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CONSUMER BEHAVIOR OF ALCOHOLIC BEVERAGES

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ABBREVIATIONS

[AB]	Alcoholic beer
[AOC]	Appellation d'origine contrôlée (Controlled Designation of Origin)
[APC]	Alcohol per capita consumption
[BFS]	Bundesamt für Statistik (Federal Office of Statistics)
[BLW]	Bundesamt für Landwirtschaft (Federal Office for Agriculture)
[DOCG]	Denominazione di origine controllata e garantita (Controlled and guaranteed denomination of origin)
[EDI]	Eidgenössisches Departement des Innern (Federal Office of Internal Affairs)
[EZV]	Eidgenössische Zollverwaltung (Federal Customs Administration)
[HWL]	Health warning label
[NAB]	Non-alcoholic beer
[OIV]	Organisation International de la Vigne et du Vin (International Organization of Vine and Wine)
[RRS]	Risk reduction strategies
[WHO]	World Health Organization
[WSET]	Wine and Spirits Education Trust

Chapter 1

GENERAL INTRODUCTION

1.1. Introduction

Drinking alcohol is a vital part of many cultures around the world. A large proportion of global wine and beer production occurs in Europe and alcohol represents a weighty sector in many countries (Brewers of Europe, 2020a; International Organization of Vine and Wine [OIV], 2019). In addition to Europe's significant role in alcohol production, Europeans consume considerable amounts of alcohol. Consequently, Europe registers the highest per capita alcohol consumption (World Health Organization [WHO], 2018). However, European countries differ in how much and what they drink. While wine is the beverage of choice in southern European countries, northern Europeans consume more beer (Agnoli, Mueller, Begalli et al., 2011). The beer sector differs considerably from the wine sector, which is known for its complexity and wide price range. The wine market consists of a plethora of brands produced by a large number of often small, family-owned wineries (Lockshin & Hall, 2003). Conversely, consumers find a manageable number of beer brands in a shop, bar, or restaurant because the beer market is heavily dominated by large enterprises, such as Carlsberg or Heineken, which produce most of the beer consumed (Brewers of Europe, 2020c). In Switzerland, 99% of all the beer consumed is produced by only 51 of over 1,000 breweries (Brewers of Europe, 2020b).

The wine and beer markets are constantly transforming. What, where, and how much consumers drink has been changing and shows trends resembling those in the food sector. For food, there is a strong demand for healthy, natural, local, and sustainable food products, and this has become apparent on wine and beer shelves too (Nielsen, 2015). Products like "natural wine," craft beer, or alcohol-free beer and wine are gaining popularity especially among young consumers (Brewers of Europe, 2020c; Vecchio, Parga-Dans, Alonso González et al., 2021). Although wine remains the most consumed alcoholic beverage in Switzerland, the shares of beer and spirits have increased (Swiss Wine Promotion, 2017). The locations where these beverages are consumed are also changing. Although Swiss consumers are increasingly buying beer off-trade (retail) compared to on-trade (restaurant, bars), most of the wine sold is on-trade (Bundesamt für Landwirtschaft [BLW], 2021; Brewers of Europe, 2020b). Purchasing alcohol for home consumption is a different buying experience than a public setting, like a bar or restaurant. There are several types of risk consumers face when buying wine or other alcohol (Bruwer, Fong, & Saliba, 2013). For example, buying a bottle of wine in a restaurant is particularly risky due to the product's complexity, high prices, and the social pressure to select

something that pleases one's company (Jaeger, Danaher, & Brodie, 2010). The complexity of wine destems from the excessive number of products, variety of brands, varietals, origins, and producers, and this is further enhanced by consumers' limited ability to interpret the information at hand (Olsen, Thompson, & Clarke, 2003). How and how much consumers drink alcohol has been changing as well. Drinking alcohol, particularly wine, with dinner, to celebrate, or on special occasions is part of Swiss culture. However, regular, weekly, or even daily moderate consumption with meals is increasingly being replaced by less frequent but more excessive drinking on weekends (Bundesamt für Statistik [BFS], 2019). Drinking wine, beer, and other alcoholic beverages is a cultural norm in Switzerland. Yet alcohol consumption poses considerable health risks and disease burden (Gmel, 2020; Rehm, Gmel, Gmel et al., 2017). Negative outcomes of frequent and/or excessive alcohol consumption may be reduced by drinking less or drinking beverages with a lower strength of alcohol. To summarize, traditional wine and beer consumption is undergoing changes in terms of beverage type and there is increasing awareness that drinking alcohol can cause damage to the body and lead to a range of other negative consequences (Jané-Llopis, Kokole, Neufeld et al., 2020).

This dissertation investigates consumer behavior toward alcoholic beverages with a focus on the two major beverage types consumed in Europe: wine and beer. First, it investigates the trend toward more natural products in wine. Second, it assesses how the complexity of wine challenges consumers in making a choice in a social environment—namely, a restaurant. Third, the dissertation investigates consumers' perceptions of alcohol consumption as a threat to their health. More specifically, it probes whether health warning labels (HWLs) on alcohol containers increase consumers' perceived risk of consumption, which may, in turn, affect alcohol intake. Finally, the dissertation examines how consumers who drink a healthier alternative to alcoholic beer (AB), non-alcoholic beer (NAB), are viewed by others and investigates how social norms influence consumers' choices.

1.2. A driver of choice: perceived naturalness

Buying natural and minimally processed foods is one of the major global food trends (Nielsen, 2015). Sales of products with an "all natural" claim have seen a strong increase in recent years and perceived naturalness has been found to be a major buying incentive (Nielsen, 2015). Considerable research has investigated the phenomenon of seeking "natural" food products. It was found that consumers infer the intrinsic qualities of a product by the perceived naturalness of the product (Berry, Burton, & Howlett, 2017). A product that is perceived as

natural is regarded as healthier, purer, and tastier (Román, Sánchez-Siles, & Siegrist, 2017; Rozin, Spranca, Krieger et al., 2004). Furthermore, perceived naturalness evokes positive feelings and pastoral views of nature in consumers (Amos, Pentina, Hawkins et al., 2014). The word "natural" conveys a sense of authenticity, trust, transparency, and control (Moscato & Machin, 2018). Perceived naturalness is correlated with both a product's attractiveness and purchase intent (Binninger, 2015). Despite there being no official definition of naturalness, consumers seem to have no issues in judging a product's naturalness and use a "natural-is-better" heuristic when selecting a product (Román et al., 2017; Siegrist & Hartmann, 2020).

Owing to the importance of the positive reaction that "natural" products evoke in consumers, many studies have examined what causes a product to be perceived as natural or not (for a summary, see, Román et al., 2017). It was found that product traits that induce a feeling of naturalness can be grouped into three categories (Román et al., 2017). The first category concerns how the food or raw material is grown, such as organic production, and the origin of the product. For example, locally sourced and organically grown were linked with "natural" products (Hasselbach & Roosen, 2015). The second category concerns the production of products—namely, the ingredients used in the production and processing of the materials. In this regard, it was found that chemical processes reduce the perceived naturalness more than physical processes do (Rozin, 2005). Furthermore, it seems that human intervention and the presence of artificial substances reduce a product's perceived naturalness (Rozin, Fischler, & Shields-Argeles, 2012). A negative attitude toward chemicals further strengthens the preference for natural food (Dickson-Spillmann, Siegrist, & Keller, 2011). The third category concerns properties of the final product, such as freshness, eco-friendliness, or health properties.

In the wine sector, the trend toward more natural products is reflected in an augmented demand for so-called "natural wines." To this day, there is no scientific or legal definition of natural wine. This lack of definition is problematic because it means producers can market or sell their wines as "natural wines" without having to comply with any particular standard, which may confuse consumers. According to Howard (2013), the term "natural wines" refers to wines from grapes from organic or biodynamic vineyards, produced with minimal use of chemicals or technical processing. This definition, although unofficial, indicates that the categories according to which a product's naturalness can be analyzed are relevant for wine. The production and origin of the raw material, the grapes, were found to be of major importance for natural wine (Vecchio et al., 2021). In terms of the production process, the addition of sulfites to the wine was found to reduce the perceived naturalness of such wines (Pöchtrager,

Niedermayr, & Sajovitz, 2018). Although natural wines represent a niche in the global wine market, these changes show that the trend toward more natural products that has long been observed in the food sector is also gaining leverage in the wine sector. Hence, even wines that are not sold as "natural wines" may be subject to consumers' evaluation of their perceived naturalness.

In comparison to the phenomenon of "natural wine," there is no "natural beer" trend. However, the number of so-called microbreweries is strongly growing (Brewers of Europe, 2020c). In Switzerland, the number of microbreweries, which typically produce craft beer, increased from 623 in 2015 to 933 in 2018—in other words, the appearance of more than 300 microbreweries in only three years (Brewers of Europe, 2020b). Consequently, craft beer, defined as traditionally manufactured beer by independent breweries in small quantities (Brauerei-Verband, 2021), is gaining a market share. Craft beers are brewed for consumers who appreciate beer with original, complex flavor profiles (Jaeger, Worch, Phelps et al., 2020). The demand for craft beer and the increasing number of microbreweries indicate that also for beer, consumers seek more authentic, local, and more natural products.

To date, research on consumers' perceived naturalness has concerned mainly the food sector. However, the above-described change in demand for types of beer and wine implies that alcoholic beverages are part of the naturalness trend. In this regard, it is interesting to investigate what influences an alcoholic beverage's perception as natural. Due to the advanced movement of "natural wine," my colleagues and I conducted a study, described in Chapter 2, to analyze whether concepts regarding the perceived naturalness of food, such as its origin or production processes, also apply to wine.

1.3. A particular place of consumption: the restaurant

Changes in the consumption of food and beverages not only concern the type of products but also the ways in which these products are consumed. The share of out-of-home meals consumed has increased in recent years and this accounts for a large percentage of household spending (Bruwer, Perez Palacios Arias, & Cohen, 2017). Sales of alcoholic beverages, such as wine and beer, account for an important amount of restaurants' and especially bars' turnover (Oliveira-Brochado & Vinhas da Silva, 2014). Ordering a beer in a restaurant or bar is somewhat different from ordering wine. Due to the dominance of a few large beer brands, many establishments offer only a limited number of products consisting of

draft and bottled beers. Moreover, since the beer market is dominated by a few large brands, consumers are likely familiar with the beers offered (Brewers of Europe, 2020b).

However, the wine listings in a restaurant often far exceed the beers offered. Not only is the number of wine options more extensive, but there is also a larger price range, especially for full bottles. Due to the tremendous variety that exists on the market, consumers are likely unfamiliar with the majority of offered wines. Furthermore, compared to buying wine in a retail setting, consumers do not see the bottles and labels in restaurants. Therefore, the amount of information presented is limited (Cohen, d'Hauteville, & Sirieix, 2009). As the wine, oftentimes, is also enjoyed with another person or in a group, choosing a wine is frequently a collective decision rather than an individual one (Hammond, Velikova, & Dodd, 2013). Thus, it is not surprising that selecting a wine in a restaurant was found to be stressful for consumers (Jaeger et al., 2010; Terrier & Jaquinet, 2016). Moreover, buying wine in a restaurant was found to be more demanding than buying wine for home consumption, since consumers perceive more and higher risks when doing the former (Corsi, Mueller, & Lockshin, 2012).

Among the different types of risks consumers face when buying wine, the most important one is the functional risk of choosing a wine that one does not like the taste of or that has cork taint (Lacey, Bruwer, & Li, 2009; Mitchell & Greatorex, 1989). In addition, there is the social risk of choosing something that others do not approve of, which results in feelings of embarrassment or shame because one may appear ignorant about wine (Lacey et al., 2009). This risk is particularly elevated in restaurants due to the public setting and lack of control over the situation (Ritchie, 2007). Finally, consumers face a high financial risk when buying a wine of low value for money, especially in restaurants, where the mark-ups add to the prices of the bottles (Martínez-Carrasco Martínez, Brugarolas Mollá-Bauzá, Del Campo Gomis et al., 2006).

The degree to which these risks affect consumers when selecting a wine in a restaurant depends on the consumer's individual characteristics, such as involvement, past experiences, age, or gender, as well as situation-specific factors, such as the occasion or type of establishment (Bruwer, Li, Lang et al., 2012; Lacey et al., 2009). For example, in a fine dining restaurant, consumers perceive a lower risk due to a restaurant's reputation and consumers' confidence that the wines on the menu have been carefully selected by the staff (Lacey et al., 2009). To reduce the perceived risks, consumers use different risk reduction strategies (RRS), such as price (Quester & Smart, 1998). The most important RRS was found to be the seeking of information (Lacey et al., 2009). The primary source of information about the wine in a restaurant is the wine list. Another source of information is the restaurant staff. However, not

all restaurants have trained staff or even sommeliers to professionally consult with restaurant patrons. Consumers are also often unwilling to contact the staff for more information (Dewald, 2008; Lacey et al., 2009).

The wine list should assist restaurant patrons in finding a wine that they like the taste of and that complements the food (Cohen et al., 2009). Therefore, consumers must know what style of wine, such as light, heavy, acidic, or aged, pairs well with the food. A restaurant wine list is typically organized according to the origin of the wine (Gil-Saura, Ruiz-Molina, & Berenguer-Contrí, 2008). The conventional information provided on the list includes origin, producer, brand, and sometimes grape variety and taste description (Ruiz-Molina, Gil-Saura, & Berenguer-Contrí, 2010). A description of the taste or style of the wine, which some restaurants offer, was found to reduce the functional risk for consumers and may, therefore, increase the likelihood that a wine will be chosen (Corsi et al., 2012).

If there is no description of the style of wines, consumers must infer the taste from the information given, such as the wine's origin. For example, a Rosso di Montalcino is a light red wine from Tuscany that pairs well with light main courses, such as a simple pasta. In comparison, Brunello di Montalcino, from the same village, Montalcino, is a heavier, older, and more expensive red wine that, due to the wine-making process and aging time, pairs better with heavier meat dishes. However, on a wine list that organizes wines according to origin, these wines would be listed next to each other. They may even be described as being from the same producer and made from the same grape variety. Such a wine list might be understood to signal that these wines have a similar taste, but in reality, the taste of the two wines is very different. Thus, without information about the style of the wine and lacking prior knowledge of their own, insecure consumers may choose the more expensive Brunello di Montalcino as a risk-reduction strategy and end up with a wine that does not complement the food chosen (Bruwer, Fong, & Saliba, 2013). Conversely, on a wine list that organizes wines according to style, a restaurant patron would see that the two wines must taste different because one would be categorized as light and the other as heavier.

The ability to know what a wine will taste like depending on where it is from can be highly challenging for consumers due to the complexity and diversity of wine (Ashton, 2014). Many consumers do not know how a certain country, region, or village affects the flavor profile of wine (Honoré-Chedozeau, Chollet, Lelièvre-Desmas et al., 2020). Even consumers with a strong understanding of and experience with wine encounter disconfirmations between expected and actual taste (D'Hauteville, Fornerino, & Perrouty, 2007). Often, the person in charge of creating the wine list is the owner, manager, or sommelier of the restaurant, who is

experienced and passionate about wine (Oliveira-Brochado & Vinhas da Silva, 2014; Terblanche & Pentz, 2019). Thus, they may be more experienced with wine than the average consumer and may be unaware of customers' (in)ability to identify a wine they enjoy from the wine list they are presented. A wine list should offer customers the information they need to reduce the overall risk when they select a bottle and find a wine they enjoy. Consumers' personal traits, such as involvement or knowledge, can have an important influence on what kind of information they seek and which RRS they use (Bruwer, Perez Palacios Arias, et al., 2017; Hammond et al., 2013).

1.3.1. Involvement

Involvement is conceptualized as a consumer's motivation to search for information about a product (Brennan & Mavondo, 2000). It is a goal-directed emotional state that determines the personal (perceived) relevance of a purchase decision or the product itself. This perceived relevance is the result of inherent needs, values, and interests. In the context of wine, consumers with low and high involvement notably differ in attitude and behavior around wine: people with a high involvement with wine were found to drink more wine, spend more on a bottle of wine, and have more experience with and more knowledge of wine (Bruwer, Chrysochou, & Lesschaeve, 2017; Park & Moon, 2003; Rahman & Reynolds, 2015). Consumers with high involvement use both intrinsic and extrinsic cues (Rahman & Reynolds, 2015). For example, such consumers value the origin and the appearance of a wine, whereas low-involvement consumers pay more attention to the price (Hollebeek, Jaeger, Brodie et al., 2007; Rahman & Reynolds, 2015).

Drinking wine leads to increased exposure to the product and often results in higher involvement as well as more knowledge in the field (Rahman & Reynolds, 2015). However, years of drinking moderate this effect. That is, long experience with wine does not mean that consumers have high involvement with wine and are knowledgeable. In fact, younger generations were found to be often more involved with wine compared to Baby Boomers (Bauman, Velikova, Dodd et al., 2019).

1.3.2. Knowledge

Wine is an information-intensive and complex product. There are three types of knowledge relating to wine (Ellis & Mattison Thompson, 2018). Objective knowledge denotes facts about wine and can be measured, for example, by whether someone knows what grape variety a Chianti wine is typically made of (Sangiovese). Subjective knowledge is what

someone thinks they know—for example, when someone claims to know "a lot" about wine (Ellis & Caruana, 2017). Experience represents a third type of knowledge. For instance, someone may know from previous experience that they do not like the astringent taste of Rioja wines. Experienced consumers usually also have high involvement with wine, but only some of them have high objective knowledge (experts), while others, referred to as snobs, simply think they know a lot (Ellis & Caruana, 2017). Experts process product information in a deeper and more detailed way and use more attributes when evaluating wine than wine novices do (Lockshin, Jarvis, d'Hauteville et al., 2006). Compared to non-experts, experts have had more exposure to various products and have, therefore, developed more skills and conceptual knowledge compared to non-experts (D'Hauteville et al., 2007; Honoré-Chedozeau, Lelièvre-Desmas, Ballester et al., 2017). Wine novices have more fragmented knowledge that can lead to difficulties in extracting the relevant information about a wine as well as making incorrect inferences about the wines (Honoré-Chedozeau et al., 2017).

Wine lists are important in representing the restaurant itself and are key for customer satisfaction, the restaurant experience, and customer loyalty (Gil-Saura et al., 2008; Oliveira-Brochado & Vinhas da Silva, 2014; Terblanche & Pentz, 2019). It is important, therefore, for restaurants to understand their customers and the information that helps them find a wine they like and that pairs well with the food (Barber, Almanza, & Donovan, 2006). A good wine list was found to be easy to use, diverse, modern, and innovative (Oliveira-Brochado & Vinhas da Silva, 2014). Anticipating consumers' difficulties with the complexity of wine by optimizing the wine list may positively affect wine sales, which will, in turn, have a significant impact on a restaurant's turnover (Bruwer, Perez Palacios Arias, et al., 2017). In this sense, a wine list organized by wine style may be useful for consumers to find a wine that they enjoy and that complements the food. To this end, my colleague and I conducted a study (presented in Chapter 3) to assess how the organization of a wine list according to wine style rather than origin affects consumers' selection of a bottle of wine in a restaurant and whether restaurant patrons would prefer this type of wine list.

1.4. A cultural issue: drinking alcohol in Europe

Drinking wine, beer, and spirits is a central element of European cultures. What people drink differs between European countries. While Northern European countries predominantly drink beer, Southern European countries consume more wine. This disparity is due to the historic cultivation of grapes in the warmer south and cereals and hops in the cooler regions in

the north (Glover, 2000). Despite its position in the heart of Europe and cool alpine climate, Switzerland has an important wine culture. Since the early 1900s, wine has been the most consumed beverage in Switzerland and accounted for the largest share of total pure alcohol intake (Eidgenössische Zollverwaltung [EZV], 2021). Although this is still the case today, the consumption of beer and spirits is increasing (EZV, 2021). The cultural significance of wine, beer, and spirits has evolved, especially in the twentieth century. The production and consumption of alcoholic beverages from the distillation of potatoes and fruits was considered a major socio-economic problem that needed to be tackled (Auderset & Moser, 2016). For decades, the Swiss Alcohol Board made considerable efforts to reduce excessive spirit consumption, whereas wine and beer, despite being the most consumed alcoholic beverages, were not addressed with such vigor (Auderset & Moser, 2016).

An important consequence of alcohol production in many European countries is high alcohol consumption (WHO, 2019). Europeans have by far the highest alcohol per capita consumption (APC). While the world's APC is 6.4 liters of pure alcohol per year, Europeans have an average consumption of 10 liters (WHO, 2018). This number includes abstainers, who account for about 40% of European citizens (WHO, 2018). Hence, excluding people who do not drink alcohol, Europeans have a yearly APC of 17.2 liters of pure alcohol, which equals roughly one liter of beer with 5% alcohol by volume per drinking person per day.

In Switzerland, the share of people who drink alcohol is higher than the European average: 82% drink alcohol and the number of abstainers has not changed much since 1992 (BFS, 2019). The APC decreased from 10 liters in 1992 to almost 8 liters in 2020 including abstainers (EZV, 2021). On average, a Swiss adult drinks 32 liters of wine, 53 liters of beer, and four liters of spirits per year (EZV, 2021). However, the patterns of alcohol consumption have changed. The share of people who consume alcohol daily decreased from 20% to 11%, while the prevalence of heavy episodic drinking increased across all age groups and both sexes (BFS, 2019).

1.4.1. Consequences of alcohol consumption

Drinking alcohol in vast amounts is not without consequences. Continuous and/or excessive alcohol consumption can cause a great number of negative outcomes, such as various diseases, violence, neuropsychiatric disorders, or injuries (for a summary, see e.g., Room, Babor, & Rehm, 2005). Alcohol consumption is associated with cancer in seven sites of the human body: the oropharynx, larynx, esophagus, liver, colon, rectum, and female breast (Connor, 2017). These cancer types have a dose–response relationship and there does not seem

to be a relation to the type of beverage (Connor, 2017). This means that drinking more and/or more often increases the probability of developing cancer in these sites irrespective of the type of alcoholic beverage consumed. At the same time, both wine and beer contain beneficial non-alcoholic compounds, such as resveratrol or polyphenolic compounds (Lippi, Franchini, & Guidi, 2010; Osorio-Paz, Brunauer, & Alavez, 2020). Low levels of red wine consumption have been found to have a potentially positive cardioprotective effect, indicating that consumers with moderate consumption have a lower risk of developing cardiovascular diseases compared to abstainers (Room et al., 2005; Saleem & Basha, 2010).

WHO (2018) established drinking guidelines to inform consumers about moderate consumption and assist consumers in refraining from exceeding the recommended upper limits. Unfortunately, it was repeatedly found that consumers did not know the daily limits (Hobin, Shokar, Vallance et al., 2020; Mongan, Millar, O'Dwyer et al., 2020). Furthermore, these guidelines were criticized for potentially suggesting that a safe level of drinking exists and for fostering beliefs in the health benefits of alcohol consumption. Consequently, consumers might falsely assess consumption risks, which could result in even greater consumption (Latino-Martel, Arwidson, Ancellin et al., 2011).

1.4.2. Health beliefs

Despite the number of potential negative outcomes of alcohol consumption, many consumers are only aware of some of these risks (Gmel, Marmet, & Notari, 2017). Knowledge of the health effects of wine seems to be limited and consumers are unaware of the link between alcohol and cancer (Annunziata, Pomarici, Vecchio et al., 2016; Pechey, Clarke, Mantzari et al., 2020). People’s preexisting beliefs about what causes cancer (e.g., genetic predisposition) may affect their perception of how their lifestyle adds to their risk of developing cancer (Pettigrew, Jongenelis, Chikritzhs et al., 2014). Although wine, beer, and spirits all contain ethanol, the associations people have with these beverages vary. Drinking beer and spirits is associated with problematic alcohol consumption, whereas drinking wine is considered classy (Dey, Gmel, Studer et al., 2014). Moreover, the notion that moderate wine consumption is good for health is widespread in Europe (Vecchio, Decordi, Grésillon et al., 2017). Such health beliefs may lead to lower perceived health risks of alcohol consumption (Bocquier, Fressard, Verger et al., 2017).

1.4.3. Perceived risk of drinking

Risk perception is an important determinant for someone's drinking behavior (Bocquier et al., 2017; Sjöberg, 1998). That is, the more probable and the more negative someone perceives the consequences of alcohol consumption to be, the lower the probability of them drinking alcohol will be (Wilson, Zwickle, & Walpole, 2019). Consumers who have more frequent and/or higher alcohol consumption, and thus face an increased risk of experiencing negative consequences, have been found to perceive a lower risk compared to people with low consumption (Bocquier et al., 2017; Corrales-Gutierrez, Mendoza, Gomez-Baya et al., 2019). Furthermore, they are more likely to relativize or deny the risk of drinking alcohol (Bocquier et al., 2017). It is difficult to estimate whether people drink as a result of their low perceived risk or whether they trivialize the risk to reduce the cognitive dissonance between the risk they expose themselves to and their actual behavior (Bocquier et al., 2017). Consumers seem, on the one hand, to accept a high voluntary risk of alcohol consumption, which may be due to a lack of awareness of its harmfulness; on the other hand, they may perceive the benefits of drinking to be so high that they consider the threat to health an "acceptable" risk (Rehm, Lachenmeier, & Room, 2014).

1.4.4. Health warning labels

Drinking alcohol is a risky behavior in which consumers voluntarily engage that has considerable costs for public health (Room et al., 2005). There are various possibilities for governments to intervene in order to reduce the disease burden and reduce the costs of the harmful use of alcohol, such as increasing prices, imposing sales restrictions, or introducing warning labels on alcohol containers. The latter option has had considerable success in lowering the disease burden of tobacco consumption (Noar, Francis, Bridges et al., 2017). In the case of alcohol, countries are increasingly introducing warning labels, such as "Don't drink and drive," or pregnancy warnings (European Commission, 2014). However, labels, for example, displaying links like www.drinkresponsibly.com or pictograms of a pregnant woman drinking, have repeatedly been criticized due to their ambiguity and negligible size (Rosenblatt, Dixon, Wakefield et al., 2019; Tinawi, Gray, Knight et al., 2018). These depictions are usually on the back label of the container, and the time consumers spend looking at back labels is very limited (Mueller, Lockshin, Saltman et al., 2010). Furthermore, the labels have been criticized for not being salient enough, being difficult to read, being too small, and not containing signal words, such as "Caution!" (Tinawi et al., 2018). Consequently, the amount of time consumers

spend looking at warning labels on alcohol containers is negligible, which compromises their effectiveness (Kersbergen & Field, 2017).

Due to the low effectiveness of current warning labels, organizations and researchers, in growing numbers, are suggesting including tobacco-inspired warning labels on the front of alcohol containers to attract people's attention and increase their effect (Annunziata, Agnoli, Vecchio et al., 2019; Jané-Llopis et al., 2020). The argument for including warning labels on alcohol containers is that consumers are confronted with the warning at the points of purchase and consumption (Hobin, Weerasinghe, Vallance et al., 2020). The learnings from tobacco labeling suggest that warning labels should be large in size, displayed on the front of the product, and their messages should be rotated, and that deterring imagery has an additional effect in convincing consumers not to consume the product (Noar et al., 2017).

Several studies have investigated the effectiveness of HWLs that contain a plain-text warning (text-only), a pictorial warning combined with text (image-and-text), or drinking guidelines. Various studies have found a stronger effect of image-and-text than text-only warnings (Rosenblatt et al., 2019; Wigg & Stafford, 2016). However, such highly salient HWLs increase people's avoidance and rejection (Clarke, Pechey, Mantzari et al., 2020b; Sillero-Rejon, Attwood, Blackwell et al., 2018). In other words, consumers try not to look at the label and react negatively toward, for example, pictures of a diseased liver on a wine bottle to deter people from consuming it.

1.4.5. Acceptance of health warning labels

Lack of acceptance from consumers lowers the probability that HWLs on alcohol containers will be implemented (Reynolds, Archer, Pilling et al., 2019). HWLs perceived to be the least acceptable were often the most effective in motivating people to drink less (Clarke, Pechey, et al., 2020b; Pechey et al., 2020). Less intrusive text-only labels were repeatedly found to be more accepted than image-and-text warnings, since the latter remind consumers of tobacco packs (Clarke, Pechey, et al., 2020b; Rosenblatt et al., 2019; Wigg & Stafford, 2016). Although women and people high in health literacy and socio-economic status were found to be more supportive, people with high alcohol consumption levels were less supportive of HWLs (Vallance, Stockwell, Zhao et al., 2020). Increased awareness and knowledge that alcohol can cause health problems may strengthen the acceptance of policy measures like including warning labels on alcohol containers (Hobin, Weerasinghe, et al., 2020; Reynolds et al., 2019).

The risks consumers face when drinking are diverse and perceived risk is crucial in determining whether someone engages in a risky behavior like alcohol consumption (Bocquier et al., 2017; Sjöberg, 1998). Hence, if HWLs can increase consumers' perceived risk of drinking alcohol, they may be an effective intervention to reduce negative outcomes from consumption. Although many studies have assessed the effect of HWLs on alcohol containers, no research has focused on the perceived risk of consumption as the main outcome variable, despite this being a potential indicator of how effective HWLs may be in reducing harmful alcohol use. The cultural role of alcoholic beverages in (European) societies and the associations that consumers may have with these drinks, particularly wine, may pose a considerable challenge to the effectiveness of such labels. An intervention by public authorities has to be effective in addressing the targeted behavior while being accepted by the public. A low-intrusiveness intervention, like a label, may be more acceptable than increasing taxes but may not effectively alter drinking behavior (Hagmann, Siegrist, & Hartmann, 2018). The historic importance of the alcohol industry as well as the cultural acceptance of alcohol and the drinking culture in Europe may prevent restrictive alcohol labeling and favor lax legislation (Rehm et al., 2014). To investigate this issue, my colleagues and I conducted two studies concerning HWLs on alcohol containers and measured the perceived risk. Moreover, we analyzed how beliefs in wine's health benefits affect perceived risk and the acceptance of HWLs. The studies are described in Chapters 4 and 5.

1.5. A way out: consumption of non-alcoholic beer and social influence

A way of reducing the harmful use of alcohol is to motivate consumers to drink beverages that have a lower alcohol content or are alcohol-free (Bucher, Deroover, & Stockley, 2018). Lowering the alcohol content of a beverage like wine or beer means that consumers do not have to compromise on their lifestyle and can benefit from the non-alcoholic compounds these beverages contain, which are beneficial to health (Bucher, Deroover, & Stockley, 2019; Mellor, Hanna-Khalil, & Carson, 2020). While alcohol-free wine has become available on the market only in recent years, NAB was first launched in the late 1980s and by now accounts for up to 9% of the beer consumed in some European countries (Brewers of Europe, 2020a; Glover, 2000). The perceived target consumers of wine and beer with lower alcohol levels are pregnant women, sportspeople, dieters, drivers, and underage consumers (Vasiljevic, Couturier, & Marteau, 2019). Furthermore, it was found that health consciousness and weight management positively influence the choice of beer with a reduced alcohol content (Chrysochou, 2014). At

the same time, consumers' conceptualizations of NAB compared to beer with alcohol were found to be neutral to negative (Silva, Jager, van Bommel et al., 2016). It was suggested that the main benefit consumers see in NAB is that it can be consumed when driving as well as on other occasions when drinking an alcoholic beverage would be inappropriate (Vasiljevic et al., 2019). However, selling NAB as a replacement for beer with alcohol may not reach target groups, since NAB may be seen more as an alternative to sugary soft drinks than a substitute for alcoholic beer. This raises the question of whether NAB is consumed instead of or in addition to beer containing alcohol.

1.5.1. Social influence

What we eat and drink is influenced by our social environment. Information about what someone consumes is used to form stereotypes about different types of food and is reflected in the saying "You are what you eat" (Vartanian, Herman, & Polivy, 2007). For example, people who follow a vegetarian diet are perceived to be more virtuous and less masculine than meat eaters (Ruby & Heine, 2011). Furthermore, hosts that serve guests a vegetarian menu, rather than one with meat, are perceived to be more trend conscious, alternative, and health-conscious (Funk, Sütterlin, & Siegrist, 2020). Such consumption stereotypes may be used for impression management by consumers—that is, to convey a particular self-image (Vartanian et al., 2007). For beer, there is no literature so far on how consumers are perceived by others depending on what type of beer they drink. Hence, if the image of NAB is negative or represents values or characteristics one would not like to convey, this may lower the probability of a consumer favoring NAB over beer with alcohol.

1.5.2. Consumption norms

Drinking alcohol during social gatherings, such as having a glass of wine with a meal, as is common in Mediterranean countries, is part of social norms in many societies (Vecchio et al., 2017). The minor share of NAB consumed in comparison to the total amount of beer consumed in European countries suggests that consumption of alcoholic beer can still be regarded as the norm (Brewers of Europe, 2020a). Social norms include subjective norms—namely, what a person thinks peers perceive as appropriate behavior (Fang, Ng, Wang et al., 2017). For example, if someone thinks they will be perceived as boring or rational when drinking NAB at a party, then they may adopt the norm of drinking beer with alcohol when attending parties. Personal norms may differ from subjective norms and are based on prior experience (Herman & Polivy, 2005). For example, a person might perceive no pressure to

drink alcoholic beer because drinking NAB on an earlier occasion yielded no negative reaction or attention.

Consuming NAB would be a way to enjoy beer while reducing one's alcohol intake. Nonetheless, there may be factors, such as consumption norms of drinking beer with alcohol or stereotypes of people who drink NAB, preventing consumers from replacing alcoholic beer with a healthier NAB. A study was conducted for this dissertation to investigate how consumers of alcoholic beer and NAB are perceived and to what degree norms and other factors inhibit people from switching to consuming NAB. The study is presented in Chapter 6.

1.6. Overview of the dissertation

This section summarizes the chapters and online studies that were conducted for this dissertation. The remainder of the dissertation consists of five chapters and a general discussion. In Chapter 2, consumers' perceived naturalness of wine is assessed. In Chapter 3, two studies conducted to investigate wine choice in a particular situation—namely, in a restaurant—are presented. Chapters 4 and 5 investigate how consumers' perceived risk of drinking alcohol is affected by the presence of HWLs on alcohol containers. Finally, Chapter 6 assesses the social influence on alcohol consumption—that is, stereotypes associated with consumers of alcoholic and non-alcoholic beer. The findings of the studies are reflected in the general discussion in Chapter 7.

Chapter 2: *How do you perceive this wine? Comparing naturalness perceptions of Swiss and Australian consumers*

The first study assessed how different attributes of a wine affect its perceived naturalness. More specifically, participants from Switzerland and Australia evaluated how natural they perceived wines from different origins or produced in different manners to be. Comparisons of the perceived naturalness of wine with different attributes were made between the two countries as well as between consumers with low and high involvement with wine. Wine from an Old-World producing country, aged in an oak barrel, or bottled with a cork was perceived as being the most natural. Naturalness was more important to Swiss than to Australian consumers and to wine drinkers with high involvement. Winemaking practices, such as the use of sugar for fermentation, the addition of sulfites, or the use of gelatin for clarification of the wine, were perceived as being the most unnatural.

Chapter 3: *Rethinking the wine list: Restaurant customers' preference for listing wines according to wine style*

This chapter presents two studies that investigated consumers' wine choices in restaurants. In the first study, participants in an online study were presented with one of two different wine lists. One was organized according to the wines' origin and the other according to wine style categories. The decision time and perceived difficulty of the choice were assessed. In the second study, participants were presented both wine lists and were asked to state which list they would prefer to choose a wine from in a restaurant. The first study showed that although the style-grouped wine list offered additional information about wine style, there was no reduction in consumers' perceived difficulty in choosing a wine as well as in the time required to choose a wine. The second study revealed that a large group of consumers would nevertheless prefer a style-grouped wine list over the typical origin-grouped wine list.

