

The Influence of Country of Origin and Wine Expertise on Consumer Perceptions in Pinot Noir Wines

Jingxian An, Brent Young, Paul Kilmartin, Wei Yu

Abstract—Australia and New Zealand are neighbouring countries in the New World wine industry, and their Pinot noir wines have gained both production and reputation in recent years, competing in the international market. Consumer perception is heavily influenced by wine expertise, which plays a significant role in shaping their perceptions. This study aims to investigate the effects of country of origin and wine expertise on consumer perceptions. The results indicate that consumers' perceptions of Pinot noir wines' astringency, sourness, sweetness, clarity, and bitterness are impacted by both country of origin and wine expertise. Of the five sensory attributes, sourness was found to have a more significant influence on consumer perceptions, while clarity had a minimal impact. Additionally, the study found that country of origin had a greater impact on consumer perceptions than wine expertise.

Keywords—Australia, country of origin, consumer perception, New Zealand, wine expertise.

I. INTRODUCTION

GEOGRAPHICALLY, New World Pinot noir wine producing countries Australia and New Zealand are neighbours; both have used the countries as a brand to promote their wine, but both compete in the international markets [1], [2]. For example, the 'New World' wine industries of New Zealand and Australia both have experienced rapid growth in the recent years, owing largely to a rapid expansion of export markets and volumes [3]. Pinot noir is Australia's second most popular red cultivar, trailing only Shiraz, with a 23% share of 'red wine consumed in domestic on-trade' category and over 5000 ha of vineyards in Australia are planted to Pinot noir [4]. Pinot noir is New Zealand's second most planted grape variety, trailing only Sauvignon Blanc. New Zealand Winegrowers announced that with 10282 million litres exported in the five years to June year-end 2020, New Zealand Pinot noir has seen impressive growth in expert sales. New Zealand and Australia are neighbours and are both famous for producing Pinot noir wines [4]. In order to improve the international marketing of New Zealand wines, it will be also useful to investigate whether Pinot noir wines produced from New Zealand and Australia can bring different consumer perceptions.

Based on wine expertise, panellists can be classified as experts and novices. Experts are well-versed in wine and can lead wine tastings. Expert tasters have outperformed novices in sensory panel studies, as the experts are more familiar with the

stimuli and description tasks, resulting in a more consensual, shared vocabulary [5]. When evaluating and describing wines, for example, experts may differentiate the sensory properties of the wines into finer and more dimensions. Because of their superior wine knowledge, they may incorporate perceived flavours into more differentiated wine categories [6].

The pleasure that red wine provides to novices and experts is not the same. Experts prefer to make as many choices as possible during the wine purchasing process in order to maximise their expected satisfaction. They seek information and use that information to make purchasing decisions during the decision-making process. Naive consumers, on the other hand, are more likely to simplify their product selection by relying on a small number of extrinsic cues such as price and design [7] or selecting wines with which they are familiar [8]. It is unlikely that acceptable products will be identified [9]. When consumers are casual or social drinkers, they frequently find a wine they enjoy and buy it again and again. In this case, winemakers must ensure that each bottle provides the same experience to the consumer every time. By contrast, consumers who have limited knowledge about wines are only concerned with whether they like the wine. Experienced wine tasters, on the other hand, have knowledge and ability to discriminate various tastes when tasting wines, which can please them [8]. To improve the international marketing of New Zealand Pinot noir wines, it is necessary to investigate the influence of wine expertise on consumers' perceptions as well.

In this paper, the influence of country of origin (New Zealand and Australia) and wine expertise on consumer perceptions will be investigated to enhance international marketing of New Zealand Pinot noir wines.

II. MATERIALS AND METHODS

A. Pinot Noir Wines

In this investigation, 117 bottles of commercially available New Zealand wines from five main regions (Central Otago, Marlborough, Martinborough, Nelson and North Canterbury) were studied, with retail prices ranging from NZ \$10 to NZ \$80, and vintage years from 2011 to 2020. Meanwhile, 18 bottles of commercially available Australian Pinot noir wines were studied as well.

