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HEALTH PSYCHOLOGY | RESEARCH ARTICLE

Demographical, personality, alcohol use, and mental health characteristics associated with different alcoholic beverage preferences among students

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Abstract: The study investigates correlates (i.e. demographics, personality, alcohol use and alcohol-related harm, alcohol expectancies, and mental health) of different alcoholic beverage preferences (i.e. beer/alcopops/cider, wine, and liquor/spirits). Data were collected by an online survey during fall 2016. Participants were invited to the survey based on participation in a former survey that was sent to students in Bergen, Norway, in fall 2015. The current sample consists of 5,217 participants. A multinomial regression analysis was conducted, where alcoholic beverage preferences comprised the dependent variable. Several correlates were associated with beverage preferences. For instance, being a woman and the personality trait conscientiousness were inversely related to a preference for beer/alcopops/cider while positively associated with a preference for wine. Preferences for wine or liquor/spirits were positively associated with depression and inversely related to anxiety. Conscientiousness as a personality trait might be a common factor in the

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PUBLIC INTEREST STATEMENT

Knowing who chooses which alcoholic beverage can be important. For instance, previous research has demonstrated that health benefits associated with wine may be explained by wine-drinkers` healthy diet. In this study, we identified individual characteristics among Norwegian students preferring beer/alcopops/cider, wine, and liquor/spirits, respectively. Beer/alcopops/cider-drinkers were more likely to be younger, male, Norwegian-born, non-religious, and less conscientious (as a personality trait), and to have a low income and higher alcohol use. Wine-drinkers were more likely to be older, female, religious, more conscientious, and to report more depression- and fewer anxiety symptoms. Finally, liquor/spirits-drinkers were more likely to be male, expect few negative outcomes of alcohol use, and to report more depression- and fewer anxiety symptoms. Our findings are mostly in line with previous research. The association between wine drinking and conscientiousness (i.e. a personality trait) may partly explain why wine-drinkers are healthier, as conscientious individuals tend to be healthier.

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relationship between wine preference and favourable health outcomes, and this trait should be controlled for in future studies. The current findings seem contrary to the assumed gender equality in Norway, where the strong association between sex and alcoholic beverage preferences suggests that traditional gender divisions prevail even in the current young and urban sample.

Subjects: Health psychology; personality; mental health

Keywords: Alcoholic beverage preferences; students; depression; anxiety; alcohol use; personality

1. Introduction

Specific alcoholic beverages have been used to symbolise different social affiliations like class and gender for as long as humans have enjoyed alcohol (Dietler, 2006; Dumbili, 2018). The most famous study on the symbolism of different alcoholic beverages is Bourdieu (1984)'s study in the French population, where alcoholic beverage preferences were found to predict economic and cultural capital. Studies on the correlates of beverage preferences have contributed to a deeper understanding of the association between wine and positive health outcomes (e.g., lowered mortality and lowered risk of cardiovascular diseases). Subsequently, this association has mainly been attributed to different common third variables such as healthy diet and low-risk alcohol use (Gartner et al., 2019; Jensen et al., 2002; Klatsky et al., 2003; Sluik, Bezemer et al., 2016; Sluik, Brouwer-Brolsma et al., 2016). Further, an increasing number of publications have suggested that alcoholic beverage preferences may also relate to mental health, although the mechanisms through which alcoholic beverage type may influence mental health are not known (Godos et al., 2018; Pavlidou et al., 2018; Strandberg et al., 2007; Stranges et al., 2006; Yan et al., 2019).

Based on previous research one may expect individual characteristics of demographics, personality, alcohol use and cognitions and health to be related to alcoholic beverage preferences. Demographics are likely to relate to alcoholic beverage preferences as such characteristics are important social identity markers and known to predict a range of consumer behaviours, including choice of alcoholic beverage (Agnoli et al., 2018; Carpenter et al., 2013; Klatsky et al., 1990; Lennox et al., 2018). Personality traits are another type of individual characteristics that are immensely important for identity and thus likely to be reflected in one's choice of alcoholic beverage (Dietler, 2006; Stryker, 2007). Further, personality traits have consistently been found to predict different aspects of alcohol use, although personality traits have not previously been assessed in relation to alcoholic beverage preferences (Malouff et al., 2007; Theakston et al., 2004). Further, previous research has identified alcohol use and alcohol cognitions as predictors of alcoholic beverage preferences (Babor, 2010; Kuntsche et al., 2006). Several explanations have been offered for the associations between alcoholic beverage preferences and alcohol use and cognitions (Jensen et al., 2002; Mäkelä et al., 2007). For one, the link may be explained by confounding factors (e.g., socioeconomic status) determining both alcoholic beverage preferences and alcohol use and cognitions. Alternatively, the association may be explained by cultural beliefs related to different alcoholic beverages (e.g., spirits give fewer hangover symptoms) making individuals with certain alcohol habits and/or cognitions more likely to prefer the beverage that their cultural beliefs suggest as most appropriate. Finally, the association may relate to how easy it is to become intoxicated by different beverages, where those who wish to become intoxicated may prefer beverages facilitating transcendence to such a state. Previous research has also established a link between alcoholic beverage preferences and health outcomes (Klatsky et al., 2003). As mentioned, the reasons for the latter link are not fully understood but are believed to be, at least in part, related to alcoholic beverages as identity markers, where those in groups with healthier habits, in particular those with higher socioeconomic status, are more likely to prefer certain beverages (e.g., wine) over others (Klatsky et al., 2003).