Chapter 4: *Risk perception and acceptance of health warning labels on wine*

An online study was conducted to assess the influence of HWLs on consumers' perceived risk of wine consumption. Two types of labels were used: one text-only warning with a cancer warning statement and an image-and-text warning additionally depicting a diseased liver. The perceived risk of drinking wine was only affected by the HWL if the consumption quantity was not specified. The effect of the image-and-text HWL, despite its deterring picture, was smaller than the effect of the text-only HWL. The acceptance of HWLs was low and the strongest predictors were cultural worldviews, beliefs in beneficial health effects of wine, and frequency of alcohol consumption.

Chapter 5: *How health warning labels on wine and vodka bottles influence perceived risk, rejection, and acceptance*

Beliefs about beneficial health effects are unique to wine. Therefore, an HWL may have a different effect if depicted on a beverage that has no health-promoting reputation, such as vodka. The study presented in this chapter assessed the effect of HWLs on wine and vodka on perceived risk of consumption. The HWL had no effect on risk perception, but the type of beverage did. The risk of vodka consumption was perceived to be higher than that of wine. Health beliefs were the major determinant of perceived risk. The rejection of an HWL on wine was higher than for vodka and was mainly determined by the perceived effectiveness of such labels, perceived health effects of the beverage, social norms, and individualistic values.

Chapter 6: *You are what you drink: Stereotypes about consumers of alcoholic and non-alcoholic beer*

What we consume is influenced by our social environment. The study in Chapter 6 assessed consumers' prejudices about consumers of beer with and without alcohol. Participants in the study rated a fictitious person described as drinking alcoholic or non-alcoholic beer by using several bipolar attribute pairs. The type of beverage had a significant effect on the assessment of the person's character. NAB consumption was mainly determined by consumers' negative impression of the taste of NAB and personal norms.

Chapter 7: *General discussion*

In this last chapter, the main findings of the dissertation are summarized and put into the context of the existing research. The strengths and limitations of each study are mentioned, and the implications for practitioners in the alcohol business and for policymakers are provided. Finally, directions for future research in the realm of alcohol and its consumption are presented.

Chapter 2

HOW DO YOU PERCEIVE THIS WINE? COMPARING NATURALNESS PERCEPTIONS OF SWISS AND AUSTRALIAN CONSUMERS

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Abstract

Consumers around the globe are showing an increasing demand for food products that are perceived as being natural. The present study aimed to assess what properties of wine have an influence on the perceived naturalness of wine, with a focus on winemaking techniques. An online survey was conducted in the German-speaking part of Switzerland (n = 252) and in Australia (n = 234). Wine naturalness was significantly more important to Swiss respondents compared to Australian respondents as well as to respondents with a high level of involvement with wine compared to respondents with a low level of involvement. Wine from an "Old World" wine-producing country, wine that was aged in barriques, or wine sealed with an oak cork were perceived as the most natural. The addition of sugar, sulfites, or the use of gelatin were regarded as the most unnatural properties of wine. In terms of production, additives were perceived as significantly less natural than processing aids and technologies that are used in winemaking. Significant differences in the naturalness perception of different wine attributes were found between the two countries, Switzerland and Australia, as well as between respondents with a high level of involvement with wine and those with a low level. The findings of this study add to the research on naturalness perception and may help winemakers and marketers to optimize communication with their consumers.

2.1. Introduction

For food manufacturers around the globe, the term “natural” has become key for promoting their products because consumers are showing an increasing demand for natural food (Petty, 2015; Román et al., 2017). When food products are perceived as natural, they are perceived as tasting better and being more nutritious, safer, fresher, healthier, and less harmful to the environment (Amos et al., 2014; Berry et al., 2017). Furthermore, natural products are perceived to be more authentic and transparent and provide a sense of trust and control (Moscato & Machin, 2018; Rozin et al., 2012). As Li and Chapman (2012) put it, individuals use a “natural-is-better” heuristic to simplify their decision about what food to buy. Despite the frequent use of the term natural in food marketing, there is no clear definition of naturalness. Consumers across countries define natural as the absence of human intervention or artificial substances as well as the absence of additives (Rozin et al., 2012). Knowing about consumers’ naturalness perception has become essential for creating and promoting a new product as consumers might refuse a product due to a perceived lack of naturalness, which would lead to reduced product turn-over for firms (Román et al., 2017).

The trend toward more natural products was long neglected by the wine sector. For several reasons, wine is classified as a special food category. Whereas most other food categories have a manageable number of brands, the variety of wines in stores often consists of several hundred brands (Lockshin & Hall, 2003). When purchasing a wine, consumers face the challenge of choosing a bottle from a very wide variety of products within a large price range. In most cases, consumers do not have the possibility to taste a wine prior to purchasing it, especially in retail stores. Hence, consumers are forced to rely on cues other than taste to choose a wine (Schäufele & Hamm, 2018; Speed, 1998). Price, brand, country/region of origin, grape variety, awards, sustainability aspects, packaging, and label design are among the most important factors that influence wine choice (Barber et al., 2006; Drennan, Bianchi, Cacho-Elizondo et al., 2015; Gustafson, Lybbert, & Sumner, 2016; Lockshin et al., 2006; Schäufele & Hamm, 2018; Thomas & Pickering, 2003; Yang & Paladino, 2015). The degree to which these factors influence consumers varies depending on different factors, such as gender, age, country, and level of interest in or involvement with wine (Barber et al., 2006; Drennan et al., 2015; Robertson, Ferreira, & Botha, 2018; Sáenz-Navajas, Ballester, Peyron et al., 2014). The latter is of special interest for wine marketers and wine producers because people with a high level of involvement with wine were found to consume more wine, spend more for a bottle of

wine, and have greater knowledge of wine (Park & Moon, 2003; Rahman & Reynolds, 2015). Furthermore, involvement level has an influence on how important a wine's appearance, such as color and clarity, are to consumers (Rahman & Reynolds, 2015).

Today, the naturalness trend is no longer being ignored by the wine sector. One reason for this is the rising demand for so-called "natural wines." There is no official definition of natural wines. However, the widely adopted term natural wine refers to a wine produced by organic or biodynamic vineyard standards with minimal chemical and technological interventions during winemaking (Howard, 2013). Although the natural wine movement is still young and accounts for a negligible share of wines sold on the international market, the movement underscores the increasing importance of naturalness in wine. While winemakers and marketers are debating about the definition of natural wine, we aimed to find out when a wine is perceived as being natural from a consumer perspective.

The goal of the present study was twofold. First, we were interested in how important wine naturalness is in comparison to various factors such as price or country of origin when choosing a bottle of wine. Second, we examined how different attributes influence a wine's perceived naturalness. In particular, different winemaking techniques that may or may not be found in a wine's description, were assessed in regard to how natural they are perceived. As stated earlier, the consumers' characteristics, such as the country of residence or level of involvement with wine can have an influence on how consumers evaluate and choose a wine. Therefore, a cross-country survey was conducted in Switzerland and Australia and the answers were analyzed based on 1) the country of residence and 2) the involvement level with wine of the respondent.

To find out how different attributes affect a wine's perceived naturalness, a variety of attributes were chosen based on an approach published in a review about the importance of naturalness in food by Román et al. (2017). Reviewing 72 studies in 32 countries, they found that naturalness in food is crucial to consumers over time and across countries. The authors showed that attributes determining consumers' perceived naturalness can be separated into three categories. The first category contains attributes about how the food was grown, namely organic and local production. The second category contains attributes about the way the food is produced and processed, with attributes such as artificial ingredients or the processing methods. The third category contains properties attributed to the final product, such as healthiness, eco-friendliness, taste, and freshness. The approach by Román et al. (2017) was adapted for the present survey about perceptions of the naturalness of wine. For the category about how the food was grown, four attributes concerning the origin of the grapes and the

production system were selected. Referring to the second category, 14 attributes about additives, processing aids, and technologies used in winemaking were selected. Packaging is missing in the framework of Román et al. (2017) but was perceived to be important for the present study. Therefore, we included questions related to the type of cork used. We did not include questions related to perceived properties of natural wine, such as expected healthiness or taste, as this has been done previously for food naturalness (Berry et al., 2017; Li & Chapman, 2012). The findings may help winemakers to better address consumers' needs and expectations related to wine purchase and consumption.

2.2. Material and methods

2.2.1. Data collection and sample characteristics

An online survey was conducted in the German-speaking part of Switzerland (n = 252) and in Australia (n = 234). The idea behind choosing these two countries was to have one country from the Old World wine-producing countries—namely most European countries, including Switzerland—and one country from the New World with a comparably young history in winemaking, such as the U.S., Argentina, Australia, and New Zealand. The survey was conducted by a market research company (respondi AG, Cologne, Germany). The questionnaire was created in German using the software Qualtrics® and was translated into English for the Australian respondents.

Invitations to fill out the online questionnaire were sent via e-mail to the Swiss and Australian panels of the market research company with the only prerequisites for participation being age and consumption frequency.

Respondents had to be legally admitted to drink wine, hence at least 18 years old. An upper age limit of 69 years was set. Only people with a regular wine consumption of at least several times a month were allowed to participate in the survey because the potential findings are particularly relevant for regular wine drinkers. The representativeness of the survey was assessed by comparing the share of participants in the different age groups to the share of regular wine consumers from studies about wine consumption in both Switzerland and Australia. It was found that the Swiss sample was representative of regular wine drinkers in Switzerland in terms of age distribution (Swiss Wine Promotion, 2017), whereas in the Australian sample regular wine drinkers in Australia aged 55 years and older were overrepresented and regular wine drinkers aged 30 to 44 were underrepresented (Australian Institute of Health and Welfare, 2016). This might have an impact on the interpretation of the

results and the comparison of the Swiss and Australian sample. The Australian participants have a higher average consumption per week than the Swiss participants and drink wine more often but spend on average the same amount of money for a bottle of wine. In the two involvement groups, participants with a high level of involvement with wine drink on average more wine, with a higher frequency, than the low-involvement respondents. The latter spend between CHF/$AUD 8 and CHF/$AUD 15, while high-involvement respondents spend on average between CHF/$AUD 15 and CHF/$AUD 25 for a bottle of wine. This could be observed in both countries. A gender quota was set at 50%. No prior knowledge about wine was required to complete the survey. The survey was run in January 2018 until the desired number of responses was attained.

2.2.2. Survey structure

Respondents were led through the survey without the possibility to go back to previous questions. Every question had to be answered before proceeding to the next page. Once respondents passed the filter question "*On average, how often do you drink wine?*" their level of involvement with wine was assessed. After respondents rated how important various factors are when buying a wine, they were asked to rate how natural or unnatural they perceive a wine with a certain attribute to be. Each attribute was followed by a short description. At the end, respondents were asked to indicate their frequency and amount of consumption as well as their expenditure on wine.

2.2.3. Involvement

An involvement measurement was used to assess the level of interest in and enthusiasm and excitement over wine following the approach of Lockshin, Spawton and Macintosh (1997). To assess the level of involvement with wine—namely product and brand decision involvement—respondents were asked to indicate how strongly they agree or disagree with a range of statements about their interest in wine, such as "*I have a strong interest in wine*" or "*Which wine I buy matters a lot.*" Answers could be given using a five-point Likert-type scale, ranging from *I agree* (= 1), *I rather agree* (= 2), *neither/nor* (= 3), *I rather disagree* (= 4), to *I disagree* (= 5). To test whether the 10 items from the questions about the product and the brand decision involvement can be used as one involvement construct, a principal component analysis was run. The first component accounted for 50.5% of the variance, and the visual inspection of the scree plot indicated a one factor solution. Hence, all 10 involvement items were included in the involvement construct. Cronbach's α of the construct of 0.88 showed high

internal reliability of the scale. To assign participants to low- and high-involvement groups, for each participant, the sum of the given answers of the involvement questions was calculated. The median was calculated separately for Switzerland (*Mdn* = 19) and Australia (*Mdn* = 21). Participants with a sum of higher than the median of their country were assigned to the low-involvement group (*n* = 229), resulting in 115 Swiss and 114 Australian participants with a low level of involvement with wine. Participants with a sum equal to or lower than the median of their country were assigned to the high-involvement group (*n* = 257), meaning that their responses showed that they were highly interested in wine (Table 1), resulting in 137 Swiss and 120 Australian participants with a high level of involvement in wine. In the low-involvement group, there were more females (58%) compared to the group of respondents with a high level of involvement (44%).

Table 1. *Overview of the Swiss and Australian sample.*

	Switzerland		Australia	
	n	%	*n*	%
Gender				
Male	127	49	118	49
Female	125	51	116	51
Age Groups				
≤ 24	15	6	2	1
25–34	38	15	13	6
35–44	42	17	18	8
45–54	68	27	39	17
55–64	54	21	79	34
≥ 65	35	14	83	35
Average consumption frequency	Once a week		More than once a week	
Average consumption per week	300–400 ml		400–500 ml	
Average expenditure for a bottle of wine	CHF/$AUD 8.00-15.00		CHF/$AUD 8.00-15.00	
Involvement				
Low involvement	115	46	114	49
High involvement	137	54	120	51

2.2.4. Relative importance of naturalness

There are several factors that have a major influence on wine choice described in the literature, such as price, brand, country of origin, grape variety, and others (Lockshin et al., 2006; Schäufele & Hamm, 2018). To gain an idea of how important a wine's perceived naturalness is compared to some of the factors that were found most decisive for wine choice, respondents were asked to indicate how important the following factors are when choosing a wine: price, taste, organic labeling, evaluation by a wine critic, naturalness, country of origin, and grape variety. Answers were given using a five-point Likert scale, ranging from *unimportant* (= 1), *rather unimportant* (= 2), *neither/nor* (= 3), *rather important* (= 4), to *important* (= 5). The list of factors to consider for wine choice is not definite but was limited to factors that are well established, such as price or grape variety, and factors that might be related to the naturalness perception, such as organic labeling.

2.2.5. Perceived naturalness of wine

The core part of the survey was the assessment of the perceived naturalness of wines with different attributes. Twenty-one attributes were selected, following the framework of Román et al. (2017) described in the introduction, and were structured into three categories (Fig. 1). To gain a better idea about which wine attributes might be relevant for naturalness perception to regular wine consumers, five informal interviews were conducted with people working in the field, namely in wine production and wine trading. However, to our knowledge, there is no statistical data on how frequently these wine attributes—namely the additives, processing aids, and technologies—are used in winemaking. The attribute *vanilla aroma*, which is forbidden in both countries (Eidgenössisches Departement des Innern [EDI], 2016; Australian Government, 2019), was integrated for comparison with established winemaking techniques.

The 21 wine attributes were grouped into three categories, each containing subcategories. The first category, "How the grapes are grown," contained two attributes in the subcategory of origin (Old World wines vs. New World wines) as well as two attributes in the subcategory for the production system of the grapes (organic vs. nonorganic). The second category, "How the wine is produced," contained 14 attributes in the three subcategories of additives, processing aids, and production techniques frequently used in winemaking, according to the (OIV, 2017). The third category, "Packaging," contained only the subcategory of "closure," with three attributes about the type of closure of a wine bottle.

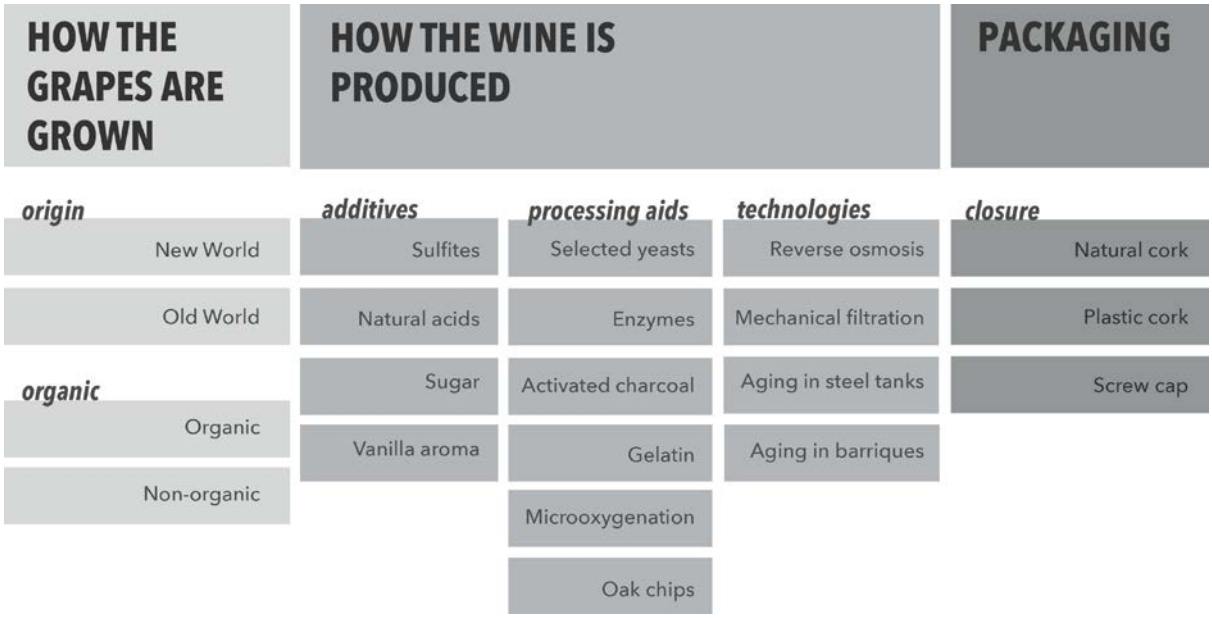

Figure 1. *The framework by Román, Sánchez-Siles and Siegrist (2017) was adapted for the present study to assess how important different wine attributes are for a wine's perceived naturalness.*

Respondents were presented with 21 specific wine attributes that were explained and followed by the question "*How do you perceive this wine?*" (Table 2). Questions were asked using a continuous rating scale ranging from *unnatural* to *natural*. The answer was given by moving a slider, which had no indication in regard to value or grid lines. The answers were then converted to values from 0 to 100, with 100 being the maximum of naturalness.

2.2.6. Data analysis

To ensure that the participants read the possible answers and followed the instructions, respondents whose duration of completing the survey was less than half of the median (*Mdn* = 426 s) were excluded from the survey (n = 36), following the approach of Hartmann, Keller and Siegrist (2016).

Table 2. *Wine attribute description.*

	Attribute	Explanation
How the grapes are grown	Old World	Countries from the "Old World" are considered countries with a long tradition in winemaking, mainly European countries, such as France, Italy, Spain, Germany, and Switzerland.
	New World	Countries from the "New World" are considered countries where wine production did not exist before colonization by the Europeans, such as the U.S., Argentina, South Africa, Chile, and Australia.
	Organic production*	
	Non-organic production*	
How the wine is produced	Added sulfites	The addition of sulfites is used for expanding the expiration of the wine as well as a preventative measure against undesired microbiological processes.
	Clarified with gelatin	The gelatin bonds to undesired particles and is deposited on the ground without remaining in the wine and is separated when draining or filtering.
	Clarified with activated charcoal	Pulverized charcoal is mixed with wine and absorbs undesired particles in the wine. When the charcoal is deposited on the ground, the wine is drained or filtered.
	Mechanical filtration	The clarification of the wine is carried out with a particle filter to get rid of solids.
	Micro-oxygenation	The continuous addition of small amounts of oxygen to the wine to improve the aroma, structure, and texture.
	Added vanilla aroma	The synthetic vanilla flavoring gives the wine a scent of vanilla that usually gets into the wine through maturation in oak barrels.
	Aging in barriques	The aging of the wine takes place in wooden barrels, mainly French oak. The wine absorbs the flavor from the wood, while minimal doses of air and alcohol diffuse through the wood, which has a positive impact on the texture of the wine.
	Aging in steel tanks	Aging in steel tanks instead of wooden casks.
	Aging with oak chips	Oak chips can be added to the wine that is being aged in steel tanks to add barrel-like aromas to the wine and stabilize its color.
	Reverse osmosis [1]	According to the principle of osmosis, water is removed from the wine through high pressure, which makes the wine more concentrated, richer in flavor, and increases the level of alcohol.
	Added sugar	Caster sugar can be added to make up for a lack of sugar in the grapes to improve fermentation as well as to obtain a desired level of alcohol or residual sugar in the wine.
	Added natural acids	Adding natural acids, such as tartaric acid, malic acid, or lactic acid, to compensate for a lack of acid from the grapes.
	Added enzymes	Enzymes are added to improve or speed up processes during winemaking, such as the fermentation.
	Fermented with selected yeasts	By selecting a certain type of cultivated yeast from a laboratory, the yeasts that are present on the grapes by nature (called "wild yeast") are dominated, and the fermentation is then carried out by the selected variety of yeast.
Packaging	Oak cork*	
	Plastic cork*	
	Screw cap*	

* Attributes for which no description was provided.

[1] Reverse osmosis can also be used for reducing the alcohol level of a wine. However, we wanted to focus on one specific effect of reverse osmosis since the description might have been difficult for respondents to understand the principle.

2.3.Results

The results section follows the course of the questionnaire. First, the ratings of the importance of factors for wine choice, including naturalness, are presented, followed by a detailed analysis of the perceived naturalness ratings of wine attributes from the three different categories, including the subcategories in Fig. 1.

2.3.1. Relative importance of the naturalness of wine

In the first part of the questionnaire, participants were asked to indicate how important a number of factors are when they choose a wine. For the analysis of variance, a MANOVA was conducted, including the seven variables of taste, grape variety, country of origin, price, naturalness, organic label, and the evaluation of a wine critic as within-subject factors—named "items" in Table 3—as well as the two variables of country and involvement. Table 3 shows that the main effect "items" and "involvement" were significant. Furthermore, the two-way interactions "items" × "country" and "items" × "involvement" as well as the three-way-interaction "items" × "country" × "involvement" were all significant.

Table 3. *MANOVA for the importance of different factors ("items") rated by respondents (N = 486).*

	F	*df*	*p*	η_p^2
Items	274.87	5, 2341	0.000	0.360
Country	2.81	1, 482	0.094	0.006
Involvement	83.21	1, 482	0.000	0.147
Country × Involvement	0.001	1, 482	0.980	0.000
Items × Country	12.41	5, 2341	0.000	0.030
Items × Involvement	17.47	5, 2341	0.000	0.040
Items × Country × Involvement	2.48	5, 2341	0.031	0.010

Note. Due to the significance of the Mauchly's test of sphericity, the values are reported with the Huynh-Feldt correction.

Comparing how important the different factors are to the respondents, the results shown in Fig. 2 indicate that taste was the most important factor (M = 4.62, SD = 0.68). An evaluation by a wine critic and an organic label were among the least important factors. The importance of the remaining factors for wine choice—grape variety, country of origin, naturalness, and price—differed depending on the country and the involvement level of the respondent.

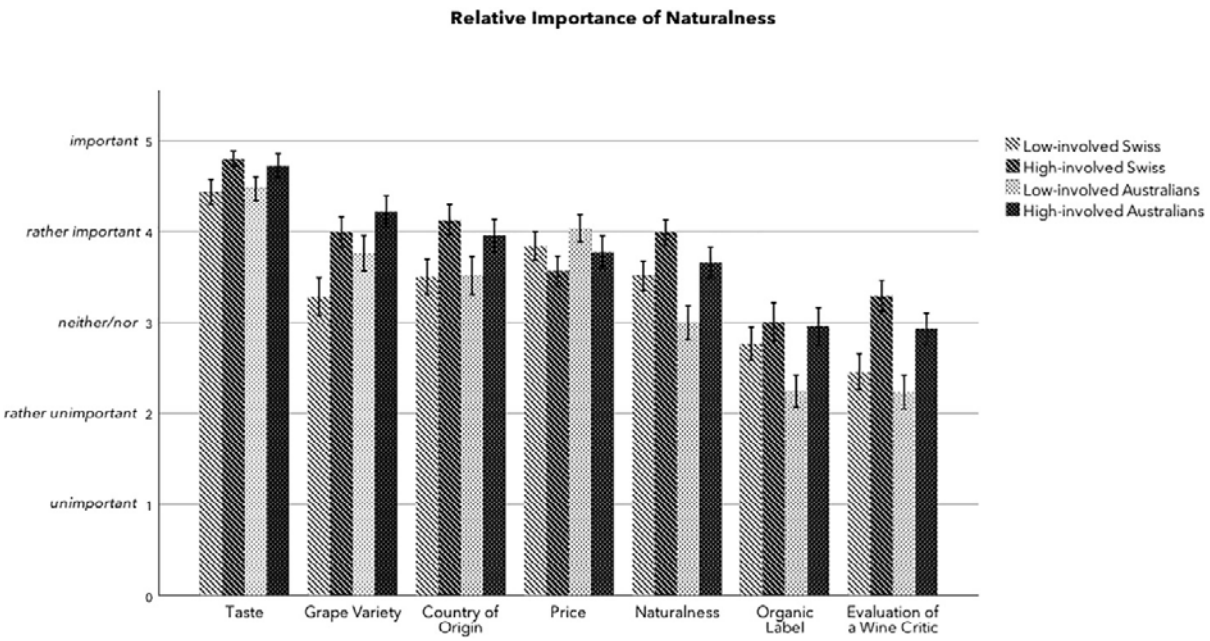

Figure 2. *Importance of different factors for wine choice. Bars represent mean values of perceived importance. Wine naturalness was most important to high-involved Swiss respondents. Error bars represent 95% confidence intervals.*

The factor naturalness showed to be of high importance for wine choice in comparison to other factors. Naturalness was significantly more important, $F(1,482) = 26.36$, $p < 0.001$, for Swiss ($M = 3.77$, $SD = 0.88$) than for Australian respondents ($M = 3.34$, $SD = 1.09$). Also, it was significantly more important, $F(1,482) = 47.54$, $p < 0.001$, for the high-involvement respondents ($M = 3.84$, $SD = 0.89$) than for low-involvement ($M = 3.26$, $SD = 0.98$) respondents. There was no significant interaction of involvement and country for the factor naturalness.

2.3.2. Perceived naturalness of wine attributes

The following section discusses the results of the second part of the questionnaire, entailing how natural participants perceived the wine attributes of the three categories "how the grapes are grown," "how the wine is produced," and "packaging." For the analysis of variance, a MANOVA was conducted, including the 21 wine attributes as dependent variables—named "wine attributes" in Table 4—as well as the two independent variables of involvement and country.

Table 4. *MANOVA for the perceived naturalness of wine attributes rated by respondents (N = 486).*

	F	*df*	*p*	η_p^2
Wine attributes	146.1	14, 6696	0.000	0.254
Country	10.1	1, 482	0.002	0.021
Involvement	18.8	1, 482	0.000	0.037
Country × Involvement	0.2	1, 482	0.654	0.000
Wine attributes × Country	9.1	14, 6696	0.000	0.019
Wine attributes × Involvement	2.5	14, 6696	0.001	0.005
Wine attributes × Country × Involvement	1.0	14, 6696	0.479	0.002

Note. Due to the significance of the Mauchly's test of sphericity, the values are reported with the Huynh-Feldt correction.

Both, "country" and "involvement" were significant main effects, but there was no significant interaction of "country" × "involvement" nor was the three-way interaction "wine attributes" × "country" × "involvement" statistically significant. Therefore, the impact of country and involvement on perceived naturalness were independently evaluated.

To assess the effect of country and involvement on the naturalness perception of the wine attributes separate t-tests were run. First, the general results about the rating of perceived naturalness of the different wine attributes are mentioned, followed by the effects of country and involvement on participants' perceived naturalness of the wine attributes.

The attributes that were on average, for both samples, perceived as the most natural were *aging in barriques*, closure with an *oak cork*, wine originating from the *Old World*, and wine from *organic* production (see Table 5). The most unnatural, with a mean below 50, were the addition of *vanilla aroma*, followed by the widely adopted techniques of adding *sugar* to the wine, the use of *sulfites* for preservation, and the use of *gelatin* for clearing the wine.

From the first section of attributes (Table 5, "How the grapes are grown"), *Old World* origin was perceived as more natural than *New World* origin. Although wine having an origin from the *Old World* was perceived as more natural by respondents from both countries, Swiss respondents perceived it to be significantly more natural than the Australian respondents. In contrast, wine from the *New World* was perceived to be significantly more natural by Australians than the Swiss. In terms of vineyard cultivation, wine from *organic* production was perceived as more natural than wine from *non-organic* production, with the Swiss respondents rating *organic* as more natural than respondents in the Australian sample. Respondents with a

high level of involvement with wine rated all attributes in the first section as more natural than low-involvement respondents, confirming the result of *Old World* wines being perceived as more natural than *New World* wines and *organic* being perceived more natural than *non-organic*.

Table 5. *Perceived naturalness of wine attributes by Swiss and Australian respondents.*

		Switzerland		Australia		
		Mean [a] (SD)	95% CI	Mean [a] (SD)	95% CI	*t*-value [b] (*df* = 484)
How the grapes are grown	Old World	79 (14)	[78, 81]	74 (17)	[72, 76]	3.90**
	Organic	77 (22)	[75, 80]	73 (21)	[70, 76]	2.81*
	New World	58 (22)	[55, 60]	69 (18)	[66, 71]	–6.10**
	Non-organic	56 (23)	[53, 58]	57 (21)	[54, 59]	–0.05
How the wine is produced	Aging in barriques	81 (18)	[79, 83]	79 (16)	[77, 81]	1.39
	Mechanical filtration	64 (21)	[62, 67]	63 (21)	[60, 65]	0.92
	Micro-oxygenation	60 (20)	[57, 62]	60 (21)	[57, 62]	–0.06
	Aging in steel tanks	59 (25)	[56, 62]	58 (22)	[55, 60]	0.65
	Aging with oak chips	59 (24)	[56, 62]	64 (20)	[61, 66]	–2.54*
	Reverse osmosis	51 (23)	[48, 54]	58 (21)	[56, 61]	–3.78**
	Natural acids	50 (22)	[48, 53]	51 (21)	[48, 54]	–0.20
	Addition of enzymes	49 (23)	[47, 52]	55 (22)	[52, 58]	–2.59*
	Selected yeasts	49 (22)	[46, 52]	57 (21)	[55, 60]	–4.45**
	Activated charcoal	48 (24)	[45, 51]	59 (22)	[57, 62]	–5.49**
	Gelatin	46 (24)	[43, 49]	50 (23)	[47, 53]	–1.61
	Sulfites	46 (21)	[43, 48]	47 (23)	[44, 50]	–0.77
	Addition of sugar	43 (23)	[40, 46]	47 (24)	[44, 50]	–2.11*
	Vanilla aroma	32 (23)	[29, 35]	42 (23)	[39, 45]	–4.76**
Packaging	Oak cork	80 (17)	[78, 82]	75 (19)	[73, 78]	2.76**
	Plastic cork	52 (25)	[49, 55]	53 (25)	[49, 56]	–0.22
	Screw cap	52 (24)	[49, 55]	62 (24)	[59, 65]	–4.26**

[a] Values range from 0 (unnatural) to 100 (natural).

[b] * $p < 0.05$, ** $p < 0.01$.

From the second section of attributes (Table 5, "How the wine is produced"), significant differences in the perceived naturalness of wine were found between the Swiss and Australian respondents for the following attributes: *activated charcoal*, *vanilla aroma*, *the use of selected yeasts*, *reverse osmosis*, *the addition of enzymes*, *aging with oak chips*, and *the addition of sugar*. Except for the traditional technique of wine *aging in barriques*, all other attributes

mentioned were perceived as significantly more natural by Australian respondents than by Swiss respondents. Among low- and high-involvement respondents, significant differences in perceived naturalness were found for the following attributes from the second section of wine attributes: *aging in barriques*, $t(484) = -3.75$, $p < 0.001$, the use of *sulfites*, $t(484) = -3.11$, $p = 0.002$, the use of *enzymes*, $t(484) = -2.91$, $p = 0.004$, *micro-oxygenation*, $t(484) = -2.70$, $p = 0.007$, and the use of *gelatin* for clearing the wine, $t(484) = -1.99$, $p = 0.045$. All of the five attributes were perceived as more natural by respondents with a high level of involvement compared to people with a low level of involvement with wine.

The attributes in the second section of wine attributes were classified as additives, processing aids, and technologies (see Fig. 1). Paired sample *t*-tests revealed that additives ($M = 45$, $SD = 16$) are perceived as significantly less natural, $t(485) = -16.52$, $p < 0.001$, than processing aids ($M = 54$, $SD = 15$). The latter was also viewed as significantly less natural, $t(485) = -16.07$, $p < 0.001$, than technologies ($M = 64$, $SD = 14$).

From the third section of attributes (Table 5, "Packaging"), *oak corks* were perceived as the most natural closure. Oak corks were perceived as significantly more natural by the Swiss than by the Australian respondents. In contrast, Australians perceived *screw caps* as significantly more natural than the Swiss respondents. In terms of respondents' involvement level, the attribute *oak cork* was perceived significantly more natural by people with a high level of involvement with wine, $t(484) = -3.91$, $p < 0.001$.

2.4. Discussion

2.4.1. The importance of wine naturalness

The findings of the present study show that importance of naturalness and the perception of what makes a wine natural differ depending on a respondent's country of residence and the level of involvement with wine. For Swiss respondents, naturalness was the second most important factor for wine choice, together with country of origin, and was even more important than price and grape variety, whereas participants from the Australian sample rated the factor naturalness on average as being less important than price and grape variety when they choose a wine. The findings add to the literature stating that the importance of food naturalness varies across countries and cultures (Rozin et al., 2004). Participants with a high level of involvement with wine found naturalness significantly more important than people with a low level of involvement. Similarly for food, it was found that people with a higher level of involvement are more concerned about the naturalness of food (de Boer, Hoogland, &

Boersema, 2007). Comparing two countries in terms of a construct such as involvement can be problematic since the assessment method with Likert-type scales might be perceived differently across countries (Steenkamp & Baumgartner, 1998). The issue was addressed by taking into account the involvement medians of each country separately to assign participants to either higher low-involvement groups. Furthermore, if the participants from the two countries interpreted the scale differently, differences would be expected for all assessed ratings. However, this was not the case, thus we assume that the participants from the two countries can be compared to each other.

2.4.2. Different perception of wine attributes

The present study further suggests that the naturalness perception of different wine attributes varies among the regular wine consumers of the two countries and levels of involvement, not only in terms of a wine's origin but also in the way it was produced and how it is sealed. The origin of a wine has a strong connectivity to its perceived naturalness. Respondents from both countries and from both low- and high involvement groups considered wine from the Old World, which is known for a long tradition in winemaking, as more natural than wine from the New World. The results are in line with the literature finding that naturalness and tradition are strongly linked (Siegrist & Sütterlin, 2017). Hence, people may strongly associate wine with the Old World, even when living in the New World. Respondents from both countries perceived wine originating from their own region as being significantly more natural than how the respondents from the other countries perceived it, which may be an effect of ethnocentrism.[1] The association of wine and the traditional Old World seems to have a stronger effect on a wine's perceived naturalness than the fact that a wine is from someone's origin. Another hint as to the importance of tradition for perceived naturalness was the naturalness ratings of aging in barriques, which was perceived in both countries and both groups of involvement level to be by far the most natural winemaking technique. Similarly, traditional oak corks were perceived as significantly more natural than the more modern screw caps or plastic corks. However, the preference for natural corks compared to other types of closures is a well-known phenomenon (Reynolds, Rahman, Bernard et al., 2018).

