

Article

Do Wine Flaws Really Matter to Wine Consumers' Intention to Purchase Wine—An Online Study

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Abstract: Purpose: Exploring antecedents of flawed wine purchase intention, this study attempts to assess consumer acceptance leading to the purchase or consumption of a flawed wine product as well as build a profile of flawed wine consumers. Design/Methodology/Approach: A survey, from Amazon Mechanical Turk (Mturk) with 260 valid survey responses collected. ANOVA with post hoc testing was used to analyze the data. Findings: Results reflect that attitude, subjective knowledge, perceived behavioral control, perceived risk, and sensory appeal all significantly influence intent to purchase a flawed wine product. Additionally, environmental attitude significantly influences their intent to purchase wines with flaws and their attitude toward flawed wine. Originality: To date, no research has explored consumer acceptance of flawed wines. This study attempted to fill a gap in the literature and add to the overall body of knowledge regarding flawed wines and consumer understanding/acceptance of flawed wines, as well as generating a profile of potential flawed wine consumers. Research Limitations/Implications: Consumer panel data is not as rich as an experimental study design; however, this work starts an academic conversation on flawed wine and provides a foundation for future research. Practical Implications: The results of this study offer practical opportunities, from educating consumers toward a richer understanding of wine flaws; promotional opportunities for wine producers with a product to be disposed of, enhancing revenue generation; and how sensory appeal and environmental concern are beneficial to furthering the understanding and predictability of consumer intentions to purchase flawed wines.

Keywords: wine flaws; sensory appeal; knowledge; perceived risk; purchase intention; attitude



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1. Introduction

The Hartmann et al. (2021) [1] and Wong et al. (2018) [2] studies on suboptimal food sensory preferences propose a product's appeal will influence consumers' product selection preference and purchase intention. This research on food preferences, sensory appeal, and purchase intention is indispensable; however, further study regarding wine products is needed. Studies that segment consumers using influencers of wine consumer purchase behavior are broad and varied, as shown in Table 1. Yet, regarding wine products, little critical research has been performed that considers how important certain aspects of the sensory experience, such as flaws, are to the consumer's intention to purchase.

Table 1. Sample studies on the influence of wine consumer behavior.

Topic	Studies
Packaging Attributes	Barber and Almanza (2007); Mueller et al. (2011); Goodman (2009); Loose and Szolnoki (2012); Barber et al. (2010); Barber et al. (2009) [3–8]
Region/Country of Production	Perrouy et al. (2006); Adinolfi et al. (2011); Santos et al. (2006); Espejel et al. (2011); McCutcheon et al. (2009); Famularo et al. (2010); Remaud and Lockshin (2009); Barber and Taylor (2011) [9–16]
Price and Willingness to Pay	Barber et al. (2012); Lee et al. (2018) [17,18]
Sustainably Produced Wines [organic, biodynamic, etc.]	Lanfranchi et al. (2019); Barber et al. (2009); Barber (2010) [19–21]
Sensory Attributes	Taylor et al. (2010); Rognså et al. (2017); Koone et al. (2014); Bruwer et al. (2011); Niimi et al. (2017); Francis and Williamson (2015) [22–27]
Demographics/Psychographics	Brunner and Siegrist (2011); Bruwer et al. (2011); Bruwer and Li (2007); Olsen et al. (2007); Ritchie (2007); Barber et al. (2006) [25,28–32]

Wine, through symbols, can represent powerful ideas or qualities and is interpreted into attitudes, experiences, and behaviors, leading to a greater positive attitude and more intense sensory, emotional, cognitive, and social experience (De Toni et al., 2021) [33]. Research has defined wine as an experiential product with quality accessed only after consumption. Charters and Pettigrew (2007) [34] and Barber et al. (2007) [35] noted wine is fundamentally complex and its complexity enhances within novice markets.

The purpose of this study is to begin the conversation of flawed wines by developing a profile of wine consumers who may find these products less of a concern during their purchasing decisions. Understanding these attributes may provide insights for retailers and producers on how best to educate and promote wines with minor flaws, thereby removing the stigma associated with the sensory aspect of wine enjoyment. In addition, for low to moderate-quality produced wines, producers may be less concerned about the exacting nature of wine production if wines with minor flaws are in fact acceptable to consumers.

The following section will describe the theoretical background of this study, the research procedures used to develop the measurement items, and data collection. The results section will illustrate a profile of the participants' socio-demographic and wine consumption behavior. Lastly, practical implications for wine experts, producers, and industry professionals who market, distribute, and sell wine products will be provided.

2. Literature Review

2.1. Novice versus Experienced Consumers

What does it mean to be an expert or novice wine consumer? Significant work exists discussing differences between novice and experienced consumers. Su et al. (2008) [36] noted the level of consumer proficiency is an essential part of choice behavior decisions, such as information search or product evaluation. Taylor-West et al. (2008) [37] stated novice consumers, compared to experienced consumers, perceive products as complex, exhibiting low understanding and experience with the product, with consumption behavior influenced by risk perception and perceived behavioral control when the product is complex.

