateness of the price range and increments included in the MPL. The protocol of study II was accordingly adapted to include the differences in experimental design; and the informed consent, information, instructions, and questionnaire of the experiment were translated into French before being back-translated into Spanish to ensure correspondence.

[6] To measure objective wine knowledge, we adapted the questionnaire developed by Frøst and Noble (2002) and employed by Gustafson, Lybbert and Sumner (2016) to the Spanish and French wine markets. See appendix, table A2.

4. Modeling approach and estimation methods

Multiple price listing elicitation generate interval, right-censored WTP data[7]. We adopt a panel setting to acknowledge the sequential nature of the rounds, and the most basic specification of our value of information model is:

$$(1) \qquad Bid_{ijt} = \beta_1\left(Juice_{jt}\right) + \beta_2\left(Firm_{jt}\right) + \beta_3\left(GI_{jt}\right) + \beta_4\left(Score_{jt}\right) + \gamma_t + \alpha_i + \varepsilon_{ijt};$$

where $i = 1, 2, ..., N$ indexes the individual, $j = 1, 2, ..., 12$ the experimental session, and $t = 0, 1, 2, 3$ the round number. Note that $t = 0$ always corresponds to the practice round offering information about fruit juices, which we include to provide a point of reference. Bid_{ijt} represents the maximum WTP stated by each participant, $Juice_{jt}$, $Firm_{jt}$, GI_{jt}, $Score_{jt}$ are binary variables indicating the type of information provided at time *t* in session *j*, according to the experimental design in table 1. We adopt a specification without a constant, which enables estimating WTPs for all information sources, rather than measuring differences between them. Therefore, β_k $k = 1, ..., 4$ represent the average valuation of each information source. γ_t are intercepts netting out of the error term any learning or ordering effects, while the residual include individual-specific effects α_i, which can be thought of as an individual's tendency to bid high (or low) for any type of information, plus the idiosyncratic error term ε_{ijt}. Subscripts to distinguish the Spanish and French experiments are omitted for simplicity, while session-specific intercepts δ_j where only included in robustness checks, and deemed unnecessary.

[7] The minimum bid (€ 0) is discrete point data as negative WTP for information is not reasonable here.

When measuring the effect of between-subject experimental treatments or subject-specific covariates we are interested in the average effect on all maximum bids, and/or the information-specific effects. When such variables are qualitative (e.g. High vs. Low price), as in all but one of our regressions, average effects are captured by a model including a main-effect indicator variable, D_{ijt} , as in

$$Bid_{ijt} = \beta_2\left(Firm_{jt}\right) + \beta_3\left(GI_{jt}\right) + \beta_4\left(Score_{jt}\right) + \beta_5\left(D_{ijt}\right) + \gamma_t + \alpha_i + \varepsilon_{ijt}; \quad (2)$$

for $t = 1,2,3$; while label-specific effects are measured with the fully interacted model[8]:

$$\begin{aligned} Bid_{ijt} = {} & \beta_2\left(Firm_{jt}\right) + \beta_3\left(GI_{jt}\right) + \beta_4\left(Score_{jt}\right) + \\ & + \beta_5\left(D_{ijt} * Firm_{jt}\right) + \beta_6\left(D_{ijt} * GI_{jt}\right) + \beta_7\left(D_{ijt} * Score_{jt}\right) + \gamma_t + \alpha_i + \varepsilon_{ijt} \end{aligned} \quad (3)$$

More complex models arise when considering multiple covariates, but the logic remains the same. One will note that equation (3) omits the estimates (and data) from the $t = 0$ practice round, as all treatments and covariates of interest are ostensibly unrelated to the practice round bids[9].

Owing to the interval nature of MPL data, regression models are typically estimated via random-effect interval regression (e.g Andersen et al. 2006; Asioli, Mignani and Alfnes 2021), a MLE estimator based on the assumption that α_i is i.i.d. $N\left(0,\sigma_\alpha^2\right)$, ε_{ijt} is i.i.d. $N\left(0,\sigma_\varepsilon^2\right)$, and the individual-specific effects are uncorrelated with the regressors. This assumption is certainly appropriate for model (1), and whenever D_{ijt} in models (2) and (3) captures elements randomized through the experimental design. This would include whether the wine offered were in the high vs.

[8] Note that estimating the models in (2) and (3) is equivalent to estimating a single model including both main effects and interaction effects. In our specification, the null hypothesis that there are no label-specific interaction effects would take the form $\beta_5 = \beta_6 = \beta_7$. That is, the effect of D_{ijt} is the same across all labels. In a specification with main and interaction effects one would test for the significance of the interaction terms. The main advantage of our chosen specification is that resulting estimates do not need to be interpreted as differences with an omitted variable.

[9] This only matters when measuring the average effect of $\beta_5 D_{ijt}$, which would be biased towards zero if we included the juice data.

low price range (Study I, Spain) or the type of wine information awarded for free to a subset of participants (Study II, France).

However, estimating how information acquired through rounds affects subsequent bids, or the effect of subject-specific covariates such as high vs. low wine knowledge is more problematic. For the case of previously acquired information, D_{ijt} is a dummy variable indicating whether individual *i* has "purchased" a specific kind of information in a previous round. If we define bid^*_{jt} as the randomly drawn market price of the information provided in session *j* in round *t* then $D_{ij(t=2)} = I\left\{bid_{ij(t=1)} \geq bid^*_{j(t=1)}\right\}$ and $D_{ij(t=3)} = I\left\{bid_{ij(t=1)} \geq bid^*_{j(t=1)}\right\} + I\left\{bid_{ij(t=2)} \geq bid^*_{j(t=2)}\right\}$, where *j* includes only the sessions in which a specific information was provided in the given time period. For example, if one is interested in measuring the effect of having purchased firm information in Study I (Spain) , then (see table 1) $j = 1,2,3,4$ for $I\left\{bid_{ij(t=1)} \geq bid^*_{j(t=1)}\right\}$ and $j = 5,6,7,8$ for $I\left\{bid_{ij(t=2)} \geq bid^*_{j(t=2)}\right\}$.

It is obvious that, owing to incentive-compatibility, individuals having a tendency to bid higher (have larger α_i) are more likely to receive the information, which makes access to information endogenous. Fixed-effects interval regression models based on the normal distribution suffer from the incidental parameter problem, and, to the best of our knowledge, alternative estimators have yet to be developed. One simple solution we adopt here is to treat the data as point rather than interval (e.g. only consider the lower bound of each interval), and then proceed with traditional least squares fixed effects (within) estimation. This will bias (downward) the estimates of the information-specific constants in equation (3), but will not otherwise influence interaction terms measuring *differences* in bids across rounds, which is the object of our interest.

