

Louvain School of Management

The study of the impacts of the electronic shelf labels featuring a wine rating on the consumers in grocery stores.

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Summary

Technologies are on the rise. The retailing world has embraced the move by offering to their customers smart technologies that reshape their shopping activity. These tools are called smart retailing technologies and can take many different shapes. This research will study the case of the electronic shelf labels (ESLs) that are gradually substituting the regular shelf labels. Our work will focus on the impact of ESLs embedded with a product rating on the consumers. Moreover, we will consider the case of a wine rating.

Hence our following research question: “What are the impacts of an electronic shelf label featuring a wine rating on the consumers in the grocery stores?”.

Furthermore, we will consider the effect of two product rating variables: the source and the score. Our conceptual framework will examine the influence of these two variables on the customer view of the rating credibility, usage, perceived quality of the wine, and his wine purchase intention. We will also study the effects of the usage of the rating on the retailer loyalty.

This work will start with the exploratory research that includes the literature review and the qualitative interviews. The literature review will be the mean to be familiar with the relevant concepts of the topic. The interviews will allow us to gain insights on the topic from the consumers point of view. After that, we will build a total of 17 hypotheses. Following this phase, we will collect data through an online experiment based on a questionnaire that will be built with 4 potential scenarios. We will then test the hypotheses with statistical analysis which will lead us to the results of our work. We will finish the work by expressing limits and further research of our study as well as the managerial recommendations.

In conclusion of this study, we can say that the rating score has a major impact on the consumers as it positively influences both the customer perceived quality of the wine and his purchase intention. While neither of the rating source or the rating score affect the rating credibility, we observed a positive influence of the wine rating credibility on its usage. Eventually, the usage of the wine rating improves the loyalty to the retailer for both wine shopping and general shopping.

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I. INTRODUCTION

We live in an era full of fast technology innovations. The applications of these new technologies are limitless. The shopping, and the retail world are no exception. Nowadays the customer's journey integrates many digital contacts. More generally, the technology is the first protagonist of the retailing evolution¹. Technological tools called smart technologies in retailing (SRT) are reshaping our shopping. Roy et al. (2017) have characterized the notion of smartness as the “The socio economic and technological developments fueled by rapid advancements in information and communication and connected technologies”. Many retailers implement new smart technologies in their shops such as digital screens, augmented reality mirrors, self-scans and many more. The electronic shelf labels (ESLs) are one of them. They are replacing the regular shelf labels with their new features. QR codes, RFID connections, and client interactions are examples of new possibilities. They also foster product ratings. Indeed, ESL can aggregate in real time all the customers product ratings and display it on its screen. This work will focus on the case of the product rating featured on the ESLs. More particularly, it will consider the case of a wine rating.

The aim of this study is to discover the impacts of a product rating on the consumers. Indeed, it will seek for the understanding of the clients' attitude towards the ESL product rating. Moreover, this work will consider the effects of two kinds of sources: the retailer and the customers. It will also consider the effects of two rating scores: the 3-stars out of 5 and the 5-stars out of 5. We will discover how the source and the score impacts the credibility of the rating, its usage, the retailer loyalty, the perceived product quality, and the customers' purchase intention.

This study places itself in a context of a literature that is more oriented to the SRTs and their impact on the retailer. Indeed, it is clear now that the ESLs enhance the retailer's performances with costs cuts for instance. On the other hand, there is still a few theoretical materials that consider the impacts of the ESLs on the customers. Hence, it is the purpose of

¹ Hopping, D., 2000. Technology in retail. *Technol. Soc.* 22 (1):63–74. [http://dx.doi.org/10.1016/S0160-791X\(99\)00042-1](http://dx.doi.org/10.1016/S0160-791X(99)00042-1).

this study to shed the light on the influences of the ESL product rating in a customer centric manner.

In order to be able to lead this mission, we will adopt the following methodology: We will start by doing a literature review to get familiar with the topic. After this, we will conduct qualitative interviews in order to gain insights from consumers on our topic. Thanks to these two phases, we will build a conceptual framework made of 17 hypotheses on the matter. Then, we will collect quantitative data through an online experiment. This experiment will take the shape of a questionnaire. Every respondent will get one of the 4 potential scenarios. In these scenarios we will variate the wine rating source (retailer vs clients) and its score (3-stars vs 5-stars). After this, we will run a statistical analysis to reject or accept the hypotheses. Finally, we will formulate the results, limits and further research, and the managerial recommendations.

II. EXPLORATORY RESEARCH

A. Literature Review

We started this study with the broad topic of: “The electronic shelf labels in retailing”. Eventually have shifted the scope toward a narrower research question. Our research question is thus the following: “What are the impacts of an electronic shelf label featuring a wine rating on the consumers in the grocery stores?”. Knowing this, it becomes crucial to state and explain the relevant themes developed by the literature in order to understand the key topics of our problematic. Moreover, this part will help us refine our research question from the broad topic of the electronic shelf label in retailing to the very case described above. We will start to go over the literature with the retailing section to continue with the customer centric theories relevant to our study. After that, we will go over the information credibility theories. To continue with the literature regarding the electronic shelf label and their potential product rating. We will finish with theoretical materials on wine.

1. Retailing

A key concern in our scope described above, is the retailing. Indeed, we consider in-store impacts of technologies implemented by retailers. In this first section of the literature review, we will present the relevant theories behind retailing.

Therefore, let us specify what is the notion of retailing. According to Cambridge dictionary (n.d.), the notion of retailing is ‘the activity of selling goods to the public in-store or on the internet.’.

a) Smart retailing

The scope of our study is more precise than the general retailing sector. Indeed, it considers the smart retailing. Pantano and Timmermans (2014, p.106) have described the conception of smart retailing as the use of smart technologies in the domain of retailing with the condition of a “further level of smartness related to the employment of the technology”. Furthermore, these authors explain that in smart retailing, firms and consumers will be able to “reinvent and reinforce” their position in the economic society by enhancing their shopping experience from the use of technologies. For example, customers have access to much more information about the products and services than before. This reshapes the balance of bargaining power between firms and customers. In that sense, ESLs and their featured ratings can cope with that trend since it allows the user to access to additional information.

Considering the paper of Pantano and Timmermans (2014), to be at a higher level of smartness, retailers will face two kinds of challenges.

- Organizational process challenge: Thanks to the new technologies, retailers will be able to also collect big data, even tacit information, and derive insights from it. In that extent, technological tools will help companies to better understand the needs of the consumers which eventually will lead to more adapted technologies meant for the consumer experience. This concern resonates with our problematic. In the case of ESLs, customers could leave an appreciation or a user review about a product, and the retailer would gain insight upon it.

- Selling activities challenge: On the other hand, “selling activities” are also subject of changes. First of all, strict physical relations are decreasing since consumers can access P&S (product and service) through their smartphone or any other connected devices at anytime and anywhere. Moreover, selling assistant used to be human. Nowadays they are being complemented or substituted with selling assistant technologies (RFID, Augmented reality, electronic shelf label, etc). This means that many information and advice consumers used to seek from a human selling assistant, can now be retrieved from technologies. In our case, ESL’s product ratings can be a source of information about the quality of the good.

Pantano and Timmermans (2014) assume that all these effects address several opportunities that retailers must grasp. We will cover the ones that are relevant to our case.

- 1) First, retailers need to provide relevant information to the customer for their purchase experience. We will see in the customer section of the literature review that it copes with our study case of a rating featured on an ESL.
- 2) Retailers have the duty to ensure the value of using a specific technology. It is true that wrong management of technologies could lead to negative impact on their business. At the end of the day, do ESLs and their product ratings bring value to customers?

Apart from this, in Roy et al. (2017, p.258), the authors describe the smart retailing as an evolution of the ICT (information and communication technologies) in the retail sector which features the “merge” of both physical and digital “worlds of customers”². ESLs are no exception since it features digital information on a physical device which is in a physical store.

² Kim, H. Y., Lee, J. Y., Mun, J. M., & Johnson, K. K. (2017). Consumer adoption of smart in-store technology: assessing the predictive value of attitude versus beliefs in the technology acceptance model. *International Journal of Fashion Design, Technology and Education*, 10(1), 26-36.

Pantano, E., Priporas, C. V. (2016). The effect of mobile retailing on consumers' purchasing experiences: A dynamic perspective. *Computers in human behavior*, 61, 548-555.

Pantano, E., & Timmermans, H. (2014). What is smart for retailing?. *Procedia Environmental Sciences*, 22, 101-107.

In parallel, Meuter et al. (2000) suggest that one of the technology purposes for retailing is to provide the customer with relevant information about a product or a service. In that sense, ESLs and their featured information, such as the potential product rating, constitute a tool of smart retailing.

b) Smart technologies

Since our topic covers smart technologies, let us specify what the notion of smartness in technology signifies. The notion of smartness itself is described in the paper of Roy et al. (2017) as the “socio economic and technological developments fueled by rapid advancements in information and communication and connected technologies.”³.

Many other authors have participated to the elaboration of this topic of the literature.

Baz (1996) has added the idea of the smart technologies’ ability to sense and control.

Haque et al. (2013) mentioned the fact that smart technology means connectivity “with other networks and devices”.

Giffinger et al. (2007), in their turn, elaborate their definition of smart technology through the concept of technologies able of awareness, flexibility, transformability, synergy, individuality, self-decisiveness, and strategic behavior.

Harrison et al. (2010) define smart being a function of “instrumented, interconnected, and intelligent objects.”. They specify that smart technology grasps and integrates real-time data which enhances the quality of the stakeholders’ decisions.

Furthermore, Roy et al. (2017, p.258) highlights the fact that these technologies allow collaboration and value creation which eventually leads to “innovation, entrepreneurship and competitiveness (p. 179)”⁴.

³ Demirkan, H., Spohrer, J. (2014). Developing a framework to improve virtual shopping in digital malls with intelligent self-service systems. *Journal of Retailing and Consumer Services*, 21 (5), 860-868.

Dennis, C., Brakus, J.J., Gupta, S., Alamanos, E. (2014). The effect of digital signage on shop- perbehavior: the role of the evoked experience. *Journal of business research*, 67 (11), 2250–2257.

⁴ Gretzel^a, U., Sigala, M., Xiang, Z., Koo, C. (2015) . Smart tourism: foundations and developments. *Electron. Mark.* 25 (3), 179–188. <http://dx.doi.org/10.1007/s12525-015-0196-8>.

Gretzel^b, U., Werthner, H., Koo, C., & Lamsfus, C. (2015). Conceptual foundations for understanding smart tourism ecosystems. *Computers in Human Behavior*, 50, 558-563.

On the other hand, Höjer and Wangel (2015, p.258) tell us that: smartness is not about independent technologies but rather the “interconnection and the synchronization of these (technologies) and the systems they include, so that they work in concerted action [...]”. As stated by Akhilesh (2020), it is the sum of hardware, software, and the network of all that create the smart technologies.

All these acceptions considered, Roy et al. (2017, p.258) came up with this general definition of smart technology: “smart technology can be defined as value-creating connected and synchronized smart objects or devices that interact with one another, sense the environment, and guide and control their functions autonomously.”

c) Smart Retailing Technology

After having addressed retailing and smart technology, let us now focus on smart technologies supporting retailing. More particularly, they are called: “smart retailing technologies” (SRTs). In that sense, we have proven that ESLs are an SRT since it is a technological tool consumers use to shop. Implementing SRTs can allow retailers to build a competitive market position. However, this market position relies on the propensity and the ability to use SRTs. Thus, investing and implementing such technologies does not always deliver expected returns (Willems et al. 2017). There is a need for understanding each SRTs that a retailer will use in order to be sure its influences will cope with the company’s strategy. In that sense, an assessment of the customers’ attitude and behavior towards an SRT can provide the retailer with valuable insights and evaluation of this tool (Roy et al., 2017). This motivates our research that aims to understand better the perception of ESLs featuring a product rating from the customer’s point of view.

d) Retailer

We understand the notion of retailer as the instance that has the activity of selling goods to the public. Furthermore, in our scope, the retailer will be a brick-and-mortar store since we are tackling the theme of electronic shelf labels. For reminder, the kind of retailer at

stakes is a grocery retailer. Moreover, the grocery retailer will be an imaginary one so that the brand equity won't impact our dependent variables in the experiment phase.

(1) Trust

Writing about the retailers, it is important to bend on its trustworthiness. Indeed, consumers can have different level of trust they assign to one retailer. Sirdeshmukh et al. (2002, p.17) offer us the following definition: "Therefore, we define consumer trust as the expectation that a firm is dependable and will deliver on its promises". In Sparks and Browning (2011, p.1311) study, which cover the topic of travel and hospitality, we see that consumers have access to customers review so "they can base their belief or trust that a firm will deliver quality service."

Another finding about trust in the retailer comes from Sichtmann (2007) and Comegys et al. (2009). The papers state that the trust assigned to a firm by consumer positively impacts the purchase intention.

(2) Reputation

When addressing the retailer characteristics, its reputation is also a variable that impacts the consumers. According to Ou et al. (2006), the reputation is the perception of the retailer that the customers have in mind over the time. In Kim and Choi (2012, p.221), the authors write: "The concepts of 'manufacturer reputation', 'brand name', and 'corporate credibility' are closely interrelated, and all refer, at heart, to consumer perception of trust in a corporation."⁵. In this context, the corporation concept in the previous citation is the retailer perception. But what is the effect of the retailer reputation on consumers? We see that in Kim and Choi (2012), the reputation of an online retailer tends to enhance the perceived product quality. Alongside with the perceived product quality, it appears in this study that the retailer reputation also positively impacts the purchase intention of the consumers

⁵ Herbig, P., & Milewicz, J. (1995). To be or not to be... credible that is: a model of reputation and credibility among competing firms. *Marketing Intelligence & Planning*.

(3) Loyalty

Furthermore, it is important to approach the notion of loyalty. The retailer loyalty, or the store loyalty, is “the tendency to be loyal to a focal retailer as demonstrated by the intention to buy from the retailer as a primary choice” (Pappu and Quester, 2006, p.320). It is important to express the fact that our future quantitative research will be done through a questionnaire that will place the respondents in a virtual context with a scenario, they will not be in the store. Therefore, we will understand the retailer loyalty as in Koufaris (2002). Thus, the *loyalty* will be understood as the *intention to return*.

In Hennig-Thurau et al. (2002) and Das (2014), we see that the authors have noticed that the retailer loyalty improves the purchase intention of the consumer.

Furthermore, we see in Alsaoud (2019) that three variables affect the level of loyalty to the store. Indeed, smaller prices, large variety of product, and a quick checkout improve the store loyalty.

e) Key concepts

In this retailing section we have specified that our scope considers smart retailing that uses smart retailing technologies (SRTs). We have defined what SRTs are and the one that we consider, the electronic shelf labels. Meanwhile, we have explained the importance of retailers’ need to cope with their customers’ expectations and desires. Namely through the impacts of the retailer trust, reputation, and loyalty on the consumers. Therefore, we are addressing in the following section, the customer topic.

2. Customer

In this work, our concern is to tackle the impacts of smart technologies in retailing and more precisely the impacts of the electronic shelf labels featuring a product rating on the customers. Many companies implement SRTs for internal reasons (i.e., reduction cost), but they do not always know the influences on the customers. Therefore, we want to focus on the consumer centric perspective and the case of electronic shelf label featuring a product rating, to understand the impacts of such technology on people.

For instance, one of the SRTs' effects is the fact that it can trigger visits to the point-of-sales and eventually increase sales (Poncin and Ben Mimoun, 2014). Thus, we can understand the major edge on the market one company could grasp because of its understanding of clients' characteristics.

a) Product

As mentioned above, we consider in this work a product rating. Before addressing the notion of reviews and ratings, we will describe the kind of product at stakes in our study. Indeed, when considering a product review, it is important to state what kind of product we face. In Trenz and Berger (2013), the authors tell us that depending on the kind of product, experience or search goods, the review results will be different. For instance, a good such as a DVD, video game, book will relatively be more likely to be reviewed since they are experience goods, and it is often subject of criticism and evaluation⁶. In Dellarocas et al. (2010), the authors have considered the case of a movie and said that movies are likely to be reviewed soon after its “consumption”.

⁶ Dellarocas, C., Gao, G. (Gordon), Narayan, R. (2010). Are Consumers More Likely to Contribute Online Reviews for Hit or Niche Products? *Journal of Management Information Systems*, 27 (2), 127–157.

Duan, W., Gu, B., Whinston, A. B. (2008). The dynamics of online word-of-mouth and product sales—An empirical investigation of the movie industry. *Journal of Retailing*, 84 (2), 233–242.

Zhu, F., Zhang, X. (Michael) (2010). Impact of Online Consumer Reviews on Sales: The Moderating Role of Product and Consumer Characteristics. *Journal of Marketing*, 74 (2), 133–148.

For the good of our research, it will be important to state the kind of product we will consider. It is often required to consider a good which has a minimum level of popularity so that it generates a greater number of reviews to study⁷.

First, we will consider a good that can be found in a grocery store because we have covered in this literature many papers addressing the food retailing sector. For instance, Garaus et al. (2015), Das (2014), etc. This implies that our retailer will be a grocery retailer as well.

Secondly, Pan and Zhang (2011) tells us that that review valence is more likely to impact the experiential goods than utilitarian ones. We will thus, consider an experiential good because of the shape of our review, that is a 5-stars score. “Experiential products represent the hedonic aspect of consumption, and are characterized by an affective experience of aesthetic or sensual pleasure, fantasy, and fun [...]” Pan and Zhang (2011, p.600).

Lastly, the product we will tackle will be a product with a brand that nobody knows, so that the brand equity of this very product will not affect our variables relationships.

According to these reasons, we will choose the case of wine. Indeed, we can easily find this product in a grocery store, and it is mostly understood as an experiential good since it corroborates with the definition of Pan and Zhang (2011). Moreover, in our interviews, wine has been taken as an example of product that would be interesting to feature a rating. We will see it in the exploratory part of our work. Finally, the considered wine will be named the “Vina”. “Vina” is a fictional wine.

⁷ Chen, Y., and J. Xie. 2008. Online consumer review: A new element of marketing communications mix. *Management Science* 54, no. 3: 477–91.

Clemons, E. K., Gao, G. “Gordon”, Hitt, L. M. (2006). When Online Reviews Meet Hyperdifferentiation: A Study of the Craft Beer Industry. *Journal of Management Information system*, 23 (2), 149–171.

Mudambi, S. M., Schuff, D. (2010). What Makes a Helpful Online Review? A Study of Customer Reviews on Amazon.com. *MIS Quarterly*, 34 (1), 185–200.

Pan, Y., Zhang, J. Q. (2011). Born Unequal: A Study of the Helpfulness of User-Generated Product Reviews. *Journal of Retailing*, 87 (4), 598–612.

b) Perceived quality of the product

We could not address the concept of product without talking about the quality of the products consumers might consider buying. Here, the product quality will be understood as the perceived product quality since the customer could not have tried the wine since he has not purchased it yet. But let us offer a definition of the perceived good quality. The product perceived quality is “the estimation made by the consumer relying on the whole set of basic as well as outer dimension of the product or the service”⁸. Thus, the judgement of the product made by the consumer based on multiple intrinsic and extrinsic variables of this very product. Keller (2008) adds to this definition the notion that the perceived quality is the perception of the quality and the superiority in comparison of alternatives.