Wine complexity may emphasize consumers' difficulties placing wine they experienced into their memory, with novice consumers usually unable to evaluate it even through tasting experiences (Latour et al., 2011) [38]. While experienced "connoisseurs" consumers believe the standard elements of wine (origin, aging, and varietal purity) are important characteristics of quality, less experienced or "novice" consumers are more concerned with product appearance, advertising, or word of mouth (Latour et al., 2011) [38]. Experienced

consumers can assess wine quality through grape variety and blind positive emotions and are influenced by brand and packaging, unlike novice consumers, who have not developed preferences for certain attributes (Mueller and Szolnoki, 2010; Latour et al., 2011) [38,39]. D’Alessandro and Pecotich (2013) [40] noted the importance of segmenting consumers on wine expertise and wine knowledge as a vital marketing tool because wine experts generally purchase (in funds and quantity) a greater amount of wine than novices. They also underscored how novice wine consumers have difficulty assessing sensory quality and cannot ascribe an appropriate context difference in quality even if detected, while Schumaker, Chandra, Malfeito-Ferreira, and Ross (2017) [41], using varying levels of *Brettanomyces* found differences between levels of expertise in ability to detect the level of *Brettanomyces*.

Pickering et al. (2013) [42] characterized consumers, using sensory testing, into novices or experienced to affirm their wine experience. Wine sensory work by Joy et al. (2020) [43], observed the challenges of disentangling the differences among the sensory assessments experienced by an individual using different evaluation methods. They found differences in expressed experiences resulting from knowledge and familiarity with wine, particularly between a wine connoisseur and novices. The distinction between enjoyment and evaluation is simple; an expert primarily deals with the evaluation, while enjoyment is for everyone (Joy et al., 2020) [43].

Hayes and Pickering (2012) [44], found wine experts more likely to have greater tasting ability than other wine consumers, signifying a difference between judgments of wine quality and value. They further noted novice wine consumers are cautiously adopting expert endorsements or recommendations because quality assessment is reliant on experience and liking, which is associated with taste responsiveness.

2.2. Importance of Understanding Sensory Attributes as an Influencer of Purchase Intention

The following definition of a flawed wine was obtained from the Orange County Wine Society (Scott, Costa Mesa, CA, USA, 2023) [45]:

“To start with, let’s understand the difference between a wine flaw and a wine fault. A wine flaw is an imperfection in the wine, such as a slight off-odor, minor cloudiness, bubbles, or small particles in the wine. A wine flaw might also include an imbalance with acidity/sweetness, short finish, lack of exceptional aroma or flavor, or color that is slightly off from expectations for that varietal. These are all considered wine flaws because they are not considered normal for the wine type, but they are minor enough that the wine is still drinkable.”

For purposes of this study, and defined in the survey instrument, the following definition was modified from the above:

“A wine flaw is an imperfection in the wine which is not considered normal for the wine type but is minor enough that the wine is still drinkable (e.g., minor cloudiness, imbalance with acidity/sweetness, short finish, lack of exceptional aroma or flavor)”.

Sensory science research has suggested one individual’s detection thresholds (levels of aroma detected) are not the same as another’s. Thus, the possibility two different wine consumers or experts will assess a wine as clean or flawed is worth further study (Francis and Williamson, 2015) [27]. Just as the greatest wine critics in the world differ in their ability to detect lower levels of compounds such as TCA (corked wine taint) and the lack of exceptional aroma or flavor, so may wine consumers. Furthermore, subjectivity (personal preference/tolerance) or knowledge and ability can lead to divergent views about what is considered a minor or major wine flaw (Francis and Williamson, 2015; Lesschaeve, 2007) [27,46]. For example, Prescott et al. (2005) [47] and Lesschaeve (2007) [46] stated the aim of controlling wine quality is designed to reject wines impacted by unfavorable flavors or aromas; recognizing that, although zero tolerance for wine flaws is the objective, what is unacceptable for a wine expert can be acceptable for some consumers.

One taster might consider the level of a flaw in wine to be an unacceptable detractor from the fruit and will downgrade the wine’s quality. In contrast, another taster might find the same characteristic does not degrade and may even enhance the wine

(Lesschaeve, 2007) [46]. The fact there are various definitions of quality arises from the range of perspectives from which quality has been studied (Jover et al., 2004) [48]. Quality can be discussed from the viewpoints of technical/productive, consumer, or spirituality (Costa et al., 2021) [40], among others.

The purpose of oenology is to attain the highest quality in wine (Jover et al., 2004) [48], which can be objectively assessed through established factors, such as ripeness, the acidity level of grapes, fermentation temperatures, and the style of aging containers. Jover et al. (2004) [48], having consulted with oenologists and wine producers, divided these factors into two groups: (1) factors of quality regarding the grape (Viticulture) and (2) factors of quality regarding the winemaking process (Oenology). Jover et al. (2004) [48] further explained these factors outline the technical product specifications or palatability characteristics.

However, when considering the subjective viewpoint of wine appreciation, which depends on an individual's senses, producers need to consider two potential processes for articulating wine quality. First are the wine experts, who may influence the criteria of objective wine quality such as visual characteristics or bouquet, or through the ethereal descriptors, such as charm, pleasure, or complexity (Taylor et al., 2010; Jover et al., 2004) [22,48]. The other process is the wine's perceived quality from the lens of consumers, whose perceptions are, in turn, influenced by several factors, such as the perceived risk of the purchase, and their subjective knowledge. This concept of perceived quality attempts to mediate between objective product characteristics and consumer preferences (Bruwer et al., 2017) [49]. This concept stresses that perceived quality may differ from objective quality, and those consumers use cues to evaluate quality for personal and situational consumption. They generally are not experts and probably do not know much about the processes involved in producing and aging wines (Bruwer et al., 2017) [49].