This approach is not available when studying the effect of wine knowledge, because knowledge is a time-invariant subject-specific covariate. In this case, we want to determine whether high knowledge consumers tend to bid more (or less) for certain types of information. Individuals with larger α_i may be particularly keen to receive information before making any decision (including the fruit juice they will receive), or simply enjoy "winning" the offered information more than they care about (or understand) the monetary incentives in the bidding process. The concern is that wine knowledge may correlate with α_i, positively or negatively, thereby biasing the estimates. Our solution here is to eliminate individual specific effects by subtracting each individuals' bid for fruit juice information from the bids in the wine information. Since $Bid_{ij(t=0)} = \beta_1\left(Juice_{jt}\right) + \alpha_i + \varepsilon_{ijt}$, this generates the model:

$$\left(Bid_{ijt} - Bid_{ij(t=0)}\right) = \tilde{\beta}_2\left(Firm_{jt}\right) + \tilde{\beta}_3\left(GI_{jt}\right) + \tilde{\beta}_4\left(Score_{jt}\right) + \\ + \beta_5\left(D_{ijt} * Firm_{jt}\right) + \beta_6\left(D_{ijt} * GI_{jt}\right) + \beta_7\left(D_{ijt} * Score_{jt}\right) + \gamma_t + \eta_{ijt} \tag{4}$$

for $t = 1, 2, 3$; where $\tilde{\beta}_k = \beta_k - \beta_1$ is the average WTP for information source *k* minus the WTP for juice information, $\eta_{ijt} = \left(\varepsilon_{ijt} - \varepsilon_{ij(t=0)}\right)$ is the error term, and individual-specific effects have been removed so that equation (4) can be estimated via interval regression.

5. Data and Estimation Results

Table 2 presents the sociodemographic descriptors for study 1 and 2, compared to the national averages, and descriptive statistics for the wine knowledge test.

	Spain		France	
	Population	Sample Study I n=148	Population	Sample Study II n=144
Female (%)	51.0 [1]	54.0	51.7 [3]	52.8
Age (%) Spain: [0.342 (0.843)][a] France: [25.895 (<.001)][a]				
18–34	20.8 [1]	25.7	19.7 [3]	25.0
35–54	36.3 [1]	26.3	25.4 [3]	38.9
≥ 55	42.9 [1]	48.0	33.7 [3]	36.1
Education level (%)				
Primary	32.5 [2]	16.3	17.5 [3]	2.8
Secondary	27.7 [2]	27.9	41.5 [3]	22.9
Higher	39.7 [2]	55.8	40.9 [3]	74.3
Income level (%)				
≤ €1500 /month	N/A	33.3	N/A	11.1
€1501–€2500/month	N/A	26.5	N/A	29.2
€2501–€3500/month	N/A	19.7	N/A	24.3
> €3500/month	N/A	20.4	N/A	35.4
Household size	N/A	2.76	N/A	2.25
Wine Knowledge Score				
Mean	N/A	12.8	N/A	8.6
(s.e.)	N/A	(6.4)	N/A	(4.7)

[1] INE (2021). https://www.ine.es/jaxi/Tabla.htm?path=/t20/e245/p08/l0/&file=02003.px&L=0. Accessed 25.04.2022
[2] Eurostat 2021. Population aged 25-64 by educational attainment level, sex, and NUTS 2 regions (%). https://appsso.eurostat.ec.europa.eu/nui/show.do. Accessed 25.04.2022
[3]–INSEE (2021) - https://www.insee.fr/fr/statistiques/6024136#tableau-figure6_radio1 & https://www.insee.fr/fr/statistiques/6535231?sommaire=6535307&q=%C3%A9ducation Accessed 20.04.23

Table 2: Sociodemographic, economic characteristics, and objective wine knowledge by study

Both the Spanish and French samples are approximately balanced in terms of female/male representation. The French sample is somewhat more affluent and better educated than the Spanish sample. The main thing to note about the wine knowledge variable is the dispersion in test scores, which suggests significant variation in the sample. While the Spanish sample produced a higher

average test score, the specific questions were different in each country (see table A2), so scores are cardinally comparable only within each study.

Table 3 presents the estimates of the average value of information (equation (1)) for the Spanish and French data estimated via random effect interval regression, with standard errors based on asymptotic theory.

	Study I - Spain		Study II - France	
JuiceType	23.72	***	26.52	***
	(1.34)		(1.67)	
Firm	27.40	***	28.08	***
	(1.64)		(2.47)	
GI	33.32	***	36.94	***
	(1.67)		(2.66)	
Score	35.25	***	37.40	***
	(1.66)		(2.67)	
Gamma2	3.23	**	-3.53	
	(1.62)		(2.47)	
Gamma3	0.38		-0.62	
	(1.62)		(2.50)	
sigma_u	8.97	***	11.46	***
	(0.88)		(1.16)	
sigma_e	13.45	***	16.00	***
	(0.20)		(0.24)	
Rho	0.31		0.34	
	(0.04)		(0.05)	
Number of observations	592		503	

*** p<.01, ** p<.05, * p<.1

[a]: a pairwise Wald test of equality of coefficients between Study I and Study II does not reject the null hypothesis. $\chi^2_{(4)} = 4.82$; p=0.31

Table 3: Value of information[a] for juice type, winery name, GI, score

WTP estimates are strikingly similar when comparing Study I and Study II: expert reviews is the most valued source of information (¢35.2 in Spain vs ¢37.4 in France), followed by the geographical indications (¢33.3 in Spain vs ¢36.9 in France), and the winery name (¢27.4 in Spain vs ¢28 in France). A joint test of pairwise equality of parameters across Study I and II did not reject

the null hypothesis ($\chi^2_{(3)} = 0.95$, $p = 0.81$). Results also display logical coherence, in that valuation of the juice flavor was lowest in both samples (¢23.7 in Spain vs ¢26.5 in France), as one would expect. The 95% confidence intervals in figure 4 imply that, while point estimates differ, the valuations of GI and expert reviews information are not statistically different, and the same is true for winery name vs. juice information. In both samples, more than 30% of the panel variance can be attributed to the individual-specific effects (sigma_u).

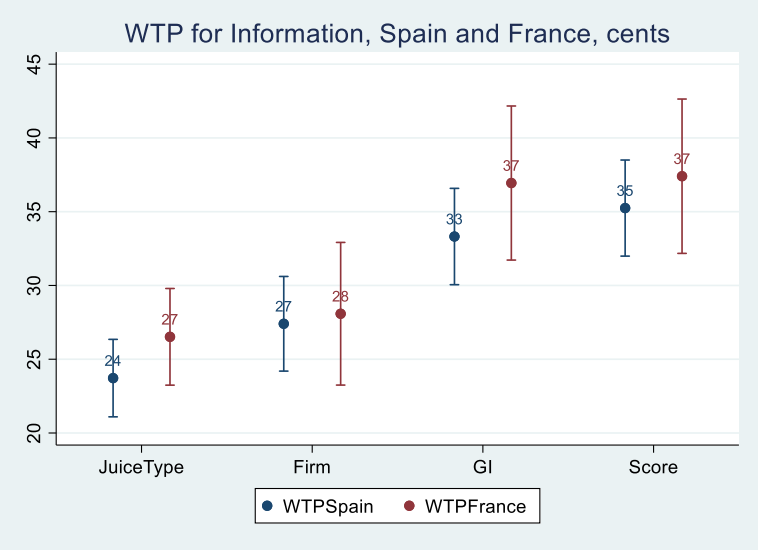

Figure 4: Average value of information in Spain (Study I - blue) and France (Study II - red) with confidence intervals

Table 4 shows how the between-subject experimental treatments (price range in Study I, and free information in Study II), affect valuation for information, and represent empirical counterparts to equations (2) and (3).

