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Associations between human values and alcohol consumption among Norwegians in the second half of life

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Abstract

Previous studies investigating human values and alcohol consumption have mainly focused on adolescents, so the current study examined associations between human values and alcohol consumption in a cohort of Norwegians in the second half of life (40 years and above).

Human values were studied within Schwartz' theory [Schwartz, S. H. (1992). Universals in the Content and Structure of Values: Theory and Empirical Tests in 20 Countries. In M. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 25, pp. 1-65). New York: Academic Press.] A survey was carried out in 2002/2003 among Norwegians aged 40 to 79 years ($n = 4\ 149$). The respondents completed measures of human values, drinking frequency and typical drinking quantity. Females (9%) were more likely to report abstinence than males (3%). Males also reported a higher consumption level. Individuals with high education had lower levels of abstinence (4%) than those with basic education (7%) and high education was also related to more consumption. People aged 40-60 years were less likely to abstain from alcohol (3%) than individuals aged 61 years and above (10%) and the former also reported a higher consumption. Multivariate analyses adjusting for demographics as well as somatic and mental health showed that Hedonistic values were related to a lower probability of abstaining, while Conformity and Universalism values were associated with a higher probability of abstaining. The Achievement and Hedonism values were associated with more alcohol consumption, whereas Universalism, Tradition and Conformity were related to lower alcohol consumption.

Key words: Values; psychological; alcohol; Norway

1. Introduction

Alcohol consumption is associated with physical illness (e.g. cancer, stroke, and liver cirrosis), psychological and neurological problems (e.g. depression and epilepsy) as well as different types of accidents (Room et al., 2005). Alcohol may also be regarded as the most harmful recreational substance available to the public (Nutt et al., 2010). In the last decades, studies of alcohol consumption have mainly focused on adolescents and young adults, while there has been less focus on alcohol consumption among adults in the second half of life (aged 40 years and above).

There are several reasons for why more alcohol-related research is needed among individuals in the second half of life. The proportion of this population-segment will increase in the coming years due to lower birth rates in subsequent cohorts, improved general health, and because large cohorts from the post World War II period are currently approaching retirement (Støver et al., 2012). This is likely to intensify the need for tailored public-health interventions in this age group. Although alcohol consumption tends to decrease with age (Plebani et al., 2013), alcohol use and binge drinking seem to be increasing among aging adults in high income countries (Blazer & Wu, 2011; Bye & Østhus, 2011; Geels et al., 2013). Alcohol tolerance also decreases with age (Kalant, 1998). Aging adults with high alcohol consumption may also be overall more prone to injury and this risk may elevate by the fact that they are the largest consumers of medications that enhances the effect of alcohol (Moore et al., 2007; Nordfjærn et al., 2014). Due to the fact that consumption may be related to both accidents, exaggerated alcohol responses due to organ changes and drug-alcohol interactions, targeted public health interventions among this sub-populations are prudent.

For these reasons, studies that investigate factors which predict alcohol use among adults in second half of life are warranted. The knowledge gained from such studies may in turn be used in public health interventions targeted towards this population sub-group.

One of the questions that have not received sufficient attention by researchers is how individual differences in human values may be related to alcohol use. Schwartz (1992) suggested a universal typology of human values and defined these values as guiding components in a person's life, reflecting that human values are stable parts of a person's identity that influence perceptions, attitudes and behaviours. Human values also constitute individual criteria or standards for behaviour, and could shape motivations, which in turn may create drive for certain behaviours. Schwartz argued that people's value system consists of ten different dimensions: Power, Achievement, Hedonism, Stimulation, Self-direction, Universalism, Benevolence, Tradition, Conformity, and Security. These 10 dimensions are, in turn, divided into a system reflecting four overarching human value factors: Openness to change (human values fostering change and independent thought), Conservatism (human values fostering preservation, stability and traditional practice), Self-transcendence (human values favoring the welfare of others), and Self-enhancement (seeking dominance over others and preserve own well-being). Definitions of the specific dimensions in the typology are given in Table 1.