1.1. Demographical and personality characteristics associated with alcoholic beverage preferences

Previous research has identified a range of demographical variables associated with alcoholic beverage preferences. Age has been inversely associated with a preference for alcopops/beer and positively associated with a preference for wine, while the association between liquor/spirits preference and age varies between cultures (Agnoli et al., 2018; Jung et al., 2001; Klatsky et al., 1990; Sutherland & Willner, 1998). Sex has consistently been linked to alcoholic beverage preferences, where women tend to prefer wine to beer, and men tend to prefer beer to wine (Agnoli et al., 2018; Grønbæk et al., 2000; Klatsky et al., 1990; Siegel et al., 2011; Trasberg, 2020). The findings regarding liquor/spirits preference and sex are more mixed (Agnoli et al., 2018; Dawson, 1993; Grønbæk et al., 2000; Klatsky et al., 1990; Siegel et al., 2011). Culture, as reflected in country of birth, has also been found to be related to choice of alcoholic beverage (Babor, 2010), where, for example, native Norwegians tend to prefer beer (World Health Organization, 2019). Few studies have investigated the relationship between religious identification and alcohol use, but one study found that religious adolescents preferred wine to beer and liquor (Cochran, 1993). The number of studies on the association between civil and parental status and alcoholic beverage preferences is limited. One study showed no association between marital status and alcoholic beverage preferences (Gruenewald et al., 2000). With regard to personal income, a preference for wine has been positively associated with income, while beer and liquor/spirits preferences have been associated with lower income (McCann et al., 2003; Trasberg, 2020).

In addition to demographics, personality factors could also relate to alcoholic beverage preferences, as choice of alcoholic beverage could be used to symbolise personality. Knowledge of the associations between personality traits and alcoholic beverage preferences can further enhance the understanding of the relationship between specific alcoholic beverages and health outcomes. Nevertheless, to date, few studies have investigated the relationship between personality and alcoholic beverage preferences. One previous study found higher scores on neuroticism to be related to beer-drinking among men, whereas lower scores on neuroticism and higher scores on extroversion were related to wine-drinking among women (Mortensen et al., 2001). However, the reference categories in this study were non-beer-drinkers and non-wine-drinkers; hence, the study did not assess preferences per se.

1.2. Alcohol use and expectancies associated with alcoholic beverage preferences

Other factors that may relate to alcoholic beverage preferences are general alcohol use and alcohol expectancies. Cultural norms and perceptions may cause people who differ in drinking habits and have different expectancies concerning the outcomes of alcohol use (e.g., relaxation versus exhilaration) to choose different alcoholic beverages. Beer and liquor/spirits are more commonly used when an individual engages in different forms of excessive drinking, while drinking wine appears to be more common with low/moderate consumption (Babor, 2010; Jensen et al., 2002; Mäkelä et al., 2007; Naimi et al., 2007; Siegel et al., 2011; Stern et al., 2017). The type of alcoholic beverage most commonly involved in excessive drinking tends, however, to vary across culture and time (Babor, 2010). Further, it is important to emphasise that alcoholic beverage type is far from the only determinant of alcohol habits. For instance, individuals with serious alcohol problems are likely to drink excessively regardless of beverage type as any form of alcohol can trigger addiction. Alcoholic beverage preferences might also be related to alcohol expectancies as they have been tied to a closely related concept, namely drinking motives (Kuntsche et al., 2006). Accordingly, a recent study found adolescents to have different expectancies towards different alcoholic beverages. Beer was associated with a happy and angry mood, whereas white wine was associated with a sad mood (Cook et al., 2020). Further, a study among women with alcohol problems found them to have the most positive expectancies towards beer, compared to wine and hard liquor (Devoulyte et al., 2006).

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1.3. Mental health factors associated with alcoholic beverage preferences

Few studies have investigated whether there is an association between mental health and alcoholic beverage preferences. It could be reasoned that alcoholic beverage preferences could be associated with mental health status, as different alcoholic beverages, to a certain degree, seem to be used to achieve different ends. For instance, spirits have been reported to be consumed more frequently in excess, as opposed to beer, alcopops and wine, by those who drink mainly in order to alleviate negative emotions (Kuntsche et al., 2006). In one study among American adults, those who preferred beer or had a mixed beverage preference had better mental health compared to those who preferred wine or liquor (Stranges et al., 2006), while another study found those who preferred wine to have better mental health compared to those preferring beer or spirits (Strandberg et al., 2007). It is not known why alcoholic beverage preferences are associated with mental health, but suggested explanations include third variables predicting both beverage choice and mental health (e.g., socioeconomic status), ingredients in specific beverages which may facilitate or hamper mental health and alcohol expectancies associated with different beverages (e.g. wine as having stress relieving properties), making those who are looking for a specific effect (e.g. stress relieve) likely to prefer certain beverages over others (Godos et al., 2018; Pavlidou et al., 2018; Strandberg et al., 2007; Stranges et al., 2006; Yan et al., 2019). In support of the claim that ingredients in specific alcoholic beverages may influence mental health, some studies on animals and humans have suggested that certain ingredients in red wine may protect against depression (Godos et al., 2018; Pavlidou et al., 2018; Yan et al., 2019).

1.4. The student population

The university/college setting is often strongly associated with alcohol use in the eyes of the general public. Some research suggests that students have a higher consumption of alcohol compared to others with similar characteristics, although this has not been consistently found (Bingham et al., 2005; Kenney et al., 2018; O'Malley & Johnston, 2002; Slutske et al., 2004). Enrolment in higher education has, however, consistently been found to predict an increase in alcohol use (Bingham et al., 2005; O'Malley & Johnston, 2002). Binge drinking, i.e. consuming larger amounts of alcohol on a single occasion, is believed to be more common among university/college students than among other groups (Slutske et al., 2004; Tavolacci et al., 2016). Another likely hallmark of student drinking is related to the fact that many students will be below the legal age for consuming/purchasing hard liquor or have just reached this age. In Norway, individuals can purchase hard liquor from the age of 20, while those entering higher education directly after high school are 18 or 19 years old. Liquor/spirits is known to increase the blood-alcohol concentration faster than beverages with lower alcohol concentration (Mitchell et al., 2014; Roberts & Robinson, 2007; Smart, 1996). Individuals with little experience with hard liquor (e.g., young students) may not know their tolerance level for liquor/spirits and become more intoxicated than planned, which may in part explain students' increased tendency to binge drink. Students' alcohol habits have raised concern in terms of their health and the drinking habits they may establish during this period of their life (Erevik, Pallesen et al., 2017). The special relationship students have with alcohol make them a particularly interesting group for alcohol research, and knowledge on correlates of alcoholic beverages in this population may inform initiatives aimed at preventing or reducing alcohol-related harm among students. For instance, knowledge of correlates of liquor/spirits preferences could inform interventions aimed at reducing the consumption of hard liquor.

