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RESEARCH ARTICLE



Age-related variations of the psychosocial determinants of problematic alcohol consumption

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ABSTRACT

Objective: As alcohol consumption generally occurs in interpersonal contexts, many studies have examined the psychosocial mechanisms underlying drinking habits. However, most have focused on young/student populations, and far less is known regarding how these psychosocial determinants evolve through adulthood. We thus compared the weight of psychosocial factors in problematic alcohol consumption among young, middle-aged and older people from the general population.

Methods: A general population sample completed an online survey ($N = 614$, $M_{\text{age}} = 34.44$, Range = 18–85). We measured demographic variables, problematic alcohol consumption and alcohol-related psychosocial factors (i.e. expectations, motives, norms, social identity, anxiety and depression). We performed dominance analyses to rank the importance of these psychological factors in explaining problematic alcohol consumption across young (18–24, $n = 252$), middle-aged (25–40, $n = 179$), and older (>40 , $n = 183$) individuals.

Results: In young adults, enhancement motives were the most important determinant of problematic alcohol consumption, followed by social drinking identity, coping and social motives. In the middle-aged group, social identity had the highest contribution, followed by social and enhancement motives. Finally, problematic alcohol consumption among older adults was mainly related to coping motives and social identity.

Discussion: We showed that the psychosocial determinants of problematic alcohol consumption differ with age. While social drinking identity has a significant influence throughout the age groups, we documented a progressive shift from positive (social/enhancement) to negative (coping) reinforcement between younger and older individuals. This study provides a better understanding of the profiles of consumers according to age, and offers guidelines to adapt prevention and interventions to the age group targeted.

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Problematic alcohol consumption; psychosocial factors; general population; age; dominance analysis

1. Introduction

Problematic alcohol use is a major public health concern worldwide (WHO, 2018), and a promising avenue to understand and prevent this deleterious habit is to identify its interpersonal determinants (Cornilov et al. 2019). Indeed, beyond the well-established cognitive (Kushner et al. 2000; Gil-Hernandez et al. 2017) and psychopathological factors [e.g. depression (Uekermann et al. 2003) and anxiety (Kushner et al. 2000)], psychosocial factors also influence the development and maintenance of alcohol use (Kornreich et al. 2002; Bora and Zorlu 2017; Pabst et al. 2020). In terms of psychological factors, and more specifically emotional ones, the role of depression is particularly relevant to consider as they both frequently co-occur with excessive alcohol consumption. Concerning social factors, drinking social norms (i.e. rules that guide behavior by encouraging conformity; Chung and Rimal 2016) have a central role as they

influence drinking habits, particularly in youth (Mange et al. 2021). Moreover, alcohol-related expectancies (i.e. beliefs about the effects of one's own drinking; Goldman 1994) and drinking motives, namely *enhancement* (i.e. drinking to increase positive affects), *coping* (i.e. drinking to reduce negative affect), *social reinforcement* (i.e. drinking to increase social interactions and interpersonal well-being) and *social conformity* (i.e. drinking to avoid social rejection or reduce social pressure) ones, constitute important problematic alcohol consumption predictors (Kuntsche et al. 2005). More specifically, research indicates that social motives, along with enhancement ones, are the main predictors of consumption and binge drinking in youth (Lannoy et al. 2017; Mange et al. 2021). A final but understudied social factor determining drinking habits is *drinking identity* [i.e. considering problematic alcohol consumption as a defining or core part the self (Conner et al. 1999)], which predicts alcohol use over and beyond social norms and drinking motives (DiBello et al.

Table 1. Sample characteristics on demographic, alcohol-related and psychopathological variables.

