Full Length Research Paper

The decision making process on the adoption of innovations in the Brazilian Serra Gaúcha hills vitiviniculture: The case of Wine Producers Association of Altos Montes, at Serra Gaúcha/Rio Grande do Sul/Brazil (APROMONTES)

de OLIVEIRA Gabriel Nunes[1]*, ARBAGE Alessandro Porporatti[1,2] and COSTA Nilson Luiz[1]

[1]Departamento de Economia, Universidade Federal de Santa Maria, Palmeira das Missões, Rio Grande do Sul, Brazil.
[2]Department of Agricultural Education and Rural Extension (DEAER), Federal University of Santa Maria-RS, Brazil.

This article discusses the decision-making process of Wine Producers Association of Altos Montes, at Serra Gaúcha/Rio Grande do Sul/Brazil (APROMONTES) winegrowers and winemakers, in their process of adopting innovations to increase their competitiveness. To do that, we used the Prospect Theory. Data collection was conducted through interviews with 12 wineries, 25 winegrowers of APROMONTES wineries, and, as witnesses, seven winegrowers, members of the Rural Labor Union (STR), from Flores da Cunha, Rio Grande do Sul/Brazil. The results point to the fact that both the wineries and winegrowers support their decisions on heuristics of judgment, and, wine producers use mainly the affect, representative, anchoring and adjustment heuristics, while the wineries used representative and affect heuristics. In this perspective, we identified winegrowers as "affective decision makers" whose decisions are based primarily on emotional aspects. On the other hand, the wine makers as "copier decision makers" whose decisions are supported primarily by observing the decisions of other wine producers: The practice of overflow.

Key words: Decisions, judgment heuristics, wine production sector.

INTRODUCTION

The Agro industrial System (SAG) Vitiviniculture located in the Serra Gaúcha/Rio Grande do Sul/Brazil hills products are facing strong price competition from products from other countries and even other producing regions in Brazil. Therefore, generating demand for innovations in the production processes and management, and also, the creation of new products that can increase the sector's competitiveness (Protas et al., 2002; Visão, 2025, 2006).

However, by adopting such innovations, the SAG sets

*Corresponding author. E-mail: ambientalgnu@uol.com.br.

new trading levels between the various links of the supply chain, since such innovations have - for winegrowers - the vineyards conversion character, planting specific varieties, in addition to the adoption of new production methodologies. These innovations result in higher levels of specific assets and greater complexity in the transactional process between winegrowers and winemakers, which could generate more uncertainty, due to the increased risk perspective. This can lead these agents not making the investments necessary to the innovation process, which may decrease the chances of SAG in a highly competitive environment (Paiva and Lentz Jr., 2011).

An important asset to this investigation is the discussion raised by Simon (1972, 1977, 1980) of rationality as a theory of human behavior. Simon (1977) moves the actions of global rationality model towards a bounded rationality perspective. This author (1977) proposes three levels of analysis: (a) To list all possible behavioral alternatives; (b) To determine all the future consequences to adopt each of these alternatives; (c) To compare these alternatives, which should be evaluated by the sets of consequences following each one of them. Torres Junior and Moura (2011) complement Simon's proposal by suggesting the following steps: (i) To understand the problem, its context and possibilities; (ii) To establish the criteria to be chosen according to the scope of the decision-maker/organization; (iii) To establish the alternatives as well as the influences of these alternatives in the defined objectives; (iv) To collect information to evaluate the consequences of each alternative as well as the possibilities to generate new alternatives; (v) To evaluate the alternatives considering the costs, estimated results, risks and other objectives; (vi) To choose and implement the defined actions and (vii) To follow the results, acting in the correction of problems, returning, if necessary, to the first step (understand the problem).

Looking at Simon's (1977) and Torres Junior and Moura's proposals (2011), we begin to understand how the decision-making process is cognitively complex. Therefore, another theory may be brought into picture to unveil the decision-making process on the adoption of innovations: The Prospect Theory.

The Prospect Theory

In an attempt to clarify the in and outs of Prospect Theory, Kahneman (2011) makes use of a working model of the human mind consisting of two systems: System 1 (fast) and system 2 (slow). The system 1 works automatically and therefore quickly, with minimum effort, and no perception of voluntary control. It has innate abilities, common in other animals, such as the ability to perceive the world, to identify objects, to drive attention to prevent loss and fear, to incorporate repetitive activities,

associating ideas, to read and understand the nuances of social situations. All these processes are stored in our memory and are accessed unintentionally and without effort. Some automatic activities: Distinguish distances between objects, recognize a docile nature.

System 2 takes notice of effortful mental activities that require complex calculations. It is typically lazy, slow and logical, therefore, works on complex issues. It can build thoughts by ordering series of steps. These activities have common features. They require much attention and are suspended when that attention is diverted. Some examples: filling in the form of income tax, count the occurrence of the letter "a" on a page.

We can visually describe Kahneman's proposal (2011) as follows (Figure 1). Kahneman (2011) describes the associative process as another system 1 skill, whereas when we see, hear or feel something, in the end, we suffered some stimulus, we have as a result the called associative activation, in which ideas that were memorized activate many other ideas, like a twister shaking the brain, which psychologists call associative memory.

Kahneman (2011) points out that the system 1 is characterized by creating stories with causal connections from the perception of information which we are exposed and this is an automatic operation. This story with its causal connections is achieved by system 2 that accepts it.

The quickness of system 1 has already been approached but it is important to treat how this occurs and what is its consequence. Quick conclusions would have no major problems if there was a high probability that they were not wrong.

The stories we have built are the System 1's responsibility. They rely on activated ideas and are not recovered by the memory - as if they never existed. In other words, there is no possibility of using them. Kahneman (2011) highlights the fact the quantity and quality of information whereupon the story will be settled are negligible. Faced with this information, the system 1 is quick to draw its conclusions.

The author points out that the attitude would be towards the search for more information about the problem, what would be important to build a conception of the subject-matter being investigated. The first attribute is enough for system 1 to deduct and issue its conclusion, with all cognitive comfort and, when this system seeks congruence with system 2, which is slow, it finds out that the system 2 will secure the intuitive beliefs generated by the system 1. Kahneman (2011) created an expression to refer to the perception of disability beyond what is evident to System 1: WYSIATI (what you see is all there is).