Investigating alcoholic beverage preferences among students could also be particularly relevant because characteristics of students (e.g. being a cosmopolite and intelligent) suggest that they are likely to be early adopters of new trends and trendsetters for the rest of society (Pedersen, 2015; Rogers, 1995). Investigating correlates of alcoholic beverage preferences among students could thus give an indication as to whether traditional connotations of different alcoholic beverages (e.g. wine as feminine) is likely to be changing or to remaining constant at a societal level.

In summary, more studies on correlates of alcoholic beverage preferences are required, especially since alcoholic beverage preferences and the connotations of different alcoholic beverages

(e.g. classy, masculine, etc.) are constantly changing (Gómez-Corona et al., 2016; Lennox et al., 2018; Müller et al., 2010). Few recent studies have investigated correlates of alcoholic beverage preferences, and some potential correlates remain largely unexplored. Further, there are no Norwegian studies on the topic. Students and former students may be a particularly suitable sample for research on alcoholic beverage preferences as this group is considered trendsetting (Pedersen, 2015).

1.5. Objectives

Against this backdrop, the current study aims to investigate correlates (i.e. demographics, personality, alcohol use and expectancies, and mental health factors) of different alcoholic beverage preferences (i.e. beer/alcopops/cider, wine, and liquor/spirits) in a sample of Norwegian students and former students. The current study has an exploratory design, and, regrettably, no clear hypotheses were formulated. We did, however, expect to replicate established findings from previous studies, i.e. preference for wine to be more common among women, those with higher incomes, and those with lower alcohol consumption; preference for beer to be more common among men, those born in Norway, those with lower incomes, and those with higher alcohol consumption; and liquor/spirits preference to be associated with a higher alcohol consumption. Further, since wine consumption compared to consumption of other alcoholic beverages has been associated with better physical health in previous studies, we expected those with better mental health to report a preference for wine.

2. Methods

2.1. Sample

The current sample consists of 5,217 participants who participated in an online survey in 2016, with a response rate of 51.5%. The individuals who were invited to participate in the survey had all participated in an online survey in 2015 (response rate: 39.4%) and were all students (i.e. bachelor- or master level) in Bergen, Norway, in 2015. The response rate of 51.5% for the 2016 survey (which the current study is based on) is likely to be higher among the individuals who actually received the invitation, as the participants were contacted via their student e-mails from 2015. Hence, some of those who had ended their education presumably did not receive the invitation.

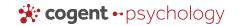### 2.2. Measurements

2.2.1. Demographics

Demographics were assessed with questions regarding age, sex, country of birth, religious identification, civil status, parental status, and monthly disposable income.

2.2.2. Personality

Personality was measured with the 20-item Mini-International Personality Item Pool (MINI-IPIP). Mini-IPIP is considered a reliable and valid measure of the five-factor model's personality dimensions: Extroversion, agreeableness, conscientiousness, neuroticism, and intellect/imagination (Donnellan et al., 2006). There are four items for each of the five personality traits, and for each trait the total-score ranges from 4 to 20. The items measuring extroversion, agreeableness, conscientiousness, neuroticism, and intellect/imagination had Cronbach's alphas of.83, .79, .69, .76, and .75, respectively.

2.2.3. Alcohol use and alcohol-related harm

Alcohol use and alcohol-related harm were measured with the Alcohol Use Disorders Identification Test (AUDIT), comprising 10 items assessing alcohol consumption, alcohol-related harm, and symptoms of alcohol dependency the past year (Babor et al., 2001; Bohn et al., 1995). Total AUDIT-scores range from 0 to 40, where higher scores indicate higher alcohol consumption and that the respondent is experiencing more alcohol-related harm, including dependency symptoms. In the present study, the AUDIT obtained a Cronbach's alpha of .78.

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2.2.4. Positive and negative alcohol expectancies

Positive and negative alcohol expectancies were assessed by items gathered from Alcohol-E (Berman et al., 2004). Alcohol-E includes 17 items assessing levels of positive alcohol expectancies (e.g., expecting better sleep as a result of alcohol intake), and 13 items assessing levels of negative alcohol expectancies (e.g., expecting anxiety as a result of alcohol intake). Total scores range between 0–68 and 0–52 on the measurement of positive and negative alcohol expectancies, respectively. Cronbach's alpha for the items measuring positive alcohol expectancies was .89, while Cronbach's alpha for the items measuring negative alcohol expectancies was .79 (present study).

2.2.5. Alcoholic beverage preferences

Alcoholic beverage preferences were also measured by items from Alcohol-E (Berman et al., 2004). The respondents were asked: "How frequently do you drink … ": a) "Beer/alcopops/cider (maximum 4.7% alcohol by volume)?", b) "Wine (7–15% alcohol by volume)?" and c) "Liquor/spirits (30–60% alcohol by volume)?". Response alternatives: Never; I have drunk it, but not the last year; 1 time per month or more seldom; 2–4 times a month; 2–3 times per week; 4 times per week or more often.