	Study I: Price Range					Study II: Exogenous Info				
	Avg. Effect		By Label			Avg. Effect		By Label		
Firm	28.82	***	28.69	***	Firm	28.39	***	28.07	***	
	(2.07)		(2.27)			(2.76)		(2.75)		
GI	34.80	***	33.36	***	GI	37.46	***	37.27	***	
	(2.09)		(2.28)			(2.95)		(2.95)		
Score	36.93	***	38.70	***	Score	37.91	***	38.56	***	
	(2.09)		(2.33)			(2.96)		(2.96)		
HighPrice	-2.74				InfoGiven	-0.19				
	(2.13)					(2.93)				
Firm*HighPrice			-2.38		FirmGiven			-3.64		
			(2.98)					(4.16)		
GI*HighPrice			0.56		ScoreGiven			5.88		
			(3.02)					(4.28)		
Score*HighPrice			-6.53	**	GIGiven			-2.37		
			(3.05)					(4.13)		
Gamma2	3.29	*	3.27	*	Gamma2	-3.68		-3.76		
	(1.86)		(1.85)			(2.79)		(2.79)		
Gamma3	0.37		0.27		Gamma3	-0.65		-0.76		
	(1.85)		(1.84)			(2.82)		(2.82)		
N	444		444		N	360		360		

*** p<.01, ** p<.05, * p<.1
Note: variance estimates omitted

Table 4: Effect of varying price range (Study I, Spain) and exogenously provided information (Study II, France)

In both cases, estimates imply a null result. $D_i = \text{HighPrice}_i$ in the first column of table 4 is a dummy variable indicating participants in the high price treatment and estimates show that, on average, bids in higher wine price sessions are not statistically different from the lower price ones. When interacted with each information source, two of the coefficients are non-significant, while bids for score information were about ¢6 lower than in the high price sessions, a result we find difficult to interpret. In the first column of relative to study II, $D_{ijt} = InfoGiven_{ijt}$ indicates the condition where any of the three information sources was awarded in the first round) while in the second specification the dummies are information-specific. Contrary to our expectations, neither

specification shows any change in valuation when one of the information sources is endowed during the first auction.

The estimates in table 5 pertain to models investigating the moderating effect of wine knowledge/expertise on the perceived value of each information source.

	RE Spain		FE Spain[b]		RE France		FE France[b]	
(STD.W.Know)*Firm	2.41	*	2.78	**	1.09		-0.28	
	(1.28)		(1.20)		(1.72)		(1.63)	
(STD.W.Know)*GI	2.22	*	2.67	**	0.24		-1.70	
	(1.29)		(1.21)		(1.77)		(1.68)	
(STD.W.Know)*Score	-1.34		-0.99		-1.94		-3.57	**
	(1.31)		(1.23)		(1.78)		(1.69)	
sigma_u	8.99	***	4.64	***	11.47	***	6.66	***
	(0.87)		(0.92)		(1.17)		(1.18)	
sigma_e	13.38	***	13.56	***	16.00	***	16.34	***
	(0.20)		(0.29)		(0.24)		(0.33)	
N	592		592		503		503	
(High Knowledge)*Firm	1.43		1.57		3.86		2.80	
	(3.31)		(3.09)		(5.34)		(5.15)	
(High Knowledge)*GI	6.48	*	6.70	**	5.15		3.35	
	(3.40)		(3.19)		(5.72)		(5.56)	
(High Knowledge)*Score	-2.95		-3.05		-13.36	**	-13.45	***
	(3.39)		(3.18)		(5.26)		(5.01)	
sigma_u	8.98	***	4.71	***	11.50	***	6.94	***
	(0.88)		(0.92)		(1.16)		(1.16)	
sigma_e	13.44	***	13.62	***	15.85	***	16.21	***
	(0.20)		(0.27)		(0.24)		(0.33)	
N	592		592		503		503	

*** p<.01, ** p<.05, * p<.1

[a]: estimates for the label-specific intercepts and auction number dummies omitted.

[b]: Wald test of equality of parameters between Study I (Sp_2) and Study II (Fr_2): $\chi^2_{(3)} = 9.35$, p=0.02; $\chi^2_{(3)} = 7.03$ p=0.07

Table 5[a]: Effect of objective wine knowledge on WTP for Firm, GI, Score in study I (Spain), and study II (France)

For the sake of comparison for each study we present *selected*[10] estimates from the random effect model (RE) in equation (3) and the transformed dependent variable, fixed effect-type (FE) approach presented in equation (4). While the absence of α_i in (4) suggests estimation via pooled interval regression (with cluster-robust standard errors), all models are estimated using the random effect estimator, which remains consistent and equivalent to pooled regression under the null hypothesis of no individual-specific effects. Additionally, we present estimates for two alternative measures of objective wine knowledge: in the upper panel we use the standardized wine knowledge score of each participant ($STD.W.Know_i$, a continuous variable), a specification assuming a constant, linear effect. In the lower panel, we define $D_i = HighKnowledge_i$ as a dummy variable for individuals in the top quartile of the wine knowledge distribution of each sample, so that estimates represent a contrast between high knowledge individuals and the rest of the sample, thereby allowing for nonlinearities.

First, we draw attention to the differences between the untransformed vs. transformed dependent variable estimates. If one considers the panel-level estimates of the variance (sigma_u), they will note that, while not fully eliminated, subtracting the practice round bid from the wine information round bids consistently diminished (by about half) the noise variation attributable to the individual-specific effects. However, differences between the estimates from the two models are small, suggesting that perhaps endogeneity and correlation with other omitted determinants of the value of information may not be a significant concern for the case of objective wine knowledge. Notably, standard errors tend to be smaller for the transformed dependent variable model, so we interpret the corresponding results.

[10] Information-specific intercepts $\tilde{\beta}_k$ and round number γ_t estimates are uninteresting and omitted for brevity.

A comparison of the estimates from study I (Spain) and study II (France) shows that, while the estimates differ across locations, their logic and interpretation remains consistent. In Spain, we find that a one-standard-deviation increase in wine knowledge corresponds to an increase in bids of about ¢ 2.5 for GI and firm information, and no significant effect for score information. Results from France show no increase in bids for GI and firm information, but a significant decrease in the valuation for score information (¢3.5). When considering the top quartile in knowledge (vs. the rest), we measure an increase of ¢6.7 for GI information in Spain, and a sizable ¢13.5 discount for score information in France.

Table 6 shows how information acquired through the MPL mechanism changes bids in later rounds. Even though we found no evidence that endowing information changes bidding behavior (see right side of table 4), to avoid any confounding effects we exclude from this analysis all participants who received endowed information, thereby halving the sample size for study II. The table includes the sample percentage who, at the beginning of each round, had purchased an information type. For example, in the Spanish experiment no one possessed information about winery names at the beginning of the first wine round (by design). At the beginning of the second round, 12 percent of participants received such information, and the percentage increased to 25 percent before the last round. In the right side of the table we present *selected*[11] estimates for the model in equation (3) estimated via interval regression (Random Effect, RE) and within least squares regression (fixed effects, FE).

[11] Information specific intercepts β_k are omitted for brevity.