Regarding the judgments we make about certain people or situations, Kahneman (2011) clarifies that we are capable of answering a multitude of questions that we are made by others or by ourselves. These questions are
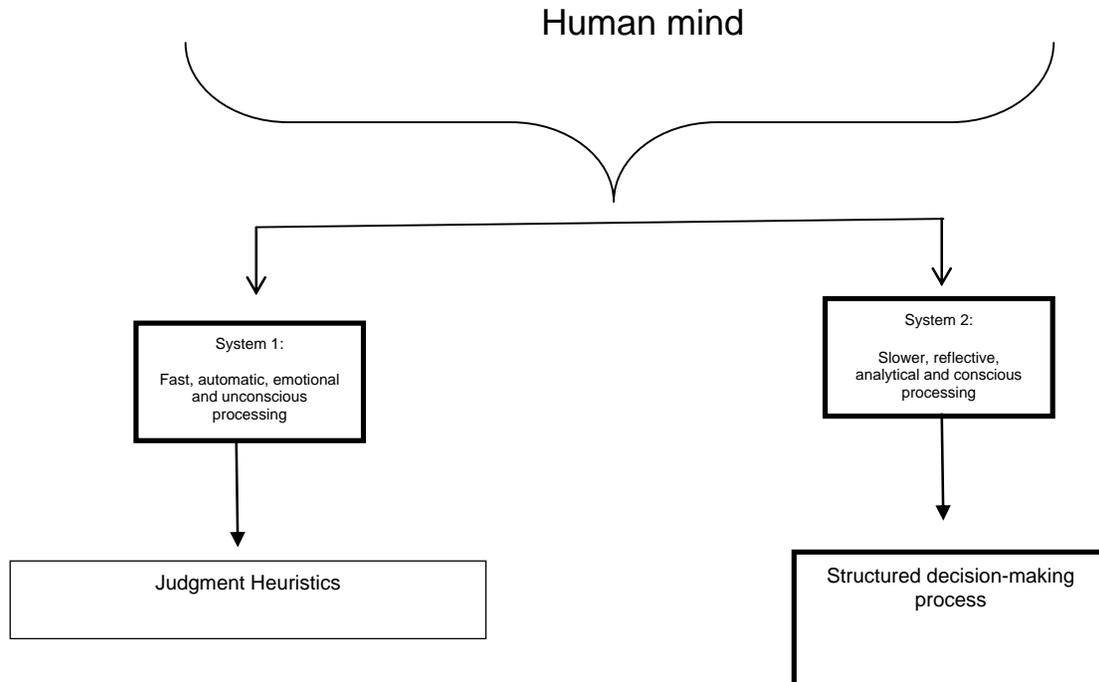
Human mind

System 1:		System 2:
Fast, automatic, emotional and unconscious processing		Slower, reflective, analytical and conscious processing

| Judgment Heuristics | | Structured decision-making process |

Figure 1. Mental Model based on Kahneman (2011).

sent to the system 2, which will conduct an investigation inside the memory in search of answers. But the system 1 proceeds continuously monitoring what is happening in the mind and beyond, continuously, generating ratings of the various features of the situation without specific goals and inferring little effort into it. It is precisely this basic assessment that is responsible for the intuitive judgment (heuristics), which takes the place of the most difficult issues.

Kahneman (2011) defines, technically, heuristics as a simple procedure that helps getting appropriate responses, even incomplete, for complex issues. Among the heuristics, the author lists the representation, where the probability in which things, people and events are evaluated, following the criterion of the degree to which is representative of, or similar to something is already known. That is, studies prove that events that should be assessed according to their probabilities are evaluated by the similarity and representativeness.

This type of trial, according to Kahneman and Tversky (1974), leads to significant errors, given that neither the similarity nor the representativeness is influenced by factors that interfere on the probabilities of course trials. That is, they are not settled in data probabilistic basis.

According to Kahneman (2011), the availability heuristic is a cognitive procedure (trial heuristics) in which people estimate the frequency of a class or the probability of an event by the easiness in which instances or occurrences can be brought to mind. It is the confidence in which the elements come to mind. When

we encounter a specific feature, any figure immediately comes to mind that represents these characteristics. This availability may be favored by the frequency that such events are presented, like the media exposure for instance.

Imagination is also responsible for a significant bias in the probability assessment in real situations, because if some difficulties are perennials in our mind, it is possible that the situation could be impregnated by these difficulties. However, these difficulties do not have the actual probability of their occurrence.

Another device of availability which can lead to a bias is illusory correlation, in which two events that have a high mental frequency can occur simultaneously via the associative bonding, leading to an idea that there is a correlation between them.

There are situations in which the evaluation process for decision making is given by estimation of the initial values that ranges toward a final result. This initial rate can take values depending on the questioning or a partial calculation to provide that value. Moreover, these different starting points yield different estimates, which produce bias towards the initial values. Kahneman and Tversky (1974) call this process the anchoring phenomenon or heuristic adjustment and anchoring. This phenomenon can be seen when the individual is exposed to a value or is based on some incomplete computing at the beginning of its assessment, which can lead the individual to insufficient adjustments.

Another important issue, addressed by Kahneman

(2011) are the emotions, because they surround our daily lives and our decisions. The author leads us to reflect on the fact that, as the effect of emotions, there is a more pronounced dominance of the findings on the arguments. The author presents the psychologist Paul Slovic, who proposed the affect heuristic.

In this heuristic, people allow their empathy and repulsion to influence their beliefs about the world. logically system 2 can intervene in this process by the self-criticism, but, according to Kahneman (2011), the system 2 acts more as a protector of system 1 than as a critical analyst of emotions involved. System 2 searches for information, but this search turns more to the endorsement of beliefs than to an intention to evaluate them in all respects.

Another aspect addressed by Kahneman (2011) is the halo effect, that is to assign greater weight to first impressions, disregarding, in many cases, subsequent information, or selected information that may corroborate with those who received greater weight.

But the framing effect was first described by Kahneman and Tversky (1984) and later worked by Kahneman (2011). The emotional aspect is very important in the framing of questions. To exemplify that Kahneman (2011) describes Amos Tversky's experiment, conducted at the Harvard Medical School. There, doctors received statistical results on two different lung cancer treatment: (a) surgery and (b) radiation. The survival rates were higher after surgery although riskier than radiation within a five-year treatment. Half of the doctors were given the following information: "The survival rate in the first month after surgery is of 90%" and the other half received: "The mortality rate in the first month after surgery is of 10%".

The result was that 84% of the doctors in the first group decided for the surgery against 50% in the second group. Kahneman (2011) argues that the information of survival is more reassuring than the information about the mortality rate even for trained professional such as doctors. In other words, we tend to focus on what generates less emotional damage.

Therefore, this author points out that different ways of presenting different information usually recall different emotions. Kahneman (2011) highlights that reframing is laborious and system 2, which is responsible for this alternative, is slow and "lazy."

In terms of decision based on structured processes to adopt innovations, scope of this investigation, we follow the perspective in Figure 2.