	Total sample (N = 614)			Younger group (n = 252)			Middle-aged group (n = 179)			Older group (n = 183)		
	Min	Max	Mean (SD)	Min	Max	Mean (SD)	Min	Max	Mean (SD)	Min	Max	Mean (SD)
Age	18	85	33.44 (14.03)	18	24	21.23 (1.64)	25	40	31.50 (4.94)	41	85	52.14 (8.60)
Male, N (%)			204 (33.2 %)			86 (34.1 %)			71 (39.7 %)			47 (25.7 %)
Female, N (%)			410 (66.8%)			166 (65.9 %)			108 (60.3 %)			136 (74.3 %)
AUDIT total	1	33	5.51 (4.19)	1	33	6.44 (4.54)	0	23	5.08 (3.61)	1	22	4.66 (3.98)
HADS-Depression	0	19	4.14 (3.40)	0	18	4.15 (3.40)	0	16	4.00 (3.33)	0	19	4.26 (3.47)
HADS-Anxiety	0	20	7.35 (4.02)	0	19	7.84 (4.36)	0	20	6.75 (3.76)	0	16	7.28 (3.70)
DMQ-social motives	3	15	7.85 (3.32)	3	15	8.97 (3.04)	3	15	7.67 (3.31)	3	15	6.50 (3.16)
DMQ-coping motives	3	15	5.26 (2.92)	3	15	5.42 (3.11)	3	15	4.95 (2.65)	3	15	5.33 (2.88)
DMQ-enhancement motives	3	15	7.14 (3.07)	3	15	8.42 (3.07)	3	15	6.71 (2.94)	3	13	5.79 (2.53)
DMQ-conformity motives	3	15	4.31 (2.30)	3	15	4.63 (2.62)	3	13	4.27 (2.21)	3	11	3.90 (1.79)
AEQ-Alcohol-related expectancies	9.17	87	38.59 (18.15)	9.17	87	44.43 (16.77)	9.17	80.50	37.07 (17.86)	9.17	79	28.69 (16.27)
Social norms	0.75	5.50	2.83 (0.95)	0.75	5.50	2.90 (0.90)	0.75	5.25	2.91 (1.00)	0.75	5.50	2.66 (0.95)
Drinking Identity	1	5	1.51 (0.76)	1	5	1.52 (0.78)	1	3.80	1.54 (0.76)	1	5	1.46 (0.72)

AEQ: Alcohol Expectancies Questionnaire; AUDIT: Alcohol Use Disorders Identification Test; DMQ: Drinking Motives Questionnaire; HADS-A: Hospital Anxiety and Depression Scale-Anxiety; HADS-D: Hospital Anxiety and Depression Scale-Depression.

2018). Thus, although less explored than affective factors (e.g. anxiety and depression), these psychosocial factors constitute key predictors of excessive alcohol use.

However, these psychosocial determinants of alcohol use have often been studied individually and more importantly, solely among adolescents, young adults or university students (Lannoy et al. 2017; DiBello et al. 2018; Mange et al. 2021). Indeed, little is known about the contribution of these psychosocial factors to explain problematic alcohol use in the general population, and more specifically in middle-aged or older individuals (e.g. D'Aquino et al. 2023). Yet, alcohol consumption habits evolve through life, notably through reduced binge/heavy drinking episodes but increased daily alcohol consumption (Richard et al. 2019), which could be explained by differences in psychosocial factors that predict problematic alcohol use among younger, middle-aged, and older individuals. Therefore, this study examines the relative contributions of these psychosocial factors on problematic alcohol consumption across age groups.

2. Methods

2.1. Participants and procedures

A sample of 614 participants aged 18 to 85 years ($M_{age} = 33.44$; $SD_{age} = 14.03$), completed an online survey shared through social networks. Inclusion criteria were to be at least 18 years old, to be fluent in French and to drink alcohol at least once a month (see Table 1).

2.2. Ethics

The ethical committee of the University of Lille approved the study (Reference: 2022-591-S104). All data are anonymous and we collected no identifying data. Participants did not receive any compensation.

2.3. Measures

2.3.1. Demographic variables

We recorded sex, age, and self-reported French language fluency of the participants.