	Study I - Spain						
	% Sample by round #			Estimates by model			
	1	2	3	Interval Regression (RE)		Within Regression (FE)	
Purchased Firm Info	0%	12%	25%	-9.67	***	-14.08	***
				(2.69)		(2.44)	
Purchased GI Info	0%	11%	28%	0.60		-1.54	
				(2.62)		(2.45)	
Purchased Score Info	0%	32%	56%	-1.78		-8.37	***
				(2.50)		(2.37)	
Gamma2	-	-	-	4.89	***	7.50	***
				(1.87)		(1.61)	
Gamma3	-	-	-	3.46		8.72	***
				(2.42)		(2.14)	
Number of observations				592		592	
	Study II - France						
	% Sample by round #			Estimates by model			
	1	2	3	Interval Regression (RE)		Within Regression (FE)	
Purchased Firm Info	0%	27%	30%	-4.31		-9.90	**
				(4.34)		(3.97)	
Purchased GI Info	0%	23%	50%	-7.61		-14.26	***
				(4.69)		(4.18)	
Purchased Score Info	0%	22%	39%	-1.87		-10.67	***
				(4.66)		(4.09)	
Gamma2	-	-	-	-0.20		5.96	**
				(3.67)		(2.94)	
Gamma3	-	-	-	4.54		13.70	***
				(4.95)		(3.96)	
Number of observations				296		296	

*** p<.01, ** p<.05, * p<.1

[a]: estimates for the information-specific intercepts omitted.

Table 6[a]: Percent of sample who purchased information and its average effect on subsequent bids

A first observation is that, by the last round about a quarter of participants in study I (Spain) received firm and GI information, while more than half received expert reviews. In study II (France), about a third of participants stated their last bid having received firm and expert reviews, while a full half had purchased GI information. This is consistent with the results in table 3, showing slightly higher valuations in France. A comparison of the random and fixed effects estimates suggests that, as we anticipated, endogeneity is a problem in this case, biasing the random

effect estimates towards zero in both experiments. Accordingly, we focus the interpretation on the fixed effect estimates. It is also worth pointing out how the standard errors tend to be larger in study II, owing to the smaller sample size.

Results from both studies show that, on average, people who purchase information in earlier rounds tend to decrease their bidding in the following ones. The round number estimates (Gamma2, Gamma3) on the other hand imply that, holding constant the information received, participants tend to increase bids in later auctions. The observed reduction in bids after receiving a certain type of information can be interpreted as a measure of redundancy between information sources, and more useful information sources will make other signals redundant or not needed. In study I (Spain), those who received firm information reduced their subsequent bids the most (¢14), followed by expert reviews (-¢8), while the estimate for GI is non-significant (a test of equality of coefficients rejects the null $\chi^2_{(2)} = 12.58 \quad p = 0.002$). In France, GI information is associated with the largest average reduction (-¢14), followed by expert reviews (-¢10.6) and winery names (-¢9.9), but the smaller sample size cause larger and overlapping confidence intervals ($\chi^2_{(2)} = 0.6$ $p = 0.74$). We also estimate a more detailed model of the (3x2) label-specific effects (e.g. the effect of firm information on GI or score valuation). Results show some interesting patterns, but the inference is limited by low statistical power, so we relegate these estimates to table A3 in the appendix.

6. Discussion and Policy Implications

We conducted laboratory experiments simulating a wine shopping experience to measure the effectiveness of geographical indications, expert reviews, and winery names in conveying quality information. The *ex ante* value of each information source was elicited via multiple price listing and a sample of wine consumers in Spain (study I) and France (study II). Experimental treatments

include the order in which information was auctioned (study I and II), the price range of the wines for sale (study I), and the exogenous (non bid-dependent) release of one out of three sources of information (Study II). Average WTP for information sources is estimated via random effect interval regression, while fixed effects (within) regression is used to measure how purchasing one information source in an earlier MPL round changes the perceived value of other cues. We also present a simple and, to the best of our knowledge, novel way of estimating marginal effects for observational, potentially endogenous time-invariant subject characteristics (i.e., wine knowledge) leveraging practice rounds to eliminate, or at least attenuate, the influence of individual-specific unobserved heterogeneity.

We structure the discussion along three main thematic areas of contribution. First, we address the motivating question of this article, and elaborate on the effectiveness of GIs in informing consumer choices by using our experimental results to provide policy implications. We generate a tentative estimate of the consumers surplus generated by the information carried by the GI labeling scheme. Then, we summarize and assess the experimental findings against the backdrop of the original research hypotheses, discussing the implications for policy on how consumers interpret quality cues in markets for highly differentiated experience goods. Then, we contrast the resulting picture against the typical behavioral assumptions adopted in the large body of theory studying GIs, identify possible constraints, and offer some suggestions for future advancements.

Our first result relates to how consumers in France and Spain value access to GI information when purchasing wine, and the consumer surplus generated by GI labels. This directly ties to the stated objective of the EU GI policy of informing consumer choices. We offer three interpretations of our results, which accord varying degrees of faith into the external validity of

laboratory experiments. The first interpretation is literal: since GI information in the real world is provided to consumers at no additional cost over the market price, participants' bids provide a direct measure of the consumer surplus generated by the labeling scheme at each purchasing occasion. We reiterate that the relevant counterfactual here is not a world without GIs (which may provide lower average quality), but rather a world where GIs exist, but an evil genie has erased the information from all bottles. According to 2020 Kantar data[12], the average French consumers purchased bottled still wine 13 times per year (43.6 bottles/year, 3.4 bottles/shopping trip), implying a yearly surplus of € 4.81 per consumer. Estimates for Spain could be calculated using analogous statistics, which we are unable to find at the time of writing.[13] These estimates are useful in that they provide a direct measure of the ability of GIs to inform consumers, and we do so within a realistic setting with multiple competing quality signals.

The cardinal interpretation of experimental estimates is also subject to the standard caveats: MPL mechanism are susceptible to framing effects (Andersen et al. 2006), and our samples, while representative in term of demographics, are quite small compared to the consumer population. In our opinion, the most prominent issue is that, while the MPL method is incentive compatible, it necessarily is a single-shot game, whereas real life is generally a repeated game. A consumer may agree to spend 30 cents once to access GI information in an experimental setting, but that does not mean they would do the same every time they purchase a bottle of wine. Be that as it may, one can use the experimental estimates to draw comparative inference. Villas-Boas et al. (2021) conducted an in-store experiment in 2006 to measure the causal effect of expert reviews on U.S. consumer demand, estimating a surplus of $2.03 ($2.88 in 2022 dollars) per consumer associated with the

[12] Source: FranceAgriMer. Ventes et achats de vins tranquilles- Bilan 201. Edition Juillet 2022.
[13] According to the Ministry of Agriculture, Fishing and Alimentation GIs represent 51.5% in volume and 80.3% in value of wines consumed in the country in 2022, but no data is available on the number of bottles purchased nor purchasing frequency - Informe del consumo alimentario en España 2022 (mapa.gob.es)

value of information. Our results show that the valuation of expert reviews in France or Spain is not statistically different from the valuation for GIs, so the main leap of faith in using this same value for GIs is extrapolating from Californian to European consumers. For those who remain skeptical, there is one more interpretation, which is both allegorical and alcohol free. How important are GIs as a source of information? We find that, for both Spanish and French wine consumers, buying a wine without knowing GIs is much worse (about 1.5 times) than choosing a fruit juice without knowing its flavor. Overall, it seems safe to conclude that GIs represent an effective means of informing consumer choices.