As such, wine is a complex beverage, both chemically and sensorially, it is remarkable the limited research to date attempting to understand consumers' sensory preferences for wines and how this correlates with the actual purchase (Yang & Lee, 2020) [50].

2.3. Key Constructs Used for Segmentation

This study attempts to understand the role of wine consumers' acceptance of wine flaws when deciding to purchase a wine product and begin understanding who these wine consumers are and what can be done to create an acceptance of wines with minor flaws. The results should act as an important tool for winemakers, food, and beverage professionals, as well as industry groups that promote and distribute wine products. The results will show how minor sensory flaws are assessed and could influence the value; they are willing to pay.

The following will discuss the important and relevant literature around sensory appeal, knowledge, purchase risk, attitude toward wine with flaws, perceived consumer effectiveness, subjective normative behaviors, purchase intention, and environment.

Sensory Appeal—Sensory appeal (SA) refers to the allure of the product's taste, appearance, texture, and smell to consumers. Loebnitz and Grunert (2018) [51] show consumers will choose fruits and vegetables with a perfect appearance, while Schifferstein et al. (2013) [52] found along with vision and taste, the smell of a food item was an important influencer of consumer buying choices. Thus, SA and purchase desire are inseparable. Symank et al. (2018) [53] demonstrates a positive relationship between sensory perception, overall liking, and purchase intention for visually suboptimal bananas. Yet, overall liking and purchase intention decreases when the product exceeds a certain ripening status. Loebnitz and Grunert (2018) [51] indicated consumers perceive abnormally shaped vegetables as riskier, and paradoxically, they associate natural vegetable shape abnormalities with genetically modified, despite having no other information available.

Parr et al. (2002) [54] investigated the sensory evaluation of wine as a function of domain-specific expertise. Wine experts and novices measured sensory threshold, odor recognition, odor identification, and consistency of odor naming. Results showed superior sensory recognition by expert wine judges, despite their sensory sensitivity and bias

measures being like those of novices. Lesschaeve (2006) [55] noted evaluation of wine quality customarily is performed by winemakers, who have the skill through experience to distinguish faulty wines. Lesschaeve (2006) [55] further noted the purpose of “tasting expertise” as a skill is not to identify unknown wines. Rather, it is an exercise of quality control that will determine if a wine has any faults, which may decrease its value or render the wine unfit for consumption.

Bruwer et al. (2011) [28] suggested the wine industry needs to know more about wine sensory preferences. King et al. (2010) [56] investigated the effect of *Saccharomyces* yeast co-inoculations on wine volatile composition and sensory profiles to determine whether differences sufficiently affect consumer acceptance. Niimi et al. (2017) [26] studied how consumers’ and experts’ sense of wine mouthfeel relates to wine quality.

D’Alessandro and Pecotich (2013) [57] studied the evaluation of wines by expert and novice consumers, finding novices had trouble evaluating quality and, even when detecting quality differences, were unable to assign a sensible meaning to these differences. Francis and Williamson (2015) [27] suggested that the results of several studies reporting consumer responses to off-flavors noted consumers reacted very negatively to a modest level of common wine flaws. These consumers felt wine producers should not be selling wines in the market without adequate consideration to eradicating the faults, thus decreasing their chance of repeat purchase. Subjective Wine Knowledge—Previous research on consumer knowledge has determined it is a primary variable influencing purchase behavior (Hadar et al., 2013; Oh and Abraham, 2016) [58,59] and includes three components: objective knowledge, subjective knowledge (SK), and past experiences. Oh and Abraham (2016) [59], Dodd et al. (2005) [60], Aertsens et al. (2011) [61], and Barber et al. (2009) [8] showed objective knowledge and subjective knowledge influence the decision process differently. Objective knowledge influences search strategies, while SK provides consumers with increasingly superior self-confidence and is a better predictor of purchase behavior; thus, SK reflects self-perceived knowledge.

Ellis and Thompson (2018) [62] suggested SK is consumers’ perception of information they have in their memory about a particular topic thereby reflecting confidence in their knowledge. For example, Ellis and Thompson (2018) [62] found consumers with low SK were more likely to ask experts for their opinions rather than for specific product attribute information. On the other hand, according to Barber (2009) [63], an individual with below-average objective wine product knowledge may be extremely confident about their degree of knowledge (high SK) relying on themselves to make the buying decision. Subjective knowledge, or what consumers think they know about a product, is reported to be stronger than objective knowledge as a motivator of purchasing behaviors (Ellis and Caruana, 2018) [64]. According to Koklic (2011) [65] and Laroche et al. (2003) [66], SK is significantly and directly related to perceived risk. Based on the above, the role of SK in the prepurchase search behavior supports our selection of SK as a central knowledge construct in this study.