[1] Ethnocentrism: The evaluation of other cultures according to preconceptions originating in the standards and customs of one's own culture. *English Oxford Living Dictionaries, retrieved from: https://en.oxforddictionaries.com/definition/ethnocentric.*

Naturalness was often found to be linked to people buying organic (Hasselbach & Roosen, 2015), which is more prevalent among young consumers. In this study, it was found that the Swiss perceived organic as more natural than the Australians and non-organic as less natural than the Australians. The reason for the significant differences in the naturalness perception of organic and non-organic wine may be explained by the fact that the Swiss sample comprised more young people, while in the Australian sample group, older people were overrepresented. A clear difference in perception was found between additives, processing aids, and technologies. Additives were by far the attributes that were perceived as being the least natural. Processing aids, inducing a chemical manipulation of the wine such as the use of enzymes, were perceived as less natural than technologies that affect the wine in a physical process, such as mechanical filtration. These results confirm the findings from other studies that the chemical manipulation of a food product reduces the perceived naturalness of a product more strongly than physical processes do (Evans, de Challemaison, & Cox, 2010; Rozin, 2005).

In terms of bottle closure, there was a clear preference for natural corks compared to screw caps or plastic corks. However, screw caps were perceived as significantly more natural by the Australians than by the Swiss. This may be explained by the fact that Australia was among the first countries to promote screw caps for closure, with the result that nowadays the large majority of Australian wines are sold with screw caps. Interestingly, even though most winemakers in Australia use screw caps, the respondents in the Australian sample still perceived oak corks to be more natural than screw caps.

2.4.3. Relevance for wine labeling

Due to a lack of knowledge on wine, the label becomes an essential source of information about the product itself and has a major influence on the purchasing decision (Charters, Lockshin, & Unwin, 1999; Elliot & Barth, 2012; Gluckman, 1990). From the additives, processing aids, and technologies that were rated in this study, only the addition of sulfites and the use of gelatin is part of the mandatory labeling in cases where the amount exceeds a certain level (EDI, 2016). However, the use of sulfites is more prevalent in winemaking, and, thus, consumers may be more familiar with the attribute sulfites from wine labels compared to other attributes about additives, processing aids, and technologies. Interestingly, it is perceived as being among the most unnatural attributes. D‘Amico, Di Vita and Monaco (2016) even found a higher willingness to pay for wines without added sulfites. The findings for the attribute of sulfites support a study by Evans et al. (2010) showing that

being more familiar with a product attribute does not necessarily result in perceiving the product as being more natural.

While Bastian, Saltman, Johnson et al. (2015) have found that consumers would like additives and preservatives that were used during winemaking to be mentioned on the wine label, Mueller et al. (2010) have found a negative effect of ingredient information on back labels. The results of the present study and the case of the wine attribute sulfites offer an indication that for wine, providing information about ingredients and winemaking processes might have a negative impact on the wine's perceived naturalness. As pointed out by Mueller et al. (2010) and supported by this study, the effect of information on back labels likely depends on the type of information.

2.5. Implications and directions for future research

Consumers have a strong feeling of insecurity or even fear of making a wrong wine choice (Drennan et al., 2015; Gmuer, Siegrist, & Dohle, 2015; Olsen et al., 2003). Thus, for wine marketers and producers, it is essential to know how consumers choose a wine. In this context, consumers' naturalness perception should be taken into consideration.

The implications of this study can be useful for winemakers and wine marketers in optimizing their communication strategy toward regular wine consumers. As was explained, there are different groups of consumers with varying levels regarding the perceived importance of wine naturalness as well as with different perceptions of what makes a wine natural. The widely used descriptions of wine that often contain information about the production process may be adapted to increase the perceived naturalness, namely by mentioning cases where a wine has been aged in barriques. Cork closure and indications of organic production systems are another way to increase perceived naturalness by consumers. Furthermore, the results of this study are relevant in terms of new regulations about wine labeling, such as requiring the labeling of certain winemaking techniques that may have a negative impact on the perceived naturalness of wine. For future research, there are several issues to consider. The present study separately assessed the importance of different factors that may affect wine choice, including a wine's naturalness as well as perceived naturalness of wine attributes separately. Hence, it is not known how consumers would prioritize a wine's perceived naturalness in a real-world setting, where different wine attributes are combined in one wine. Future studies should take into account that there are other cues of a bottle of wine, such as the label design, that might affect its perceived naturalness and a consumer's buying decision. Furthermore, to study the

differences between regular wine consumers from different countries, future research should compare countries from the New World and the Old World, respectively, to assess whether they are comparable with each other in terms of the perception and evaluation of wine. Meanwhile, research should not neglect the finding of this study that a consumer's level of involvement with wine might have an equally important impact on how the wine is evaluated.

2.6. Conclusion

This study investigates consumer perception of wine naturalness by distinguishing between, first, the Old World wine producing country of Switzerland and the New World country of Australia, and second, between people with a low level and people with a high level of involvement with wine. The results demonstrate certain wine attributes linked to tradition, such as aging in barriques or the use of an oak cork, being perceived as particularly natural. On the other hand, some widely used practices in winemaking, such as the use of sulfites or the addition of sugar, are perceived as the least natural. The findings of the present study are relevant for the research on naturalness perception and may have implications in wine labeling and communication towards wine consumers. More research is needed to determine how a wine's perceived naturalness affects consumers' behavior when choosing a bottle. Furthermore, it would be interesting to investigate how perceptions of wine naturalness and views on its importance differ between consumers and other actors in the wine sector, such as wine traders or producers.

Chapter 3

RETHINKING THE WINE LIST: RESTAURANT CUSTOMERS' PREFERENCE FOR LISTING WINES ACCORDING TO WINE STYLE

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Abstract

Purpose – The purpose of this research was to examine difficulties that consumers have when choosing wine in a restaurant and whether structuring a wine list according to wine style rather than origin facilitates decision-making.

Design / methodology – We conducted two online studies in Switzerland to assess whether a wine list organized according to wine style categories, such as *fresh and dry* or *bold and fruity*, reduces consumers' perceived difficulty of choice compared to a traditional origin-grouped wine list and which wine list consumers prefer. In the first study (N = 577), participants received either an origin-grouped or a style-grouped wine list. In the second study (N = 276), participants received and evaluated both wine lists.

Findings – In Study 1, participants with the style-grouped wine list had a longer decision time, but perceived difficulty of choosing a wine was the same as that for the origin-grouped wine list. Study 2 revealed that participants strongly preferred either the origin- or style-grouped wine list. Overall, more than half the participants preferred the style-grouped wine list, indicating that many consumers may appreciate wine lists organized according to wine style.

Practical implication – The findings underscore that restaurants should recognize customer preferences for wine list structures, which may influence customer satisfaction.

Originality / value – This paper assesses consumer perceptions of different wine list structures and how they affect consumers' selection of a wine in a restaurant.

3.1. Introduction

Wine sales are an important part of many restaurants' turnover (Oliveira-Brochado & Vinhas da Silva, 2014; Ruiz-Molina et al., 2010). For consumers, selecting a wine from a restaurant wine list can be daunting (Olsen et al., 2003). This is because restaurant patrons usually do not see the wine bottle, and the label in particular, the wines and information about them are limited, and the decision is often not an individual but a collective one (Cohen et al., 2009; Hammond et al., 2013).

Restaurant patrons perceive a high functional risk of choosing a wine they will not like the taste of (Bruwer, Fong, et al., 2013; Lacey et al., 2009). As a strategy to reduce this risk and find a wine they like, they search for information, most notably in the wine list (Hammond et al., 2013). Therefore, the wine list should offer information to help consumers assess whether they will like the taste of a wine. While most wine lists offer information about the origin of the wine, the brand, producer, grape varieties, or vintage, studies have found that consumers would appreciate a description of the taste or wine style, such as *light*, *fruity*, or *bold*, as additional information about the wine to reduce their risk of choosing something they will not like (Corsi et al., 2012; Mitchell & Greatorex, 1989). Furthermore, it has been suggested that organizing wine lists in a way other than the widespread practice of listing wines according to their origin may affect consumers' wine choice in a restaurant (Corsi et al., 2012). The present study aimed to investigate how a wine list that organizes the wines according to style categories rather than origin affects consumers' difficulty in selecting a bottle of wine and whether consumers would prefer such a wine list.

3.1.1. Literature review

Choosing a wine in a restaurant has been found to be stressful for consumers and to evoke higher levels of perceived risk than buying wine as a gift or for home consumption (Jaeger et al., 2010; Olsen et al., 2003; Terrier & Jaquinet, 2016). Consumers face several types of risks when buying wine, such as functional, physical, time-related, psychological, social, or financial risks (Bruwer, Fong, et al., 2013; Mitchell & Greatorex, 1989). The risk of choosing a wine that does not please one's palate or does not match the food (functional risk) has been perceived as the most important risk for restaurant patrons (Bruwer, Fong, et al., 2013; Lacey et al., 2009). Consequently, consumers employ risk-reduction strategies to find a wine that they like (Bruwer, Fong, et al., 2013). The most important strategy consumers deploy to reduce their perceived risk is seeking information (Bruwer, Fong, et al., 2013).

The main source of information about wine in a restaurant is the wine list (Hammond et al., 2013). Another possibility is to ask the restaurant staff (Hammond, Barber, & Almanza, 2009). However, it has been found repeatedly that not all restaurants have a wine specialist or trained staff with whom clients can consult (Oliveira-Brochado & Vinhas da Silva, 2014). Furthermore, most restaurant customers, especially younger people, do not ask for advice, possibly so as not to appear ignorant in front of others (Hammond et al., 2013; Lacey et al., 2009).

The restaurant wine list

The wine list is not only a source of information for restaurant patrons but is an essential part of a restaurant's offering and can be used as a strategy to differentiate one establishment from others (Berenguer, Gil, & Ruiz, 2009). Optimizing the wine list is key for restaurants to target customers effectively and may increase wine sales, which are an important driver of restaurant turnover (Gil, Berenguer, & Ruiz, 2009). Furthermore, a good wine list is thought to increase customer satisfaction and add to the perceived value and prestige of a restaurant (Ruiz-Molina et al., 2010).

Studies on restaurant wine lists have shown that there are some well-established practices in terms of structure and information. The listings are mainly determined by a wine steward (sommelier) or restaurant owner who is passionate about wine (Gil-Saura et al., 2008). The number of wines included on the wine list and the price range greatly vary among restaurants and depend on the type of establishment (Gil-Saura et al., 2008). In terms of information, most wine lists include the origin of the wine, the producer, brand, grape variety, vintage, and price (Ruiz-Molina et al., 2010). Some restaurants additionally provide information about the taste or style of the wines (Yang & Lynn, 2009). From a consumer perspective, information about the intrinsic quality of a wine, such as its style, has been identified as one of the most important product cues for selecting a wine (Bruwer, Chrysochou, et al., 2017). Such information should, thus, be included on the wine list.

Another trait most wine lists have in common is the organization of the wines on the list according to their origin. This has been found in European as well as other countries (Gil et al., 2009; Terblanche & Pentz, 2019; Yang & Lynn, 2009). Organizing wine lists according to origin refers to the classification system used in numerous wine-producing countries that is mostly based on the origin of the wines. However, Honoré-Chedozeau et al. (2017) found that many wine consumers have difficulty understanding the wine classification system, and that limited knowledge may lead consumers to make wrong inferences about wines.

Wine is a complex product and the information included on many wine lists may be of limited help to consumers trying to determine whether they like a wine. In many New World wine-producing countries, such as the United States or Australia, the number of grape varieties is smaller compared to Old World producers, like France or Italy, and many wines are single varietal wines, which is mentioned in the name of the wine (Cohen et al., 2009). Studies from these latter countries have found that grape variety is an important cue for consumers to select a bottle of wine from a wine list (Choi & Silkes, 2010). In the case of wines produced in Europe, if the grape variety is not known to the consumer or not mentioned, and no information about the taste is given, it can be difficult to know what to expect in a bottle. For example, a wine described as a Barolo DOCG consists of 100% Nebbiolo grapes and is aged at least 18 months in a wooden barrel, which results in a particular flavor and a certain astringency due to the tannin of the wood. However, without knowledge of how such a wine is produced and how this affects the organoleptic experience, it is impossible for a consumer to grasp whether the wine will please their palate and match the food.

Consumers vary in their ability to process and use information about a wine and infer its taste or style (Cox, 2009). In this context, the consumer's interest in and prioritization of a product, referred to as product involvement, is a useful benchmark (Bruwer, Cohen, & Kelley, 2019; Ogbeide & Bruwer, 2013; Rahman & Reynolds, 2015). People with more involvement with wine have been found to be more knowledgeable, drink more wine and more often, and spend more on a bottle of wine (Bruwer & Campusano, 2017). Knowledgeable consumers of wine process information differently than novices do. Experts examine the information more deeply, and their knowledge has a more organized cognitive structure than of lay consumers (Park & Moon, 2003). Furthermore, they can recognize the diagnostic value of a wine attribute, while less knowledgeable consumers use the attributes at hand to evaluate a product independently of their value (Perrouty, d'Hauteville, & Lockshin, 2006). For example, a Rioja "Reserva" is aged for three years, of which at least one year is in barrels, and it sells for a higher price than a Rioja "Crianza," which is aged for only two years, with six months in barrels. Therefore, the flavors of the two wines differ greatly, and this affects how they should be paired with food. On a wine list, a novice wine consumer may see the two wines from the same origin and grape variety as two equivalents, while an expert can identify what the "Reserva" means, how it affects the style of the wine, and how well it will pair with food. Nevertheless, it has been found that consumers who have a lot of experience and knowledge to infer the taste of a wine from the information given are not necessarily more self-confident in selecting a bottle of wine (Hammond et al., 2009; Olsen et al., 2003). In fact, even highly experienced consumers

experience disconfirmation between the expected and actual taste (Ashton, 2014; D'Hauteville et al., 2007; Honoré-Chedozeau et al., 2020). One explanation for this may be that consumers who are experienced and perceive themselves to be knowledgeable about wine overestimate their know-how. The Dunning-Kruger effect, as it is called, leads to wrong expectations of a wine's taste (Aqueveque, 2018).

The wine list is created by a person from the restaurant who is usually knowledgeable about wine, and the list is made for consumers who may have limited experience with wine and perceive high levels of risk when selecting a wine from the wine list (Berenguer et al., 2009). Sirieix, Remaud, Lockshin et al. (2011) reasoned that there is a discrepancy between consumers' interest in wine lists and the way restaurants construct them. Corsi et al. (2012) suggested that the order in which information on the wine list is presented may affect how consumers choose wine in a restaurant and needs further research.

For restaurants, the most important attribute of a wine list is that it is easy for customers to use (Gil-Saura et al., 2008). The difficulty with which a consumer makes a purchase decision is indirectly expressed in the decision time. If consumers have difficulty in identifying differences between alternatives, they need more time to make a purchase decision (Chabris, Morris, Taubinsky et al., 2009). Hence, if someone struggles to distinguish between wines on a wine list, either due to lack of knowledge, experience, or self-confidence, the decision time is potentially greater. A wine list that organizes the wine listings according to wine style offers easily accessible, additional information about the wine and may make it easier to find a wine that suits one's palate and matches the food. Consequently, the decision time may be reduced, especially for people with limited wine knowledge.

Many studies on restaurant wine lists have focused on the restaurateurs' perspective. Gil-Saura et al. (2008) and Ruiz-Molina et al. (2010) suggested that more research is needed to understand the wine list from a consumer perspective and identify consumers' needs and preferences regarding the design and structure of a wine list. Dewald (2008) suggested that organizing a wine list from lightest to heaviest and including taste descriptors may be a helpful tool to assist restaurant patrons in understanding what they can expect in a bottle. Furthermore, Yang and Lynn (2009) suggested that organizing a wine list according to wine style may help restaurants with consumers that are not oenophilic and are less likely to buy wine otherwise.

The goal of this paper is to determine whether organizing a restaurant wine list according to wine style rather than origin facilitates the decision-making process and whether consumers would prefer this. In the first study, participants received either an origin-grouped or style-grouped wine list. The decision time and level of perceived difficulty of choosing the

wine were compared between participants with the two wine lists. In the second study, participants received both wine lists and were asked to compare them in terms of attractiveness, ease of choice, and overall preference. The results presented in this paper provide insights into the difficulties consumers face when choosing wine and whether wine lists organized according to wine style would be preferred. The paper also provides important insights to help restaurants improve their wine lists for customers.

3.2. Study 1

The goal of the first study was to examine whether participants' wine choice in a restaurant could be facilitated by organizing the wine list according to style rather than origin. Consequently, participants would not need to infer the taste of a wine from its origin, which studies have found is difficult (Ashton, 2014; Honoré-Chedozeau et al., 2020). Thus, if restaurant patrons know what they are looking for, a wine list that organizes wine according to style may make it easier for them to find a wine that suits their palate and matches the food. This may reduce their decision time (Chabris et al., 2009) as well as their perceived difficulty of choosing a wine.

3.2.1. Material and methods

Participants were randomly assigned to one of two groups—one with a wine list organized according to country of origin and one with a wine list organized according to wine style categories. Participants had to choose the wine they would select in a restaurant situation and their decision time was recorded. Afterward, they were asked questions about how difficult they perceived choosing a wine from the list to be. Decision time and perceived difficulty of choice were compared between the two groups.

Data collection and sample characteristics

The online experiment was conducted in the German-speaking part of Switzerland (N = 577) and integrated into another study unrelated to wine (environmental behavior and tampering with nature). The data were collected by a market research company (respondi AG, Cologne, Germany). Respondents had to be at least 18 years old. No prior knowledge of wine was required to participate. The survey ran in June 2019 until the desired number of responses and quotas for gender and age were obtained. In total, there were 317 male and 260 female participants. The average age was 45 years (SD = 14). The sample was representative of Swiss wine consumers in terms of age, gender, and education (Swiss Wine Promotion, 2017).

The wine list

Wine lists ($N = 32$) from various restaurants in Switzerland were analyzed to create two realistic wine lists for the study. The wine lists were analyzed for order, design, length, types of wine, price levels, and information provided. All restaurants but one (i.e., 31 restaurants) organized their wines by origin. This approach to organizing wines is widespread in Europe and beyond (Gil et al., 2009; Terblanche & Pentz, 2019; Yang & Lynn, 2009). One restaurant organized its wines according to descriptors of a wine's style, such as "light and fruity" or "big and bold."

Two fictitious wine lists based on the analyzed wine lists were created using Adobe InDesign. Both wine lists contained the same 20 wines at the same price points with the same graphic design and fonts. The selection of wines and information included on the wine lists, such as wine type (white and red), country of origin, and price, were defined to represent an ordinary wine list one could find in a Swiss restaurant. The wine lists consisted of five white wines and 15 red wines. Switzerland, Italy, Spain, and France each accounted for four wines. A fifth category, called "South Africa/Australia/USA" also had four wines. Each wine was assigned to the price category closest to its original wine list price.

To simplify the task of choosing a wine, the lists only offered wines by the bottle and their length was limited to two pages. The lists also excluded rosé and focused on dry, still wine. Since price levels for wine vary significantly, we set four price points that were based on the analyzed wine lists, which were similar in length. The four price points were CHF 45, CHF 60, CHF 80, and CHF 105. The value of the Swiss Franc was equal to the U.S. dollar at the time.

Figure 3 (a) and (b) depict the two wine lists created for the study, organized according to country of origin and organized into style categories, respectively. The categories for white wines were *fresh and fruity*, *fresh and dry*, and *bold and fruity*, while those for the red wines were *light and fruity*, *classic and elegant*, *bold and aged in barrique*, and *bold and fruity*. The categories were chosen to give the consumer an interpretable description of the taste of the wine (Hall, Lockshin, & O' Mahony, 2001). The assignments of the wines to the style categories was discussed with a sommelier to ensure the categories were appropriate for the selected wines. A description of wine style was used, rather than actual taste, because a style that results from winemaking practices, such as aging in oak barrels, may describe more accurately what a consumer experiences on the palate more than a description of the taste might.

To create a wine list that was complex enough to be realistic, but simple enough to limit possible variables that affect wine choice, we focused on the types of information we found on the analyzed wine lists—namely, wine/brand name, producer, and country or region of origin. On the taste-grouped wine list, information about taste was considered to be additional information that could affect wine choice.

The 20 wine listings on both the origin-grouped and taste-grouped wine lists mentioned the name of the wine or brand first, followed by the producer. Then the region of origin was listed, including a designation of origin if there was one. Finally, the country of origin was given. Of the listings, seven mentioned the grape variety rather than an actual wine name, such as *Shiraz, Cape Mentelle, Margaret River, Australia*. The survey was qualitatively pretested in the research group before conducting the experiment.

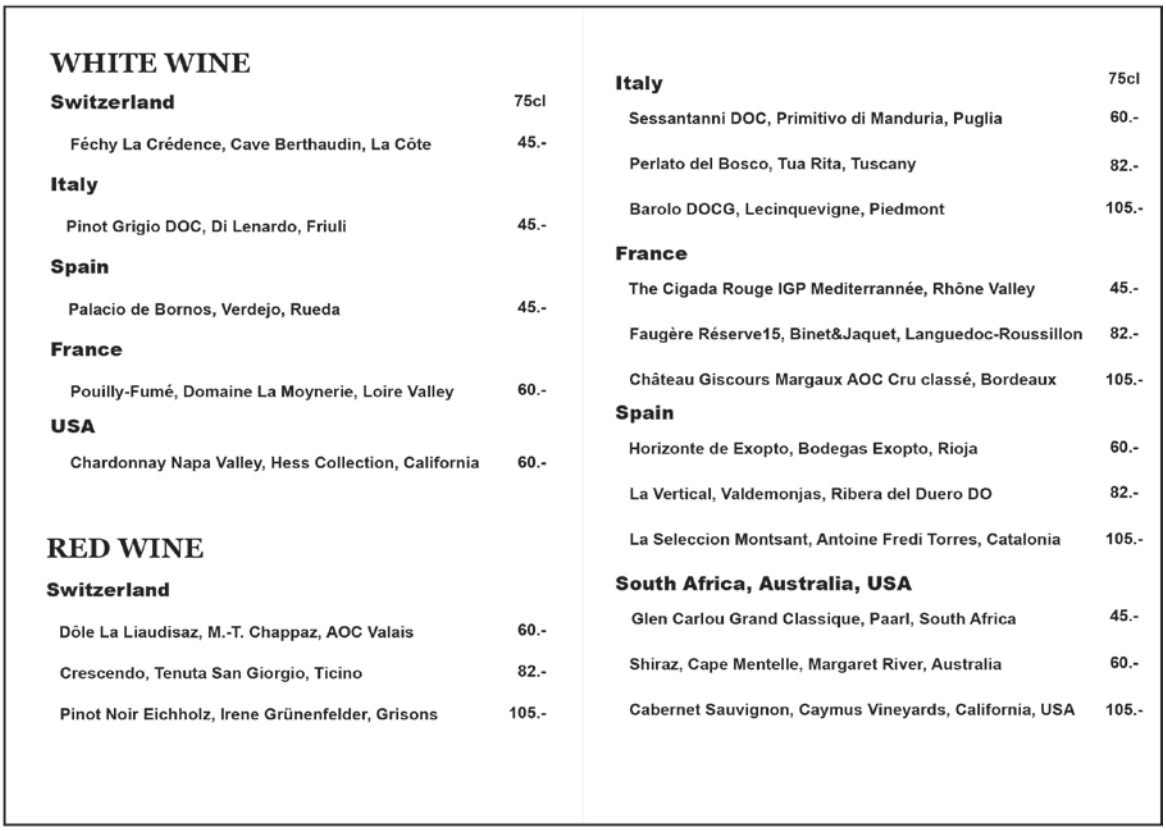
The experiment

Before conducting the experiment, we set an inclusion criterion to make inferences about people who consume wine when dining at a restaurant. Participants were asked to indicate when they last had wine with dinner in a restaurant. Possible answers were "*within the last week*," "*within the last month*," "*within the last three months*," "*more than three months ago*," and "*I don't drink wine*." Only people who had consumed wine in a restaurant during the previous three months were included in the experiment.

Piqueras-Fiszman and Jaeger (2014) previously reported that creating an evoked context that describes a real-life situation may have important effects on participant responses. Therefore, participants in our study were asked to imagine sitting in a restaurant with a group to make the restaurant situation seem more real. They were presented with a selection of three dishes and asked to choose which one they would normally select. The three menu options were as follows: (a) a vegetarian dish comprising puff pastry filled with vegetables and a side salad; (b) a fish dish of zander on vegetables and boiled potatoes; or (c) a meat dish of beef entrecote with steamed vegetables and noodles. After selecting a dish, participants were randomly assigned to one of the two groups with different wine lists. The first group (n = 290) received the origin-grouped wine list and the second group (n = 287) received the style-grouped wine list. The quotas for gender and age groups were the same as for the entire survey.

Participants were asked to look at their wine list and choose a wine for themselves and an imaginary group of friends. Timestamps were recorded every time they clicked "continue" to move to the next question. Decision time was calculated by subtracting each timestamp from the one that preceded it.

(a)



WHITE WINE

Switzerland	75cl
Féchy La Crédence, Cave Berthaudin, La Côte	45.-
Italy	
Pinot Grigio DOC, Di Lenardo, Friuli	45.-
Spain	
Palacio de Bornos, Verdejo, Rueda	45.-
France	
Pouilly-Fumé, Domaine La Moynerie, Loire Valley	60.-
USA	
Chardonnay Napa Valley, Hess Collection, California	60.-

RED WINE

Switzerland	
Dôle La Liaudisaz, M.-T. Chappaz, AOC Valais	60.-
Crescendo, Tenuta San Giorgio, Ticino	82.-
Pinot Noir Eichholz, Irene Grünenfelder, Grisons	105.-

Italy	75cl
Sessantanni DOC, Primitivo di Manduria, Puglia	60.-
Perlato del Bosco, Tua Rita, Tuscany	82.-
Barolo DOCG, Lecinquevigne, Piedmont	105.-
France	
The Cigada Rouge IGP Mediterrannée, Rhône Valley	45.-
Faugère Réserve15, Binet&Jaquet, Languedoc-Roussillon	82.-
Château Giscours Margaux AOC Cru classé, Bordeaux	105.-
Spain	
Horizonte de Exopto, Bodegas Exopto, Rioja	60.-
La Vertical, Valdemonjas, Ribera del Duero DO	82.-
La Seleccion Montsant, Antoine Fredi Torres, Catalonia	105.-
South Africa, Australia, USA	
Glen Carlou Grand Classique, Paarl, South Africa	45.-
Shiraz, Cape Mentelle, Margaret River, Australia	60.-
Cabernet Sauvignon, Caymus Vineyards, California, USA	105.-

(b)

WHITE WINE

fresh and fruity	75cl
Pinot Grigio DOC, Di Lenardo, Friuli, Italy	45.-
Féchy La Crédence, Cave Berthaudin, La Côte, Switzerland	45.-
fresh and dry	
Palacio de Bornos, Verdejo, Rueda, Spain	45.-
Pouilly-Fumé, Domaine La Moynerie, Loire Valley, France	60.-
bold and fruity	
Chardonnay Napa Valley, Hess Collection, California, USA	60.-

RED WINE

light and fruity	
Dôle La Liaudisaz, M.-T. Chappaz, AOC Valais, Switzerland	60.-
Crescendo, Tenuta San Giorgio, Ticino, Switzerland	82.-
Perlato del Bosco, Tua Rita, Tuscany, Italy	82.-

classic and elegant	75cl
Glen Carlou Grand Classique, Paarl, South Africa	45.-
Pinot Noir Eichholz, Irene Grünenfelder, Grisons, Switzerland	105.-
Château Giscours Margaux AOC Cru classé, Bordeaux, France	105.-
Cabernet Sauvignon Caymus, Vineyards, California, USA	105.-
bold, aged in barrique	
The Cigada Rouge IGP Mediterrannée, Rhône Valley, France	45.-
Horizonte de Exopto, Bodegas Exopto, Rioja, Spain	60.-
Barolo DOCG, Lecinquevigne, Piedmont, Italy	105.-
La Vertical, Valdemonjas, Ribera del Duero DO, Spain	105.-
bold and fruity	
Sessantanni DOC, Primitivo di Manduria, Puglia, Italy	60.-
Shiraz, Cape Mentelle, Margaret River, Australia	60.-
Faugère Réserve15, Binet&Jaquet, Languedoc-Roussillon, France	82.-
La Seleccion Montsant, Antoine Fredi Torres, Catalonia, Spain	105.-

Figure 3. *Origin-grouped (a) and style-grouped (b) wine lists used in the study.*

Perceived difficulty of choice

After they made their wine decision, participants' perceived difficulty of selecting a wine was assessed. They were asked to indicate how strongly they agreed or disagreed with six statements about how easy or difficult they perceived choosing the wine to have been. Answers were given on a 5-point Likert-type scale, where only the extreme response categories of *strongly disagree* (1) and *strongly agree* (5) were verbally anchored. The other response categories were numerically anchored. A principal component analysis was conducted to test whether the six items loaded on one component. Bartlett's test of sphericity was significant, $\chi^2(15) = 1401.13$, $p < 0.001$, indicating that the items are significantly correlated with each other. A scree plot indicated a one component solution that had an explained variance of 57%. One item with a factor loading smaller than 0.60 was excluded. Items that had negative wordings were recoded and their mean was calculated (Table 6). A higher mean indicated higher perceived difficulty of choosing a wine from the wine list. Cronbach's α of 0.86 and the composite reliability of 0.88 showed high internal reliability of the scale.

Table 6. *Items used to assess the perceived difficulty of choosing a wine.*

Item	Factor loading
I found it easy to choose a wine (recoded).	0.78
I was overwhelmed by the wine list.	0.82
I am sure that I chose a wine that pairs well with the food (recoded)	0.71
Deciding on a wine was a difficult decision.	0.82
I found it difficult to choose a wine that matches the food.	0.86

Note. Cronbach's α of the scale with the above items was 0.86.

Involvement

Due to the significant effect of people's degree of involvement with wine on their behavior, a 10-item involvement measurement scale was used to assess participants' level of interest, enthusiasm, and excitement for wine. The scale followed the approach of Lockshin et al. (1997). Respondents were asked to indicate how strongly they agreed or disagreed with a range of statements about their interest in wine, such as "*I have a strong interest in wine*" or "*Which wine I buy matters a lot.*" Answers could be given using a 5-point Likert-type scale ranging from *I agree* (1) to *I disagree* (5). Only the two extreme points of the scale were verbally anchored. Again, a principal component analysis was used to reduce the number of items and suggested that the items were significantly correlated with a significant Bartlett's

test of sphericity, $\chi^2(45) = 3336.86$, $p < 0.001$. Furthermore, the analysis of the scree plot indicated a one-factor solution (explained variance of 53.7%). Two items were excluded due to factor loadings smaller than 0.60. Cronbach's α of the construct was 0.91 and the composite reliability was 0.92, which showed high internal consistency of the scale. The mean of the eight items was calculated for the involvement score (Table 7). For our analyses, a median split of the scale was used. Participants with a mean equal to or higher than the median (*Mdn* = 3.5) were assigned to the high-involvement group (*n* = 306), and those with a mean lower than the median were assigned to the low-involvement group (*n* = 271).

Table 7. *Items used to assess participants' involvement with wine.*

Item	Factor loading
I have a strong interest in wine.	0.78
Wine is one thing I have in common with some of my good friends.	0.70
I am very concerned about the wines I purchase.	0.83
Deciding which wine to buy would be an important decision.	0.85
Which wine I buy matters a lot.	0.81
I would choose my wine very carefully.	0.84
I enjoy choosing the wine to match the occasion.	0.70
Deciding among the many different wines takes time when I shop.	0.62

Note. Cronbach's α of the scale with the above items was 0.91.

Data analysis

The data were analyzed using SPSS version 26.0. Participants who stated that they do not drink wine (*n* = 295) or that the last time they drank wine with dinner in a restaurant was more than three months ago (*n* = 380) were not included in our analysis, since the findings are specifically relevant for people who regularly consume wine in restaurants. Decision time was an essential part of the experiment. Therefore, participants who interrupted the survey (*n* = 29) were excluded from further analysis, since their decision time may have varied due to the interruption. Furthermore, respondents whose duration of completing the survey was less than half the median (*Mdn* = 1,960) were excluded from the survey (*n* = 56) according to the approach of Hartmann et al. (2016). This ensured that participants had read the possible answers and followed the instructions. These cleaning measures resulted in a total of 577 participants whose responses were analyzed.

The outcome variable decision time was not normally distributed as indicated by the Kolmogorov-Smirnov test, D(577) = 0.27, $p < 0.001$. Therefore, we used non-parametric Mann–Whitney *U* tests to analyze differences between the two wine lists as well as between low- and high-involvement participants. For the outcome variable perceived difficulty of choice, a 2 × 2 analysis of variance (ANOVA) was used to analyze the main and interaction effects of wine list and involvement group. A linear regression model was used to determine the predictors of perceived difficulty of choice. Chi-squared tests were used to analyze wine choices between groups.

3.2.2. Results

The two groups did not differ in terms of age, $t(575) = 0.72$, $p = 0.471$, $d = 0.06$, gender, $\chi^2(1) = 1.12$, $p = 0.290$, $\varphi = 0.04$, or education, $t(575) = -1.55$, $p = 0.122$, $d = 0.02$, suggesting that the randomization was successful. Participant decision times were significantly different between the two experimental groups, as indicated by the Mann–Whitney *U* test, $z = -2.28$, $p = 0.022$, $r = -0.09$. Participants with the style-grouped wine list looked at the wines longer (*Mdn* = 55 s, interquartile range [IQR] = 34 s) than participants with the origin-grouped wine list (*Mdn* = 49 s, IQR = 33 s). There was no significant difference in decision time between participants with a low involvement with wine (*Mdn* = 50 s, IQR = 35 s) and a high involvement with wine (*Mdn* = 54 s, IQR = 34 s), in either the origin-grouped wine list, $z = -0.39$, $p = 0.695$, $r = -0.02$, or the style-grouped wine list, $z = -1.54$, $p = 0.123$, $r = -0.09$.

The perceived difficulty of choice did not differ between participants with the origin-grouped wine list and the style-grouped wine list, $F(1, 573) = 0.225$, $p = 0.636$, partial $\eta^2 < 0.001$. Low-involvement participants had significantly more difficulty in choosing a wine compared to high-involvement participants, $F(1, 573) = 120.59$, $p < 0.001$, partial $\eta^2 = 0.174$. The interaction between the independent variables of wine list type and involvement group was not significant, $F(1, 573) = 0.043$, $p = 0.836$, partial $\eta^2 < 0.001$. This indicates that consumers who are not highly involved with wine struggle to select a bottle of wine from a wine list irrespective of how the wine list is organized.

A linear regression analysis was conducted to investigate the predictors of perceived difficulty of choice, the dependent variable. The predictors were decision time, involvement, the wine list, age, sex, and education. The model was significant, $F(6, 570) = 40.10$, $p < 0.001$, and explained 29% of the variance in perceived difficulty of choice. The strongest predictors were involvement with wine and age. That is, the greater someone's interest in wine and the

older someone is, the less difficulty they have in selecting a bottle of wine from a wine list (Table 8).