Turning now the attention to the original research hypotheses and what can be learned from our experiments about consumer behavior, our results show that GIs and expert reviews have, on average, similar information content, and are more valuable than winery names. This pattern is consistent across Spanish and French consumers, suggesting that the reputation and information dynamics are quite robust, and are likely to hold in other markets where wine consumption is common. The implication is that, even though firm names and expert reviews offer much more specific cues than the collective reputation mechanism behind GIs, signal complexity, trustworthiness, and consumers' ability to understand quality cues are important factors to consider.

Contrary to our expectations, increasing the price of the wines offered for sale didn't increase the value of accessing information sources, neither in absolute nor in relative terms. Thus, prices do not appear to influence the value of information, or at least not within the limits of the price differences we considered. In addition to accepting the null result at face value, two possible alternative explanations come to mind, one linked to the experimental environment, and one more general. A first possibility is that the endowed money was seen by participants as a budget

constraint. This budget was the same for high and low prices sessions, so participants in high price sessions may have perceived to have a lower disposable income, thereby offsetting the increase in the value of information. However, the participation money was calibrated to always exceed any required payments, and therefore was never binding. An additional interpretation is offered by the possible quality-signaling effect of price, which has been reported in both theory (Bagwell and Riordan 1991) and applied settings (Schnabel and Storchmann 2010). We did not consider this mechanism *a priori* because price signaling is stronger when consumer are uninformed and no other information is available (Zeithaml 1988; Lockshin et al. 2006), which is not the case in our setting. However, it is still possible that participants in the high-price treatment considered all the wines for sale a safe bet and, despite the larger expenditure, they did not feel a greater need for information than those in the low-price sessions. Future work will need to find creative ways to distinguish between these competing hypotheses, and perhaps consider higher price segments (albeit the negative consequences for the necessary experimental budget are obvious).

Our experiments produced only mixed evidence of decreasing marginal returns to additional information sources. In study II, providing the first envelope of wine information for free to all participants did not affect bids in the subsequent rounds. On the other hand, fixed effects estimates tell us that, *for those who purchased information through the MPL process*, the value of subsequent information diminishes. The italics here emphasize that there is a strong element of self-selection. The magnitude of this decreasing marginal effect is sizable, averaging about 10 cents, but there is no clear pattern to say which source of information supersedes the others, as relative effect sizes are inconsistent across study I and II. Taken together, these findings suggest that consumers are heterogeneous in their understanding of the information.

Congruently with this last observation, we find that wine expertise plays an important role in determining consumers' ability to use quality cues, and not all information sources are created equal. Expert reviews are more useful to unexperienced consumers, while knowledgeable consumers can extract more information from winery names. As there are many more firm names than GIs, we expected that designations of origin would fall somewhere in-between, but instead we find that the role of expertise in moderating GIs effectiveness resembles much more the case of firm names than that of expert reviews. This result should not be overstated, as the effect of knowledge is relatively small compared to the total value of GI information, but it does grant some support to those (e.g. (Livat et al. 2019)) who lament the excessive number and intricacies of GI schemes. To summarize, our results suggest that expert reviews, GIs, and firm names are only imperfect substitutes of each other, and may communicate to different consumer segments.

Our findings have clear implications for the large body of economic theory studying the effects of GIs. An excellent survey of the literature on quality labels by Bonroy and Constantatos (2014) highlights how seemingly conflicting results are often due to different modeling assumptions, so it is useful to contrast our empirical findings with the behavioral assumptions at the foundation of these models. In the following paragraphs we offer some reflections, with the tacit understanding that abstracting from the intricacies of the real world to isolate a single issue is an uncontested prerogative of theory work.

Taken together, our results confirm that early seminal work (e.g. Zago and Pick 2004; Moschini et al. 2008) studying the GI quality signal in isolation from other cues may be overly simplistic. This has been already recognized, and a few contribution examined the interactions between collective reputations linked to GIs and firm reputations (Menapace and Moschini 2012; Costanigro et al. 2012; Yu et al. 2018). Our results also present empirical evidence in support of

the idea that some types of information are "imperfect", in the sense that some are most suited to convey information to sophisticated consumers, while others speak to less experienced ones (Bonroy and Constantatos 2008). As assumed in Yu et al. (2018), we thought of GIs as an easy-to-understand signal, while firm names are for the sophisticated. However, our results show that expert reviews are a better example of a signal for unexperienced consumers because, unlike GIs, their information content is uncorrelated with previous knowledge. Related to this, what still seems to be missing in the extant body of theory is an explicit, endogenous treatment of the consumers' learning process in the original spirit of Stigler (1961) and Nelson (1970), which is dynamic in nature, and crucially different when considering alternative sources of information.

The fact that GIs, firm names, and expert reviews are rather imperfect substitutes of each other also seems to imply that the representation of quality as a unidimensional ordinal concept (à la Mussa and Rosen, 1978) may hold for intra-GI quality tiers (as in Costanigro et al. 2019), but may be less congruent when studying consumer choices between GIs. Either quality is multidimensional (as in Steenkamp 1990), and different cues inform different quality dimensions; or designations of origin convey elements of both horizontal and vertical differentiation, which would be fitting with the idea of *sui generis* goods. This, paired with consumer variety seeking behavior and interest in new experiences (as in Zeithammer and Thomadsen 2013) may justify the staggering proliferation of GIs, which remains unexplained by theory.

References

Addor, F., and A. Grazioli. 2002. "Geographical Indications beyond Wines and Spirits." *The Journal of World Intellectual Property* 5(6):865–897.

Agdomar, M. 2007. "Removing the Greek from Feta and Adding Korbel to Champagne: The Paradox of Geographical Indications in International Law." *Fordham Intellectual Property, Media & Entertainment Law Journal*. Available at: https://www.semanticscholar.org/paper/Removing-the-Greek-from-Feta-and-Adding-Korbel-to-Agdomar/8336765a6901a149ece4045e0ae9b96b7d03cafc [Accessed August 14, 2023].

Akerlof, G.A. 1970. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *The Quarterly Journal of Economics* 84(3):488–500.

Andersen, S., G.W. Harrison, M.I. Lau, and E.E. Rutström. 2006. "Elicitation using multiple price list formats." *Experimental Economics* 9(4):383–405.

Asioli, D., A. Mignani, and F. Alfnes. 2021. "Quick and easy? Respondent evaluations of the Becker–DeGroot–Marschak and multiple price list valuation mechanisms." *Agribusiness* 37(2):215–234.

Ay, J.-S. 2021. "The Informational Content of Geographical Indications." *American Journal of Agricultural Economics* 103(2):523–542.

Bagwell, K., and M.H. Riordan. 1991. "High and Declining Prices Signal Product Quality." *The American Economic Review* 81(1):224–239.

Banerjee, A., E. Duflo, A. Finkelstein, L.F. Katz, B.A. Olken, and A. Sautmann. 2020. "In Praise of Moderation: Suggestions for the Scope and Use of Pre-Analysis Plans for RCTs in Economics." Available at: https://www.nber.org/papers/w26993 [Accessed January 31, 2024].