2.3.2. Alcohol consumption variables

We evaluated problematic alcohol consumption with the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al. 1993, French version: Gache et al. 2005), evaluating the intensity and dangerousness of alcohol consumption through 10 items (Cronbach's $\alpha = .79$). The questionnaire also includes some questions about symptoms related to dependence. It has a range of 0 to 40. Consumption is considered risky or problematic with the total score is above 7 for women 8 for men.

2.3.3. Psychopathological variables

We assessed anxiety-depressive symptomatology using the self-reported "Hospital Anxiety and Depression Scale" (HADS, Zigmond and Snaith 1983), which measures anxiety (Cronbach's $\alpha = .79$) and depression (Cronbach's $\alpha = .77$) symptoms on Likert scales. We computed a subtotal score for each dimension.

2.3.4. Psychosocial variables

We assessed:

- *Drinking motives* with the "Drinking Motives Questionnaires Revised Short Form" (DMQ-R-SF, Kuntsche and Kuntsche 2009, French version: Mange et al. 2021), a short version of the Drinking Motives Questionnaire Revised (Cooper 1994). It measures four motives: enhancement, social, coping and conformity (Cronbach's $\alpha = .74, .83, .87$, and $.84$ respectively). Each item is rated on a 5-point Likert scale.
- *Alcohol-related expectations* with the 55-item Alcohol Expectancy Questionnaire (AEQ, Brown et al. 1987, French version by Vautier and Moncany 2008). We rated each item on an 11-point Likert scale and computed a total score (Cronbach's $\alpha = .97$).
- *Drinking social norms* by combining two measures in an overall score (Cronbach's $\alpha = .80$). Descriptive norms were measured by adapting items from the AUDIT-C (including the first 3 items of the AUDIT, Haug et al. 2011) so that they referred to the "most important people" for the participant.

Injunctive norms were measured by asking the participants how much "the most important people" for them would approve various drinking behaviors (e.g., drinking alcohol, getting drunk, Krieger et al., 2016; Lac & Donaldson, 2021). Items were rated on a 7-point Likert scale.

- *Drinking Identity* with the 5-item Alcohol Self-Concept Scale (Lindgren et al. 2013), an adapted version of the Smoker Self Concept Scale (Shadel & Mermelstein 1996; French version by Mauduy et al. 2022). We assessed Drinking Identity with the 5-item Alcohol Self-Concept Scale (Lindgren et al. 2013), an adapted version of the Smoker Self Concept Scale (Shadel & Mermelstein 1996; French version by Mauduy et al. 2022). This scale assesses the importance of alcohol consumption for self-image, as well as other people's perception of the role of alcohol in the individual's life. The five items are as follows: "Drinking alcohol is part of my self-image", "Drinking alcohol is part of who I am", "Drinking alcohol is a part of my personality", "Drinking alcohol is a large part of my daily life" and "Others view drinking alcohol as part of my personality". These items are rated on a 5-point Likert scale ranging from 1 for "strongly disagree" to 5 for "strongly agree". We computed the total score, summing the score for each of the 5 items. Higher total score indicates higher tendency to consider alcohol consumption as an integral part of one's life and self-concept. When looking at the Smoker Self-Concept scale's validity, (Shadel & Mermelstein 1996) showed that the original scale had a satisfactory internal validity (Cronbach $\alpha=.85$). They also showed that higher scores on this scale shows the importance of considering oneself a smoker for self-image. In our sample, the Alcohol Self-Concept Scale has very good psychometric qualities. Its internal consistency is satisfactory ($\alpha = .86$). Concerning its construct validity, confirmatory factor analysis testing its unidimensionality indicates good fit indicators ($\chi^2 = 24.55$, CFI = 0.99, TLI = 0.97, RMSEA = 0.08). As for its external validity, the results of our statistical models show that the scale is strongly associated with alcohol consumption and problematic drinking.