2.2.6. Mental health

Mental health was measured by the 25-items Hopkins Symptoms Checklist (HSCL-25) (Derogatis et al., 1974). The HSCL-25 consists of 25 items concerning anxiety and depressive symptoms. Respondents are asked to rate the level of symptoms of anxiety (e.g. heart palpitations) and depression (e.g. feeling of hopelessness) experienced during the past two weeks (response alternatives: not at all; a little; quite a bit; extremely). Total-scores range from 10 to 40 for the anxiety scale, and from 15 to 60 for the depression scale. In the current study, the Cronbach's alpha for the items measuring symptoms of depression was .90, while the Cronbach's alpha for the items measuring symptoms of anxiety was .82.

2.3. Procedures

Data were collected by an online follow-up survey during fall 2016. Individuals who participated in a survey among students (i.e. bachelor- or master level) in Bergen, Norway during fall 2015 (response rate: 39.4%) were invited to participate in the follow-up survey (which the current study is based on) including questions on alcoholic beverage preferences. The survey was available for approximately two months. A thorough dropout analysis comparing non-responders in the follow-up to responders was conducted in a previous paper (Erevik, Torsheim et al., 2017). This dropout analysis suggests only a few differences between responders and non-responders, and the effect sizes of these differences are within the realm of what is considered as very small. As compensation for participation in the survey, participants could be drawn to win two iPhone7s and 50 gift cards each with a value of 500 NOK ~ 61 USD/53 EUR. Participants were given information about the study, data-storage and use, potential risk and benefits associated with participation, and their right to abstain from participation before they could choose to respond to the survey. The participants were also informed that it would not be possible to identify them based on any published material. The study was approved by the Regional Committee for Medical and Health Research Ethics, health region western Norway (project number 2015/1154).

   All analyses were conducted with IBM SPSS Statistics 24. The 282 participants who reported never to drink alcohol were excluded from the analyses involving alcoholic beverage preferences altogether. Further, missing data were deleted list-wise. In the main analysis 384 participants (7.8%) were excluded due to non-response to some of the included independent variables, of these 77 were only missing on the independent variables while the rest were missing on both some of the independent variables and the dependent variable. None of the missing cases were solely missing on the dependent variable. Listwise deletion was chosen because the missing data primarily concerned the predictor variables. In such instances listwise deletion in logistic regression analyses causes less biased results compared to other common

approaches for handling missing data (Allison, 2001, 2014). An adjusted, unconditional (as we applied the same model to all cases and as the groups were included in the model as separate dummy variables) multinomial logistic regression analysis was conducted. The dependent variable was nominal and consisted of different alcoholic beverage preferences (i.e. beer/ alcopops/cider, wine, and liquor/spirits). The alcoholic beverage preference categories were computed by adding those who reported drinking beer/alcopops/cider more frequently than wine and liquor/spirits to the beer/alcopops/cider preference category, and those who reported drinking wine more frequently than beer/alcopops/cider and liquor/spirits to the wine prefer- ence category, etc. Those who did not report drinking either beer/alcopops/cider, wine, or liquor/spirits more often than the other beverages comprised a mixed preference category. The mixed preference category was used as a reference category. The same categorisation of alcoholic beverage preferences was used in Strandberg et al. (2007)'s study. The categorical independent variables were dichotomous or dichotomised before the regression analysis: Sex (response option: man vs. response option: woman), country of birth (response option: Norway vs. other countries (response options: North of Europe; other parts of Europe; Asia, Africa; Central/South America; North America; Oceania)), religious identification (response option: non- religious vs. religious (response options: Buddhism; Hinduism; Islam; Judaism; Catholic Christianity; Orthodox Christianity; Protestant Christianity; other)), civil status (not single (response options: steady romantic partner, but living alone; in a cohabitant relationship; married/registered partnership; other) vs. response option: single), and parental status (response option: do not have child/ren vs. have child/ren (response options: have daily custody of a child/ren; have shared custody of a child/ren; have a child/ren, but not custody)). The continuous independent variables were computed into z-scores to aid the comparison of different odds ratios. The continuous independent variables comprised age, disposable monthly income, extroversion, agreeableness, conscientiousness, neuroticism, openness, alcohol use and alcohol-related harm (AUDIT-score), positive alcohol expectancies, negative alcohol expec- tancies, symptoms of depression, and symptoms of anxiety.

3. Results

The full sample's characteristics and the characteristics of those reporting different alcoholic beverage preferences are illustrated in Table 1. A total of 83.7% reported that they were students in 2016. The current sample's mean age was 25.8 (SD = 6.3); 64.8% were women, and 92.7% were born in Norway. A total of 31.0% reported a preference for beer/alcopops/cider, while 17.3% reported a preference for wine, and 1.5% a preference for liquor/spirits. The remaining 50.2% had a mixed preference for beer/alcopops/cider, wine, and/or liquor/spirits.

The correlations between the included independent variables were computed before conducting the multinomial logistic regression analysis investigating their associations with alcoholic beverage preferences. The correlations between the independent variables did not suggest multicollinearity (the full correlation matrix is presented in Table 2).

The associations between the demographic, personality, alcohol use and alcohol-related harm, alcohol expectancies, and mental health variables and alcoholic beverage preferences are reported in Table 3. The model included 17 independent variables and was significant (p < .001, χ^2 = 970.642, df = 51). The model explained between approximately 19.2% (Cox & Snell) and 21.7% (Nagelkerke R^2) of the variance in alcoholic beverage preferences. Those who preferred beer/alcopops/cider were more likely to be younger, male, born in Norway, non-religious, have a lower income, and a lower score on conscientiousness, as well as report a higher alcohol use and more alcohol-related harm, compared to those who reported a mixed preference. The respondents with a preference for wine were more likely to be older, female, religious, score higher on conscientiousness, and report more symptoms of depression and fewer symptoms of anxiety, compared to those who reported a mixed preference. Finally, a preference for liquor/spirits was associated with the male sex, fewer negative alcohol expectancies, more symptoms of depression, and fewer symptoms of anxiety, respectively.