Perceived Risk—Research on the various dimensions of perceived risks has examined the relationship with wine consumer behavior (e.g., Outreville and Desrochers, 2016; Campbell and Goodstein, 2001; Lacey et al., 2009; Bruwer et al., 2011; Lockshin and Corsi 2012; Beneke et al., 2012) [25,67–71]. Perceived risk (PR) is the uncertainty concerning the expectations and consequences resulting from the purchase, operating as a hindrance to purchasing behavior. Thus, when a product purchase is judged to be risky, it will have a greater negative influence on attitude, with purchase intention expected to be low (Zhang and Yu, 2020; Campbell and Goodstein, 2001; Wang and Hazen, 2016) [68,72,73]. Conversely, when a product purchase is thought to be lower in risk, the influence on attitude will be more positive, leading to high purchase intention (Campbell and Goodstein, 2001; Wang and Hazen, 2016) [68,73].

According to Gupta and Sajani (2019) [74], because of the complex and distinct characteristics of wine, customers perceive a high degree of PR. Thus, reviewing a wine label for pertinent information reduces the risk of purchasing a substandard wine. Gupta and

Sajnani (2019) [74] further hypothesized PRs adversely influence the consumers' attitudes toward the purchase of wine, finding a reduction in risk perception positively affected the consumers' attitude toward wine purchasing behavior. Outreville and Desrochers (2016) [67] found PR was a critical factor influencing consumer behavior during a decision to buy or not to buy a wine product, suggesting consumers may employ risk-reduction strategies, however, with prior information available to consumers there could be an overall reduction of PR thereby increasing the willingness to buy.

Attitude toward Wines with Minor flaws—For the context of this study, a flawed wine represents an imperfection not considered normal for the wine type but is minor enough that the wine is still drinkable, such as minor cloudiness, imbalance with acidity/sweetness, short finish, lack of exceptional aroma or flavor. Although research on consumer attitudes toward wines with flaws or faults is very limited at best; however, Prescott et al. (2005) [47] testing consumers' and experts' threshold for accepting tainted wine, found that consumers on average were tolerant and less sensitive to taint than was an expert. Wong, Hsu, and Chen (2018) [2] assessed consumer attitudes toward sub-optimal food, finding that consumers' attitude was the main predictor of their intention to purchase suboptimal foods.

Consumer attitude as a precursor of purchase intention is reinforced through years of research in the tourism and hospitality field of study (Gupta and Sajnani, 2019) [74]. Attitudes are essential to consumer behavior research and marketing often seek ways to determine and modify attitudes about products, brands, and services. Strong attitudes regarding a social issue and product category can predict behavior, with attitude as a strong determinant of willingness to purchase (Barber, 2012; Barber et al., 2012) [17,75].

From the consumer perspective, attitudes are precursors of purchase intention and behavior (Sarabia-Andreu and Sarabia-Sánchez, 2018) [76]. They found explicit attitudes (more strongly related to deliberate drivers, such as taste, flavor, etc.) significantly influence purchase intention. Gupta and Sajnani (2019) [74] hypothesized consumers' behavioral intentions toward wine are positively affected by the consumers' attitudes toward wine.

Research has determined attitudes stemming from preconceived notions about a product affect individuals' inclination to purchase that product; hence, they develop attitudes regarding a specific product despite not directly experiencing it (Wong, et al., 2018) [2]. Their intentions regarding a product reveal how much the individual is willing to try a particular product or to engage in a particular attitude (De Toni et al., 2021) [33], with attitudes toward a product likely to influence future behaviors (Wong et al., 2018; Barber et al., 2012) [2,17].

Perceived Behavioral Control—Perceived behavioral control (PCB) is rooted in the Theory of Reasoned Action and is defined as a domain-specific belief similar to self-efficacy in social learning theory, whereby individuals believe their actions make a difference in solving a problem through product purchase decisions (Montano and Kasprzyk, 2015; Barber et al., 2016) [77,78]. Often individuals are certain their actions result in particular outcomes and thus bring about change. While others have little confidence in their ability to make a difference; thus, PCB is situational or issue-specific, and this personal belief might be formed under the influence of more general or abstract value orientations Bishop and Barber, 2015; (Barber et al., 2016; Kitipattarapoomikul, 2013) [78–80].

For wine consumption, PCB can be assumed to be closely interconnected with the concept of risk, and this perception of risk influences choice; the higher the PR, the lower the PCB will be (Barber et al., 2016; Agnoli et al., 2016) [78,81]. In their study of pro-environmental wine purchase intention, Bishop and Barber (2015) [79] found those with a lower level of PCB did not consider their purchase behavior makes a difference to the environment.

Sabina del Castillo et al. (2021) [82] discussed PCB as the individual's perception of their ability to engage in a certain behavior or how the level of complexity is perceived, which in turn reveals their extent of control over a behavior. Multiple studies have demonstrated the greater an individual's PCB, the stronger their intention to engage in

the behavior (Sabina del Castillo et al., 2021) [82]. For their part, Capitello et al. (2015) [83] showed there is a meaningful relationship between PBC and wine consumption intention.

Subjective Normative Behavior- The idea that subjective normative behavior (SNB) represents an important determinant of intentions to act appears to be well-established for a range of behaviors (Bishop and Barber, 2015) [79]. Bishop and Barber (2015) [79] suggested companies promote a particular subjective behavior of avoidance, depending on the product offered, such as with wine faults or flaws, such that consumers should only buy products that are well made and shun those that are not, regardless of if the product may cost more. As discussed by Patch et al. (2005) [84] and Ajzen (2006) [85], TPB assumes normative factors are based on perceptions of whether specific significant others believe an individual should perform the behavioral action or not (normative belief) and the motivation to comply with the wishes of these significant others.