2.4. Data analysis

We conducted the analyses with R (version 4.1.1). For this, we constituted three age groups: younger adults (18–24 years old; $n = 252$), middle-aged adults (25–40 years; $n = 179$), older adults (>40 years old; $n = 183$). First, we performed three multiple linear regression analyzes with repeated ($N = 1000$) K-fold cross-validation (James et al. 2013) to test the significant influence of psychosocial factors on AUDIT scores of the three age groups. Second, we conducted three dominance analyses (Groemping 2007) with bootstrapping method ($N = 1000$ samples) to rank the factors according to their relative contributions on AUDIT scores. Dominance analysis allows to counteract the limitations of traditional statistical methods assessing the strength of factors in models (see Nimon and Oswald 2013), by using the square of

part correlation (i.e. r^2) instead of the traditional standardized regression coefficient (i.e. β).

Pearson correlation between all variables were also examined and presented in [Supplementary Tables 1–4](#).

3. Results

The analyses (see [Table 2](#)) indicated that our model explained 50.64% of the AUDIT scores among *younger adults* [$F(10,243) = 24.93$, $p < .001$]. More precisely, social, coping and enhancement motives, alcohol expectancies and drinking social identity are significantly associated with AUDIT score. Results of the dominance analysis indicated that enhancement motives ($r^2 = 0.128$, $\Delta R^2 = 25.28\%$) and social drinking identity ($r^2 = 0.124$, $\Delta R^2 = 24.49\%$) are first, followed by, coping motives ($r^2 = 0.100$, $\Delta R^2 = 19.75\%$) and social motives ($r^2 = 0.087$, $\Delta R^2 = 17.18\%$) ([Figure 1\(a\)](#)).

Among *middle-aged adults*, our model explained 49.3% of the AUDIT scores [$F(10,168) = 13.15$, $p < .001$]. Sex, social, coping and enhancement motives, and drinking social identity were significantly associated with AUDIT score. Results of the dominance analysis indicated that social drinking identity is first ($r^2 = 0.091$; $\Delta R^2 = 20.73\%$) followed by four other variables, namely, social motives ($r^2 = 0.087$; $\Delta R^2 = 19.82\%$), enhancement motives ($r^2 = 0.059$; $\Delta R^2 = 13.44\%$), coping motives ($r^2 = 0.054$; $\Delta R^2 = 12.30\%$) and sex ($r^2 = 0.053$; $\Delta R^2 = 12.07\%$) ([Figure 1\(b\)](#)).

Among older adults, the model explained 61.28% of the AUDIT scores [$F(10,172) = 27.22$, $p < .001$]. Only sex, coping motives and social drinking identity were significantly associated with AUDIT score. The variable coping motives ($r^2 = 0.191$, $\Delta R^2 = 31.17\%$) has the highest relative weight in older adults' group, followed by social drinking identity ($r^2 = 0.177$, $\Delta R^2 = 28.88\%$), enhancement motives ($r^2 = 0.081$, $\Delta R^2 = 13.22\%$) and alcohol expectations ($r^2 = 0.068$, $\Delta R^2 = 11.10\%$) ([Figure 1\(c\)](#)).

4. Discussion

We offered the first integrative exploration of the respective weight of psychosocial predictors on problematic alcohol consumption in a large sample of drinkers from the general population, stratified by age. A first main result is that, across all age groups, social, coping and enhancement motives, alcohol-related expectations and social drinking identity constituted the main predictors of AUDIT total score, above and beyond other psychosocial factors (e.g. conformity motives, social norms), but also demographic (e.g. sex) and intraindividual (e.g. depression, anxiety) variables. Dominance analysis further highlighted that the hierarchy across these factors varied depending on age group. Enhancement motives dominated in younger adults, followed by social identity, coping and social motives, while the best predictor among middle-aged adults was social identity, followed by social and enhancement motives. Finally, among older adults, coping motives were the strongest predictor, followed by social identity.