Table 8. *Linear regression analysis for perceived difficulty of choosing a wine.*

	Unstandardized B [95% CI]	SE (B)	Beta	*t*
Constant	4.60 [4.19, 5.00]	0.21		22.30**
Decision time	0.00 [0.00, 0.00]	0.00	0.04	1.24
Involvement	−0.37 [−0.45, −0.29]	0.04	−0.35	−9.31**
Wine list [a]	0.02 [−0.04, 0.09]	0.03	0.03	0.72
Age	−0.02 [−0.03, −0.02]	0.00	−0.33	−8.81**
Gender [b]	−0.03 [−0.16, 0.10]	0.07	−0.02	−0.46
Education	−0.03 [−0.08, 0.01]	0.02	−0.06	−1.56

* $p < 0.05$, ** $p < 0.01$

[a] Dummy-coded wine list 0 = origin-grouped, 1 = style-grouped

[b] Dummy-coded gender 0 = male, 1 = female

We further analyzed which wines were selected in the experiment. Overall, there were no significant differences between the wines that were selected by the two groups, $\chi^2(19) = 21.64$, $p = 0.303$, $\varphi = 0.20$, including in terms of price and origin. An overview of the wines that the two groups selected can be found in Table 9. Of the 20 wines, seven included the grape variety in the name, such as "pinot noir" in the wine *Pinot Noir Eichholz, Irene Grünenfelder, Grisons, Switzerland*. Participants who received the style-grouped wine list selected a wine mentioning the grape variety in the name significantly more often, $\chi^2(1) = 6.44$, $p = 0.011$, $\varphi = 0.11$, compared with participants with the origin-grouped wine list.

Despite the difference in perceived difficulty of choosing a wine for low- and high-involvement participants, the two groups did not ultimately choose different wines, $\chi^2(19) = 29.81$, $p = 0.054$, $\varphi = 0.23$, in terms of origin or price.

Since wine and food pairing is considered important for wine choice, we analyzed which wines were chosen among participants with different menu selections and found that their choices differed significantly, $\chi^2(38) = 261.72$, $p < 0.001$, $\varphi = 0.48$. People who selected the fish entrée chose mostly white wines, whereas people who selected the meat entrée often chose heavy red wines, such as Barolo. The number of participants who chose the vegetarian, fish, or meat dish before looking at the wine list was similar between the two groups, $\chi^2(2) = 1.55$, $p = 0.461$, $\varphi = 0.05$.

Table 9. *Wine choices of participant groups with the two different wine lists.*

	Origin-grouped (*n* = 290)		Style-grouped (*n* = 287)	
	n	%	n	%
Switzerland				
Crescendo, Tenuta San Giorgio, Ticino	16	5.5	16	5.6
Dôle La Liaudisaz, M.-T. Chappaz, AOC Valais	36	12.4	23	8.0
Féchy La Crédence, Cave Berthaudin, La Côte (W)	48	16.6	30	10.5
Pinot Noir Eichholz, Irene Grünenfelder, Grisons	14	4.8	18	6.3
Italy				
Sessantanni DOC, Primitivo di Manduria, Puglia	36	12.4	35	12.2
Barolo DOCG, Lecinquevigne, Piedmont	19	6.6	18	6.3
Perlato del Bosco, Tua Rita, Tuscany	3	1.0	9	3.1
Pinot Grigio DOC, Di Lenardo, Friuli (W)	28	9.7	33	11.5
France				
Château Giscours Margaux AOC Cru classé, Bordeaux	7	2.4	7	2.4
Faugère Réserve15, Binet&Jaquet, Languedoc-Roussillon	4	1.4	2	0.7
Pouilly-Fumé, Domaine La Moynerie, Loire Valley (W)	11	3.8	4	1.4
The Cigada Rouge IGP Mediterrannée, Rhône Valley	7	2.4	9	3.1
Spain				
Horizonte de Exopto, Bodegas Exopto, Rioja	13	4.5	14	4.9
La Seleccion Montsant, Antoine Fredi Torres, Catalonia	1	0.3	1	0.3
La Vertical, Valdemonjas, Ribera del Duero DO	4	1.4	3	1.0
Palacio de Bornos, Verdejo, Rueda (W)	10	3.4	13	4.5
Overseas				
Cabernet Sauvignon, Caymus Vineyards, California, USA	8	2.8	13	4.5
Chardonnay Napa Valley, Hess Collection, California, USA (W)	8	2.8	19	6.6
Glen Carlou Grand Classique, Paarl, South Africa	4	1.4	5	1.7
Shiraz, Cape Mentelle, Margaret River, Australia	13	4.5	15	5.2

Note. Frequencies and column percentages are shown. White wines are marked with (W).

Although the task of choosing a wine was hypothetical and participants did not have to pay for the wine in reality, they had a tendency to choose wine from the two cheapest price categories, at CHF 45 (32%) or CHF 60 (39%), rather than wines at the higher price points (CHF 82, CHF 105).

3.2.3. Discussion

A wine list with wines organized according to wine style rather than origin increased participants' decision time and did not lower their perceived difficulty of choosing a wine. Longer decision times were previously linked with more difficulty in deciding (Chabris et al., 2009). This indicates that the restaurant wine decision was not facilitated by offering additional information about wine style. In Switzerland, style-grouped wine lists are rare, and thus, the increased decision time may be a result of participants' lack of familiarity with the organization of the wine list. No difference in decision time was found between participants with different levels of involvement with wine. A previous study found that high-involvement consumers perceive wine to be more important and have a higher level of hedonism regarding wine (Bruwer & Campusano, 2017). Hence, although high-involvement participants had less difficulty in choosing a wine, their decision time was not lower than low-involvement participants, which was likely due to their curiosity and anticipation of selecting a wine from the list rather than difficulty in doing so. Therefore, decision time may not be an optimal proxy for participants' difficulty in choosing a wine from the list.

Perceived difficulty of choosing a wine was the same for both wine list groups. This indicates that insights into how a wine tastes may not be sufficient to reduce levels of insecurity and difficulty when it comes to selecting a wine (Jaeger et al., 2010). Age and involvement level were the main predictors of perceived difficulty of choosing a wine. Knowledge and experience can both be results of increasing years of drinking wine or high exposure to wine, even at a young age (Ellis & Mattison Thompson, 2018; Rahman & Reynolds, 2015). Having more experience and knowledge of wine may be linked with being more able to distinguish between alternatives and, therefore, finding it easier to make a decision. High-involvement participants, who are assumed to have more knowledge of wine, did have less difficulty in choosing a wine. Yet other studies have found that people with high involvement with wine are not necessarily more self-confident when selecting a wine and perceive more risk when doing so compared to low-involvement consumers (Bruwer & Campusano, 2017; Cohen et al., 2009). Hence, people with high involvement with wine, compared to those with low

involvement, may be more at ease with choosing a wine but because selecting a wine is an important decision, and in their view, the stakes are high, the perceived risk is higher.

We found that wine choice was not affected by the type of wine list. Participants with the style-grouped wine list showed about the same preference pattern for the wines on their list as those with the origin-grouped list. Since wine choice is an important driver of restaurant turnover (Bruwer, Perez Palacios Arias, et al., 2017), this finding shows that even if a restaurant decides to change to a style-grouped wine list, the customers' wine choices may not change significantly as a result, and the restaurant's margins may not be affected. Our results further support previous findings that wine and food pairing is an important driver of wine choice both for those who create the wine list and those who chose a wine from it (Jaeger et al., 2010; Sirieix et al., 2011).

Participants with the style-grouped wine list frequently selected wines that mentioned the grape variety in the name, such as *Chardonnay Napa Valley, Hess Collection, California, USA*. Organizing wine lists according to wine style may shift consumer attention toward aspects of the wine other than its origin. Or perhaps participants with the style-grouped wine list were unfamiliar with the structure and, thus, focused on a familiar grape variety as a strategy to reduce their risk (Lacey et al., 2009).

Surprisingly, low- and high-involvement participants did not differ in the wines they selected. Although high-involvement participants were found to be more variety-seeking and low-involvement participants were found to be more sensitive to price (Ellis & Mattison Thompson, 2018; Hollebeek et al., 2007; Lockshin, Quester, & Spawton, 2001), they did not choose different wines in terms of price or country of origin. Bruwer and Campusano (2017) found that independent of involvement level, the highest risk related to wine choice in a restaurant is that the wine may be overpriced.

The results from our first study show that the organization of a wine list does affect consumer decision-making. Participants with a style-grouped wine list took longer to make a wine decision, but the difficulty they had in choosing a wine was not affected by the way the wine list was structured. Participants in this study received an origin-grouped or a style-grouped wine list, but which of the two wine lists they would prefer in a restaurant was not assessed.

3.3. Study 2

In most restaurants, consumers are accustomed to selecting wine from an origin-grouped wine list (Gil et al., 2009; Terblanche & Pentz, 2019; Yang & Lynn, 2009). Therefore, we conducted a second study to let participants compare the origin- and style-grouped wine lists and determine their preference. Since the latter may be especially useful to consumers with limited experience and knowledge of wine, we wanted to determine how their preferences may be linked to objective wine knowledge and involvement with wine.

3.3.1. Material and methods

Data collection and sample characteristics

The internet panel of our research group was used to conduct an online survey in the German-speaking part of Switzerland (n = 276). Invitations to fill out the survey were e-mailed to all subscribers above 18 years of age, who were informed that the study was about wine and they did not require knowledge of the topic. The survey was run in October 2019. The average age of participants was 64.9 years, and men accounted for 66.3% of the sample (n = 183).

Survey

Like in Study 1, participants were asked when they last had wine with dinner in a restaurant to filter out people for whom the results would not be relevant. Participants were asked to imagine sitting in a restaurant and receiving two different wine lists. They were asked to look carefully at the two wine lists and compare them. The two wine lists were the same as in Study 1—an origin- and a style-grouped wine list.

After carefully comparing the two wine lists, participants were asked to answer four questions: "*Which of the two wine lists would you prefer in a restaurant to choose a wine from?*"; "*Which of the two wine lists did you find clearer?*"; "*Which of the two wine lists did you find more attractive?*"; and "*Which of the two wine lists would make it easier for you to choose a wine?*" To answer, participants moved a slider with the possible responses of "*wine list no. 1*" on the left and "*wine list no. 2*" on the right. Responses were converted to numbers ranging from 0 to 100, where a score of 0 indicated that someone would fully prefer the origin-grouped wine list, while 100 indicated an absolute preference for the style-grouped wine list. Participants did not see any numbers when moving the slider, nor did they see the terms "origin-grouped" and "style-grouped." We ran a principal component analysis to test whether the four questions listed above could be employed as one construct to indicate a preference for either the origin-grouped or style-grouped wine list, which we refer to as wine list preference. The

Bartlett's test was significant, $\chi^2(6) = 969.36$, $p < 0.001$, which indicates that the items were significantly correlated. The first component accounted for 83% of the variance, visual inspection of the scree plot indicated a one-factor solution, and Cronbach's α of 0.93 for the construct and 0.95 for composite reliability of 0.95 showed high internal reliability of the scale.

After participants' opinions about the two wine lists were assessed, they were asked the 10 questions from the involvement measurement described for Study 1. The Bartlett's test of sphericity of the items was significant, $\chi^2(45) = 1515.54$, $p < 0.001$, and the scree plot of the principal component analysis indicated a one-factor solution, and the first component accounted for 53% of the variance. All 10 involvement items were included in the construct with a Cronbach's α of 0.90 and a composite reliability of 0.92. The median split was used as described earlier (*Mdn* = 4), resulting in 146 participants assigned to the high-involvement group and 130 assigned to the low-involvement group.

Participants' objective wine knowledge was assessed with 10 questions based on the entry-level Wine and Spirits Education Trust (WSET®) certification test. The ten multiple-choice questions assessed general knowledge of wine, such as what grape variety can be found in a particular region and what grape variety is most often associated with a certain aroma. The possible responses included one correct answer, two false alternatives, and the option "*I don't know*." An answer was coded as 1 if it was correct and 0 if it was incorrect or the participant did not know the answer. The sum of the correct answers was calculated to use for analyses. Finally, participants' wine consumption and sociodemographic data were assessed.

Data analysis

The data were analyzed using SPSS version 26.0. People who had not ordered wine in a restaurant during the previous three months were excluded from the study. The same data cleaning measures as in Study 1 (see Section 3.2.1., *Data analysis*) were used to ensure that participants had read the possible answers. The median duration to complete the survey was 493 s; thus, people with a duration less than 246 s were excluded from the survey ($n = 9$). The data cleaning measures resulted in a total of 276 participant responses that were analyzed.

The Kolmogorov-Smirnov test indicated that the data from the preference score were not normally distributed, $D(276) = 0.09$, $p < 0.001$; therefore, the Mann–Whitney *U* test was used to analyze differences between low- and high-involvement participants and between men and women, while Spearman's *rho* was used to assess the correlation between preference score and other variables.

3.3.2. Results

The goal of Study 2 was to analyze whether people prefer a style-grouped or origin-grouped wine list. The overall preference scores had a median of 53.2 and 53.3% of participants had a preference score above 50, indicating that a slight majority of people favored the style-grouped wine list in terms of overall preference, attractiveness, clarity, and ease of choice. Specifically, answers to the question "*Which of the two wine lists would you prefer in a restaurant to choose a wine from?*" (Fig. 4) show that participants had a strong preference for either the origin-grouped or style-grouped wine list (*Mdn* = 61.5).

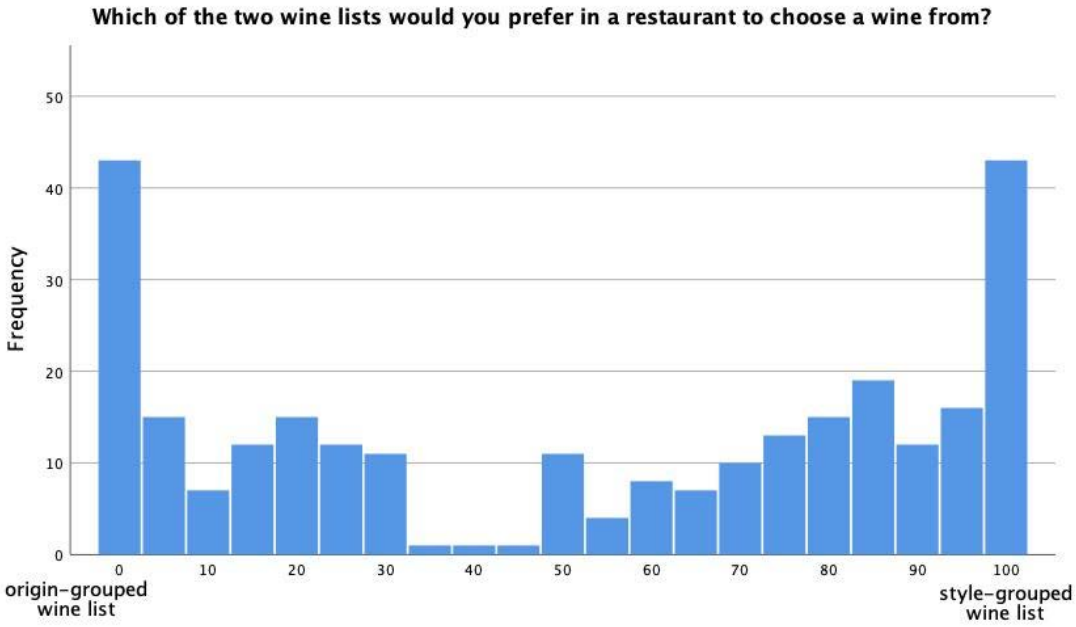


Figure 4. *Histogram of wine list preference to choose from in a restaurant.*

Since involvement is considered an important measure to distinguish between groups of consumers, we analyzed the average preference scores of low- and high-involvement participants. The Mann–Whitney *U* test results showed no significant difference between the low- and high-involvement participants, $z = -1.54$, $p = 0.124$, $r = -0.09$, and the correlation between involvement level and overall preference score was low and insignificant, Spearman's *rho* = −0.093, $p = 0.124$. Table 10 gives an overview of the medians and IQR.

The number of correct answers to the objective wine knowledge questions was not significantly correlated with the average preference score for the wine lists, Spearman's *rho* = 0.043, $p = 0.480$. This means that while someone may have the knowledge required to extract information about the style or taste of a wine from an origin-grouped wine list, they may still prefer a style-grouped wine list.

The average preference score was not correlated with participants' age, Spearman's *rho* = −0.078, $p = 0.191$. In terms of gender, we found that women had a higher median of the preference score (*Mdn* = 67.3) than men did (*Mdn* = 49.5). However, the Mann–Whitney *U* test showed that this difference was not statistically significant, $z = -1.92$, $p = 0.055$, $r = -0.12$.

Table 10. *Wine list preference scores of low- and high-involvement participants.*

Which of the two wine lists...	Low-involvement Mdn (IQR) *n* = 130	High-involvement Mdn (IQR) *n* = 146	Mann–Whitney *U*	*p*
...would you prefer in a restaurant to choose a wine from?	68 (68)	50 (85)	8,394	0.097
...did you find clearer?	50 (55)	35 (69)	8,285	0.068
...did you find more attractive?	65 (57)	51 (66)	8,848	0.331
...would make it easier for you to choose a wine?	69 (69)	54 (81)	8,485	0.128
Overall preference score	61 (56)	48 (65)	8,472	0.124

Note. A preference score of 0 indicates a preference for the origin-grouped wine list, whereas 100 indicates a preference for the style-grouped wine list.

3.3.3. Discussion

The standard practice in Switzerland and other countries is to structure wine lists according to country or region of origin (Terblanche & Pentz, 2019; Yang & Lynn, 2009). However, this practice may need to be revised. The results of our study suggest that a considerable number of consumers may prefer a style-grouped wine list depicting wines according to style rather than origin. At the same time, some consumers prefer a wine list organized by origin. This shows that restaurant patrons have different needs and preferences regarding the restaurant wine list that restaurants should consider.

The study showed that many consumers, irrespective of their age, sex, experience with wine, and knowledge of wine, may appreciate the description of a wine's taste or style, which is in line with earlier studies (Hall et al., 2001; Hammond et al., 2009). Such a description provides additional information that may help consumers reduce their perceived risk of choosing the wrong wine (Bruwer, Fong, et al., 2013) and increase their willingness to buy

(Outreville & Desrochers, 2016). Lacey et al. (2009) suggested that if consumers make more informed and suitable wine decisions, this is beneficial to the restaurant because it increases customer satisfaction.

It was assumed that people with higher degrees of involvement with wine and levels of objective wine knowledge may prefer the more familiar origin-grouped wine list, since they may have sufficient knowledge to infer the taste of a wine from its origin. Honoré-Chedozeau et al. (2017) found that while experts seem to be familiar with classification systems based on wine origin, wine novices have difficulty in identifying relevant information about a wine. This may lead to misunderstandings and false inferences about wine. However, involvement and objective wine knowledge were not significantly correlated with participants' wine list preferences. Choi and Silkes (2010) found that knowledge of wine is not necessarily linked with a consumer's confidence in choosing a wine. The present study suggests that even though someone may be knowledgeable about wine, a wine list that organizes wines according to wine style, therefore offering additional information, may nevertheless be preferred.

Older adults were overrepresented in this study, as were men. However, earlier studies found that even consumers with long experience of drinking wine do not feel very confident in choosing wine in a restaurant (Hammond et al., 2009) and that that experience is not a significant predictor of the way wine list information is used (Hammond et al., 2013). Furthermore, older consumers, such as baby boomers, who were well represented in this study, were found to have lower involvement compared to younger generations, despite having more experience with wine, which in itself may be more decisive for behavior than age is (Bauman et al., 2019). However, we did not find significant associations between age or involvement and wine list preference.

Earlier studies found that the most important trait of a wine list for restaurant owners and managers is ease of use (Berenguer et al., 2009; Gil Saura et al., 2008). Therefore, in light of our results, people in charge of wine lists should ask whether their wine list meets customers' requirements. Organizing a wine list according to wine style may be an innovative approach for restaurants and may be used to differentiate from other restaurants (Berenguer et al., 2009; Sirieix et al., 2011). Considering the importance of wine sales, restaurant managers and owners should include their customers in the menu design process to ensure that it pleases the audience, which may also affect customer satisfaction and increase sales (Gil-Saura et al., 2008).

3.4. Conclusions, implications, limitations, and future research

The present paper investigated how wine list structure and additional information about the style of wine affects the difficulty of choosing a wine. Participants with a wine list that grouped wines into wine style categories did not have less difficulty in choosing a wine. Nevertheless, we found evidence that a large share of consumers who are usually exposed to origin-grouped wine lists in restaurants may prefer a style-grouped wine list. We also found support for origin-grouped wine lists, which underscores the need for restaurants to understand customer preferences and involve customers in the process of creating wine lists.

There are several research questions that future studies should address. The present study assessed how wine list structure influences the perceived difficulty of choosing a wine in a restaurant. We did not assess how the perceived functional, social, or financial risk is influenced if a wine list features taste or style descriptors. Neither did we measure the confidence and satisfaction of participants choosing the wine. Furthermore, participants in Study 1 were asked to choose a wine for themselves and their imaginary group. However, it is likely that the format of an online study could not simulate the social risk of the described situation and participants chose a wine solely for their own needs or taste. The studies were both conducted in Switzerland, which limits the generalizability of the results and warrants further research to compare the findings to other countries. Future studies should investigate how the structure of the wine list and additional information about wine style affect consumers' wine choices in restaurants, their satisfaction with their choices, and their confidence in making decisions. Instead of using online questionnaires, future studies could conduct qualitative studies to gain more insights in consumers' difficulties with ordering wine in a restaurant, or they could investigate this issue directly in a restaurant. Quantitative studies should pre-test with the target population. Furthermore, future research should include restaurant managers and sommeliers to identify potential research questions regarding different wine lists for their business.

The results of the present study can help restaurant owners and managers improve their wine lists according to their customers' preferences and, by doing so, potentially increase customer satisfaction with their restaurant experience, which could positively affect wine sales. For example, restaurants could give customers the option to choose from an origin-grouped or style-grouped wine list. This could be done by using a tablet on which both wine lists are available. For restaurants with large wine lists, defining wine style categories may be more difficult, since the wines may not fit a category or some categories may contain only a few wines. In this case, including a description of the taste or style would be a start to provide more

information about the intrinsic qualities of the wine and reduce consumers' risk of selecting a wine they do not like.

Chapter 4

RISK PERCEPTION AND ACCEPTANCE OF HEALTH WARNING LABELS ON WINE

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Abstract

Wine is an essential part of European culture. Unfortunately, the consumption of alcohol, such as wine, can have negative health effects. Health warning labels (HWLs) are increasingly presented as a measure to warn consumers of the threat alcohol poses to their health. At present, only a few countries in Europe have introduced mandatory HWLs on wine bottles. This may be due to the cultural and economic significance of wine and the European public's refusal to accept HWLs on a product like wine. To investigate this issue, we conducted an online experiment in the German-speaking part of Switzerland and assessed the perception of risk in participants who were presented wine bottles featuring different types of HWLs. We also studied how health beliefs and cultural worldviews influence the perception and acceptance of HWLs. Our study revealed a small effect of HWLs on consumers' risk perception. There was no difference between a simple text-only HWL and a label featuring a deterring picture (image-and-text HWL). The major determinants of HWL acceptability were cultural worldviews and health beliefs. That is, participants who opposed government intervention for collective wellbeing and espoused a belief in the health benefits of wine were less likely to accept HWLs on wine. More research is needed to assess the effectiveness of HWLs in real-life situations and the importance of culture to the acceptance of such a public intervention measure.

4.1. Introduction

Wine production and consumption are essential aspects of European culture. Roughly 60% of the world's wine supply is produced in Europe, and Europeans, who account for only a tenth of the world's population, consume more than half the wine produced worldwide (OIV, 2018). Europeans' high consumption of wine and other alcoholic beverages is reflected in high rates of alcohol-related morbidity and mortality (WHO, 2019).

Besides government campaigns to draw consumers' attention to the potential harms of alcohol consumption, health warning labels (HWLs) on alcohol containers are gaining increasing attention as potential interventions to reduce the harms of continuous and/or excessive drinking.

The present study aimed to investigate the effectiveness of different types of HWLs in increasing consumers' perceptions of various risks of alcohol consumption. The study also assessed how different factors, such as perceived health benefits of wine consumption, or individualistic values influence the perception and effectiveness of HWLs among wine consumers. The next section presents the background of the study. This is followed by a description of the methods used to investigate this issue. Then the results are presented. The discussion contextualizes the findings in relation to the existing literature, and the paper ends with a conclusion and suggestions for future research.

4.1.1. Background literature

Several studies have investigated the influence of different types of HWLs on outcome variables, such as negative emotions evoked by such labels, consumers' reactions to HWLs, or consumption and buying behaviors. Tobacco labeling has often been used as a benchmark for comparing labels with a simple warning statement (text-only HWL) and those additionally displaying a deterring image (image-and-text HWL). Wigg and Stafford (2016) identified a higher intention to quit or reduce alcohol consumption in people exposed to HWLs than in people not exposed to HWLs. Clarke, Pechey, Mantzari et al. (2020a) found that HWLs with a cancer warning increased fear arousal and negatively affected the selection of an alcoholic beverage, with image-and-text HWLs having a stronger impact than text-only HWLs. Stafford and Salmon (2017) measured consumption speed and found that both text-only and image-and-text HWLs significantly reduced the speed of consumption, which affected the amount consumed. Rosenblatt et al. (2019) found the strongest effect of image-and-text HWLs on negative emotional arousal. Wigg and Stafford (2016) also identified a significant increase in fear arousal for image-and-text HWLs as well as text-only HWLs compared to HWL-free

alcohol containers but no difference between the two labels. Depictions of bowel and liver cancers were found to elicit the most negative emotional response (Pechey et al., 2020).

Although perceived risk plays a key role in determining the degree to which people engage in a risky behavior, like alcohol consumption (Riddel & Hales, 2018), perceived risk has been used as an outcome variable in only a few studies. Clarke, Pechey, et al. (2020a) found higher perceived risk of cancer in groups exposed to an HWL with a cancer message compared to groups exposed to no HWL. However, Sillero-Rejon et al. (2018) found that perceived risk did not increase with image-and-text HWLs. Therefore, additional research is needed to assess the potential of HWLs to alter consumers' perceived risk of alcohol consumption. For the present study, we hypothesized that HWLs increase consumers' perceived risk of alcohol consumption and that image-and-text HWLs have a stronger effect than text-only HWLs.

At present, warning labels are mandatory in only a few European countries. This may be primarily due to the cultural and economic significance of wine and the lobbying in this sector. Another reason may be that alcohol consumers do not see the need for HWLs because they do not feel wine consumption has a negative impact on their health (Sillero-Rejon et al., 2018), or they may relativize and deny the risks associated with alcohol consumption (Bocquier et al., 2017).

In fact, studies have repeatedly found that many consumers in Europe and beyond believe that drinking wine in moderation has positive health effects (Annunziata et al., 2016; Saliba & Moran, 2010; Vecchio et al., 2017). Although some research has shown the preventative effect of moderate wine consumption on cardiovascular diseases (see e.g., Saleem & Basha, 2010), the number of scientists and doctors warning of the detrimental effect of guidelines for moderate consumption is growing. Experts have proposed ceasing to provide guidelines for safe consumption to consumers, since such guidelines may be misinterpreted and lead to increased consumption (Latino-Martel et al., 2011). Riddel and Hales (2018) echoed this, suggesting that beliefs in the health benefits of wine may lead to misperceptions of the risk of consuming alcohol. This study aimed to investigate whether health beliefs reduce the perceived risk of consumption and influence the effectiveness of HWLs.

Although many studies found a potential of HWLs to evoke fear or negative emotions, they have also found that the stronger the effect of the HWL, the more people tried to avoid it and the greater their aversion to HWLs was (Sillero-Rejon et al., 2018). In particular, consumers with the highest consumption levels were found to react the most negatively to HWLs (Jarvis & Pettigrew, 2013). The acceptability of HWLs, most notably of tobacco-related

image-and-text HWLs, has been found to be very low (Clarke, Pechey, Kosite et al., 2020; Clarke, Pechey, et al., 2020a). This may be due to the anticipated loss of pleasure when consuming a product, like wine, bearing such a label. In fact, public acceptance of HWLs on alcohol was found to be particularly low for wine (Reynolds et al., 2019). Yet public acceptance is a key driver for the probability of HWLs being implemented (Reynolds et al., 2019).

Therefore, more research is needed to assess how HWLs can increase consumers' risk of consumption while being regarded as acceptable (Clarke, Pechey, Kosite, et al., 2020). For example, text-only HWLs may be less effective but garner more public acceptance and may, therefore, raise awareness while deterring people and lowering their alcohol consumption (Stafford & Salmon, 2017). We hypothesized that text-only HWLs are more accepted than image-and text HWLs.

Acceptance of attempts to reduce the negative consequences of alcohol consumption using public intervention methods, such as HWLs, may be affected by consumers' worldviews and their opinions of the role of government in society (Kahan, Jenkins-Smith, & Braman, 2011). Kahan et al.'s (2011) study showed that cultural predisposition affects how people respond to risks. Annunziata et al. (2019) stressed that there are important differences between cultures regarding the role of wine in everyday life that may affect perceptions and acceptance of HWLs. In other words, considering the importance of wine in Europe, consumers are likely to perceive HWLs communicating the potential risks of wine consumption as a threat to their cultural values, which may evoke negative reactions toward the HWLs or even their rejection. It is, therefore, important to understand not only what kind of labeling the public will accept but also how cultural worldviews affect consumer acceptance of such interventions.

The goal of the present study was to assess the effectiveness of text-only and image-and-text HWLs with a cancer warning message in increasing consumers' perceptions of various risks. We hypothesized that HWLs increase consumers' perceived risk of consuming wine and that image-and-text HWLs have a stronger effect than text-only HWLs. Furthermore, the study aimed to assess how health beliefs, alcohol consumption, and cultural worldviews affect the perception and acceptance of HWLs on wine bottles. The findings presented in this paper add to the knowledge of HWLs on wine bottles, their potential acceptance by consumers, and the role that cultural values play in this context.

4.2. Material and methods

After participants accessed the online questionnaire, their alcohol consumption level was assessed. They were randomly assigned to one of three experimental conditions and were presented wine bottles with or without HWLs. They had to indicate their perception of various risks. Following this, we assessed participants' perceived need for HWLs and acceptance of the HWLs used in the experiment. Then participants' perceived health benefits of wine consumption were measured. Finally, their cultural orientations and worldviews were examined using a value scale suggested by Kahan et al. (2011). More details about the participants, the conduct of the experiment, and assessment of the different scales are provided below.

4.2.1. Data collection and sample characteristics

We conducted an online experiment in the German-speaking part of Switzerland (N = 457). Data were collected in October 2020 by a market research company (respondi AG, Cologne, Germany) until the desired number of responses and quotas for gender and age were attained. Participants had to be at least 18 years old. Wine consumption frequency was used as a filter question to exclude people who do not consume wine. No prior knowledge of wine was required. Following Hartmann et al. (2016's) approach, participants who did not finish the survey or who completed it within less than half the median duration (Mdn = 664 s) were excluded from further analysis to ensure that participants had read the possible answers and followed the instructions. Of the total of 457 participants, 226 were male and 231 were female. The mean age was 46 years (SD = 16 years). Participants were randomly assigned to one of three experimental conditions: 156 in the control group, 157 with a text-only HWL, and 144 with an image-and-text HWL. Age and gender quotas for the three conditions were the same as for the entire study.

4.2.2. Alcohol consumption

For participants' total alcohol intake, consumption frequency and quantities of wine, beer, and spirits were assessed. For consumption frequency, possible answers were *never* (0), *rarely* (1), *once in three months* (2), *once a month* (3), *several times a month* (4), *once a week* (5), *several times a week* (6), and *daily* (7). Participants who choose *never* were excluded from the study. The mean consumption frequency for wine, beer, and spirits was calculated to use as a proxy for alcohol consumption level. The median split (Mdn = 3.3) was used to create

groups with less (n = 201) and more frequent consumers of alcohol (n = 256). People with a value below or equal to the median were assigned to the less frequent alcohol consumers group.

4.2.3. Experiment

To assess the influence of an HWL on risk perception, we designed an experiment with three conditions. Participants in the first condition, the control group, were presented a wine bottle with no warning label. Participants in the second condition were presented a bottle with a textual warning label below the actual wine label stating "Alcohol causes deadly liver cancer." In the third condition, the same bottle with the text warning was shown with an image of a diseased liver above the text (Fig. 5). The two types of warning labels were chosen for comparison to the existing literature about text-only and image-and-text warning labels on wine (see e.g., Clarke, Pechey, Kosite, et al., 2020). The main label presenting the origin of the wine was fictitious and was created using Adobe InDesign. It mentioned all mandatory information that is found on wine labels, such as the vintage, origin, alcohol content, and volume, as well as some additional information to make the label look more authentic, such as estate bottled wine (*mise en bouteille au Château*).

Figure 5. *Wine bottles presented in the experiment.*

Note. Bottles presented in (1) the control group, (2) the second condition with the text-only warning, and (3) the third condition with the image-and-text warning.

After participants inspected the bottle, they were asked five questions about their level of perceived risk regarding wine consumption from the bottle of wine presented to them (Table 11). Two items were used to assess the risk of cancer from regular consumption and impact on health in general without specifying the amount consumed. Another two items assessed the risk of consuming a specified amount of wine—namely, two glasses on a regular basis or half a bottle on just one occasion. Another item was included about the risk to an unborn child, since current warning labels already address this risk, for example, in France. The displayed bottle was the same for every question and the order of the risk questions was randomized. To answer, participants had to move a slider with no indication of value and no grid lines. This rating was transformed into a value between 0 and 100.

Table 11. *Risk items evaluated by the experimental groups.*

Name	Risk item	Labels of scale [a]
Not quantified consumption		
Cancer	How high do you perceive the risk of falling ill with cancer if you drink this wine regularly?	No risk (0) – very high risk (100)
Health impact	How do you perceive the impact on your health if you regularly consume the above wine?	Not negative at all (0) – very negative (100)
Quantified consumption		
Two glasses	How high do you perceive your personal risk if you consume two glasses a day of the above wine?	No risk (0) – very high risk (100)
Half a bottle	Do you worry about your health if you consume half a bottle of the above wine?	Not at all (0) – yes, a lot (100)
Pregnancy		
Unborn Child	How high do you perceive the health risk to an unborn child if the mother regularly drinks the above wine?	No risk (0) – very high risk (100)

[a] Numbers in parentheses indicate the value assigned to the label.

4.2.4. Acceptance and convincingness of health warning labels

After participants were shown only one of the three bottles (Fig. 5) and were asked to evaluate the perceived risk of wine consumption, they were presented with all three bottles: control, text-only, and image-and-text warning. They were asked to compare the three bottles and state which type of wine labeling they found most convincing, which one was the most acceptable, which one they thought would have the greatest impact on people's drinking behavior, and which one was most likely to prevent pregnant women from drinking.

4.2.5. Perceived need for health warning labels

Participants were asked about their perceived need for HWLs on wine bottles. They had to indicate their agreement with seven statements using a 5-point Likert-type scale. The items used for this scale were adapted from Annunziata, Pomarici, Vecchio et al. (2016) and can be found in Table 12. The Likert-type scale had the following answer options: *I disagree* (1), *I rather disagree* (2), *I neither agree nor disagree* (3), *I rather agree* (4), and *I agree* (5). A principal component analysis (PCA) was conducted to see whether the items would load on one factor. The scree plot indicated a one-factor solution for the items and the explained variance was 47%. The scale had a high reliability with Cronbach's alpha of 0.89. For further analyses, the mean of the seven items was calculated.

4.2.6. Perceived health benefits of wine

Participants were asked about their perceived benefits of wine consumption to their health. Again, participants had to indicate their agreement to statements (Table 12) using the above-described 5-point Likert-type scale. The PCA revealed a one component solution with all factor loadings higher than 0.56. Cronbach's alpha of 0.76 showed the scale's good reliability. The mean of the six items was calculated. The midpoint of the scale (3) was used to assign participants to groups representing fewer (n = 228) and more (n = 229) perceived health benefits of wine consumption. Participants with a mean equal to or smaller than the midpoint were assigned to the group with fewer perceived health benefits of wine.