Perceived quality is a key component of the potential purchase. Mirabi et al. (2015) have found in their paper that product quality has a positive impact on the purchase intention. While in Saleem et al. (2015), we see that the perceived quality of a product directly impacts its purchase intention.

c) Product purchase intention

When we tackle the consumer journey, it becomes clear we need to address the very main goal of it, the purchase. Rather than the action of buying, we will focus on the will of the consumers to acquire a product or service, thus the intention of purchase. Let us describe what the purchase intention is. In Younus et al. (2015), the authors say: “Purchase intention is the preference of consumer to buy the product or service. In another words, purchase intention has another aspect that the consumer will purchase a product after evaluation.”. The purchase intention is a set of multiple influences of variables, or external factors (Keller, 2001). For instance, the customer’s knowledge about a product seems, in Younus et al. (2015), to have a strong significance of positive correlation with the purchase intention.

⁸ Grunert, K. G. (2005). Food quality and safety: consumer perception and demand. *European review of agricultural economics*, 32(3), 369-391.

One main variable that we consider in this work and that affects the product purchase intention is the valence of the product review. Indeed, as we see in Floh et al. (2009) the valence of the review has a positive impact on the product purchase intention.

Another variable affecting the purchase intention is the source a product information. In our case of the product rating, we see that in Weinberger and Dillon (1980), the effect of an unfavorable or favorable product information has more effects on the intention of purchase if the information comes “from an independent testing agency or local women” rather than “the trade and professional association source”. This implies that neutral sources are preferred compared to professional sources. Meanwhile, unfavorable information about a product has a greater impact on the intention of purchase than a positive one. On the condition that the receiver has got the piece of information from a customer source rather than a “marketer-dominated” source.

d) Need for information

In their shopping experience, customers make choices. When making choices, customers need information in order to make rational purchases. Thus, information is a concept closely related to consumerism. “Increasing the information available to consumers is undoubtedly beneficial” (Howells, 2005, p.350). In the paper of Howells (2005), we see that collecting information is a way for customers to protect themselves against poor quality consuming. Because clients are more aware of the goods’ quality, they theoretically would make better (purchase) decisions. Alongside with this effect, information allows customers to raise standards of goods through the competition rules. However, the paper limits this effect by saying that “consumers may not always respond to information provided as rationally as traditional economic models sometimes assume” (Howells, 2005, p.350). This noise between what strong logic and how consumers behave, relies on the multiple aspects that reduce the effectiveness of information considering (Howells, 2005). These aspects can be for example, the lack of time. Moreover, consuming is only a part of customers’ life, thus some people would choose not to consider the available information. Another aspect would be the fact that there are no alternatives to a product, thus the available information on this very product does not allow the clients to choose another good. This information is then considered as non-useful.

On the other hand, Nelson (1970) raises the attention on the topic of the information availability. Indeed, choosing product upon information is important. But the pieces of information need to be available to the consumers. Sometimes the information is directly available to the customer. On the other hand, there are also many times where the info is not directly available. In these cases, the customer will have to choose whether to seek for it or not. For instance, in Nelson (1970), customers facing low prices will have more chances to drop the information seeking phase. Considering the latest context, one of the ways to investigate product information is to retrieve it from relatives or friends. Therefore, the info is retrieved via the word-of-mouth (WOM). In our work, we will consider the case of a rating featured on the ESL as the said information. This rating will either be made by the retailer or from customers.

In Lackermair et al. (2013), the authors prove that reviews and ratings are an important source of information for the customers. This supports the considered case of our study, the product ratings. Their results show that 74,04% of the respondents judged online reviews as “important” or “very important”. Thus, we want in this research to know whether in-store reviews are also seen as important or useful.

e) Review

As explained in the “need for information”, friends and relatives can be a good source of information regarding a product judgement. Through cognition, the person will choose whether or not to process this information and base her behavior upon it. In this section, he said information is the consumer review of a product. At first sight, Trenz and Berger (2013) inform us that the helpfulness of an online customer review is the ratio of the sum of the positive helpfulness reviews on the total of the helpfulness reviews. But we will see that it is not as simple as these authors affirm.

Do customers' reviews have an impact on sales? This is an information our work will investigate. Lackermair et al. (2013, p.1) supports this assumption. Indeed "product reviews and rating are popular tools to support buying decisions of consumers.". Trenz and Berger (2013) have done the synthesis of multiple scientific research which have explored this topic. The report shows that the results of this question are variegated. Many authors suggest that the score of the product rating has a positive impact on the sales⁹. On the other hand, other authors neglect any effect¹⁰.

Moreover, in Trenz and Berger (2013, p.4), the authors retrieved the information of several studies¹¹ and go further by telling us that the "the variance or standard deviation in online

⁹ Archak, N., Ghose, A., Ipeirotis, P. G. (2011). Deriving the Pricing Power of Product Features by Mining Consumer Reviews. *Management Science*, 57 (8), 1485–1509.

Chevalier, J. A., Mayzlin, D. (2006). The Effect of Word of Mouth on Sales: Online Book Reviews. *Journal of Marketing Research*, 43 (3), 345–354.

Clemons, E. K., Gao, G. "Gordon", Hitt, L. M. (2006). When Online Reviews Meet Hyperdifferentiation: A Study of the Craft Beer Industry. *Journal of Management Information system*, 23 (2), 149–171.

Li, X., Hitt, L. M. (2008). Self-Selection and Information Role of Online Product Reviews. *Information Systems Research*, 19 (4), 456–474.

Yang, J., Mai, E. (Shirley) (2010). Experiential goods with network externalities effects: An empirical study of online rating system. *Journal of Business Research*, 63 (9/10), 1050–1057.

Ye, Q., Law, R., Gu, B. (2009). The impact of online user reviews on hotel room sales. *International Journal of Hospitality Management*, 28 (1), 180–182.

Ye, Q., Law, R., Gu, B., Chen, W. (2011). The influence of user-generated content on traveler behavior: An empirical investigation on the effects of e-word-of-mouth to hotel online bookings. *Computers in Human Behavior*, 27 (2), 634–639.

¹⁰ Duan, W., Gu, B., Whinston, A. B. (2008). Do online reviews matter? An empirical investigation of panel data. *Decision Support Systems*, 45 (4), 1007–1016.

Forman, C., Ghose, A., Wiesenfeld, B. (2008). Examining the Relationship Between Reviews and Sales: The Role of Reviewer Identity Disclosure in Electronic Markets. *Information Systems Research*, 19 (3), 291–313.

Park, J., Gu, B., Lee, H. (2012). The relationship between retailer-hosted and third-party hosted WOM sources and their influence on retailer sales. *Electronic Commerce Research and Applications*, 11 (3), 253–261.

¹¹ Archak, N., Ghose, A., Ipeirotis, P. G. (2011). Deriving the Pricing Power of Product Features by Mining Consumer Reviews. *Management Science*, 57 (8), 1485–1509.

customer ratings serves as a more accurate predictor of sales growth than the simple average.”. But this proposition is rejected by other authors¹².

Furthermore, some writers support the fact that the volume of online review has a positive effect on the revenue¹³. Whereas other studies did not find any significance of the effect of volume on sales¹⁴.

Chevalier and Mayzlin¹⁵ have discovered a more important effect of the marginal bad review on sales than the marginal good review. Meaning a poor-quality product review will impact more the sales than a good quality review.

Clemons, E. K., Gao, G. “Gordon”, Hitt, L. M. (2006). When Online Reviews Meet Hyper differentiation: A Study of the Craft Beer Industry. *Journal of Management Information system*, 23 (2), 149–171.

Hu, N., Pavlou, P. A., Zhang, J. (2009). Overcoming the J-shaped Distribution of Product Reviews. *Communications of the ACM*, 52 (10), 144–147.

¹² Chintagunta, P. K., Gopinath, S., Venkataraman, S. (2010). The Effects of Online User Reviews on Movie Box Office Performance: Accounting for Sequential. *Marketing Science*, 29 (5), 944–957.

Ye, Q., Law, R., Gu, B., Chen, W. (2011). The influence of user-generated content on traveler behavior: An empirical investigation on the effects of e-word-of-mouth to hotel online bookings. *Computers in Human Behavior*, 27 (2), 634–639.

¹³ Archak, N., Ghose, A., Ipeirotis, P. G. (2011). Deriving the Pricing Power of Product Features by Mining Consumer Reviews. *Management Science*, 57 (8), 1485–1509.

Chevalier, J. A., Mayzlin, D. (2006). The Effect of Word of Mouth on Sales: Online Book Reviews. *Journal of Marketing Research*, 43 (3), 345–354.

Dellarocas, C., Zhang, X., Awad, N. F. (2007). Exploring the value of online product reviews in forecasting sales: The case of motion pictures. *Journal of Interactive Marketing*, 21 (4), 23–45.

Duan, W., Gu, B., Whinston, A. B. (2008). Do online reviews matter? — An empirical investigation of panel data. *Decision Support Systems*, 45 (4), 1007–1016.

Forman, C., Ghose, A., Wiesenfeld, B. (2008). Examining the Relationship Between Reviews and Sales: The Role of Reviewer Identity Disclosure in Electronic Markets. *Information Systems Research*, 19 (3), 291–313.

Li, X., Hitt, L. M. (2008). Self-Selection and Information Role of Online Product Reviews. *Information Systems Research*, 19 (4), 456–474.

¹⁴ Clemons, E. K., Gao, G. “Gordon”, Hitt, L. M. (2006). When Online Reviews Meet Hyper differentiation: A Study of the Craft Beer Industry. *Journal of Management Information system*, 23 (2), 149–171.

Chintagunta, P. K., Gopinath, S., Venkataraman, S. (2010). The Effects of Online User Reviews on Movie Box Office Performance: Accounting for Sequential. *Marketing Science*, 29 (5), 944–957.

¹⁵ Chevalier, J. A., Mayzlin, D. (2006). The Effect of Word of Mouth on Sales: Online Book Reviews. *Journal of Marketing Research*, 43 (3), 345–354.

There is a lot of contradiction in the literature about the effect of the reviews on the sales. Part of the explanation resides in the fact that the researches consider different samples and sample sizes of the products at stakes¹⁶.

(2) Bias and fraud

Considering online product ratings, several bias may come into place. Many authors that we have considered through the paper of Trenz and Berger (2013) agree on the fact that positive reviews outnumber average ratings. In other words, there is more high score ratings than midpoint and low score ratings. In, Lackermair et al. (2013), we see that 76,92% of the participants reviews where positive against 10,77% of negative ones, and 12,31% neutral. Moreover, other authors¹⁷ acknowledge two biases in this context. The first one refers to the fact that people who think that a product reflects remarkably high or low quality are more likely to write a review than people who think the product shows an average quality. Hu et al. (2009) and Koh et al. (2010)¹⁸ call this bias the “underreporting bias”. Moreover, Hu et al. (2009) describe the “purchase bias” as the fact that high product ratings are more likely to be in a greater number than low product ratings because people who have lower evaluation priorly to the purchase will not buy the product thus not write a bad product quality review. Furthermore, other authors approach this bias in a timely manner¹⁹. They support the fact that a product rating is likely to be high in the introducing of a product and will decrease with time because the early adopters (which are the early reviewer) are more likely to offer positive product evaluations.

Another kind of fraud or review manipulation is the fact that any retailer, producer, or any actor that takes part in the selling process may submit good online reviews under anonymity

¹⁶ Zhou, W., Duan, W. (2012). Online user reviews, product variety, and the long tail: An empirical investigation on online software downloads. *Electronic Commerce Research and Applications*, 11 (3), 275–289.

¹⁷ Hu, N., Pavlou, P. A., Zhang, J. (2009). Overcoming the J-shaped Distribution of Product Reviews. *Communications of the ACM*, 52 (10), 144–147.

¹⁸ Koh, N. S., Hu, N., Clemons, E. K. (2010). Do online reviews reflect a product’s true perceived quality? An investigation of online movie reviews across cultures. *Electronic Commerce Research and Applications*, 9 (5), 374–385.

¹⁹ Duan, W., Gu, B., Whinston, A. B. (2008). Do online reviews matter? — An empirical investigation of panel data. *Decision Support Systems*, 45 (4), 1007–1016.

Hu, N., Bose, I., Gao, Y., Liu, L. (2011). Manipulation in digital word-of-mouth: A reality check for book reviews. *Decision Support Systems*, 50 (3), 627–635.

in order to enhance the rating or the awareness of the product²⁰. This raises the question of the credibility of the information. Indeed, if many bias and frauds are possible, do the customers trust the online reviews?

(3) Review Helpfulness

Now that we have introduced the notion of product reviews, let us consider its helpfulness. Indeed, depending on the nature of the reader or the review, the helpfulness of the evaluation variates. On this matter the literature is not quite unanimous on the characteristics that influence the helpfulness. On the one hand, 4 authors cited in Trenz and Berger (2013) have found a positive impact of the review length on its helpfulness, especially for the search goods. On the other hand, Korfiatis et al. (2012)²¹ suggest that stylistic characteristics of a review impacts more the helpfulness than the review length.

Pan and Zhang (2011) find in their study that positive product reviews are more likely to be noted as helpful than negative ones. In this study, product reviews are more likely to be helpful considering utilitarian goods rather than experiential goods. It is important to state out that there are less helpful review ratings for experience goods. As a matter of fact, there are twice as less helpful review ratings for experiential goods than for utilitarian ones in this study.

Another key information read in Trenz and Berger (2013, p.6), is the fact that “Characteristics of the reviewer influence review helpfulness as well (Forman et al., 2008; Pan and Zhang, 2011).”. Forman et al. (2008)²² clarifies that the more information a reviewer gives on his review about himself and his personality, the more it will be helpful for the reader when implementing the review information in their purchase behavior.

²⁰ Hu, N., Bose, I., Gao, Y., Liu, L. (2011). Manipulation in digital word-of-mouth: A reality check for book reviews. *Decision Support Systems*, 50 (3), 627–635.

²¹ Korfiatis, N., García-Bariocanal, E., Sánchez-Alonso, S. (2012). Evaluating content quality and helpfulness of online product reviews: The interplay of review helpfulness vs. review content. *Electronic Commerce Research and Applications*, 11 (3), 205–217.

²² Forman, C., Ghose, A., Wiesenfeld, B. (2008). Examining the Relationship Between Reviews and Sales: The Role of Reviewer Identity Disclosure in Electronic Markets. *Information Systems Research*, 19 (3), 291–313.

On the other hand, according to the following authors, there have been no agreement in the literature about the effects of review length, review extremity and message sidedness on the review helpfulness (Trenz and Berger, 2013).

Considering the source of an information, the Li et al. (2013) study finds an influence of the source of the review on its helpfulness. Indeed, “Subjects perceived that the customer-written product review has higher review helpfulness than the expert-written product review” (Li, et al., 2013, p.24). In our case, the expert is the retailer since he is supposed to have a clear view on its products up for sale. Will see in the interviews that it is not so certain.

f) Rating

In our study, we will take the case of an ESL featuring a product rating. Earlier, we have talked about product reviews being the evaluation of the goods. In this study, the review will take the shape of a rating. Because in Lackermair et al. (2013), we have read that 83% of their sample would compare good and poor ratings together. To do so, they prefer to compare short content together rather than a long-written review, because of the unstructured nature of textual user reviews (Lackermair et al., 2013).

The rating is an evaluation of a product²³. It can take several shapes. In our study, we will consider a 5-stars scale.

(1) Score

Regarding the score, we will face two possibilities of valences: a 3 stars product rating and a 5 stars product rating (both out of a maximum score of 5 stars).

Let us see why choosing these two valences. First, we wanted two different evaluations in order to be able to assess the impacts of the score variable. Secondly, we chose the 3-stars rating because through our literature research, very few studies considered average scores. Instead, they addressed extreme valences. Furthermore, in the literature, there are findings

²³ De Pelsmacker, P., Dens, N., & Kolomiiets, A. (2018). The impact of text valence, star rating and rated usefulness in online reviews. *International Journal of Advertising*, 37(3), 340-359.

that are contradictory with the effect of average valence. For instance, Forman et al. (2008)²⁴ found that extreme score ratings were more helpful than average ones. Whereas Mudambi and Schuff (2010)²⁵ finds exactly the opposite. Thus, there is a need to make further findings on this matter.

Furthermore, the score of the rating can also be called the valence of the rating. According to Moe (2009), the rating valence has a positive impact on the perceived quality of the product. On the other hand, the paper explains that people have a representation of the product quality not only based on the valence of the score but also based on the social influences. The author tells us that when posting a rating, people could be influenced by social influences when deciding the rating score. Which makes the rating a “noisy” indicator of the product quality. But there is a clear influence of the valence of the score on the product perceived quality.

(2) Source

Product reviews and ratings are information that can be released from multiple sources. Indeed, retailers, customers, blogs, independent testing agencies (Weinberger and Dillon, 1980), and many other actors are potential advocates of the product review and rating. In our case, we will consider a scenario whereas the product rating featured on the ESL, comes from either the retailer or the customers. In the first case, the retailer would prepare the rating. In the second case, it would be an average of the collected customers' rating. What are the impacts of the source variable on the rating's influence? This will be a question we will try to answer.

²⁴ Forman, C., Ghose, A., Wiesenfeld, B. (2008). Examining the Relationship Between Reviews and Sales: The Role of Reviewer Identity Disclosure in Electronic Markets. *Information Systems Research*, 19 (3), 291–313.

²⁵ Mudambi, S. M., Schuff, D. (2010). What Makes a Helpful Online Review? A Study of Customer Reviews on Amazon.com. *MIS Quarterly*, 34 (1), 185–200.

(3) Usage

Since the product rating will be featured on the ESL, we will address the topic of its usage in the electronic shelf label “usage” section of the literature review. The usage will be addressed through the technology acceptance model developed in Davis (1989).

g) Key concepts

In the customer section, we have defined what product we are considering in this study that is the wines and more specifically the “Vina”. Since we address the product at stakes, we have also provided literature regarding the customer determinants of the perceived quality of products and the product purchase intention. After that, we made a link to the notion of the customer’ need for information. This informational customer need allowed us to shift towards the description of the product review and its impacts and manipulation. Eventually we defined what a rating is and clarified our scope by explaining our wine rating sources and scores. In the next part of the literature review, we will address the concept of credibility of the information from the customer’s point of view. Credibility will be our starting point of the future conceptual framework.

3. Information credibility

As previously explained, information is a key matter in shopping. When addressing information, it becomes relevant for the customers to assess the level of credibility assigned to a given information. Do I trust the accuracy of the product information? Do I trust the source and its frankness? Many questions can arise when facing a given piece of information to be relied upon for a potential purchase. For instance, in Chevalier and Mayzlin (2006)²⁶, the authors explain that the consumer is aware that the information provider might only be motivated in sales. Thus, this very client could also judge the piece of information as non-credible since it is displayed to influence him to buy the product rather than to inform him.

Information credibility is closely related with the source credibility. Indeed, depending on the known source of the information, a customer will chose to assign a certain level of credibility. Of course, credible sources are known to be more persuasive than non-credible sources²⁷. Goldsmith et al. (2000, p.44) provide us with a definition of the source credibility: “the extent to which the source is perceived as possessing expertise relevant to the communication topic and can be trusted to give an objective opinion on the subject”. We understand then that the key factors of the source credibility are its expertise and trustworthiness. The notion of expertise is the level of experience, knowledge, or skills a given source has²⁸. In the same manner, trustworthiness is the declination of the integrity, honesty, and veracity with which the source provides the message²⁹.