Considering this perspective, this paper discusses how the decision-making processes take place in the productive relationship that includes both wineries and winemakers, using the prospect theory as a theoretical benefit.

MATERIALS AND METHODS

In this paper, we adopted a qualitative methodology (PATTON,

1986) that allowed capturing the stories of life experiences, especially with regard to production and industrial processes surrounding the agribusiness systems, in this case, the wine industry of the Brazilian Serra Gaúcha, in its aspects of negotiation and decision to invest in technological innovations. Data collection was personally conducted by researchers in the region spanning the APROMONTES (Montes Altos Wine Producers Association), in the Serra Gaúcha hills, Rio Grande do Sul/Brazil, where the wineries are and winemakers are located (Tonietto et al., 2013).

Definition of the sample

This study had two phases. In the first phase, we conducted semi-structured interviews with the leaders of each of the wineries associated with the APROMONTES (Montes Altos wine Producers Association). In the second one, we raffled two winegrowers linked to each of the wineries, with two exceptions: (a) One winery whose grape production is verticalized, and (b) The winery V12. In this second case (V12), we interviewed not two but four winegrowers because of their proximity with the winemakers. Besides, we also interviewed winegrowers associated to the Rural Workers Union (STR) randomly as they entered the STR agency in the city of Flores da Cunha, Rio Grande do Sul, for the payment of their health plans.

Our sample resulted in the completion of 43 (forty-three) interviews with a total duration of 45 (forty-five) hours, distributed in twelve (12) wineries surveyed, totalizing 16.61 h. Twenty-five winegrowers associated to each of the wineries of APROMONTES answered the questionnaire totalizing 24.41 h. And, as witnesses were heard seven (7) members of the winegrowers STR (Rural Workers Union) of Flores da Cunha and Nova Padua) with whom we spent 3.96 h.

Analytical procedures

To process the data collected in this study, we used NVivo software (QSR, 2011). According to Ames (2013), the basic structures of NVivo are the Document System, where the sources of the data collected in our research are located and the Index System which contains nodes, according to a pre-defined classification. According to Ames (2013), these features make possible to insert, organize and sort our data by generating matrices, charts, analysis and consultation models, either by source, by node or by key words.

In the classification of the information collected, the sources were stratified into three categories: (a) Wineries that bring together the twelve winery members of APROMONTES; (b) Linked winemakers, representing the wine growers who provide grapes for each of the twelve wineries that were chosen, and; (c) Randomly chosen winegrowers in the STR (Rural Workers Union of Flores da Cunha) who had no relation to any of the twelve wineries linked to Apromontes.

The review process was owed to the hearing of the interviews and the coding of the relevant passages in their respective category analysis (node).

Finally, the encodings were evaluated according to their density as a percentage of the total of the interviews, allowing their analysis and subsequent link of their references.

The following tables shown are from the general framework of discourse density, aiming a better explanation of each of the subjects covered. The general framework for discourse density has a 100% density in each of the corresponding columns to the wineries, winemakers and winegrowers linked to the STR. To identify the participants and their discourse in this study, we use the following index system proposed by NVivo software:

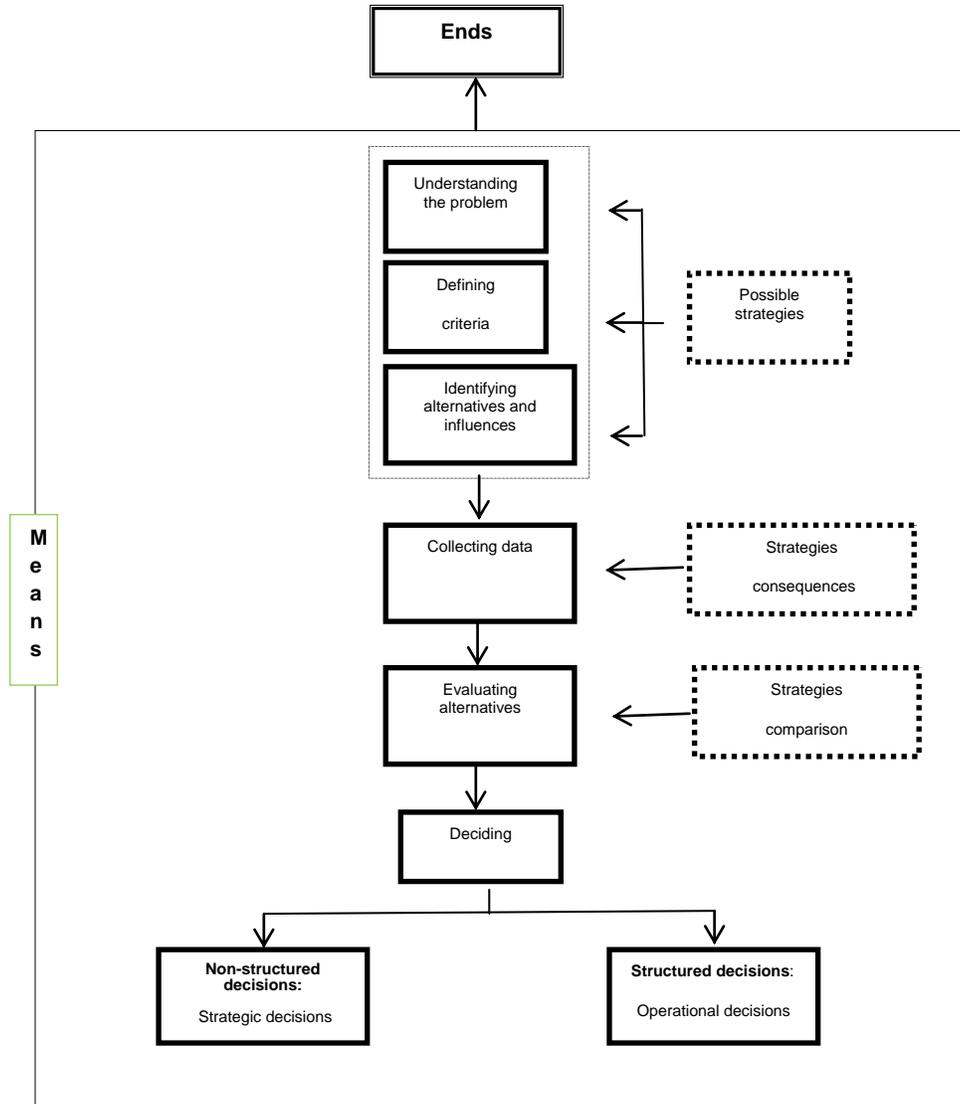*<Internal \\ V062-Winegrower> - § 2 coded references [5.81%*

Figure 2. Decision-making model based on Simon (1972, 1977, 1980) and Torres Junior and Moura (2011).