Insert Table 1 approx here

Several studies have linked Schwartz' (1992) human value typology to a range of behaviours including organizational behaviour (Smith et al., 2002), pro-environmental behaviour (Karp, 1996), pro-social behaviour (Schwartz & Shalom, 2010), and political voting (Caprara et al.,

2006). However, few studies have examined whether this typology is related to alcohol consumption. Schwartz et al. (2001) linked the human value system with a crude estimate of alcohol consumption frequency (i.e. the number of alcohol brands ever used) in a cross-sectional study among individuals in South-Africa. The findings showed that Tradition values were negatively correlated with alcohol use and Hedonism was positively associated with use. Hedonism and Stimulation were found to be the most important correlates of high alcohol consumption in a cross-sectional sample of 156 college students from the United States (Dollinger & Kobayashi, 2003). Kropp et al. (1999) reported that college students who consumed beer were more likely than non-beer consumers to report high Stimulation and low Security values.

These few previous studies that examined the associations between human values and alcohol use consisted of small samples, applied univariate statistical procedures, and did not incorporate multiple indicators of alcohol consumption. Multiple indicators of alcohol use, such as the frequency of use and typical quantity consumed, may provide a more complete description of the severity level and harm potential of consumption. Related to the rather small samples sizes in previous studies, research regarding how human values are associated with the probability of abstaining from alcohol also remain scarce. Furthermore, no published studies have focused on the association between human values and alcohol consumption among individuals in the second half of life. Possibly, aging adults score differently on human values than younger individuals. Younger individuals may, for instance, report stronger Hedonistic values, whereas individuals in the second half of life could have stronger Traditional values (Hellevik, 2002). This could potentially cause differences in the associations that these variables have with alcohol use among younger individuals and those in second half of life.

Midlife typically initiates at the age of 40 and represents a transition period where the individuals start to focus more on guiding the next generation (Eriksson, 1959). This could also involve a shift in values from a more egocentric focus to stronger altruistic motives (e.g. manifested by raising a family and guiding junior staff at the work place in this period). Although this period may last throughout life, there may be additional shifts in people's values when individuals turn 60 years and usually retire from their work activities. A forty year old may also more often encounter situations involving alcohol, such as during work travels or business meetings. Due to this potential shift in both values and alcohol exposure from age 40 to individuals turn 60 years, we also conducted stratified examinations across individuals aged 40 – 60 years and 61 years and above.

1.1. Aims and hypotheses

The aim of the current study was to investigate associations between human values and alcohol consumption in a cohort of Norwegian adults aged 40 to 79 years. Based on previous work, we hypothesized that human values related to Self-transcendence (Universalism and Benevolence) and Conservation (Conformity, Tradition and Security) are negatively associated with alcohol consumption and with probability of abstaining from alcohol. We also hypothesized that Openness to change (Self-direction) and self-enhancement (Power, Achievement, Stimulation and Hedonism) are positively associated with alcohol consumption, and with low probability of abstaining from alcohol.

2. Methods

2.1. Sampling

The current study used cross-sectional data from The Norwegian Life Course, Ageing and Generation Study (NorLAG) carried out by Norwegian Social Research (NOVA) and Statistics Norway in 2002/2003 (Slagsvold et al., 2012). A review of the study protocol was undertaken by the Norwegian Social Science Data Services and was approved before data collection commenced. A total of 24 municipalities (and six districts in Oslo) were selected from four regions in Norway based on criteria such as population size, population density, standard of living, age distribution, and income. The random sample obtained from the selected areas comprised 8298 individuals aged 40 to 79 years by the end of 2001. Individuals in the sample were contacted and asked to participate in a computer assisted telephone interview. A total of 5 559 individuals responded, which equals a response rate of 67%. During the telephone interview the respondents were also invited to complete a mailed questionnaire sent to their residential address. A combined telephone and mailed survey was used because some test batteries included sensitive questions. These questions were included into a mailed questionnaire in order to improve the confidentiality and anonymity of the respondents. Variables of primary interest in the current study were measured by this questionnaire.

Our mailed questionnaires were returned by 75% of the sample ($n = 4\ 149$) who participated in the phone interviews (age $M = 56.72$, $SD = 10.12$, 54% females). There were no significant differences in gender, age and geographic distribution between questionnaire respondents and non-respondents who failed to participate in all components of the study (see also Norwegian Social Research, 2012; Koløen et al., 2013;). Therefore, the sample may be regarded as representative of the Norwegian population aged 40 to 79.