Purchase Intention—Purchase intention (PI) is a commonly used tool of marketers when planning marketing strategies (Morwitz, 2012) [86] as it has proven to be a reliable predictor of consumers' actual behavior and possible new product acceptance (Sarabia-Andreu and Sarabia-Sánchez, 2018) [76]. In the study by De Toni et al. (2021) [33], they postulated a consumer's PI was their mindful decision to purchase a wine product based upon a complex process of evaluative and normative judgment. They further suggested attitude, PCB, SNB, and PI are important to the consumer's behavior.

Barber et al. (2012) [17], when segmenting wine consumers' environmentally produced wine, noted purchase intention is measured in several ways, for instance, by measuring the expressed intention to purchase using a scale composed of several positively worded statements of purchase behaviors.

Environmental Attitude—Vital to consumer behavior research and marketing are attitudes toward a product, service, or brand. The focus of market research has been a greater understanding of attitudes and how to predict consumer behavior, in so doing changing consumers' attitudes to elicit an appropriate behavior (Barber et al., 2009) [8]. Pulling from current literature, examples of environmental concerns wine producers confront are water use and quality, organic and inorganic solid waste disposal, greenhouse gas emissions, energy consumption, chemical, and land use (Gabzdylova et al., 2009, p. 993; Barber et al., 2009; Forbes et al., 2009; Knowles and Hill, 2001; Pullman et al., 2010) [8,87–90].

Barber et al. (2010) [91], Barber et al. (2009) [8], and Khaleeli and Jawabri (2021) [92] each suggested that environmental attitude (EA) is vital to studying consumer behavior and marketing generally seeks how to understand and alter attitudes regarding products, brands, and services; thus, to be better able to predict behavior. Moreover, they suggest that clear attitudes concerning social issues may predict behavior and the environment. Studies found attitude a very likely predictor when there is a positive attitude toward performing an environmentally friendly act, such as buying an organic (Barber et al., 2010; Bishop & Barber, 2014) [91,93].

3. Methodology

3.1. Data Collection

Participants were recruited through Amazon Mechanical Turk (Mturk) and paid \$0.75 for completing the study. Mturk is a crowdsourcing platform designed to recruit individuals from the general public to complete surveys. It allows for predefined criteria and qualifications, such as country of residence (U.S.) and 21 years of age or older. Additionally, screening questions were included to focus the sample on those who have consumed wine in the previous thirty days. Research from the hospitality literature has used Mturk to collect similar data (e.g., Liu & Mattila, 2017; Wu, Mattila & Hanks, 2015) [94,95] because Mturk samples have been shown to be a valid method to collect data (Paolacci et al., 2010) [96]. The survey was self-administered in November 2021. Data were collected from 260 participants. See Tables 2 and 3 for the participants' data.

Table 2. Demographics and other variables by flawed wine purchase intention ($n = 260$).

	Overall	Flawed Wine PI		
		High ($n = 44$)	Moderate ($n = 172$)	Low ($n = 44$)
Subjective Knowledge ¹	4.6	5.0	4.6	3.8
Subjective Normative Behavior ²	3.6	4.2	3.7	2.7
Perceived Risk ³	4.0	4.2	4.0	3.7
Purchase Control ⁴	3.8	4.3	3.9	3.1
Attitude toward flawed wines ⁵	3.7	4.4	3.8	2.6
Average Age ⁶	36.5	37.9	35.9	37.4
Sensory Appeal of Flawed Wines ⁷				
Wines with minor flaws have a pleasant aroma	3.7	4.2	3.8	3.2
Wines with minor flaws taste good	3.8	4.2	3.9	3.0
Wines with minor flaws are visually appealing	3.8	4.2	3.9	3.4
Gender				
Male	62%	18%	63%	19%
Female	38%	15%	71%	13%
Education				
High school diploma	5%	25%	67%	8%
Some college	3%	-	67%	33%
Associate degree in college	4%	10%	50%	40%
Bachelor's degree in college	64%	16%	67%	17%
Master's degree	22%	21%	66%	13%
Professional degree (JD, MD)	1%	-	100%	-
Doctoral Degree (Ph.D.)	1%	-	33%	67%
Income				
Less than \$40,000	23%	25%	54%	21%
\$40,000–\$69,999	47%	16%	70%	15%
\$70,000–\$99,999	22%	16%	67%	17%
\$100,000 or more	7%	11%	79%	11%

¹ not significantly different, $F(2, 257) = 479.27, p < 0.01$; ² not significantly different, $F(2, 257) = 105.40, p < 0.01$; ³ not significantly different, $F(2, 257) = 195.91, p < 0.01$; ⁴ not significantly different, $F(2, 257) = 402.62, p < 0.01$; ⁵ significantly different, $F(2, 257) = 217.26, p < 0.01$; ⁶ significantly different, $F(2, 257) = 1.301, p > 0.10$; ⁷ significantly different, $F(2, 257) = 302.37, p < 0.01$.