Jingxian An and Wei Yu are with the University of Auckland, New Zealand (e-mail: anjingxian904439@gmail.com, w.yu@auckland.ac.nz).

B. Analytical Measurements

Shimadzu 2550 glass cells with 0.2 cm path length were used for colour measurements. The colour of red wine can be determined at absorbance 420 nm (A_{420nm}) for yellow colour, absorbance 520 nm (A_{520nm}) for red colour and absorbance 620 nm (A_{620nm}) for blue colour [10]. In addition, the chemical age analysis was performed using the methods detailed in [10]. The total phenolics and total flavanol assay was performed using the methods detailed elsewhere [11], [12]. Furthermore, total flavan-3-ols, total anthocyanins and total tannins assays were performed using the methods outlined in [13], [14].

C. Sensory Evaluation

A panel of seven experts (six men and one woman ranging in age from 24 to 40 years) evaluated 78 bottles (labelled from No.1-No.78) of 117 bottles of New Zealand Pinot noir wines with astringency, bitterness, sourness, sweetness, and clarity from score 1 to score 10. The remaining 39 bottles of New Zealand Pinot noir wines (labelled No.79-No.117) were evaluated by 13 novices with five sensory attributes including clarity, astringency, bitterness, sourness and sweetness from score 1 to score 10.

Experts for New Zealand Pinot noir wines, five experts and eight novices were required to evaluate the clarity, astringency, bitterness, sourness, and sweetness of 18 bottles Australian Pinot noir wines from score 1 to score 10.

All experts and novices are international people who have lived in New Zealand for many years.

III. RESULTS AND DISCUSSION

A. The Impact of Country of Origin and Wine Expertise on Consumer Perception

PCA has explained total 63% variances (35% in PC1 and 28% in PC2) in Fig. 1. According to Fig. 1 (a), it can infer that the distance between sourness and PCA origin is the longest among five sensory attributes, indicating that sourness plays significant influence on consumer perceptions compared to sensory attributes. In the meanwhile, the distance between clarity and PCA origin is the shortest among five sensory attributes, which means the effect of clarity is negligible compared with the effects of the other variables on consumer perceptions.

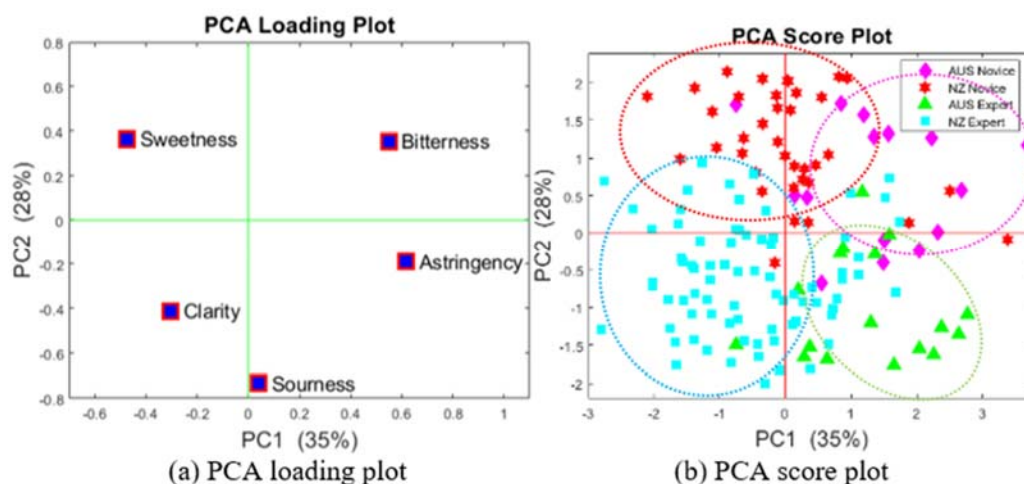


Fig. 1 The influence of country of origin and wine expertise on consumer perception

In Fig. 1 (b), there are four clusters in PCA score plot. New Zealand Pinot noir wines evaluated by novices have located in the upper left corner, New Zealand Pinot noir wines evaluated by experts have located in the lower left corner, Australian Pinot noir wines evaluated by novices have located in the lower right corner and Australian Pinot noir wines evaluated by experts have located in the upper right corner.