4.2.7. Cultural worldviews

The implementation of mandatory warning labels on wine bottles is a government intervention. Thus, people may perceive such labels differently depending on their opinion of the state's responsibility to interfere and protect its citizens. Therefore, data were collected on participants' cultural orientations and worldviews using a scale proposed by Kahan et al.

(2011). The authors suggested measuring cultural worldviews on two dimensions: hierarchy and individualism. Hierarchy refers to social orderings in terms of race, gender, and class, whereas individualism addresses social orderings in terms of individual rights and their restrictions for the wellbeing of the collective. Since only the individualism subscale was particularly relevant for the present study, the hierarchy subscale was excluded. Table 12 shows the six items from the individualism scale. Responses could be given on a 7-point Likert-type scale ranging from *I don't agree at all* (1) to *I completely agree* (7), where only the extreme points were verbally anchored. The items loaded on one factor and had an explained variance of 59%. As the scale had high reliability (α = 0.86), the mean was calculated for use in further analyses. A higher mean indicated more individualistic values, such as thinking the government does not need to determine individual rights for the welfare of society. Conversely, a low mean meant putting societal welfare above individual rights.

4.2.8. Data analysis

The influence of the three experimental groups with different warning labels was analyzed with one-way analyses of variance (ANOVAs) for each risk. The type of warning label participants saw (no label, text-only HWL, image-and-text HWL) was the independent variable and perceived risk was the dependent variable. Due to the potential influence of perceived health benefits of wine and consumption frequency of alcohol on a participant's risk perception, separate 3 × 2 × 2 ANOVAs were conducted for the individual risk items. The explanatory variables were the experimental groups, perceived health benefits of wine (2 levels, see above), and consumption frequency (2 levels, less and more frequent consumers). For the acceptability of HWLs, a binary logistic regression analysis was done with the predictors of gender, alcohol consumption frequency, perceived health benefits of wine, and individualistic values. For perceived need for HWLs, a linear regression analysis was carried out using the same predictors.

Table 12. *Items used for the different scales with factor loadings.*

	Factor loadings
Perceived need for health warning labels	
Warnings on wine labels have a positive influence on society.	0.69
I don't find it necessary to point out the negative consequences of wine consumption for pregnant women (recoded).	0.50
Wine labels should contain a warning that one is not supposed to drive after drinking.	0.85
Warning labels on wine bottles aren't necessary (recoded).	0.87
I appreciate if wine bottles carry warning labels.	0.88
Wine labels should advise not to drink wine when taking medicine.	0.83
Perceived health benefits of wine	
Moderate consumption of red wine is healthy.	0.68
Wine consumption prevents cardiovascular disease.	0.80
If you only consume small amounts, you can drink wine every day.	0.68
Even small amounts of wine can negatively impact your health (recoded).	0.62
Moderate consumption of white wine is healthy.	0.74
Wine consumption is only dangerous if you get drunk.	0.56
Cultural worldviews (individualistic values)	
The government interferes far too much in our everyday lives.	0.77
The government should do more to advance society's goals, even if that means limiting the freedom and choices of individuals (recoded).	0.82
It's not the government's business to try to protect people from themselves.	0.75
The government should stop telling people how to live their lives.	0.85
Sometimes, the government needs to make laws that keep people from hurting themselves (recoded).	0.65
The government should put limits on the choices individuals can make so they don't get in the way of what's good for society (recoded).	0.76

4.3. Results

We were interested in whether HWLs affect the perceived risk of wine consumption. Table 13 provides an overview of the means of risk perception ratings of the five risk items presented in the three experimental groups. The three groups did not differ in age, gender, educational level, or alcohol consumption frequency (univariate ANOVAs [chi-squared for gender], $p > 0.05$). Thus, we assumed that the randomization was successful. One-way ANOVAs and post-hoc tests were conducted for each risk item separately. The results show significant differences between groups for the risk items in which the consumption quantity was not specified: *cancer*, $F(2, 452) = 10.95$, $p < 0.001$, and *health impact*, $F(2, 452) = 3.55$, $p = 0.030$.

Table 13. *Means and standard deviations of the five risk items for the three experimental groups.*

Name	Risk item	No HWL	Text-only HWL	Image-and-text HWL
		M (*SD*)	*M* (*SD*)	*M* (*SD*)
Not quantified consumption				
Cancer	How high do you perceive the risk of falling ill with cancer if you drink this wine regularly?	36 (26) [a]	49 (27) [b]	47 (27) [b]
Health impact	How do you perceive the impact on your health if you regularly consume the above wine?	45 (27) [a]	53 (27) [b]	51 (27) [ab]
Quantified consumption				
Two glasses	How high do you perceive your personal risk if you consume two glasses a day of the above wine?	48 (29)	52 (30)	49 (28)
Half a bottle	Do you worry about your health if you consume half a bottle of the above wine?	46 (31)	47 (32)	45 (33)
Pregnancy				
Unborn Child	How high do you perceive the health risk for an unborn child if the mother regularly drinks the above wine?	87 (16)	85 (19)	88 (16)

Note. Different letters in the same row indicate significant differences ($p < 0.05$) between the means of the experimental groups based on Tukey's post-hoc test.

No significant differences were detected between the three groups for the risk items in which the consumed quantity was specified and for the *unborn child* item. The latter attained the highest scores of the five risk items with an overall mean of 87 with a standard deviation of 17, indicating a high perceived risk. Therefore, we found that our hypothesis that HWLs can increase consumers' perceived risk of consuming wine is only partially true.

Tukey's post-hoc tests showed that for *cancer*, there was a significant difference between the control group and both the group with the text-only HWL ($p < 0.001$) and the group with the image-and-text HWL ($p = 0.001$). The two groups with warning labels did not differ significantly from each other ($p = 0.811$). For *health impact*, Tukey's post-hoc test revealed significant differences between the control group and the text-only HWL group ($p = 0.029$) but not between the control group and the image-and-text HWL group ($p = 0.145$). Again, the two groups with HWLs did not show a significant difference in perceived risk for this item ($p = 0.801$). Hence, our hypothesis that image-and-text HWLs more strongly increase the perceived risk of consumers could not be confirmed. For the following analyses, we focused on these two risk items for which we found significant differences between the groups.

Table 14. *Univariate ANOVAs for the risk items* cancer *and* health impact.

	Cancer			*Health impact*		
	F	*df1, df2*	*p*	*F*	*df1, df2*	*p*
Main effects						
Experimental group	9.62	2, 445	< 0.001	2.23	2, 445	0.108
Perceived health benefits of wine	51.39	1, 445	< 0.001	110.00	1, 445	< 0.001
Alcohol consumption frequency	0.74	1, 445	0.389	6.02	1, 445	0.015
Interaction effects						
Experimental group × Perceived health benefits of wine	1.53	2, 445	0.219	3.75	2, 445	0.024
Experimental group × Alcohol consumption frequency	2.04	2, 445	0.131	0.37	2, 445	0.690
Perceived health benefits of wine × Alcohol consumption frequency	0.07	1, 445	0.791	0.08	1, 445	0.777
Experimental group × Perceived health benefits of wine × Alcohol consumption frequency	0.87	2, 445	0.421	1.68	2, 445	0.188

Note. $N = 457$.

People who believe in the health benefits of wine may have lower risk sensitivity. Furthermore, higher alcohol consumption frequency was previously found to be negatively correlated with perceived risk of alcohol consumption. Therefore, we conducted two separate 3 × 2 × 2 ANOVAs with Tukey's post-hoc tests with the dependent variables of *cancer* and *health impact* and used the experimental group, the perceived health benefits of wine (2 levels), and alcohol consumption frequency (2 levels) as independent variables (Table 14). The experimental group had a main effect on the perceived risk of cancer but not on the general health impact. There was a significant main effect of perceived health benefits of wine on both *cancer* and *health impact.* Participants who believe that wine is beneficial to their health if consumed in moderate amounts perceived a lower risk of falling ill with cancer (M = 34, SD = 25) compared to participants with less belief in such health benefits of wine (M = 53, SD = 26). Similarly, participants with strong health beliefs perceived a lower health impact of wine consumption (M = 37, SD = 24) compared to those with fewer beliefs in the health benefits of wine consumption (M = 63, SD = 24).

There was a significant interaction effect of experimental group × perceived health benefits of wine for the risk item *health impact.* Hence, the effect that the presence of an HWL had on participants' perceived health impact differed between participants with more or less perceived health benefits of wine. In the group with more perceived health benefits of wine, the HWL significantly affected the perceived health impact, $F(2, 225) = 4.71$, $p = 0.010$. More specifically, participants with the text-only label (M = 42, SD = 25) perceived a more negative impact on their health (p = 0.014) than participants with no HWL (M = 31, SD = 22). Participants in the image-and-text HWL group (M = 40, SD = 24) also perceived a more negative health impact than the no HWL group (p = 0.052). There was no significant difference between the two groups with text-only and image-and-text HWLs (p = 0.895). Conversely, in the group with fewer perceived health benefits of wine, there was no significant difference between the three experimental groups with and without HWLs, $F(2, 226) = 0.081$, $p = 0.922$.

Alcohol consumption frequency had a significant main effect on *health impact* but did not significantly affect participants' perceived risk of cancer. The health impact of regular wine consumption was perceived as more severe by participants who consume alcohol less frequently (M = 47, SD = 27) than by participants with higher alcohol consumption (M = 41, SD = 27). There were no significant interaction effects between alcohol consumption and the experimental group or perceived health benefits of wine, nor were there significant three-way interactions.

The above results show that labels on wine bottles warning consumers of liver cancer increased the perceived health risk if the quantity consumed was not specified. However, the presence of a warning label did not alter participants' perceived risk in a realistic scenario in which the amount consumed was specified, nor did it affect the perceived health risk of another person—namely, an unborn baby intoxicated by a drinking mother. The results also indicate the importance of the perception of health beliefs from wine and the relationship between alcohol consumption frequency and the perceived risk.

For the successful implementation of HWLs, public acceptance is crucial. We found that the image-and-text HWL had the lowest acceptability. Labeling with no health warning was considered the most acceptable (59.5%) and the most convincing (54.5%). However, in terms of people's drinking behavior, 53.4% stated that the wine label with the image-and-text HWL had the highest impact (Table 15). Similarly, 54.9% thought the latter was the most likely label to prevent pregnant women from drinking.

Table 15. *Comparison of wine labels in terms of convincingness, acceptability, and effectiveness.*

Variable	Question	No HWL		Text-only HWL		Image-and-text HWL	
		n	%	*n*	%	*n*	%
Convincingness	Which of the wine labels do you find most convincing?	249	54.5	107	23.4	101	22.1
Acceptance	Which of the wine labels do you find most acceptable?	272	59.5	153	33.5	32	7
Effectiveness drinking	Which of the wine labels do you think has the greatest influence on people's drinking behavior?	121	26.5	92	20.1	244	53.4
Effectiveness pregnancy	Which of the wine labels do you think is most likely to prevent pregnant women from drinking?	101	22.1	105	23.0	251	54.9

Note. $N = 457$. Participants had to choose one of the three bottles with either no HWL, a text-only HWL, or an image-and-text HWL. The percentages are calculated for rows.

To ensure that the responses were not influenced by the experimental manipulation, we conducted chi-squared tests. None of the comparisons were significant, indicating that exposure to a bottle with a warning label did not affect participants' assessments of the label's acceptability, convincingness, perceived effectiveness in influencing people's drinking behavior, and ability to prevent pregnant women from drinking.

For the potential implementation of HWLs on wine bottles, it is important to know what determines consumers' acceptance of such warning labels. We conducted a binary logistic regression analysis to predict whether or not a participant will accept HWLs on wine bottles. We dummy-coded the dependent variable *acceptance*. If participants chose the wine bottle with no HWL as the most acceptable one, the dummy value was 0; if they chose either the text or image-and-text HWL, the dummy value was 1. As predictor variables, we used alcohol consumption frequency, perceived health benefits of wine, individualistic values, and gender (Table 16).

As Table 16 shows, participants who perceived no health benefits of wine consumption and tended to be communitarian rather than individualistic were the likeliest participants to accept HWLs on wine bottles. The model was significant, $\chi^2(4) = 77.57$, $p < 0.001$, and the strongest negative predictors were individualistic values and perceived health benefits of wine.

Table 16. *Results from the binary logistic regression analysis for acceptance of HWLs on wine bottles.*

Variable	*B*	SE B	*OR*
Constant	2.97	0.68	19.45**
Alcohol consumption frequency	0.00	0.08	1.00
Perceived health benefits of wine	−0.32	0.15	0.72*
Individualism values	−0.65	0.10	0.52**
Gender [a]	0.32	0.22	1.38

Note. $N = 457$. Nagelkerke $R^2 = 0.21$.

*$p < 0.05$, **$p < 0.001$

[a] Dummy-coded gender: 0 = male, 1 = female.

Previous studies found that consumers' acceptance of HWLs will likely depend on their perceived need for displaying such warnings on wine bottles. Increasing consumers' awareness of this need, therefore, may lead to increased acceptance of such HWLs. We conducted a linear regression analysis for perceived need for HWLs with the predictors of alcohol consumption frequency, perceived health benefits of wine, individualistic values, and gender (Table 17).

The model was significant, $F(4, 452) = 35.58$, $p < 0.001$, and explained 23% of the variance in perceived need for HWLs on wine bottles. The results show that being individualistic and perceiving health benefits of wine decreased the perceived need for HWLs

on wine bottles. The strongest negative predictor was the variable individualistic values. This indicates that participants with critical views on public authorities' use of interventions for the welfare of society perceived HWLs as being less necessary compared to participants supporting curbing individual rights for collective wellbeing.

Table 17. *Results from the regression analysis for perceived need for health warning label.*

Variable	*B*	SE B	*β*
Constant	5.01	0.27	
Alcohol consumption frequency	−0.04	0.03	−0.05
Perceived health benefits of wine	−0.16	0.06	−0.11*
Individualistic values	−0.34	0.04	−0.42**
Gender [a]	0.10	0.09	0.05

Note. $N = 457$. $R^2 = 0.23$

* $p < 0.05$, ** $p < 0.01$

[a] Dummy-coded gender: 0 = male, 1 = female.

4.4. Discussion

The present study examined the influence of HWLs on wine bottles on consumers' perceived risk of wine consumption. It further investigated how beliefs in the health benefits of wine, alcohol consumption frequency, and cultural worldviews influence the perception and acceptance of HWLs.

We found that although HWLs increased the perception of some risks, the effect was small. The findings support the hypothesis that HWLs can increase some perceived risks of wine consumption. However, no evidence was found that image-and-text HWLs have a stronger effect than text-only HWLs, which was reported in an earlier work (Wigg & Stafford, 2016). Kersbergen and Field (2017) showed that the attention consumers pay to warning labels is proportional to the size of the label, which may, in turn, influence the label's effect. Even though the image-and-text HWL in this study was larger, we did not find a stronger effect in comparison to the smaller text-only HWL. This may be because labels with deterring images, like the ones used in this study, can cause consumers to avoid or reject the labels, diminish the time spent looking at them, and thus, lessen their effect (Clarke, Pechey, et al., 2020a; Sillero-Rejon et al., 2018).

We also found that the HWLs only elevated participants' perceived risk when the consumption quantity was not specified. Participants with drinking patterns that differed from those specified may not have felt susceptible in the first place; thus, the warning label did not affect their risk perception of such a drinking habit. A previous study found that HWLs did not affect people's perceived susceptibility to alcohol-related risks even when the imagery was highly severe (Sillero-Rejon et al., 2018). Hence, if consumers do not feel susceptible to a risk, a warning label may have no effect.

The study further demonstrated that beliefs in the health benefits of wine and a person's drinking habits strongly influenced their perceived risk of wine consumption. Beliefs that wine can have a beneficial effect on health if it is consumed in moderation are widespread in Europe (Annunziata et al., 2016; Vecchio et al., 2017) and may lead consumers to relativize or even deny the risk they face when they drink (Bocquier et al., 2017). This study found that participants who believe in the potential health benefits of wine consumption had lower perceived risk compared to those with no such convictions. Addressing such health beliefs may be a challenge for policymakers, since it was previously found that many consumers feel they are well informed about the risks of alcohol consumption, though they, in fact, are not (Annunziata et al., 2016; Bocquier et al., 2017).

Moreover, participants with higher alcohol consumption frequency had lower perceived risk compared to participants with a less frequent alcohol consumption, which has been reported in the literature (see e.g., Riddel & Hales, 2018; Sjöberg, 1998). Consumers with a high alcohol consumption may more strongly downplay the risk of alcohol consumption (Bocquier et al., 2017) and react more negatively to HWLs on alcohol containers (Jarvis & Pettigrew, 2013). However, we cannot say whether frequent drinking is a result of low perceived risk or whether consumers relativize the perceived risk of their (high) consumption to reduce the cognitive dissonance between their behavior and the risk they expose themselves to.

HWLs are part of mandatory labeling in only a few countries in Europe. Low acceptance of such warning labels on alcohol containers has been identified (Reynolds et al., 2019), especially if these labels include deterring images similar to those on tobacco products (Clarke, Pechey, Kosite, et al., 2020). In traditional wine-producing countries, such as those in Europe, lack of consumer acceptance is a key driver against the implementation of HWLs on wine bottles (Stafford & Salmon, 2017). The findings of the present study support our hypothesis that acceptance of text-only HWLs is higher compared to image-and-text HWLs. A bottle with no warning label was perceived as most acceptable, which was also observed in

samples of French and Italian consumers (Annunziata et al., 2019). Further, we found cultural worldviews to be the most decisive factor in the acceptance of HWLs (or the lack thereof). The importance of cultural worldviews in people's openness regarding policy interventions has been reported previously, for example, regarding climate change (Shi, Visschers, & Siegrist, 2015).

The lack of acceptance of HWLs on wine bottles may be a result of consumers' lack of awareness of the link between wine consumption and negative health effects (Pechey et al., 2020). In the cases of energy-dense foods and sugar-sweetened beverages, it was found that the acceptance of HWLs on packaging was related to higher public awareness of the negative impact of consumption on health (Pechey et al., 2020). Ignorance of the potential harm of alcohol consumption combined with a belief in the health benefits of wine may reduce consumers' perceived need for, and acceptance of, HWLs (Annunziata, Pomarici, et al., 2016b; Bocquier et al., 2017; Corrales-Gutierrez et al., 2019; Saliba & Moran, 2010). Hence, raising awareness of the link between alcohol consumption and its associated risks by providing accurate information seems essential for increasing consumers' acceptance of HWLs on beverages like wine.

The literature concerning HWLs on alcohol containers has often suggested that HWLs represent a way of informing consumers about the downsides of alcohol consumption and may, therefore, help people make better decisions and decrease their consumption (Al-Hamdani & Smith, 2017; Annunziata et al., 2019; Jongenelis, Pratt, Slevin et al., 2018; Wigg & Stafford, 2016). However, if the goal of depicting a deterring image or a warning text is to simply inform consumers, it is questionable why the warnings should aim to evoke feelings like fear or an elevated perception of risk to prevent people from drinking. Other studies have suggested that HWLs that evoke negative feelings (rather than inform) motivate consumers to drink less (Rosenblatt et al., 2019; Sillero-Rejon et al., 2018; Wigg & Stafford, 2016). Our results show that many participants thought HWLs could effectively influence drinking behavior, which was reported previously in the literature (Miller, Ramsey, Baratiny et al., 2016). However, in France, where HWLs on wine bottles are mandatory, consumers have been repeatedly found to underestimate the risk of consumption and perceive the HWLs to be ineffective (Annunziata et al., 2019; Annunziata et al., 2016). Thus, the warning label in place is either not effective in informing consumers or is not a sufficient deterrent to raise consumers' perceived risk. Jongenelis et al. (2018) stressed that in cultures where alcohol consumption is well accepted, as in Europe, warning labels on wine bottles are unlikely to change behavior if used in isolation. The results from this study confirm the importance of cultural worldviews in the perception of

HWLs and suggest that the effectiveness of such labels may be restricted by widespread beliefs in the health benefits of wine consumption.

The present study faced several limitations. As participants answered an online questionnaire, we cannot state how HWLs affect perceived risk in a real-life consumption situation and whether they are (un)able to alter consumers' buying and consumption behaviors. The online questionnaire assessed consumption using overlapping answer options. We do not, however, assume that this significantly influenced our results. Investigations into perceptions and behaviors with alcohol are prone to social desirability bias (Davis, Thake, & Vilhena, 2010). While acceptance of HWLs on wine bottles was found to be low and cultural values seemed to play a pivotal role in this context, we do not know whether HWLs on alcoholic beverages that are not as deeply rooted in Swiss culture as wine is may be more acceptable.

Future studies should use real-life scenarios to assess how effective HWLs are in altering people's drinking behavior in the long term. Consumers' acceptance is key to the implementation of warning labels (Reynolds et al., 2019). Hence, research must address the question of whether an HWL that consumers accept can nevertheless alter their perceived risk of consuming wine and, by doing so, affect their drinking behavior. Furthermore, future studies should investigate the role of culture in the acceptance of HWLs by comparing different countries and alcoholic beverages. For example, vodka does not have the important place in Swiss culture that wine does, and therefore, an HWL on a beverage like vodka may be received differently. Public policies must take into account consumers' lack of knowledge of the effects of alcohol consumption and address the widely held belief that moderate wine consumption is healthy.

4.5. Conclusion

The present study assessed the impact of HWLs on wine bottles on wine consumers' risk perception. Specifically, it investigated consumers' acceptance of HWLs and the degree to which perceived health benefits and cultural worldviews affect consumers' perceptions of such labels. The effect of HWLs on perceived risk in a sample of Swiss consumers was small. The results indicate that HWLs may not increase consumers' risk perception if they do not feel susceptible to a risk in the first place. The effects of text-only and image-and-text HWLs were similar, but the latter was regarded as much less acceptable. Belief in the health benefits of wine consumption negatively affected the risk perception and acceptance of HWLs. The present study further showed that cultural worldviews play a pivotal role in determining

consumers' acceptance of HWLs. Future studies should investigate the role of culture in the perception of HWLs and whether HWLs that are acceptable to consumers are effective in raising awareness of the potential harm related to regular and/or excessive wine consumption and, consequently, influence consumers' buying and consumption behaviors.

Chapter 5

HOW HEALTH WARNING LABELS ON WINE AND VODKA BOTTLES INFLUENCE PERCEIVED RISK, REJECTION, AND ACCEPTANCE

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Abstract

Background: Wine consumption has a particular place in the culture of many European countries, and beliefs that wine offers health benefits are widespread. High consumption of wine and other alcoholic beverages among many Europeans correlates with alcohol-related accidents and disease burdens. Health warning labels (HWLs) on alcohol containers have been increasingly recommended to deter consumers from drinking. However, findings on the impact of HWLs on consumers' behavior have been mixed. Moreover, many European consumers have been found to reject the use of warning labels as a policy intervention, especially for wine, perhaps due to its cultural and economic importance.

Methods: An online study with a between-subjects design was conducted in Switzerland (N = 506) to assess whether HWLs can influence the perceived risk associated with drinking wine and vodka, a beverage insignificant to Swiss culture. Participants were presented an image of either a wine or vodka bottle with or without an HWL presenting a liver cancer warning statement. They were then asked to indicate their perceived risk of regularly consuming the depicted beverage. Acceptance and rejection of HWLs were also assessed.

Results: The perceived risk of vodka consumption exceeded the corresponding risk for wine but was unaffected by an HWL. Perceived health benefits were the main, negative predictor of perceived consumption risk. Participants mainly rejected HWLs due to their perceived effectiveness, perceived health effects, social norms, and individualistic values.

Conclusions: Perceived risk is an important determinant of drinking behavior, and our results suggest that HWLs may be unable to alter risk perceptions. Furthermore, a strong belief in the health benefits of alcohol consumption, particularly wine consumption, reduce risk perceptions and may be unaffected by HWLs.

5.1. Introduction

The production of alcoholic beverages is an important sector in many European economies, and wine, beer, and spirits are central to many European cultures. In Switzerland, wine and beer are the most popular alcoholic beverages, whereas spirits such as vodka account for only a minor share of consumption (BFS, 2019). Per capita, European citizens—including Swiss—consume twice as much alcohol as the world average (Jané-Llopis et al., 2020). Therefore, European alcohol consumption norms' correlation with alcohol-related diseases, accidents, and dependency is unsurprising (WHO, 2019).

Extensive literature has demonstrated alcohol's harmfulness in terms of health risks (for a summary, see, e.g., Connor, 2017). However, several studies have reported that only a minority of consumers are aware of the threat that regular or excessive alcohol consumption poses to their health, such as cancer risk, and they are unfamiliar with recommended drinking guidelines to reduce such risks (A. Annunziata et al., 2016; Bates, Holmes, Gavens et al., 2018; Vallance et al., 2020). Risk perception is an important factor in determining the degree to which someone engages in a risky behavior, such as alcohol consumption (Siegrist & Arvai, 2020; Sjöberg, 1998). Rehm et al. (2014) suggested that the lack of knowledge about alcohol's adverse effects has led to a high level of risk acceptance. Moreover, they suggested that educating people about the risks of alcohol consumption can change drinking behavior.

Interventions to increase consumers' knowledge about alcohol have faced several challenges, however. First, consumers have been repeatedly found to feel well informed about alcohol's health risks (Bocquier et al., 2017). Therefore, they may not feel that they need more information about these risks, or they may not believe in such risks. Second, young consumers especially often feel that they are not susceptible to long-term risks such as cancer, which may reduce the effectiveness of alcohol-risk information campaigns (Scholes-Balog, Heerde, & Hemphill, 2012). Third, many consumers have been found to believe that wine offers beneficial health effects if consumed in moderation (A. Annunziata et al., 2016) and that other factors—such as genetic predisposition—may more decisively lead to cancer than lifestyle choices (S. Pettigrew, M. Jongenelis, T. Chikritzhs et al., 2014). Such pre-existing beliefs are particularly widespread among people who consume large amounts of alcohol (Creyer, Kozup, & Burton, 2002), and they may challenge consumer-information interventions' effectiveness. In countries such as Italy or France, where drinking wine is part of social norms (Agnoli, Boeri, Scarpa et al., 2018), adverse outcomes have been associated with other alcoholic beverages but not with wine (Annunziata et al., 2019).

The dilemma of alcohol consumption is often compared to the problems of smoking. Many researchers have suggested that, instead of informing people about the risks of alcohol, consumption-deterring warning labels—such as the labels that have proven effective on tobacco products—may be a more promising, low-cost approach to decrease alcohol consumption (Jongenelis et al., 2018; Vallance et al., 2020; Wigg & Stafford, 2016). Several countries have already introduced some sorts of health warning labels (HWLs) on alcohol containers, such as the United States, Australia, and France. These labels have repeatedly proven ineffective since consumers do not notice them due to their size and position or have remained unchanged after their implementation (Kersbergen & Field, 2017; Pham, Rundle-Thiele, Parkinson et al., 2018). Consequently, several studies have tested whether more salient, tobacco-like HWLs effectively deter consumers and affect drinking behavior. Front labels including warning text or even frightening images can increase consumers' fear or negative emotions (Jongenelis et al., 2018; Pettigrew et al., 2014). Clarke, Pechey, et al. (2020b) reported that cancer warning statements increase consumers' cancer risk perception but also increase their reactance to or rejection of such labels. Staub, Fuchs and Siegrist (2022) found that HWLs increase wine-consumption risk perception whether they are only textual or use both text and images—but only if these HWLs do not specify consumption quantities. Other studies have found that such labels do not change alcohol-related outcome expectancies (Krischler & Glock, 2015) and are unlikely to change behavior since these labels' effects depend on whether consumers feel susceptible to the presented risks in the first place (May, Eliott, Crabb et al., 2020).

Moreover, the HWLs that most affected fear or consumption intentions also provoked the strongest reactance (Clarke, Pechey, et al., 2020b; Sillero-Rejon et al., 2018). Furthermore, few consumers perceived HWLs as acceptable, especially for wine (Pechey et al., 2020; Reynolds et al., 2019). Rehm et al. (2014) argued that this lack of acceptance of and rejection of HWL is likely due to a lack of knowledge about alcohol's risks. Furthermore, they suggested that other factors influence reactions to warning labels. One such factor may be attitudes toward alcohol and alcohol-related behaviors, which differ between cultures (Scholes-Balog et al., 2012).

Many studies have used different alcoholic beverages to assess HWLs' effect but have not reported on any differences in outcome variables between beverage types (Clarke, Pechey, et al., 2020b; Krischler & Glock, 2015; Miller et al., 2016; Pechey et al., 2020). Annunziata, Agnoli, Vecchio et al. (2020) suggested that warning labels and their reception among consumers depend on beverage types. For example, warnings on beer were accepted more than

warnings on wine. Moreover, Annunziata et al. (2019) stressed that future research should investigate beverage types' role on reactions to HWLs and whether wine's cultural role in many European countries causes consumers' lack of HWL acceptance. Thus, HWLs on wine may be less accepted than HWLs on other alcoholic beverages, such as vodka, which is not as deeply rooted in western European cultures and economies as wine.

The effectiveness of interventions such as HWLs in changing drinking behavior varies between individuals. For example, consumers who consume large amounts of alcohol were found to have lower risk perceptions for alcohol consumption (Creyer et al., 2002), so HWLs may be less effective for these consumers. Furthermore, the reaction to and acceptance of government interventions are also affected by personal opinions of governments' roles in restricting individual rights to protect citizens, which are called *individualistic values* (Kahan et al., 2011). Staub et al. (2022) found that individualistic values are a major determinant of consumers' acceptance of HWLs on wine bottles.

The present paper aims to address these gaps in the literature. First, this study assesses HWLs' potential to alter the perceived risk of alcohol consumption among a sample of Swiss consumers. Second, the study aims to investigate whether the HWLs' effects on perceived risk and the acceptance of HWLs differ for alcoholic beverages with varying cultural significance to Swiss consumers, particularly wine and vodka.

We hypothesized that the perceived risk of regular alcohol consumption is higher among people exposed to HWLs on alcohol containers than people who are not exposed to HWLs. Based on widespread health beliefs about wine, we also assumed that the perceived risk of wine consumption is lower than the perceived risk of vodka consumption. Due to wine's cultural significance in Switzerland, we hypothesized that HWLs on wine are perceived as less acceptable than HWLs on vodka. Furthermore, we sought to estimate how such factors as drinking norms, individualistic values, and alcohol consumption influence the rejection of HWLs on wine and vodka. Our results provide insights into the HWLs' potential to increase consumers' risk perceptions and, therefore, affect drinking behavior. Additionally, the present study adds to the knowledge of alcohol HWLs and how factors other than the labels themselves influence consumers' HWL perceptions and reactions.

5.2. Material and methods

To assess how HWLs on different beverages affect risk perceptions among alcohol consumers, we conducted an experiment. First, participants' wine and spirits consumption

frequencies and quantities were assessed. Then, participants were assigned to one of four experimental groups. Two groups were presented with an image of a wine bottle, while the other two groups were presented with an image of a vodka bottle. One wine bottle and one vodka bottle included an HWL depicting a statement about cancer risk, while the other bottles did not include HWLs. Participants were asked to state their perceived consumption risk. Next, all participants were presented with an image of a bottle of the beverage they had been presented in the previous step that included an HWL. We measured their acceptance, rejection, and perceived effectiveness of the depicted HWL. Further, we assessed participants' perceived social norms of wine and vodka consumption, respectively, as well as their perceived health effects and perceived benefits of alcohol consumption generally. Finally, we used a scale by Kahan et al. (2011) to measure participants' individualistic values, which may be relevant to HWL implementations on alcohol containers. The following subsections provide more detailed information about the various parts of this study.

5.2.1. Data collection and sample characteristics

We conducted an online experiment with participants from the German-speaking part of Switzerland (n = 506). A market research company (respondi AG, Cologne, Germany) collected the study's data in May 2021 until attaining the desired number of responses and meeting quotas for respondents' age and gender. To be eligible to participate in the study, respondents had to be at least 18 years old and drink alcohol. We used the time taken to complete the questionnaire to exclude participants who seemed not to have taken time to carefully read and respond to our questions. Accordingly, participants whose completion times were below half of the median (Mdn = 357 s) were excluded. In stating their gender, participants had the option to select *male*, *female*, or *other / not specified.* Only one respondent chose the latter option, which was an insufficient amount for statistical tests; therefore, this respondent was excluded. The study's final sample comprised 251 male participants and 255 female participants. Their mean age was 47 years (SD = 16).

5.2.2. Alcohol consumption

Respondents were asked how often they consumed alcohol so that we could exclude respondents who did not drink alcohol. Then, respondents were asked how often they drank wine and how many 100 ml glasses they drank per occasion. In our analysis, we estimated numbers of standard glasses by multiplying consumption frequencies by consumption quantities. The answer options for consumption frequency were coded based on numbers of

occasions per month: *I do not drink wine* (0), *less than once a month* (0.5), *about once a month* (1), *several times a month* (2), *about once a week* (4), *several times a week* (12), and *daily* (30). The answer options were recoded into specific numbers of glasses: *less than a glass* (0.5), *1–2 glasses* (1.5), *2–3 glasses* (2.5), *3–4 glasses* (3.5), *4–5 glasses* (4.5), *1 bottle* (7.5), or *more than 1 bottle* (8). Respondents' total wine consumption, thus, represented an approximation of their number of standard units of wine consumed in one month. For spirits, the experiment followed the same procedure as it had for wine. The answer options for spirits consumption frequency were the same, and they were coded in the same manner. For spirits consumption quantities, participants were asked how many 40 ml glasses of spirits they normally drank per occasion. The answer options were the same as for wine, except that the highest possible quantities were *5–6 glasses* and *more than 6 glasses*, which were coded as 5.5 and 7 glasses, respectively. Again, a multiplication of respondents' consumption frequency by quantity was used to estimate the number of standard units of spirits they had consumed per month. If a respondent answered that they drank neither wine nor spirits, they were excluded from the study since we sought to assess consumers of wine and spirits.

5.2.3. Experimental procedure

This study aimed to assess whether HWLs affect consumers' alcohol risk perception and whether this effect depends on beverage type. Therefore, participants were assigned to one of four groups. One group was presented with an image of a wine bottle that included an HWL (Fig. 6, b), and one group was presented with an image of a vodka bottle that included an HWL (Fig. 6, d). One group was presented with an image of a wine bottle without an HWL (Fig. 6, a), and one group was presented with an image of a vodka bottle without an HWL (Fig. 6, c). The product labels were fictitious and had been created using Adobe InDesign. The labels contained mandatory information for wine or vodka labels, such as volume or alcohol percentage, to make them look authentic. A text-only HWL was used for the two bottles with an HWL, based on previous studies' indication that cancer-related messages were highly effective (see e.g., Clarke, Pechey, et al., 2020b; Pettigrew et al., 2014). The HWL text read, "Alcohol causes deadly liver cancer."

Following their presentation with a bottle image, participants were asked three questions about their perceived risk of regular wine or vodka consumption, respectively. They were asked to move a slider to indicate their response. The sliders had no grid lines and no indication of values. The labels on the left and right of the sliders were adapted to each question. Participants' ratings using the sliders were coded with values between 0 and 100. The questions were: "*How do you estimate your personal risk if you consume this wine (or vodka) regularly?*" (*low* [0] to *high* [100]); "*How do you estimate the impact on your health if you consume this wine (or vodka) regularly?*" (*negative* [0] to *positive* [100]); and "*How likely is it that you will suffer from negative consequences if you consume this wine (or vodka) regularly?*" (*very unlikely* [0] to *very likely* [100]). The three questions' order was randomized. Since regular consumption may differ among consumers, we did not specify how often *regularly* meant.