Coverage]
Reference 1 to 4.09% Coverage

This index system can be read as follows:

<Internal: The data (interviews) inserted in and processed by the software
V062-Winegrower: The winegrower number 2 from the winemaker 6
§ 2 coded references [5.81% Coverage]: Two coded discourses which cover, in terms of time, 5.81% of the participant' discourse
Reference 1 to 4.09% Coverage: The first reference (discourse) covers, in terms of time, 4.09% of the participant's discourse.

RESULTS

The general results in the decision-making process on the adoption of innovations in the action area of the wine industry of APROMONTES can be seen from Table 1.

One can observe that there is a predominance of the affect heuristic in both groups of winegrowers at very close levels, and the winegrowers linked to the wineries have a value of 35.46% and STR 35.87%, while the wineries present a number of 14.29%. Examples of how to define emotional issues decisions in this type of heuristic can be viewed in the transcript of V062 and then V2:

<Internal \\ V062-Harvesters> - § 2 coded references [5.81% Coverage]
Reference 1 to 4.09% Coverage:

Mr. John Doe does not need to sign anything to me, if he

Table 1. Decision heuristic and structured decision.

Description	STR Winegrowers (%)	Wineries (%)	Winegrowers linked (%)
Affect heuristic	35.87	14.29	35.46
Anchoring and adjustment heuristic	33.51	7.99	28.63
Representativeness heuristic	28.7	16.48	22.5
Availability heuristic	1.92	4.74	1
Understanding the Problem	0	30.21	6.22
Identifying alternatives and Influences	0	11.36	4.36
Collecting Information	0	4.44	1.29
Selecting criteria	0	10.48	0.55

tells me to take the grapes there I take them. I do what they ask me to. They have asked me to do things to increase the quality and I believed them. Our part is done, we produced quality, but the problem is that we delivered grape with 15 degree that should get a price of R$ 0.57, but they paid R$ 0.49 or R$ 0.50.

<Internal \\ V2 Winery> - § 3 coded references [11.82% Coverage]
Reference 1 to 1.73% Coverage:

My relationship with producers is good because we are all neighbors and its a long term relationship. Of course there are cases that we have to negotiate the prices because the table wine is R$ 0.70; we cannot afford to pay R$ 0.57 for the grape.

We can see that even the winemakers are used to affect heuristic, although at lower levels (14:29%), but one can still verify the occurrence of this decision-making procedure, as it can be seen in the winery V2's discourse already presented.

Fragments of discourses previously presented fit the contributions of Kahneman (2011) related to the affect heuristic, in which people consent that their emotions influence their assertions about a situation. The author points out that there is the possibility of the individual performing a self-criticism, seek information, but these are almost always selected to ratify the decision influenced by the load of affection.

A second decision-making heuristic identified in the interviews is the Anchoring and adjustment heuristic, which presented more relevance among winegrowers, whether associated or STR, with 28.63 and 33.51%, respectively. The wineries presented a number of 7.99%. The following is an excerpt from V031:

<Internal \\ V031-Harvesters> - § 1 coded reference [8.62% Coverage]
Reference 1 to 8.62% Coverage:

To adopt this innovation, we made a test; we did a piece to see how it worked. The climate is complicated, so we

have to have these alternatives. A problem in one year prejudices the other years because the vine gets weak. Every year we do something different, planted pieces of new varieties to see how it works and produce different things and then apply to the whole if it works.

The above references point to situations in which the decision is based on the estimation of values ranging towards a result. The point is that this initial value is related to questioning the capacity or the existence of information that allows partial calculations that lead to value. Thus, different starting points yield different estimates, which produce biased toward the initial values. It is precisely this process that Kahneman and Tversky (1974) call the anchoring phenomenon, which can be verified by the extent that the individual is subjected to an incomplete value or at the start of their evaluation, which can take one to insufficient adjustments.

By analyzing the discourses of winegrowers, we notice that their anchoring and adjustment heuristic became intensified with regard to their vineyards, since the decisions are given at a time "t" and the results will be checked in a "t + x", where "x" is characterized by a period of more than a year, which is typical of perennial crops. Besides, as the winegrower (STR1) pointed out, climate variations favor or require adjustments and docking procedures. In turn, the wineries do not present, over their discourses, evidence that the decision to rely on anchoring and adjustment process is in the same proportions as the winemakers, and the discourse density is around 25.72% of the average observed on both associated winegrowers and on STR.

Another operative heuristics verified throughout our interviews was the representativeness heuristic. Although it was the third in the scale percentage of density greatness, it showed a higher proportion comparing the wineries to the average of winegrowers (associated and STR), getting around 64.38%, while in the foregoing heuristics this ratio was 40.07 and 25.72% for heuristics affection and adjustment, and anchor respectively. In our view, it is relevant because it shows that the wineries rely strongly in the heuristics of representativeness, which can be seen in Table 1, in which the associated

winegrowers had a 22.5% density for heuristic representation, while the STR growers showed 28.7%. Already the wineries had 16.48%. Here are some references (the STR3, V022 and V11) on the representativeness heuristic:

<Internal \\ STR3-Winegrower> - § 2 coded references [15.88% Coverage]
Reference 1 to 4.61% Coverage:

There is no information regarding that, I hear that's bad market, but who knows. My decision to cut the Coder is because everyone is cutting because it is worthless.

Reference 2 to 11.27% Coverage:

I bought the equipment because the neighbors bought it. What I saw in the neighbor and I thought it would be nice is irrigation, but we do not have water. I saw this covered grape in the neighborhood, Niagara, we are thinking about it ... but still we did not speak with any buyer to see if there is any interest. But I will do the same because the way we are ... I'm observing that those who planted are doing well, who knows, you know, by the time I plant it can go wrong, it seems that we are always late.

<Internal \\ V022-Winegrowers> - § 2 coded references [14.63% Coverage]
Reference 2 to 6.56% Coverage:

We did a study of various alternatives and chose one. But we always observe the others to see if it works. We started Irrigation because we have used it in other cultures (garlic) so we did it for the vine.

<Internal \\ V11-Winery> - § 2 coded references [9.86% Coverage]
Reference 2 to 3.85% Coverage:

In our region, there is a culture of copying and being larger than the other. On one side it is good, but it can be dangerous as it can lead to take a step longer than the legs. But I have to agree that it does go forward. We thought enough alternatives, not just specific things to solve a specific problem. It does not always work.

We can observe that, in the discourses presented earlier, in which we demonstrate the representativeness heuristic, the evaluation criteria of things, people and events are based on a representative system, or do not follow a probabilistic criterion, often, not even follow simple return analysis criteria.