Combined with Figs. 1 (a) and (b), New Zealand Pinot noir wines evaluated by Novice consumer were located in the upper left side of the PCA score plot, while those evaluated by experts were located in the lower left side, as shown in Fig. 1 (b). Based on the PCA loading plot in Fig. 1 (a), it can be inferred that New Zealand Pinot noir wines can bring sweetness to novice and clarity to experts. In the meanwhile, Australian Pinot noir wines can bring bitterness to novices and astringency and clarity to experts. According to a prior study, the taste of the wine is the

most influential aspect influencing consumers' expectations and decisions [15]. In conclusion, the country of origin and wine expertise have a substantial impact on consumers' perceptions, which may influence consumers' expectation and choice as well.

B. The Importance of Country of Origin on Consumer Perception

The influence of 117 bottles of New Zealand and 18 Australian Pinot noir wines on consumers' perception has been investigated by PCA analysis. PCA has explained total 63% variances in Figs. 2 (a) and (b) and total 67% variance in Figs. 2 (c) and (d). Pinot noir wines from Australia are denoted by a blue dot, while Pinot noir wines from New Zealand are denoted by a pink dot. According to Fig. 2 (b), Australian Pinot noir wines can impart astringency, bitterness, and sourness to experts based on Figs. 2 (a) and (b). Fig. 2 (b) shows where the

majority Australian Pinot noir wines evaluated by experts (experienced consumers) are positioned in left hand compared to most New Zealand Pinot noir wines. Similarly, Australian Pinot noir wines can bring novices with more astringency, bitterness, and sourness as well combined with Figs. 2 (c) and (d). It can infer that experts and novices have similar consumer perceptions on New Zealand and Australian Pinot noir wines based on basic sensory attributes astringency, bitterness, sourness, sweetness, and clarity, which are mostly caused by

country of origin. The notion of country of origin encompasses the notion that wines from specific geographical regions may be regarded as different. The relevance of location is not unique to wine, but it is possibly more strongly connected with quality than with any other agricultural product [16]. For instance, the provenance of a product might alter its appearance, scent, and taste [17]. From the results of this study, it can be extrapolated that nation of origin may impart different sensory attributes to consumers, regardless of whether they are experts or novices.