²⁶ Chevalier, J. A., Mayzlin, D. (2006). The Effect of Word of Mouth on Sales: Online Book Reviews. *Journal of Marketing Research*, 43 (3), 345–354.

²⁷ Craig, S.C. and McCann, J.C. (1978) ‘Assessing communication effects on energy conservation’, *Journal of Consumer Research*, September, Vol. 5, No. 2, pp.82–89.

Hovland, C.I. and Weiss, W. (1951) ‘The influence of source credibility on communication effectiveness’, *The Public Opinion Quarterly*, Vol. 15, No. 4, pp.635–650.

Ohanian, R. (1990) ‘Construction and validation of a scale to measure celebrity endorsers’ perceived expertise, trustworthiness, and attractiveness’, *Journal of Advertising*, Vol. 19, No. 3, pp.39–52.

²⁸ Hovland, C.I., Janis, I.L. and Kelley, H.H. (1953) *Communication and Persuasion*, Yale University Press, New Haven, CT.

²⁹ Erdogan, Z.B., Baker, M.J. and Taggs, S. (2001) ‘Selecting celebrity endorsers: the practitioner’s perspective’, *Journal of Advertising Research*, Vol. 41, No. 3, pp.39–48.

From the customer aspect, this credibility will positively influence his opinions or attitude³⁰. Moreover, when reading Ismagilova et al. (2020) we see that the authors have found a positive impact of the information source trustworthiness on its adoption.

a) *Customer review Credibility*

As said before, consumers would be more likely to rely on customer product reviews rather than retailer product reviews. Indeed, they see the source as fellow consumers thus assign more trust to the information rather than advertisers or marketers' messages³¹. Furthermore, Senecal and Nantel's (2004) tell us that peer reviews are seen as more trustworthy than reviews made from experts, even though the latter is considered as more professional. Since the customers do not have self-interest on writing misleading reviews, they are seen as credible. It is likely to be a great source of information on products. On the other hand, not all the peer evaluations show the same level of credibility. Indeed, when reading a consumer review, a client might also ask himself what is the level of credibility of this consumer to make a product evaluation. Argument quality, specificity, information, etc are many variables that might influence one's level of credibility and veracity he assigns to a review (Doh and Hwang, 2009). Furthermore, Purnawirawan et al. (2015) find that a product

³⁰ Craig, S.C. and McCann, J.C. (1978) 'Assessing communication effects on energy conservation', *Journal of Consumer Research*, September, Vol. 5, No. 2, pp.82–89.

Hovland, C.I. and Weiss, W. (1951) 'The influence of source credibility on communication effectiveness', *The Public Opinion Quarterly*, Vol. 15, No. 4, pp.635–650.

Ward, C.D. and McGinnies, E. (1974) 'Persuasive effects of early and late mention of credible and noncredible source', *Journal of Psychology*, Vol. 86, No. 1, pp.17–23.

Woodside, A.G. and Davenport, W. (1974) 'The effects of salesman similarity and expertise on consumer purchasing behavior', *Journal of Marketing Research*, Vol. 11, No. 2, pp.198–202.

³¹ Fong, J. and Burton, S. (2008) 'A cross-cultural comparison of electronic word-of-mouth and country-of-origin effects', *Journal of Business Research*, Vol. 61, No. 3, pp.233–242.

Grewal, R., Cline, T.W. and Davies, A. (2003) 'Early-entrant advantage, word-of-mouth communication, brand similarity, and the consumer decision-making process', *Journal of Consumer Psychology*, Vol. 13, No. 3, pp.187–197.

Herr, P.M., Kardes, F.R. and Kim, J. (1991) 'Effects of word-of-mouth and product-attribute information on persuasion: an accessibility-diagnostics perspective', *Journal of Consumer Research*, March, Vol. 17, No. 4, pp.454–462.

rating showing a lower score is likely to be seen as credible since “it indicates that they are not controlled or censored by a company.” (Purnawirawan et al., 2015, p.22).

b) Retailer review credibility

When facing a product rating made by a retailer, the consumer is in right of asking himself about the veracity of the rating. Indeed, the source of the product evaluation is different than the customers’ ratings. In the mind of the client, it might play a role to the assignation of credibility level to this rating. We will cover this in the following paragraph.

As said before in this work, the customers might not trust de retailer in his role of product reviewer. Indeed, they may think that the retailer only wishes to improve its profits through increased sales. Therefore, the retailer has the incentive to rate its products in a too excessively high manner. In that sense, he increases the perceived quality of its product, thus improves its sales.

c) Key concepts

In this section, we have covered the theme of information credibility. More particularly, the topic of product reviews credibility. We have talked about the sources of the reviews and their aspects that affect the level of credibility. In the next section we will consider the literature linked to the electronic shelf label definition, credibility, usage, and rating.

4. Electronic shelf labels

The reason why we have addressed the topic of SRTs earlier in the literature review, is that the electronic shelf labels are one of them. Besides, it is the medium to display the product rating. Indeed, in the case of a clients rating, the score needs to update itself according to new reviews on the product. Therefore, a classical label could not do the work. There is a need for a connectivity and a capacity to adjust information in real time which the ESL can deliver. We will cover the level of credibility we can assign to this device. Let us first, provide a definition and examples of what an ESL is.

An electronic shelf label (ESL) is a device which is understood in Soutji et al. (2017) as an electronic price tag capable of adjusting the displayed information, such as the price, in real time through computerized transmitters. According to Roy et al. (2017), we can say that electronic shelf labels can be placed under the umbrella of the smart technologies for multiple reasons. First, they are connected and synchronized thanks to a connection to a computer. Besides the price, ESL can display different levels of information in different shapes and colors. It can show prices, available quantities, product descriptions, barcode information, regions of origin and many more features such as augmented reality, RFID, QR codes, direct payment method and other embedded technologies (Garaus et al., 2016). Since the ESL can also be understood as a screen, the possibilities are varied. Hence our choice to tackle the possibility of a product rating. The authors also argue the ESL reduces adjustment cost due to a change of price and thus allow flexible price strategies. Indeed, as smart technologies, ESLs are able to change their price autonomously whenever the data of the change of price is available. On the other hand, what are the impacts of the ESLs on the consumers? Not many researches cover this topic.

In the next pages, we have provided you examples of ESLs. The goal is to offer a clearer picture of what an ESL is.

Figure 1: Examples of ESLs (e-ink).



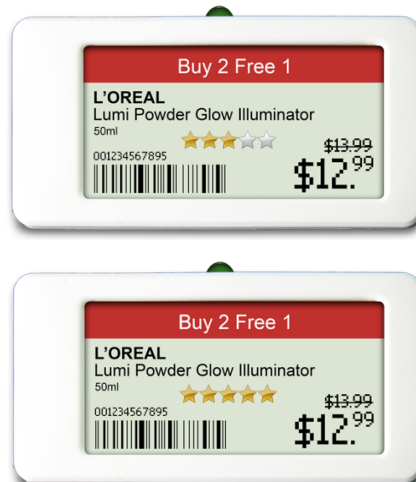
(Soutij et al. 2017)

Figure 2: Examples of ESLs (multiple shapes).



(OnePointRetail, n.d.)

Figure 3: Examples of ESL product ratings.



(label : Label Nest, n.d.,

Stars rating: Clipart Library, n.d.)

We have also prepared a representation of the ESLs examples we will use in the scenarios of our questionnaire. As mentioned before, the product at stakes is the “Vina”. Please note that for the good of the research, the words clients and retailer have been translated in French, in order for the respondents to understand their scenario. (Clients=clients, distributeur=retailer).

Figure 4: Examples of Vina’s ESL rating.



(source of the previous images:

- Label image: Alibaba.com, n.d.
- Star rating: Clipart Library, n.d.)

a) Credibility

In the section of the information credibility, we have covered the level of credibility assigned to the source of the rating featured on the ESL. In this section we will address the level of credibility one can assign to the ESL itself. Indeed, when reading the paper of Sundar (2008), we understand that along with the information source credibility, there is also the credibility of the medium that offers the information. In our case, the ESL is the medium that offers the information and more precisely the product rating.

To judge the credibility of the ESL that displays a product rating, we will consider the paper of Sundar (2008) that illustrates the Main Model.

For the judgement of the credibility, the author tells us that there is a cognitive path in our mind starting from affordance to the credibility judgement.

Figure 5: The Main Model.

The MAIN Model

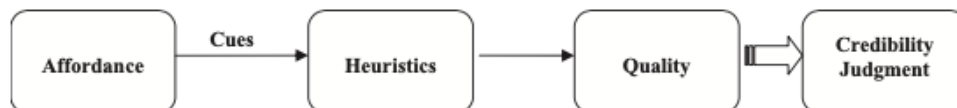


Figure 1
Overview of the MAIN Model.

(Source: Sundar, S. S., 2008, p.79)

The starting point of the model is “affordance”. An affordance is understood in the paper as the “particular capability possessed by the medium to facilitate a certain action” (Sundar, 2008, p.79). For instance, an affordability of a keyboard is the ability for the user to type. In our case the affordance we consider with the ESL is the feature of a product rating.

The second phase of the Main model is the cue. A cue is a signal that a user perceives that will be the starting point of a judgement rule (heuristic) which can result in estimations of content quality. For instance, if we see a famous economist talking about the 2008 stock market crash, our eyes and our ears will tell us that we recognize him or her as an expert. And an expert is seen as credible. Thus, the cognitive path is the following: I see an economist (cue), then he is an expert (heuristic), an expert says qualitative message, Therefore I trust the information given as credible. The last technical term we want to address is modalities. A modality is the shape of an information. In our case, the product ratings will be featured as a 5-stars scale.

Considering the Main model, we will list and explain the relevant heuristics of our scope.

- 1) The Coolness heuristic: modality enhancement can lead to the judgement of the modality with a high level of hipness. Thus, it will be likely to assign a greater credibility to the content. Meaning that if the 5-stars rating appears as cool, it will have good chances to be understood as credible.

- 2) The novelty heuristic: if the modality is felt as new there are chances that one assigns a greater credibility of the content. A 5-stars rating featured on labels might be understood as disruptive and new, thus can be felt as credible.
- 3) The helper heuristic: If someone sees the modality as a helper to accomplish his task, then it will lead to a higher level of content credibility. In our case, if a customer understands the ESL as a helper for making better quality purchases, he might see this ESL as credible.
- 4) The responsiveness heuristic: If the modality corrects its content in real time based on other people inputs, then one could judge the content as more credible. For instance, if a client submits a rating about a product and automatically sees the rating adapting itself, he will judge the ESL as more credible.

b) Usage

Now that we have described what an electronic shelf label is, let us bend over its propensity to be use.

First of all, considering the whole device, we can assume that they are largely used when available. Indeed, as they are replacing regular shelf labels, people still need to get information about the product such as its price and other relevant information.

Second of all, new features are available on the ESL. In this study we consider the case of product ratings. How does it impact the consumer? and more precisely, how do our 2 scenarios (Customer ratings vs retailer ratings and 5-stars ratings vs 3-stars ratings) impact the use of these labels? This is a question that is important to respond to. Therefore, this postulate will be covered in our experiment.

On the other hand, we can use the TAM model to predict the customers propensity to use the ESLs embedded with the product rating. Indeed, TAM (technology acceptance model) theory is widely accepted by the literature and specifies that perceived usefulness and the perceive ease of use are key determinants of user behavior toward a technology (Davis, 1989).

Moreover, perceived usefulness is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989, p.320).

Meanwhile, perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort." (Davis, 1989, p.320). In this definition, effort is

understood as a limited resource that actors allocate among different activities for which they are responsible (Radner and Rothschild, 1975). Furthermore, Davis (1989) shows that usefulness is more significantly linked to the usage than ease of use. Whereas, in a causal perception, ease of use can be an antecedent to usefulness which in turns impacts the usage (Davis, 1989). Considering the ESLs, we find in Garaus et al. (2016) that the electronic shelf label is even easier to use than classical shelf label, which seem to be already easy to use. By extension, in our ESL rating case, we can conclude that it is likely to be felt as easy to use as the only action needed is to read the 5-stars measure. On the other hand, it is important to discover whether or not ratings are useful. Furthermore, it is important to understand which one of the customer or retailer reviews are more useful as well as the 5 stars rating or the 3 stars rating. For a reminder, the helpfulness is understood as the degree to which a person believes that using a particular system would enhance his or her job performance. The job performance is the efficiency with which customers' shop.

We can consider that there is no influence of the product rating valence on the perceived usefulness because in Purnawirawan et al. (2015) the authors do not find any significant effect.

After knowing the impacts on the perceived usefulness and the ease of use, it is interesting to discover their impact on other variables.

Firstly, in Koufaris (2002) the author finds a significant positive effect of the perceived usefulness of the web store on the intention to return. And we understand the intention to return as a construct of the loyalty. They discovered that the perceived usefulness of a technology is positively related to the intention to return. In our research the technology at stakes is the electronic shelf label featuring a product rating. And the intention to return is the loyalty to the retailer.

Along with the perceived usefulness, Koufaris (2002) also investigates the potential positive effect of the ease of use of their technology on the intention to return. But found no significant effects here.

After tackling the notion of usage, it is time to disclose that we will address the usage of the rating itself rather than the usage of the ESL. Firstly, as the ESLs replace the regular labels, we think that customers will have to use the new generation of labels as they seek for the product price and other highly important information. Secondly, it is likely to be easy to use

since the only action needed to use the ESLs is to read them. For these reasons, we expect the usage of the ESLs to be high no matter the variables of our study. The key question we will ask ourselves will be addressing the potential usage of the product rating in the case of the wine product.

It is still important to state out the fact that the considered labels must be the ESLs. Indeed, in our scenarios, the source can be the clients. Thus, when there is a change in the ratings provided from customers, the label needs to update its featured product rating. The ESLs is capable of providing instant update of the rating.

c) Key concepts

In this Section, we have defined what an ESL is and provided examples of it. After that, we have addressed the credibility of the device itself to display a product rating. Eventually we have decided to shift from the assessment of the credibility of the ESL featuring a product rating to the assessment of the credibility of the rating itself. Lastly, we have also described the level of usage of the ESL. Once again, we decided to eventually consider the usage of the wine rating rather than the ESL featuring a wine rating. In the following section of the literature review, we will tackle the theme of wine. Since the product at stakes is wine, there is a need to cover the literature on the aspects that are likely to interfere in the future experimentation.

5. Wine

As we have narrowed down our research question on the wine case, it is important to give theoretical information on this matter.

Firstly, we are confident with our previous argument which stated that the wine consumerism is an experience. Indeed, in Platania et al. (2016), we see that there is a rise of customers behavior toward the hedonistic aspect of the wine. Especially because wine is related with food in an experiential manner.

In the following sections we will consider wine aspects that influence customers' behavior. These variables are understood as extrinsic of the wine since they do not constitute any aspects of the liquid itself such as the taste or the color. The reason is that in our scope, the people considering the purchase of the "Vina" have never tasted it before since it is a hypothetical new trademark on the market. Thus, they could not have tasted it yet. Therefore, only extrinsic variables are considered.

a) Price

As many authors³² suggest, the price of the wine is one of the major criteria for the purchase decision. On the other hand, the price of wine is not a variable that we consider in this work.

³² Koewn, C., Casey, M., 1995. Purchasing behaviour in the northern ireland wine market. *Br. Food J.* 97 (11), 17–20.

Quester, P., Smart, J.G., 1998. The influence of consumption situation and product involvement over consumers' use of product attributes. *J. Consum. Mark.* 15 (3), 220–238.

Chaney, I.M., 2000. External search effort for wine. *Int. J. Wine Mark.* 12 (2), 5–21.

Rasmussen, R., Lockshin, L., 1999. Wine choice behaviour: the effect of regional branding. *Int. J. Wine Mark.* 11 (1), 36–46.

Mtimet, N., Albisu, L.M., 2006. Spanish wine consumer behavior: a choice experiment approach. *Agribusiness* 22 (3), 343–362.

Ritchie, C., Elliott, G., Flynn, M., 2010. Buying wine on promotion is trading- up in UK supermarkets: a case study in wales and northern ireland. *Int. J. Wine Bus. Res.* 22, 102–121.

However, it is important for us to provide the respondents of our questionnaire with a wine ESL image featuring a rating and a price. Indeed, since our research is experimental (multiple scenarios) and that it is conducted online, the respondents need to imagine themselves as they were in-store. For that, the price seems to be a mandatory information to be featured on the label (see the interviews). On the other hand, prices are not a variable at stakes in this research. Thus, we will use an average price to collect data that are as least influenced by the price as possible. The average price seems indeed to have less influences on our variables. for example, we see in Corsi and Remaud (2020) that low prices and high prices have the highest effect on the customer loyalty. Which makes average prices less impacting. Furthermore, we will consider average price per bottle of 75cl in Belgium and France (since our sample is likely to be French and Belgian due to our acquaintances and the questionnaire distribution). In World health organization (2018), we see that the average price of a bottle of 75cl of wine in USD is 8,18\$ for Belgium and 5,85\$ in France. The average of these two prices is 7,015\$. Using the exchange rate at the date that these data were collected (26/10/2018; Exchange-rates.org., 2021), the average price per bottle of 75cl in euro equals 6,14€.

b) Other criteria

There are many aspects of the wine that contributes to the purchase decision. According to Platania et al. (2016, p.89), the following criteria influence the purchase decision: “The origin, the grape variety, the vintage aspect, the name, the trademark, the alcohol content, the place of bottling”. Also, consumers’ evaluation of the wine depends on their knowledge of the origin of the products³³.

³³ Koewn, C., Casey, M., 1995. Purchasing behaviour in the northern ireland wine market. Br. Food J. 97 (11), 17–20.

Quester, P., Smart, J.G., 1998. The influence of consumption situation and product involvement over consumers' use of product attributes. J. Consum. Mark. 15 (3), 220–238.

Chaney, I.M., 2000. External search effort for wine. Int. J. Wine Mark. 12 (2), 5–21.

Orth, U.R., Krška, P., 2002. Quality signals in wine marketing: the role of exhibition awards. Int. Food Agribus. Manag. Rev. 4, 385–397.

Platania, M., Privitera, D., 2010. Organic wine: perceptions and choices of italian consumers. In: Lindgreen, A., Hingley, M., Harness, D., Custance, P. (Eds.), Market Orientation: Transforming Food and Agribusiness Around the Customer. Gower Publishing Company, Burlington, pp. 275–285 (ISBN: 978-0-566-09208-4).

The year has also an impact on the purchase³⁴.

All these factors considered, we chose not to show the bottle and its featured information in our scenarios. The aim was to limit their influences on the answers of the questionnaire. Furthermore, we have mentioned before that we consider a new trademark of wine, that is the “Vina”, so that we limit the impact of the customer knowledge about the trademark.

c) Implication in the wine

When exploring the wine literature, we observe that the purchase behavior can vary depending on the customer’s involvement with wine. In Escandon-Barbosa and Rialp-Criado (2019), we see that in contrast with the non-expert customer, the expert consumer has a longer purchase process. He will consider more information and more source of information than the low involved customer. Highly involved customers value greater amount of information available on the label. Based on the multiple data, they will distinguish the wines into categories (Solomon, 1997). Thus, these profiles will make decisions based on the largest

Dean, R., 2002. ‘The changing world of the international fine wine market’. Aust. New Zealand Wine Ind. J., 84–88.