3.2. Measurement and Instrument Development

The questionnaire items were modified, pre-tested, and refined from previous studies. All items were measured on a Likert scale from 1 to 5. Attitude (4) $\alpha = 0.83$ (Wong et al., 2018) [2] measured attitude toward purchasing wine with flaws, perceived risk (7) $\alpha = 0.74$ associated with purchasing wine with flaws, and PI (4) $\alpha = 0.84$ for wines with flaws. Subjective knowledge (5); $\alpha = 0.83$ questions asked participants to rate their wine knowledge, sensory appeal (3) $\alpha = 0.72$ (Wang et al., 2013) [97] was used to understand respondents' preferences for flawed wine (e.g., pleasant aroma). Perceived Behavioral Control (3) $\alpha = 0.84$ (Sabina del Castillo et al., 2021) [82] measured the respondent's belief in their purchase control and subjective normative behavior (3); $\alpha = 0.73$ (Bishop and Barber, 2015) [79] measured how important people close to them would view the purchase of wines with flaws.

3.3. Data Analysis

Purchase Intention was grouped, using the mean and standard deviation, into three distinct items labeled high PI, moderate PI, and PI intention (adapted from Bishop and Barber, 2014) [93]. The reliability coefficient, Cronbach's Alpha for each construct, was adequate ($\alpha > 0.70$), suggesting reliability (Hair et al., 2010) [98]. ANOVA was performed to compare the effect of PI on the construct variables SK, SNB, PR, purchase control, attitude

toward flawed wines, SA, and average age (see Tables 2 and 3). A separate ANOVA was run to compare the effect of (EA) on construct variables PI, attitude, PR, and behavioral control (see Table 4). The construct was grouped, using the mean and standard deviation, into three distinct items labeled high, moderate, and low EA. Tukey’s HSD Test for multiple comparisons was performed for post hoc testing if the ANOVA was significant.

Table 3. Respondent wine behavior profile (n = 260).

Important Decision Factors for Purchasing a Wine ¹	Total	Flawed Wine PI		
		High (n = 44)	Moderate (n = 172)	Low (n = 44)
Variety (blend, single grape)	3.7	4.1	3.7	3.3
Wine Reviews	3.8	4.2	3.8	3.3
Sensory components of the wine	3.9	4.1	3.9	3.5
Grape varietal	3.7	4.2	3.7	3.2
Quality of wine	3.9	4.1	3.9	3.4
“The wine I purchase” ¹ :				
. . . is pleasing to taste and smell	3.9	4.1	4.0	3.5
. . . has an acceptable standard of quality	4.1	4.3	4.1	3.8
. . . is well balanced	4.1	4.6	4.1	3.8
When consuming wine, how important are the following? ¹				
Body of the wine	3.6	3.3	3.7	3.5
Finish of the Wine	3.5	3.3	3.5	3.5
Dry	3.3	3.1	3.3	3.5
Sweet	3.7	3.4	3.7	3.8
Savory	3.4	3.1	3.5	3.3
Frequency of wine consumption				
I drink wine every day	14%	17%	75%	8%
Once a week	22%	23%	56%	21%
2–3 times a week	33%	17%	69%	14%
2–3 times a month	22%	11%	75%	14%
2–3 times a quarter	6%	13%	40%	47%
Special occasions, holidays, social gatherings with friends, or at home	3%	-	56%	44%

¹ 5-point Likert importance scale.

Table 4. Respondent environmental attitude (n = 260).

	Overall	Environmental Attitude		
		High (n = 55)	Moderate (n = 170)	Low (n = 35)
Purchase Intent ¹	3.8	4.0	3.8	3.2
Attitude ²	3.7	3.9	3.8	3.1
Perceived Risk ³	4.0	4.2	3.9	3.7
Behavioral Control ⁴	3.8	3.7	3.8	4.0

¹ F(2, 256) = 159.68, p < 0.01; ² F(2, 257) = 331.29, p < 0.01; ³ F(2, 257) = 251.83, p < 0.01; ⁴ F(2, 257) = 368.29, p < 0.01.

4. Results

4.1. Descriptive Statistics of Respondents

The sample consisted of 62% males, 70% under 40 years of age, 64% with a four-year college degree, with 46% earning between USD 40,000–70,000 per year. Table 2 provides a complete profile of respondents. When respondents were grouped by PI of a flawed wine, there were significant differences, p < 0.01 for all study constructs, particularly between high and low PI.

4.2. Results of Analysis of Variance Procedures

As shown in Table 2, one-way ANOVA testing results of PI on SK ($F(2, 257) = 479.27, p < 0.001$; SNB $F(2, 257) = 105.4, p < 0.001$; PR $F(2, 257) = 195.19, p < 0.001$); PCB ($F(2, 257) = 402.62, p < 0.001$); and attitude toward flawed wines ($F(2, 257) = 217.26, p < 0.001$) were all significant. The average age was not significant ($F(2, 257) = 1.3, p = 0.274$). For all variable constructs except average age, Tukey's HSD post hoc test for multiple comparisons found that the mean value of PI was not significantly different between high PI with moderate PI ($p < 0.001$) and with low PI ($p < 0.001$). Significance testing between PI groups was not performed for average age as the ANOVA was not significant.

The ANOVA testing of PI and SA components of flawed wines was significant ($F(2, 257) = 302.37, p < 0.01$). Tukey's HSD post hoc test for multiple comparisons found that the mean value of PI was significantly different between high PI with moderate PI ($p < 0.001$), and with low PI ($p < 0.001$). The remainder of Table 2 provides a PI profile by demographic data. The respondents with lower incomes were more likely to purchase wine with flaws, which corresponds with the data regarding education level, whereas those with a lower level of education were also more likely to purchase wines with flaws.