Table 2. Predictive weight of psychosocial variables on AUDIT score (multiple linear regression) with bootstrapping dominance analysis ($N = 1000$) across three age groups.

Groups	Variables	Estimate	SE	95% Confidence Interval		t value	Square of part correlation (r^2)	90% Confidence Interval for r^2		ΔR^2
				2.5%	97.5%			5%	95%	
Younger adults (18–24 years)	(Intercept)	6.426	0.217	5.999	6.852					
	Sex	−0.304	0.460	−1.211	0.602	−0.661	0.003	0.001	0.013	0.59%
	DMQ-Social motives	1.074	0.291	0.500	1.647	3.690***	0.087	0.057	0.128	17.18%
	DMQ-Coping motives	1.231	0.273	0.693	1.769	4.506***	0.100	0.058	0.149	19.75%
	DMQ-Enhancement motives	1.406	0.282	0.850	1.962	4.984***	0.128	0.085	0.184	25.28%
	DMQ-Conformity motives	−0.148	0.243	−0.626	0.331	−0.608	0.008	0.005	0.023	1.58%
	AEQ-Alcohol-related expectancies	−0.585	0.296	−1.167	−0.002	−1.977*	0.040	0.028	0.051	7.90%
	HADS-Depression	0.3118	0.269	−0.211	0.847	1.184	0.009	0.002	0.029	1.78%
	HADS-Anxiety	−0.272	0.277	−0.818	0.274	−0.980	0.005	0.003	0.015	0.99%
	Social norms	−0.048	0.214	−0.470	0.374	−0.224	0.003	0.001	0.025	0.59%
	Drinking identity	1.370	0.251	0.875	1.863	5.465***	0.124	0.068	0.193	24.49%
	(Intercept)	5.248	0.214	4.826	5.669					
	Sex	1.640	0.462	0.728	2.552	3.551***	0.053	0.022	0.096	12.07%
Middle-aged adults (25–40 years)	DMQ-Social motives	0.950	0.335	0.288	1.611	2.836**	0.087	0.056	0.131	19.82%
	DMQ-Coping motives	0.811	0.273	0.271	1.350	2.968**	0.054	0.015	0.129	12.30%
	DMQ-Enhancement motives	0.278	0.306	−0.327	0.882	0.3660	0.059	0.034	0.099	13.44%
	DMQ-Conformity motives	0.205	0.244	−0.277	0.687	0.839	0.027	0.008	0.076	6.15%
	AEQ-Alcohol-related expectancies	−0.273	0.327	−0.919	0.373	0.406	0.043	0.026	0.077	9.79%
	HADS-Depression	−0.235	0.267	−0.762	0.293	−0.879	0.003	0.002	0.019	0.68%
	HADS-Anxiety	0.249	0.284	−0.312	0.809	0.877	0.004	0.002	0.021	0.91%
	Social norms	0.343	0.219	−0.090	0.775	1.564	0.019	0.003	0.051	4.33%
	Drinking identity	0.918	0.233	0.458	1.378	3.942***	0.091	0.042	0.158	20.73%
	(Intercept)	4.943	0.220	4.508	5.377					
	Sex	1.173	0.459	0.267	2.079	2.554*	0.017	0.004	0.048	2.77%
	DMQ-Social motives	0.120	0.265	−0.404	0.643	0.451	0.034	0.017	0.066	5.55%
	DMQ-Coping motives	1.802	0.270	1.269	2.336	6.668***	0.191	0.128	0.259	31.17%
Older adults (>40 years old)	DMQ-Enhancement motives	0.447	0.280	−0.104	0.999	1.602	0.081	0.052	0.118	13.22%
	DMQ-Conformity motives	0.071	0.223	−0.368	0.511	0.321	0.019	0.007	0.050	3.10%
	AEQ-Alcohol-related expectancies	0.068	0.281	−0.488	0.624	0.242	0.068	0.041	0.105	11.10%
	HADS-Depression	−0.299	0.248	−0.788	0.191	−1.205	0.007	0.004	0.018	1.14%
	HADS-Anxiety	0.056	0.240	−0.418	0.531	0.234	0.006	0.003	0.019	0.98%
	Social norms	0.020	0.191	−0.356	0.396	0.105	0.013	0.005	0.046	2.12%
	Drinking identity	1.417	0.225	0.973	1.862	6.291***	0.177	0.092	0.267	28.88%