Jarvis, W., Rungie, C., Lockshin, L., 2003. Analysing Wine Behavioural Loyalty. International Wine Marketing Colloquium, Adelaide, luglio (2003).

Angulo, A.M., Gil, J.M., Gracia, A., Sanchez, M., 2000. Hedonic prices for spanish red quality wine. Br. Food J. 2 (7), 481–493.

Espejel, J., Fandos, C., Flavia’n, C., 2011. Antecedents of consumer commitment to a pdo wine: an empirical analysis of Spanish consumers. J. Wine Res. 22, 205–225.

Barber, N., 2009. Wine consumers information search: gender differences and implications for the hospitality industry. Tour. Hosp. Res. 9 (3), 250–269.

³⁴ Combris, P., Lecocq, S., Visser, M., 1997. Estimation of a hedonic price equation for Bordeaux wine: does quality matter?. Econ. J. 107, 390–402.

Combris, P., Lecocq, S., Visser, M., 2000. Estimation of a hedonic price equation for Burgundy wine. Appl. Econ. 32 (8), 961–967.

Lecocq, S., Visser, M., 2006. What Determines wine prices: objective vs. sensory characteristics. J. Wine Econ. 1 (n. 1), 42–56.

possible set of information. In addition, “Expert consumers make a deeper and more detailed analysis of the label than do non-expert consumers.” (Escandon-Barbosa and Rialp-Criado, 2019)

While the study of Mueller et al. (2009, p.1) agrees on the fact that “highly involved wine drinkers enjoy the search process”. They explain that the lower involved wine drinkers, such as non-expert customers, might be overwhelmed by the amount of information regarding the considered wine.

For these reasons, we can make the assumption that the highly involved customers will tend to consider more information than the simple wine rating featured on the ESL. They will question the credibility of the source as well as the credibility of the score more than low involved customer that just want to make a quicker purchase. Furthermore, the rating seems to facilitate the quick purchase. And for the highly involved customer, the information of the rating is marginally less important than low involved ones because they consider a larger set of data. Thus, the low involved customers will tend to use more the rating than the highly involved ones.

d) Key concept

To finish the literature review, we have covered the theme of wine and more particularly, its variables that have an impact on our dependent variables at stakes. Moreover, we have pointed out few variables of wine retailing that we want to withdraw from our experimentation. On the other hand, we have explained the variables that we think will be interesting to include in the experiment that is the implication of people in the wine.

B. Qualitative research

Before explaining the reason why we have conducted a qualitative research, let us specify its definition. According to Sukamolson, (2007, p.4) the qualitative research is “actually an umbrella term encompassing a wide range of methods, such as interviews, case studies, ethnographic research and discourse analysis, to name just a few.”. The information collected are qualitative material. It is collected with a limited number of respondents. The aim is to understand more in depth the attitudes and behaviors toward the phenomenon at stakes (Bathelot, 2019).

We have conducted a qualitative research in order to investigate the topic a step further. Indeed, after getting familiar with the subject, thanks to the literature review, it became important to explore more in depth the topic considering the point of view of interest, the consumers’ one. Moreover, the aim of this study was to shed the lights on our research question’s constituents and key variables. Indeed, the qualitative research was needed to approach users’ perception of their technology environment, retail environment, and eventually the electronic shelf labels and their product rating. Additionally, the literature that covers the impacts of ESL and rating on consumers, is still young. Thus, there is a need to enrich our research with additional knowledge in order to be able to construct hypothesis to test in a quantitative research. Eventually, this helped us considering and discovering key variables of ESLs potentially impacting customers’ shopping.

To make our qualitative research, we have interviewed 6 participants eager to share their thoughts about our topic. The interviews were conducted in semi-structured manner. We will discuss the construction of the interviews in the following section.

1. Interview guide

We have chosen to conduct the qualitative research through individual interviews. The interview guide, as well as the interviews transcripts, are available in the appendix. For the interviews, we have created a guide in a form of open questions. In that way, interviewees can express themselves with greater extent than close questions. We have constructed broad questions in order for the debate to stay in the scope of our topic. Although questions were asked to interviewees, they were able to answer in a manner where they could bring their arguments wherever they wanted. This provided us with richer content about customers' main concerns. It allowed us to be closer to the consumer's point of view regarding the electronic shelf labels and their product rating. The interviews were conducted in French because our available respondents were either French or Belgian. In order for them to deliver rich answers and understand the question, it was mandatory to speak in their mother language.

The interviews were divided in 5 parts. The structure was such that we started with broad questions to continue towards narrower questions.

At the beginning of the interviews, we informed the respondents that there were no right answers. They were master of their argumentation, guided with the semi-structured interview. Furthermore, the technical vocabulary was defined when needed.

The first part tackled the topic of technology. The aim was to discover the profile of the respondent regarding their habits, tastes, and behaviors towards technologies in general. After that, we continued toward the retailing part. Once again, the goal was to understand the way people shop.

The third part considered the technology and the retail environment. But this time, the two parts connected. Indeed, in this section we entered our topic of the smart technologies in the context of retailing. The aim was to introduce the interviewees to the subject and let them get familiar with examples of smart technologies in retailing. That way, they would have a clearer picture of what is this concept and what already happening. On the other hand, this part allowed us to gather information on this broad topic before getting more in depth with the ESLs and their product rating.

Then, we continued with the fourth part of the interview, the ESL. After having collected general information on our broad topic, it was important to dig in the case of ESLs in retailing.

The last group of questions of our interview guide considered our main topic: The ESLs and their featured product rating. Indeed, this section allowed us to create, along with the literature, our hypotheses.

Thanks to the interviewees, we managed to draw up a conceptual framework with hypothesis to test.

2. Methods

We have conducted a total of 6 interviews in order to investigate our topic in a deeper manner. The questions were designed in a way to stay in touch with our topic. However, the respondents had the opportunity to go as far as they wanted in their argumentation. You can find the profiles of the respondents in the table n°1.

Table 1: interviewees description.

NAME	AGE	PROFESSION/BACKGROUND
David	53yo	Fireman
Luca	24yo	Informatic engineer, data analyst and AI developer.
Lolita	28yo	- Local and organic food grocery store employee – Catering and Dairy manager. - Dietitian.
Olivier	58yo	Head of the supply chain of a company in the aroma industry.
Emile	23yo	Student in marketing.
Véronique	55yo	Naturopath.

We can see in the previous table that we have taken respondents that have different profiles. They have a variegating knowledge of the marketing. In total, we have conducted six interviews. We stopped at 6 because we were facing saturation regarding the answers. Indeed, the answers started to be redundant. Therefore, we concluded that we have had gathered a large enough sample of participants to reflect quality information.

3. Interviews synthesis.

In this section, we will provide you with a synthesis of the interviews.

The first main point grasped in the interviews is that smartphones are in the heart of the respondents' life. Secondly, it appears that all the participants shop in grocery stores.

Considering shopping, a key variable for the respondents is the level of information they get for their potential purchases. Lolita said: *"a good experience is whenever I am informed on what I am buying"*. In his turn, Olivier answered the questions of what a good experience is with: *"I enter, I see a choice of product that I seek for with the information that relates to what advantages I want to have in the product."*. Additionally, Luca, David, Olivier, Véronique and Lolita said that shelf labels are the main source of product information.

Considering the retailer, the level of trust placed in him impacts the purchase intention. For David and Luca, the level of trusts in a retailer impacts positively the trust they place towards its products. In other words, they will be more likely to purchase them. For Olivier, it is more about knowing the retailer. For instance, when he goes to the Fnac and small bookstores, he knows he'll get good advice and therefore good quality of products. Hence, he will shop more. Emile, he will construct his own opinion of the retailer after going in store. Thus, the reputation has no influences anymore after the first visit. Lolita says that the reputation of a retailer impacts positively both her perceived quality of the product and her purchase intention. Moreover, the trust also impacts positively her purchase intention because she'll trust the advice of the sellers. However, it is important to inform you that Véronique said there were no influence of neither the trust nor the reputation on her purchase intention. On the other hand, the reputation has an impact on her perceived product quality. The extent of it will depend on whether the reputation advocate has good intentions.

Another key element of the shopping we found in the interviews is the rapidity of the experience. Indeed, they talked about the waiting lines and other constituents of the shopping experience that were a pain. David likes his shopping when the store is not overcrowded. Emile answered the question of the "words to describe a qualitative shopping experience" with: *"That it is quick."*. Olivier said: *"rapidity, quality of choice and value for money."*. Luca told us later in his interview: *"the first thing I look for (when shopping) is to go the fastest way possible."*

This conducts us to the topic of the SRTs. Indeed, many of the respondents acknowledged that the smart retailing technologies allow them to shop in a faster way. For instance, Luca , Lolita, and Olivier like the self-scan because it reduces the time spent in the shop. Lolita talked about the ordering screens and said: *“It allows to gain some time [...]”*. Emile said: *“What I like, is that it (SRT) allows the consumer to go way faster.”*.

We also have noticed that there were a kind of SRT application that the respondents especially enjoy. Indeed, they like the scanning of a label to get further information. Namely, through QR code. Olivier said: *“I scan a label and I can get access to a bunch of information from this label”*. It also allows them to compare products. For that, they use their smartphone. For instance, Lolita and Véronique use “Yuka”. A mobile application where they can find the composition of the products they scan. Moreover, Emile and Lolita use or have used “Vivino”. It is a mobile application that allows you to scan a bottle of wine for accessing information on the wine as well as customers’ reviews. Emile and Lolita say that it is interesting because there is a large choice of product in the wine district, and it is difficult to choose a bottle. It is also for these reasons that we chose the wine as our product of interest in our study.

Then we asked the interviewees whether the presence of smart retailing technologies could influence their choice of shop, they all agreed but Olivier on the fact that there is an influence.

We asked the participants what the terms of electronic shelf label mean to them as well as what they would expect on it. They all spoke about the notion of complementary information it could provide them. In the table n°2 you can find their expectations.

Table 2: Information expectation featured on the ESL.

Things, the respondents would Expect on the ESL
Things we can see on classical labels (David, Luca)
Product Name (Lolita)
Price (Lolita, David)
Price per kg (Véronique)
Origins (Véronique, Lolita, David, Emile)

Product composition (Véronique, Emile, David)
Manufacture information (David)
QR codes/ scan tag (Lolita, Emile, Olivier, Luca)
Product comparisons (Emile, Olivier)
Environmental impact (Lolita)
Local product/ non-local product, #of intermediaries (Lolita)
Signal of everything that impacts negatively the health (Véronique)

Lolita, Emile, David and Luca enjoy in the ESL the offer of additional information. On the other hand, Olivier says that the difficulty about those labels is to know where the information comes from. He says that it will be useless if we are not able to verify the info. He also raises an important question: *“Is it from independent parties?”*. Which brings us to the topic of the source and its credibility which we will see later in this interview synthesis. Furthermore, Luca and David talk about the fact that it needs to be easy to use. Otherwise, it is more painful than useful. Emile would like to have ratings out of 10 on the ESL. We will cover this in the next section of the interview.

In the following questions we have seen a huge concern of the respondents towards the transparency of the information and the credibility of the ESL which depends also on the credibility of the featured information. Véronique said: *“Who will create these connected labels? That is the question!”*. For Lolita it is a matter of who provides the information and whether she trusts the source and the evaluation criteria. Olivier shares his thoughts about the ESL credibility: *“It depends on where they come from”*. However, David said that the ESL embedded with product ratings are credible because it involves the retailer’s credibility and responsibility.

It is also important to state out the fact that every single respondent said that the level of credibility of the information impacts their use or consideration of this very information. Lastly, in this section, the respondents told us that they would like to see consumer review on the ESLs. Only Véronique was a bit more mitigated. Furthermore, David would like it if it was easy and quick to read. This also supports the fact that we chose to study the product ratings which are easy and quick to read.

This leads us to the last section of the interviews. In this part, we asked the respondents questions about our case: the electronic shelf labels featuring a product rating. First, we were interested to know what kind of product are relevant to a rating. For Emile, it is important to

feature a rating *“for the product with a large range, a large choice in the shop.”*. Luca and Olivier added the notion of knowledge. He said that it would be relevant for product for which they have less Knowledge. According to David and Véronique, ratings would be interesting on wines.

Considering the credibility of the rating, Lolita says that the retailer is a good source because of his professionalism, but only if she trusts him and his knowledge. On the other hand, she says that the customers’ rating is interesting because they do not care about the profits on the product thus are unbiased. For Emile, it is important that it comes from the consumers because he thinks the retailer always tries to *“rip him off”*. David says that the advantage of the retailer’s rating is that the seller can verify the product information such as its origins. So, he can be a sort of “insurance” in the provided data veracity. On the other hand, he also likes the customers’ rating because we can *“benefit from their experience”*. He says that the customers source is more credible. For Véronique, the retailer’s rating is not interesting because *“If it is the retailer, he will surely put up a score that advantages him.”*. Luca says that the rating provided by the retailer is not reliable because there is a big conflict of interest. He likes the consumers’ rating better and find it more credible. Olivier joins the point of view of Emile and Véronique when he says: *“He (the retailer) probably has the tendency to put forward product with strong margins compared to others.”*. Moreover, the consumers’ score is hard to manipulate, thus more credible, and we have real people’s opinion.

After that, we have asked questions on the valences of the potential scores. Lolita, Luca, and Emile told us that they think high scores are less credible. Especially the 5 out of 5 stars. Luca says: *“it indicates a bias.”*. Lolita, in her turn, tells us: *“A 5 out of 5 score is something to be wary of.”*. On the other hand, all the respondents told us that the credibility assigned to the rating score has a major influence on the usage of this information in the respondents’ shopping activity. David says that if he is happy of a system which has a good credibility, he will use it more. Luca says: *“If I don’t assign any credibility to it, I won’t take this into consideration.”*.

Considering the score of the product ratings, Luca, David, and Véronique agreed on the fact that there is a positive effect of the score and the perceived quality. On the other hand, Lolita said she is not sure it has an impact on the perceived quality, but it positively impacts her

purchase intention. Emile says there is a positive impact since he already is positively influenced by the health score (A, B, C, D, E).

Then, they all agreed on the fact that there was an influence of the ESL product rating on the retailer reputation.

Lastly, we asked the interviewees whether offering a product rating on the ESLs would impact their propensity to go on this shop. Véronique and Luca agreed. Lolita and Emile answered that they would be more likely to go to a shop that provides them with product ratings. But only if the latest is made based on interesting criteria. David would come back to this store if it provided a rating that make sense to him.

a) Key results of the interviews

In conclusion, we are confident on the relevance of our case. Indeed, we consider the electronic shelf labels embedded with a product rating which answers two needs of the interviewees: the need for information and the need to be fast when shopping. Truly, the ESL seems to be an important source of information for the interviewed consumers. The rating seems to help them getting information about the products. And it can be read in a quick manner. As we said, rapidity is an important topic for the respondents. Furthermore, the interviews also support the fact that we have chosen the case of wine as the product at stakes to be rated on the ESL. Indeed, it is a good which a few people know about its characteristics. And there is also a wide range of it on the shelves. Besides, two of the respondents have cited the wine directly in the interviews. Furthermore, all participants mention the grocery store when getting asked which shop, they go to. Thus, it is consistent with our chosen scope of the grocery store.

But the collected insights are not sufficient to settle on the truth of the considered effect of the ESL embedded with product rating. Therefore, the collected information, along with the literature review, will allow us to construct hypotheses. We will then test these assumptions through a quantitative research made on a wider sample in order get more reliable results.

C. Conclusion of the exploratory research

To finish our exploratory research, let us now provide a synthesis of the main points gathered during the literature review and the interviews.

Through the exploratory research we have covered key topics and concepts that have eventually led us the second part of the study, the experimentation research.

The first phase of the exploratory research was the literature review. First, we have learned about the retailing world, and more specifically the smart retailing and smart retailing technologies aspects. We have then covered the determination and impacts of the retailer's trust, reputation, and loyalty.

After that, we have addressed the topic of consumer. In this section, we have mobilized literature about the product and the consumers perceived product quality and product purchase intention. Then, we learned about the need for information of the customers which led us to the consumer review theme. Eventually we explored the product ratings topic as we shifted towards a more precise kind of review. We looked over the multiple rating sources and the potential usage of the said rating.

Thirdly we considered the information credibility as we learned in the previous section that it was a key variable of the customer attitude toward the rating.

Then, we introduced the electronic shelf labels that are the smart technology we explore in this study. we continued with the gathering of valuable information regarding the credibility of the ESL and its product rating.

Lastly, we have studied the literature of the wine topic as this product made sense to consider in-store ratings. We have addressed the variables of the wine that impact customer such as its price or the implication of the customer in wine.

After that, we have conducted 6 interviews. Therefore, we managed to collect insights that helped us make choices into the direction of this study. First, we have learned that the ESL product rating is in line with people's need for information and rapidity when shopping. Secondly, the interviews led us to the choice of the wine as the considered product in this study. Namely because it is a complicated good and available in many different choices.

Thanks to the literature review and interviews, we have decided to narrow down our research to the case of wine rating (that is available on the ESL).

Even though the theory of the Main Model could help us address the credibility of the ESL, we think it is not relevant. Thus, after having pointed out the relevant heuristics to judge the credibility of the ESLs, we have chosen to redirect our study of the credibility on the rating itself rather than the ESL. Indeed, we saw in the interviews that the respondents did not address the credibility of the electronic shelf label. When we asked them questions and matters linked with the Main Model heuristics, none of them was too excited about it. Furthermore, when we asked questions about the credibility, we saw that the interviewees talked about the credibility of the rating source rather than the device credibility. For these reasons, going further with the ESL credibility, itself, seems not interesting to us and the interviewees. Therefore, we will address the credibility of the rating instead.

On the other hand, it remains crucial to address the topic of ESLs in the literature as they are supposed to feature a rating that can be made from clients reviews. Therefore, the displayer needs to adjust itself in real time when a new rating has been posted. The ESLs allow that.

In the next part of the study, we will discover how the wine rating available on the ESL affects the consumers. More particularly, we will start with the judgement of the wine rating credibility. Through the causal hypotheses, we will start with the wine rating credibility to finally arrive at the perceived product quality and the customers' product purchase intention. We will also cover the relationship hypotheses of the scenario variables (source and score) and their ultimate impacts on consumers. This quantitative research will be done through an experimentation that aims to evaluate the effect of the wine product rating source and score. It will involve 4 scenarios that will immerse the respondents into the situation of wine shopping. The scenarios explanation and the conceptual framework of our study are available in the following experimentation research section.

III. EXPERIMENTATION RESEARCH

This part of our study regards the quantitative research. According to Sukamolson (2007), the quantitative research is a set of multiple aspects. It aims to explain a phenomenon based on the analysis of numerical collections of data through mathematical methods, more particularly using statistics.