This type of heuristic decision, according to Kahneman and Tversky (1974), can lead to significant biases as similarity and representativeness are not good elements, given that they are not influenced by factors that, of course, interfere in probability judgments because they

are not supported by data probabilistic basis. This can be seen in the V12 discourse (Reference 2 to 4.09%):

<Internal \\ V12-Winery> - § 3 coded references [8.81% Coverage]
Reference 2 to 4.09% Coverage:

Many wineries do not even have a cost sheet let alone the search for this kind of information. There are many wineries that plant focused on volume and insist on entering the high-quality wine niche. This at first cannot be achieved.

The initiative to access vinifera markets is an example of representativeness heuristic, in which the decision was made by the idea of similarity and representation, as illustrated by V12 discourse (Reference 2 to 4.09% coverage). There is no use of data to support the decision, only perceptions that generate evidence for others, thus forming a halo effect, which takes proportions that generate cyclical crises, as seen highlighted in V2 (Reference 1 to 3.14%).

<Internal \\ V2 Winery> - § 3 coded references [15.66% Coverage]

Reference 1 to 3.14% Coverage:

In 1995 the vitiviniculture exploded and they planted, planted. Many who planted vinifera grapes are having to sell for common grape, they will finish spoon and cut out. Then they begin to grow again. See that there is a mismatch between the planting and the market. That is cyclical, every 10 to 15 years that happens. There is a disruption between the wineries and producer. When the market begins to improve, it is time to plant new vineyards.

Kahneman and Tversky (1974) refer to the issue of representativeness, in which there is insensitivity to predictability, which stems from the way people anticipate situational descriptions. These predictions happen by representation, for example, in the case of a neighbor whose description is favorable, and harvest well and makes money from the culture, which indicates that the activity is promising. On the other hand, if the description of the neighbor is not favorable, their initiatives will not be considered. There is a tendency to ignore the degree of reliability of this description, making people rely only on the suitable aspects of the information, generating previsions that do not guarantee the accuracy of the results.

By analyzing the data from our research, the availability heuristic has not been identified over the discourses with relevant intensity, compared with the previous ones (Affect, Anchoring and adjustment and representativeness), for both the group of associated

Table 2. Presence of information.

Description	STR winegrowers (%)	Wineries (%)	Winegrowers linked (%)
Fairs	0	1.2	0.28
Business trip	0	0.38	0

winegrowers and the STR, the density percentages were around 1 to 2%, a weighted average of 1.47%, whereas this heuristic (availability) was observed in the group of wineries 4.74%, which also is not a significant number. However, this value (4.74%) is three times higher (3.22) than the average of winegrowers (1.47%).

This information is at least curious because, conceptually, the availability heuristic, according to Kahneman (2011), is defined as a cognitive procedure in which people estimate the frequency of a class or the probability of an event by the easiness in which cases or occurrences can be brought to mind. In other words, the confidence in which the elements come to mind. When we encounter a specific feature, we think immediately of any figure that represents these characteristics. This availability may be favored by the frequency in which such events are presented to us, and this is directly linked to the informational level we have. Let's see some references given by V5 on the subject:

<Internal \\ V5> - § 3 coded references [10.13% Coverage]
Reference 3 to 1.38% Coverage:

The idea of attracting by the package came from travelling, where we found that the packaging appeal segments the market, each package for a different market and wine compatible with every type of consumer. For example, we launched the LA Young Wine, using wine of fresh years and low alcohol content to reach young consumers and prepare them for other types of wine.

The V5 discourse (Reference 3 to 1.38% Coverage) shows that the wineries have access to different types of information from the winegrowers and this allows them to develop different mindsets in number and complexity. Table 2 obtained from the analysis of discourse density shows that the wineries have 81.08% density of participation in fairs while winegrowers had a density of only 18.92%. The Excerpt from V10, below, shows an example of participation in fairs.

<Internal \\ V10> - § 3 coded references [9.35% Coverage]
Reference 3 to 1.45% Coverage:

Every two years, we go to Italy, to the Simei show and to the Vinitaly. Anyway, we are always looking for information. We search in Germany, Italy and France about machines because there we have the best in the beverage industry.

When we look at the business trip participation, the wineries have a 100% density. Let us look at the references regarding the V1 and V5 trips:

<Internal \\ V1> - § 1 coded reference [0.85% Coverage]
Reference 1 to 0.85% Coverage:

I get informed through contacts with producers in Europe.

<Internal \\ V5> - § 2 coded references [14.06% Coverage]

Reference 1 to 5.43% Coverage:

I have just been to Italy and there, there is this vertical integration. Most industries produce their grapes to produce their wine. This is a culture that comes from the past. The few winemakers have organized themselves into cooperatives to produce the wine. So, Europe is different. The Argentine is a mixture.

Reference 2 to 8.63% Coverage:

We seek these innovations visiting other countries. For example, when we visited Spain, I saw that they trimmed soon after harvest. When I came here I met with our technician and discuss the importance of leaving the branches on the vine until August. He said no. I asked what was the problem of cutting now, after the harvest? He said he thought it was okay, so we made a test. That is how innovation happens. It resulted in a good product, hand labor rationalization, cost reduction and specialization of staff. Now Embrapa [Brazilian Government Reseach Company] is researching the subject. With the bottles was the same thing, our staff had been researching and came up with the idea. We have to understand that the wine industry in Europe has more than 1000 years, and their reality is different from ours.

The fragments of discourses presented above serve as evidence wineries are more exposed to different information provided by participation in fairs and business negotiations. These activities allow the wineries to adopt three times more availability heuristic than the

winemakers, because the information collected along these experiences assume the conformation of cognitive frames that are more easily accessed and incorporated into its heuristic decision processes.

We can go back to the Structured Decision-Making Processes which are: (a) Understand the problem; (b) Define the selection criteria; (c) Identify the resolution alternatives of the problem and its influences; (d) Collect information, and (e) Evaluate alternatives.

We can see that when we look at the density of the wineries discourse, 30.21% of the time is geared to understanding the problems to which the wineries are exposed. See example of V10:

<Internal \\ V10> - § 2 coded references [4.20% Coverage]
Reference 1 to 2.02% Coverage:

Every innovation we want is discussed in the winery and in the sector. The tendency is that the winery will seek for vertical integration of the high-quality products or look for suppliers that are legalized as a company.

Reference 2 to 2.17% Coverage:

We want to be a small winery with great potential.