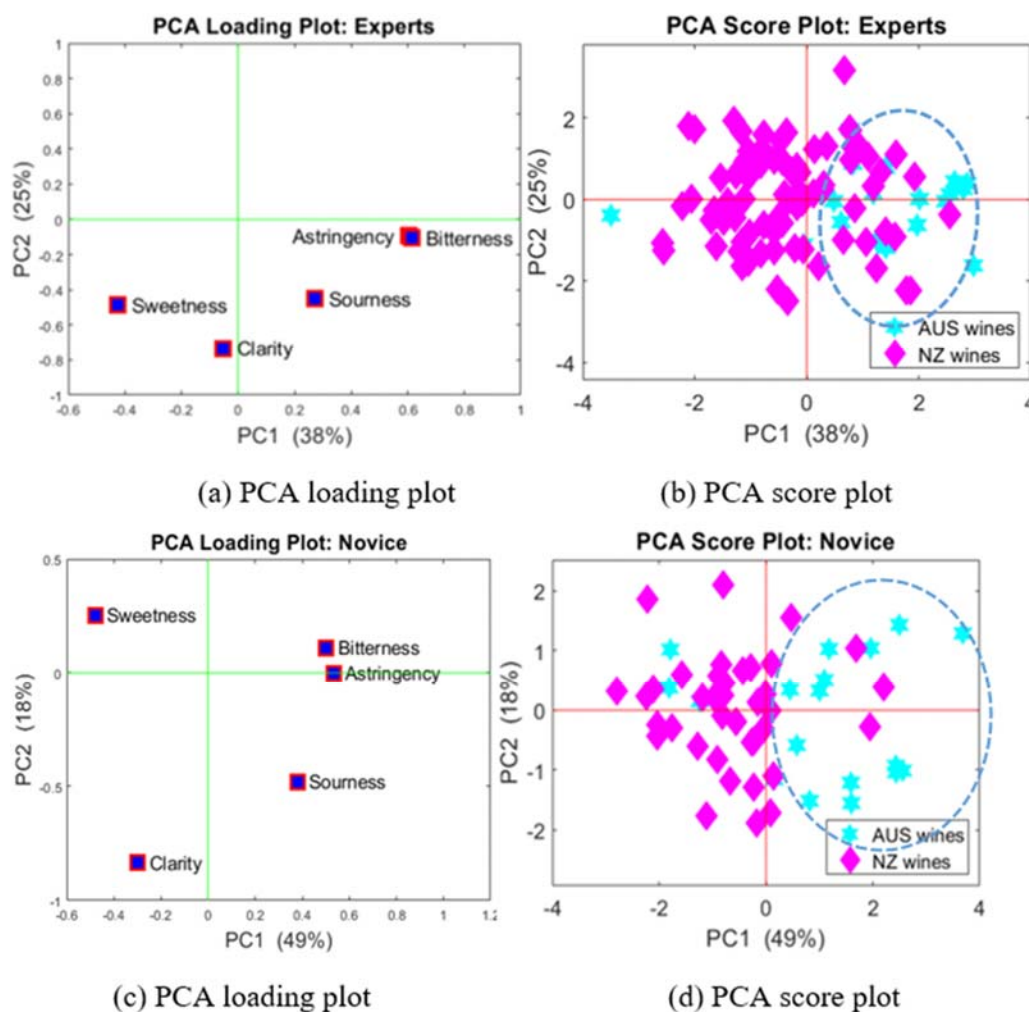


Fig. 2 The influence of the country of origin on consumer perceptions

C. The Importance of Wine Expertise on Consumer Perception

The influence of wine expertise on consumers' perceptions on New Zealand and Australian Pinot noir wines have been investigated in Fig. 3. Based on Fig. 3 (a), it can infer that New Zealand Pinot noir wines evaluated by novices have located in the upper right corner and New Zealand Pinot noir wines evaluated by experts have located in the lower left corner. Combining Figs. 3 (a) with (b), it can infer that New Zealand Pinot noir wines can bring sweetness, astringency and bitterness to novices and the perception of experts about New Zealand Pinot noir wines is positive with clarity and sourness. Based on

Figs. 3 (c) and (d), the sensory attributes of 18 bottles Australian Pinot noir wines evaluated by novices are in the right upper position, indicating that 18 bottles Australian Pinot noir wines evaluated by novices are positive in terms of astringency, bitterness, and sweetness. Meanwhile, 18 bottles Australian Pinot noir wines are in the lower left position, indicating that Australian Pinot noir wines evaluated by experts are sourness and clarity. Wine is a product with multiple sensory characteristics and multidimensional elements, including colour, aromas, tastes, and mouthfeel [18]. Prior research on wine expertise has focused on experts' or novices' perceptual (detection, discrimination, and classification) or descriptive (description, matching) task performance [19]. In this paper, it

can be extrapolated from this article that experts and novices may perceive Pinot noir wines from the same country

differently depending on their level of wine knowledge.