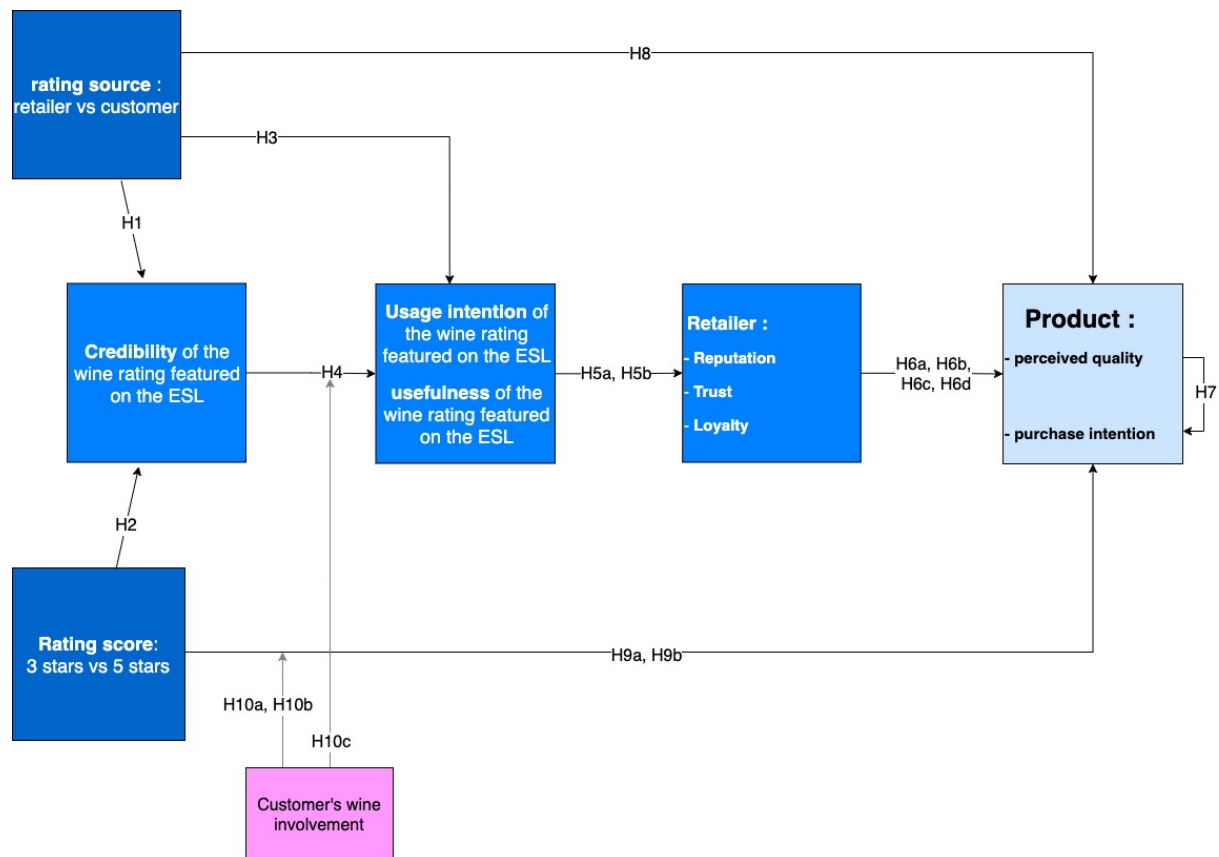
To collect data, we will give a questionnaire to a sample of the population. This sample will be much bigger than the exploratory one. Therefore, we will be able to extrapolate our findings to the population after statistical analysis.

It is important to state out the fact that in this case, the quantitative research will take the shape of an experiment. I will aim to evaluate the effects of the wine rating according to two manipulations, the source and score of the rating. The respondents will be immersed into a wine shopping situation that takes place in a grocery store. They will answer the questionnaire according to the scenario they will be randomly assigned to.

A. Conceptual framework

We have illustrated our hypotheses with a conceptual framework (figure n°6) to help the reader to have a clearer picture of our research design.

Figure 6: Conceptual framework.



B. Hypotheses

In this section, we will name the hypotheses seen in the conceptual framework. Secondly, we will justify the several hypotheses with the literature theory and the interviews materials.

1. Hypothesis 1

- **H1: Customers' wine ratings are more credible than retailer's product ratings.**

In this hypothesis, we talk about the effect of the rating source on its credibility. The source can be either the clients or the retailer. The credibility is the level of veracity and reliability the customer assigns to the rating. As we already said in the bias and fraud section of the review point of the literature, retailer might manipulate the product rating score through anonymity in order to sell more. In that sense, the retailer rating might be seen as less credible than the customers rating.

Moreover, in the interviews, we have seen that in general, the respondents find the customer's rating more credible.

2. Hypothesis 2

- **H2: The credibility of the rating is higher when the score equals 3 stars than when it equals 5 stars.**

In this hypothesis, we address the effect of the rating valence on the credibility of the wine rating. The rating score or valence is the number of stars the wine received, out of 5 stars. The credibility is explained in H1. We have seen in Hu et al. (2009) and Koh et al. (2010), that there is an underreporting bias in the product ratings, thus average product ratings are not as often published as low or high product ratings. Therefore, we can assume that if a consumer sees a rating showing an average score, such as 3 stars out of 5, he will be likely to assign a great credibility to this score. Moreover, in Purnawirawan et al. (2015), lower valence of a product rating is considered as more credible as it would not be controlled by a company.

In the exploratory research, three of the participants said that they would beware of the maximum rating, such as the 5 out of 5 stars score. Therefore, higher scores are less credible.

3. Hypothesis 3

- **H3: The customers' wine rating is more likely to be used than the retailer's one**

In this hypothesis, we assume that depending on the source, the usage of the rating might vary. The usage of the wine rating is the fact that customer include this information into their decision. Applying the TAM theory to our case, we know that the usage of the ESL product rating is a function of its helpfulness. In this matter, Li et al. (2013) finds that the customer product reviews are seen as more helpful than expert-written ones. This shows that the clients' rating would be more used than the retailer's one that is seen as the expert. Through the interviews, we have noticed that the subjects would rather use the customers' rating rather than the retailer's rating.

4. Hypothesis 4

a) H4

- **H4: The credibility of the wine rating influences positively its usage.**

The credibility that is defined in H1 increases the level of usage of the rating that is explained in H3. Thanks to Ismagilova et al. (2020), we have mentioned before that the information source trustworthiness, and by extension the credibility of the source, has a positive influence on the information adoption. When we apply this to our study, we see that the more the source of the product rating is credible, the more consumers will use this information.

We have noticed that all the interview subjects told us that the credibility has a major role in the usage of the ESL product rating.

5. Hypothesis 5

a) H5a

- **H5a: The wine rating usage improves the customers' loyalty to the retailer.**

We cover in this hypothesis the fact that the usage defined in H3 impacts positively the loyalty to the shops that displays wine ratings. The loyalty is the fact that a customer would return to the shop or not. We will consider two kinds of loyalty in this experiment. The loyalty to the retailer in terms of grocery shopping and the loyalty to the retailer in terms of wine shopping. Indeed, we have seen that a faster checkout improves the store loyalty. Since the wine rating can help the customers to take faster decisions, it means that if they use the wine rating, they can check out in a faster manner which eventually will increase the store loyalty.

This copes with the interviewees' need for shopping rapidity. Indeed, a store that allows people to be faster, is expected to retain more customers. Besides, there is a consensus between the interviewees to say that they would be more likely to go in shops that have ESLs embedded with product ratings (everything else being equal). Which also improves the store loyalty.

b) H5b

- **H5b: The wine rating's perceived usefulness improves the retailer loyalty.**

Along with the usage, we think that the usefulness of the wine rating featured on the ESL can play a role on the fact that the customers would come back to this store. The usefulness of the wine rating is the extent to which the use of the rating has enhanced the job of the client to shop. Earlier in this research, we covered the fact that Koufaris (2002) found a significant effect between the technology perceived usefulness and the intention to return. In this work we will test the same effect between the perceived usefulness of the electronic shelf label featuring a product rating and the retailer loyalty.

In the interviews, we have seen that the product ratings can be a variable of interest in the choice of the shop to go. But this depends on the usefulness of the product evaluation. For instance, David said: *"the day I find an efficient tool, I am sure I'll stay loyal."*

6. Hypothesis 6

a) H6a

- **H6a: Good retailer's reputation improves the perceived product quality.**

In this hypothesis, we consider the effect of the retailer reputation on the consumer perceived product quality. The reputation is the mental perception of the retailer that a client has in his mind (Ou, 2006). And the perceived quality is the level of quality a customer assigns to a product before using or consuming it. Kim and Choi (2012) have found a positive effect of the retailer reputation on the consumers' perceived product quality.

Luca agrees on the fact that the reputation will eventually reverberate on the product perceived quality. Emile and Lolita also agree that there is an effect. So does Véronique, but on the condition to know what the incentives of the retailer's advocate are.

b) H6b

- **H6b: The retailer trust improves the purchase intention.**

If a customer has faith in the retailer to deliver what he is expected to, then the customer's purchase intention will be higher. The purchase intention is the customer eagerness to buy. As we stated in the trust point of the retailer section, Sichtmann (2007) and Comegys et al. (2009) found that the trust in a firm positively affects the purchase intentions. We can see in the interviews that all the participants believe that their trust in the retailer influences positively their purchase intention.

c) H6c

- **H6c: Good retailer's reputation increases the purchase intention.**

The reputation of the retailer explained in H6a, will increase the purchase intention of the customer explained in H6b. The reputation of the retailer that customers have in mind, positively impacts the intention of those customers to buy products. As we mentioned earlier, the study of Kim and Choi (2012) finds a positive impact of the retailer reputation on the purchase intention.

For the half of the interview subjects, the retailer reputation indeed influences positively the purchase intention.

d) *H6d*

- **H6d: The retailer loyalty increases the purchase intention.**

The loyalty explained in H5 that the customer has toward the retailer, will increase the purchase intention explained in H6b. As mentioned in the loyalty point of the retailer section in the literature review, the retailer loyalty has a positive impact on the purchase intention. We have not collected information about this matter in our interviews. On the other hand, we assume that going more often to a shop will induce an increase in the purchases. Thus, in the purchase intention.

7. Hypothesis 7

- **H7: The wine perceived quality increases the purchase intention.**

If the perceived quality of a product increases, then the customer will be more likely to purchase it. Both perceived quality and purchase intention are defined in H6. When a consumer faces a product he assumes to have a good quality, will make his intention to purchase it higher than if it was a poor quality. Mirabi et al. (2015) and Saleem et al. (2015) suggest that there is a positive impact of the perceived product quality on the purchase intention.

All the interviewees believed that there is a strong link between their product perceived quality and their intention to buy it. But not only in the related questions. Indeed, we have seen all along the interviews that they often spoke about the perceived quality when considering the purchase intention. As if the perceived quality of a product, influences positively the purchase intention.

8. Hypothesis 8

- **H8: The product purchase intention is higher when the source of the rating is the customers rather than the retailer.**

The source defined in H1 increases more the purchase intention (defined in H6) when it is the clients rather than when it is the retailer. As stated in the product point of the customer section in the literature review, professional related sources of information about a product have a smaller impact on the purchase intention than independent sources. Furthermore, we see in Luca's interview that the rating source type can influence his decision on whether to buy the product or not. He goes further and tells us that he thinks of the customer's rating to be more influential. Olivier also says that his propensity to buy can be influenced by the type of the source. He will be more likely to buy product when the source is the clients.

9. Hypothesis 9

a) H9a

- **H9a: The perceived quality of the Vina is higher when the rating equals 5 stars rather than 3 stars.**

When the score (explained in H2) equals 5 stars, the perceived quality (defined in H6) is greater than when it equals 3 stars. When the customer faces a product that has a 5 stars score, he will have a better perceived quality than if he was in front of a 3 stars rating. Indeed, we have seen in Moe (2009) that the rating valence can be an indicator of the product quality. In the interviews, we have noticed that all the respondents, but Lolita, answered that the valence of the score influences positively their perceived product quality. Lolita did not say the otherwise, but she does not know whether there is an effect or not.

b) H9b

- **H9b: The purchase intention is higher when the rating score equals 5 stars rather than 3 stars.**

When the score (explained in H2) equals 5 stars, the intention to purchase (defined in H6) is greater than when it equals 3. We have seen that many authors retrieved from Trenz and Berger (2013) suggest that the product rating score has a positive impact on the sales.

Along with this, Emile, Lolita, David, and Luca found that there is a positive correlation between the score valence and their purchase intention. Véronique and Olivier said there was an impact of the first variable on the second but did not provide the positive or the negative nature of it.

10. Hypothesis 10

a) H10a, H10b

- **H10a: The impact of the wine rating score on the perceived quality is lower for the highly involved wine customer.**
- **H10b: The impact of the wine rating score on the purchase intention is lower for the highly involved wine customer.**

The notion of the involvement of the people in wine is another aspect relevant to our case. The involvement of the people in wine can be related to the customer level of expertise in wine. Depending on the profile of the person choosing the wine, it seems that the influences of the wine rating might variate. An expert of the wine might rely differently on a simple 5-stars notation compared to someone who does not know anything about wine. In addition, we have seen in the wine section of the literature review that highly involved wine customers might consider more information than lower ones. In other words, a simple stars rating might not be sufficient for those profile to have a clear perceived quality and an intention to purchase. They would consider more information thus making the rating information less decisive. Additionally, low involved people want to make quicker purchase, which the rating in stars seems to allow. Therefore, we think that the effect of the rating score on the perceived quality (H9a) as well as the purchase intention (H9b) is lower for highly involved wine customers.

In Lolita's interview, who is a dietician, we have seen that she used the "Yuka" app at first to help her in her product choice, for health criteria. After she graduated, she became an expert of the diet and thus would not agree all the time with this app. She started not using it as she became more involved in the diet world. She also told us that the credibility of the app was not as good as she thought when she first used it. This resonates with the other interviews since the respondents were clear on the fact that a product rating would be interesting for product that are complicated. Thus, once someone becomes an expert of such product, he

might start to see the good as not complicated. Therefore, he will rely on his own information to make a purchase choice.

b) H10c

- **H10c: The effect of the wine rating credibility on its usage is greater for highly involved wine customers.**

We have also covered in the literature review the fact that highly involved wine customers question more the information they face than lower involved customers. Especially the credibility. Thus, we have also made the following hypothesis which states that the effect of the credibility of the rating on its usage (H4) is greater for highly involved wine customers.

IV. QUANTITATIVE RESEARCH DESIGN

The objective of the quantitative research is to study the impacts of the independent variables on the dependent variables. The quantitative research will be conducted through an experimentation that aims to evaluate the effect of the wine product rating source and score. It will involve 4 scenarios and thus 4 groups of respondents. The scenarios will immerse the respondents into the situation of wine shopping. You can find the description of the scenarios in the “experimental design” section that follows this one. The aim is to refute or accept, until proved wrong our hypotheses. We will then investigate whether the source and the score of a wine rating influences the consumers in their beliefs and behavior. The independent and dependent variables are featured in the following table.

Table 3: independent and dependent variables.

Independent Variables (S-V)	Dependent variables (I)
- Customer rating source: retailer – customers - Product rating score: 3stars – 5 stars	- Credibility (of the ESL’s product rating) - Usage intention (of the ESL’s product rating) - Retailer’s reputation - Retailer’s trust - Retailer’s loyalty - Product purchase intention - Product perceived quality

A. Methodology and data collection

First, it is important to state that our statistical analysis will be done through the SPSS software.

1. Experimental design

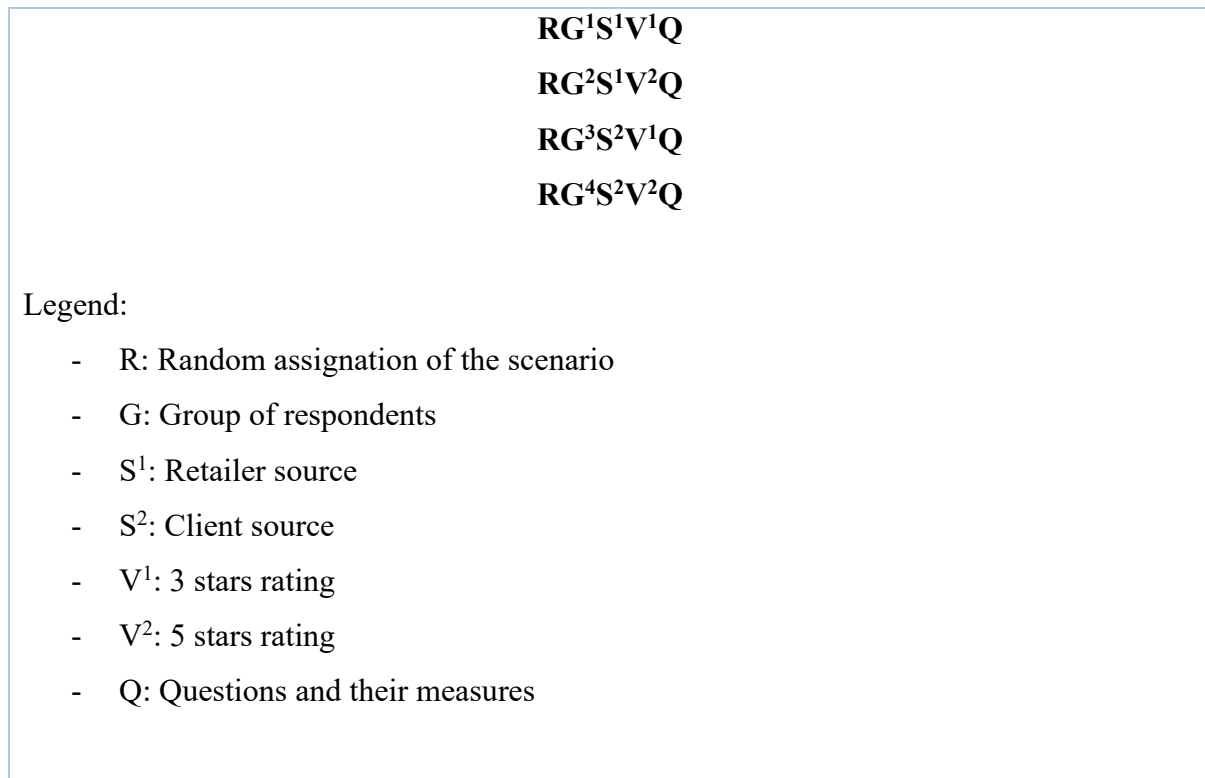
We have built a questionnaire in order to collect quantitative data for answering our hypotheses. This questionnaire starts by a scenario which places the respondent into a context of wine shopping in a grocery store. A bottle of the wine called “Vina” gets their attention. On the Vina’s electronic shelf label, they can see the score and the source of the rating. A picture of the ESL featuring the Vina rating is also provided to the respondents (such as the ones in the ESL section of the literature review). You can find the scenarios in the appendix.

4 possibilities of scenario:

- The source of the Vina rating is the clients, and the score is 3 stars out of 5
- The source of the Vina rating is the clients, and the score is 5 stars out of 5
- The source of the Vina rating is the retailer, and the score is 3 stars out of 5
- The source of the Vina rating is the retailer, and the score is 5 stars out of 5

The variables are then double. It variates on the source and on the score of the rating. It is important to remind you that both the Vina and the distributor are given to the respondents as new ones on the market. Thanks to the Qualtrics option, we were able to randomly assign a scenario to the respondents. Every participant faced only one scenario. On the other hand, all the respondents had the same questions.

Figure 7: representation of the experimental design



2. Questionnaire structure

In this section, we will provide you with the structure of our questionnaire. First, it starts with a brief explanation of the research. Then, it is followed by the acceptance of the agreement of the questionnaire answering. In the second time, the respondents face a randomly assigned scenario and its description. After having read the scenario, respondents can start answering the questions. At the end of the questionnaire, there are 2 questions to check whether the participants understood the scenario they were in. After that, we ask questions in order to identify the type of respondent.