We emphasize that the criteria to qualify the discourse as a problem of understanding lies on the clearness in which the individual sees the situation, regardless of whether it would be the ideal explanation. In this sense, the linked winegrowers had a 6.22% density, as demonstrated in the examples of V102:

<Internal \\ V102> - § 4 coded references [7.60% Coverage]
Reference 3 to 1.49% Coverage:

One issue that would have to work is to adjust the workforce to the area of the vine. What is happening is that there are not enough workers, then we hire. Besides the fact the workers hired are expensive, they are also unqualified and because they do not harvest or prune right, the profit that area would earn is lost. So, there is no use in having that area anymore if you do not have manpower to work on it. Then you should reduce the area to match the volume of available workforce.

Regardless of the nature of the problem of winemakers, references presented demonstrate that they can identify it clearly. However, it is a small value compared with the decision heuristic. In the case of the STR winegrowers, it was not identified any of these issues in their discourses.

Further, we can see the most formalistic part of a structured decision process consisting of the definition of the chosen criteria, the identification of alternatives to solve the problem and the evaluation of the conse-

quences. Again, these are procedures identified with greater density in the discourse of the wineries. However, in the discourse of the associated winegrowers, these values are much smaller.

In wineries, the collection of information is 4.44% *of the density of their* discourses, the survey of alternatives and influences *are 11.36% of the density of their* discourses *and the definition of the chosen criteria is 10.48% of the density of their* discourses. In turn, associated winemakers present in the same sequence, 1.29, 4.36 and 0.55%. We have not observed any of these categories in the discourses of the winegrowers of STR.

Another possibility of seeing Table 1 framework data would be checking the density of discourses horizontally, view which shows the density percentage when we see the sum of the interviewees talking time for each category of analysis. This can be confirmed by the information presented in Table 3.

We can identify, through the density of discourses, that the winemakers have their decision-making processes based on heuristics, including affect heuristic that has higher density, demonstrating that 75.39% of the time dedicated to this category exposed winemakers. The wineries showed a percentage of 24.62%. It is important to notice the supremacy of the values of associated winegrowers in relation to the STR winegrowers. There is evidence via discourse density that STR winemakers interviewed are using heuristic decision making.

However, lower values related to its associated pairs can be explained because they are apparently not as articulated to expose their views as the associated.

One can see that the anchoring and adjusting heuristic is a decision-making process very present in the winegrowers' discourse, with the highest density of 81.89% of the time. The representativeness heuristic also has a strong impact on the decisions of winegrowers, spending 63.61% of the time devoted to it. Although the horizontal analysis of the availability heuristic ratifies the vertical analysis, which demonstrated the increased use of this heuristic by the wineries: 77.30% against 22.7% of winegrowers. It is worth having in mind that the values in the vertical analysis were not significant.

Concerning the structured decision-making process, if we use simple average, the vertical analysis of the discourse density, we can see that the wineries respond for 56.49% of the discourse density of these categories while winegrowers respond for 12.42%. However, we must emphasize that from these 56.49%, 53.48% are related to the category understanding the problem (30.21%). Alternatives and influences appear with 11.36% and criteria selection with 10.48%. However, the collection of information comes up with 4.44% of the interviewees talking time. The categories of analysis that constitute the formal part of the structured decision-making process are not supported by a consistent information process.

Table 3. Decision heuristics and structured decision (analysis in the line).

Description	STR winegrowers (%)	Wineries (%)	Winegrowers linked (%)	∑ Winegrowers (%)
Affect heuristic	10.81	24.62	64.58	75.39
Anchoring and adjustment heuristic	13.28	18.11	68.61	81.89
Representativeness heuristic	11.08	36.39	52.53	63.61
Availability heuristic	5.49	77.31	17.21	22.7
Understanding the problem	0	82.11	17.89	17.89
Identifying alternatives and Influences	0	71.14	28.86	28.86
Collecting Information	0	76.52	23.48	23.48
Selecting criteria	0	94.74	5.26	5.26

Table 4. Supporting elements in heuristic decisions.

Description	Halo effect	Framing effect	Neglect of the rate base	Overconfidence
Affect heuristic	32.43	37.71	31.24	56.81
Availability heuristic	5.73	0	2.58	0
Representativeness heuristic	42.21	32.47	36.34	32.41
Anchoring and adjusting heuristic	19.63	29.82	29.84	10.78

If there is not a set of information available to support decision-making process what is left is what Kahneman (2011) calls WYSIATI (What you see is all there is), a term created by the author and which reflects the perception of what is evident in System 1 (autonomous System), as it provides consistency and cognitive comfort, which leads the individual to accept an assertion as the truth, leading to a plausible attitude. This lead the way towards the heuristic decisions.

Supporting elements in heuristic decisions

According to Kahneman (2011), jumping to conclusions can be effective to the extent that there is a significant probability that the conclusions are correct, and if the costs of a possible error are plausible and if this assumption saves time and effort. Presuming is dangerous in unfamiliar situations because there is much to be lost in the game and there is no time to gather more information. This is an intuitive scenario where errors are likely to happen. They can be avoided with a deliberate intervention of system 2 (system consideration). However, by the lack of information of a comprehensive context, the system 1 (automatic system) generates its own context, supported on experience. It is like a bet, in which predominates the rule of support on recent events that have a higher weight in the understanding of a new situation.

In this regard, Kahneman (2011) also points out that, contrary to what the philosophers of science (who propose the testing of hypotheses to reject them), people and the scientists themselves sometimes get hold of data that have greater possibilities of being reconcilable with the beliefs that they have at that time. However, Kahneman (2011) points out that this decision process generates some biases, some effects (Table 4).

None of these supporting elements are relevant to the availability heuristic, which may have been compromised by the low density observed in this category, as has been shown previously. Regarding the neglect of the rate base, it has a slightly lower density in the anchoring and adjusting heuristic (29.84%), a fact that, in a way, brings surprise, because even if it is a heuristic working with small numbers (gradual adjustments), we found a considerable degree of negligence about the trends of information series.

The overconfidence aspects are also more observable in the affect and representativeness heuristics, with a density of 56.81 and 32.41% respectively, which is predictable because, according to Kahneman (2011), the overconfidence as well as the halo effect and the effect of environment are also a manifestation of WYSIATI. This happens because when we estimate a quantity or situation, we rely on the information that comes to mind and build a coherent story in which the estimate makes sense. This is because it is impossible to admit information that does not come to mind for specification of that information.

This overconfidence is not something that primarily affects only people with no information or little information. Kahneman (2011) presents numerous cases

of recognized experts from the financial world, medical professionals and the legal world. The author argues that training activities have been tried to mitigate the problems of overconfidence, however, does not consider as something promising. An example Kahneman (2011) quotes is the case of judges who were encouraged to consider competing hypotheses. However, the author points out that overconfidence are a result correlated to the System 1 (automatic), which can be suppressed but not eliminated. This is because overconfidence is based on the coherence of the story that the individual built and not by the quality and quantity of information that supports it.