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Table 1. Sample characteristics

	Full sample (N = 5,217) Mean (SD)/%(95% CI)	Mixed preference (n = 2,323) Mean (SD)/%(95% CI)	Beer/alcopops/cider preference (n = 1,433) Mean (SD)/%(95% CI)	Wine preference (n = 801) Mean (SD)/%(95% CI)	Liquor/spirits preference (n = 71) Mean (SD)/%(95% CI)
Frequency of consumption of alcoholic beverages[a]					
Beer/alcopops/cider	3.6 (0.9)	3.6 (0.7)	4.3 (0.7)	2.6 (0.9)	2.3 (1.0)
Wine	3.4 (0.9)	3.5 (0.8)	2.9 (0.9)	4.1 (0.6)	2.2 (1.0)
Liquor/spirits	2.5 (1.0)	2.6 (1.1)	2.5 (0.9)	2.0 (0.9)	3.7 (0.7)
Demographics					
Age	25.8 (6.3)	25.6 (6.3)	24.8 (4.5)	27.8 (8.4)	23.9 (5.4)
Women	64.8% (63.5–66.1%)	71.3% (69.4–73.1%)	41.5% (39.0–44.1%)	90.7% (88.7–92.7%)	47.1% (35.2–59.1%)
Born in Norway	92.7% (92.0–93.4%)	93.0% (92.0–94.1%)	94.9% (93.8–96.1%)	90.9% (88.9–92.9%)	88.6% (80.9–96.2%)
Religious identification	26.7% (25.5–27.9%)	25.3% (23.5–27.0%)	18.1% (16.2–20.1%)	33.7% (30.4–37.0%)	25.4% (15.0–35.7%)
Single	43.6% (42.2–44.9%)	41.9% (39.9–43.9%)	49.4% (46.8–52.0%)	35.2% (31.9–38.5%)	47.9% (36.0–59.8%)
Have child/ren	13.0% (12.1–13.9%)	12.5% (11.1–13.8%)	7.9% (6.5–9.3%)	21.7% (18.9–24.6%)	7.0% (0.9–13.1%)
Monthly disposable income[b]	3.1 (1.4)	3.1 (1.4)	2.9 (1.3)	3.4 (1.5)	2.9 (1.3)
Personality[c]					
Extroversion	13.9 (3.7)	14.1 (3.6)	13.9 (3.7)	14.1 (3.5)	13.5 (4.2)
Agreeableness	16.9 (2.8)	17.0 (2.8)	16.3 (2.9)	17.4 (2.4)	16.4 (3.2)
Conscientiousness	14.7 (3.2)	14.8 (3.2)	14.1 (3.3)	15.2 (3.1)	14.8 (3.1)
Neuroticism	11.1 (3.7)	11.3 (3.6)	10.5 (3.7)	11.8 (3.7)	11.2 (3.9)
Openness	14.6 (3.3)	14.5 (3.3)	14.8 (3.2)	14.4 (3.3)	14.5 (3.6)
Alcohol use and expectancies					
Alcohol use and alcohol-related harm (AUDIT-score)[d]	7.5 (4.7)	7.6 (4.3)	9.3 (4.7)	6.6 (3.9)	7.6 (5.0)

(Continued)

Table 1. (Continued)

	Full sample (N = 5,217)	Mixed preference (n = 2,323)	Beer/alcopops/cider preference (n = 1,433)	Wine preference (n = 801)	Liquor/spirits preference (n = 71)
Positive alcohol expectancies[d]	16.3 (10.4)	16.0 (10.4)	17.5 (10.2)	14.9 (10.4)	17.4 (12.8)
Negative alcohol expectancies[e]	5.8 (5.3)	5.7 (5.5)	6.3 (5.1)	5.0 (5.2)	4.8 (5.2)
Mental health					
Symptoms of depression[f]	24.5 (7.5)	24.6 (7.6)	24.1 (7.2)	25.1 (7.6)	25.6 (8.3)
Symptoms of anxiety[g]	15.2 (4.2)	15.4 (4.3)	14.9 (4.0)	15.3 (4.1)	14.7 (3.8)

SD = standard deviation, CI = confidence interval, [a] 1 = Never, 2 = I have drunk it, but not the last year, 3 = 1 time per month or more seldom, 4 = 2–4 times a month, 5 = 2–3 times per week, 6 = 4 times per week or more often, [b] 1 = 0–5000 NOK, 2 = 5000–10 000 NOK, 3 = 10 000–15 000 NOK, 4 = 15 000–20 000 NOK, 5 = 20 000–25 000 NOK, 6 = More than 25 000 (5000 NOK~ 614 USD/529 EUR), [c] Total scores range from 4–20 for each trait, [d] Total scores range from 0–40, [e] Total scores range from 0–68, [f] Total scores range from 0–52, [f] Total scores range from 15–60, [g] Total scores range from 10–40.