2.2. Measures

Human values were measured by the well-established 21-item Basic Human Values Scale (Schwartz, 1992). The European Social Survey (ESS) version was used with gender neutral items (see also Bilsky et al., 2011). This instrument measures the ten dimensions suggested in Schwartz (1994) (i.e. Power, Achievement, Hedonism, Stimulation, Self-direction, Universalism, Security, Benevolence, Tradition, and Conformity). Descriptions about hypothetical persons are presented, and asks respondents to indicate the similarity of the hypothetical person to themselves. Responses were made on a scale ranging from (1) “not like me at all” to (6) “very much like me”. Previous work found that this instrument has adequate reliability and validity in a range of countries, including Norway (Strand, 2006).

Somatic and mental health was screened by the 12-item Short-Form Health Survey (SF-12) (Ware Jr et al., 1996). We established norm-based standardized scores by an algorithm developed by NOVA (see also Gandek et al., 1998). This algorithm took into account that the 12 items were measured by somewhat different anchors. The dimensionality, reliability and validity of the scale have been tested in numerous countries, including Norway (e.g. Gandek et al., 1998).

Two items concerning alcohol consumption were applied. The first item asked the respondents about annual drinking frequency (“daily/almost daily” (coded 365); “2-3 times a week” (coded 130); “once a week” (coded 52); “2-3 times a month” (coded 30); “once a month” (coded 12); “less frequent than the preceding options” (coded 6); “not been drinking the last 12 months” (coded 0); and “have never been drinking alcohol” (coded 0)). Annual typical drinking quantity was measured by the second item: “if you drank alcohol during the last year, how many ‘drinks’ did you usually drink on each occasion (a drink is 0.5 liters of

beer, one glass of wine, a small glass of fortified wine or 4 centiliters of spirits)”. Responses were made using an open-ended response field where respondents specified the typical amount consumed on each occasion. We used the responses to the drinking frequency item to group the respondents into abstainers (if their drinking frequency was 0), and alcohol consumers (if their drinking frequency was not 0). We also established an alcohol consumption variable by multiplying drinking frequency with typical quantity (converted to liters of pure alcohol by multiplying with 0.015). This created an index which took both the annual frequency of use and the annual typical drinking volume into consideration.

Demographic covariates (respondents’ gender, age education, basic = high school or below, high = university/college), and marital status (unmarried/not living with spouse, married/living with spouse) were also included in the analyses.

2.3. Statistical procedures

Descriptive statistics, chi-square (χ^2) tests and independent samples t-tests were conducted as appropriate to examine patterns of abstaining from alcohol and alcohol consumption levels across demographic sub-groups in the cohort. Cramer’s phi and Cohen’s d were estimated to provide effect sizes for the abstaining and consumption variables, respectively. Pearson’s product moment correlations and point bi-serial correlations for correlations involving gender were calculated to examine associations between demographics and z-scores of the psychological variables with alcohol consumption. Multiple logistic regression analysis was carried out in order to test whether human values predicted alcohol abstention. Also, multiple linear regression analysis was conducted to test whether human values predicted alcohol consumption. The alcohol consumption variable was log-transformed to avoid violation of the assumption of homoscedasticity in regression analysis. This also effectively excluded the

abstainers from this analysis ($n = 218$), as a value of zero cannot be logged. We also conducted separated multiple logistic and linear regression analyses in order to test whether the associations differed among individuals aged between 40-60 years and 61 and above. Both the logistic and linear regression analyses used z-scores for the continuous psychological variables. All analyses were carried out in IBM® SPSS® Statistics 21.0.

3. Results

Table 2 displays the proportion of alcohol abstinence and consumption across demographic sub-groups in the present cohort. Females were more likely than males to abstain from alcohol and the latter also reported a higher consumption. People with high education were less likely to report abstinence and had higher consumption levels than individuals with basic education. The proportion of the sample aged 40-60 years were less likely to abstain from alcohol and had higher consumption levels compared to individuals aged 61 years and above.