DISCUSSION

The survey results point to a preponderance of affect, anchoring and adjustment and representativeness heuristics by the winegrowers, which is also present in the decision making of the wineries. This is a predictable result, according to the ideas of Kahneman and Tversky (1979), and Kahneman (2011), because the heuristics are simple procedures that help get satisfactory answers, even if imperfect, to complex questions. That is the case of the decision to adopt certain innovations.

These decision heuristic (judgment) often serves as a reasonable approximation of reality. However, they can generate, as previously mentioned, biases caused by the halo effect, which is characterized by a tendency to like (or dislike) everything that relates to how we see people and situations, even those that were not observed. Biases can also be generated by overconfidence, due to the neglecting of evidence, because what counts are the beliefs that are related to the quality of the narrative, which takes into account what is seen, even if it is little.

In this study, we observed biases arising from the framing effect, they are different ways to display the same information and repeatedly evoke different emotions in addition to the neglecting of the rate base. This leads one to ignore statistical facts to consider issues such as the neglect case of information about the historical sequence of production and product demand (either grape or wine), information on grapevines planted area.

These are biases that were significant in our research, leaving evidence of heuristic decision cognitive processes undertaken by winegrowers when negotiating with winemakers. They also have their own heuristic decision-making processes, which leads to incompatibilities that may hinder the decision to adopt a desired innovation, since the framings of these parts are not aligned.

Although Kahneman, Tversky (1979) and Kahneman (2011) did not work on which heuristics generates certain biases, we found in our work, a strong alignment between

the halo and framing effects and the affect and representativeness heuristics, which seems to have a logical, given that "like" or "dislike" relates to the affection and the way we see certain things become representations of reality. These are valuable issues in our research, because, like we discussed in the analysis, the decisions of winegrowers and winemakers are constituted primarily as affect and representativeness heuristics and they suffer direct influence of "liking someone or something" process, as in the case of a winegrower that likes or dislikes certain winemaker, or the degree he likes his activity or some form of production.

This issue of "liking" a way of producing, when contrasted with the high incidence of path dependence, elucidates the fact that the choices are conditioned by the choices made previously, which becomes familiar and representative in the subsequent periods. According to Kahneman (2011), our automatic system (System 1) will remove the ambiguity and, unconsciously, will build a story that is as consistent as possible in order to endorse the decision towards the actions or people already known. If there is no message immediately disapproving the previous concept, the association of this with the past or the first impression about the person will spread as if the message was true.

The conjunction between heuristic decision (in our case the affect and representativeness) with the path dependence defines a vision of technological opportunity restricted to issues of quality of the raw material (framing), which, by the way, is sought by the wineries as the key to increase competitiveness, which is being adopted by the winemakers. However, other technological, production and management opportunities are not addressed and, when they are, the participants of this research come up with some kind of "story" to justify excluding such opportunities.

The observed decision heuristics are also enhanced by the practice of overflow (spillover) and in this case, it revealed the halo effect because the concept that a winemaker or a winegrower has within the community creates the conditions for the others to follow him, even before the specific characteristics that, perhaps, might exist. According to Kahneman (2011), even though the situation remains ambiguous, it will be interpreted in a way that makes them consistent in the context.

Another issue that seems to support the affect and representativeness heuristics regards the specific characteristics of the assets, which, in this case, focus on the physical characteristics, because the terrain and weather restrict production to the vine and to the human specificity. This is because there is a tacit knowledge (know-how) that gravitates around the vine, acquired primarily from learning by doing. However, we are proposing here extending human asset specificity, incorporating an affective dimension, personified in the bond of the "individual" to its production object (vine)

because, during the research, we found this bond through discourses like "the vine is very clever, more than you, because it teaches you to prune " and "The vine is as a person, she talks ...".

This type of asset specificity appears to be a kind of catalysis when adopting affect heuristic in either accepting or rejecting decisions to innovate. We add that the affective dimension of human specificity favors a greater or lesser degree of representativeness heuristic, because this is an observable sense in other winegrowers, which provides that the winegrowers identify with each other when making a decision.

Affect heuristic proved to be so intense during the research that we could observe that construct "trust" was adapted by the operant actors in the sector to account for the necessary transactional relationships. This adaptation is polarized in trust for the payment because the participants recognize that what is discussed in terms of payment and product delivery will be fulfilled and the existence of distrust to establish a fair price for the grape, understanding that there is an opportunistic behavior in that dimension. This conceptual adaptation is a "story" suggested by Kahneman (2011), in which one creates a context that considers an observable reality. This is due to the fact that there is a need to transact the production. However, the transactions require the presence of trust, but that does not exist in its scope. Therefore, it is necessary a mental construct that gives greater cognitive comfort when making decisions and this is made possible by the two trust dimensions presented: (a) Allowing the transaction (I trust that they will pay) and (b) One that can be "saved" not to mess with the transaction (they take advantage in price). This is a procedure also checked with the winemakers, who trust that winegrowers will do what is asked of them in vineyard. However, they do not trust that the grapes will be fully delivered to the winery. Another important aspect regarding the use of heuristics decision relates to the primacy of one category over the other, because we observed that one does not exclude the other. The heuristics may occur simultaneously or sequentially. We see this fact in using affect heuristic in a position to adopt innovations, followed by anchoring and adjustment heuristic, whose meaning is to correct observed deviations in the initial decision supported by he affect heuristic and, once implemented, creates a new starting point (anchor) for subsequent phases. Taking up the issue of decision-alignment on the adoption of innovations among winemakers and their winemakers, we notice that although the wineries also support their decisions to innovate on heuristics, their understanding of the problem to be faced is superior to wine producers in a ratio of about five to one (30.21 vs. 6.22%), in addition to that, wineries articulate better the survey of alternatives and the influences they cause and decide, considering better defined criteria for choosing than the winegrowers. However, the lack of gathering and handling information weaken the decision-making process.

On the other hand, the understanding of what is the problem to be attacked creates a mismatch between the decision-making processes of winemakers, in relation to its winemaker suppliers of raw material (grape), because this disparity generates a framing effect that is, if not divergent, in a different level. Thus, any movement towards adoption of innovation to improve competitiveness by the wineries is understood by winemakers as something centered only on production quality. What is worse reduced to produce grapes with glucometric degree measured in Babo scale degrees. This divergence frame (framing) creates an environment of distrust, both by the wineries in relation to winegrowers as winegrowers in relation to wineries. This can be verified as we review the density of this lack of confidence, which ranges from 5% by the wineries to 3.6% by the winegrowers. This environment creates side effects that also interfere in the decision to adopt innovations.