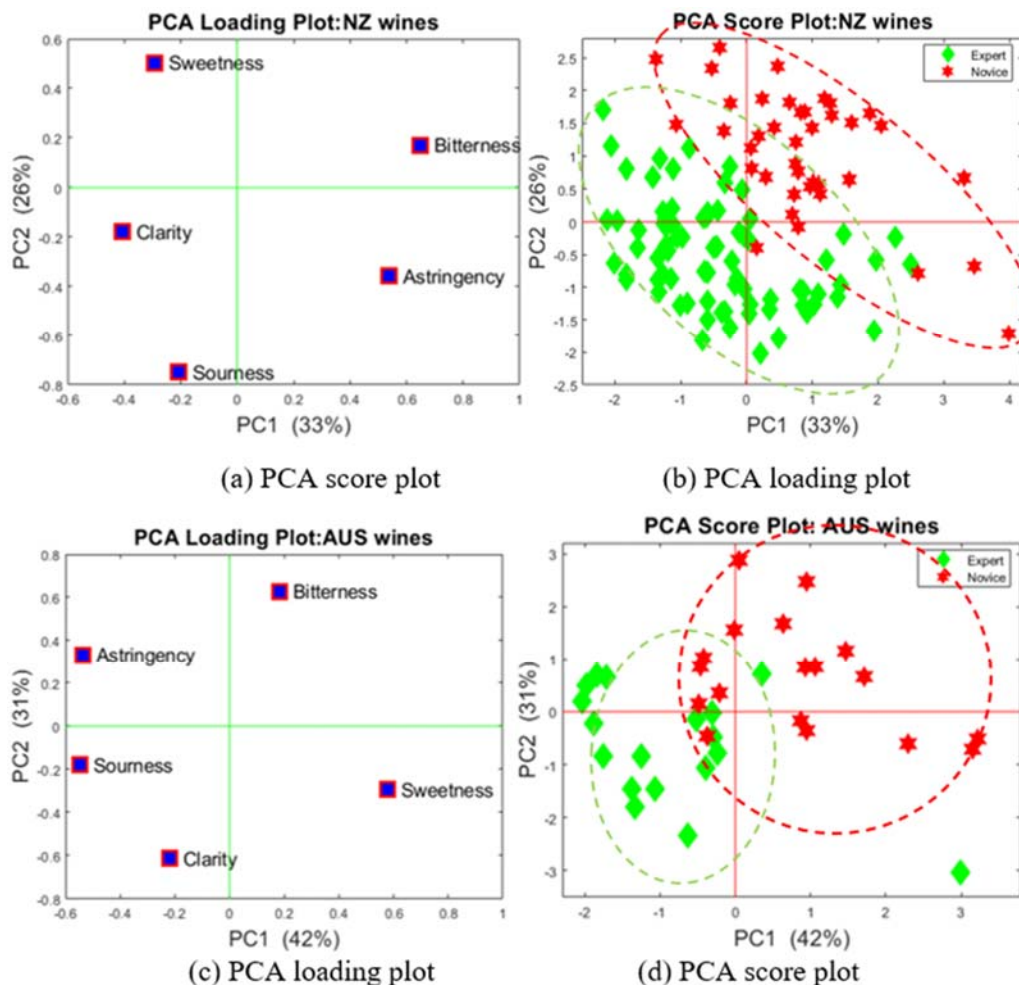


Fig. 3 The influence of origin of countries on consumer perceptions

IV. CONCLUSION

New Zealand and Australia are neighbours in New World wine producing countries, and their Pinot noir wines have grown rapidly in production and reputation in recent years, competing in international marketing. Meanwhile, wine expertise is an important factor to play an important role in influencing consumers' perceptions. In this paper, the influence of country of origin and wine expertise on consumers' perception has been investigated. Consumers' perceptions in terms of Pinot noir wines' astringency, sourness, sweetness, clarity and bitterness are influenced by wine expertise and country of origin at the same time. Among five sensory attributes, sourness has significant influence on consumer perceptions and clarity has minimal influence on consumer perceptions. In contrast to wine expertise, country of origin has a greater impact on consumer perceptions.

However, there are still some limitations to this research. The Australian Pinot noir wines sampled were mainly from South Australia or South-eastern Australia and have middle or low price points, in contrast to the diverse regions, vintages, and

price points of New Zealand Pinot noir wines. In the future, it would be beneficial to sample a broader range of Australian Pinot noir wines from different regions, vintages, and price points.