Insert Table 2 approx here

Means and standard deviations of the human values, and mental and physical health are shown in Table 3. When the mean scores of human values were ranked, the respondents reported the highest scores on Security ($M = 4.71$, $SD = 0.80$), Benevolence ($M = 4.68$, $SD = 0.76$) and Universalism ($M = 4.44$, $SD = 0.71$). The lowest scores were on Power ($M = 2.65$, $SD = 0.87$), Achievement ($M = 3.06$, $SD = 0.96$) and Stimulation ($M = 3.07$, $SD = 1.01$). The sample reported somewhat poorer somatic health than mental health.

Insert Table 3 approx here

Bi-variate correlations between demographics, mental and somatic health, and human values are shown in Table 4. The correlation coefficients ranged from weak to moderate strength. In line with Schwartz' theory (1994) those who valued Power also reported strong Achievement values. Individuals who reported high Hedonism values also reported stronger human values on the Stimulation index. The dimensions related to Conservation (i.e. Security, Conformity and Tradition) were also positively correlated, which is in line with the theory. Benevolence and Universalism, which represent Self-transcendence, were also moderately positively correlated. Females scored lower on the Power and Achievement human values than males, and higher than males on the Security and Benevolence human values. Age was positively associated with Tradition and Conformity, but negatively associated with Hedonism. High education was positively associated with Power, Achievement, Stimulation and Self-direction, and negatively associated with Security, Tradition and Conformity values.

Human values belonging to the overarching categories of Conservation (Conformity, Tradition and Security) and Self-transcendence (Universalism) were negatively associated with alcohol consumption and related to an increased likelihood of abstaining. In contrast, human values belonging to the category of Self-enhancement (Hedonism, Achievement, Stimulation and Power) were positively associated with alcohol consumption and with a reduced likelihood of abstaining from alcohol.

Insert Table 4 approx here

The next step was to test whether human values predicted abstinence, while controlling for demographics as well as mental and somatic health. The logistic regression analysis (Table 5) showed that Hedonism was negatively associated with abstinence, whereas Conformity and

Universalism were positively associated with abstinence. Female gender and old age were related to a higher probability of abstaining from alcohol. Somatic health negatively predicted abstinence.

Another logistic regression analysis was carried out to investigate potential differences in associations between human values according to age-groups (40-60 years vs. 61 years and above). This analysis did not reveal substantial differences across the two groups and female gender and Conformity remained the more important predictors of abstinence across the two age-groups. Hedonism was also found to be a consistent predictor of a lower probability of abstaining from alcohol across the groups.

Insert Table 5 approx here

Table 6 displays a multiple linear regression model which tested whether human values predicted alcohol consumption, controlling for gender, age, education, marital status and somatic and mental health. Achievement and Hedonism were positively associated with alcohol consumption, while Universalism, Tradition and Conformity were negatively associated with alcohol consumption. Females and older individuals had lower alcohol consumption compared to males and younger people, respectively. Somatic health and high education were positively associated with alcohol consumption.

Insert Table 6 approx here

An additional multiple linear regression model stratified by the two age-groups did not reveal substantial differences in the role of values for alcohol consumption. Hedonism and

Universalism remained the two more important predictors across the two groups. However, the role of Tradition values seemed more important for reduced alcohol consumption in the group aged 61 and above ($B = -0.18$, $p < 0.005$, $CI\ 95\% = -0.31; -0.06$) compared to the 40-60 age-group ($B = -0.08$, $p < .05$, $CI\ 95\% = -0.15; -0.01$).

4. Discussion

The objective of the current study was to examine associations between human values and alcohol consumption in a cohort of Norwegian adults in the second half of life. We found that Hedonistic values were associated with a lower probability of abstaining from alcohol, whereas Conformity and Universalism values were related to a higher probability of abstaining. Achievement and Hedonistic values were associated with greater alcohol consumption, while Universalism, Tradition and Conformity were related to lower alcohol consumption.

The finding that Hedonism positively predicted alcohol consumption was in line with our research hypothesis. This adds support to previous cross-sectional work using relatively crude estimates of alcohol consumption (Schwartz et al., 2001; Dollinger & Kobayashi, 2003).