Figure 6. *Alcohol bottle images presented to the four experimental groups.*

Therefore, participants' risk statements referred to their respective definitions of *regular consumption*. Participants who had stated that they drank wine but not spirits were assigned to one of the two wine groups, while participants who had stated that they drank spirits but not wine were assigned to one of the vodka groups. All other participants were assigned randomly to one of the four groups. Principal component analysis (PCA) was conducted to determine whether the three risk items loaded on one factor. The risk scale's explained variance of 63% and Cronbach's α of 0.71 indicated good reliability. The mean of the three risk items was calculated and will be called *mean perceived risk* in the remainder of this paper.

5.2.4. Acceptance of health warning labels

After participants had stated their perceived risk associated with their respective products' consumption, we assessed how acceptable they found the depiction of HWLs on wine or vodka bottles, respectively. Therefore, the two groups that had been presented with images of wine bottles (with and without an HWL) were presented with the image of a wine bottle that included an HWL at this stage of the experiment. They were asked, "*Are you for or against the depiction of such labels on wine bottles?*" Similar to the previous questions, this question used a slider with no gridlines or indication of value and the labels *against* (0) and *for* (100). Furthermore, we asked participants, "*How acceptable do you find the HWL depicted on the bottle?*" The slider for this question was labeled *unacceptable* (0) to *acceptable* (100). For the experimental groups that had been presented with images of vodka bottles, the same procedure was followed, but their questions evaluated vodka bottles with an HWL, rather than wine bottles. Since the two variables highly correlated ($r = 0.85$, $p < 0.001$) and the scale had good reliability (Cronbach's $\alpha = 0.92$), the mean of the two items was calculated to use in further analyses.

5.2.5. Additional variables

The study assessed several constructs to further investigate consumers' perceptions of HWLs on wine and vodka bottles, particularly the rejection of HWLs, the perceived effectiveness of such labels, social norms about drinking wine or vodka, and these beverages' perceived health effects. Additionally, participants' perceived benefits of drinking alcohol generally and their individualistic values were measured (Table 18). All constructs were measured using several items. Participants were asked to indicate their agreement using a seven-point Likert-type scale, ranging from (1) *I fully disagree* to (7) *I fully agree*. Only the extreme points of the scale were verbally anchored. Principal component analyses were

conducted separately for each of the constructs to reduce the number of items. The items' factor loadings, as well as the constructs' explained variance and the reliability, are presented in Table 18. Four items had factor loadings below 0.60 and were excluded. For reliability, a Cronbach's alpha value equal to or higher than 0.70 was considered acceptable. For the remaining items, means were calculated for each construct to support our analyses.

To determine the rejection and perceived effectiveness of HWLs, participants were presented with an image of a wine or vodka bottle that included an HWL, depending on their experimental group. Social norms about drinking and perceived health effects were measured separately for wine and vodka. Accordingly, participants in the wine groups were asked about social norms about drinking wine and about wine's perceived health effects, while the vodka groups were asked the same questions but about vodka, rather than wine.

If a consumer perceives many benefits to drinking alcohol, such as having more fun, this perspective may affect the perceived risk of alcohol consumption. Therefore, we adapted a scale by Creyer et al. (2002) to assess the perceived benefits of drinking alcohol without referring to any specific type of alcohol (Table 18).

The acceptance of HWLs on alcohol containers may, further, be influenced by consumers' opinions of public authorities' legitimacy in restricting individual rights. Therefore, we used part of a scale developed by Kahan et al. (2011) to assess individualistic values. The original scale comprised two subscales measuring, respectively, people's preferences for social order in terms of social class, race, and gender (the hierarchy subscale) and the social order in terms of individual rights and restrictions for common wellbeing (the individualism subscale). Since only the individualism subscale was deemed important in the present research context, we only used the items in this subscale (Table 18). A higher mean indicates that someone has more individualistic values and opposes governments' restrictions of individual rights. A lower mean, accordingly, means that someone supports public authorities' interventions.

Table 18. *Factor loadings of scale items reproduced by individual PCAs for each construct.*

Construct	Factor loading	Explained variance	Cronbach's α
Rejection of health warning labels (HWLs)		75.0%	0.83
"The depicted warning label is exaggerated."	0.89		
"The depicted warning label is manipulative."	0.84		
"The depicted warning label bothers me."	0.87		
HWLs' perceived effectiveness		51.3 %	0.89
"The depicted warning label causes people to drink less alcohol."	0.87		
"The depicted warning label is effective."	0.86		
"The depicted warning label leads people to rethink their alcohol consumption."	0.86		
"The depicted warning label is helpful to reduce alcohol consumption in society."	0.89		
Social norms		65.7 %	0.91
"If you have visitors, it is rude not to offer wine (or vodka)."	0.76		
"A special occasion comes with drinking a glass of wine (or vodka)."	0.87		
"It is normal to toast with wine (or vodka) in front of children."	0.71		
"Drinking a glass of wine (or vodka) after work with colleagues is normal."	0.79		
"A nice dinner includes a glass of wine (or vodka)."	0.90		
"Celebrating something comes with toasting with a glass of wine (or vodka)."	0.90		
"There is nothing unusual about drinking a glass of wine (or vodka) during the week."	0.71		
Health effects of wine (or vodka)		58.7 %	0.82
"Moderate consumption of wine (or vodka) is healthy."	0.86		
"Wine (or vodka) consumption prevents cardiovascular disease."	0.81		
"If you only consume small amounts of wine (or vodka), you can drink every day."	0.85		
"Wine (or vodka) consumption is only dangerous if you get drunk."	0.68		
Benefits of drinking alcohol		62.6 %	0.88
"Alcohol facilitates contact with peers."	0.83		
"When drinking alcohol, you have more fun."	0.83		
"Alcohol helps you relax."	0.77		
"Alcohol facilitates sexual encounters."	0.78		
"Alcohol makes it easier to handle stress."	0.83		
"Alcohol gives people something to do."	0.69		

Table 18 (continued). *Factor loadings of scale items reproduced by individual PCAs for each construct.*

Individualistic values		49.5 %	0.78
"The government should do more to advance society's goals, even if that means limiting the freedom and choices of individuals." (recoded)	0.67		
"It's not the government's business to try to protect people from themselves."	0.65		
"The government intervenes far too much in our everyday lives."	0.76		
"Sometimes, the government needs to make laws that keep people from hurting themselves." (recoded)	0.69		
"The government should stop telling people how to live their lives."	0.81		

5.2.6. Data analysis

2 × 2 analyses of variance (ANOVAs) with the independent variables *HWL group* (two levels) and *beverage type* (two levels) were used to estimate the main effects and interaction effects on perceived risk, acceptance, and rejection. Furthermore, separate linear regressions for wine and vodka were used to estimate the predictors of perceived risk and the rejection of HWLs on wine and vodka bottles, respectively. The explanatory variables of perceived effectiveness of HWLs, social norms, health effects, perceived benefits of drinking alcohol, and individualistic values were analyzed for the four experimental groups using 2 × 2 ANOVAs.

5.3. Results

The four experimental groups (for wine and vodka bottles with and without HWLs) did not differ in terms of gender, $\chi^2(3) = 0.78$, $p = 0.855$, education, $F(3, 502) = 0.95$, $p = 0.418$, or alcohol consumption, $F(3, 502) = 0.35$, $p = 0.790$, suggesting that our experiment's randomization succeeded. The four groups did differ, however, in age, $F(3, 502) = 6.59$, $p < 0.001$. The vodka groups with an HWL ($M = 43$, $SD = 15$) and without an HWL ($M = 44$, $SD = 15$) had a lower average age than the wine groups with an HWL ($M = 50$, $SD = 17$) and without an HWL ($M = 49$, $SD = 16$). This difference may have occurred because participants were asked how often they consumed spirits such as gin, whiskey, or vodka. These spirits are often used as ingredients in cocktails, which are mainly consumed by younger people (Swiss Wine Promotion, 2017). The difference in age between the wine and vodka groups was considered in the following analyses.

In investigating HWLs' influence on risk perceptions for wine and vodka, this study found that HWL did not significantly affect mean risk perceptions.[2] The inclusion of an HWL on an alcohol container did not increase perceived personal risk, $F(1, 502) = 0.01$, $p = 0.920$. However, beverage types significantly affected perceived personal risk, $F(1, 502) = 127.66$, $p < 0.001$. No significant interaction term was observed, $F(1, 502) = 0.00$, $p = 0.979$. Participants in the wine groups perceived, on average, significantly less risk ($M = 47$, $SD = 21$) than participants in the vodka groups ($M = 66$, $SD = 19$). Therefore, participants who had been presented with an image of a wine bottle perceived a lower personal consumption risk, a less negative health impact for regular consumption, and a lower likelihood of suffering negative consequences due to regular consumption than participants who had been presented with an image of a vodka bottle.

We, therefore, rejected our hypothesis that HWLs increase consumers' perceived alcohol consumption risk. However, we accepted our hypothesis that consumers' perceived vodka consumption risk exceeds their perceived wine consumption risk.

Since wine and vodka seem to elicit different levels of perceived risk, two linear regressions were conducted to assess how different factors influenced risk perceptions about regular consumption (Table 19). *Mean perceived risk* was the dependent variable. The predictors were *HWL group*, *social norms*, *perceived health effects*, *perceived benefits of drinking alcohol*, *wine or vodka consumption*, respectively, *gender*, *age*, and *education*. Both the model for wine consumption, $F(8, 247) = 8.94$, $p < 0.001$, and the model for vodka consumption were significant, $F(8, 241) = 7.40$, $p < 0.001$. Respectively, they explained 20% and 17% of the variance in participants' perceived risk of regular consumption.

For both wine and vodka, the only significant predictor of perceived risk was the perceived positive health effects of wine or, in the vodka groups' case, vodka. This finding shows that the more someone perceives health benefits from the consumption of wine or vodka, the lower their perceived consumption risk.

[2] Since the experimental groups differed by average age, a univariate analysis of covariance (ANCOVA) was conducted using *age* as a covariate. The variable *age* was significant, $F(1, 501) = 6.25$, $p = 0.013$, but the results for the main and interaction effects were the same as without the covariate. Therefore, we reported our ANOVA results. Additionally, univariate ANOVAs were conducted separately for each of the three risk items. The main and interaction effects, or the lack thereof, were the same as for the *mean risk perception* variable.

Table 19. Linear regression of the perceived risks of wine and vodka consumption.

	Wine (n = 255)				Vodka (n = 250)			
	Unstandardized B [95% CI]	SE (B)	Beta	t	Unstandardized B [95% CI]	SE (B)	Beta	t
Constant	56.28 [28.04, 84.52]	14.34		3.92**	75.00 [46.94, 103.06]	14.25		5.26**
Health warning label (HWL) group [b]	0.48 [–4.06, 5.03]	2.31	0.01	0.21	0.44 [–3.88, 4.75]	2.19	0.01	0.20
Social norms [a]	–1.29 [–3.31, 0.74]	1.03	–0.09	–1.25	–2.81 [–5.68, 0.06]	1.46	–0.16	–1.93
Health effects [a]	–6.04 [–8.11, –3.96]	1.05	–0.39	–5.72**	–4.97 [–7.52, –2.42]	1.29	–0.30	–3.84**
Benefits of drinking alcohol	1.67 [–0.03, 3.36]	0.86	0.12	1.94	1.27 [–0.62, 3.15]	0.96	0.09	1.32
Alcohol consumption [a]	–0.08 [–0.25, 0.10]	0.09	–0.05	–0.88	–0.11 [–0.49, 0.27]	0.19	–0.04	–0.57
Gender [c]	3.58 [–1.06, 8.23]	2.36	0.09	1.52	3.74 [–0.77, 8.24]	2.29	0.10	1.63
Age	–0.04 [–0.19, 0.12]	0.08	–0.03	–0.47	–0.12 [–0.27, 0.03]	0.08	–0.10	–1.62
Education	0.71 [–1.72, 3.14]	1.23	0.03	0.58	–1.00 [–3.36, 1.36]	1.20	–0.05	–0.83

* $p < 0.05$, ** $p < 0.01$.

[a] These variables were beverage-specific. For example, *social norms* referred to social norms about drinking wine for the wine groups and social norms about drinking vodka in the vodka groups.

[b] Dummy-coded HWL group: 0 = no HWL, 1 = with an HWL.

[c] Dummy-coded gender: 0 = male, 1 = female.

We further examined the acceptance of HWLs using a 2 × 2 ANOVA with *acceptance* as the dependent variable and *HWL group* and *beverage type* as independent variables. A significant effect was found for *beverage type*, $F(1, 502) = 76.02$, $p < 0.001$. HWLs were perceived as more acceptable on vodka bottles ($M = 61$, $SD = 31$) than on wine bottles ($M = 36$, $SD = 33$). Similar to our earlier finding that exposure to an alcohol container with an HWL in assessing perceived consumption risk did not alter the acceptance of HWLs, $F(1, 502) = 0.29$, $p = 0.588$, the interaction between *HWL group* and *beverage type* had no effect. Therefore, we accepted our hypothesis that HWLs are perceived as more acceptable on vodka bottles than on wine bottles.

The rejection of HWLs was found to be an important indicator of consumers' perception of HWLs. Our results show that the rejection of HWLs was significantly higher for wine compared to vodka, $F(1, 501) = 58.70$, $p < 0.001$. Exposure to an HWL during the experiment did not affect participants' rejection of HWLs, $F(1, 501) = 1.44$, $p = 0.230$, for either wine or vodka. To investigate the influences on participants' rejection of HWLs, we again conducted two separate linear regressions for wine and vodka. The predictors were *perceived effectiveness*, *social norms*, *perceived health effects of wine and vodka*, *perceived benefits of drinking alcohol*, *individualistic values*, *alcohol consumption*, *gender*, *age*, and *education* (Table 20).

The model was significant for both wine, $F(9, 246) = 11.75$, $p < 0.001$, and vodka, $F(9, 240) = 12.76$, $p < 0.001$. The strongest predictor in both models was *perceived effectiveness*, followed by *individualistic values*. In the wine case, *perceived health benefits* and *social norms of drinking* were additional significant predictors. The models explained 28% of participants' rejection of HWLs in the wine groups and 30% of the corresponding rejection in the vodka groups.

In other words, the more a participant perceived HWLs as ineffective and opposed government restrictions of individual rights, the higher their rejection of HWLs. For participants in the wine groups, beliefs that wine consumption offers positive health effects and that drinking wine is part of social norms further increases the rejection of HWLs.

Table 20. Linear regression for the rejection of health warning labels (HWLs) on wine and vodka bottles.

	Wine (n = 255)				Vodka (n = 250)			
	Unstandardized B [95% CI]	SE (B)	Beta	t	Unstandardized B [95% CI]	SE (B)	Beta	t
Constant	2.39 [0.07, 4.70]	1.18		2.03	1.42 [–0.88, 3.73]	1.17		1.22
HWLs' effectiveness [a]	–0.38 [–0.52, –0.24]	0.07	–0.32	–5.41**	–0.41 [–0.53, –0.28]	0.06	–0.36	–6.31**
Social norms [a]	0.17 [0.01, 0.33]	0.08	0.15	2.15*	0.20 [–0.03, 0.43]	0.12	0.13	1.73
Health effects [a]	0.22 [0.05, 0.39]	0.09	0.17	2.60*	0.19 [–0.01, 0.40]	0.10	0.13	1.87
Benefits of drinking alcohol	0.13 [0.00, 0.27]	0.07	0.12	1.94	0.11 [–0.04, 0.26]	0.08	0.09	1.43
Individualistic values	0.20 [0.04, 0.36]	0.08	0.15	2.52*	0.31 [0.16, 0.45]	0.07	0.24	4.13**
Alcohol consumption [a]	0.00 [–0.01, 0.01]	0.01	–0.01	–0.14	0.00 [–0.03, 0.03]	0.02	–0.01	–0.15
Gender [b]	0.01 [–0.35, 0.38]	0.18	0.00	0.07	0.08 [–0.28, 0.43]	0.18	0.02	0.43
Age	0.00 [–0.01, 0.01]	0.01	0.02	0.41	0.01 [0.00, 0.02]	0.01	0.08	1.42
Education	0.07 [–0.12, 0.26]	0.10	0.04	0.71	0.03 [–0.16, 0.21]	0.10	0.01	0.27

* $p < 0.05$, ** $p < 0.01$.

[a] These variables referred to beverage types. For example, participants in the wine groups were asked about HWLs' effectiveness on wine bottles, whereas participants in the vodka groups were asked about HWLs' effectiveness on vodka bottles.

[b] Dummy-coded gender: 0 = male, 1 = female.

These results show that consumers seem to have different associations with wine compared to vodka, which influences how they react to HWLs on these beverages' containers. HWLs on wine bottles (M = 2.9, SD = 1.4) were perceived to be significantly less effective, $F(1, 503) = 9.29$, $p < 0.001$, than HWLs on vodka bottles (M = 3.3, SD = 1.4). Furthermore, the social norms of drinking, as well as its perceived positive health effects, were found to differ between wine and vodka. On average, the wine groups (M = 4.4, SD = 1.5) expressed higher scores for social norms, $F(1, 503) = 337.06$, $p < 0.001$, than the vodka groups (M = 2.3, SD = 1.1), indicating that drinking wine aligns more with social norms than vodka does—for example, when entertaining guests or on special occasions. Moreover, wine (M = 4.4, SD = 1.3) was perceived to offer more beneficial health effects, $F(1, 503) = 174.95$, $p < 0.001$, than vodka (M = 2.9, SD = 1.1). The experimental groups with and without HWLs did not differ in terms of perceived effectiveness, social norms, or perceived health effects, and the interaction between HWL groups and beverage types was also insignificant.

5.4. Discussion

Our results suggest that the perceived risk of regular alcohol consumption is determined by the type of alcoholic beverage but not altered by bottles' inclusion of an HWL. Increasing risk perceptions has been suggested to effectively influence drinking behavior (Peadon, Payne, Henley et al., 2011). Our study indicates that HWLs may not be the right approach for such interventions. We could not replicate the findings of an earlier study in which the same kind of cancer HWLs on wine bottles increased perceived consumption risks compared to HWL-free bottles (Staub et al., 2022). The reason for this difference may be that the previous study assessed the perceived risk of developing cancer, while the present study measured both personal risk and the likelihood of suffering negative consequences due to regular consumption. Therefore, HWLs may be able to raise risk perceptions of a specific threat but not perceived consumption risks in general.

Earlier studies about HWLs found that HWLs may provoke negative emotional arousal, stronger intentions to reduce drinking, slower consumption, or avoidance (Clarke, Pechey, et al., 2020b; Pechey et al., 2020; Sillero-Rejon et al., 2018; Wigg & Stafford, 2016). While previous research has found that HWLs affect consumers in several different ways, the current study yielded no such findings, perhaps because the previous studies used different HWLs (e.g., image-and-text labels) (Clarke, Pechey, et al., 2020b; Pechey et al., 2020; Sillero-Rejon et al., 2018) or young-adult or adolescent participants, rather than adult participants

(Annunziata et al., 2019; Jarvis & Pettigrew, 2013; Krischler & Glock, 2015; Morgenstern, Dumbili, Hansen et al., 2021; Rosenblatt et al., 2019; Scholes-Balog et al., 2012; Stafford & Salmon, 2017; Wigg & Stafford, 2016). Wine is mainly consumed by older consumers, and wine HWLs' effect on younger consumers may not be comparable to their effect on older consumers. Furthermore, some studies have collected data in countries such as the United States or Australia with different alcohol cultures (Creyer et al., 2002; Jongenelis et al., 2018; Miller et al., 2016). Many European countries have particularly alcohol-friendly cultures, which influence how consumers react to interventions seeking to change their drinking behavior (Annunziata et al., 2019).

Much research has evaluated HWLs' design and framing to determine the greatest effect on consumers (see, e.g., Pettigrew et al., 2014; Rosenblatt et al., 2019) but neglected beverage types' influence. The present study successfully showed that a deeply culturally rooted beverage (such as wine in Switzerland) does not elicit the same level of risk perception as a beverage without such a cultural significance (such as vodka in Switzerland), so consumption of the former is, therefore, unaffected by HWLs. Some readers might argue that such differences in perceived risk are due to the beverages' different alcoholic strengths. A standard unit of an alcoholic drink refers to a specific amount of pure alcohol (Jané-Llopis et al., 2020), so regardless of whether a person drinks a glass of wine or a small shot of vodka, the effect of the servings' ethanol is comparable (Connor, 2017). However, consumers seem to perceive different levels of consumption risk for different types of alcoholic beverages. The reason for this difference in the current study may be Swiss consumers' associating wine with traditional drinking norms, whereas they associate spirits consumption more with adverse health effects (Annunziata et al., 2020; Dey et al., 2014). Although beverage-specific variations in risk perception have been reported (Greenfield & Rogers, 1999), the probability of experiencing negative outcomes of alcohol consumption was also found to be better predicted by alcohol consumption level than preferred beverage types (Dey et al., 2014).

The notion revealed in the current study that wine is a "healthy" alcoholic beverage confirms earlier findings that people believe other beverages have more detrimental effects on health than wine (Agnoli et al., 2018; Vecchio et al., 2017). Consumers' convictions about wine's health effects were found to be unaffected by HWLs, but these convictions may differ between countries, depending on wine's role in their cultures (Creyer et al., 2002). Our results suggest that health beliefs are an important driver of perceived consumption risks and how consumers react to HWLs. Policy-makers must account for consumers' associations with different alcoholic beverages' harmfulness or perceived positive health effects, which

determine their perceived risk and—eventually—their drinking behavior (Greenfield & Rogers, 1999).

The awareness of the link between alcohol consumption and disease was found to be associated with increased support for alcohol policies (Bates et al., 2018). Peadon et al. (2011) argued that increasing consumers' risk perceptions of drinking alcohol may be more effective than traditional awareness campaigns. However, campaigns that correctly inform people about alcohol's influence on their health and address the "wine is healthy" attitude may be more accepted and successfully increase consumers' perceived risk compared to interventions such as HWLs (Thomson, Vandenberg, & Fitzgerald, 2012).

The current study's findings indicate that a lack of (perceived) effectiveness is a major driver of people's HWLs rejections. Previous research found that consumers perceive warning labels as ineffective and do not believe their drinking behavior would change after HWLs were implemented (Annunziata et al., 2019; Miller et al., 2016). Reynolds et al. (2019) emphasized that the effectiveness of an intervention (such as a warning label) could increase its acceptability. Although participants in the current study perceived HWLs as more effective on vodka bottles than on wine bottles, our study does not provide evidence suggesting that HWLs raise risk perceptions and may, therefore, effectively alter drinking behavior.

Earlier work found that the acceptance of an intervention may not depend on intrusiveness (Bos, van der Lans, van Kleef et al., 2018). Furthermore, food labels have been found to be a well-accepted policy intervention (Hagmann & Siegrist, 2020). The present study found that, when consumers are confronted with an intervention in a realistic scenario—such as confronting HWLs on alcohol containers—such interventions may be perceived as too intrusive. This perception is especially likely in the case of culturally important products, such as wine in Switzerland, and acceptance of such interventions may be low. Individualistic values were found to be an important driver of consumers' HWL rejection, in line with an earlier study that found the acceptance of wine HWLs to be lower among consumers with individualistic values (Staub et al., 2022). These cultural values have been reported to affect support for policies in other contexts, such as climate change (Shi et al., 2015).

Drinking alcohol is customary in many European countries. The social norms of drinking and its high acceptance in western societies have grown historically, supported by the alcohol industry's strong political influence (Rehm et al., 2014). The perceived pleasure and benefits that people associate with wine drinking may be so high that wine's risks are considered "reasonable," resulting in consumers' rejection of approaches such as HWLs to

warn them about alcohol consumption's potential negative effects. Consequently, governments face little pressure to change their alcohol policies.

5.5. Limitations and implications for future research

This study faced several limitations. Participants were assigned to either vodka or wine groups. Therefore, we did not determine whether a low acceptance and strong rejection of wine HWLs could also be found if the wine-group participants had also evaluated vodka HWLs. Moreover, we used a single, text-only HWL in this study. We did not assess what *regular consumption* meant to participants, so their risk perceptions may have referred to different consumption levels. Additionally, this study was conducted in Switzerland, limiting our findings' generalizability. Consumers in other countries with different alcohol cultures and preferred beverages may not react the same way that this study's Swiss participants reacted. Finally, this study used an online format to assess respondents' perceptions of HWLs. However, we do not know how such labels would be perceived and reacted to in real-life situations, such as restaurants or grocery stores.

Despite these limitations, this study's findings offer several important implications. The study's HWLs, with a text-only cancer warning statement, did not increase respondents' risk perceptions, and health beliefs were found to be major predictors of risk perceptions. Therefore, future studies should investigate whether HWLs may effectively raise risk perceptions of drinking alcohol in societies with different alcohol cultures, where beliefs about wine consumption's positive health effects are less abundant. This study found that risk perceptions for alcohol consumption were higher for vodka than wine. Researchers should, accordingly, examine how different associations for various beverages influence behavior and how our findings could be used to reduce the negative outcomes of alcohol consumption through communication. For example, researchers could use a specific alcoholic beverage, such as vodka, to inform about the risk of consuming one standard unit of a drink. Policy-makers should address the widespread belief that wine consumption can offer positive health effects so that consumers can correctly assess their consumption risk and understand that alcohol's damage primarily stems from consumption patterns, not beverage types.

5.6. Conclusion

The present study investigated the acceptance of HWLs and their effectiveness on wine and vodka bottles as a potential policy intervention to increase consumers' perceptions of alcohol consumption risks. We found that risk perceptions did not increase when alcohol containers included an HWL but, rather, were determined by the beverage types that consumers considered drinking. The risk of drinking wine was perceived to be lower than the risk of drinking vodka. Consumers who believe in positive health effects from drinking wine or vodka had lower risk perceptions and rejected HWLs. The acceptance of HWLs was higher among participants who thought HWLs were effective but lower among participants with individualistic values who refused governmental restrictions to individual rights. Drinking wine is part of social norms in Switzerland, but vodka drinking is less socially normative in this country. This difference reflected in participants' negative reaction toward and low acceptance of HWLs on wine bottles. Therefore, policy-makers must account for such interventions' effectiveness and—more importantly—acceptance possibly varying, depending on beverage types. Europe's drinking culture is linked to specific beverages, and this study's findings may not be reproduced through similar assessments in other regions where wine is less abundant. Risk perception is important in determining the degree to which someone engages in a risky behavior, such as alcohol consumption, but it may not be affected by interventions such as HWLs on alcohol containers. This study's findings add to the knowledge about HWLs and risk perception related to alcohol consumption. Furthermore, this study has highlighted the importance of beliefs about alcohol consumption's health effects and their influence on perceptions of risky drinking behaviors.

Chapter 6

YOU ARE WHAT YOU DRINK: STEREOTYPES ABOUT CONSUMERS OF ALCOHOLIC AND NON-ALCOHOLIC BEER

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Abstract

People infer what someone is like from what they eat or drink. Such stereotypes can also influence behavior, since consumers' choices reflect how they wish to be perceived. Beer is one of the most widely consumed alcoholic beverages worldwide but particularly in Germany. Although one may avoid the negative effects of alcohol by consuming non-alcoholic beer (NAB), negative perceptions of NAB may prevent alcoholic beer consumers from switching to NAB. This study investigated stereotypes associated with alcoholic and non-alcoholic beer consumption via an online vignette experiment. German participants (N = 509) received a description of a fictitious man or woman ordering either an alcoholic beer or NAB and were asked to evaluate the character using 14 bipolar adjective pairs. Beer type (alcoholic or non-alcoholic) had a significant influence on nine adjective pairs. Drinking NAB was associated with being health-conscious, rational, disciplined, modern, stronger, feminine, tolerant, satisfied, and relaxed. As choosing NAB may be motivated by a desire to convey a particular image or other social and individual factors, the study investigated determinants of consuming NAB. The most important negative predictor was prejudice about NAB's taste. For women, personal norms of drinking alcoholic beer decreased the probability of consuming NAB, while being health-conscious and younger increased this probability. Thus, despite positive associations with NAB consumption, NAB's reputation for having an inferior taste to that of alcoholic beer and consumers' personal norms of drinking alcoholic beer may prevent consumers from switching to NAB. Practical implications and directives for future studies are provided.

6.1. Introduction

Germany is famous for its beer culture, and the number of German beer festivals organized around the world is just one sign of this. Germany produces more than twice the amount of beer of any other country in Europe and has one of the highest per capita beer consumption rates of 100 liters per year (Brewers of Europe, 2020c). Non-alcoholic beer (NAB) has been on the market since the 1980s, and despite increasing awareness of the damaging effects of alcohol, it still accounts for only a small share of the total amount of beer consumed (Brewers of Europe, 2020a; Glover, 2000). Although NAB contains health beneficial non-alcoholic compounds and no harmful ethanol, many consumers refrain from choosing it over alcoholic beer (Osorio-Paz et al., 2020). Therefore, it is important to uncover what determines someone's openness to switching from consuming alcoholic beer to a healthier alternative, such as NAB.

What we eat and drink is not merely a question of hunger or thirst but is also a result of the social influence of our environment (Higgs & Thomas, 2016). Therefore, the decision to abandon alcoholic beer for NAB may be due to an appetite for non-alcoholic hoppy beverages as well as the people around us and their (unconscious) influence on us. The consumer, through their choice of beverage or food product, conveys a particular image of themselves, referred to as self-presentation (O'Grady, 2013). At the same time, people use information about what someone consumes to form stereotypes of certain products (Vartanian et al., 2007). Hence, someone may choose alcoholic beer over NAB to give a certain impression, and others observing this may infer what the consumer is like from their choice of beverage. Stereotypes about other people that we form can influence our own consumption behavior depending on the stereotypes we would like to be associated with (Vartanian et al., 2007). Investigating stereotypes about NAB and alcoholic beer, therefore, can provide insight into the image that consumers may aim to convey by drinking one or the other.

Besides stereotypes, other social and individual factors may influence the choice of alcoholic beer over NAB. Consumers rely on their perception of what peers would consider appropriate behavior in a given situation (subjective norms) as well as past experiences (personal norms) to adapt their behavior (Ajzen, 1991; Cooke, Dahdah, Norman et al., 2016). Furthermore, the decision to drink alcoholic beer may depend on whether someone anticipates deriving benefits from drinking alcohol in general and has concerns regarding health (Creyer et al., 2002; Sinkevičius, 2016). Finally, someone may decide to drink alcoholic beer simply because they dislike the taste of NAB.

The main goal of this study was to investigate the stereotypes consumers form about people on the basis of the type of beer they drink. Participants received a description of a fictitious male or female target person and were asked to evaluate the person using several bipolar adjective pairs. Another goal of this study was to investigate how factors other than stereotypes may influence someone's beer choice. The following sections provide a background of the importance of stereotypes about alcoholic beer and NAB. We also present how other determinants—namely, subjective norms, personal norms, perceived benefits of drinking alcohol, health consciousness, or someone's opinion of the taste of NAB—may influence the decision to consume NAB.

6.1.1. Literature review

Eating and drinking often happen in the presence of others. The consequence of the social context of consumption is that what and how much we eat or drink is strongly influenced by the people surrounding us, how we perceive them, and how we want them to perceive us (McFerran, Dahl, Fitzsimons et al., 2010; O'Grady, 2013). The decision to drink an alcoholic rather than a non-alcoholic beverage in a social context may be used to manage a desirable self-presentation, such as attractiveness (O'Grady, Harman, Gleason et al., 2012). For example, in interactions between men and women, Corcoran and Michels (1998) found that men think women will view them negatively if they have a non-alcoholic drink, while women think men will view them negatively if they have an alcoholic drink. Thus, evaluations of a person having an alcoholic beer or an NAB may differ depending on their gender. It was also reported that young men drink more when they want to appear attractive and that they seem to be aware that drinking alcohol affects how others view them (O'Grady et al., 2012). The type of image someone is trying to convey through a behavior is connected to their perception of others exhibiting this behavior. Hence, the decision to drink alcoholic beer rather than healthier NAB likely depends on the person's view of others consuming alcoholic beer or NAB, respectively.

Consumer stereotypes

Information about what and how much we consume is used by others to draw conclusions about what we are like, resulting in stereotypes associated with particular foods or quantities consumed. Such stereotyping has been investigated mainly in the food domain (Hartmann, Ruby, Schmidt et al., 2018; Ruby & Heine, 2011; Yantcheva & Brindal, 2013). Portion size, fat content, and type of food are factors that influence how attractive, desirable, health-conscious, or environmentally friendly the person consuming it is perceived to be (Funk

et al., 2020; Hartmann et al., 2018; Yantcheva & Brindal, 2013). For example, someone eating a regular fat meal was found to be perceived as thinner and more desirable than someone eating a high fat meal (Yantcheva & Brindal, 2013). Consumers buying healthier food were viewed as more disciplined compared to people following a less healthy diet (Saher, Arvola, Lindeman et al., 2004). Meat consumers were found to be perceived as less health-conscious, less environmentally friendly, brave, interesting, and less knowledgeable compared to vegetarian consumers (Hartmann et al., 2018). Furthermore, hosts offering a vegetarian menu were perceived as more health-conscious than hosts offering a menu with meat (Funk et al., 2020).

Such stereotypes are an important determinant of behavior, since consumers adapt their behavior to manage a desirable impression of themselves, and may have a decisive influence on someone's decision to consume NAB or alcoholic beer (Vartanian et al., 2007).

Consumers' perceptions of others drinking NAB or alcoholic beer may be affected by the different functional and emotional associations they have with alcoholic beer compared to NAB (Silva, Jager, van Bommel, et al., 2016; Silva, Jager, van Zyl et al., 2016). Beer was associated with positive emotions, such as *relaxed* and *satisfied*, while NAB was seen as a functional beverage and evoked neutral or negative emotions, such as *rational*, *conscious*, or *disappointed* (Silva, Jager, van Bommel, et al., 2016). The associations consumers have with NAB and alcoholic beer may be used to infer what a person is like. In this sense, a person described as drinking NAB may be perceived less positively than a person described as drinking alcoholic beer.

Further, what someone eats or drinks may be linked to how masculine or feminine they are perceived to be. For example, vegetarians were perceived as less masculine than omnivores (Ruby & Heine, 2011). In this context, beer is interesting because drinking beer is perceived to be a particularly masculine activity and acceptance of binge drinking and public drunkenness is higher if men are involved, compared to women (de Visser & McDonnell, 2012). Moreover, drinking alcohol was identified as a way for men to confirm their masculine status (Fugitt & Ham, 2018). A previous study found that the perceived target consumers of NAB are women (Vasiljevic et al., 2019). It may be that NAB fails to convey a sense of masculinity due to the absence of alcoholic strength which may affect how masculine a person consuming it is evaluated especially if it concerns men.

To investigate stereotypes associated with a product, some previous studies used vignette experiments (Hartmann et al., 2018; Ruby & Heine, 2011). In a vignette experiment, participants are assigned to one or more scenarios in which a key variable, such as the type of food someone is eating, is modified (Atzmüller & Steiner, 2010). Using this indirect approach

to assess what people think of others depending on the type of beer they drink may reveal inferential beliefs that otherwise would remain unknown (Dover, 1982).

The main goal of the present study was to investigate stereotypes about consumers of alcoholic beer and NAB using a vignette experiment. We hypothesized that the type of beer (alcoholic beer vs. NAB) someone drinks would influence how people evaluate their character. Moreover, we hypothesized that someone is likely to be perceived as less masculine if they are described as drinking NAB, compared to someone described as drinking alcoholic beer, especially if the person described is a man.