Table 3 shows the respondents' wine behavior and knowledge. High flawed wine PI respondents, overall, thought variety, reviews, sensory components, varietal, and quality were more important when deciding to purchase a wine than the other two flawed wine PI groups. Regarding sensory components, those in the high flawed wine PI group want a well-balanced wine, followed by one that has an acceptable standard of quality, and, lastly, a wine that is pleasing to taste and smell. Although the moderate and low PI groups follow the same rank order, there is a decreasing level of importance across the three groups.

When analyzing characteristics of wine, such as the body, finish, and whether it is dry, sweet, or savory, it was found these were overall most important to those in the moderate and low PI group. Meaning these may be key decision factors for whether to purchase wine. Of these characteristics, sweet wine was the most important attribute leading to PI across all intent groups. To further assess the characteristics of those consuming flawed wine, the frequency of wine consumption was analyzed. The results show that those who infrequently consume wine were less likely to buy a flawed wine, and those who frequently consume wine were more likely to purchase a flawed wine.

Table 4 shows the results of the one-way ANOVA testing results of (EA) on PI ($F(2, 256) = 159.68, p < 0.01$); attitude ($F(2, 257) = 331.29, p < 0.01$); PR ($F(2, 257) = 251.83, p < 0.01$); and behavioral control ($F(2, 257) = 368.29, p < 0.01$). For all variable constructs, Tukey's HSD post hoc test for multiple comparisons found that the mean value of EA was significantly different between high EA with moderate EA ($p < 0.001$) and low EA ($p < 0.001$).

4.3. Results of Respondent Knowledge of Flawed Wine Characteristics and Consumption

Table 5 further assesses respondents' overall knowledge of flawed wines and their consumption of wines with minor and major flaws in the last three months. Overall, respondents were knowledgeable about the definition of a wine flaw and had consumed wine with minor flaws more so than wine with major flaws. This evidence suggests that some wine flaws are considered drinkable and those that are not. Table 5 further breaks down the characteristics of flawed wine to understand which consumers believe are drinkable versus undrinkable. Overall, all the characteristics of flawed wine were considered undrinkable by respondents. When a panel of wine experts was asked, they determined that wine with sediment, an imbalance of acidity/sweetness, and off-color wines were considered wine flaws that were drinkable. All others, according to this panel, were considered undrinkable.

Table 5. Respondent knowledge of flawed wine characteristics and consumption.

Flawed Wine Knowledge		False	True					
A wine flaw is an imperfection not considered normal for the wine type but is minor enough that the wine is still drinkable (e.g., minor cloudiness, imbalance with acidity/sweetness, short finish, lack of exceptional aroma or flavor).		40%	60%					
Flawed Wine Consumption		False	True					
In the past three months, I have consumed wine with minor flaws.		39%	61%					
In the past three months, I have consumed wine with major flaws.		51%	49%					
Characteristic of Wine	Total	Flawed Wine PI			Total	Flawed Wine PI		
		High (n = 44)	Moderate (n = 172)	Low (n = 44)		High (n = 44)	Moderate (n = 172)	Low (n = 44)
		Wine Flaw Drinkable			Wine Flaw Not Drinkable			
Over-the-Hill	40	20%	47%	33%	41	10%	61%	29%
Oxidation	24	30%	37%	33%	91	9%	74%	18%
Cooked/Maderized	23	44%	26%	30%	66	12%	73%	15%
Sediment ¹	41	17%	52%	31%	53	21%	64%	15%
Wine Diamonds	32	22%	50%	28%	70	13%	63%	24%
Volatile Acidity	22	41%	32%	27%	73	10%	75%	15%
Imbalance with acidity/sweetness ¹	28	22%	46%	32%	52	13%	73%	13%
Lacks exceptional aroma ¹	34	12%	56%	32%	66	20%	64%	17%
Color is slightly off from expectations for varietal ¹	41	14%	52%	34%	62	16%	61%	23%
Corked	30	20%	53%	27%	56	20%	70%	27%

¹ A panel of wine experts rated these items as “Flaw Drinkable”; for all other items the wine panel rated them as “Not at all Drinkable”.

5. Discussion

This study endeavored to begin the dialog of how wine producers, food establishments that sell wine, and wine retailers could promote flawed wines with positive promotional programs. Although Francis and Williamson (2015) [27] found consumers were not likely to purchase wines with off-flavors, this study, by developing a profile of wine consumers, suggests strategic promotion campaigns that may save any environmental impact from pouring wines out, increase revenue by selling, even at a discount, flawed wines, and educate wine consumers about minor sensory flaws who otherwise may opt-out of purchasing wines with flaws.

Interestingly, individuals with lower incomes and education levels were more likely to purchase flawed wines. There may be an underlying belief flawed wines are inherently not good and will therefore be discounted, leading to a stronger intent to purchase for individuals on a tight budget. Or these consumers may not have the sensory experience to care if flawed wines are considered by experts to be less than desirable. Gracia and Gómez (2020) [99] found certain consumers were willing to purchase suboptimal food if there were locally grown and sustainable. Aschemann-Witzel (2018) [100] found neither communicating savings, reduction in food waste nor products labeled as organic influenced the purchase decision. Individuals who consume wine more often, a minimum of two to three times per week, were also more likely to purchase flawed wine, suggesting there may be a budget constraint present here as well, or they are willing to try new things. This too may benefit from the work of Aschemann-Witzel (2018) [100] who found cost saving to consumers was not a driving force in the decision to consume.