Bonroy, O., and C. Constantatos. 2014. "On the Economics of Labels: How Their Introduction Affects the Functioning of Markets and the Welfare of All Participants." *American Journal of Agricultural Economics*:aau088.

Bonroy, O., and C. Constantatos. 2008. "On the use of labels in credence goods markets." *Journal of Regulatory Economics* 33(3):237–252.

Cardoso, V.A., A.E.B.S. Lourenzani, M.M. Caldas, C.H.C. Bernardo, and R. Bernardo. 2022. "The benefits and barriers of geographical indications to producers: A review." *Renewable Agriculture and Food Systems* 37(6):707–719.

Castriota, S., and M. Delmastro. 2015. "The Economics of Collective Reputation: Evidence from the Wine Industry." *American Journal of Agricultural Economics* 97(2):469–489.

Cei, L., G. Stefani, E. Defrancesco, and G.V. Lombardi. 2018. "Geographical indications: A first assessment of the impact on rural development in Italian NUTS3 regions." *Land Use Policy* 75:620–630.

Chilla, T., B. Fink, R. Balling, S. Reitmeier, and K. Schober. 2020. "The EU Food Label 'Protected Geographical Indication': Economic Implications and Their Spatial Dimension." *Sustainability* 12(14):5503.

Costanigro, M., C.A. Bond, and J.J. McCluskey. 2012. "Reputation Leaders, Quality Laggards: Incentive Structure in Markets with Both Private and Collective Reputations." *Journal of Agricultural Economics* 63(2):245–264.

Costanigro, M., J.J. McCluskey, and C. Goemans. 2010. "The Economics of Nested Names: Name Specificity, Reputations, and Price Premia." *American Journal of Agricultural Economics* 92(5):1339–1350.

Costanigro, M., G. Scozzafava, and L. Casini. 2019. "Vertical differentiation via multi-tier geographical indications and the consumer perception of quality: The case of Chianti wines." *Food Policy* 83:246–259.

Curzi, D., and M. Huysmans. 2022. "The Impact of Protecting EU Geographical Indications in Trade Agreements." *American Journal of Agricultural Economics* 104(1):364–384.

Deselnicu, O.C., M. Costanigro, D.M. Souza-Monteiro, and D.T. McFadden. 2013. "A Meta-Analysis of Geographical Indication Food Valuation Studies: What Drives the Premium for Origin-Based Labels?" *Journal of Agricultural and Resource Economics* 38(2):204–219.

European Commission and Directorate-General for Agriculture and Rural Development. 2021. *Study on economic value of EU quality schemes, geographical indications (GIs) and traditional specialities guaranteed (TSGs) : final report*. Publications Office.

Ferreira, C., L.M. Costa Pinto, and L. Lourenço-Gomes. 2021. "Effect of region of origin on willingness to pay for wine: an experimental auction." *Applied Economics* 53(32):3715–3729.

Frantz, F. 2016. "Twenty Years of TRIPS, Twenty Years of Debate: The Extension of High Level Protection of Geographical Indications – Arguments, State of Negotiations and Prospects." *Annual Survey of International & Comparative Law* 21(1):93.

Friberg, R., and E. Grönqvist. 2012. "Do Expert Reviews Affect the Demand for Wine?" *American Economic Journal: Applied Economics* 4(1):193–211.

Frøst, M.B., and A.C. Noble. 2002. "Preliminary study of the effect of knowledge and sensory expertise on liking for red wines." *American Journal of Enology and Viticulture* 53(4):275–284.

Glogoveţan, A.-I., D.-C. Dabija, M. Fiore, and C.B. Pocol. 2022. "Consumer Perception and Understanding of European Union Quality Schemes: A Systematic Literature Review." *Sustainability* 14(3):1667.

Goebel, B., and M. Groeschl. 2014. "The Long Road to Resolving Conflicts between Trademarks and Geographical Indications." *The Trademark Reporter* 104:829.

Gustafson, C.R., T.J. Lybbert, and D.A. Sumner. 2016. "Consumer knowledge affects valuation of product attributes: Experimental results for wine." *Journal of Behavioral and Experimental Economics* 65(Supplement C):85–94.

Haeck, C., G. Meloni, and J. Swinnen. 2019. "The Value of Terroir: A Historical Analysis of the Bordeaux and Champagne Geographical Indications." *Applied Economic Perspectives and Policy* 41(4):598–619.

Hilger, J., G. Rafert, and S. Villas-Boas. 2010. "Expert Opinion and the Demand for Experience Goods: An Experimental Approach in the Retail Wine Market." *Review of Economics and Statistics* 93(4):1289–1296.

Ilbert, H., and M. Petit. 2009. "Are Geographical Indications a Valid Property Right? Global Trends and Challenges." *Development Policy Review* 27(5):503–528.

Klain, T.J., J.L. Lusk, G.T. Tonsor, and T.C. Schroeder. 2013. "An experimental approach to valuing information." *Agricultural Economics*:n/a-n/a.

Livat, F., J.M. Alston, and J.-M. Cardebat. 2019. "Do denominations of origin provide useful quality signals? The case of Bordeaux wines." *Economic Modelling* 81:518–532.

Lockshin, L., W. Jarvis, F. d'Hauteville, and J.-P. Perrouty. 2006. "Using simulations from discrete choice experiments to measure consumer sensitivity to brand, region, price, and awards in wine choice." *Food Quality and Preference* 17(3–4):166–178.

López-Bayón, S., M. Fernández-Barcala, and M. González-Díaz. 2020. "In search of agri-food quality for wine: Is it enough to join a geographical indication?" *Agribusiness* 36(4):568–590.

Meloni, G., and J. Swinnen. 2018. “Trade and terroir. The political economy of the world’s first geographical indications.” *Food Policy* 81:1–20.

Menapace, L., G. Colson, C. Grebitus, and M. Facendola. 2011. “Consumers’ preferences for geographical origin labels: evidence from the Canadian olive oil market.” *European Review of Agricultural Economics*. Available at: http://erae.oxfordjournals.org/content/early/2011/01/06/erae.jbq051.abstract [Accessed April 7, 2011].

Menapace, L., and G. Moschini. 2012. “Quality certification by geographical indications, trademarks and firm reputation.” *European Review of Agricultural Economics* 39(4):539–566.

Milano, M.Z., and A.A. Cazella. 2021. “Environmental effects of geographical indications and their influential factors: A review of the empirical evidence.” *Current Research in Environmental Sustainability* 3:100096.

Monten, L. 2005. “Geographical Indications of Origin: Should They Be Protected and Why - An Analysis of the Issue from the U.S. and EU Perspectives.” *Santa Clara Computer & High Technology Law Journal* 22:315.

Moschini, G., L. Menapace, and D. Pick. 2008. “Geographical Indications and the Competitive Provision of Quality in Agricultural Markets.” *American Journal of Agricultural Economics* 90(3):794–812.

Mussa, M., and S. Rosen. 1978. “Monopoly and product quality.” *Journal of Economic Theory* 18(2):301–317.

Nelson, P. 1970. “Information and Consumer Behavior.” *Journal of Political Economy* 78(2):311–329.

Raustiala, K., and S.R. Munzer. 2007. “The Global Struggle over Geographic Indications.” *European Journal of International Law* 18(2):337–365.