AEQ: Alcohol Expectancies Questionnaire; DMQ: Drinking Motives Questionnaire; HADS: Hospital Anxiety and Depression Scale. Statistical significance at * $p < .05$; ** $p < .01$; *** $p < .001$.

Our results are in line with previous ones (e.g. Kuntsche et al. 2005) showing that the motivation related to positive reinforcement, namely enhancement motives (e.g. to feel good, to have fun), are key determinants of problematic alcohol use in younger adults. The identification of drinker identity as the second most important predictor supports previous research showing that social group identity is associated with higher alcohol consumption as well as higher intention to binge in younger adults (Hunt and Burns 2017; Mange et al. 2021). The fact that we do not replicate previous results regarding the influence of social norms on consumption (Mange et al. 2021) might be related to differences in the sample selected, as these earlier studies focused on binge drinking in university students rather than on the general population. Global alcohol consumption (evaluated here through the AUDIT) and binge drinking might thus be partly related to different predictors. We centrally show that the role of drinking motives evolves with age, as (1) the middle-aged group showed social motives as an important predictor, suggesting the evolution toward external motives rather than internal positive reinforcement; (2) coping motives became the central predictor among older adults, suggesting a transition toward negative reinforcement (i.e. drinking to reduce negative affects) during adulthood.

Psychosocial factors thus evolve with age, regarding both the focus (internal versus external) and valence (positive versus

negative) of drinking motives. The secondary role played by social motives in youth might appear surprising at first glance, but previous research has documented the dominant role of enhancement motives at the early alcohol consumption stages (Lannoy et al. 2019), and the emergence of social motivations among middle-aged adults, notably to strengthen cohesion in work environment (Buvik 2020). Our results among older adults also echo previous ones showing that coping motives become predominant with age, alcohol being used to reduce negative emotions when self-regulation becomes less efficient (Livingstone and Isaacowitz 2021). Future research could further refine the different roles of drinking motivations according to age through the use of modified or adapted versions of the DMQ-R scale. Indeed, Grant et al. (2007, 2009) validated a version of the DMQ-R with 5 (vs. 4) components in undergraduate students, by separating the scale of coping motives into two subscales (i.e. coping anxiety and coping depression). Concerning its validity, Grant et al. (2009) showed an association between a high level of coping motives for depression and higher consumption in relation to depression moods, and similarly, coping motives for anxiety predicted higher consumption in relation to anxiety moods. Therefore, although our study shows that coping motivations are present in younger adults and intensify with age, in qualitative terms we could examine whether these coping motivations are of the same nature (i.e. related to anxiety or depression) in younger