Once again, besides the scenario description, all the questions are the same for any questionnaire candidate.

Furthermore, we have provided you with the questionnaire questions in the appendix.

a) Variables' measures and questions design

To measure our variables, we have gathered items and scales scientifically reliable. Indeed, for each of them we have put in the table n°4 the adapted items, their scale, and their sources.

Since our questionnaire was in French, we have translated the items and scales based on the double check translator.

(Double check translators: we type in the English sentences in the translator and get the French translation as output. After that we inverted the translation direction and typed in the French translation to see if the English output was similar to the first input)

Table 4: Variables measures' items, scale, and source.

Variable	Items	Scale	Source
Credibility (of the ESL's product rating)	- Can the wine's ESL rating be trusted? - Is the wine's ESL rating accurate?	7-points Likert-scale: 1(strongly disagree) to 7(strongly agree)	West (1994)

	- Is the wine's ESL rating fair? - Does the wine's ESL rating tell the whole story? - Is the wine's ESL rating unbiased?		
Usage intention (of the ESL's product rating)	- I find the wine's ESL rating easy to use. - It was easy for me to become skillful at using wine's ESL rating. - Using wine's ESL rating increases productivity (meaning: decreasing the time spent in the shop). - Using wine's ESL rating increases my effectiveness of grocery shopping. - Using wine's ESL rating makes it easier to grocery shopping.	7-points Likert-scale: 1(strongly disagree) to 7(strongly agree)	Subramanian (1994)
Retailer's reputation	- Sell high quality merchandise - Is a prestigious store - Is a high-quality store	7-points Likert-scale: 1(strongly disagree) to 7(strongly agree)	Teas and Agarwal (2000).
Retailer's trust	- I trust this retailer. - I think I can rely on this retailer to serve me well - I think I can trust this retailer will not try to cheat me - This retailer is reliable because it is mainly concerned with the customer's interests	5-points Likert-scale: 1(strongly disagree) to 7(strongly agree)	Aydin and Özer (2005).

Retailer's loyalty	- How likely is it that you will visit this retailer again in the future? - I feel loyal to this retailer. - I will not buy from other retailers. - This retailer is my first choice	7-points Likert-scale: - For the first question: 1(extremely unlikely) to 7(extremely likely) - For the following question: 1(strongly disagree) to 7(strongly agree)	Koufaris (2002); Pappu and Quester (2006)
Product perceived quality	- My overall impressions of the bottle of the Vina. - The risk involved in purchasing this bottle of wine named Vina is. - Compared to other wine, the quality of the Vina wine is	7-points Likert-scale: - 1st question: 1(very bad) to 7(very good) - 2nd question: 1(very high) to 7(very low) - 3rd question: 1(much lower than average) to 7(much higher than the average)	Purohit and Srivastava (2001).
Product purchase intention	- I plan on buying this bottle of Vina - I intend to try the Vina	7-points Likert scale: from 1(disagree) to 7(agree).	Barber and Taylor (2013), Bower and Landreth (2001),

	- I would consider purchasing The Vina - I am interested in tasting the Vina		Barber et al. (2012), Loureiro (2003)
Clients' implication in wine	- I feel particularly attracted to wine. (relevance) - Wine is a product for which I assign a special importance. (relevance) - I like talking about wines. (Interest) - We can say wine is a product that interests me. (Interest) - I really enjoy getting information for the purchase on wines. (Attractivity to the considered activity) - Wine is a product that means a lot to me. (Attractivity to the considered activity)	7-points Likert scale: from 1(disagree) to 7(agree).	Strazziéri and Hajdukowicz-Brisson (1995)

3. Questionnaire diffusion

To distribute our questionnaire, we have used social media post, direct messages, and emails. Firstly, we have posted the link of our questionnaire with a brief description on Facebook and LinkedIn. We have also asked many of our friends and family members to repost it. In that sense, we managed to have people with different ages to answer and repost the questionnaire. Emails were sent to people with different ages, asking for their responses as well as their family members' and friends'. We chose these channels to get as many responses as possible considering our limited financial conditions.

V. DATA ANALYSIS

In this part, we will analyze the quantitative data collected through our questionnaire to settle on the veracity of our hypotheses. The aim will be to accept or refute the hypotheses we have built in the previous part of the work. Before addressing the use of the data for the hypotheses results, we will cover the management and description of the database. We will first present our sample, to continue with the data management. After that we will describe the identification of the respondents and the equivalence of the groups. Next, we will investigate the validity and reliability of the measures that we have reduced into main variables for the questionnaire. Finally, we will run the statistical analysis for the hypotheses acceptance or rejection.

A. Sample description

In this study, we have chosen to use a non-probability convenience and snowball sample (Taherdoost, 2016). Considering our financial limits, it was a good mean to reach the maximum of participants (Ackoff, 1953).

The convenience has been conducted through social media posts (Facebook and LinkedIn), as well as emails and direct messages.

The snowball method took the shape of the repost of our questionnaire by friends, family, and acquaintances. We have asked differently aged people for the diffusion of the questionnaire.

This sample is non representative of the population (Taherdoost, 2016). But the random assignment of the scenarios to the respondents will ensure the validity of our experimental design. On the other hand, to allow this validity, we will have to ensure that the 4 groups will be equivalent in terms of participants characteristics.

B. Preliminary analysis

In order to be able to analyze the data that we have collected, there is a need to clean and manage the database.

Firstly, we have gathered 500 questionnaire responses. On the other hand, many of them were not usable. First, we have deleted the responses that were done through the review phase of the questionnaire. The review mode was used by us to check the validity of the questionnaire design before its diffusion.

Secondly, we have dropped any responses from participants who did not finish the questionnaire. In fact, the ones who did not complete the questionnaire did not even answer a single item. Thus, we have dropped 209 uncompleted questionnaires and one review questionnaire. At this point we were left with 290 respondents.

To make sure people answered the questionnaire according to the scenario they were given to, we have asked two questions regarding the variables of the source and the score.

Thus, we have dropped the questionnaire of the respondents who did not correctly reply to the check questions of the scenario understanding. Whether it was the wrong answer or the “I forgot” answer, the whole questionnaire was taken off the data base. This led us to a total of 214 complete and usable responses.

According to Carricano and Poujol (2008), this number is large enough to expound the results as the minimum required is 100 answers.

Furthermore, we did not have to replace missing values because there were none.

You can find in the table n°5 the repartition of the respondents into their scenario assignation.

Table 5: Scenario participants assignation.

Retailer – 3 stars	Retailer – 5 stars	Clients – 3 stars	Clients – 5 stars
56	57	53	48

C. Identification of the respondents

In this section, we are addressing the relevance of the respondents' profile to our study.

There are 214 respondents. The youngest of them is 18 years old and the oldest is 73. The mean of the age of the participants is 36 years.

Considering the sex, we have gathered the data of 100 women (46,7%) and 114 men (53,3%). Furthermore, there is 14 people (6,5%) who never buys wine. On the other hand, 27 of them (12%) buy wine every year, 99 (46,3%) each month, 71 (33,2%) every week, and 3 (1,4%) every day.

Lastly, 194 people go to supermarkets and 20 do not.

Generally, we have 93,5% of people who buy wine et and 90,7% of respondents who shop in grocery stores. We consider these rates as sufficient to analyze them to answer our hypotheses.

D. Scale and measure's validity and reliability

In this section, we will analyze the validity and reliability of our measures and scales. The goal is to reduce the items that measure a main variable into a single construct.

To build our questionnaire, we have collected items found in the literature that approach our variables. Secondly, we adapted these broad items to our research case. Thirdly, we have translated these items from English to French. These manipulations of the items make the assessment of the validity and reliability even more important.

Through the questionnaire, we have measured the following variables: the credibility of the rating, the perceived usefulness of the rating, the usage of the rating, the loyalty to the retailer (in terms of wine purchase and grocery purchase), the trust in the retailer, the reputation of the retailer, the perceived quality of the Vina, the purchase intention of the Vina, and the implication of the respondents in wine.

1. Validity of the scale

To assess the validity of the scales we have run a principal component analysis (PCA).

The aim is to make an assessment of the potential interrelationship between items that approach the same variable, so that we can summarize and reduce the data into a single item (Steils, 2018).

For running the PCA, we will have to satisfy the condition of having a 5 times bigger observation number than the items number (Steils, 2018). This condition is met for all the variables.

Secondly, to know whether the variables are “factorizable”, we run a Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity test. The first one measures the degree to which multiple variables can be explained by another. With a degree that must be higher than 0,5 (Steils, 2018). The second test allows us to test the null hypothesis which stipulates that the variables are not correlated in the population. We will need a rate of under 0,05 to reject the null hypothesis to prove a correlation in the items and the main variable and go further in the data analysis.

Table 6: KMO and Bartlett's test.

Variable	KMO	Bartlett's test	Approx. Chi-square	Total variance explains	Number of items before the validity check	Number of items after the validity check
Perceived usefulness	0,677	0,000	306,871	77,256	3	3
Usage	0,761 (0,738: Before the drop of Facilite2_compétence)	0,000	375,152	67,278 (58,334: Before the drop of Facilite2_compétence)	5	4
Wine purchase intention	0,791	0,000	917,601	85,584	4	4
Credibility of the rating	0,803	0,000	724,232	70,834	5	5
Wine perceived quality	0,667	0,000	147,537	65,968	3	3
Loyalty	0,622 (0,638: Before the drop of Fidel_revenir)	0,000	236,388	66,480 (56,283: Before the drop of Fidel_revenir)	4	3
Loyalty for wine purchase	0,695 (0,745: Before the drop of Fidel_revenir)	0,000	254,774	74,672 (61,693: Before the drop of Fidel_revenir)	4	3

Trust in the retailer	0,807	0,000	457,485	73,813	4	4
Reputation of the retailer	0,657	0,000	346,790	77,008	3	3
Wine implication	0,925	0,000	1336,671	82,158	6	6

We see that all the target reduced variables have a KMO indicator that is above 0,6, and we have set the acceptable level at 0,5. Therefore, the main variables can be explained by their respective items. Furthermore, the significance measure of the Bartlett's sphericity indicates that we can reject the null hypothesis mentioned earlier for all the variables.

To know whether we will keep all the items for the dimension reduction we look at the communalities that need to be higher of 0,4 (Carricano and Poujol, 2008). We see that only the following items are under this level: the Facility2_competence (which assess the level of needed competencies in order to use the rating), and Fidell1_revenir (which assess the likeliness of the people to come back to the shop). Therefore, we withdraw these items from the variable they are supposed to approach. After that, we have run a new KMO and Bartlett's sphericity tests to check the validity without these two items.

To finish, all our items have a total explanation of the variance of their respective variables that exceeds 60%.

All of this considered, we can say that it is valid to reduce the variables dimension from their items to a single measure. Only the items Facility2_compétence and Fidell1_revenir will need to be taken off the reduction. You can find in the table n°6, the number of items for each variable before and after the validity test.

Additionally, you can find the Stata tests of the validity in the appendix.

2. Reliability

In this section we will assess the reliability of the reduced variables. The aim is to guarantee that variables are free from random errors. Furthermore, we need to ensure that the

scales consistently measure the variable they are supposed to. For this we will look at the Cronbach's alpha indicator. The closest it is to 1, the more the construct will be reliable. The minimum tolerated is a level of 0,7 (Steils, 2018). Moreover, our variables have the same scale and the same direction which makes them ready to be controlled on their reliability.

Table 7: Reliability test with Cronbach's alpha.

Variable	Cronbach's alpha
Perceived usefulness	0,845
Usage	0,831
Wine purchase intention	0,944
Credibility of the rating	0,886
Wine perceived quality	0,738
Loyalty	0,746
Loyalty for wine purchase	0,830
Trust in the retailer	0,881
Reputation of the retailer	0,849
Wine implication	0,956

We can see in the table that all the constructs' Cronbach's alpha are above 0,7. Thus all the reduced constructs are reliable for the future analysis of our hypotheses.

E. Equivalence of the groups

The aim of this study is to discover meaningful results that will show influences of the ESLs wine ratings on the consumers. In order to do so, we need to have equivalence in our 4 groups (4 scenarios). Indeed, we need the same profiles in the groups because we want to know the differences of results based exclusively on the scenario variables alternatives. Thus, we need to exclude any other effect that might bias the results. If all the groups feature the same profiles of respondents, we will exclude unwanted effects. And the differences in the responses between the 4 groups will be due to the scenario variables.

Furthermore, we have a sample of 214 participants. In other words, we want independent group samples in terms of age, gender, wine purchasing frequencies, wine implication and grocery store habit.

For the variable of gender, the grocery store habit and wine purchase frequency we will run a Chi-square test because it is a comparison between three nominal variables. On the other hand, for the age and wine implication we will run an ANOVA test because these two variables are metric. If the p value of these tests is above 0,05, it means that our scenario samples are independent. In other words, the groups will be equivalent in their characteristics. We illustrate the equivalence of the groups in the table n°8.

Table 8: Equivalence of the groups.

Variables/results	Significance	F	df
Age	0,990	0,039	- 3 (between groups) - 210 (within groups) - 213 (total)
Wine implication	0,340	1,124	- 3 (between groups) - 210 (within groups) - 213 (total)
Gender repartition	0,702	Not an ANOVA. You can find the means in the appendix.	
Wine purchase frequency	0,799		
Grocery store habit (go vs do not go)	0,217		

We can see in the table n°8 that all the samples are free from any effect of these 5 variables. Additionally, you can find more details about the equivalence of the groups in the appendix (such as the means).

We can say that our groups are equivalent, and they show relatively equivalent profiles. Therefore, we will be able to consider the results we will have in the end of the hypotheses analysis.

F. Hypotheses tests

Now that our data material is ready, valid, and reliable, we are going to accept or reject our hypotheses based on statistical analysis. You will find in the appendix, the complement of the tests we have run for the hypothesis rejection or acceptance.

1. Hypothesis 1

- **H1: Customers' wine ratings are more credible than retailer's product rating.**

In the first hypotheses, we address the impact of the rating source on the credibility of the wine rating. We use the T-test to compare the means of our 2 independent samples (clients rating vs retailer rating). We choose the T-test since we have one metric and one nominal variable. In order to accept our hypothesis, we will need a p-value that is under 0,05. If it is higher than 0,05, it means that we do not reject the null hypothesis which states that there are no differences between the means of the retailer rating credibility and the clients rating credibility. If the p-value is under 0,05, it means that there is a significant difference between the means of the credibility based on the source. Thus, we will be able to compare the means and see which one is greater.

Table 9: Independent samples t-test: Credibility and source.

Group Statistics					
	Source	N	Mean	Std. Deviation	Std. Error Mean
CREDIB	distributeur	113	3.8407	1.06743	.10042
	Clients	101	3.7762	.94203	.09374

Independent Samples Test										
Levene's Test for Equality of Variances				t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CREDIB	Equal variances assumed	1.177	.279	.466	212	.642	.06447	.13833	-.20821	.33715
	Equal variances not assumed			.469	211.969	.639	.06447	.13737	-.20631	.33525

In opposition with our hypothesis, we see that the mean of the rating credibility is higher when the source of the rating is the retailer (3,8407>3,7762). On the other hand, the difference between the two means is not significant because the p-value is above 0,05 (t=0,469; p-value=0,639 >0,05). Therefore, we cannot reject the null hypothesis which states that there is no significant difference between the two means.

Therefore, we **reject the hypothesis H1**.

2. Hypothesis 2

- **H2: The credibility of the rating is higher when the score equals 3 stars rather than 5 stars.**

For this hypothesis, we have run the same test as in H1.

Table 10: Independent samples t-test: Credibility and score.

Group Statistics					
	score	N	Mean	Std. Deviation	Std. Error Mean
CREDIB	3etoiles	109	3.7706	1.01464	.09719
	5etoiles	105	3.8514	1.00500	.09808

Independent Samples Test										
Levene's Test for Equality of Variances				t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CREDIB	Equal variances assumed	.618	.433	-.585	212	.559	-.08079	.13810	-.35301	.19143
	Equal variances not assumed			-.585	211.834	.559	-.08079	.13807	-.35296	.19139

In opposition with our hypothesis, we see that the mean of the rating credibility is higher when the score equals 5 stars than when it equals 3 stars ($3,8514 > 3,7706$). On the other hand, the difference between the two means is not significant because the p-value is above 0,05 ($t = -0,585$; $p\text{-value} = 0,559 > 0,05$). Therefore, we cannot reject the null hypothesis which states that there is no significant difference between the two means.

Consequently, we **reject H2**.

3. Hypothesis 3

- **H3: The customers' wine rating is more likely to be used than the retailer's one**

Once again, we used the same test than in H1 and H2.

Table 11: Independent samples t-test: Usage and score.

Group Statistics

	Source	N	Mean	Std. Deviation	Std. Error Mean
usage	distributeur	113	5.0177	1.08135	.10173
	Clients	101	4.9307	.94810	.09434

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
usage	Equal variances assumed	.891	.346	.623	212	.534	.08701	.13976	-.18850	.36251
	Equal variances not assumed			.627	211.926	.531	.08701	.13874	-.18648	.36049

In opposition with our hypothesis, we see that the mean of the rating usage is higher when the source of the rating is the retailer than when it is the clients ($5,0177 > 4,9307$). On the other hand, the difference between the two means is not significant because the p-value is above 0,05 ($t=0,627$; $p\text{-value}=0,531 > 0,05$). Therefore, we cannot reject the null hypothesis which states that there is no significant difference between the two means.

Therefore, we **reject the hypothesis H3**.

4. Hypothesis 4

- **H4: The credibility of the wine rating influences positively its usage.**

At first, we have run a linear regression to study the effect of the credibility on the usage of the ESL wine rating. Unfortunately, the conditions to run such statistics were not met. Indeed, there was a problem with the homoscedasticity. Indeed, the residuals have different variances. You can see the Stata results in the appendix.

Therefore, we have chosen to use the general linear model (GLM). First of all, the graph shows a tendency of the usage to grow with the credibility. Then, the Levene's test of the equality of error variances indicates a p-value of 0,197, which is higher than 0,05. Thus, the residual variances do not differ between the scenarios.

In the following table, we see that the p-value assigned to the interaction test equals 0,573. Thus, we keep the hypothesis of no interaction between the scenarios and the usage (Table n°12).

Table 12: general linear model: Credibility and usage. (1)

Tests of Between-Subjects Effects						
Dependent Variable: usage						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	75.425 ^a	7	10.775	15.220	.000	.341
Intercept	98.606	1	98.606	139.288	.000	.403
Scenario	.845	3	.282	.398	.755	.006
CREDIB	69.832	1	69.832	98.642	.000	.324
Scenario * CREDIB	1.419	3	.473	.668	.573	.010
Error	145.833	206	.708			
Total	5521.375	214				
Corrected Total	221.258	213				

a. R Squared = .341 (Adjusted R Squared = .318)

Therefore, we re-run the test without including in the model the scenario and credibility interaction (Scenario * CREDIB).

Considering the effect of the rating credibility, we see a significant effect of the credibility on the usage since the p-value equals 0,000 and that is lower than 0,05 (Table n°13).

