



Pennsylvania Wine Market & Research Promotion Program

Progress Report

A financial status report and a project performance report will be required on a semi-annual basis. October and April reports are due. A final report may serve as the last semi-annual report due 30 days after completion of the contract. Grantees shall monitor performance to ensure that time schedules are being met and projected goals by time periods are being accomplished. Please submit reports to: RA-AGCommodities@pa.gov.

SECTION 1 – SUMMARY INFORMATION

Date of Report:	<u>May 3, 2021</u>		
Contract/PO#:	<u>PO-63019420</u>	Fiscal Year: <u>2020-2021</u>	Round of Grant: <u>4</u> (i.e. Round 1, Round 2, etc)
Title of Paper:	<u>Final Report for “What Do Consumers Look for in PA Wines? A Mixed-Methods Approach to Study the Importance of Regionality and Hybrid Grapes”</u>		
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Progress Report:	<input type="checkbox"/> October	<input type="checkbox"/> April	
	<input checked="" type="checkbox"/> Final		
Area of Focus:	<input checked="" type="checkbox"/> Research		
	<input type="checkbox"/> Marketing		

SECTION 2 –OBJECTIVES | TIMELINES | OUTCOMES | BUDGET

(A comparison of actual accomplishments to the objectives for that period?)

This project aims at understanding consumer perception and attitudes towards PA produced wines, to provide information to successfully tap into this larger consumer market. Building on our two-year study on sensory regionality of PA-grown Riesling and Vidal blanc wines, as assessed by a trained descriptive panel and PA winemakers, here we studied the consumer perception of PA grown wines, with a focus on the importance of regionality and attitudes towards hybrid wines.

We employed a two-pronged, mixed-methods approach:

(A) an online conjoint analysis survey with over 1,000 wine consumers from the mid-Atlantic region to uncover mental categories of commercial PA wines based on external cues and to quantify both how important regional information on the label is to these consumers and whether the use of a hybrid varietal name on the wine label is affecting consumer choice.

(B) qualitative focus groups paired with a mental categorization exercise with PA wine consumers from the Commonwealth to reveal consumer perception, feelings, and attitudes towards wines made in PA from PA-grown grapes (hybrid vs. non-hybrid grapes).

(A) Results from the Online Conjoint Analysis of Consumer Perception of PA and hybrid wines

Details for this study have recently been published in the open access journal Beverages (Todd et al., 2021; attached). This survey fielded in May of 2020 and had 1011 complete and usable respondents out of 2646 total responses. Respondents were 63% female (n = 638), with 24% of respondents being between the ages of 21 and 35 (n=244), 40% between 36 and 50 (n=402), and 36% between 50 and 70 (n=365). Most participants were from New York (32%, n=324), followed by Pennsylvania (20%, n=206), New Jersey (15%, n=152), Ohio (12%, n=123), Virginia (11%, n=114), with the rest (9%, n=92) coming from Maryland, West Virginia, and Washington DC. Sixty percent of respondents indicated to consume white wine at least per week.

Respondents looked at variations of a wine label with different wine type and location texts, as well as differing font types and images. We varied 4 different aspects of the wine label:

- wine type (white wine; Vidal blanc; White Table wine)
- font type (cursive; sans-serif)
- location text (county level ‘Proudly produced in Lehigh County, PA’; AVA level ‘Lehigh Valley AVA’; state level ‘Pennsylvania’)
- image (flourished image, simple image; see **Figure 1**).



Figure 1. Two example wine labels presented to the respondents that vary in wine text, location text, image, and font.

Overall, consumers selected “White Wine” text and scripted fonts most frequently, with a generalized county text being more highly selected than American Viticultural Area (AVA) or state texts, however the location text had a lower importance than expected.

For the overall analysis of all 1011 consumers, **wine type** was found to be the most important attribute, with an overall importance score of 45.4%. *White Table Wine* was significantly disliked (negative utility score of -22.9), followed by a neutral score of 0.3 for *Vidal Blanc*, and +22.6 for *White Wine*, **showing a preference for ‘White Wine’** over the other wine types. **Font Type** was the next important attribute, with an overall importance score of 34.5%, with a **clear preference for the cursive style font** over the sans-serif font. The **location** attribute had some influence, with an importance of 14.6%, with **preferences for the county text (+12.1) over state (-9.0) and AVA (-3.1) texts**. Lastly, the **image** showed **very little preference**, if any, with both weak importance (5.5%) and low utility scores (+1.7 and -1.7 for the more flourished and less flourished images respectively).

Regarding the **wine type**, further analysis of respondents **revealed consumer segmentation based on several levels:**

(i) whether consumers have had or not have had tasted Vidal blanc wine before. Those who are familiar with Vidal blanc (n=300 ‘yes’) were also much more likely to **prefer the wine label that had ‘Vidal blanc’** on the label.

(ii) consumers that displayed higher objective and subjective wine knowledge (Ellis & Caruana 2018) **and/or scored higher in variety seeking behavior** (van Trijp & Steenkamp 2007) showed an increasing preference for the Vidal blanc text on the label over the more generic white wine and white table wine texts.

This implies that consumer preference strongly depends on (i) prior experiences with specific, lesser-known varieties, (ii) personal variety-seeking behavior and/or (iii) factual wine knowledge. From this data it is clear that a more informed consumer, whether truly informed or those who think themselves informed, as well as those who are more interested in new wines, are more likely to choose the wine label that uses the varietal text, e.g., Vidal blanc. **This is an important consideration for the industry, as educating consumers could lead to better sales of this variety and may help direct marketing efforts for this variety. This also implies that involved consumers (e.g., those that visit wineries) would respond more favorably to front labels that feature the specific grape varietal on the label!**

Regarding the location text, the AVA text was not the most preferred location code – instead, the **generalized county text ‘Proudly produced in Lehigh Valley, PA’ was the most preferred.** AVA was expected to show a stronger preference than the proudly produced statement, especially as AVA indicates some level of governmental regulation and prestige. This confusion or lack of knowledge about AVA designations among mid-Atlantic consumers was mirrored in the questionnaire, where only 116 of the 1011 participants (=11.4%) correctly identified the meaning of AVA, with 395 participants admitting to not knowing, and 500 participants incorrectly identifying what AVA meant, even with the “I don’t know” option available. These results reveal a need for consumer education or targeted marketing practices about AVA designations. Although not expected, the **strong preference for the county text ‘Proudly produced in Lehigh Valley, PA’ could be easily implemented by producers to draw attention to locally produced wines and regional profiles in Pennsylvania.**

=> In conclusion, this research provides actionable information to local wineries within the mid-Atlantic region on consumer label preferences, specifically in terms of wine type and regionality text, and gives novel insight into the choices of mid-Atlantic consumers.

(B) Results from Virtual Focus groups to uncover Consumer Perception of PA and hybrid wines.

To further gain consumer insights into the perception of PA and hybrid wines, virtual focus groups with wine consumers from the Commonwealth were conducted in spring of 2021. Originally proposed as 3-4 in-person focus groups across the Commonwealth, the current Covid-19 pandemic and the restrictions placed by Penn State on in-person human subjects research forced us to re-design these focus groups into a virtual, remote format. We consulted with Dr. Sarah Kirkmeyer, adjunct professor in the Department of Food Science at Penn State and a world-renowned expert on quantitative and qualitative consumer research, including virtual focus groups. Together with her input as well as the use of a trained focus group moderator (Dr. Bakke), we developed a protocol that both kept our researchers and consumers safe and also allowed us to gather this important data in a remote way.

Four focus groups with a total of 14 participants (11 women, 3 men) were conducted to gain qualitative understanding of how consumers viewed Pennsylvania wines and hybrid wines in particular. Participants were recruited from an existing database maintained by the Sensory Evaluation Center at The Pennsylvania State University (PSU) and from PSU branch campuses and by word of mouth. Participants filled out an online screening survey to determine eligibility: 1) 22-70 years old; 2) no food allergies or sensitivities to alcohol; 3) do not avoid alcohol for medical or ethical reasons; 4) not pregnant or breastfeeding; 5) regularly consume white wine; 6) regularly or occasionally consume Pennsylvania wine; 7) comfortable participating in a focus group; 8) articulate; 9) met technology requirements. Two groups were conducted with participants located in Central Pennsylvania (surrounding the State College area). The other two groups were conducted with participants in Southwestern Pennsylvania (near the Pittsburgh area). Each group lasted 60 minutes and was comprised of 2-4 participants led by an experienced moderator who followed a structured guide. All groups were conducted via video conferencing on the Zoom platform. One female participant dropped out at the beginning of the focus group due to internet issues. Prior to the start of focus groups, the moderator read aloud a description of activities the focus groups would entail and described risks and benefits of the research. Participants gave verbal consent before proceeding with the research. All procedures, including this consent process, were designated as exempt research by the Office of Research Protections at PSU (protocol 12536). Participants were compensated for their participation according to the IRB-approved rate.