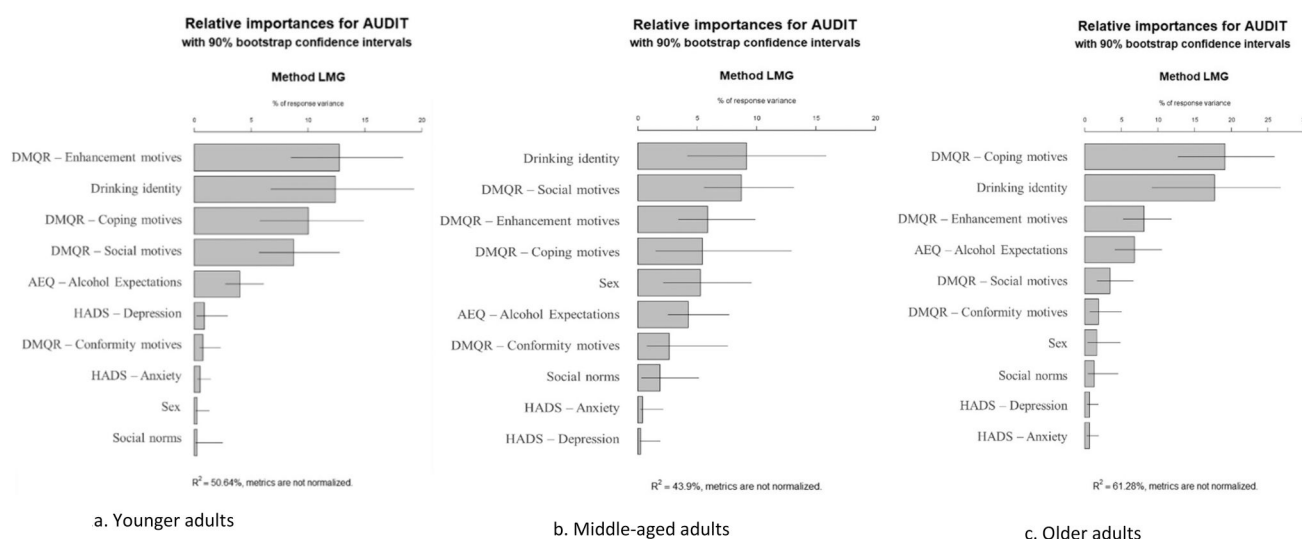


Figure 1. Relative weights of the 10 factors on the AUDIT score (with $N = 1000$ bootstrapping confidence intervals) for younger (Figure 1a), middle-aged (Figure 1b) and older adults (Figure 1c).

and older adults. Moreover, and more recently, D'Aquino et al. (2023) validated the DMQ-A, a version of the DMQ-R adapted for adults, with a confidence motivation component (i.e. drinking to reduce social inhibition) that replaced the conformity motivation, and a new component, i.e. taste-related that refers to drinking for enjoyment of the taste. This version resulted from their observation that motivations to conform diminish with age, giving way to more self-confident motivations in adults. Thus, the use of modified and/or population-specific version of the DMQ would enable future research to go beyond the present results, in particular by clarifying the role of motivation to comply with alcohol consumption.

Altogether, our results thus point age as an important factor to consider when investigating the alcohol-related motives. At the theoretical level, they highlight the importance to systematically considering age as an important variable when evaluating the alcohol consumption predictors. From a clinical standpoint, they also call for developing age-adapted prevention and treatment strategies.

Some limitations should be acknowledged. First, the online convenience sample used for this study is not totally representative of the general population. To overcome this limitation, future studies could for instance apply the stratified random sampling method based on participants' characteristics such as education level, gender and marital status to generalize the results to the general population. Also, and despite the age stratification, some age ranges were poorly represented, particularly people aged 60 or above, whom constitute an at-risk group for excessive alcohol consumption (Richard et al. 2019) and might present specific interpersonal predictors (e.g. related to social isolation; Luo et al. 2021). Second, we did not measure some potential moderators, including family history of alcohol consumption, adverse childhood events and early life stress, which can modulate alcohol-related expectations and motives (Enoch 2011; Waddell et al. 2020).

Beyond these limits, we offered the first integrative exploration of the predictive value related to a wide range of psychosocial factors on alcohol consumption in different age

categories. We showed that drinking motives and drinking social identity constitute key predictors of drinking habits, but that the hierarchy across factors evolved with age, with a transition from interpersonal variables related to positive reinforcement toward factors associated with negative reinforcement during adulthood. Our results thus call for the adaptation of prevention and treatment approaches to participants' age, in order to focus on the interpersonal predictors associated with each age group.

Ethical approval

The study was approved by the Ethics Committee for the behavioral sciences of the University of Lille (2022-591-S104). The confidentiality of participant data was fully preserved through the use of anonymizing codes.

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