Previous wine literature has shown an individual’s attitude is a strong determinant of willingness to purchase (Barber, 2012) [75]. Accordingly, the findings indicate respondents whose attitude was open to buying flawed wines had the highest amount of PI, believing buying flawed wines was a good idea and pleasant to consume. Respondents also believed

there was a level of PCB over their purchase decisions that significantly influenced flawed wine PI, supporting Capitello and colleagues' (2015) [83] findings.

Perceived risk is closely associated with PCB and was found to influence flawed wine PI. Research by Agnoli and colleagues (2016) [81] found the higher the PR, the lower the PCB. The results here show both constructs influence flawed wine PI, suggesting a balance must be struck to create ideal purchase behavior.

Subjective knowledge was found to significantly influence flawed wine PI, supporting several previous works that SK influenced wine purchase behavior, such as variety seeking (Ellis and Thompson, 2018), exploratory wine acquisition (Vigar-Ellis et al., 2015) [101], and intrinsic and extrinsic product cues (Chrea et al., 2011; Agnoli et al., 2016) [81,102]. The results of this study suggest an individual's SK will influence the selection of flawed wines. Regarding SNBs providing motivation to comply with the wishes of significant others (Ajzen, 2006; Patch et al., 2005) [84,85], the results show individuals are more likely to purchase flawed wine when others important in their life believe it is a good idea.

Wine is a sensory experience, and as such extant literature focuses on the consumer's evaluation of sensory components with Bruwer et al. (2011) [25] suggesting there needs to be more known about wine sensory preferences. This research shows respondents believe flawed wine is not devoid of sensory experience, nor is it always negative. Individuals in the high PI group found flawed wine to have a pleasant aroma, taste good, and be visually appealing, more so than those in the moderate and low PI groups.

When looking at the wine behavior profile, respondents who were most likely to purchase flawed wine considered wine reviews and grape varietal in their purchase decision, more so than those in the moderate or low groups. Secondary to wine reviews and varietal, sensory components and quality were also influential in purchase decisions. Although there is no exact science to prevent the array of flaws from occurring or which varietal they affect, expert wine reviews for flawed wines should focus on the nuances of the wine rather than dismiss it as flawed. These results support previous research that showed wine reviews significantly influence purchase behaviors (Barber, 2018) [103] and, in the case of flawed wine, may override quality and sensory factors affecting the wine.

Lastly, respondents' EA significantly influences their intent to purchase wines with flaws and their attitude toward flawed wine. Specifically, the higher their level of environmental concern, the more likely they are to have a favorable attitude toward the flawed wine and to purchase the flawed wine. Regarding behavioral control, whereby individuals believe certain actions make a difference in solving a problem (Barber et al., 2016) [78], the results show those with a low level of EA exhibit the greatest amount of behavioral control. Specifically, their actions are not controlled by a desire to be environmentally conscientious. Whereas those with a high level of EA exhibit the lowest amount of behavioral control, implying there are greater influences beyond self-gratification on their purchase decisions. EA influences PR so much that those with a higher level of EA experience a higher level of risk. These individuals may choose to continue buying a familiar brand because they have researched and selected it for its commitment to environmental consciousness.

5.1. Practical Implications and Conclusions

The results of this study offer several practical opportunities, from educating consumers with a richer and deeper understanding of wine flaws (compared with faults) to marketing opportunities to help wine producers move products that may otherwise be disposed of; thus, enhancing revenue, and how both SA and environmental concern appear to be useful constructs in furthering the understanding and possibly the predictability of consumer intentions regarding the purchase of flawed wines.

From the education perspective, with the aid of wine experts, retail outlets, and restaurants, flawed wines could be discussed in terms of sensory attributes and sold by offering samples of flawed wines before purchase to alleviate the PR and allow for sensory evaluation before purchase. Additionally, this information can aid marketers

in reaching individuals who are more likely to purchase wines with flaws leveraging environmental concerns.

Wine companies have recognized the need to better understand consumer preferences to sustain and develop their businesses in a globally competitive market. Such an understanding allows wineries to design wine styles to better respond to consumer needs, wants, and expectations. This research begins the academic conversation regarding flawed wines and builds a profile of consumers most likely to purchase flawed wines to aid producers and sellers of wine.

5.2. Limitations and Future Research

This research was conducted on an online panel data site (Mturk), utilizing screening questions to screen out undesirable respondents; however, does not eliminate the potential for errors in sampling. Secondly, having an equal distribution of data points between groups would provide more useful comparisons between groups. To continue building on the foundation developed here, future research should focus on experimental design style investigations to further identify techniques to improve the sale and marketing of flawed wines. This would include similar work performed by Bishop and Barber (2014) [93] and Barber et al. (2016) [78] who used the same participants for collecting survey data and a tasting auction-style experiment. Future research should also continue to explore the antecedents of flawed wine PI to determine which are most influential and how individuals and companies that sell wine can utilize them effectively to increase sales and reduce waste. Lastly, future research should further explore flawed wine consumption outcomes (satisfaction, willingness to pay, etc.) to further assess drinkable versus undrinkable wine flaws.

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