Table 13: general linear model: Credibility and usage. (2)

Tests of Between-Subjects Effects						
Dependent Variable: usage						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	74.006 ^a	4	18.502	26.260	.000	.334
Intercept	108.978	1	108.978	154.676	.000	.425
CREDIB	70.642	1	70.642	100.264	.000	.324
Scenario	2.263	3	.754	1.071	.363	.015
Error	147.252	209	.705			
Total	5521.375	214				
Corrected Total	221.258	213				
a. R Squared = .334 (Adjusted R Squared = .322)						

The table n°14 shows us the extent of the effect of the credibility of the wine rating on its usage.

Table 14: general linear model: Credibility and usage. (3)

Parameter Estimates							
Dependent Variable: usage							
Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	2.909	.248	11.722	.000	2.420	3.399	.397
CREDIB	.572	.057	10.013	.000	.459	.685	.324
[Scenario=1.00]	-.147	.165	-.887	.376	-.472	.179	.004
[Scenario=2.00]	-.031	.165	-.191	.849	-.356	.293	.000
[Scenario=3.00]	-.264	.167	-1.579	.116	-.594	.066	.012
[Scenario=4.00]	0 ^a	.	.	.	.	.	.
a. This parameter is set to zero because it is redundant.							

Indeed, we see that the credibility has a positive impact on the usage. More particularly, the level of usage increases by 0,572 when the credibility increases by one.

The expected level of the wine rating usage is the following: $2,909 + 0,572 \cdot \text{credibility} + e$

Therefore, we can **accept H4**. Until proven the otherwise.

5. Hypothesis 5

We started this analysis by running a multiple linear regression to analyze the effect of the usage and usefulness of the wine rating on the retailer loyalty. Unfortunately, we have had the same problem with homoscedasticity than in H4. Furthermore, the condition of the MLR collinearity was not met. The VIF indicator equals 15,766. Anything that is above 10 is critical.

Therefore, we have chosen to run a GLM. Moreover, we have collected data on two different kinds of loyalty. The one that considers the loyalty for general grocery shopping (FIDGEN). And the one that considers the loyalty to the retailer for wine shopping (FIDVIN). We provide a GLM for both.

Furthermore, you can find the Stata results of the satisfaction of the conditions in the appendix.

a) H5a

- **H5a: The wine rating usage improves the customers' loyalty to the retailer.**

(1) FIDVIN

First of all, the graph shows a tendency of the loyalty in terms of wine to grow with the usage. It seems to be an effect. Secondly, the Levene's test of the equality of error variances indicates a p-value of 0,365, which is higher than 0,05. Thus, the residual variances do not differ between the scenarios.

In the table n°15, we see that the p-value assigned to the interaction test equals 0,580. Thus, we keep the hypothesis of no interaction between the scenarios and the usage.

Table 15: general linear model: Usage and loyalty to the retailer in terms of wine. (1)

Tests of Between-Subjects Effects						
Dependent Variable: FIDVIN						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	64.554 ^a	7	9.222	7.962	.000	.213
Intercept	6.340	1	6.340	5.474	.020	.026
Scenario	1.782	3	.594	.513	.674	.007
usage	54.106	1	54.106	46.716	.000	.185
Scenario * usage	2.281	3	.760	.656	.580	.009
Error	238.588	206	1.158			
Total	2811.556	214				
Corrected Total	303.142	213				

a. R Squared = .213 (Adjusted R Squared = .186)

Therefore, we re-run the test without including in the model the scenario and usage interaction (Scenario * usage).

On the other hand, we see a significant effect of the usage of the wine rating on the loyalty to the retailer in terms of wine shopping. Indeed, the p-value equals 0,000 which is less than 0,05 (table n°16).

Table 16: Table n°16: general linear model: Usage and loyalty to the retailer in terms of wine. (2)

Tests of Between-Subjects Effects						
Dependent Variable: FIDVIN						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	62.273 ^a	4	15.568	13.509	.000	.205
Intercept	5.646	1	5.646	4.899	.028	.023
usage	59.626	1	59.626	51.737	.000	.198
Scenario	.807	3	.269	.234	.873	.003
Error	240.869	209	1.152			
Total	2811.556	214				
Corrected Total	303.142	213				

a. R Squared = .205 (Adjusted R Squared = .190)

We see in table n°17 that the effect of the usage of the wine rating on the loyalty in terms of wine shopping is positive. Indeed, the level of loyalty increases by 0,523 when the usage increases by 1.

Table 17: : general linear model: Usage and loyalty to the retailer in terms of wine. (3)

Parameter Estimates							
Dependent Variable: FIDVIN							
Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	.781	.401	1.950	.052	-.008	1.571	.018
usage	.523	.073	7.193	.000	.380	.666	.198
[Scenario=1.00]	.095	.211	.451	.652	-.321	.512	.001
[Scenario=2.00]	.096	.210	.455	.650	-.319	.510	.001
[Scenario=3.00]	-.045	.215	-.211	.833	-.469	.378	.000
[Scenario=4.00]	0 ^a	.	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Therefore, the expected level of loyalty to the retailer in terms of wine shopping equals:
 $0,781 + 0,523 * \text{usage} + e$.

Consequently, we can **accept H5a** when considering the loyalty to the retailer in terms of wine shopping.

(2) FIDGEN

First of all, the graph shows a tendency of the loyalty to grow with the usage. It seems to be an effect. Second of all, the Levene's test of the equality of error variances indicates a p-value of 0,886, which is higher than 0,05. Thus, the residual variances do not differ between the scenarios.

In the table n°18, we see that the p-value assigned to the interaction test equals 0,629. Thus, we keep the hypothesis of no interaction between the scenarios and the usage.

Table 18: general linear model: Usage and loyalty to the retailer in terms of grocery shopping. (1)

Tests of Between-Subjects Effects						
Dependent Variable: FIDGEN						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	40.511 ^a	7	5.787	6.904	.000	.190
Intercept	15.410	1	15.410	18.383	.000	.082
Scenario	1.406	3	.469	.559	.643	.008
usage	34.929	1	34.929	41.669	.000	.168
Scenario * usage	1.458	3	.486	.580	.629	.008
Error	172.681	206	.838			
Total	2723.889	214				
Corrected Total	213.193	213				

a. R Squared = .190 (Adjusted R Squared = .162)

Therefore, we re-run the test without including in the model the scenario and usage interaction (Scenario * usage).

On the other hand, we see in the table n°19 a significant effect of the usage of the wine rating on the loyalty to the retailer in terms of grocery shopping. Indeed, the p-value equals 0,000 which is lesser than 0,05 (table n°19).

Table 19: general linear model: Usage and loyalty to the retailer in terms of grocery shopping. (2)

Tests of Between-Subjects Effects						
Dependent Variable: FIDGEN						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	39.053 ^a	4	9.763	11.718	.000	.183
Intercept	15.290	1	15.290	18.351	.000	.081
usage	37.889	1	37.889	45.474	.000	.179
Scenario	1.040	3	.347	.416	.742	.006
Error	174.139	209	.833			
Total	2723.889	214				
Corrected Total	213.193	213				

a. R Squared = .183 (Adjusted R Squared = .168)

Additionally, we see in the table n°20 that the effect of the usage of the wine rating on the Loyalty is positive. Indeed, the level of loyalty increases by 0,417 when the usage increases by 1.

Table 20: general linear model: Usage and loyalty to the retailer in terms of grocery shopping. (3)

Parameter Estimates							
Dependent Variable: FIDGEN							
Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.223	.341	3.590	.000	.551	1.894	.058
usage	.417	.062	6.743	.000	.295	.539	.179
[Scenario=1.00]	.176	.180	.981	.328	-.178	.531	.005
[Scenario=2.00]	.173	.179	.967	.335	-.180	.525	.004
[Scenario=3.00]	.142	.183	.775	.439	-.219	.502	.003
[Scenario=4.00]	0 ^a	.	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Therefore, the expected level of loyalty to the retailer in terms of grocery shopping equals:
 $1,223 + 0,417 * \text{usage} + e$.

Therefore, we can **accept H5a** when considering the loyalty to the retailer in terms of general shopping.

b) *H5b*

- **H5b: The wine rating's perceived usefulness improves the retailer loyalty.**

(1) *FIDVIN*

First of all, the graph shows a tendency of the loyalty in terms of wine shopping to grow with the usefulness. It seems to be an effect. Second of all, the Levene's test of the equality of error variances indicates a p-value of 0,380, which is higher than 0,05. Thus, the residual variances do not differ between the scenarios.

In the table n°21, we see that the p-value assigned to the interaction test equals 0,335. Thus, we keep the hypothesis of no interaction between the scenarios and the usefulness.

Table 21: general linear model: Usefulness and loyalty to the retailer in terms of wine. (1)

Tests of Between-Subjects Effects						
Dependent Variable: FIDVIN						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	60.325 ^a	7	8.618	7.311	.000	.199
Intercept	14.160	1	14.160	12.013	.001	.055
Scenario	1.001	3	.334	.283	.838	.004
Usefulness	51.128	1	51.128	43.375	.000	.174
Scenario * Usefulness	1.185	3	.395	.335	.800	.005
Error	242.818	206	1.179			
Total	2811.556	214				
Corrected Total	303.142	213				

a. R Squared = .199 (Adjusted R Squared = .172)

Therefore, we re-run the test without including in the model the scenario and usefulness interaction (Scenario * Usefulness).

On the other hand, we see a significant effect of the usefulness of the wine rating on the loyalty to the retailer in terms of wine shopping. Indeed, the p-value equals 0,000 which is lesser than 0,05 (table n°22).

Table 22: general linear model: Usefulness and loyalty to the retailer in terms of wine. (2)

Tests of Between-Subjects Effects						
Dependent Variable: FIDVIN						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	59.140 ^a	4	14.785	12.664	.000	.195
Intercept	14.421	1	14.421	12.353	.001	.056
Usefulness	56.493	1	56.493	48.389	.000	.188
Scenario	.946	3	.315	.270	.847	.004
Error	244.002	209	1.167			
Total	2811.556	214				
Corrected Total	303.142	213				

a. R Squared = .195 (Adjusted R Squared = .180)

Additionally, we see in the table n°23 that the effect of the usage of the wine rating on the loyalty in terms of wine shopping is positive. Indeed, the level of loyalty increases by 0,467 when the usefulness increases by 1.

Table 23: general linear model: Usefulness and loyalty to the retailer in terms of wine. (3)

Parameter Estimates							
Dependent Variable: FIDVIN							
Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.136	.366	3.108	.002	.416	1.857	.044
Usefulness	.467	.067	6.956	.000	.335	.600	.188
[Scenario=1.00]	.065	.213	.308	.759	-.354	.485	.000
[Scenario=2.00]	.118	.212	.555	.579	-.300	.535	.001
[Scenario=3.00]	-.057	.216	-.266	.791	-.484	.369	.000
[Scenario=4.00]	0 ^a	.	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Therefore, the expected level of loyalty to the retailer in terms of wine shopping equals:
 $1,136 + 0,467 * \text{usefulness} + e$.

Therefore, we can **accept H5b** when considering the loyalty to the retailer in terms of wine shopping.

(2) FIDGEN

First of all, the graph shows a tendency of the loyalty in terms of grocery shopping to grow with the usefulness. It seems to be an effect. Second of all, the Levene's test of the equality of error variances indicates a p-value of 0,779, which is higher than 0,05. Thus, the residual variances do not differ between the scenarios.

In the table n°24, we see that the p-value assigned to the interaction test equals 0,855. Thus, we keep the hypothesis of no interaction between the scenarios and the usefulness.

Table 24: general linear model: Usefulness and loyalty to the retailer in terms of grocery shopping. (1)

Tests of Between-Subjects Effects						
Dependent Variable: FIDGEN						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	40.514 ^a	7	5.788	6.905	.000	.190
Intercept	23.926	1	23.926	28.542	.000	.122
Scenario	.773	3	.258	.307	.820	.004
Usefulness	35.751	1	35.751	42.650	.000	.172
Scenario * Usefulness	.650	3	.217	.258	.855	.004
Error	172.679	206	.838			
Total	2723.889	214				
Corrected Total	213.193	213				

a. R Squared = .190 (Adjusted R Squared = .163)

Therefore, we re-run the test without including in the model the scenario and usefulness interaction (Scenario * Usefulness).

On the other hand, we see a significant effect of the usefulness of the wine rating on the loyalty to the retailer in terms of grocery shopping. Indeed, the p-value equals 0,000 which is lesser than 0,05 (table n°25).

Table 25: general linear model: Usefulness and loyalty to the retailer in terms of grocery shopping. (2)

Tests of Between-Subjects Effects						
Dependent Variable: FIDGEN						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	39.865 ^a	4	9.966	12.017	.000	.187
Intercept	25.596	1	25.596	30.864	.000	.129
Usefulness	38.701	1	38.701	46.666	.000	.183
Scenario	1.047	3	.349	.421	.738	.006
Error	173.328	209	.829			
Total	2723.889	214				
Corrected Total	213.193	213				

a. R Squared = .187 (Adjusted R Squared = .171)

Additionally, we see in the table n°26 that the effect of the usefulness of the wine rating on the Loyalty is positive. Indeed, the level of loyalty increases by 0,387 when the usefulness increases by 1.

Table 26: general linear model: Usefulness and loyalty to the retailer in terms of grocery shopping. (3)

Parameter Estimates							
Dependent Variable: FIDGEN							
Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.436	.308	4.658	.000	.828	2.043	.094
Usefulness	.387	.057	6.831	.000	.275	.498	.183
[Scenario=1.00]	.154	.179	.859	.391	-.199	.507	.004
[Scenario=2.00]	.190	.178	1.067	.287	-.161	.542	.005
[Scenario=3.00]	.136	.182	.747	.456	-.223	.495	.003
[Scenario=4.00]	0 ^a	.	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Therefore, the expected level of loyalty to the retailer equals: $1,436 + 0,387 * \text{usefulness} + e$.

Therefore, we can **accept H5b** when considering the loyalty to the retailer in terms grocery shopping.

6. Hypothesis 6

For the hypothesis H6a we will run a simple linear regression. On the other hand, as the 3 other hypothesis (H6b, H6c, H6d) have the same dependent variable, we will use a multiple regression.

a) H6a

- **H6a: Good retailer's reputation improves the perceived product quality.**

Table 27: Simple linear regression of the perceived quality in function of the retailer reputation.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	REPUT ^b	.	Enter

a. Dependent Variable: PQUAL

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.406 ^a	.165	.161	.72216	1.927

a. Predictors: (Constant), REPUT

b. Dependent Variable: PQUAL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.785	1	21.785	41.773	.000 ^b
	Residual	110.562	212	.522		
	Total	132.347	213			

a. Dependent Variable: PQUAL

b. Predictors: (Constant), REPUT

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.041	.233		13.044	.000		
	REPUT	.367	.057	.406	6.463	.000	1.000	1.000

a. Dependent Variable: PQUAL

Looking at the regression results in the table n°27, we see that the Durbin-Watson indicator is close to 2 (1,927) so that there is independence between the error terms. The residuals are normally distributed, and the scatterplots show no tendency with most of the data between -2 and 2. The p-value is under 0,05 which makes the results significant.

The retailer reputation (REPUT) explains 16,5% of the variance in the perceived quality (PQUAL).

Here is the formula of the expected product quality value in function of the retailer reputation: $3,041 + 0,367 * \text{REPUT} + e$

There is a significant positive effect (although small) of the retailer reputation on the perceived quality. Therefore, we can **accept H6a** (until proved otherwise).

b) H6b, H6c, H6d

- **H6b: The retailer trust improves the purchase intention.**
- **H6c: Good retailer's reputation increases the purchase intention.**
- **H6d: The retailer loyalty increases the purchase intention.**

We have run 2 multiple regressions. One with the loyalty to the retailer and the other one with the loyalty to the retailer considering wine purchase. We see in the table n°28 that neither of the two kinds of loyalty were significantly impacting the purchase intention.

Table 28: regression of the purchase intention in function of reputation, trust and loyalty.

Model with FIDVIN

Coefficients ^a								
Model	Unstandardized Coefficients			Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error					Tolerance	VIF
1	(Constant)	1.461	.430		3.398	.001		
	REPUT	.400	.106	.271	3.766	.000	.714	1.401
	CONF	.294	.105	.215	2.797	.006	.627	1.594
	FIDVIN	.092	.080	.086	1.160	.248	.679	1.473

a. Dependent Variable: INTACH

Model with FIDGEN

Coefficients ^a								
Model	Unstandardized Coefficients			Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error					Tolerance	VIF
1	(Constant)	1.399	.434		3.223	.001		
	REPUT	.411	.106	.278	3.884	.000	.723	1.384
	CONF	.311	.104	.227	2.996	.003	.643	1.555
	FIDGEN	.075	.092	.058	.811	.418	.719	1.390

a. Dependent Variable: INTACH

Thus, we have withdrawn from the multiple regression the loyalty as independent variable. Which leaves us with the analysis of the multiple regression of the impact of trust and reputation on the purchase intention.

Table 29: regression of the purchase intention in function of reputation and trust.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	CONF, REPUT ^b	.	Enter

a. Dependent Variable: INTACH

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.468 ^a	.219	.212	1.14369	1.739

a. Predictors: (Constant), CONF, REPUT

b. Dependent Variable: INTACH

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	77.491	2	38.746	29.621	.000 ^b
	Residual	275.995	211	1.308		
	Total	353.486	213			

a. Dependent Variable: INTACH

b. Predictors: (Constant), CONF, REPUT

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.445	.430		3.359	.001
	REPUT	.428	.104	.290	4.130	.000
	CONF	.343	.096	.251	3.577	.000

a. Dependent Variable: INTACH

We see in the table n°29 that this model is valid. Indeed, the Durbin-Watson indicators is relatively close to 2 (1,739) so that the errors are independent. They are normally distributed.

The scatterplot shows no tendency with almost all the values included between -2 and 2.

Finally, all the variables show a variance inflation factor that is under 2 (1,329).

Regarding the analysis, the p-value of the retailer's reputation and trust are under 0,05. And so is the p-value of the model.

Furthermore, the model shows that the trust and the reputation explain 21,9% of the variance in the purchase intention. The following formula of the expected purchase intention shows that the trust in the retailer (CONF) and its reputation (REPUT) have a positive effect on the purchase intention (INTACH).

The expected purchase intention = $1,445 + 0,428 * REPUT + 0,343 * CONF + e$

In conclusion of the 6th hypothesis, we **reject H6d**, and we **accept H6b and H6c** (until proved wrong).

7. Hypothesis 7

- **H7: The wine perceived quality increases the purchase intention.**

For this hypothesis, we have mobilized a simple linear regression. The aim is to investigate the impact of the perceived quality on the purchase intention.

Table 30: Simple linear regression of the purchase intention in function of the perceived quality.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	PQUAL ^b	.	Enter

a. Dependent Variable: INTACH

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.634 ^a	.402	.399	.99858	1.715

a. Predictors: (Constant), PQUAL

b. Dependent Variable: INTACH

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	142.086	1	142.086	142.489	.000 ^b
	Residual	211.400	212	.997		
	Total	353.486	213			

a. Dependent Variable: INTACH

b. Predictors: (Constant), PQUAL

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.016	.398		.039	.969
	PQUAL	1.036	.087	.634	11.937	.000

a. Dependent Variable: INTACH

We can see in the table n°30 that the Durbin-Watson indicators is relatively close to 2 (1,715). The residuals are normally distributed, and the scatterplots shows no tendency with most of the data between -2 and 2. We see that the perceived quality (PQUAL) of the wine explains 40,2% of the purchase intention (INTACH).