Determinants of NAB consumption

The choice to drink an alcoholic beverage can be used for a particular self-presentation but is also swayed by other social and individual factors (O'Grady, 2013). People's choices are influenced by what they perceive others find appropriate, and norms can impact behavior even if others are not present (Howland, Hunger, & Mann, 2012). In Germany, most of the beer consumed contains alcohol; thus, ordering a beer with alcohol is likely considered the norm (Brewers of Europe, 2020a). For alcohol consumption, it appears that two types of norms are particularly relevant: subjective norms and personal norms.

Subjective norms are part of the theory of planned behavior and are defined as someone's perception of what behaviors are expected or approved by surrounding others, such as family, peers, or colleagues (Ajzen, 1991; Cooke et al., 2016). Subjective norms concerning beer consumption can influence alcohol identity—that is, how much one perceives oneself as a "drinker"—which, in turn, influences whether or not someone drinks alcoholic beer (Fang et al., 2017; Wang, 2020). Thus, if someone perceives high social pressure to drink alcoholic beer, this person is unlikely to consume NAB.

While subjective norms reflect what someone thinks others perceive as appropriate behavior, personal norms refer to what one personally perceives as the desirable behavior to exhibit in a specific situation, and personal norms have been found to exert an important influence on consumption behavior (Fang et al., 2017; Herman & Polivy, 2005). For example, a prior negative experience of drinking NAB, such as being asked to justify this choice, may reduce one's probability of choosing to drink NAB.

Drinking alcoholic beer has an inebriating effect that NAB cannot offer. Hence, if someone seeks this effect and perceives benefits from it, such as having more fun or feeling more relaxed, the more likely they will be to drink alcoholic beer (Creyer et al., 2002). Expected positive outcomes of alcohol consumption were previously shown to positively

influence the selection of an alcoholic beverage (Corcoran & Michels, 2008). Furthermore, if someone believes that drinking alcohol can have a desirable effect, this increases their probability of using alcohol for self-presentation (O'Grady, 2013).

Although some consumers perceive benefits of drinking, alcohol consumption can have considerable negative health consequences, and someone's health consciousness can influence their decisions regarding alcohol consumption (Sinkevičius, 2016). Chrysochou (2014) found that health concerns and weight management are the main reasons why consumers choose beer with a lower alcohol content. Hence, being health-conscious may increase someone's odds of drinking NAB rather than alcoholic beer. However, it was suggested that many consumers do not consider NAB a replacement for alcoholic beer but, rather, consume it on occasions where the effects of alcohol are unwanted or inappropriate, such as at a business lunch or when driving (Silva, Jager, van Bommel, et al., 2016; Vasiljevic et al., 2019). Therefore, the consumption situation may differ for NAB versus alcoholic beer.

Despite the advantages of NAB, such as its lower calorie content or the ability to drive when drinking it, someone is unlikely to choose NAB if they do not like its taste. It has been shown repeatedly that NAB has a reputation for having little taste and that taste is the most important factor discouraging people from buying NAB (Chrysochou, 2014; Silva, Jager, van Bommel, et al., 2016). Hence, if someone believes that drinking NAB will result in a disappointing experience because alcoholic beer tastes better, this may reduce their likelihood of drinking NAB.

The choice of an alcoholic beer or NAB may be a result of stereotypes a consumer associates with these beverages but is likely influenced by other social and individual factors. We hypothesized that among consumers who have subjective and personal norms favoring alcoholic beer rather than NAB, those who perceive benefits of drinking alcohol and have negative expectations of the taste of NAB and those who are not health-conscious are less likely to consume NAB.

The results from this study offer important insights into the image of NAB consumers and the determinants of (not) drinking NAB instead of alcoholic beer in a society with a high affinity for beer.

6.2. Material and methods

6.2.1. Data collection and sample characteristics

We conducted an online experiment in Germany (N = 509). The data were collected by a market research company (respondi AG, Cologne, Germany). The ethical commission of ETH Zürich approved the study before the data collection began (approval number EK-2021-N-70-A). The study was conducted in May 2021 until the desired number of responses and quotas for gender and age were reached. Participants who completed the questionnaire at a speed below the median time of the entire sample (Mdn = 349 s) were excluded, since the short duration indicated inaccurate reading and answering of the questions. The final sample (N = 509) consisted of 247 male and 262 female participants. The mean age was 47 years (SD = 15).

6.2.2. Procedure

Participants received an online questionnaire consisting of three parts. In the first part, we assessed participants' age and consumption of beer with and without alcohol. Participants who were below 18 years old or who did not drink beer with or without alcohol were excluded from the study. Participants who passed these filter criteria were asked to state their consumption frequency and quantity of beer with and without alcohol as well as the place of consumption. In the second part, we conducted the experiment to investigate stereotypes associated with alcoholic beer and NAB. Therefore, participants were assigned to one of four experimental groups. They were presented with a description of a person consuming alcoholic beer and NAB and were asked to evaluate the described person on a range of adjectives. In the third part, we assessed various scales to investigate the determinants of being an NAB consumer. More specifically, we assessed the subjective and personal norms of consuming beer with and without alcohol. Furthermore, participants were asked to state their agreement with a set of statements regarding the benefits of consuming alcohol in general and to indicate their beliefs about the taste of NAB. Finally, we assessed participants' health consciousness and level of education. The following sections provide more details about the conduct of the experiment and assessments of the different scales.

Consumption of (non-alcoholic) beer

For the consumption frequency of alcoholic beer, participants had the possible answers of *I don't drink beer with alcohol* (1), *less than once a month* (2), *about once a month* (3),

several times a month (4), *about once a week* (5), *several times a week* (6), and *daily* (7). For consumption quantity, participants were asked how many glasses they normally drink when consuming alcoholic beer. They could select one of the following answers: *less than a glass* (1), *1–2 glasses* (2), *2–3 glasses* (3), *3–4 glasses* (4), *4–5 glasses* (5), *5–6 glasses* (6), or *more than 6 glasses* (7). There was a note that a glass of beer refers to 33 cl. Then participants were asked where they most often consumed alcoholic beer before COVID-19, since their answers could otherwise be biased due to the most recent lockdowns and imposed restrictions. The options were *restaurant* (1), *bar/pub* (2), *club/party* (3), *at a friend's place* (4), *at home* (5), or *other* (6). Participants who stated that they do not drink alcoholic beer were not asked about consumption quantity or place of consumption. For NAB, the same procedure was followed.

Stereotype experiment

The main goal of this study was to investigate consumers' perceived stereotypes about people who drink NAB or alcoholic beer. To investigate this issue, we used a vignette study. The vignette method was previously used in studies to research people's views on meat consumers and vegetarians (Hartmann et al., 2018; Ruby & Heine, 2011). With such a method, participants are presented with scenarios in which the variables of interest are systematically manipulated. The approach is useful because it employs an indirect method to measure attitudes and judgments (Atzmüller & Steiner, 2010). The present study aimed to indirectly measure the influence of the type of beer on participants' opinion of the person consuming it. Participants were presented with the following description (scenario): *Susanne [Peter] is 35 years old. She [he] lives in Zurich. After work, she [he] is meeting her [his] friends in a restaurant and orders a [non-alcoholic] beer*. The two variables of interest that were manipulated were the type of beer the person drank (alcoholic beer or NAB) and the gender of the target. The male target was named Peter and the female target Susanne, which are both common German first names. Each participant, thus, read the description of either Susanne or Peter drinking a beer or NAB. After reading the description, participants were asked to evaluate the described person on a range of bipolar adjectives reflecting the character and lifestyle of the person. The adjectives were selected according to what is typically used in the Big Five inventory (Kovaleva, Beierlein, Kemper et al., 2013). Furthermore, we included a range of adjectives that were deemed relevant in the context of beer and alcohol consumption, such *as tense–relaxed, health-conscious–not health-conscious,* or *active–inactive*. Table 21 (section 6.3.1) provides an overview of the adjectives used. Participants were asked to evaluate the described person (*in my view, Susanne [Peter] is*) by moving a slider for each adjective pair. The slider had no

indication of value and no grid lines. The rating was transformed into a value between 0 and 100 (e.g., 0 = *undisciplined*, 100 = *disciplined*). All participants were presented with the 14 bipolar adjectives in a random order. After they evaluated the characteristics of the described person, participants were asked whether the beer the person drank contained alcohol or not. This step was included to ensure that participants were aware of this detail and the manipulation was successful. Participants that did not correctly answer the question were excluded from the analysis. Within the total sample, 235 participants received the description of Peter, and Peter was drinking NAB in 126 of these cases, and 235 received the description of Susanne, and Susanne was drinking NAB in 125 of these cases. The quotas for age and gender were the same as for the four conditions of a man (Peter) or woman (Susanne) consuming alcoholic or non-alcoholic beer, respectively.

Scales assessment

Subjective norms. Participants were asked to indicate their agreement with eight statements about subjective norms of consumption of beer with and without alcohol. Therefore, we expanded a scale used by Wang (2020). Agreement could be stated on a 7-point Likert-type scale with the possible answers ranging from *I fully disagree* (1) to *I fully agree* (7). Only the extreme points were verbally anchored. A principal component analysis was conducted to test whether the items loaded onto one component. The explained variance of the first component was 44%, but the scree plot justified a one-component solution. All factor loadings were higher than 0.71, and a Cronbach's α of 0.84 showed good reliability of the scale with the items from component 1. The final subjective norms scale included the following items: *people who drink NAB are viewed as fun killers*; *it is inappropriate to offer guests NAB*; *my friends think negatively of NAB*; *people who are important to me think I should drink beer with alcohol*; and *it is weird to drink NAB if other people drink beer with alcohol*. The mean of the five items was calculated, with a higher mean indicating that a participant perceived the social norms to be in favor of alcoholic beer rather than NAB.

Personal norms. The items used to assess participants' personal norms regarding NAB were *if I drink NAB, people ask me why; I don't need to justify myself to my friends if I drink NAB* (reverse coded)*;* and *I'm ashamed to drink NAB at a party.* Again, answers could be given on a 7-point Likert-type scale as described above. All three items loaded onto one factor with all factor loadings being higher than 0.72. Cronbach's α of 0.63 indicated moderate reliability of the scale. For further analyses, the mean of the three items was calculated, with a higher mean indicating that a participant's personal norms were not in favor of NAB.

Beliefs about the benefits of alcohol consumption. The perceived benefits of consuming alcohol in general were assessed using five items adapted from Creyer et al. (2002) scale. Participants provided answers on a 7-point Likert-type scale as described above (see above, Subjective norms). Principal component analysis suggested a one-component solution. The scale had high reliability (α = 0.88) and included the following items: *alcohol facilitates contact with others*; *one has more fun when drinking alcohol*; *alcohol facilitates sexual encounters*; *alcohol makes it easier to handle stress*; and *alcohol gives people something to do*. The mean of the five items was calculated, with a higher mean value indicating that someone perceived more benefits from consuming alcohol.

Health consciousness. Participants' health consciousness was assessed using four items, such as *my health depends on what I eat and drink* and *I think it is important to live healthily*, and was partially based on a previous study by Schifferstein and Oude Ophuis (Schifferstein & Oude Ophuis, 1998). Again, a 7-point Likert-type scale was used. The items loaded onto one factor and had good reliability with Cronbach's α of 0.85. The mean of the scale was calculated to use for further analyses. A higher mean indicated higher health consciousness.

Taste expectations of non-alcoholic beer. Participants were asked to indicate their agreement on a 7-point Likert-type scale with three statements about the taste of NAB. The three items were *NAB tastes better than beer with alcohol* (reverse coded); *the taste of beer with alcohol strongly differs from that of NAB*; and *beer with alcohol tastes better than NAB.* All factor loadings were higher than 0.625 and loaded on one component. The scale had an acceptable reliability with Cronbach's α of 0.71. The mean of the items was calculated, with a higher mean indicating that someone thought NAB has an inferior taste to alcoholic beer.

6.2.3. Data analysis

Stereotype experiment

The evaluation of a person's characteristics based on 14 bipolar adjectives included only participants who correctly remembered whether or not the beer in the description was alcoholic beer (n = 470). We conducted a three-way repeated measures analysis of variance (ANOVA). Characteristics ratings were the within-subjects factor and beer type (2 levels), target gender (2 levels), and rater gender (2 levels) were the between-subjects factors. The gender of the rating participant was used as a between-subjects factor because it could influence their evaluation of the described person. Due to the sample size and number of tests, a

significance level of $\alpha = 0.01$ was used. We also wanted to know how beer type, target gender, and rater gender influenced evaluations of the different adjective pairs. Therefore, we conducted univariate ANOVAs for each adjective pair separately. The adjective pairs were the dependent variable and beer type (2 levels), target gender (2 levels), and rater gender (2 levels) were the independent variables.

Determinants of being an NAB consumer

We investigated the factors that influence whether someone is willing to drink NAB or not. The frequency of consuming NAB was recoded into a dichotomous NAB consumption variable. Participants who stated that they never drink NAB were coded as a 0, indicating that they do not drink NAB, whereas all other participants were coded as a 1, indicating that they drink NAB. With this dichotomous variable (NAB consumer), two binary logistic regressions were conducted separately for men and women, since they may perceive drinking beer or NAB differently. The predictors used in the regressions were subjective norms, personal norms, perceived benefits of alcohol consumption, health consciousness, taste expectations of NAB, and age.

6.3. Results

6.3.1. Stereotype experiment

The two between-subjects factors, beer type and target gender, resulted in four experimental groups. The participants in these four groups did not differ in terms of gender, age, or level of education. They also did not differ in terms of frequency and quantity of alcoholic or non-alcoholic beer consumption, indicating that the randomization was successful.

The three-way repeated measures ANOVA revealed a significant main effect of within-subjects factor characteristics, $F(13, 5850) = 229.90$, $p < 0.001$, partial $\eta^2 = 0.34$. The degrees of freedom are reported under the assumption that sphericity was given, since the Greenhouse-Geiser adjustment for violation of sphericity revealed the same results. The between-subjects factors of beer type, $F(1, 450) = 59.80$, $p < 0.001$, partial $\eta^2 = 0.12$, target gender, $F(1, 450) = 25.07$, $p < 0.001$, partial $\eta^2 = 0.53$, and rater gender, $F(1, 450) = 8.71$, $p < 0.001$, partial $\eta^2 = 0.19$, were all statistically significant. There was a significant two-way interaction between both characteristics and beer type, $F(3, 5850) = 28.35$, $p < 0.001$, partial $\eta^2 = 0.06$, and characteristics and target gender, $F(13, 5850) = 24.35$, $p < 0.001$, partial $\eta^2 = 0.05$. The two-way interaction between characteristics and rater gender was not significant, $F(13, 5850) =$

2.36, $p = 0.019$, partial $\eta^2 = 0.01$. The three-way interactions of characteristics × beer type × target gender, $F(13, 5850) = 2.79$, $p = 0.001$, partial $\eta^2 = 0.06$, was significant, suggesting that the effect of beer type on the rating of characteristics differed between Peter and Susanne. None of the remaining three- or four-way interactions were significant.

The results show that the alcohol content of beer, the gender of the described person, as well as the gender of the rating participant had an influence on how the described person was perceived on a range of characteristics. Table 21 provides an overview of the means and standard deviations of the adjective pairs.

Table 21. *Means of characteristic ratings of Peter and Susanne drinking alcoholic or non-alcoholic beer by rater gender.*

	Men				Women			
	Peter		Susanne		Peter		Susanne	
Characteristic	AB M (SD) *n* = 49	NAB M (SD) *n* = 61	AB M (SD) *n* = 65	NAB M (SD) *n* = 66	AB M (SD) *n* = 60	NAB M (SD) *n* = 65	AB M (SD) *n* = 45	NAB M (SD) *n* = 59
Undisciplined (0) – disciplined (100)	58 (23)	82 (17)	64 (22)	77 (18)	57 (19)	81 (16)	67 (21)	81 (17)
Cowardly (0) – brave (100)	64 (18)	63 (19)	61 (19)	65 (22)	61 (13)	72 (18)	70 (17)	69 (16)
Irrational (0) – rational (100)	61 (22)	83 (15)	67 (20)	80 (18)	58 (18)	86 (15)	69 (19)	83 (19)
Tense (0) – relaxed (100)	72 (22)	74 (22)	73 (20)	77 (22)	72 (19)	82 (19)	77 (18)	80 (19)
Popular (0) – unpopular (100)	31 (18)	32 (19)	34 (23)	30 (23)	29 (14)	26 (21)	27 (20)	35 (26)
Intolerant (0) – tolerant (100)	68 (19)	75 (18)	71 (18)	76 (20)	68 (17)	76 (19)	74 (18)	76 (21)
Boring (0) – interesting (100)	64 (21)	61 (24)	68 (21)	64 (25)	64 (16)	70 (21)	74 (15)	70 (24)
Unsatisfied (0) – satisfied (100)	73 (19)	74 (18)	73 (20)	78 (20)	71 (19)	81 (16)	75 (19)	78 (19)
Traditional (0) – modern (100)	46 (23)	68 (22)	55 (25)	73 (21)	54 (22)	72 (20)	66 (25)	72 (19)
Introverted (0) – extroverted (100)	60 (17)	58 (20)	64 (19)	63 (22)	68 (15)	65 (21)	71 (17)	65 (20)
Inactive (0) – active (100)	70 (20)	73 (21)	73 (20)	74 (18)	72 (15)	82 (17)	77 (16)	80 (17)
Not health-conscious (0) – health-conscious (100)	49 (25)	79 (17)	56 (23)	79 (20)	48 (17)	78 (19)	60 (20)	79 (19)
Masculine (0) – feminine (100)	35 (22)	40 (21)	56 (24)	66 (23)	32 (16)	33 (20)	68 (18)	77 (19)
Weak (0) – strong (100)	62 (20)	68 (25)	66 (22)	75 (22)	61 (17)	79 (18)	71 (18)	78 (17)

Note. N = 470. AB refers to beer containing alcohol, NAB represents non-alcoholic beer.

For each characteristic, separate 2 (beer type) × 2 (target gender) × 2 (rater gender) ANOVAs were conducted. In the following paragraphs, we first discuss the main effect of beer type and the interaction effects of beer type with other independent variables on the individual adjective pairs. Then we examine the main effects of target gender and rater gender and the interaction effect of these variables on the adjective pair rating.

Beer type had a significant main effect on nine of the 14 characteristics. A person that was described as drinking NAB was perceived to be significantly more *health-conscious*, $F(1,460) = 184.21$, $p < 0.001$, *rational*, $F(1,459) = 127.04$, $p < 0.001$, *disciplined*, $F(1,460) = 111.40$, $p < 0.001$, *modern*, $F(1,458) = 58.54$, $p < 0.001$, *stronger*, $F(1,457) = 29.45$, $p < 0.001$, *feminine*, $F(1,459) = 11.05$, $p = 0.001$, *tolerant* $F(1,460) = 9.79$, $p = 0.002$, *satisfied*, $F(1,459) = 7.14$, $p = 0.008$, and *relaxed*, $F(1,459) = 6.94$, $p = 0.009$.

For two of these characteristics, a significant interaction of beer type × target gender was found: *rational*, $F(1,459) = 11.84$, $p = 0.001$, and *disciplined*, $F(1,460) = 9.25$, $p = 0.002$. In other words, the effect of beer type on the evaluation of these characteristics differed between the male and female targets. The female target, Susanne, was perceived as more *rational*, $t(231) = -5.34$, $p < 0.001$, when drinking NAB ($M = 82$, $SD = 19$) compared to when drinking alcoholic beer ($M = 68$, $SD = 19$). She was also perceived to be more *disciplined*, $t(231) = -5.23$, $p < 0.001$, when drinking NAB ($M = 79$, $SD = 18$) compared to when drinking alcoholic beer ($M = 66$, $SD = 21$). This effect of beer type was more pronounced for the male target. Peter was perceived as being more *rational*, $t(232) = -10.82$, $p < 0.001$, when drinking NAB ($M = 84$, $SD = 15$) compared to when drinking alcoholic beer ($M = 59$, $SD = 20$) and more *disciplined*, $t(250) = -9.84$, $p < 0.001$, when drinking NAB ($M = 82$, $SD = 16$) compared to when drinking alcoholic beer ($M = 57$, $SD = 21$). For the remaining bipolar adjectives, no significant differences in ratings were found between beer types, nor were there any two-way interactions with beer type × target gender and beer type × rater gender, nor any significant three-way interactions of beer type × target gender × rater gender.

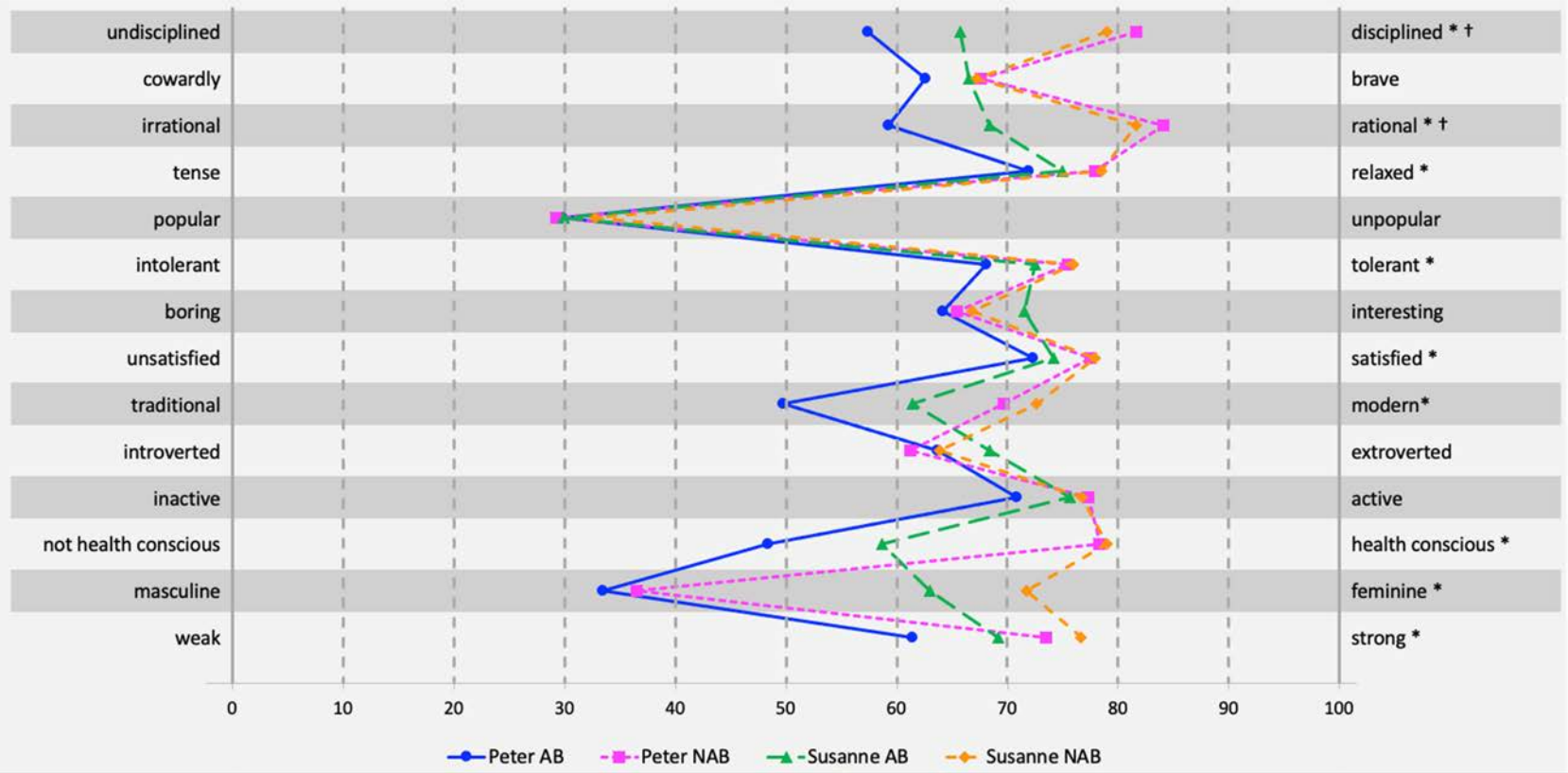
Target gender had a significant main effect on four adjective pairs. The female target, Susanne, was perceived to be more *feminine*, $F(1,459) = 278.25$, $p < 0.001$, *modern*, $F(1,458) = 10.31$, $p = 0.001$, *health-conscious*, $F(1,460) = 8.09$, $p = 0.005$, and *stronger*, $F(1,457) = 7.55$, $p = 0.006$, than Peter independently of the type of beer she was described to be ordering. There was a significant interaction of target gender × rater gender for the attribute pair masculine–feminine. Susanne was perceived to be more *feminine* by women ($M = 72$, $SD = 19$) than by men ($M = 62$, $SD = 24$), $t(232) = 3.59$, $p < 0.001$, but no significant difference in

perception between men and women was found for Peter, $t(232) = -1.94$, $p = 0.054$. All other two-way interactions of target gender × rater gender were insignificant.

Rater gender did not have a significant main effect on any of the adjective pairs. Therefore, the ratings of male and female raters were pooled for a graphical illustration of the ratings of the male (Peter) and female (Susanne) targets consuming NAB or alcoholic beer (Figure 7).

The above results provide evidence for our hypothesis that the type of beer has an influence on how someone is viewed by others. NAB consumers were perceived as more feminine than consumers of alcoholic beer. However, this effect was independent of the target's gender, and we, thus, only partially accept our hypothesis that beer type affects how masculine or feminine someone is perceived to be.

Figure 7. *Means of characteristics ratings for target gender and beer type.*



Note. The means of men's and women's ratings were pooled, since no significant interaction of rater gender and beer type was found. Peter was the male target, Susanne the female target. AB refers to beer containing alcohol, NAB represents non-alcoholic beer.

* Significant effect of beer type ($p < 0.01$)

† Significant interaction effect of beer type × target gender ($p < 0.01$)

6.3.2. Determinants of being an NAB consumer

As its second goal, this study aimed to investigate how factors other than the impressions someone may have of consumers of alcoholic beer and NAB determine whether that person drinks NAB. Therefore, two binary logistic regressions were conducted for male and female participants to determine the predictors of being an NAB consumer (Table 22). Male and female participants were analyzed separately, since norms regarding alcohol consumption and health consciousness may play a different role in men compared to women. Participants who stated that they did not consume NAB ($n = 120$) were coded with 0, while the remaining participants ($n = 389$) were coded with 1. Subjective norms, personal norms perceived benefits of drinking alcohol, health consciousness, the taste expectations of NAB, and age were used as predictor variables.

For women, the model was significant, $\chi^2(6) = 47.08$, $p < 0.001$, and the Nagelkerke pseudo R^2 was 0.29. The strongest predictors were taste expectations, personal norms, health consciousness, and age. That is, the greater someone's prejudice regarding the taste of NAB, the more she considered alcoholic beer to be part of her personal norms; the less health-conscious and the older someone was, the less likely she was to consume NAB. For men, the model was also significant, $\chi^2(6) = 34.20$, $p < 0.001$, and the Nagelkerke pseudo R^2 was 0.19. As opposed to women, men had only one significant predictor: taste expectations. Thus, the more someone believed that alcoholic beer tastes better than NAB, the less likely he was to consume NAB.

Table 22. *Binary logistic regression for the likelihood of being a non-alcoholic beer consumer.*

	Women (n = 262)				Men (n = 247)			
Variable	*B*	SE B	OR	95% CI	*B*	SE B	OR	95% CI
Constant	3.73	1.37	41.49*		5.15	1.31	173.14*	
Subjective norms	0.21	0.19	1.23	[0.85, 1.78]	−0.25	0.15	0.78	[0.58, 1.04]
Personal norms	−0.50	0.18	0.61*	[0.43, 0.86]	−0.22	0.14	0.80	[0.60, 1.06]
Health consciousness	0.45	0.16	1.57*	[1.14, 2.17]	0.05	0.14	1.05	[0.80, 1.37]
Taste	−0.77	0.16	0.46*	[0.34, 0.63]	−0.41	0.12	0.66*	[0.52, 0.84]
Benefits of alcohol consumption	0.10	0.16	1.11	[0.81, 1.51]	0.02	0.13	1.02	[0.80, 1.30]
Age	−0.02	0.01	0.98*	[0.95, 1.01]	−0.02	0.01	0.98	[0.96, 1.00]

* $p < 0.01$

Within the sample of 509 participants, 120 drank only alcoholic beer (24%), 371 drank both beer with alcohol and NAB (73%) and 18 drank exclusively NAB (3%). Exclusive NAB consumers drank NAB more often than consumers who additionally consumed alcoholic beer, $t(387) = 3.05$, $p = 0.002$, but when doing so, they drank similar amounts, $t(387) = 0.71$, $p = 0.48$. Consumers who only drank beer with alcohol consumed beer more often than consumers who drank both NAB and alcoholic beer, $t(489) = 2.34$, $p = 0.02$. Furthermore, they drank more beer per occasion compared to consumers who drank both types of beer, $t(489) = 5.35$, $p < 0.001$. These results indicate that the total alcohol intake of consumers who drank only beer with alcohol was higher compared to consumers who also drank NAB occasionally. Although men drank significantly more alcoholic beer, $t(489) = -4.81$, $p < 0.001$, and more often, $t(507) = -5.10$, $p < 0.001$, than women did, there was no difference between genders in NAB consumption frequency, $t(507) = -0.22$, $p = 0.829$, and quantity, $t(387) = -1.68$, $p = 0.093$.

It was previously reported in the literature that NAB is considered an appropriate drink on occasions when drinking alcohol would be inappropriate or illegal, such as at a business lunch or when driving. Therefore, we wanted to know whether differences exist between NAB and alcoholic beer in the place of consumption (Table 23). NAB was consumed more often in restaurants or at home, whereas alcoholic beer was more often consumed in a bar or pub, at a party, or a friend's house. However, the percentages indicate that participants drank beer with and without alcohol in the same places.

Table 23. *Places of consumption of alcoholic and non-alcoholic beer.*

	Alcoholic beer		NAB	
	n	%	*n*	%
Restaurant	54	11	73	19
Bar/Pub	59	12	23	23
Club/Party	23	5	11	3
At a friend's house	111	23	78	20
At home	236	48	196	50
Other	8	2	8	2
Total	491	100	389	100

Note. The total number of participants differed, since only participants who stated that they drink alcoholic beer and/or NAB were asked where they consume it.

6.4. Discussion

The main goal of the present study was to assess stereotypes about consumers of beer with and without alcohol. The type of beer or its alcohol content had a significant influence on how the person consuming it was viewed by others. Earlier research found that drinking alcoholic beer was associated with being *relaxed*, *happy*, or *free*, while drinking NAB was associated with neutral to negative terms, such as *conscious*, *disappointed*, or *responsible* (Silva, Jager, van Bommel, et al., 2016). The authors suggested that an improvement of the image of NAB is needed so consumers will change how they conceptualize NAB, which may increase its consumption (Silva, Jager, van Bommel, et al., 2016). In the present study, the associations of NAB consumers with traits like being *rational*, *disciplined*, or *health-conscious* were likely due to the absence of alcohol and the ability of the consumer to be in control of themselves. At the same time, a person consuming NAB rather than alcoholic beer was perceived as more *relaxed*, *satisfied*, and *tolerant*. Hence, the stereotype of a person who consumes NAB may be more positive than the conceptualizations of NAB in an earlier study implied.

Drinking alcohol, and beer in particular, is perceived as a masculine activity and can be a way to confirm a person's gender status (de Visser & McDonnell, 2012; Fugitt & Ham, 2018). The present study found that drinking beer may indeed be perceived as something men do,

since the person was perceived to be more masculine when described as drinking beer with alcohol and more feminine when drinking NAB, which was the case for both male and female targets. Hence, if NAB consumers are perceived as more feminine, people who want to appear masculine may not favor NAB over alcoholic beer (Fugitt & Ham, 2018). At the same time, NAB may be attractive for people who want to convey an image of femininity and containment. One's awareness of stereotypes linked to different beer types may influence their behavior (Vartanian et al., 2007). Thus, while one may choose alcoholic beer as a tool for self-presentation, one may do the same with NAB depending on how they want to be seen by others.

In the second part, the study investigated determinants of consuming NAB. Not being an NAB consumer was best predicted by the conviction that alcoholic beer tastes better than NAB, in line with earlier studies (Chrysochou, 2014; Silva, Jager, van Bommel, et al., 2016). Despite the considerable effort taken in recent years to improve the taste of NAB (Gernat, Brouwer, Faber-Zirkzee et al., 2020), the belief that NAB has an inferior taste compared to alcoholic beer seems to prevail. Silva, Jager, Voss et al. (2017) suggested that the opinion of a beer may be the result of it being labeled as alcohol-free rather than its actual taste. Hence, producers of NAB should give consumers the opportunity to try the NAB to convince them of the taste.

Subjective norms, or what behavior someone believes others approve of, was previously reported to strongly influence alcohol consumption (Cooke et al., 2016). However, our findings suggest that subjective norms may have no predictive power regarding NAB consumption. This may be because subjective norms are linked with a social context and change depending on the situation. For example, someone may believe they will be perceived as boring if they drink NAB at a party. However, if the person is pregnant or driving, the context may change the subjective norms, and the person may believe that others will approve of them drinking NAB. Therefore, participants in this study could have subjective norms favoring alcoholic beer consumption but nevertheless be consumers of NAB.

Personal norms, or what someone feels is the behavior one personally should show, are specific to different persons and situations and are based on prior experience (Herman & Polivy, 2005). For example, if someone drank NAB at a party and nobody reacted negatively, this person may have the personal norm of not being viewed negatively when drinking NAB. Although personal norms only affected women, the results indicate that experiencing NAB consumption as well accepted and that there is no need to be ashamed or to justify oneself, this may lower the threshold for someone to drink NAB.

Health consciousness and weight management were found to be reasons for drinking beer with a lower alcohol content (Chrysochou, 2014). The present study revealed that health consciousness may indeed be an important factor for drinking NAB but primarily for female consumers. Hence, more health-conscious consumers are more likely to buy NAB. Although the reduced calorie content and non-alcoholic compounds make NAB a healthier kind of beer (Mellor et al., 2020), it was previously found that the most important benefits of NAB are the ability to stay in control or drive, rather than health benefits (Silva, Jager, van Bommel, et al., 2016).

Previously, believing that drinking alcohol can have positive outcomes, such as stress reduction, was correlated with higher alcohol consumption (Creyer et al., 2002). Our findings suggest that such beliefs may not predict whether someone is an NAB consumer. This may be because the majority of participants were consumers of both alcoholic beer and NAB. Hence, they may believe alcohol can have desirable effects and drink alcoholic beer when they seek such effects and NAB when they do not.

Earlier studies suggested that beer with a reduced alcohol content is not perceived as a replacement for beer with alcohol but is used when drinking alcohol would be inappropriate or illegal (Vasiljevic, Coulter, Petticrew et al., 2018; Vasiljevic et al., 2019). However, the present study showed that the place of consumption did not differ between the two types of beer and that consumers who drank NAB in addition to alcoholic beer had a lower total alcohol intake. Hence, NAB may nevertheless function as a replacement for regular-strength beer. Furthermore, previous research suggested that beer with less alcohol may be more appealing to women (Chrysochou, 2014), but the present study found no difference in NAB consumption between men and women.