Table 1. Wine Description and Codes

Wine Description	Code
New York, Chardonnay, Dry	NCD
New York, Chardonnay, Semi-sweet	NCSS
New York, Riesling, Dry	NRD
New York, Riesling, Semi-sweet	NRSS
New York, Traminette, Dry	NTD
New York, Traminette, Semi-sweet	NTSS
Pennsylvania, Chardonnay, Dry	PCD
Pennsylvania, Chardonnay, Semi-sweet	PCSS
Pennsylvania, Riesling, Dry	PRD
Pennsylvania, Riesling, Semi-sweet	PRSS
Pennsylvania, Traminette, Dry	PTD
Pennsylvania, Traminette, Semi-sweet	PTSS
California, Chardonnay, Dry	PCD
California, Chardonnay, Semi-sweet	PCSS
California, Riesling, Dry	PRD
California, Riesling, Semi-sweet	PRSS
California, Traminette, Dry	PTD
California, Traminette, Semi-sweet	PTSS

Prior to the groups, participants completed a projective mapping activity. A full factorial 3x2x2 design was used to create 18 different wine descriptions that varied in location produced (California, New York, or Pennsylvania), wine variety (Chardonnay, Riesling, or Traminette), and sweetness / dryness (dry or semi-sweet) (see **Table 1**).

Participants were instructed to read the wine descriptions and to arrange them on a blank space in such a way that wines that were more similar were close together and wines that were very different were far apart using whatever criteria they chose. After completing the maps, participants were presented with each wine description and asked to select attributes that were appropriate descriptors for that wine using a check all that apply (CATA) question with the following attributes: desirable, expensive, high quality, low quality, local sustainable, and hybrid. Participants were also able to add up to four of their own descriptors not included in the list. For both activities, wine descriptions were presented

in balanced order to participants to prevent order bias. Attributes were also presented in balanced order for the CATA question for the same reason.

During the focus groups, participants were asked one by one to describe their maps (which were displayed for all participants to see) and their thought process for creating the maps. During the discussion, the moderator probed participants to better understand how location produced, wine variety, and sweetness affected participants perceptions and preferences for wine with special attention to perceptions of Pennsylvania wines. To transition to the topic of hybrid wines, the moderator shared the list of descriptors from the CATA question and asked participants what the term hybrid meant to them. The moderator probed to better understand participants knowledge around the term hybrid and if participants had any positive or negative associations with the term. In the first group participants were then presented with the following statements regarding hybrid wines:

“Hybrids allow us to spray less fungicides on our grapes, keeping the environment safer.”

“Hybrid grapes are a great investment for Pennsylvania grape growers, as they are bred for our climate.”

During the first group, neither of the statements elicited strong positive motivations toward purchasing hybrid wines, so for the final three groups the following statement was added:

“Hybrids allow us to create better tasting Pennsylvania wines.”

After each statement, participants were asked their initial impression of the statement and if it would have any effect on their purchase behavior. Particular attention was paid to believability and motivation to purchase.

Results from the projective mapping activity and focus groups provided rich information about how consumers perceive Pennsylvania wines and hybrid wines in particular. **Figure 1** shows the consensus map from the projective mapping activity. Dimension 1, which accounts for 37.88% percent of the variability,

divides wines according to dryness/sweetness with dry wines (codes ending in D) on the left side of the map and sweet wines (codes ending in SS) on the right side.

This finding was in alignment with the comments during the focus groups. Almost all participants cited **dryness vs. sweetness as the main attribute** driving their placement of the wine descriptions on the map. Further discussion revealed that this attribute was top of mind, as most participants have a particular level or dryness / sweetness that they tend to seek out for the majority of their wine drinking occasions with participants endorsing different levels of dryness or sweetness.

‘I usually steer clear of dry wines. I’m just not a huge fan of completely dry.’

‘I’m kind of the opposite, I like dry wines and tend to not really care for even a semi-sweet so that’s usually what I primarily look for.’

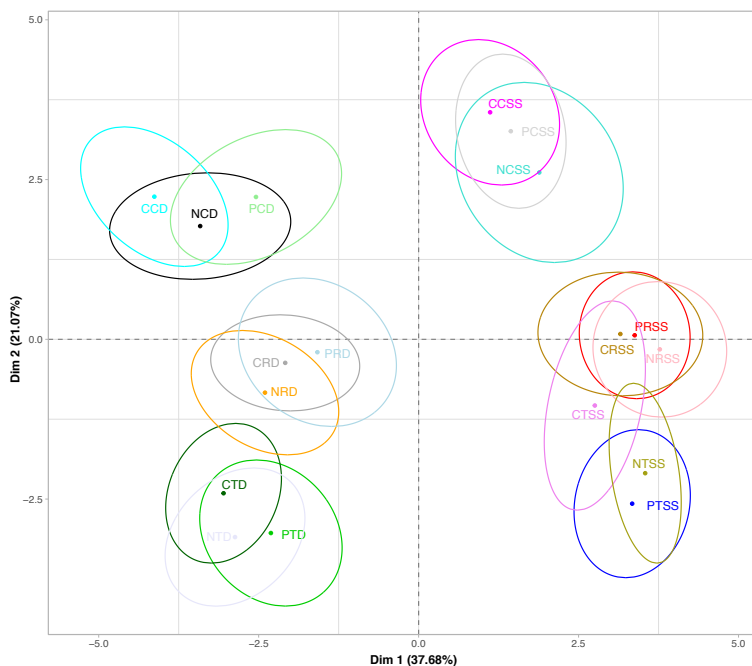


Figure 1. Mental categorization of the 18 wine descriptions by PA wine consumers. Shown are wines (codes listed in Table 1) together with their 95% confidence ellipses. Ellipses that overlap do not differ significantly from each other. The position of the wine descriptions on the graph indicate how similar they were perceived – the closer together the more similar.

'[I] would definitely agree that dry versus sweetness is the most important factor for me when thinking about buying wine or trying it.'

For most participants, wines that fall outside their suitable dryness / sweetness range are not selected or selected only occasionally if a particular wine happens to fit their mood or the particular drinking occasion (e.g., a sweeter wine than typical may be acceptable when accompanying dessert, seeking out a particular experience, or when hosting a friend who likes sweeter wines).

'I'm a real opportunist when it comes to wine. My preference is dry if it's a choice between a dry wine and a semi-sweet wine or a sweet wine. But I will try sweet wines and semi-sweet wines, just because I want to see how they're produced. If that flavor profile that's supposed to happen with this type of a grape and this type of a region comes through, and if it does, it's a good wine.'

Most participants then used wine variety as the next criteria for placing the wines on their maps, which was reflected in **Figure 1** where the second dimension of the consensus map, which accounts for 21.07% of the variance, separates wines based on variety with all Chardonnays appearing at the top of the map, Rieslings in the middle of the map, and Traminettes codes with T) on the bottom of the map. This was also reflected in participants comments.

'It's mostly based on dry vs sweetness and then according to the type of grape.'

Those who were familiar with Traminette wines considered them more similar to Rieslings compared to Chardonnays. Many participants were unfamiliar with Traminette wines, but these participants most often guessed it would be more similar to Riesling compared to Chardonnay.

Location produced was a minor factor for most participants' placements of wines on their maps, and most participants indicated that location was not a major factor when deciding which wines to purchase. Having said that, there was a **consistent sentiment across all four groups that California wines tended to be of higher quality than New York wines, which in turn were of higher quality than Pennsylvania wines.**

'I mean I'm not a big fan I'll be honest of Pennsylvania and New York wines. I am not. So I kind of lumped those guys off to their own and put California together.'

Many participants noted that Pennsylvania wines tended to be sweeter than California wines.

'My perception is I've had many that were too sweet, so I just don't even consider the Pennsylvania New York wines.'

'I think even the semi-sweet Pennsylvania ones that I've had I feel like I'm drinking simple syrup like they're too sweet for me.'

Other participants were more nuanced in their responses, noting that they liked certain wines from the Pennsylvania and New York regions.

'I think Pennsylvania New York make very good semi-sweet wines.'

'Especially Rieslings I mean that's what that's what our climate can do.'

'I think there are grape varieties that would work in Pennsylvania that aren't being used in Pennsylvania, and I'm thinking particularly of grapes, that would be native to say Eastern Austria. You know you have a similar climate condition there. You have a similar growing season.'

More involved and knowledgeable participants were able to articulate that hybrid wines are a result of crossbreeding. These participants also articulated that the process allows for the creation of new wine varieties with desirable attributes. A few of the more knowledgeable consumers knew that Traminette was a hybrid wine, but the majority of the participants did not.