Sáenz-Navajas, M.-P., E. Campo, A. Sutan, J. Ballester, and D. Valentin. 2013. “Perception of wine quality according to extrinsic cues: The case of Burgundy wine consumers.” *Food Quality and Preference* 27(1):44–53.

Schnabel, H., and K. Storchmann. 2010. “Prices as Quality Signals: Evidence from the Wine Market.” *Journal of Agricultural & Food Industrial Organization* 8(1). Available at: https://www.degruyter.com/document/doi/10.2202/1542-0485.1283/html [Accessed August 4, 2023].

Shapiro, C. 1983. “Premiums for High Quality Products as Returns to Reputations.” *The Quarterly Journal of Economics* 98(4):659–679.

Slade, P., J.D. Michler, and A. Josephson. 2019. “Foreign Geographical Indications, Consumer Preferences, and the Domestic Market for Cheese.” *Applied Economic Perspectives and Policy* 41(3):370–390.

Song, X., and X. Wang. 2022. “Fair Use of Geographical Indications: Another Look at the Spirited Debate on the Level of Protection.” *World Trade Review* 21(5):597–618.

Stanco, M., M. Lerro, and G. Marotta. 2020. “Consumers’ Preferences for Wine Attributes: A Best-Worst Scaling Analysis.” *Sustainability* 12(7):2819.

Stasi, A., G. Nardone, R. Viscecchia, and A. Seccia. 2011. “Italian wine demand and differentiation effect of geographical indications.” *International Journal of Wine Business Research* 23(1):49–61.

Steenkamp, J.-B.E.M. 1990. “Conceptual model of the quality perception process.” *Journal of Business Research* 21(4):309–333.

Stigler, G.J. 1961. “The Economics of Information.” *Journal of Political Economy* 69(3):213–225.

Török, Á., L. Jantyik, Z.M. Maró, and H.V.J. Moir. 2020. “Understanding the Real-World Impact of Geographical Indications: A Critical Review of the Empirical Economic Literature.” *Sustainability* 12(22):9434.

Vandecandelaere, E., C. Teyssier, D. Barjolle, S. Fournier, O. Beucherie, and P. Jeanneaux. 2020. “Strengthening sustainable food systems through geographical indications: evidence from 9 worldwide case studies.” *Journal of Sustainability Research* 2(4):1–37.

Villas-Boas, S.B., C. Bonnet, and J. Hilger. 2021. “Random Utility Models, Wine and Experts.” *American Journal of Agricultural Economics* 103(2):663–681.

Winfree, J.A., and J.J. McCluskey. 2005. “Collective Reputation and Quality.” *American Journal of Agricultural Economics* 87(1):206–213.

Yu, J., Z. Bouamra-Mechemache, and A. Zago. 2018. “What is in a Name? Information, Heterogeneity, and Quality in a Theory of Nested Names.” *American Journal of Agricultural Economics* 100(1):286–310.

Zago, A.M., and D. Pick. 2004. “Labeling Policies in Food Markets: Private Incentives, Public Intervention, and Welfare Effects.” *Journal of Agricultural and Resource Economics* 29(01).

Zeithaml, V.A. 1988. “Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence.” *The Journal of Marketing* 52(3):2–22.

Zeithammer, R., and R. Thomadsen. 2013. “Vertical Differentiation with Variety-Seeking Consumers.” *Management Science* 59(2):390–401.

Appendices

	Wine	Price (€)	Region	Variety	Vintage	Alcohol %	Winery	GI	Score
	Study l - Spain		**Low Price**						
A	Borsao	4.75	Aragón	Grenache red Syrah Tempranillo	2020	14.5	Borsao	Campo de Borja	91 Suckling
B	Zorzal	6.75	Navarra	Grenache red	2020	13.5	Zorzal	Navarra	91 Peñin 92 Parker
C	Protia	6.9	Castilla-León	Tempranillo	2019	14.0	Portia	Ribera del Duero	
D	Viña Real	7.45	Rioja	Tempranillo, Grenache red, Graciano, Mazuela	2018	13.5	Viña Real	Rioja	93 Suckling 89 Decanter
	Study l - Spain		**High Price**						
A	Zorzal Malayeto	13.9	Navarra	Grenache red	2020	14.0	Zorzal	Navarra	94 Parker 94 Peñin
B	Borsao Tres Picos	13.8	Aragón	Grenache red	2019	15.0	Borsao	Campo de Borja	90 Suckling 92 Peñin
C	Protos Crianza	17.73	Castilla-León	Tempranillo	2017	15.0	Protos	Ribera del Duero	91 Suckling 92 Peñin 89 Wine spectator
D	Viña Real Reserva	14.1	Rioja	Tempranillo, Grenache red, Graciano, Mazuela	2016	14.0	Viña Real	Rioja	93 Parker 91 Peñin
	Study ll – France								
A	Morgon - Corcelette	12.65	Beaujolais	Gamay	2019	13.0	Domaine des Marrans	Morgon AOC	92 Parker 92 Suckling 92 Vinous
B	Arcane XV le Diable	14.77	Rhône	Mourvèdre	2015	15.0	Xavier Vignon	Vin de France	94 Parker
C	Kaleidoscope	12.07	Alsace	Pinot Noir	2020	13.0	Domaine Julien Schaal	Alsace AOC	90 Wine enthusiast
D	Rivesaltes Primage	13.72	Languedoc - Roussillon	Grenache	2015	15.5	Chateau les Pins	Rivesaltes AOC	88 Parker

Table A1: wines for sale in Study I (Spain) and Study II (France).

Question	Country	Options	Question level, correct answer & scoring key
Most beers contain between 3% and 5% alcohol by volume. Wines usually contain ..... Select only one answer, mark it with an X	France & Spain	3-5% alcohol by volume 5-9% alcohol by volume 9-14% alcohol by volume 14-17% alcohol by volume 17-21% alcohol by volume Over 21% alcohol by volume	Basic question : C=1
Which of these grape varieties are used to produce red wines? Mark with an X all those you select	France & Spain	Cabernet Sauvignon Riesling Merlot Pinot Noir Chardonnay Gewurztraminer	Basic question: A, C, D each = 1, -2 for others
Which of these grape varieties are used to produce white wines? Mark with an X all those you select	France	Muscat Syrah Gamay Grenache Chenin Chardonnay	Basic question: A, E, F each = 1, -2 for others
Which of these grape varieties are used to produce white wines? Mark with an X all those you select	Spain	Verdejo Syrah Monastrell Garnacha Albariño Chardonnay	Basic question: A, E, F each = 1, -2 for others
Which of the following areas have an Appellation d'Origine Contrôlée (AOC) for wine? Mark with an X all those you select	France	Ajaccio Nyons Haute Provence Nîmes Bordeaux	Harder question: A+E=5, A or E alone = 2, all others = -1
Which of the following areas have a Protected Designation of Origin for wines? Mark with an X all those you select	Spain	Calatayud Moncayo Borja Siurana Rioja	Harder question: A, C, E each=1, -2 for others
Which of the following variety or combinations of varieties are used to produce AOC Bourgogne? Select only one answer, mark it with an X	France	Syrah, Grenache, Cabernet Sauvignon Cinsault, Carignan, Merlot Chardonnay, Pinot Noir, Aligoté	Basic question: C = 1, -2 for others