REFERENCES

- [1] Nallaperuma, K., Bandyopadhyay, A., & Lockshin, L. (2017). A comparative analysis of experts' and consumers' perceptions of regionality in Australian wine purchase decisions. *Journal of Wine Research*, 28(3), 194-215.
- [2] Jenkins, E. (2019). Exports: Why is New Zealand performing better than Australia in the us wine market and are there any lessons? *Australian and New Zealand Grapegrower and Winemaker*, (666), 74-76.
- [3] Banks, G., Kelly, S., Lewis, N., & Sharpe, S. (2007). Place 'From One Glance': the use of place in the marketing of New Zealand and Australian wines. *Australian Geographer*, 38(1), 15-35.
- [4] Longo, R., Pearson, W., Merry, A., Solomon, M., Nicolotti, L., Westmore, H., & Kerslake, F. (2020). Preliminary study of Australian Pinot Noir wines by colour and volatile analyses, and the Pivot® profile method using wine professionals. *Foods*, 9(9), 1142.
- [5] Le Menn, N., Marchal, R., Demarville, D., Casenave, P., Tempere, S., Campbell-Sills, H., & Marchand, S. (2021). Development of a new sensory analysis methodology for predicting wine aging potential. Application to champagne reserve wines. *Food Quality and Preference*,

- 94, 104316.
- [6] Frøst, M. B., & Noble, A. C. (2002). Preliminary study of the effect of knowledge and sensory expertise on liking for red wines. *American Journal of Enology and Viticulture*, 53(4), 275-284.
- [7] Neuninger, R., Mather, D., & Duncan, T. (2017). Consumer's scepticism of wine awards: A study of consumers' use of wine awards. *Journal of Retailing and Consumer Services*, 35(2017), 98-105.
- [8] Smith, B. C. (2019). Getting More Out of Wine: wine experts, wine apps and sensory science. *Current Opinion in Food Science*, 27, 123-129.
- [9] Barton, A., Hayward, L., Richardson, C. D., & McSweeney, M. B. (2020). Use of different panellists (experienced, trained, consumers and experts) and the projective mapping task to evaluate white wine. *Food Quality and Preference*, 83(2020), 103900.
- [10] Dobrei, A., Poiana, M. A., Sala, F., Ghita, A., & Gergen, I. (2010). Changes in the chromatic properties of red wines from *Vitis vinifera* L. cv. Merlot and Pinot Noir during the course of aging in bottle. *Journal of Food, Agriculture & Environment*, 8(2), 20-24.
- [11] Ivanova, V., Dörnyei, Á., Márk, L., Vojnoski, B., Stafilov, T., Stefova, M., & Kilar, F. (2011). Polyphenolic content of Vranec wines produced by different vinification conditions. *Food Chemistry*, 124(1), 316-325.
- [12] Tabart, J., Kevers, C., Pincemail, J., Defraigne, J. O., & Dommes, J. (2010). Evaluation of spectrophotometric methods for antioxidant compound measurement in relation to total antioxidant capacity in beverages. *Food chemistry*, 120(2), 607-614.
- [13] Ivanova, V., Stefova, M., & Chinnici, F. (2010). Determination of the polyphenol contents in Macedonian grapes and wines by standardized spectrophotometric methods. *Journal of the Serbian Chemical Society*, 75(1), 45-59.
- [14] Aleixandre-Tudo, J. L., Buica, A., Nieuwoudt, H., Aleixandre, J. L., & du Toit, W. (2017). Spectrophotometric analysis of phenolic compounds in grapes and wines. *Journal of agricultural and food chemistry*, 65(20), 4009-4026.
- [15] Hu, X., Li, L., Xie, C., & Zhou, J. (2008). The effects of country-of-origin on Chinese consumers' wine purchasing behaviour. *Journal of Technology Management in China*.
- [16] Tomasino, E., Harrison, R., Sedcole, R., & Frost, A. (2013). Regional Differentiation of New Zealand Pinot noir Wine by Wine Professionals Using Canonical Variate Analysis. *American Journal of Enology and Viticulture*, 64(3), 357.
- [17] Pearson, W., Schmidtke, L., Francis, I., Carr, B., & Blackman, J. (2020). Characterising inter and intra-regional variation in sensory profiles of Australian Shiraz wines from six regions. *Australian Journal of Grape and Wine Research*, 26(4), 372-384.
- [18] Yang, J. Y., & Lee, J. (2020). Current Research Related to Wine Sensory Perception Since 2010. *Beverages*, 6(3).
- [19] Langlois, J., Dacremont, C., Peyron, D., Valentin, D., & Dubois, D. (2011). Lexicon and types of discourse in wine expertise: The case of vin de garde. *Food quality and preference*, 22(6), 491-498.