'Not every grape variety is going to grow everywhere, and if you're trying to find something that will grow in your area you maybe need a hybrid you see something you know with a stronger root system.... Or you maybe develop a grape that needs less sunshine for our area because we don't get the sun, you know as much as California, so you want something that will ripen maybe a little earlier and that's what you're doing when you're experimenting with hybrid.'

Other participants were unsure what the term hybrid meant in relation to wine. These consumers most often believed that it meant a blend of different wines and often had a vague sense this could create a desirable outcome. In general participants said they paid little attention to whether wines were hybrids or not and thought it had little effect on their purchase decision.

'It's kind of the blend between two different wines together.'

'I've heard it. But yeah, I just thought it was blend.'

When responding to the statement that hybrid wines allow for the use of less fungicide and are better for the environment, participants indicated that while it was a positive, it would have little effect on their purchase behavior. Very few were taking environmental factors into account when purchasing wine, with other factors like price and taste being far more important.

'I want to try it, but I think it comes down to taste and price.'

'If it was available and I enjoyed it, it would probably make me more inclined to purchase that over something else, but again I would have to like it, because there's no point for me, no matter what I drink, I want to enjoy it, and if it's not good, then I will just have water instead.'

Participants were also not very moved by the statement that hybrid wines are a good investment for growers because they are more suited to the climate. Participants indicated benefits to growers were positive, but it would have little effect on their purchase behavior in light of other factors influencing their purchasing decisions.

'Pennsylvania is not an easy state to grow grapes. We can't grow them in Beaver County. We don't have the climate. We don't have the terroir. So yes, if they could find some grapes that would grow. But there again it's going to be a matter of taste if they're gonna grow something that.'

Participants responded much more positively to the statement that hybrid grapes help create better tasting wines. Since taste (and price) were their primary motivations for purchase the information that hybrids would allow for the creation of better wines created motivation for purchasing hybrid wines. Participants also indicated that based on their knowledge of hybrids, this statement was believable. When asked to rank the statements, all participants indicated that out of all the statements, this one would be most likely to motivate them to purchase Pennsylvania wines.

'I think that's a positive because there's nowhere to go but up.'

Frequency counts of the descriptors from the CATA question reinforced these findings (**Figure 2**).

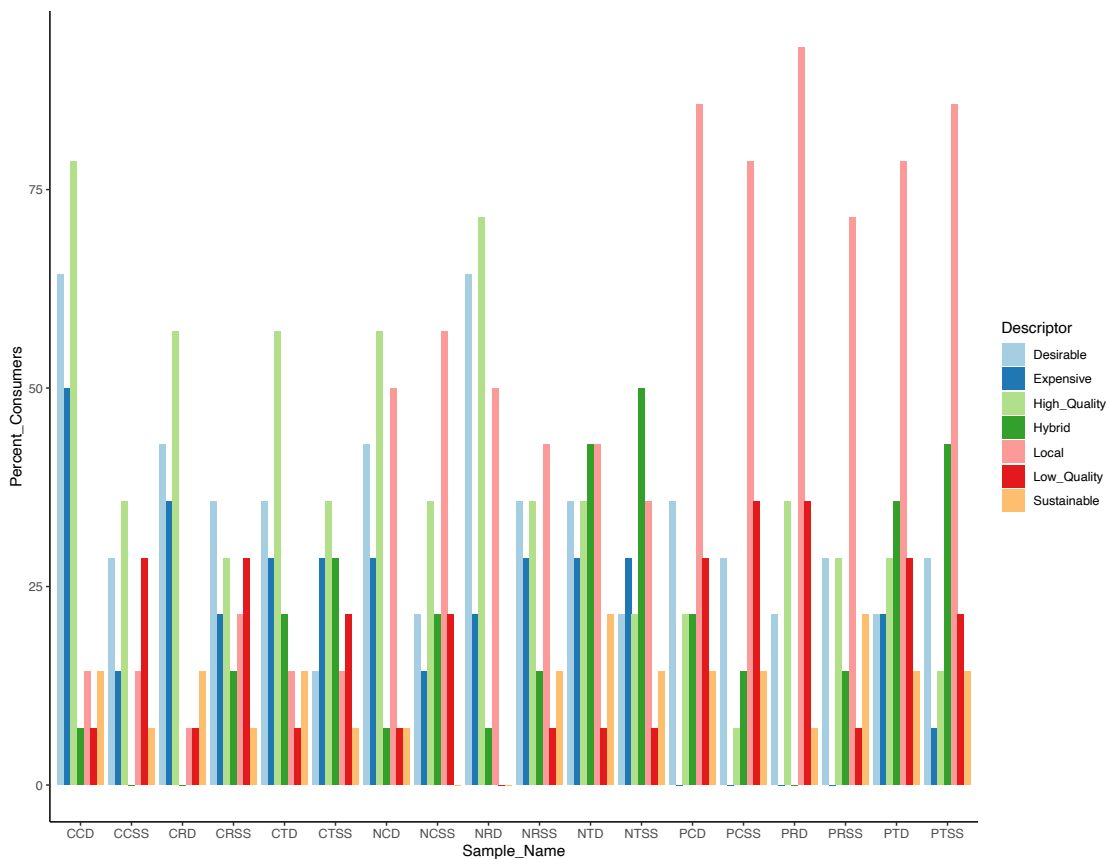


Figure 2. Descriptor frequencies for the 18 wines from PA wine consumers participating in the focus groups. Wine descriptions are noted in **Table 1**.

Unsurprisingly, Pennsylvania wines were more frequently cited as ‘local’, with 75% of participants endorsing the local attribute for all PA wine descriptions. California Dry Chardonnay and New York Dry Riesling were the wine descriptions that were most frequently cited as ‘desirable’ (over 60% endorsement), and Dry Chardonnay and Riesling from California and New York were frequently cited as ‘high quality’ (over 50% endorsement). Traminette wines were cited as ‘hybrid’ slightly more often

than other wines. Very few wines were labeled as ‘sustainable’ (all less than 25%), indicating that wine consumers are not familiar or knowledgeable about sustainable wine production.

Overall, the qualitative portion of this project provides important consumer insights: Taste (and price) were their primary motivations.

- 1) residual sugar content and wine style (dry vs. sweet) appears to be the strongest driver of consumer choice for white wines.
- 2) Grape varietal comes second, with consumers knowledgeable about Traminette wines considering them more similar to Riesling than Chardonnay, and those who are not familiar guessing it to be more similar to Riesling wines.

- 3) Production location (CA vs. NY vs. PA) was less important for the consumers, however, across all four groups consumers felt that California wines tended to be of higher quality than New York wines, which in turn were of higher quality than Pennsylvania wines. Partially this was due to the perception that PA wines tend to be sweeter than wines from CA and NY. This however, was more nuanced for those consumers that had more expertise/experience with PA wines.
- 4) The majority of consumers did not know what a hybrid wine is and thought it would be a blend of different wines. Participants said they paid little attention to whether wines were hybrids or not and thought it had little effect on their purchase decision. Only the statement that hybrids would allow for the creation of better wines created motivation for purchasing hybrid wines.

Based on these findings, it appears that PA wine consumers have a neutral perspective of hybrid grapes. Taste and price are primary motivators for these consumers. Production location appears to have a lesser impact, although wines from CA and NY are perceived as more desirable and higher in quality than wines from PA.

Financial reporting is provided by the Department of Research Accounting at PSU in accordance with the terms of the grant agreement.

SECTION 3 – SCOPE OF WORK

(Reasons why established objectives were not met, if applicable?)

Not applicable. Project deliverables are all reported as we were able to adapt our original plans to remote alternatives, despite the ongoing Covid-19 pandemic.

Findings from our quantitative online survey have been published in the open access journal *Beverages* (Todd et al., 2021). A copy of the journal article is attached. Publishing in an open-access journal allows us to share our results freely without a paywall with stakeholders from the PA wine industry.

In collaboration with Co-PI Kelley, we are planning on disseminating our findings also through blog posts at the PSU Wine & Grapes website (<https://psuwineandgrapes.wordpress.com>), and at the next PWMRB Symposium.

SECTION 4 – DELAYS/RISKS

(Reasons for any problems, delays, or adverse conditions which will affect attainment of overall program objectives, prevent meeting time schedules or objectives, or preclude the attainment of particular objectives during established time periods. This disclosure shall be accomplished by a statement of the action taken or planned to resolve the situation?)

Not applicable.

SECTION 5 – SPECIAL NOTES

(What objectives and timetables are established for the next reporting period? Etc.)