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Table 2. Pearson's correlations between independent variables, *n* = 4,551

Variable	1	2	3	4	5	6	7	8
1. Age	-							
2. Sex[a]	-.022	-						
3. Country of birth[b]	-.085***	-.007	-					
4. Religious identification[c]	.164***	.088***	-.042**	-				
5. Civil status[d]	-.148***	-.062***	.030*	-.014	-			
6. Parental status[e]	.680***	.058***	-.048**	.139***	-.239***	-		
7. Disposable income	.505***	-.027	.010	.051***	-.169***	.386***	-	
8. Extroversion	-.025	.066***	.015	.013	-.034*	-.020	.078***	-
9. Agreeableness	.008	.318***	.038**	.096***	-.072***	.049**	.029*	.346***
10. Conscientiousness	.016	.142***	-.003	.088***	-.078***	.024	.082***	.140***
11. Neuroticism	-.100***	.307***	-.052***	.030*	-.051***	-.015	-.097***	-.157***
12. Openness	.019	-.159***	-.049**	-.066***	-.014	-.009	.001	.171***
13. Alcohol use and harm	-.220***	-.172***	.088***	-.196***	.163***	-.205***	-.062***	.195***
14. Positive alcohol expectancies	-.244***	-.043**	.044**	-.080***	.147***	-.170***	-.121***	-.011
15. Negative alcohol expectancies	-.138***	-.066***	.001	-.079***	.094***	-.114***	-.100***	-.020
16. Symptoms of depression	-.162***	.156***	-.028*	-.016	.067***	-.095***	-.160***	-.217***
17. Symptoms of anxiety	-.184***	.199***	-.021	.010	.013	-.105***	-.132***	-.111***

Variable	9	10	11	12	13	14	15	16	17
1. Age									
2. Sex[a]									
3. Country of birth[b]									
4. Religious identification[c]									
5. Civil status[d]									
6. Parental status[e]									
7. Disposable income									
8. Extroversion									
9. Agreeableness	-								
10. Conscientiousness	.183***	-							
11. Neuroticism	.056***	-.185***	-						
12. Openness	.110***	-.083***	-.027	-					
13. Alcohol use and harm	-.077***	-.189***	.033*	.010	-				
14. Positive alcohol expectancies	-.050**	-.164***	.169***	-.014	.453***	-			
15. Negative alcohol expectancies	-.085***	-.206***	.244***	.040**	.431***	.398***	-		
16. Symptoms of depression	-.078***	-.311***	.634***	-.018	.129***	.292***	.368***	-	
17. Symptoms of anxiety	.020	-.213***	.574***	.008	.129***	.259***	.345***	.720***	-

[a]1 = Woman, 0 = man, [b] 1 = Norway, 0 = other country, [c] 1 = religious, 0 = non-religious, [d] 1 = single, 0 = not single, [e] 1 = have child/ren, 0 = do not have child/ren.

* p <.05, ** p <.01, *** p <.001.

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Table 3. Correlates of alcoholic beverages preferences. Adjusted multinomial logistic regression analysis, *n* = 4,551 (reference category: mixed preferences for beer, wine, or liquor, OR = 1)

	Beer/alcopops/cider preference	Wine preference	Liquor/spirits preference
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Demographics			
Age Z	0.86 (0.77–0.98)*	1.26 (1.12–1.41)***	0.86 (0.56–1.32)
Sex			
Men	1.00	1.00	1.00
Women	0.34 (0.29–0.41)***	3.92 (2.96–5.19)***	0.32 (0.18–0.56)***
Country of birth			
Countries other than Norway	1.00	1.00	1.00
Born in Norway	1.38 (1.01–1.87)*	0.85 (0.63–1.16)	0.60 (0.28–1.29)
Religious identification			
Non-religious	1.00	1.00	1.00
Religious	0.83 (0.70–0.99)*	1.28 (1.06–1.54)**	1.12 (0.64–1.97)
Civil status			
Not single	1.00	1.00	1.00
Single	1.09 (0.94–1.27)	0.93 (0.78–1.12)	1.08 (0.66–1.79)
Parental status			
Do not have child/ren	1.00	1.00	1.00
Have child/ren	1.07 (0.79–1.46)	0.99 (0.73–1.36)	0.77 (0.25–2.41)
Disposable income Z	0.90 (0.83–0.98)*	1.08 (0.98–1.19)	0.92 (0.69–1.24)
Personality			
Extroversion Z	0.94 (0.87–1.02)	1.03 (0.93–1.13)	0.96 (0.73–1.26)
Agreeableness Z	0.98 (0.90–1.06)	0.97 (0.88–1.08)	0.98 (0.76–1.26)
Conscientiousness Z	0.90 (0.83–0.97)**	1.11 (1.01–1.22)*	1.15 (0.88–1.50)
Neuroticism Z	0.94 (0.85–1.04)	1.07 (0.96–1.20)	1.14 (0.81–1.59)

(Continued)

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Table 3. (Continued)

	Beer/alcopops/cider preference	Wine preference	Liquor/spirits preference
Openness Z	1.04 (0.97–1.13)	1.04 (0.96–1.14)	0.98 (0.76–1.26)
Alcohol use and expectancies			
Alcohol use and alcohol-related harm (AUDIT-score) Z	1.37 (1.25–1.51)***	0.93 (0.82–1.05)	0.97 (0.69–1.37)
Positive expectancies Z	0.98 (0.90–1.07)	1.04 (0.94–1.15)	1.20 (0.92–1.56)
Negative expectancies Z	0.96 (0.88–1.04)	0.92 (0.82–1.02)	0.71 (0.50–1.00)*
Mental health			
Symptoms of depression	0.98 (0.87–1.10)	1.26 (1.10–1.44)**	1.61 (1.13–2.29)**
Symptoms of anxiety	0.97 (0.87–1.08)	0.82 (0.72–0.92)**	0.64 (0.44–0.93)*

Model: df = 51, χ^2 = 970.642, Cox & Snell =.192, Nagelkerke R^2 =.217.