The considerations presented here refer to the idea of classifying both winegrowers and winemakers in the decision-making process in terms of adopting innovations. In this sense, we suggest that the winegrowers are "affective decision makers" whose decisions are based primarily on personal emotional aspects or by recurrent processes of how to develop a particular activity. On the other hand, the winemakers are characterized as "copier decision makers" whose decisions are supported primarily by observing the decisions of other winemakers, that is, by the practice of spillover, without disregarding the existence of the innovative winemaker, following the Schumpeterian (1985) innovative ways that will anchor the others. This classification enables us to reflect what kind of action should be adopted to implement a new technological trajectory that enables an increase in the competitiveness of the Brazilian gaúcha wine industry, given that there is a need for a decision-making alignment between winegrowers and winemakers in planning adoption of innovations, since the vertical integration of production by the wineries is prohibitive because of the restriction of the areas for implementation of new vineyards in the Serra Gaúcha region that concentrates more than 90% of the wineries of the Rio Grande do Sul State. Therefore, the prospect that winegrowers would be more emotional in their decisions leads us to act exploring more this peculiarity. At the same time, actions aiming the winemakers should take into account that their decisions are taken supported by the observations of what the other winemakers are doing.

Conclusion

Qualitative researches are often criticized for producing biased analysis. However, a previously tested method may minimize this risk. In our case, we invested on

software for data analysis - Nvivo (QSR, 2011). This software provided the organization of data in an independent way for each of the investigated information sources.

Other limitation this investigation had to handle was the fact this is a case study (Yin, 2010). Case studies have the disadvantage of reducing the possibilities of generalizing results. In this study, we have made an attempt to compensate this limitation by applying an ethnographical investigation process. The first author of this study worked as a consulting technician for APROMONTES during a period of five years, sometime before starting this investigation. This immersion in the context helped deepen the contextual knowledge and the analysis and interpretation of results.

Considering the contributions, this study seems to have explored both empirical and theoretical dimensions of science. In terms of empirical contributions, we have described the decision-making process adopted by APROMONTES vitiviniculture and the phenomena which influenced these decisions, especially on the adoption of innovations. In terms of theoretical contributions, we highlighted the intersection of theories such as path dependence in the constitution of decision-making affect heuristics. We suggest the development of more qualitative studies to verify the connections and intensity of the categories analyzed. Future investigations on the strength of each category in the decision-making process may help the wine sector plan its actions on the adoption of innovations seeking the development of the sector.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Ames VDB (2013). As possibilidades de uso do software de análise qualitativa Nvivo. Sociologias plurais - Revista Discente do Programa de Pós-graduação em Sociologia, Universidade Federal do Paraná (UFPR), 1(2 August), 2013. URL: https://issuu.com/sociologiasplurais/docs/revista_v1n2. Retrieved on: April 10, 2013. [In: Portuguese].

Kahneman D, Tversky A (1974). Judgment under Uncertainty: Heuristics and Biases. Sci. New Series 185(4157):1124-1131. Stable URL: http://links.jstor.org/sici?sici=0036-8075%2819740927%293%3A185%3A4157%3C1124%3AJUUHAB%3E2.0.CO%3B2-M

Kahneman D, Tversky A (1979). Prospect Theory: An Analysis of Decision under Risk. Econometrica 47(2):263-291.

Kahneman D, Tversky A (1984). Choices, values, and frames. Am. Psychol. 39(4):341-350.

Kahneman D (2011). Thinking Fast and Slow. New York: FSG Books.

Paiva CA, Lentz JR L (2011). A dimensão socioeconômica da vitivinicultura gaúcha. Bento Gonçalves, Rio Grande do Sul/Brazil: Instituto Brasileiro do Vinho (Ibravin). URL: <http://www.ibravin.org.br/documentos.php?secao=6&m3=true>. Retrieved on: July 10, 2011. [In: Portuguese]

Patton MQ (1986). Qualitative evaluation methods. London: Sage Publications.

Protas JFS, Camargo UA, Melo LMR (2002). A vitivinicultura brasileira: realidade e perspectivas. Empresa Brasileira de Pesquisa Agropecuária (Embrapa), Ministério da Agricultura, Pecuária e Abastecimento, (Centro Nacional de Pesquisa de Uva e Vinho), Bento Gonçalves, Rio Grande do Sul/Brazil. URL: <http://www.cnpuv.embrapa.br/publica/artigos/vitivinicultura/>. Acessed on: Feb 15, 2012. [In: Portuguese]

QSR INTERNATIONAL (2011). Tutorial NVivo 9. 2011. URL: www.qsrinternational.com.[In: Portuguese].

Schumpeter JA (1985). A teoria do desenvolvimento econômico. 2 ed. São Paulo/Brazil: Nova Cultura. [In: Portuguese]

Simon HA (1972). Capacidade de Decisão e de Liderança. Rio de Janeiro/Brazil: Editora Fundo de Cultura. [In: Portuguese]

Simon HA (1977). The shape of automation: a psychological analysis of conflict, choice and commitment. New York: MacMillan.

Simon HA (1980). Racionalidade do processo decisório em empresas. Edições Multiplic: 1(1): 25-60. [In: Portuguese].

Tonietto J, Zanus MC, Falcade I, Guerra CC (2013). O regulamento de uso da indicação geográfica altos montes: vinhos finos tranquilos e espumantes. Bento Gonçalves, Rio Grande do Sul/Brazil: Empresa Brasileira de Pesquisa Agropecuária (Embrapa), Ministério da Agricultura, Pecuária e Abastecimento, (Centro Nacional de Pesquisa de Uva e Vinho).pp. 36. (Documentos / Embrapa Uva e Vinho, ISSN 1516-8107; 85). [In: Portuguese].

Torres Junior AS, Moura GL (2011). Decisão em administração-uma discussão In: OIH YU, A. S. Tomada de decisão nas organizações: uma visão multidisciplinar. São Paulo/Brazil: Saraiva. 336p. [In: Portuguese].

VISÃO 2025 (2006). Programa de desenvolvimento estratégico do setor vitivinícola do Rio Grande do Sul/Brazil, produced by Universidade Federal do Rio Grande do Sul, sponsored by Instituto Brasileiro do Vinho (Ibravin) and Serviço Brasileiro de Apoio à Pequena e Média Impresa, Rio Grande do Sul/Brazil. [In: Portuguese].

YIN RK (2010). Estudo de caso: planejamento e métodos. 4. ed. Porto Alegre, Rio Grande do Sul/Brazil: Bookman 320p.