References

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Van Trijp HCM, Steenkamp J-BEM (2007) Consumers' variety seeking tendency with respect to foods: Measurement and managerial implications. *European Review of Agricultural Economics* 19(2):181–195. DOI: <https://doi.org/10.1093/erae/19.2.181>

Article

USA Mid-Atlantic Consumer Preferences for Front Label Attributes for Local Wine

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Abstract: The purpose of this research was to investigate Mid-Atlantic USA wine consumers' preferences for front wine label attributes for a lesser-known/unknown local wine variety. The wine consumer base in this part of the USA exceeds that of California. Although the mid-Atlantic is experiencing an increase in the number of wineries, there is a lack of region-specific consumer research that could be the basis for marketing strategies that may differ from those in more established wine regions, such as CA. We recruited 1011 mid-Atlantic consumers who drank wine (at least 1×/month) to view variations of a wine label, differing in wine tag, location description, font types, and images in a choice-based conjoint experiment. A greater percentage of consumers selected the "White Wine" tag and scripted fonts than the other options, with a generalized county text ("Proudly produced in Lehigh County, PA") being selected by more participants than the American Viticultural Area (AVA) ("Lehigh Valley AVA") or state ("Pennsylvania") texts; however, the location text had a lower importance than the wine tag variable. This study implies that a generalized county text that describes a more specific location where the grapes were grown may be more favorable to mid-Atlantic consumers in comparison to AVA or state texts, and that traditional images and generic wine labels are more preferable than wine labels they have not seen before and more contemporary label styles. Wineries in the mid-Atlantic region may want to add generalized county texts to their labels to appeal to the regional audience. As AVAs are used to promote specific wine regions in the USA, and only some consumers choose wines based on these designations, governments and marketing organizations may want to increase education on local AVAs to increase consumer awareness and interest. In addition, consumer differences in variety-seeking behavior and subjective as well as objective wine knowledge, but not attitudes toward locally produced foods, affected wine label choice: Consumers scoring higher in variety-seeking and wine knowledge preferred the specific wine varietal over the generic wine tag; similarly, consumers that indicated familiarity with the wine varietal also preferred the specific wine tag over the generic label. Differences in consumer psychographics appear to modulate front wine label preferences.

Keywords: wine label; conjoint analysis; psychographic; white wine; Pennsylvania; Vidal blanc; consumer categorization



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1. Introduction

Vidal blanc is a hybrid grape variety that grows well in the climate of the northeast and mid-Atlantic regions of the USA but is relatively unknown by consumers in the wine market. As such, many winemakers do not sell their wines made from this grape under a Vidal blanc name but use general terms or non-grape names for their wines (e.g., "The Huntress" (Galer Estate Vidal blanc wine, Pennsylvania), "Joy White" (Cross Keys Vidal blanc wine, Virginia). Familiarity is known to affect consumer decisions, such as perceived appropriateness of use [1], implying that more familiar wines or wine types increase

consumers' imagined use cases and, therefore, increased interest. The Pennsylvanian climate is not suited for producing many of the well-known grape varieties that are familiar to consumers, such as *Vitis vinifera* varieties; the cool and wet climate is more preferential to less commonly recognized varieties, including hybrid varieties such as Vidal blanc [2].

Even though Pennsylvania (PA) is the sixth-largest wine-producing state in the country, it is not as well known by consumers as California or New York [3]; however, the PA wine industry has experienced continuous growth over the past decade and is developing into a solidified professional industry. For PA wineries, the majority selling less than 10,000 cases per year, cellar door purchases and wine tastings on-site are common income streams [4], supported by the proximity to major metropolitan areas in PA and neighboring states (mid-Atlantic states of New York, Pennsylvania, New Jersey, Virginia, Maryland, West Virginia, and Washington, DC, and Ohio).

According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA), wine consumption in this region exceeds that of California (148,347,000 vs. 176,539,000 gallons in 2016) [5], demonstrating the size of the consumer base. While there has been an increase in consumer research conducted on these wine consumers, the increase in the number of wineries in the region and size of the market deserve greater attention and more region-specific marketing strategies that may be in contrast to what is appropriate for wine regions in states (e.g., CA) and countries (e.g., Australia) with a more greatly established wine industry.

In researching the USA wine market with Philadelphia, PA, and New York City, NY, consumers, Kelley et al. [6] found that even among those residing in these mid-Atlantic cities, only 37% had ever consumed PA wine. Potential reasons for this include an industry made up of many small-scale producers and the importance of direct-to-customer sales in Pennsylvania, where context and experience will drive local consumers toward a purchase. However, with the introduction of wine into supermarkets and other less specialized stores across the state in 2016 [7], local wines are now being seen at higher frequencies in direct comparison to their regional, national, and global competitors. With Pennsylvanian wines coming under new scrutiny in mass-market comparisons, and with the relative unknown existence of Vidal blanc, this research aims to investigate mid-Atlantic USA wine consumers' preferences for front wine label attributes for a lesser-known/unknown local wine variety such as Vidal blanc, produced in a lesser-known wine region, such as Pennsylvania. Results from this study will be useful for producers to design their labels and sell their wines.

The front wine label is seen as one of the largest influencing factors of purchase among consumers [8–10]. The information presented on the label, through images and text, is influential in picking up and purchasing a bottle of wine. Chrea et al. [11] found that hedonic liking of wine labels was indicative of consumer choice, emphasizing the importance of appealing wine labels. For these reasons, wineries often contract their wine labels to be created by artists. Color [12,13], text font [14], location of origin [15,16], and wine name [17,18] on the front wine label have all been found to affect consumer response.

In their analysis of understanding typical and atypical packaging colors, Garaus and Halkias [12] compared gold and purple packaging for sparkling wine, finding that consumers were less skeptical of the "typical" gold packaging, as analyzed by typicality and skepticism scales. Lick et al. [13] also found that consumers' flavor expectations varied based on the wine label color of red wines, with red and orange associated with fruity and flowery flavors, and red and black associated with tangy flavors. These studies show that color choice of the front wine label is an important factor in communicating with and conveying information to consumers.

In their analysis of font types, Gmuer et al. [14] found that a high fluency font (one that is easy to read) increased the hedonic values of a wine, even though participants rated the low fluency font (a hard-to-read script) as more elegant. However, in this study, participants were asked to read both a front and back wine label, where the back label included a paragraph of information, which may have influenced the preferred results

of the study as not all wine consumers read the entirety of a label when they make their purchase decision.

Region of origin has been studied many times in conjunction with wine labels, as it is one portion of a wine label that can give some indication to consumers of what is in the bottle. Sáenz-Navajas et al. [15] found that region of origin was important to wine quality judgments in both an imitation auction context and a categorization task with French consumers. Veale and Quester [16] found that in the case of trying wines while looking at a label, the stated wine origin overrode the participants' own sensory perceptions. Wine from a bottle with a well-known wine region on the label was perceived as higher in quality than the same wine in a bottle labeled with an unknown wine region. This concept was also confirmed by Guidry et al. [19] who involved Texan students in a study and found that the same wine labeled as originating from France was preferred over wine labeled as originating from Texas. Lockshin et al. [20] reported that region of origin affected consumer choice, where a region with high awareness increased purchase likelihood in a choice experiment. The size of the effect was partially modulated by consumer involvement and the presence of medals, with a gold-medal wine from a high-awareness region losing favor with consumers that showed less wine involvement, as assessed by the wine involvement scale developed by Lockshin et al. [21].

Different names for the same wine were studied in the Australian market between 2011 and 2016 [17], finding that for premium wines, the French synonymous variety name would incur a price premium compared to the non-French name (e.g., Syrah vs. Shiraz, Pinot Gris vs. Pinot Grigio). Sherman and Tuten [18] compared traditional, contemporary, and novelty wine label designs for three fictitious brands of Yakima Valley, WA, and Petite Syrah wines. They found that traditional labels with regard to brand name and label design seem to be more appealing to wine consumers than other styles of wine label; however, in their study, the same variety (Petite Syrah) was displayed on each label.

A method to discover the important qualities of a multifaceted product is conjoint analysis [22,23]. Conjoint analysis has been used many times to study aspects of wine labels to understand consumer wine choice and preference [11,16,20,24]. Scientifically, the ability to look at a large group of factors and levels in an experiment is usually limited by time, money, and sample. However, conjoint analysis as a designed experiment can uncover the importance of different categories as well as reveal potential interactions between them. Choice experiments also allow participants to evaluate many different conditions in a short amount of time by using an experimental design structure, making this methodology a versatile and very helpful way to reveal consumer product choice. Ultimately, conjoint analysis highlights the compromise that consumers make when choosing a product where they have to find their best trade-off with competing product categories. Choice-based conjoint analysis (CBCA) is a fast method that mimics in-store decisions—instead of rating each variation on a scale, consumers are selecting which option they would pick—which is more typical of a purchase experience. Here, CBCA was used to quantify the importance of different wine front label factors for a Vidal blanc wine from Pennsylvania. This study focused on PA wine consumer perception, as prior research has shown that the importance of place of origin is dependent on perceived consistent match with the product [25]. Specific to this study, we were interested in the importance of location and wine type on consumer perception of wines produced in close geographical proximity to the consumer [26].