*OR odds ratio, CI confidence interval, Z the variable was based on z-scores, * p <.05, ** p <.01, *** p <.001..*

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4. Discussion

The current study aimed to investigate associations between alcoholic beverage preferences and demographics, personality, alcohol use and alcohol-related harm, alcohol expectancies, and mental health. The findings support previous findings regarding correlates of alcoholic beverage preferences (Agnoli et al., 2018; Babor, 2010; Cochran, 1993; Grønbæk et al., 2000; Jung et al., 2001; Klatsky et al., 1990; McCann et al., 2003; Siegel et al., 2011; Sutherland & Willner, 1998; Trasberg, 2020; World Health Organization, 2019) and suggest as such that traditional gender and social class divisions associated with beverage preferences still prevail. In addition to supporting previous findings, the current study further contributes with some novel results.

4.1. Age, sex, country of birth, religiosity, income, and conscientiousness were associated with alcoholic beverage preferences

Age was inversely related to preferences for beer/alcopops/cider and liquor/spirits and positively related to a preference for wine. Compared to women, men were more likely to report preferences for beer/alcopops/cider and liquor/spirits, and less likely to report a preference for wine. Norwegian-born participants were more likely to report a preference for beer/alcopops/ cider. The identified associations between age, sex, and country of birth and alcoholic beverage preferences largely support previous findings and are likely to be explained by cultural perceptions of appropriate alcoholic beverages for different ages and gender roles and Norway's long history for beer consumption (Babor, 2010; Klatsky et al., 1990; Siegel et al., 2011; Trasberg, 2020; World Health Organization, 2019). Of the correlates investigated, sex had by far the strongest association to alcoholic beverage preferences. Thus, sex seems to be the strongest determinant of the choice of beverage. The strong link between sex and beverage preferences may be somewhat surprising given that the current sample comprises relatively young, urban, and educated individuals, which suggests that gendered stereotypes associated with different beverages are pervasive. Religious participants were more likely to report a preference for wine and less likely to report a preference for beer/alcopops/cider. Although similar findings have been reported in one study among adolescents (Cochran, 1993), the current study may be the first to show this tendency among somewhat older individuals. We do not know why the religious participants had a preference for wine, but we speculate that it might be related to them participating in the religious ritual of communion where wine is consumed (Loving, 1995) as the majority of the religious participants in the current sample identified themselves as protestant Christians. Lower disposable income was positively associated with beer/alcopops/ cider preference, which in part may be related to the fact that these beverages are cheaper in Norway compared to other beverages. In addition, drinking beer has historically been associated with the working-class, and the current study's findings suggest that individuals with lower socioeconomic status may still prefer beer (Dietler, 2006; Trasberg, 2020; Willis, 1977).

Regarding the five-factor model traits, conscientiousness was inversely associated with beer/alcopops/cider preference and positively associated with wine preference. To the best of our knowledge, the current study is the first study to show this. Wine-drinkers have, however, been found to have a healthier lifestyle than beer-drinkers (Paschall & Lipton, 2005; Sluik, Bezemer et al., 2016). This is consistent with the fact that conscientiousness is marked by an increased tendency to comply with different obligations, also related to health habits (McCrae & John, 1992; Olsen et al., 2015; Steptoe et al., 2017). General healthy habits among wine-drinkers have also been suggested as a possible explanation for the link between wine consumption and favourable health outcomes (Klatsky et al., 2003; Sluik, Bezemer et al., 2016; Strandberg et al., 2007). Based on the findings in the current study, it is reasonable to speculate whether conscientiousness could be a common factor explaining both beverage preferences and health behaviours among wine-drinkers. The reasons as to why conscientious individuals would favour wine and bypass beer/alcopops/cider are unknown. One possible explanation might be that wine has a reputation as a rather healthy alcoholic beverage and thus health-conscious conscientious individuals may prefer wine.
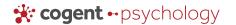
4.2. Alcohol use and alcohol-related harm and negative alcohol expectancies were associated with beverage preferences

Those with a preference for beer/alcopops/cider had an overall higher alcohol consumption and experienced more alcohol-related harm, compared to those reporting a mixed preference—which is in line with previous studies (Babor, 2010; Jensen et al., 2002; Naimi et al., 2007; Siegel et al., 2011; Stern et al., 2017). A novel finding, however, was that those reporting a preference for liquor/spirits expected fewer negative consequences of alcohol consumption. This finding is surprising, and possible explanations are not apparent. Liquor/spirits increases the blood-alcohol concentration rapidly, compared to beverages with lower alcohol concentration (a diluted liquor/spirits drink may result in an even faster absorption compared to neat liquor/spirits) (Mitchell et al., 2014; Roberts & Robinson, 2007; Smart, 1996). A rapid increase in blood-alcohol concentration has further been associated with an increased risk of alcohol-induced memory loss (White, 2003). In addition, liquor/spirits consumption has been linked to a higher likelihood of emotional and aggressive responses and cognitive impairment while under influence, although the mechanisms behind these associations are not fully understood (Pihl et al., 1984; Rehm & Hasan, 2020; Smart, 1996). It is hence conceivable that individuals who expect more negative consequences of alcohol intake avoid liquor/spirits in order to spare themselves of negative effects (i.e. memory loss, emotionality, aggression, and impairment), which may explain why a preference for liquor/spirits was associated with less negative alcohol expectancies. Fewer negative alcohol expectancies may be further related to a weaker motivation to reduce alcohol use (Jones et al., 2001), which may imply that liquor/spirits-drinkers could be more likely to oppose intervention aimed at reducing alcohol use.