		Cabernet Franc, Cabernet Sauvignon, Malbec, Petit Verdot, Merlot Gamay, Chenin, Grenache Sauvignon Blanc, Sémillon	
Which of the following grape variety or combinations of varieties are used to make Rioja PDO red wines? Select only one answer, mark it with an X	Spain	Garnacha, Monastrell, Pedro Ximénez, y Mazuelo Tempranillo, Viura, y Malvasia Macabeo Tempranillo, Garnacha, Mazuelo, y Graciano Malvasia y Tempranillo Tarragona y Graciano	Basic question: A=1, D=5, 0 for others
Which of the following variety or combinations of varieties are used to produce AOC Côtes du Jura? Select only one answer, mark it with an X	France	Riesling, Muscat, Sylvaner Chardonnay, Savagnin, Pinot Noir, Poulsard, Trousseau Ugni Blanc Syrah, Grenache, Viognier Sauvignon Blanc, Sémillon Cabernet Franc, Malbec	Harder question: B=5, 0 for others
Which of the following grape variety or combinations of varieties are used to make red wines from the Cariñena PDO? Select only one answer, mark it with an X	Spain	Tempranillo, Monastrell, Pedro Ximénez, y Mazuelo Tempranillo, Garnacha, Mazuelo, y Cabernet Sauvignon Monastrell Tempranillo, Garnacha, Mazuelo, y Graciano Viura y Tempranillo Merlot y Pinot noir	Harder question: A=1, B=5, 0 for others
Which of the following variety or combinations of varieties are used in the production of AOC Cahors? Select only one answer.	France	Cot, Merlot, Tannat, Jurançon Poulsard, Mourvèdre Chardonnay, Sauvignon blanc Cabernet Sauvignon, Malbec, Colombard Grenache, Cabernet Franc, Muscat Pinot Noir	Harder question: A=5, 0 for others
Which of the following grape variety or combinations of varieties are used to produce white wines from the Somontano PDO? Select only one answer, mark it with an X	Spain	Verdejo y Viura Chardonnay y Moscatel Chardonnay y Sauvignon blanc Moscatel, Verdejo y Alcañón Garnacha blanca, Sauvignon blanc y Viura Parraleta	Harder question: C=5, 0 for others

Table A2: Objective wine knowledge questionnaire & scoring keys

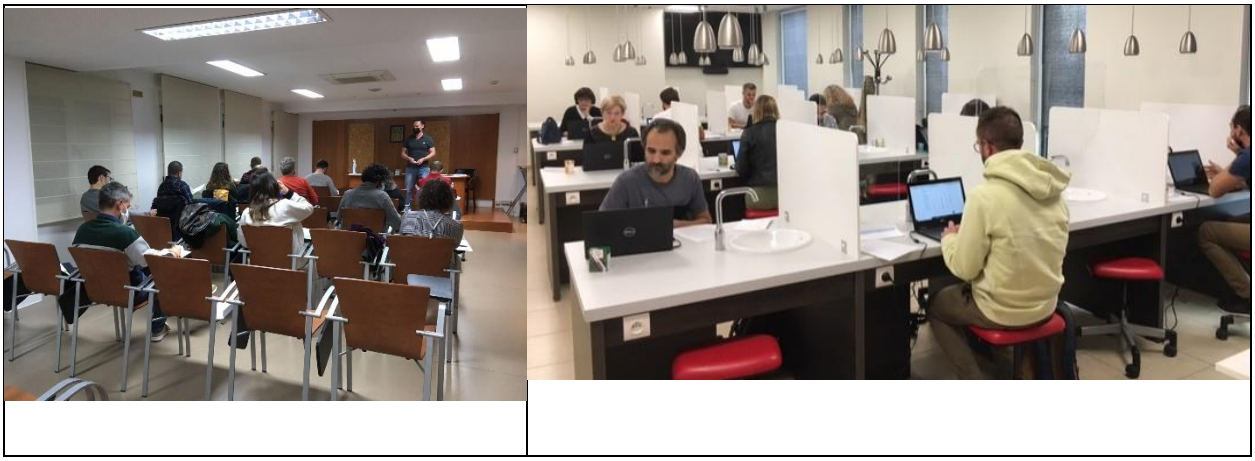

Figure A1 – Experimental setting in Spain (Study I - left) and France (Study II - right)

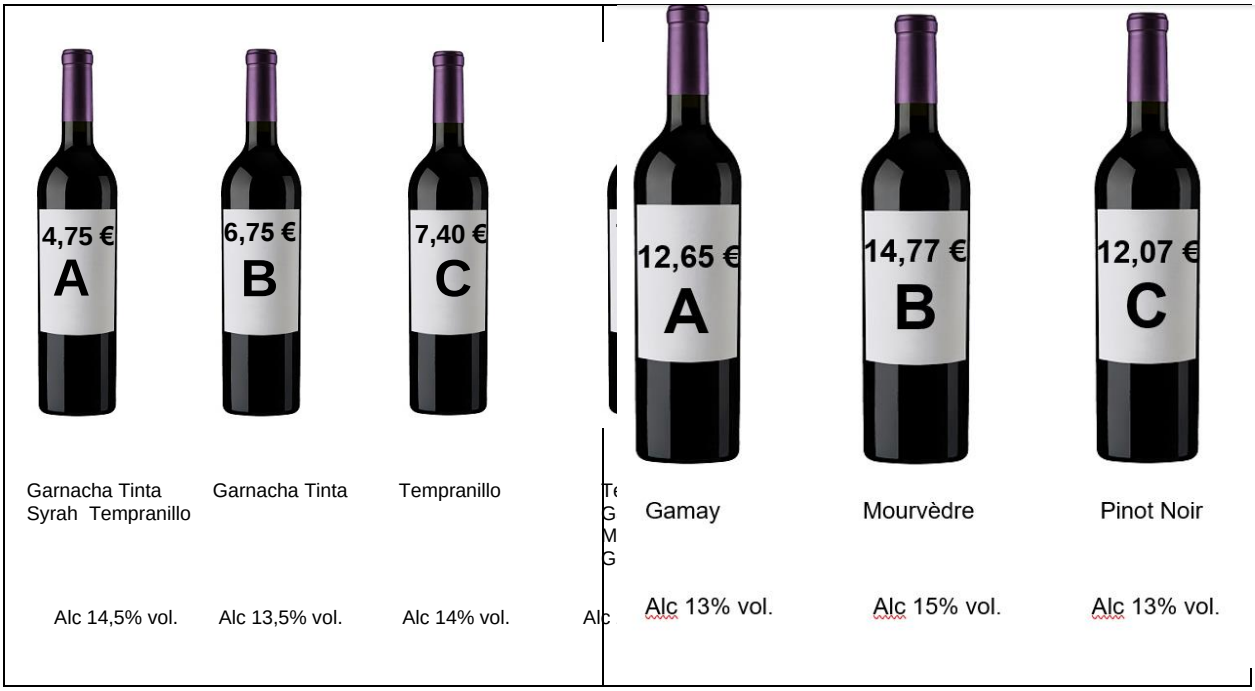

Figure A2: Endowed information sample sheets for Spain (Study I - left) and France (Study II - right)