Hedonism values are strongly related to seeking out pleasure and sensual gratification. One could argue that alcohol serves these functions, which is also in line with the manner alcohol is advertised (e.g. associated with leisure time activities, socializing, reward and enjoyment). On a biological level, alcohol stimulates dopamine activity in the brain's mesolimbic pathway causing feelings of reward, and it increases opioid activity, which causes feelings of pleasure (Chastain, 2006). Therefore, it was not surprising that Hedonistic values were associated with alcohol consumption in the current study. Interventions aimed to reduce alcohol consumption may promote alternative ways of gratification, pleasure and well-being among aging adults.

Intriguingly, and contrary to results in previous work (e.g. Schwartz et al., 2001; Dollinger & Kobayashi, 2003), we found that Conformity values were related to increased probability of abstaining, as well as to reduced alcohol consumption. Conformity values belong to the opposite segment (Conservation) than Hedonism in Schwartz' (1992) taxonomy. People who find such values important generally focus more on controlling impulses, restraining their personal desires and beliefs, and to meet social expectations rather than focusing on providing the self with gratification and pleasure. This could explain why people with high Conformity values reported more restricted behaviour in regard to alcohol consumption in the current study. The discrepancy in the findings compared to previous work could be due to the fact that the current study was conducted among people in second half of life. In this stage of life Conservation values may be stronger and more substantially linked with behaviour than in adolescence.

Meanwhile, this finding may be somewhat surprising in light of results from studies of social conformity (e.g. Teunissen et al., 2012). These studies generally showed that people with conforming tendencies tend to mimic the behaviour of others. Since the majority of the Norwegian population aged above 18 years drink alcohol (Vedøy & Skretting, 2009; Støver et al., 2012;), one could expect individuals who value conformity to imitate these behaviours. However, social conformity could be more relevant in the younger segments of the population, since it may be more important for adolescents to conform to the behavior of their peers compared to adults (e.g. Walker & Andrade, 1996). On the other hand, it should also be noted that the present study examined individuals in the second half of life and although there is a tendency of increased consumption in this group, they consume substantially less than individuals aged below 30 years (Bye & Østhus, 2012). Hence,

individuals in the second half of life may mimic the behaviour of their peers and consume less alcohol. There are also important differences in the constructs of social conformity and Conformity values. Social conformity may be regarded as a trait conceptualized as a tendency to amend behaviour in line with the behaviours and responses of others (Cialdini & Goldstein, 2004), whereas Conformity values are more strongly related to the cognitive perceived importance of adjusting behaviour in line with traditional and conservative norms in society (Schwartz, 1992).

In addition to Hedonism, Achievement values from the Self-Enhancement grid of Schwartz typology was related to higher alcohol consumption among the respondents as hypothesized. People who value Achievement usually strive to demonstrate their competence and success in different settings both in general social life and work-life. This could imply that these individuals also work harder and could thus be more vulnerable to stress and mental load. It is well known that alcohol often is used as an anxiolytic to relieve negative tension and stress (Laberg, 1990; Book & Randall, 2005). People holding strong Achievement values may be overall more likely to experience tension and stress due to their efforts, and could therefore be likely to consume more alcohol. It may also be that these individuals more often choose, or are required to, take part in after hours work gatherings where alcohol is served.

As hypothesized, human values related to Self-transcendence (Universalism) and Conservation (Conformity and Tradition) were associated with less alcohol consumption. People valuing Universalism tend to focus on understanding, appreciation, tolerance and protection of the welfare of other people. Such prosocial values could be protective in terms of alcohol consumption, because the psychopharmacological properties of alcohol are not instrumental in facilitating prosocial behaviours. For instance, drinking alcohol is related to

lower impulse control and poorer self-regulation (Miller & Fillmore, in press), which may not be conducive to prosocial behaviour. Previous work also reported that individuals who consume large amounts of alcohol are less concerned with having harmonious relations to other individuals than people who consume less (Dollinger & Kobayashi, 2003).

In line with our initial hypothesis, we found that Tradition values were associated with less alcohol consumption, particularly among older individuals aged 61 and above. This partly supports the assumption that Conservation values are more important at the late stages in the second half of life. Meanwhile, the important role of Tradition values for alcohol use among the oldest individuals may also be a cohort-effect. These individuals were more likely to be socialized in a period dominated by more conservative attitudes and values than the individuals aged 40 – 60. Together with Conformity, Tradition belongs to the opposite segment to Hedonistic values in Schwartz (1992) theoretical taxonomy. Tradition values promote conformity to values learnt during socialization, and individuals with high scores on Tradition are also more likely to hold religious beliefs (Schwartz et al., 2001). Traditional Christian beliefs and general socialization patterns in the Norwegian setting usually promote modesty in relation to alcohol.