Wine consumers are often grouped based on their behaviors, attitudes, knowledge, interests, engagement, and other such psychographic attributes in order to better understand their choices. In this study, we were interested which psychographic factors might affect the selection of front wine labels that featured a lesser-known, hybrid variety, Vidal blanc, and used different location texts, as well as how these factors possibly interact. Therefore, multiple psychographic scales were employed to better understand the consumer respondents. Variety-seeking (VARSEEK) behavior [27] has been studied in a wine context in the USA [28], and this scale was used to learn if those interested in new things may be more likely to choose an “unfamiliar” variety over a generic one. Subjective and objective wine

knowledge may also play a role. If Vidal blanc has been heard of before, or if the consumer thinks they know what Vidal blanc is, they may be more interested than an unfamiliar or uninterested consumer [29]. Lastly, an attitudinal score for local-seeking behavior, termed “Locavores” [30], was used to see if different gradations of a locally produced wine were important for consumers when making their choices, as we surveyed consumers that live in or in close proximity to PA, where a majority of wine producers generate their main income through cellar door purchases and wine tastings on-site [4].



We hypothesize that (i) wine consumers, when presented with varied wine labels, will in general prefer more generic wine tags (e.g., white wine and white table wine) over more specific, unknown wine varieties, such as Vidal blanc; however, that may differ for those consumers that have had prior experiences with the unknown wine variety. We further hypothesize that (ii) a region-of-origin text that is perceived as regulated (e.g., an American Viticultural Area (AVA) location) will drive consumer choice, and that (iii) differences in wine label preference will be informed by differences in consumer psychographics (e.g., variety-seeking behavior, attitudes toward locally produced foods, subjective and objective wine knowledge).

2. Materials and Methods

2.1. Wine Labels

The created front wine labels differed in four attributes: Font, Image, Wine Type, and Location Text, as seen in Table 1. Bottle price, although important, was not included as an attribute for several reasons: although price is an important factor in wine-purchasing decisions [31], bottle price importance depends on the retail outlet from which it is purchased (e.g., grocery store vs. wine store vs. on-site of a winery) [32]. The median bottle price in the USA ranges from USD 10 to 15 [33], with typical *V. vinifera* wines produced in PA selling for around USD 18/750 mL [34] in retail outlets, making it less feasible for PA producers to compete based on price.

Table 1. Description of the four factors, and associated levels evaluated in the choice-based conjoint analysis (CBCA) experiment. Using an orthogonal design, each factor level was combined in all possible combinations and participants rated all 36 tasks.

Factors	1	2	3
Image	 (embellished)	 (simple)	–
Font	Edwardian Script, Book Antiqua Bold (cursive)	Trebuchet, Myriad Variable Concept Light (sans-serif)	–
Wine Type Text	Vidal blanc	White Wine	White Table Wine
Location Text	Lehigh Valley AVA (AVA)	Pennsylvania (state)	Proudly produced in Lehigh County, PA (county)

Nine labels were created in Adobe® Illustrator (Creative Cloud version 23.1, Adobe Inc., San Jose, CA, USA). The label design was based on the hedonic scores of four different versions in a pre-survey with 739 respondents (data not shown), where the chosen design was significantly more liked ($F(32,952) = 9.51; p < 0.00001$) than the other three versions. The fictitious winery name was created by the researchers to both sound believable and typical of a Pennsylvanian wine experience regardless of region (Mallard ducks are a common sight in parks in Pennsylvania). “Critter labels” have been used many times to gain interest among wine consumers, and local animals can portray ideas of the local experience [18]. The yellow/gold background color was based on a “typical” wine label [12] and is also a frequently used color in Bordeaux wine labels [9].

The wine tags selected were *Vidal blanc*, the hybrid grape of interest, as well as two different generic wine tags, *White Wine* and *White Table Wine*. These were selected as *Vidal blanc* wines are often given a generic descriptive tag in Pennsylvania (e.g., white wine), instead of labeling it with its varietal name (even if it is 100% that variety), assumingly due to consumer unfamiliarity.

The location texts used were meant to discern the importance of appellation of origin of lesser-known wine regions to mid-Atlantic wine consumers. In the USA, the appellation-of-origin statements on labels only indicates a minimum percentage of grapes coming from the labeled appellation, which can be a country, a state, a county, or an approved American Viticultural Area (AVA). However, in contrast to other countries, appellation-of-origin labels in the USA only concern geographical boundaries and do not bear any quality connotations, as for example, the French or the Italian controlled and guaranteed origin denomination systems. In addition to a geographical appellation of a state and an AVA, a generic county text was included as an option, as some Pennsylvanian wineries use similar texts on their front labels.

Two different fonts were used to discern if findings reported by Gmuer et al. [14] would also translate to a USA consumer population. A more “traditional” font with a cursive main and serif subtext font was compared to a more “casual” one with two sans-serif font styles. While the primary image featured on the label was not a main focus in this study, there was some concern that an overly flourished image with a sans-serif font would look too incongruent and cause mistrust or avoidance in consumers, such as atypical packaging colors did for consumers in Garaus and Halkias [12]. Therefore, two images were tested, one with and one without the extra flourishes. Example images of the created labels are shown in Figure 1.



Figure 1. Two example wine labels used in the choice-based conjoint analysis (CBCA) experiment displaying variations in wine type, production location, font, and primary image.

2.2. Data Collection

The experiment described here was reviewed, approved, and acknowledged as exempt by The Pennsylvania State University’s Institutional Review Board under protocol STUDY000012536, and administered online. Implied informed consent was obtained from all participants on the first screen of the study, and only consenting participants’ data were collected. Consumers were recruited from the mid-Atlantic region by Dynata[®] Survey Sampling International (Westport, CT), based on recruitment criteria including consumers (i) at least 21 years of age and under the age of 70, (ii) with their main residence in the mid-Atlantic region of the United States (being described here as the states of Pennsylvania, New York, New Jersey, Virginia, Maryland, Delaware, West Virginia, and Washington, District of Columbia) and Ohio as a neighboring state to PA, as the majority of PA wines are sold in these states, and (iii) reportedly consuming white wine at least once per month (i.e., both high frequency and occasional wine drinkers [35]). Participants were compensated according to the Dynata[®] compensation scheme.

Multiple criteria were used to ensure the quality of the data collected. Participants with repeat ID numbers managed through Dynata[®] were removed prior to data processing.

Any surveys completed in under 5 min were also removed, as any participant would be hard-pressed to read every response and answer in under this time as determined by the research team. Participants were also screened based on intermittent checks in the survey (e.g., “Please select “disagree” for quality control”). Lastly, the age question was asked twice, once at the beginning of the survey and again at the end, and if these two values were not the same, the survey response was removed.

2.3. Choice-Based Conjoint Analysis (CBCA) and Psychographic Questionnaires

The choice-based conjoint analysis (CBCA) experiment was created and administered through Sawtooth Software and analyzed in Sawtooth Software Lighthouse Studio (version 9.8.0, Sawtooth Software, Inc., Provo, UT, USA). A Balanced-Overlap design provided by Sawtooth was selected so that panelists were forced to make decisions based on multiple factors at once, allowing for the analysis of interactions between factor levels. Four images were shown together in a task on the screen, and there were ten total tasks; there was no “No Choice” option available. Respondents were asked to choose the best option for them in each of the ten tasks. One of the tasks was fixed in order to pull apart location and wine tags specifically, as well as to serve as a model validity check and to test the simulated model. This holdout task was always the fifth task displayed. The other nine choice tasks were varied based on the experimental design provided by Sawtooth. From the CBCA data, utility scores were calculated using Sawtooth Software’s Hierarchical Bayes model (HB), which allows the estimation of individual participant’s utilities [22]. These utilities indicate how likely participants are to choose one level over another within one attribute. The utilities will always add up to zero, with positive ratings meaning a higher frequency of choice. Additionally, an overall importance number is calculated, summing up to 100, showing how important one factor is compared to another. The higher the importance number, the more this factor affects consumer choice [22].