6.4.1. Limitations and Future Research

The present study had several limitations. The format of an online study was used to assess people’s prejudices about the character of a person depending on the type of beer they consumed. In the description, two targets had popular German names, Susanne and Peter. Participants may have had associations with people they know who are called Susanne or Peter, which might have affected the ratings. The described situation was a workday and the place of consumption was a restaurant, thus limiting the generalizability of our results. A person described as drinking NAB on another occasion or in a different place, such as at a party or in a club, may yield different results. Moreover, specific people, such as pregnant women, or situations, such as when someone is driving, may influence perceptions of alcoholic beer or

NAB consumption. Future studies should assess how choosing an alcohol-free alternative to regular-strength beer is perceived in different situations than the one used in this study. Furthermore, research should investigate how the influence of factors affecting consumers' beer choice, such as the subjective norms assessed in this study, differs depending on the consumption situation and the setting. In this study, *masculine–feminine* was used as a bipolar adjective pair. Since it may be argued that feminine is not the opposite of masculine, future studies should assess this item using *feminine–not feminine* and *masculine–not masculine*.

The present study investigated how consumers of NAB and alcoholic beer are perceived. However, we do not know to what degree someone changes consumption behavior depending on such stereotyping to convey a particular image. For example, someone may perceive NAB consumers as *rational* but would not like to be perceived this way by others, which may decrease the probability of drinking NAB. Thus, we do not know to what degree (not) consuming NAB is a result of impression management in relation to others and other factors investigated in this study. Future studies should investigate the role of stereotypes about NAB in comparison to known determinants, such as norms, and how addressing these may promote the consumption of healthier beer. The study was conducted in Germany, which may limit the generalizability of the findings, since Germany has one of the highest shares of NAB consumption among total beer consumption in Europe and the acceptability of NAB may be higher than elsewhere (Brewers of Europe, 2020a). Consumers who drink both NAB and alcoholic beer, rather than only alcoholic beer, had a lower total alcohol intake from beer. However, we cannot infer that drinking NAB in addition to beer with alcohol reduces consumption of the latter. Future studies should investigate to what degree stereotypes affect consumer behavior and whether consumers are willing to use NAB as a substitute for beer with alcohol. The vignette experiment used in this study was shown to be a useful method to provide insights in this realm.

There are several practical implications of this study's findings. The results indicate that stereotypes associated with NAB may be more positive than how NAB has been conceptualized. Thus, beer producers could integrate the positive aspects associated with people consuming NAB, such as *modern, strong, satisfied, relaxed,* or *tolerant*, which have not been used previously in NAB advertising (Vasiljevic, Coulter, et al., 2018). At the same time, many consumers seem not to be willing to drink NAB due to negative impressions of its taste. To overcome this, beer producers should offer more possibilities to try their NAB and consequently reduce consumers' perceived risk of ordering something they will not like.

There may be several explanations for alcoholic beer's predominance in the market. If a consumer selects the alcoholic, rather than the non-alcoholic, version of a beer, this may, on the one hand, be because they would not like to be viewed as an NAB consumer, which is based on how they view others who consume NAB. On the other hand, many other variables may influence the choice of alcoholic beer, such as disliking the taste of NAB, thinking peers would not approve of drinking NAB, or having a previous bad experience of drinking NAB.

6.5. Conclusion

The present paper investigated stereotypes associated with consumers of beer with and without alcohol. An online study on a German sample revealed that the type of beer someone drank had a significant effect on how they were perceived by others. If a person was described as ordering an NAB, they were perceived to be *health-conscious*, *rational*, *disciplined*, *modern*, *stronger*, *tolerant*, *satisfied*, and *relaxed*. The findings indicate that drinking NAB may not evoke associations that are as negative as earlier studies suggested. However, a person drinking NAB was perceived as less masculine than a person drinking alcoholic beer, which supports earlier findings that drinking beer is perceived as "a male thing."

The study further aimed to assess how factors other than stereotypes determine whether someone drinks NAB. The most decisive factor in the choice to consume NAB was the belief that the taste of NAB is inferior to that of alcoholic beer. Furthermore, personal norms of drinking alcoholic beer, health consciousness, and age were significant predictors of being an NAB consumer only for women. This paper adds to the knowledge of stereotypes about the type of beer someone drinks. Future studies should assess whether inferences about others based on what beer they drink lead to changes in behavior to convey a certain image. For practitioners, image campaigns may be a way of promoting NAB and tackling potentially undesirable connotations of NAB consumption among consumers. Furthermore, producers of NAB should address misconceptions about NAB and offer tastings to overcome the negative perception that NAB has an inferior taste compared to alcoholic beer.

Chapter 7

GENERAL DISCUSSION

7.1. Introduction

Alcohol is one of the most consumed beverages. It is a widely accepted social lubricant that is part of social gatherings and dining customs across many parts of the world, particularly in Europe. The alcohol industry remains an important sector of many economies due to the creation of jobs in the production and trading of alcohol, as well as through the significant financial contribution from taxes on alcohol (Auderset & Moser, 2016; Brown, 2011). However, high levels of alcohol consumption can cause alcohol-attributable diseases, dependence, and higher costs to the public health sector (Room et al., 2005).

The demand for alcoholic beverages is undergoing changes triggered by a change in consumer behavior. The demand for more local, sustainable, and natural products as well as more transparency regarding the ingredients and manufacturing of products is increasing (Nielsen, 2015). More authentic and local products, like craft beer and natural wine, are gaining a market share and indicate that alcoholic beverages are not exempt from this paradigm shift of consumers (Brewers of Europe, 2019; Pöchtrager et al., 2018). Furthermore, the market must meet the needs of a young, knowledgeable cohort that is more involved with wine and beer and shows different consumption patterns than previous generations (Bauman et al., 2019). Older generations, especially in Mediterranean countries, often consume a moderate amount of wine in company and/or with meals (Agnoli et al., 2018; Agnoli et al., 2011). In contrast, many young European consumers drink less alcohol during the week but higher amounts on weekends, and instead of wine, they drink more beer and stronger alcohols, like vodka (Agnoli et al., 2018; BFS, 2019). At the same time, Europe is the only continent on which per capita alcohol consumption has been decreasing in the last two decades (WHO, 2018).

Alcoholic beverages are fascinating to some, inspire connoisseurship, and are deeply integrated in many cultures, but they are simultaneously debased as problematic substances: the most widely accepted and consumed drug worldwide. This discrepancy can lead to heated debates due to the varying interests of admirers and antagonists. This dissertation explored consumer behavior with alcoholic beverages from both angles. It investigated how consumers perceive alcoholic beverages in the context of a shop or restaurant. It also addressed consumers' perception of alcohol as something they consume that is potentially health-threatening. Finally, it assessed how alcohol consumption is used to form stereotypes about others. In the following paragraphs, the central findings of the studies reported in this dissertation on the perceived naturalness of wine, choice from wine lists in restaurants, HWLs, and stereotypes about

alcoholic and non-alcoholic beer are discussed. Practical implications and directions for future studies are provided for each investigated topic. The general shortcomings of the methodologies used for this dissertation are discussed with an outlook for future research. The conclusion summarizes the insights gained from the studies about consumer behavior relating to alcoholic beverages.

7.2. Central findings

7.2.1. Perceived naturalness of wine

The trend toward natural products and the notion that "natural is better" have reached the alcohol sector. The increasing demand for so-called natural wines is the obvious consequence of this (Vecchio et al., 2021). Even when a product is not labeled as "natural" consumers may use the perceived naturalness as a heuristic when making a purchase decision (Siegrist & Arvai, 2020).

Our study on the perceived naturalness of wine showed that perceived naturalness is important for wine but that differences exist between consumers and between countries. Naturalness was more important to Swiss than to Australian consumers. Furthermore, consumer involvement had an influence on the importance of perceived naturalness of wine to their purchase decision. The findings show that consumers in different markets may have different perceptions of a product, which can affect how a product should be marketed. For example, in the Australian market, screw caps are the norm and may not affect the perceived naturalness as strongly as in the Swiss market. Likewise, the involvement someone has with wine affects how important different aspects, such as the price or origin of the wine, are when purchasing wine (Bruwer, Burrows, Chaumont et al., 2013). In this sense, winemakers should not underestimate the value of highlighting their wine's "natural" aspects, since consumers with high involvement with wine, who are known to spend and consume more wine than consumers with low involvement, paid more attention to the wine's naturalness.

Several attributes that were found to be relevant in the food domain were assessed for their influence on the perceived naturalness of wine. As in the case of food, a wine's origin contributed substantially to its perceived naturalness. Wine-producing countries from the Old World, such as France or Italy, are known for their long tradition of winemaking and their labor-intensive cultivation systems that often do not allow for mechanical harvesting. Conversely, Australia, which is referred to as a New World wine-producing country, is one of the world's largest wine-producing countries and is known for using modern technologies and

large-scale production (Jackson, 2008). Our study showed that wine from Switzerland, which is considered an Old-World wine-producing country, was perceived to be more natural than wine from Australia. These findings confirm the previously reported link between naturalness and tradition (Siegrist & Sütterlin, 2017). Our finding that traditional winemaking techniques, such as aging wine in an oak barrel or sealing a wine bottle with an oak cork, were associated with perceived naturalness support the previously reported link between tradition and perceived naturalness. Organic cultivation of grapes added to a wine's perceived naturalness, which was also found to be an essential requirement for consumers of "natural wines" (Pöchtrager et al., 2018).

The processing steps in production, such as the use of certain technologies, additives, or processing aids, can substantially decrease how natural the final product will be perceived as being (Román et al., 2017). In this regard, the addition of sulfites had an especially negative influence on the perceived naturalness of wine. With the exception of sulfites (due to potential allergic reactions), wine is exempted from nutritional labeling. This may be due to historical perceptions of wine as being a single-ingredient food. These perceptions might not always hold true, as there are several steps in winemaking where additives or processing aids, such as sugar or acids, are added to balance the wine, improve its shelf life, or to benefit its quality (Battaglene, 2014). Our results in Chapter 2 show that, similar to food (Rozin, 2005), the perceived naturalness of wine is especially lowered by additives. Furthermore, physical production processes were found to reduce the perceived naturalness less than chemical processes.

The findings of our study can be useful for winemakers to optimize communication with their customers. In light of the beneficial inferences consumers make with natural products (Amos et al., 2014), winemakers should underline traditional winemaking techniques and avoid technical aspects that lower the perceived naturalness for consumers. While it is not mandatory for producers to reveal how a wine has been produced, whether sugar was added, gelatin was used to clarify the wine, or that oak chips are responsible for the astringency of the wine, winemakers who transparently communicate how their wines were produced may have an advantage if they mention aspects that increase the wines' perceived naturalness.

Future studies should investigate how perceptions of naturalness affect consumers when they buy wine and whether they use the perceived naturalness to infer the quality and taste of a wine. Moreover, we did not estimate the effects of single attributes in combination with each other on the influence of perceived naturalness. Therefore, future research should assess the degree to which the different aspects of origin, production, and packaging affect the

perceived naturalness in combination and which aspects are dominant. The increasing presence of wines labeled as “natural wines” may draw consumers’ attention toward naturalness and warrants further investigation. For example, if some wines are labeled as “natural,” consumers may question why other wines do not carry such a label and whether they are consequently perceived as less natural. Research should also investigate what role the place of purchase plays in this context. For example, buying wine from a winery’s cellar door may convey more naturalness than buying wine in a supermarket or choosing a wine from a restaurant wine list.

7.2.2. Wine choice in restaurants

Wine sales in restaurants and bars (on-trade) have been increasing over the years in Switzerland (BLW, 2021). Wine sales are an important driver of many establishments’ turnover, but selecting a bottle of wine can be a demanding task (Lacey et al., 2009) and consumers often feel intimidated when doing so (Barber et al., 2006). One reason for this is that wine is a product with a complexity and price range beyond comparison. A restaurant wine list should help consumers find a bottle of wine that they like and that pairs with the food they order (Cohen et al., 2009). Since traditional origin-grouped wine lists may be of limited help in inferring the taste of a wine, we investigated whether a wine list with wines organized according to style may be more helpful and, thus, preferred by consumers.

Our study in Chapter 3 showed that a wine list grouping the wines by style categories did not reduce consumers’ perceived difficulty of choosing a wine. Nonetheless, we were able to show that despite the well-established practice of organizing wine lists according to wine origin, many consumers preferred a wine list grouping the wines according to wine style, which offers more information about wine taste.

Our results also showed that not all consumers preferred a change in wine list organization. It was especially consumers with low involvement with wine, who are known to have less experience and knowledge of wine (Bruwer, Chrysochou, et al., 2017), who had higher levels of perceived difficulty in selecting a wine from the wine list than consumers with high involvement with wine. Organizing the wines according to style did not lower their perceived difficulty in making a selection. Consumers’ preferred wine list was independent of their experience or knowledge of wine. Hence, even though some consumers may be accustomed to origin-grouped wine lists and may know how a certain origin is reflected in a wine’s taste, they may nevertheless appreciate a style-grouped wine list. It could be precisely because of this experience with wine that consumers become aware that knowledge of the wine’s origin may not be sufficient to infer its taste. Another reason could be that although

some consumers have a high objective knowledge of wine, they may nevertheless lack confidence in making a wine selection (Hammond et al., 2009).

The prevalence of organizing wine according to origin may be questioned considering that many winemakers refuse to produce wine under a designation of origin, such as AOC (Appellation d'Origine Contrôlée). Such classifications restrict both the grape varieties and production processes with the goal of creating wines that represent the typicity of an origin. A winemaker may decide to cultivate different grape varieties and, thus, create wines that are not typical of the origin. In an origin-grouped wine list, such wines may be misleading for consumers, since they are categorized as something they, in fact, are not. A style-grouped wine list can be more useful for anticipating this phenomenon, since the individual style of the wine is taken into account rather than simply the origin.

The findings of our studies show that the default of organizing wines according to origin may not meet consumers' requirements for a user-friendly wine list. Owing to the exigent nature of wine choice for consumers, restaurants must understand their customers' needs regarding the wine list and how to satisfy them. Hence, as a first step, offering information about wine style may be appreciated by many consumers. In addition, in light of the importance of the food the wine is meant to complement, restaurants could add wine-pairing suggestions for the dishes they offer (Terrier & Jaquinet, 2016). Since the wine list is a way for restaurants to distinguish themselves from others (Ruiz-Molina et al., 2010), modern and unconventional establishments may use a taste-grouped wine list to guide their customers in selecting a wine they will like and that best matches the food.

Future studies should test how different types of wine lists are used in real-life situations—namely, in a restaurant. It would be interesting to assess whether organizing wine lists according to style reduces restaurant patrons' perceived risk when choosing a wine and whether this type of wine list organization would also be appreciated in other places of purchase, such as a wine shop or supermarket. Future studies could also investigate how the consumers' perceived difficulty in selecting a bottle of wine is affected by the increasing use of wine rating apps, such as *Vivino*, since this may be an additional source of information that may be useful for consumers.

7.2.3. Health warning labels on alcohol containers

Preventing the harmful use of alcohol has been a topic on the agenda of the Swiss Government for more than a century (Auderset & Moser, 2016). Although considerable advancements have been made in research on the effects of alcohol and campaigns have been

launched to inform consumers about the risks of drinking, the majority of Swiss people drink wine, beer, and other alcoholic beverages regularly and knowledge of alcohol's health effects is low (BFS, 2019; EZV, 2021). For example, many consumers do not think alcohol consumption can lead to cancer, though it is one of the main alcohol-related causes of death in Switzerland (EZV, 2021; Gmel et al., 2017). Wine is the most consumed beverage in Switzerland and whether or not it is perceived as risky can be decisive in determining whether and how much someone drinks (Sjöberg, 1998).

We conducted two studies using HWLs with a cancer warning and investigated how such warnings affect consumers' perceived risk of drinking alcohol. In the first study, we found a small effect of HWLs on wine bottles on the perceived risk of alcohol consumption but only if the consumed amount and frequency of consumption were not specified. It may be that if consumption was specified, such as drinking two glasses a day, consumers with a consumption pattern differing from the one described did not feel susceptible to the risk and, therefore, may not have seen the need for displaying a cancer warning on the bottle (Sillero-Rejon et al., 2018). The effect of HWLs in the first study could not be reproduced in the second study with HWLs on vodka and wine bottles, where we found no effect of HWLs on the perceived risk of consumption. However, we did find that drinking vodka was perceived as significantly riskier than drinking wine regardless of the presence of an HWL. This finding suggests that consumers' perceived risk of alcohol consumption is influenced by the type of beverage. It was previously reported that consumers do not associate wine with problematic drinking behavior like they do for beer or stronger alcohols, even though it is the drinking pattern, not the type of beverage, that is predictive of experiencing negative consequences of alcohol consumption (Dey et al., 2014). As we further showed, the difference in perceived risk between these beverage types may be the result of the health beliefs consumers have about wine but not vodka.

Our studies demonstrated the significance of the belief in Switzerland that "a glass of wine a day is good for the heart" and the potential negative impact of such a health belief on drinking behavior (Gmel et al., 2017). Participants who believed that wine consumption has positive health effects perceived a lower risk of drinking alcohol and saw no need for HWLs on alcohol containers. Wine's reputation as being beneficial to health if consumed in moderation is abundant in Europe (Vecchio et al., 2017). The belief that moderate wine consumption is healthy may foster doubts that alcohol can cause cancer, which was reported in an earlier study with a large sample of Swiss consumers (Gmel et al., 2017). Health beliefs around wine may result from guidelines issued by governments and medical institutions regarding "safe" consumption. Such guidelines reinforce the perceived health benefits of wine

and are unlikely to raise consumer awareness of the risk of alcohol consumption (Latino-Martel et al., 2011). Attaching HWLs with a cancer warning on the bottles did not alter participants' health beliefs.

It was found that many consumers shared the opinion that "everything causes cancer anyway" and that drinking alcohol would not significantly affect that risk (Pettigrew et al., 2014). Thus, it is possible that HWLs did not raise the perceived risk in our studies because participants were aware of the risk of alcohol consumption but considered it an acceptable risk in light of the perceived benefits of drinking (Martinic & Leigh, 2004).

We used an online experiment to investigate whether HWLs can increase consumers' perceived risk of drinking alcohol. Our experiment did not investigate the effects of such HWLs in a real-life environment, such as in a shop where all alcoholic beverages carry such a label. In a quasi-experiment in Canada, HWLs with a cancer warning statement were tested in liquor stores (Hobin, Weerasinghe, et al., 2020). It was found that the cancer warning statement increased the number of consumers who recalled the link between alcohol consumption and cancer. Thus, warning labels may help to increase awareness and knowledge of alcohol's damaging health effects, but the degree to which the information leads consumers to change their drinking patterns remains unknown (Morgenstern et al., 2021).

It has been argued that warning labels achieve the long-term goal of changing the perception and role of alcohol in a culture (Annunziata et al., 2016). However, our study showed low acceptance of the implementation of HWLs on alcohol containers, especially on wine bottles and in the form of a tobacco-like image-and-text warning. The rejection of such labels was enhanced by a person's opinion of the government's role in restricting individual rights (individualistic values). The importance of individualistic values for the acceptance of policy interventions was shown to be decisive in other realms, such as climate change (Shi et al., 2015). Another reason for the rejection of HWLs that we found was that such labels are perceived to be ineffective in altering drinking behavior.

In cultures where alcohol is highly accepted, such as it is in many European countries, consumers may perceive HWLs to be ineffective, which hinders their acceptance (Jongenelis et al., 2018). It is also likely that in the case of a culturally important beverage like wine, consumers see HWLs as a threat to their values, which enhances their rejection of such labels (Annunziata et al., 2019). Changing the cultural role of a beverage like wine is an ambitious goal and may face strong opposition not only from consumers but notably from the alcohol industry (Hobin, Shokar, et al., 2020). Therefore, policymakers should address health beliefs and inform consumers about the risks of alcohol consumption and that their risk is primarily

influenced by their drinking pattern rather than the type of beverage they consume (Bocquier et al., 2017). Our findings regarding consumers' perceived risk associated with different beverages could be used to improve risk communication about alcohol consumption, for example, by showing that the standard units in which alcoholic beverages are served contain comparable amounts of ethanol, and thus, drinking a beer can be just as risky as drinking a shot of vodka. Although our studies found no substantial influence of HWLs on risk perception in Swiss consumers, it would be interesting to reproduce the study in a country with a less alcohol-favorable culture than Switzerland. Furthermore, it would be interesting to investigate how the associations consumers have with specific beverage types influence their behavior.

7.2.4. Stereotypes about beer consumers

NAB, like alcoholic beer, contains compounds that can have a beneficial health effect without the damaging influence from ethanol (Mellor et al., 2020). Despite being "a beer with benefits," NAB still accounts for only a small percentage of total beer consumption (Brewers of Europe, 2020c). It seems that although drinking alcoholic beverages can have numerous negative consequences, first and foremost, in terms of health, consumers are more inclined to consume "normal" wine and beer instead of alternatives with reduced alcohol and caloric content (Vasiljevic, Couturier, Frings et al., 2018; Vasiljevic, Couturier, & Marteau, 2018).

What someone consumes is used to build stereotypes about them (Vartanian et al., 2007). In our study, we assessed how the type of beer—alcoholic or non-alcoholic beer—is used to infer the characteristics of the person consuming the beverage. Consumers of NAB were perceived as more rational, disciplined, health-conscious, relaxed, satisfied, and tolerant than consumers of alcoholic beer. While these characteristics may be positive to some, they may be perceived negatively by others. We do not know to what degree consumers adapt their consumption as part of their impression management (Yantcheva & Brindal, 2013). It may be that some consumers do not want to convey the image they associate with NAB, which may include the above-mentioned attributes. NAB producers may tackle this obstacle with image campaigns.

Our study indicated that negative expectations of the taste of NAB are the main reason not to consume NAB. This may be particularly challenging because it was previously reported that labeling beer as alcohol-free is already sufficient to evoke a negative reaction from consumers and to reduce their liking of a product (Silva, Jager, Voss et al., 2016). Product tastings may be a way to familiarize consumers with NAB and improve its reputation regarding its taste.

Despite the differences between consumers, we showed that norms of drinking alcoholic beer can be a barrier to switching to a healthier NAB. However, norms can change over time (Gërxhani & Bruggeman, 2015). While drinking wine for lunch or smoking in the office were considered normal several decades ago, such behaviors would be unimaginable in Switzerland today. Thus, although most of the consumed beer today contains alcohol, it is conceivable that consuming alcohol will have a different function in the future. Our study showed that being health-conscious positively influences the choice of NAB. The trend toward maintaining a healthy lifestyle and diet, therefore, may function as a booster of consumption of NAB or beer with a reduced alcohol content, which is already becoming apparent in the rising demand for NAB (Brewers of Europe, 2020a; Nielsen, 2015).

It was argued that non-alcoholic wine and beer should not be labeled as “wine” and “beer” because consumers do not substitute them with the corresponding alcohol-free beverage but rather perceive it as a different beverage (Silva, Jager, van Bommel, et al., 2016; Stasi, Bimbo, Viscecchia et al., 2014). Therefore, the consumption of alcoholic beverages might not decline with increased consumption of alcohol-free alternatives, since these beverages are consumed on occasions where drinking alcohol would be inappropriate, such as when driving or on a business occasion (Silva et al., 2017; Vasiljevic et al., 2019). This may be attributable to the promotion of alcoholic drinks with lower strength as a healthy alternative to soft drinks rather than a replacement for alcohol (Vasiljevic, Coulter, et al., 2018). However, our study indicated that NAB is consumed in the same places as alcoholic beer, which suggests that consumers drink NAB in a similar way and may consider it a replacement for alcoholic beer.

Our study was conducted in Germany, one of the countries with the highest rates of NAB consumption (Brewers of Europe, 2020a). Thus, conducting the study in a country with a different beer culture may yield different results. Furthermore, the situation described in our study included a person ordering alcoholic beer or NAB in a restaurant. It is possible that a description of a different situation, such as a party or in a club, may yield different evaluations. Future studies should investigate how the image of NAB consumers influences the choice of NAB.

7.3. Limitations and outlook

This dissertation investigated consumer behavior toward alcoholic beverages by means of several online studies. Limitations of the methodologies used are discussed in the following paragraphs and an outlook for future research is provided.

Conducting research on alcohol and consumer behavior is prone to social desirability, especially for self-reported levels of consumption (Davis et al., 2010). In the studies reported in this dissertation, we assessed both alcohol consumption quantity and frequency. It is likely that participants underreported their consumption to meet social expectations regarding alcohol consumption. To overcome this issue, future studies could include an assessment of people's level of impression management to adjust for inaccurate self-reports of alcohol consumption (Davis et al., 2010). We took considerable effort to design the studies in a way that would minimize social desirability biases. For example, consumers had no motivation to state a lower perceived risk than they actually perceived. Future studies on consumer behavior relating to alcoholic beverages should try to avoid questionnaires that encourage participants to answer in a socially desirable way by using observational studies or comparing statements with available consumption statistics.

The format of online assessments has several advantages, such as reaching a large number of participants from a representative sample at a relatively low cost. However, doing the assessment in a real-life situation, such as a bar or liquor store, would likely result in different findings. For example, investigating wine choice in a restaurant may be a realistic scenario, but the conditions of participation, such as the dinner occasion, type of company, or restaurant atmosphere, may vary but exert an influence on participants' behavior. The point of purchase has an influence on how consumers evaluate the product and what cues they pay attention to (Sora, Meehee, & Mark, 2015). For example, wine choice in a restaurant may be influenced by a range of factors, such as the type of establishment or type of company (i.e., dining with a group of friends vs. dining with business partners). Moreover, consumers are increasingly buying wine online and might show different behavior compared to in an offline environment (Bonn, Kim, Kang et al., 2015). The studies conducted for this dissertation did not assess actual purchase or consumption behavior. Although we gained valuable insights regarding consumers' behavior toward wine and other alcoholic beverages, we do not know how the findings might manifest in a real-life situation. For example, is perceived naturalness evaluated differently when consumers buy wine online? Does the type of establishment change how consumers use the wine list for selecting a bottle? Would an entire shelf of alcohol bottles with HWLs deter consumers from making a purchase? Is a person ordering NAB evaluated positively by others if the rest of the group is drinking alcoholic beer? These questions remain for future investigations.

Lastly, the studies were conducted in Switzerland and Germany, which both have particular alcohol cultures. This limits the generalizability of our results. In countries like

China, which shows different consumption and buying behaviors, our assessment may result in different conclusions (Lockshin, Corsi, Cohen et al., 2017).

7.4. Conclusion

This dissertation investigated several aspects of consumer behavior relating to alcoholic beverages. We investigated the trend observed in the food sector toward more authentic, healthy, and natural products in the context of wine. We found that like in the case of food, the origin, processing steps involved in the production, and traits of the final products can significantly alter the perceived naturalness of wine. It remains open to future research to assess the importance of perceived naturalness for wine choice in the marketplace and in relation to other competing cues, such as the price of a bottle. In addition, how the appearance of wines labeled as "natural wines" affects the perceived naturalness and other qualities of wines that do not bear such a label would be noteworthy.

Wine is a complex product involving various risks when making a purchase decision, especially in restaurants. We conducted online studies to investigate consumers' wine choices in restaurants and how organizing the information on the wine list affects the perceived difficulty of selecting a wine. We found that although wine lists that organize wines according to style categories are rare in Switzerland, a large group of consumers would prefer such a wine list to a traditional origin-grouped wine list. Foregrounding the intrinsic qualities of the wine rather than the origin may be more helpful to restaurant patrons seeking a wine that pairs well with the ordered dish. The results of our studies offer insights into consumers' difficulties when selecting wine in restaurants. Future studies should investigate how restaurant managers can anticipate the perceived difficulty with which consumers choose wine in a restaurant and assist them in increasing their confidence and satisfaction with the wine choice.

Based on the high levels of alcohol consumption in many countries and potential negative health effects, this dissertation addressed the question of how HWLs could affect consumers' perceived risk of drinking alcohol. We found that HWLs increased the perception of risk only marginally and that the effect of tobacco labeling may not have the same effect on alcohol containers. The perceived risk of drinking alcohol may indicate a consumer's drinking behavior. We found that not the HWL but the type of alcoholic beverage evoked a feeling of risk. Although serving sizes in restaurants and bars refer to comparable amounts of pure alcohol, drinking vodka was seen as riskier than drinking wine. The main reason for this was that many consumers believe in the health benefits of drinking wine. We do not know how

consumers would behave in a real-life situation, such as in front of a shelf full of wines displaying HWLs. However, our findings indicate that consumers' reservations about government interventions in individual rights and beliefs in the health benefits of wine consumption are reasons why they oppose the implementation of HWLs.

A reduction in alcohol consumption may be attained by replacing alcohol with alcohol-free alternatives, like NAB. We investigated to what degree someone may be perceived differently by others depending on whether they drink alcoholic beer or NAB. We found that the type of beer someone drinks leads to different stereotypes that consumers may use to convey a certain image. Many consumers hesitate to buy NAB because they think alcoholic beer tastes better, and health consciousness increases the likelihood of someone drinking NAB. Future research should investigate the degree to which stereotypes about NAB consumers influence the consumption of alcoholic beer and NAB.

This dissertation shows that alcohol, and wine in particular, is a highly appreciated and complex product that may have adverse health effects that consumers do not believe in or categorize as acceptable risks. Considering past efforts made by several governments around the world to sober up their society and eliminate the alcohol issue and the persistent consumption, this raises the question of how to advise public authorities on reducing the harmful use of alcohol. Swiss consumers do not seem to see a need to warn consumers of the risks of alcohol consumption; thus, policy interventions, like HWLs, may not be successful in increasing Swiss consumers' perceived risk of drinking. Based on the findings of this dissertation, I suggest that there is a need to better inform consumers about alcohol's health effects and clarify that the amount—not the beverage type—is decisive for the risk of alcohol consumption. Consumers should be reminded that as with many other tasty things, enjoying something but avoiding negative consequences means knowing when to stop.

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Summary

This dissertation investigated consumer behavior of alcoholic beverages. By means of several online studies, my colleagues and I researched consumers' perceptions of alcoholic beverages and how this may affect their buying and drinking behaviors. Chapter 2 addressed consumers' growing interest in "natural" products in the case of wine. Specifically, we measured how different attributes of a wine influence its perceived naturalness. Attributes linked with tradition increased the perceived naturalness of wine, whereas chemical processes in the production reduced it. Hence, winemakers should underline the attributes that increase the perceived naturalness of their wines and potentially improve the appeal of the wines. Deciding which wine to buy is a difficult decision for many consumers, especially in restaurants. Chapter 3 investigated consumers' restaurant wine choice and whether a wine list that organizes the wines according to style rather than origin reduces consumers' perceived difficulty in finding something they like. A style-grouped wine list did not reduce the perceived difficulty of choice in comparison to an origin-grouped wine list but was nevertheless preferred by many participants. Therefore, restaurants should consider rethinking their wine list to help customers select a wine they will like and that pairs with the food.

Alcoholic beverages are an important part of dining customs in many countries, but at the same time, drinking alcohol can cause dependence and harm the human body. HWLs like those used on cigarette packs are increasingly being proposed as a policy intervention to deter people from drinking. Chapters 4 and 5 investigated the effect of HWLs on consumers' perceived risk of drinking. We found only a marginal effect of HWLs on risk perception. The results showed that the perceived risk was decisively influenced by the type of alcoholic beverage someone considered drinking and by beliefs in the health benefits of drinking wine. Policymakers should address consumers' beliefs about alcohol's effect on health and communicate that rather than the beverage type, it is the amount of alcohol consumed that determines the risk of drinking. Alcohol-free alternatives, such as NAB, provide a way to reduce one's alcohol consumption but may be influenced by norms and the social environment. Chapter 6 investigated how the type of beer someone drinks (alcoholic or non-alcoholic beer) is used to form stereotypes about consumers. We found that consumers of NAB were perceived differently than consumers of alcoholic beer and that negative impressions of the taste of NAB and personal norms influenced consumption. Image campaigns and product tastings may be a way to overcome prejudices about NAB and improve its reputation.

Zusammenfassung

Diese Dissertation untersuchte das Konsumentenverhalten mit alkoholischen Getränken. In mehreren Online-Studien untersuchten meine Kollegen und ich die Wahrnehmung von alkoholischen Getränken durch die Konsumenten, und wie sich diese auf das Einkauf- und Konsumverhalten auswirken könnte. In Kapitel 2 ging es um das wachsende Interesse der Verbraucher an "natürlichen" Produkten im Falle von Wein. Konkret haben wir gemessen, wie verschiedene Attribute eines Weines seine wahrgenommene Natürlichkeit beeinflussen. Attribute, die mit Tradition verbunden sind, erhöhten die wahrgenommene Natürlichkeit des Weines, während chemische Prozesse in der Produktion sie reduzierten. Daher sollten Winzer diejenigen Attribute hervorheben, welche die wahrgenommene Natürlichkeit ihrer Weine erhöhen und möglicherweise die Attraktivität der Weine verbessern. Welchen Wein zu kaufen, ist für viele Verbraucher eine schwierige Entscheidung, insbesondere in Restaurants. Kapitel 3 untersuchte die Weinauswahl von Konsumenten im Restaurant, und ob eine Weinkarte, welche die Weine nach Stilistik anstatt nach Herkunft ordnet, die wahrgenommene Schwierigkeit der Verbraucher verringert, etwas zu finden, das ihnen gefällt. Eine nach Stilistik geordnete Weinkarte reduzierte die wahrgenommene Schwierigkeit der Weinwahl im Vergleich zu einer nach Herkunft geordneten Weinkarte nicht, wurde aber dennoch von vielen Teilnehmern bevorzugt. Daher sollten Restaurants in Erwägung ziehen, ihre Weinkarte zu revidieren, um den Kunden bei der Auswahl eines Weins, den sie mögen und der zum Essen passt, zu unterstützen.

Alkoholische Getränke sind in vielen Ländern ein wichtiger Bestandteil der Essgewohnheiten, aber gleichzeitig kann Alkoholkonsum Abhängigkeit verursachen und den menschlichen Körper schädigen. Gesundheitswarnhinweise (health warning labels [HWLs]), wie sie auf Zigarettenpackungen abgebildet sind, werden zunehmend als Massnahme vorgeschlagen, um Menschen vom Trinken abzuhalten. Kapitel 4 und 5 untersuchten die Auswirkungen von Gesundheitswarnhinweisen auf das wahrgenommene Trinkrisiko der Konsumenten. Wir fanden lediglich einen marginalen Effekt von Gesundheitswarnhinweisen auf die Risikowahrnehmung. Die Ergebnisse zeigten, dass das wahrgenommene Risiko maßgeblich von der Art des alkoholischen Getränks, das jemand zu trinken gedenkt, und von Überzeugungen von gesundheitlichen Vorteilen von Weinkonsum beeinflusst wird. Die politischen Entscheidungsträger sollten die Überzeugungen der Verbraucher bezüglich der Auswirkungen von Alkohol auf die Gesundheit angehen und darüber aufklären, dass nicht die Art des Getränks, sondern die Menge des konsumierten Alkohols das Risiko des Trinkens

bestimmt. Der Konsum von alkoholfreien Alternativen wie alkoholfreies Bier (non-alcoholic beer [NAB]) bietet eine Möglichkeit, den Alkoholkonsum zu reduzieren, kann jedoch von Normen und dem sozialen Umfeld beeinflusst werden. In Kapitel 6 wurde untersucht, wie die Art des Bieres, das jemand trinkt (alkoholisches oder alkoholfreies Bier), verwendet wird, um Stereotypen von Verbrauchern zu bilden. Wir fanden, dass Konsumenten von alkoholfreiem Bier anders wahrgenommen wurden als Konsumenten von alkoholischem Bier, und dass negative Eindrücke vom Geschmack von alkoholfreiem Bier sowie persönliche Normen den Konsum beeinflussen. Imagekampagnen und Produktverkostungen bieten eine Möglichkeit, die Vorurteile gegenüber alkoholfreiem Bier zu überwinden und seinen Ruf zu verbessern.

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