It was somewhat surprising that marital status did not relate to alcohol consumption, as previous prospective studies reported that being unmarried or divorcing was related to increased consumption (e.g. Temple et al., 1991; Karlamangla et al., 2006). However, another study reported that people reduce their alcohol consumption after a divorce, particularly females who divorce a husband with severe alcohol consumption (Smith et al., 2012). A possibility is that transitions in marital status are more important for consumption than the

current status and prospective studies should be conducted in order to investigate this in further detail.

4.1. Strengths and limitations of the study

The current study has several strengths. Firstly, we studied a relatively large sample, which may be representative of the general population of adults in the second half of life. The study is also among the first to examine multivariate relations between human values and alcohol consumption, controlling for a range of demographic and psychological covariates. Also, to our knowledge, this is the first study that links human values to the likelihood of alcohol abstinence in older age. The study also has some limitations that should be considered. Self-report measures are subject to social desirability bias. This may especially be the case for alcohol consumption, which is often underestimated compared to sales statistics (Rehm, 1998). However, several studies have reported a relatively strong correspondence between self-reported alcohol use and biological tests (Simpson et al., 2002; Secades-Villa & Fernandez-Hermida, 2003). The data were cross-sectional and the temporal order of predictors and outcomes was not assessed. It is possible that alcohol consumption influences human values, but it is equally likely that human values are formed prior to and independently of alcohol consumption. Nevertheless, the relations between values and alcohol consumption were measured and analyzed in the causal direction suggested by Schwartz' (1992) theory, where values are considered as stable and influencing behavior. Also, the values were only able to explain a relatively small amount of variance in alcohol consumption in the prediction models. However, the objective of the current study was to investigate the relationship between human values and alcohol consumption, and not to explain variation in alcohol consumption. There were also relatively few abstainers in the present cohort ($n = 236$) and

this may have caused a type II error and somewhat weakened the associations between human values and the abstainer variable.

4.2. Conclusion

In conclusion, the results from the current study of adults in the second half of life suggest that alcohol consumption is related to human values. In particular, Achievement and Hedonism values appear to be positively associated with alcohol consumption, while Universalism, Tradition and Conformity values may be protective against high alcohol consumption. We agree with the conclusions of Dollinger and Kobayashi (2003) that policy-makers and public health campaigns should take into account the value structures of the target groups. Therefore, considering the human values of those that consume large amounts of alcohol may be beneficial in reducing consumption and alcohol-related harm. Based on our findings, messages targeted at individuals high in Achievement and Hedonism may be more efficient in reducing alcohol consumption and alcohol-related harm, compared to messages aimed at the entire population of people consuming alcohol.

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Table 1. Basic human values (Ros et al., 1999)

Core human value description	Basic human values	Core definitions
Self-transcendence	Universalism	Understanding, appreciation, tolerance and protection for the welfare of all people and for nature
	Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact
Openness to change	Self-direction	Independent thought and action-choosing, creating and exploring
Self-enhancement	Power	Social status and prestige, control or dominance over people and resources
	Achievement	Personal success through demonstrating competence according to social standards
	Stimulation	Excitement, novelty, and challenge in life
	Hedonism	Pleasure and sensual gratification of oneself
Conservation	Conformity	Restraint of action, inclinations and impulses likely to upset or harm others and violate social expectations or norms
	Tradition	Respect, commitment and acceptance of the customs and ideas that traditional culture or religion provides
	Security	Safety, harmony, stability of society, of relationships, and of self