After the task experiment, participants answered questions from three validated psychographic tools: The VARSEEK scale as adapted for wines [28] consists of 8 questions that ask the degree of agreement on a 5-point Likert scale to statements such as “I like to drink exotic wines”, with the summed responses possibly ranging from 8 to 40. Second, the 11 statements from the locavore scale [30] were shown and participants indicated agreement to questions including “Locally produced foods just taste better”, on a 7-point Likert scale (possible range 11–77). Third, agreement with the 9 statements from the subjective wine knowledge questionnaire [29], e.g., “I know how to judge the quality of a bottle of wine”, were measured on a 7-point Likert scale (possible range 9–63). The 5 objective wine knowledge questions, as described in [25], were also included where the correct answer was provided alongside 3 incorrect and a “Don’t know” option (e.g., Which is the name of New Zealand’s famed Sauvignon Blanc region? With corresponding response categories: Kapiti, Hawkes Bay, Waipara, Marlborough, I don’t know). Participants responded to additional questions regarding their knowledge of what the abbreviation AVA means, demographic characteristics (age, gender, state of residence, household income), and wine consumption habits. Lastly, participants were also asked about their familiarity with Vidal blanc as a wine tag and if they had previously consumed this wine.

For data analysis, correct responses to the objective wine knowledge questionnaire and total scores from the other surveys were used as indicated by the original publications. Reliability for the psychographic questionnaires (locavore, VARSEEK, subjective wine knowledge) was evaluated by Cronbach’s α .

3. Results and Discussion

3.1. Consumer Demographics

The CBCA was administered online from May 4–8 of 2020. The study had 1011 complete and usable respondents out of 2646 total responses, mostly due to not fulfilling our recruitment criteria, failing the attention and QC checks, and/or taking less than 5 min to complete the survey (Table 2). Of those completed surveys, 86% of participants took

between 5 and 20 min to complete the survey. Respondents were 63% female ($n = 638$), with 24% of respondents being between the ages of 21 and 35 ($n = 244$), 40% between 36 and 50 ($n = 402$), and 36% between 50 and 70 ($n = 365$)—the median age was 41–45 years. Most participants were from New York (32%, $n = 324$), followed by Pennsylvania (20%, $n = 206$), New Jersey (15%, $n = 152$), Ohio (12%, $n = 123$), Virginia (11%, $n = 114$), with the rest (9%, $n = 92$) coming from Maryland, West Virginia, and Washington, DC. No panelists reported being from Delaware. The largest group of respondents (43%, $n = 435$) reported a yearly household income of over USD 100,000, with the median household income being USD 80,000–90,000, which aligns with a study by Thach and Camillo [36] who reported a median annual income of USD 85,000 for wine consumers across the 50 USA states.

Table 2. Demographic summary of consumer survey respondents ($n = 1011$).

Category	Response Option	Counts	Percentage
Gender	Male	372	36.8%
	Female	638	63.1%
	Prefer not to answer/other	1	0.1%
Age	21–25	43	4.2%
	26–30	76	7.5%
	31–35	125	12.4%
	36–40	141	13.9%
	41–45	141	13.9%
	46–50	120	11.9%
	51–55	62	6.1%
	56–60	72	7.1%
	61–65	120	11.9%
State	66–70	111	11.0%
	New York	324	32.0%
	Pennsylvania	206	20.4%
	New Jersey	152	15.0%
	Ohio	123	12.2%
	Virginia	114	11.3%
	Maryland	63	6.2%
	Washington, DC	18	1.8%
West Virginia	11	1.1%	
Income	Less than USD 20,000	48	4.7%
	USD 20,000–39,000	103	10.2%
	USD 40,000–59,000	139	13.7%
	USD 60,000–79,000	145	14.3%
	USD 80,000–99,000	141	13.9%
	Over USD 100,000	435	43.0%
Wine Consumption	Daily	71	7.0%
	A few times per week	328	32.4%
	About once per week	208	20.6%
	A few times a month	279	27.6%
	About once a month	125	12.4%

Sixty percent of respondents indicated they consumed white wine at least once per week, placing them into the high-frequency wine drinker category [35]. Based on data published in 2019 by the Wine Market Council, approximately 39% of US adults, aged 21 and older, consume wine more frequently than once every 2–3 months. Of these consumers, 89.1% consumed wine once a month, which is the wine consumer we targeted as these consumers both like wine and purchase wine [35].

3.2. General Population Results from the CBCA Experiment

Utility scores for the total study populations were calculated using Sawtooth Software's Hierarchical Bayes model (HB), as described in the Methods section. Using the holdout task, the created HB model accurately predicted participants' real choices within a 5% absolute error for each label, with an average of 3.23% absolute error (Table 3), indicating valid results [37]. This check ensured that the model did fit the participants' choices, and further analysis was conducted using the HB-modeled utilities.

Table 3. Comparison of the holdout task percentages found compared to the Hierarchical Bayes (HB) model estimate for the entire consumer population ($n = 1011$). All the presented wine labels in the holdout task used cursive font and the more embellished image.

Label	HB Model Estimate	Actual Percentage
White Wine, Pennsylvania	23.4%	18.9%
White Wine, County text	30.6%	33.3%
Vidal blanc, Pennsylvania	16.4%	20.0%
Vidal blanc, County text	29.7%	27.7%

Among the tested factors—wine tag, location, font style, and image—wine tag had the highest importance score of 45.5% (Table 4). Within that category, *White Wine* had the highest utility score (+22.6), followed by the *Vidal blanc* (+0.3) and *White Table Wine* (−22.9) tags. While we correctly hypothesized that the generic white wine text would have a higher utility than Vidal blanc, the low utility score of *White Table Wine* was not expected. In the USA 27 Code of Federal Regulations 4.21 [38], table wine is defined as “grape wine having an alcoholic content not in excess of 14 percent by volume”, which does not require any stylistic or quality attributes. The Vidal blanc wine tag has a “Frenchness” to it, which was favorable in certain populations [17,19]; however, this was not as pronounced here in our general population.

Table 4. Utilities and importance values as estimated by the Hierarchical Bayes (HB) model for the entire survey population ($n = 1011$).

Attribute	Importance	Levels	Utilities
Wine Type	45.4	<i>White Wine</i>	22.6
		<i>Vidal blanc</i>	0.3
		<i>White Table Wine</i>	−22.9
Font Type	34.5	Cursive	45.0
		Sans-Serif	−45.0
Location Text	14.6	County text: <i>Proudly produced in Lehigh County, PA</i>	12.1
		AVA text: <i>Lehigh Valley AVA</i>	−3.1
		State text: <i>Pennsylvania</i>	−9.0
		Image	5.5
		Simple Image	−1.7

This could be due to the presence of the location text, as each wine label had a Pennsylvania wine code, which would go against the “Frenchness”, as does the winery name, selected to include a representation of the Northeast USA (survey participants may not necessarily have associated Mallard ducks with “Frenchness”). The more familiar but less descriptive *White Wine* text was most preferred, which validates this more generic approach when marketing to a general wine consumer. It is also important to note that *White Wine* is often used for other wine varieties and white wine blends, and not just Vidal

blanc. There may be some bias for consumers, if they had heard of Vidal blanc and disliked it, to select other wine texts based on the experience that those other wines would indicate a difference in sensory attributes. However, the label did not include wine style (e.g., dry, sweet, or otherwise), and so any expectations on wine style would have been unique to each participant.

Based on prior research, we speculated that font style would affect consumer choice and found that font had the second highest importance score (34.5%; Table 4), with the scripted font being much more preferred to the sans-serif font (+45.0 vs. −45.0). This is in contrast to results by Gmuer et al. [14]; however, as mentioned before, our consumers were not forced to read a large body of text in the scripted font used in our study, which may explain the differing results. The script may be considered more “traditional”, which has been found to be preferred by wine consumers [18]. Also of note is that each label contained the legally required alcohol and sulfite statements. Since this text could not be enlarged on the image, and the location texts were extremely important to this research, we used an identical font size and type on all labels as comments from those who participated in the initial pre-test found it difficult to read these statements when presented in a smaller scripted font size.

Our second hypothesis concerned the impact of the location where we hypothesized that location text would be an important driver of consumer choice. Here, however, location was ranked fourth in importance (importance score of 14.6%; Table 4), which is surprising, as many studies have seen region of origin impact consumer choice strongly [15,16,19,20]. This may be due to the lesser-known state of Pennsylvania as a wine-producing state.

Within this category, we hypothesized that the regulatory AVA text (*Lehigh Valley AVA*) would be most preferred due to the perceived government oversight and prestige; this, however, was not found (Table 4). Instead, the generalized county text *Proudly produced in Lehigh County, PA* was the most preferred (+12.1; Table 4) over both the AVA text (−3.1) and the state text *Pennsylvania* (−9.0; Table 4). This confusion or lack of knowledge about AVA designations among mid-Atlantic consumers was mirrored in the question asking participants to identify the correct meaning of AVA, where only 116 of the 1011 participants (11.5%) selected the correct answer, 395 participants (39%) admitting to not knowing, and almost half (49.5%) of the participants ($n = 500$) incorrectly identified what AVA meant, even with the “I don’t know” option available (Table 5). It should be noted that this question was included after the objective knowledge questionnaire and the response categories were created to generally follow the same format as the other wine knowledge questions (i.e., one correct response, several incorrect responses, and a “I don’t know” option).