4.3. Depression and anxiety were associated with beverage preferences

Individuals who reported more symptoms of depression were more likely to report a preference for wine or liquor/spirits, whereas symptoms of anxiety were inversely associated with a preference for wine or liquor/spirits. The specific associations between beverage preferences and depression versus anxiety have not been studied before. General differences in alcohol use between depressed and anxious students have, however, been reported before, as a previous study found students with coping-anxiety versus coping-depression drinking motives to differ in terms of alcohol consumption and problems (Grant et al., 2007). The positive association between depression and a preference for wine may be surprising in view of the fact that wine is associated—although not necessarily causally—with a range of positive health outcomes including better mental health (Godos et al., 2018; Klatsky et al., 2003; Mortensen et al., 2001; Ruf, 2003; Strandberg et al., 2007). However, in the current investigation, we controlled for some of the factors that may explain the association between wine and positive health outcomes (e.g., income, conscientiousness, and alcohol use). Wine may be the preferred alcoholic beverage for individuals who are particularly occupied with their own health, as it is often reckoned as a relatively low-calorie beverage and as the most "healthy" alcoholic beverage (Klatsky et al., 2003; Mitchell et al., 2014). On the other hand, an excessive preoccupation with one's health has been further linked to depression (Barthels et al., 2015), which perhaps can offer some insights into the association between depression and a preference for wine. In addition, the association between depression and a preference for wine may in part be explained by cultural stereotypes, where red wine in particular is often portrayed as a beverage for alleviating depression in popular culture. The positive association between depression and a preference for liquor/spirits might may, on the other hand, be explained by the association between liquor/spirits consumption and coping motivations, where liquor/spirit is consumed in order to block out problems and worries (Kuntsche et al., 2006).

The inverse association between wine or liquor/spirits preferences and anxiety is surprising and difficult to explain. The association between wine or liquor/spirits preference and fewer symptoms of anxiety could be related to these preferences being less common; hence, the individuals who have such preferences may be less conforming, more secure, and less anxious. Accordingly, conformity motives have been found to be an important predictor of students with coping-

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anxiety drinking motives' alcohol use (Grant et al., 2009), a finding which further supports that the inverse association between anxiety and wine or liquor/spirits preferences might be related to anxious students being more conforming in their drinking behaviour.

4.4. Limitations and strengths

The current study is based on cross-sectional data, and causal or temporal conclusions can therefore not be drawn. Still, several of the included correlates (i.e. demographics and personality factors) are likely to have been present before the participants began drinking alcoholic beverages. Another limitation of the current study is the lack of differentiation within the different categories of alcoholic beverages. For example, it is possible that beer-drinkers also differ from alcopops- and cider-drinkers. Further, the preferences categories were based on frequency of drinking the specific alcoholic beverage. It is possible that measuring preferences based on quantity consumed or the participants' reports of alcoholic beverage preferences would have yielded different results. It should also be noted that the number of participants in each of the alcoholic beverage groups differed and that the liquor/spirits preference group was rather small (n = 71). This implies that some associations between liquor/spirits preference and the other variables investigated may have gone undetected. Further, some third variables that might explain the observed associations may not have been sufficiently measured. One such important potential third variable, only partly addressed by the income variable, is socioeconomic status.

The generalisability of the current results should also be addressed. The response rates of the first and second round brings into question if the sample is representative for its population (students in Bergen). The response rates are, however, good compared to similar studies and our participants had similar sex, age, civil status, and alcohol use characteristics compared to those reported in other studies concerning Norwegian students (Nedregård & Olsen, 2014; Sheehan, 2001; Statistisk sentralbyrå [Statistics Norway], 2017). Thus, we expect our results to be generalisable to the Norwegian student population. The results may, however, not be directly generalisable to other student populations. Still, different student populations may share some characteristics, in particular with regard to drinking cultures (Karam et al., 2007). Hence, the current results might be relevant for similar populations in other countries. However, given the hallmarks of students' alcohol use, it is important to note that the current findings may not be reflective of correlates of alcoholic beverage preferences in other populations.

The study has some notable strengths as well, including the large sample size and the wide range of correlates included and controlled for. It is important to note, however, that the large number of variables included also represent a limitation as this increases the likelihood of type I errors (p values were not adjusted for multiple comparisons). The study supports previous findings, albeit in a new context (i.e. recent, Norwegian). In addition, the present study contributes with new knowledge, especially in terms of the association between personality, mental health, and alcoholic beverage preferences.

5. Conclusions

The current findings support several previous results regarding correlates of alcoholic beverage preferences and suggest as such that traditional divisions associated with beverage preferences still prevail. For instance, sex appears to be the most important determinant of alcoholic beverage preferences. In addition to supporting previous and older findings, the current study contributes with some important novel results. One novel finding was that conscientious individuals tend to prefer wine. This trait might thus be a common factor in the relationship between wine preference and favourable health outcomes. Participants with a preference for liquor/spirits reported fewer expected negative consequences of alcohol, which may imply that liquor/spirits preference could be associated with a weaker motivation to reduce alcohol consumption. Preferences for wine or liquor/spirits were positively associated with symptoms of depression and inversely associated with symptoms of anxiety. The identified associations between beverage preferences and mental health should be the subject of future research.

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The current findings are important for several reasons. First, some of the identified correlations of alcoholic beverage preferences may act as confounders in the association between wine consumption and favourable health outcomes (Klatsky et al., 2003); hence, the current findings can inform future studies investigating health outcomes associated with wine consumption concerning important variables to adjust for. Further, the current findings can inform initiatives aimed at reducing consumption of a specific alcoholic beverage, such as, for instance, hard liquor, and how to target such initiatives. Finally, the current findings may shed light on the degree of equality in the Norwegian and similar cultures, specifically in terms of class, ethnicity and gender, as the effect of such variables on alcoholic beverage preferences may indicate the existence of group differences beyond alcoholic beverage preferences (e.g., in terms of social status).

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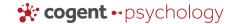Cook, M., Kuntsche, S., Labhart, F., & Kuntsche, E. (2020). Do different drinks make you feel different emotions? Examination of young adolescents' beverage-specific alcohol expectancies using the alcohol expectancy task. *Addictive Behaviors*, 106, 106375. https://doi.org/10.1016/j.addbeh.2020.106375

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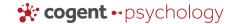
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