Table 2. Alcohol abstinence and consumption across cohort sub-groups

Indicator	Alcohol abstinence		χ^2 (Cramer's phi)	Logged alcohol consumption (Mean, SD)	/t-value (Cohen's d)
	n (%)	no yes			
Gender					
Female	1974 (91%)	184 (9%)	43.99*** (0.10)	4.16 (1.44)	11.51*** (-0.40)
Male	1879 (97%)	69 (3%)		4.71 (1.28)	
Education					
Basic	2727 (93%)	208 (7%)	15.40*** (0.06)	4.28 (1.39)	-8.88*** (-0.34)
High	1111 (96%)	44 (4%)		4.75 (1.34)	
Age					
40-60 years	2390 (97%)	86 (3%)	77.96*** (0.14)	4.55 (1.33)	7.04*** (0.26)
61 years and above	1463 (90%)	167 (10%)		4.19 (1.48)	
Marital status					
Unmarried/not living with spouse	1058 (92%)	88 (8%)	6.33** (0.04)	4.38 (1.48)	-1.18 (-0.05)
Married living with spouse	2795 (94%)	165 (6%)		4.45 (1.36)	

*** p < 0.001, ** p < 0.01

Table 3. Means and standard deviations of the psychological constructs (valid listwise $n = 4015$)

Dimension	Mean	SD
Power	2.65	0.87
Achievement	3.06	0.96
Hedonism	4.05	0.95
Stimulation	3.07	1.01
Self-direction	4.25	0.90
Universalism	4.44	0.71
Security	4.71	0.80
Benevolence	4.68	0.76
Tradition	4.26	0.94
Conformity	4.15	0.96
Somatic health ¹	47.04	11.42
Mental health ¹	54.59	8.40

¹ Norm-based standardized score

Significant ($p < 0.05$) correlation coefficients in bold

Table 5. Human values associated with reported alcohol abstinence (no = 0, $n = 3729$, yes = 1, $n = 236$)

Indicator	OR	CI 95%	Wald	B
Gender (male = 0, female = 1)	2.49	1.76; 3.50	27.07***	0.91
Age	1.04	1.03; 1.06	26.69***	0.04
Education (basic = 0, high = 1)	0.70	0.47; 1.03	3.22	-0.36
Marital status (unmarried/not living with spouse = 0, married/living with spouse = 1)	1.06	0.76; 1.48	0.13	0.06
Somatic health (SF-12)	0.88	0.78; 0.99	4.34*	-0.12
Mental health (SF-12)	1.02	0.88; 1.19	0.09	0.02
Power	0.92	0.76; 1.12	0.68	-0.08
Achievement	1.00	0.83; 1.21	0.00	0.00
Hedonism	0.63	0.53; 0.74	30.23***	-0.47
Stimulation	1.04	0.86; 1.26	0.18	0.04
Self-direction	0.94	0.79; 1.11	0.55	-0.06
Universalism	1.36	1.10; 1.67	8.30**	0.31
Security	0.96	0.79; 1.17	0.18	-0.04
Benevolence	0.94	0.76; 1.15	0.39	-0.07
Tradition	0.93	0.76; 1.13	0.53	-0.07
Conformity	1.62	1.32; 2.00	21.27***	0.49

Dependent measure = alcohol abstinence (0) no, (1) yes

Nagelkerke $R^2 = 0.15$, Cox & Snell $R^2 = 0.06$

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 6. Human values related to alcohol consumption ($n = 3179$)

Indicator	B	CI 95%	<i>t</i> -value
Gender (male = 0, female = 1)	-0.57	-0.67; -0.47	-11.04***
Age	-0.01	-0.02; -0.01	-4.52***
Education (basic = 0, high = 1)	0.34	0.24; 0.45	6.22***
Marital status (unmarried/not living with spouse = 0, married/living with spouse = 1)	-0.07	-0.18; 0.04	-1.29
Somatic health (SF-12)	0.08	0.03; 0.13	3.05***
Mental health (SF-12)	0.00	-0.05; 0.06	0.11
Power	0.04	-0.02; 0.11	1.30
Achievement	0.11	0.03; 0.16	3.32*
Hedonism	0.19	0.13; 0.25	6.35***
Stimulation	0.04	-0.02; 0.10	1.39
Self-direction	-0.07	-0.13; -0.01	-2.31
Universalism	-0.15	-0.21; -0.08	-4.46***
Security	-0.03	-0.09; 0.03	-0.99
Benevolence	0.09	0.03; 0.16	2.63
Tradition	-0.11	-0.17; -0.05	-3.41***
Conformity	-0.05	-0.11; -0.01	-1.80*

Dependent variable = alcohol consumption (logged)

Adjusted $R^2 = 0.12$

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