Table 5. Breakdown of 1011 participants’ responses to the question “What does AVA indicate when on a wine label?”. The italic answer is the correct response.

Response	Percentage (Count)
<i>The majority of the grapes are grown in the area designated on the label</i>	11% (116)
The wine is produced in accordance with winemaking laws designated by this region	8% (77)
The wine has been certified by the American Viticultural Association for quality	37% (370)
All of the grapes used to grow the wine are grown in the USA.	5% (53)
I don’t know	39% (395)

These results reveal a need for consumer education and/or targeted marketing campaigns by the wine industry to inform wine consumers about AVAs and the potential benefits associated with the designation.

Alternative to the more strictly regulated AVA designation, a county-specific text, such as *Proudly produced in Lehigh County, PA*, may be feasibly added to the front wine label to increase consumer appeal. Combining such text with the AVA (e.g., Proudly produced in the Lehigh Valley AVA) may also attract more consumer interest. A study found that

Sonoma County, CA, resonated stronger and raised more awareness among USA wine consumers than any of the Sonoma County AVAs [39,40], which indicates some usefulness of using a county label text over AVAs for consumer recognition and advertising. This may be even more true for an emerging region such as Pennsylvania compared to the more well-known Sonoma wine region. The preference for the *Proudly produced in Lehigh County, PA* tag may result from the general familiarity of counties as regions where people live, where locations are more known geographically and politically, than a potentially niche AVA that may not be as recognized by the general public.

3.3. Differences in Consumer Psychographics and Wine Knowledge Affect Wine Label Preference

Participants were asked to answer multiple validated questionnaires to understand how these psychographic factors and their wine knowledge and familiarity affected their choices in the conjoint analysis. Participants were segmented into terciles (low, medium, and high scorers) based on their responses to these psychographic questionnaires. The mean utility scores of these tercile groups were then calculated and compared.

The main wine tag factor (e.g., *White Table Wine* vs. *White Wine* vs. *Vidal blanc*) was used to better understand consumer decisions, as this attribute had the highest importance score and was pertinent to the research objectives in this study. The location text with an importance score of 14.6 was too small to detect any significant differences in utility scores due to consumer psychographics, and neither were any meaningful differences found for the font type category. All consumers seemed to agree in their preference for the cursive font.

Consumers reported their familiarity with Vidal blanc as a wine variety, and, if familiar, their opinions on the variety. We hypothesized that this familiarity would naturally affect the appeal of the *Vidal blanc* wine tag, and thus, participants were separated into three groups based on their answers to that question, and the mean utility scores were calculated for each group (Table 6). Those who reported being familiar with Vidal blanc (29.7%; n = 300) strongly preferred the *Vidal blanc* wine labels (utility score of +23.2) over both the *White Wine* and *White Table Wine* tags (+4.0 and −27.2 utilities, respectively, for the ‘yes’ group). This was in stark contrast to the overall analysis (+0.3 for the *Vidal blanc* tag; Table 4) and to those consumers who had never or only maybe heard of Vidal blanc before (−10.0 and −7.4, respectively, for the *Vidal blanc* tag; Table 6). Consumers who answered “yes” or “maybe” to being familiar with Vidal blanc were also asked what their opinions were of the varietal. Of the 476 questioned, only 10 participants responded they disliked Vidal blanc, with 203 responding that they liked the varietal and 263 having no preference.

Table 6. Participant responses to the question how familiar they are with the varietal Vidal blanc, and the mean utility scores for each response group.

	Count	White Wine	Vidal Blanc	White Table Wine
No	535	+30.7	−10.0	−20.6
Maybe	176	+29.8	−7.4	−22.5
Yes	300	+4.0	+23.2	−27.2

The total scores for subjective wine knowledge [29], variety-seeking behavior (VARSEEK) [27,28], and locavorism [30] covered nearly all of the possible score ranges, and each followed a somewhat normal distribution; the mean utility scores for the low, medium, and high scoring terciles are reported in Table 7.

Table 7. Participants' mean sum scores \pm standard deviation and ranges for the locavorism, VARSEEK and Subjective Knowledge scales, reported for overall and each tercile, and the corresponding mean utility scores of each level in the wine type factor.

Locavorism	Mean \pm SD	Range	Counts	White Wine	Vidal Blanc	White Table Wine
<i>Overall</i>	51.2 \pm 8.4	15–75	1011	22.6	0.3	–22.9
Low	42.2 \pm 4.9	15–47	343	25.7	1.5	–27.2
Medium	51.4 \pm 2.2	48–55	343	22.6	0.8	–23.4
High	60.5 \pm 4.2	56–75	325	19.4	–1.5	–17.9
Variety Seeking (VARSEEK)						
<i>Overall</i>	29.6 \pm 5.2	8–40	1011	22.6	0.3	–22.9
Low	24.2 \pm 3.7	8–28	369	33.6	–18.1	–15.5
Medium	30.5 \pm 1.1	29–32	363	20.1	7.0	–27.1
High	35.6 \pm 2.2	33–40	279	11.3	16.0	–27.2
Subjective Knowledge						
<i>Overall</i>	35.8 \pm 10.4	9–63	1011	22.6	0.3	–22.9
Low	24.8 \pm 5.8	9–32	366	29.7	–11.7	–18.0
Medium	36.9 \pm 2.3	33–40	320	26.9	–1.2	–25.7
High	47.1 \pm 5.5	41–63	325	10.4	15.3	–25.7

Overall, locavorism sum scores were on average 51.2 ± 8.4 (SD) (range 15–75), with an overall item mean of 4.65 ± 1.06 (SD), item averages ranging from 5.86 (item 9) to 3.11 (item 6), and high internal validity (Cronbach's $\alpha = 0.80$). These values are similar to those reported in the original work by Reich et al. [30]. Consumers' locavorism behavior, however, did not affect label preferences for the wine tag attribute in any meaningful way, with each consumer tercile mirroring the global utility scores (Table 7). This was in opposition to our hypothesis and surprising, especially with the large range of locavore scores found, ranging from 15 to 75 out of a possible minimum and maximum of 11 and 77, respectively. Based on anecdotal evidence from focus groups conducted for a different consumer wine study, it appears that locally produced wines may not be as large of a factor in consumer choice compared to the way locavorism affects the purchase of produce, meats, or dairy products. It could also be that our survey participants were less knowledgeable about wine production—additional research is needed to determine how locally produced wines could appeal more to consumers that show strong locavorism for other food products.

For the wine-specific VARSEEK scores, we found an average sum score of 29.6 ± 5.2 (SD) (range 8–40; Table 7), with an overall item average of 3.70 ± 0.37 (SD) and item averages ranging from 3.16 (item 8) to 4.12 (item 5). Internal validity was high (Cronbach's $\alpha = 0.84$). Our respondents appear to be similar in VARSEEK scores to US wine consumers in the Southern US [28] and higher in variety-seeking behavior compared to US residents recruited via MTurk (23.2 ± 5.3 (SD)) [41].

For subjective and objective wine knowledge, our respondents appear to subjectively think they know more about wine (average of 35.8 ± 10.4 (SD)) (Table 7) compared to those who participated in the Ellis and Thompson study (average of 24.0 ± 9.0 (SD)) [41]. Internal validity for the subjective wine knowledge questions was very high (Cronbach's $\alpha = 0.91$). In contrast, our respondents appeared to be less knowledgeable based on their responses to objective wine knowledge questions, with an average of 1.8 ± 1.0 (SD) compared to the 3.3 ± 2.1 (SD) reported by Ellis and Thompson [30]. For the objective wine knowledge scores [29] there were no participants who got all five answers correct (max. score of five), with most participants correctly answering one to two question items (Figure 2). Objective wine knowledge scores were not significantly correlated to the subjective wine knowledge scores, confirming Ellis and Caruana's findings [29] that these two scores evaluate different aspects of consumer wine knowledge.