The following formula shows the expected purchase intention in function of the perceived quality: $INTACH = 0,16 + 1,036 * PQUAL + e$

There is a positive impact of the perceived quality on the purchase intention. Therefore, we **accept H7** (until proved wrong).

It is also interesting to point out the fact that the intention of purchase is close to 0 when the perceived quality equals 0. And that the purchase intention increases a little bit more than one when the perceived quality increases by one. Thus, there is a strong relation.

8. Hypothesis 8

- **H8: The product purchase intention is higher when the source of the rating is the customers rather than the retailer.**

Table 31: Independent samples t-test: purchase intention and source.

Group Statistics										
	Source	N	Mean	Std. Deviation	Std. Error Mean					
INTACH	distributeur	113	4.7677	1.27376	.11982					
	Clients	101	4.6089	1.30548	.12990					

Independent Samples Test										
Levene's Test for Equality of Variances				t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
INTACH	Equal variances assumed	.410	.523	.900	212	.369	.15879	.17648	-.18909	.50667
	Equal variances not assumed			.899	208.073	.370	.15879	.17673	-.18961	.50719

In opposition with our hypothesis, we see in the table n°31 that the mean of the product purchase intention is higher when the source of the rating is the retailer than when it is the clients ($4,7677 > 4,6089$). On the other hand, the difference between the two means is not significant because the p-value is above 0,05 ($t=0,899$; $p\text{-value}=0,37 > 0,05$). Therefore, we cannot reject the null hypothesis which states that there is no significant difference between the two means.

We reject the hypothesis H8.

9. Hypothesis 9

We have assessed the veracity of H9a and H9b with the same test than in H8.

a) H9a

- **H9a: The perceived quality of the Vina is higher when the rating equals 5 stars rather than 3 stars.**

Table 32: Independent samples t-test: perceived quality and score.

Group Statistics					
	score	N	Mean	Std. Deviation	Std. Error Mean
PQUAL	3etoiles	109	4.2263	.67720	.06486
	5etoiles	105	4.8127	.78708	.07681

Independent Samples Test										
Levene's Test for Equality of Variances				t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PQUAL	Equal variances assumed	2.863	.092	-5.849	212	.000	-.58640	.10025	-.78402	-.38878
	Equal variances not assumed			-5.833	204.884	.000	-.58640	.10054	-.78461	-.38818

As expected, we see in the table n°32 that the perceived quality of the Vina is higher when the score of the rating equals 5 stars rather than when it equals 3 stars ($4,8127 > 4,2263$). Meanwhile the difference is significative since the $p\text{-value} < 0,05$ ($t = -5,833$; $p\text{-value} = 0,000 < 0,05$). Therefore, we reject the null hypothesis which states that there is no difference between the two means.

We **accept H9a** (until proved wrong).

b) H9b

- **H9b: The purchase intention is higher when the rating score equals 5 stars rather than 3 stars.**

Table 33: Independent samples t-test: purchase intention and score.

Group Statistics				
score	N	Mean	Std. Deviation	Std. Error Mean
INTACH 3etoiles	109	4.1422	1.23292	.11809
5etoiles	105	5.2643	1.08299	.10569

Independent Samples Test									
Levene's Test for Equality of Variances				t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower Upper
INTACH	Equal variances assumed	3.264	.072	-7.063	212	.000	-1.12208	.15886	-1.43524 -.80893
	Equal variances not assumed			-7.080	210.234	.000	-1.12208	.15848	-1.43450 -.80967

As expected, and stated in this hypothesis, we see in the table n°33 that the purchase intention is higher when the score of the rating equals 5 stars rather than 3 stars (5,2643>4,1422). Meanwhile the difference is significative since the p-value<0,05 (t=-7,063; p-value=0,000 <0,05). Therefore, we reject the null hypothesis which states that there is not any difference between the two means.

We **accept H9b** (until proved wrong).

10. Hypothesis 10

In this section we will be using a moderation analysis. Indeed, we assume that the level of implication of the respondents in wine might affect the strength of the independent variables' effects on dependents variables. For this, we have downloaded the PROCESS macro developed by Andrew f. Hayes.

a) H10a

- **H10a: The impact of the wine rating score on the perceived quality is lower for the highly involved wine customer.**

Unfortunately, we can see in the table n°34 that the effect of the implication in wine does not affect the relationship between the rating score and the perceived quality of the wine. Indeed, we see that the p-value assigned to the variable IMPVIN (implication in wine) equals 0,3437 and it is greater than 0,05. Thus, the moderator effect of IMPVIN is not significant.

Table 34: Moderation test of the implication in wine on the effect of the score on the perceived quality.

```
*****
OUTCOME VARIABLE:
PQUAL

Model Summary
      R      R-sq      MSE      F      df1      df2      p
    .3925    .1541    .5331   12.7482    3.0000   210.0000    .0000

Model
      coeff      se      t      p      LLCI      ULCI
constant  4.1378   .2143  19.3049   .0000    3.7153    4.5603
Score     .2987   .3013   .9915   .3226   -.2952    .8927
IMPVIN     .0214   .0490   .4368   .6627   -.0752    .1180
Int_1      .0629   .0663   .9490   .3437   -.0678    .1937

Product terms key:
Int_1      :      Score      x      IMPVIN

Test(s) of highest order unconditional interaction(s):
      R2-chng      F      df1      df2      p
X*W     .0036     .9007    1.0000   210.0000   .3437
```

Therefore, we must **reject H10a**.

b) H10b

- **H10b: The impact of the wine rating score on the purchase intention is lower for the highly involved wine customer.**

Unfortunately, we can see in the table n°35 that the effect of the implication in wine does not affect the relationship between the rating score and the purchase intention of the wine.

Indeed, we see that the p-value assigned to the variable IMPVIN (implication in wine) equals 0,9696 and it is greater than 0,05. Thus, the moderator effect of IMPVIN is not significant.

Table 35: Moderation test of the implication in wine on the effect of the score on the purchase intention.

```
*****
OUTCOME VARIABLE:
INTACH

Model Summary
      R      R-sq      MSE      F      df1      df2      p
    .4388    .1926    1.3591   16.6965    3.0000   210.0000   .0000

Model
      coeff      se      t      p      LLCI      ULCI
constant  3.9907   .3422  11.6610   .0000    3.3160    4.6653
Score     1.0922   .4811   2.2704   .0242    .1439    2.0405
IMPVIN     .0366   .0782   .4685   .6399   -.1175    .1908
Int_1      .0040   .1059   .0381   .9696   -.2047    .2128

Product terms key:
Int_1      :      Score      x      IMPVIN

Test(s) of highest order unconditional interaction(s):
      R2-chng      F      df1      df2      p
X*W     .0000     .0015    1.0000   210.0000   .9696
```

Therefore, we must **reject H10b**.

c) H10c

- **H10c: The effect of the wine rating credibility on its usage is greater for highly involved wine customers.**

Unfortunately, we can see in the table n°36 that the effect of the implication in wine does not affect the relationship between the rating credibility on its usage. Indeed, we see that the p-value assigned to the variable IMPVIN (implication in wine) equals 0,4626 and it is greater than 0,05. Thus, the moderator effect of IMPVIN is not significant.

Table 36: Moderation test of the implication in wine on the effect of the credibility on the usage.

OUTCOME VARIABLE: usage						
Model Summary						
	R	R-sq	MSE	F	df1	df2
	.5813	.3380	.6975	35.7333	3.0000	210.0000
						p
						.0000
Model						
	coeff	se	t	p	LLCI	ULCI
constant	2.0610	.6365	3.2380	.0014	.8062	3.3157
CREDIB	.6875	.1678	4.0968	.0001	.3567	1.0184
IMPVIN	.1673	.1332	1.2566	.2103	-.0952	.4299
Int_1	-.0257	.0350	-.7359	.4626	-.0947	.0432
Product terms key:						
Int_1	:	CREDIB	x	IMPVIN		
Test(s) of highest order unconditional interaction(s):						
	R2-chng	F	df1	df2		p
X*W	.0017	.5416	1.0000	210.0000		.4626

Therefore, we must **reject H10c**.

Unfortunately, after having conducted the test, it appears that none of the 3 hypotheses show a significant moderation of the implication of the respondents into wines on the effects of independent variables on dependent variables. Indeed, their p-value are higher than 0,05 (H10a:0,3437; H10b:0,9696; H10c:0,4626).

Therefore, we must **reject H10a, H10b and H10c**

VI. RESULTS AND DISCUSSION

In this section we will give the results of our research and comment them. In total 9 of the 17 hypotheses were accepted (until proven wrong). We can see in the table n°37 the ones who were accepted and rejected.

Table 37: Acceptation state of the hypotheses.

Variables	State
H1	Rejected
H2	Rejected
H3	Rejected
H4	Accepted
H5	Accepted
H6a	Accepted
H6b	Accepted
H6c	Accepted
H6d	Rejected
H7	Accepted
H8	Rejected
H9a	Accepted
H9b	Accepted
H10a	Rejected
H10b	Rejected
H10c	Rejected

First, we can say that the rating score and the rating source does not have any significant effect on the credibility of the wine rating.

Furthermore, the rating source does not influence the usage of the wine rating featured on the ESL.

On the other hand, the credibility assigned by the customers to the wine rating has a positive impact on the usage of this very rating. Indeed, we were able to observe in our sample a

relation of one to half. This means that when the level of credibility increases by one, the level of usage increases by a bit more than a half a point.

The usage has an impact on the loyalty. Indeed, when the usage of the wine rating increases, the loyalty to the retailer increases as well. As we mentioned before, we have studied the loyalty to the retailer in terms of wine and in terms of grocery shopping. The positive effect of the rating usage applies for both kinds of loyalty. Moreover, we can say that the impact of the usage of the wine rating on the loyalty is greater in terms of wine shopping than in terms of general grocery shopping.

This also applies to the usefulness. Indeed, the usefulness has a positive impact on the loyalty. Similarly, to the usage, it has a greater impact on the loyalty to the retailer in terms of wine shopping rather than the general grocery shopping.

More generally the effect of the usage on the loyalty is greater than the effect of the usefulness. Part of this conclusion resides in the fact that the construct of the usage is partially made of the construct of the usefulness.

After that, we have analyzed the effect of the retailer characteristics on the product perceived quality and purchase intention. We have observed a positive effect of the retailer reputation on the perceived quality of his product. In other words, people see a better quality for the products offered by a good reputation retailer rather than a poor reputation retailer. Moreover, the reputation of the retailer as well as the customers' trust in the retailer have both a significant positive effect on the customers purchase intention. On the other hand, we have not observed any significant influence of the retailer loyalty in terms of wine or in terms of grocery shopping.

As expected, we have observed a strong relation between the perceived quality of the wine, and the purchase intention customers have towards the wine. Indeed, when the perceived quality increases, the intention to purchase increases as well. More particularly the effect of the perceived quality on the purchase intention is greater than one. In other words, an increase of the perceived quality eventually results in a greater increase of the purchase intention. Which makes the perceived quality a crucial determinant of the purchase intention.

It is now crucial to address the impact of the main variables at stakes in this research, the wine rating source, and the wine rating score. First, we have not observed any significant effect of the rating source on the product purchase intention.

On the other hand, the wine rating score has a positive influence on the product perceived quality as well as the purchase intention. Indeed, the means of these two latter variables are significantly higher when the rating score equals 5 than when it equals 3.

In conclusion, regarding the two main variables of our research, the rating source does not have a significant impact on any of the 3 hypotheses we considered. In other words, the source of the rating does not influence its credibility, nor its usage, nor the purchase intention. On the other hand, the wine rating score is a key component of our research. Indeed, it positively affects the performances of the retailer with the perceived quality and the purchase intention.

Finally, we have studied the potential moderating effect of the implication of the customer in wine. In other words, the attitude and level of expertise people have towards wine. Contrary to our hypotheses, the implication in wine does not have any significant moderating effect. Indeed, it does not significantly impact the relation between the wine rating credibility and its usage. Moreover, it does not moderate the relation between the wine rating score and the perceived quality, nor the relation between the wine rating score and the purchase intention.

In conclusion, we are convinced that the rating score has a major positive impact on the attitude of the customers towards the product. Whether it is the perceived quality or the purchase intention. On the other hand, the wine rating source is not as crucial as expected by the exploratory research since it does not affect any variables at stakes.

Moreover, the credibility, which constituted a great variable of concern in our research, is not impacted by the wine rating score or its source. On the other hand, the credibility of the wine rating positively affects the usage of the wine rating.

Regarding business concerns, the usage of the wine rating impacts positively both loyalty to the retailer in terms of general grocery shopping and in terms of wine shopping. Additionally, the rating usage has a bigger effect on the loyalty to the retailer in terms of wine shopping than in terms of general grocery shopping.

VII. RECOMMENDATIONS

In this section we provide recommendations to the retailers eager to implement product ratings.

First, we advise the retailer to pay attention to the rating valence they show to the customers. Indeed, the score of the rating positively influence the perceived quality of the product which eventually enhances the purchase intention.

Secondly, the retailer who wants to retain customers and increase its loyalty can foster the usage of the ratings. In order to increase the usage of the rating, the distributor should enhance the credibility of the displayed product ratings. The credibility will be a key concern of the customers attitude towards the rating and eventually a determinant of his purchase behavior.

Furthermore, if the retailer does not want to implement this system for all the product categories, we advise him to focus on the ones that he wants to increase the loyalty for. Indeed, providing a product rating also increases the loyalty to this very product.

Considering the source of the rating, our research encourages the distributor not to spend too much time on the choice of the rating source since it does not have any significant effect.

VIII. LIMITS AND FURTHER RESEARCH

It is important to keep in mind that our research has been done in a particular context. Indeed, due to the Covid-19 crisis, we had to replace the store environment by a digital scenario. Hence, we are aware of the fact that people who answered the questionnaire were not fully immersed in the shopping atmosphere. So that their answers could differ with a physical context. We think that a further in-store experiment needs to be conducted to compare the outcomes with our results and see if the findings are consistent.

Another limit of our work is the fact that we have showed a price in the scenarios. Even though we have chosen a mean price and that all the scenarios featured the same price, it could still have an impact on the way people answered the questions.

Furthermore, we have featured a 75cl inscription on the scenario electronic shelf label. Similarly to the price, it is featured in all the scenarios, but it could still have an impact on the answers.

In the same extent, the name “Vina” could have impacts on the results.

A further research considering two sizes of the bottles, two different prices, and another name could be interesting to make. Indeed, it could shed the light on the extent to which these factors influence the impact of the rating on the consumers.

To fully grasp the effect of a product rating on a customer, it could be interesting to make the same kind of study considering a different good. Indeed, the results might variate according to the nature of the product as we mentioned in the “Customer review and product purchase intention” section. We have considered an experiential product, but it could be interesting to understand the impact of a utilitarian good rating on the consumer.

In the interviews, we have noticed that a major aspect that people expect on the ESLs, is a QR code. It seems for the respondents that to be smart, a label needs to feature a scan affordance. Meanwhile all the interviewees agreed on the fact that smartphones are in the heart of their lives. Thus, the use of a QR code is relevant since they have phones to interact with them.

On the other hand, the people have asked if they could know how the rating has been built. They want to know what the mobilized criteria are to make the 5 stars rating score. For instance, the number of clients who have reviewed the product or the different measures used to build the rating such as the quality to price ratio could be valuable information for the consumers.

Thus, it would be interesting to make a research that considers an ESL embedded with a product rating and a QR code that leads to the explanation of the score. It could improve the credibility which will increase the usage of the rating and eventually enhance the loyalty.

Furthermore, an ESL embedded with a QR code could lead to more precise reviews. In this study we have considered a 5-stars score review. But in the literature, we have seen that written comments on products are also key information for the consumers. Thus, it could be interesting to study the case of a product written review instead of a 5-stars product rating. Moreover, these two kinds of review could also be complementary. For instance, the ESL could directly show a 5-stars rating and at the same time have a QR code that would lead to more in-depth reviews.

Furthermore, we have considered the potential purchase of the Vina that is influenced by its rating. Moreover, no respondents could ever know the quality of this product in any way before buying it. On the other hand, once they have bought and tested it, the clients could agree or disagree with the assigned score of this wine. Therefore, it seems interesting to conduct a study of the impacts of the rating on consumers before and after having bought the product at stakes. In that way, we could discover if there are changes in people's attitude toward a product rating between the pre-purchase phase and the post-purchase phase.

Regarding the ESL, the interviews have brought our attention on the fact that people are very interested about the ESL featuring the product composition. It seems that this characteristic could allow the consumers to make better purchase.

Similarly, it appears that people are interested about product origins and producing cycle. It becomes interesting to study the impact of additional information about product composition on the consumers behavior and attitude.

Speed was also a key determinant of the interviewees' shopping experience. Hence, a further research considering an ESL feature that might enhance the speed of grocery shopping could be interesting to do. For instance, ESL can be embedded with a check outs technology.

Regarding the statistical results, we have ignored the cross impacts of the two scenario variables in the analysis. For instance, if we made an assumption about the impact of the product rating score on the purchase intention, we simply compared the extent of the purchase intention based on the 3- and 5-stars ratings group means. Hence, we ignored the fact that in these data some of the respondents faced the scenario of the client source and the others had the retailer source. In the real life it may occur that the effect of a 3-star rating might change whether it is linked with a client source or a retailer source. Same thing applies for all the 4 possible scenarios.

Finally, the statistical analysis has been done based on a sample of 214 respondents. Even though it is a sufficient number, we are aware that the veracity of our results would always be more robust with a greater sample.

IX. CONCLUSION

As we mentioned in the beginning of the work, the smart technologies offer more and more retailing possibilities. In the case of the electronic shelf labels, it seems that they can offer more information than the regular shelf label. QR codes, RFID connections are two of the numerous applications. In this work we chose to consider a product rating as the application.

Eventually we have decided to focus our thesis scope on the product rating itself. Moreover, we considered the case of a wine rating.

The aim of this study was to understand the impact of the ESL's product rating on the consumers. And more particularly, we wanted to understand how consumer react facing the product rating source and the product rating score. Many papers address the impact of SRTs on the retailer, but a few consider the impact of the SRTs on the consumers. The goal was to discover how people see the product rating to know whether retailers should implement it and how they should implement it.

The work was divided as following: we started with a literature review which covered the relevant topics of our work, such as the retailing, the customers, the credibility, the ESL, and the wine. After that, we have conducted qualitative interviews in order to grasp insights on our problematic. Eventually the two first parts allowed us to build hypotheses. The last part of the work consisted in an experimentation ran via a questionnaire featuring 4 possible scenarios. Finally, we statistically analyzed the data and were able to either accept or reject the assumptions we had built.

In conclusion, we can say that consumers are sensible to the wine rating valence since it affects positively their perceived wine quality as well as their purchase intention.

On the other hand, we have not observed any significant effect of the wine rating source. Regarding the credibility of the wine rating, we can say it is a major determinant of its usage, which eventually improves the retailer loyalty. This applies for the two kinds of loyalty, that is in terms of wine shopping and in terms of general grocery shopping. However, the simple presence of the information of the product source on the ESL, does not affect the level of credibility the customers assign to the product rating.

Additionally, the retailer reputation and trust, have positive impacts on the purchase intention.

This work allowed us to enlighten crucial variables about the topic of the product ratings and their impacts on the consumers. This theme is still young and will need further research in order to discover how to enhance these very variables.

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