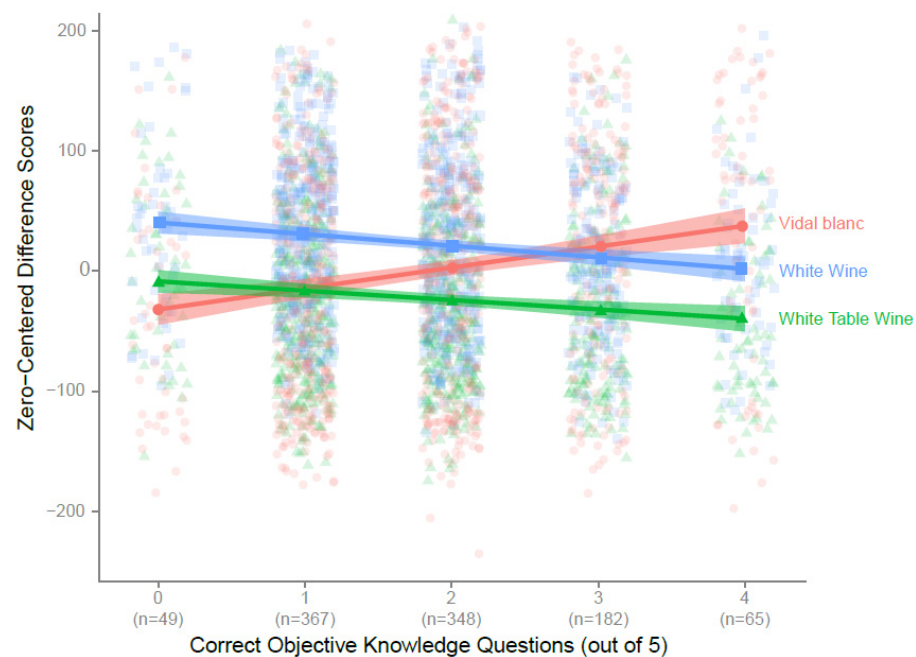


Figure 2. Participants' zero-centered difference scores over correct responses to the objective knowledge questionnaire with linear regression lines for each wine tag (red circles—Vidal Blanc: $y = -31.9 + 17.4 * x$, $R^2 = 0.03$; $p = 3.34 \times 10^{-8}$; blue squares—White Wine: $y = 40.5 - 9.66 * x$, $R^2 = 0.02$; $p = 1.80 \times 10^{-5}$; green triangles—White Table Wine: $y = -8.54 - 7.77 * x$, $R^2 = 0.01$; $p = 0.0007$).

In contrast to the non-differentiating effect of locavorism on wine label choice, in both subjective wine knowledge and variety-seeking behavior, significant differences in wine label choice emerged (Table 7), as hypothesized. This may be somewhat connected to the significant positive correlation between consumers' VARSEEK and subjective wine knowledge scores ($r(1009) = 0.402$, $p < 0.0001$), similar to previous reports [41]. Those showing low variety-seeking behavior, scoring 8–28 points out of 40 ($n = 369$; Table 7), show an equal avoidance of both *White Table Wine* and *Vidal blanc* compared to the *White Wine* tag (utility scores of -18.1 and -15.5 vs. $+33.6$). The middle third, with 29–32 points ($n = 363$; Table 7), reflects the global utilities, with a low positive *Vidal blanc* utility score ($+7.0$), a high negative *White Table Wine* utility (-27.1), and *White Wine* as the most preferred selection ($+20.1$). The tercile with the highest variety-seeking behavior (33–40 points; $n = 279$; Table 7) shows a reverse behavior of the lowest tercile: consumers in this group strongly preferred the *Vidal blanc* and *White Wine* tags (utility scores of $+16.0$ and $+11.3$, respectively) and clearly avoided the *White Table Wine* tag (-27.2 ; Table 7). The subjective wine knowledge score mirrored these results fairly consistently, which would be expected as these two scales were positively correlated.

Respondents with low subjective wine knowledge (less than 32 out of a maximum of 63; Table 7) showed a strong preference for the *White Wine* label tag ($+29.7$) over *White Table Wine* (-18.0) and *Vidal blanc* (-11.7). In contrast, the highest positive utility score for *Vidal blanc* ($+15.3$) was found for the respondents with the highest subjective wine knowledge scores (41–63 out of 63; $n = 325$).

Last, for the objective wine knowledge questions, it is of interest to note that none of the participating wine consumers, 2/3 of them being classified as high-frequency wine drinkers, were able to correctly answer all 5 questions. This could be due to the fact that the questions were developed by researchers outside of the USA and tested with 399 interviewees, 89% of whom were from New Zealand (54%), Australia (20%), and Britain (15%), and only 11% US Americans [42]. No details about the US American participants in the Forbes study [42] were provided, so it is unclear if they were similar wine consumers to the ones participating in this study or not.

Even though none of the 1011 wine consumers in our study correctly answered all five questions, separating participants based on their objective wine knowledge scores revealed an interesting and significant correlation to the three levels of the wine tag ($r(1009) = 0.173$, $p < 0.0001$): with increasing correct answers, the utility score for the *Vidal blanc* text on the label increased from -33.1 for zero correct answers to $+36.7$ when four out of five questions were answered correctly (Figure 2).

This implies that those who know more factual information about wine have a more positive impression of *Vidal blanc*. That also means that a specific varietal name for more knowledgeable wine consumers is preferred over the generic *White Wine* and *White Table Wine* tags.

Attitudinal, behavioral, and knowledge differences among consumers have previously been shown to affect wine preference [28,41]; here, we similarly found that consumers with higher variety-seeking behavior and subjective and objective wine knowledge all preferred the specific wine varietal on the front label. Local PA wine producers who often use cellar door and tasting rooms to sell their wines could use this to attract such consumers, who supposedly would also be more likely to visit wineries.

4. Conclusions

Based on a choice-based conjoint analysis online survey of 1011 mid-Atlantic consumers of the USA, wine labels from a lesser-known region, such as Pennsylvania, were selected more often with an elegant, serif-type script and a generic *White Wine* label tag. However, the preference for the generic *White Wine* tag over the variety-specific *Vidal blanc* tag seems heavily affected by (i) familiarity and prior experiences with *Vidal blanc*, (ii) interest in trying new wines as assessed by the wine-specific VARSEEK scale, and (iii) both objective and subjective knowledge of wines. Consumers that score higher in variety-seeking behavior and/or objectively or subjectively know more about wines showed a higher interest in the labels with the specific wine varietal on the label (here *Vidal blanc*). Interestingly, although consumers displayed a wide range of locavorism, as assessed by the locavore questionnaire, this did not affect wine label preference.

When choosing between wine labels that feature variations of a lesser-known wine region, albeit in closer proximity to consumers' homes compared to California, for example, consumers overall preferred labels that featured a local county text over the one featuring the producing state or labels with an AVA designation. However, based on characteristics that describe the target customer, for example, a more informed customer, the winery may want to further explore using variables that had utilities and importance scores that appealed to this more-informed segment.

We found that wine labels that featured a local county text were preferred over those with a producing state or an AVA text. This preference was not expected but could be easily implemented by producers to draw attention to locally produced wines and regional profiles in Pennsylvania and other, similar lesser-known wine regions. The consumer preferences for font, wine tag, and regional text provide wine producers with actionable insight to create front wine labels that are enticing to local consumers, where these wines can compete against regional, national, and international brands. One limitation of this study was that we did not include local, non-PA locations that are more known for their wines, such as NY or the Finger Lakes AVA. Future research could study consumer preference for locally produced wines with varying reputation, such as PA vs. NY.

In this research, we used one label design to understand what attributes influenced choice, keeping everything else equal. Future research could expand into different wine label styles (such as abstract art, photos, color schemes, etc.) to see if the results of this study are replicable across a variety of wine label styles, similar to Sherman and Tuten [18]. They found traditional labels with similar information displayed to be preferred over novel designs when all other information was equal, which is why a more typical and "traditional" wine label design was used in this study.

Overall, the US respondents in this study, although consuming wine regularly and thinking they know a lot about wine, do not appear to be highly knowledgeable as measured by the objective wine knowledge questionnaire. Instead of ignoring these consumers, this presents a great opportunity for smaller and local wineries to reach out and educate these consumers. This also presents an opportunity for more research into this large but possibly understudied consumer segment. Research findings from traditional wine-consuming countries such as France or even California may not translate at all to wine consumers in the mid-Atlantic region surveyed here.

Participants who responded that they may have heard or have tried Vidal blanc wines before were asked to describe (in words) where they think they had heard of it. In looking at these free-word responses, multiple consumers thought that Vidal blanc was another name for “white wine” generically, perhaps mistaking it for “vin blanc” in French. Context effects may have played a role in this confusion, as the two other wine tags were generic white wine terms. This may have misled consumers, and it is important to note that this could have skewed results. Therefore, in future exploration of hybrid varieties in Pennsylvania, another less confusing variety or adding a second more known variety (e.g., Riesling) could better control for a potential familiarity effect and would allow further exploring how to increase consumer interest in unknown or lesser-known wine varieties.

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