

From cannabis to problem drinking? Use and abuse from youth to adulthood

CHRISTER HYGGEN & TORILD HAMMER

ABSTRACT

AIMS – The transition from youth to adulthood is associated with changes in the consumption of drugs and alcohol. The aim is to explore the process of “maturing out” of high levels of alcohol consumption, substance use and alcohol related problems from youth to adulthood. We are particularly interested in the relationship between the use of cannabis and alcohol consumption in relation to indicators of adult roles and responsibilities and alcohol-related problems over the life-course. **METHODS** – We used data from the longitudinal panel survey Arbeid, Livsstil og Helse (ALH). The data contains information on alcohol and drug consumption, alcohol related problems and a range of indicators of adulthood like marriage and parenthood from surveys repeated in 1985, 1987, 1989, 1993, 2003 and 2010. The sample was nationally representative for the cohorts born 1965–1968 and thus contains individual histories from youth (17–20 years) to adulthood (42–45 years) with response rates ranging from 80% in 1985 to 53% in 2010 (total n=1997). **RESULTS** – Alcohol consumption is found to be substantially higher among users of cannabis than among non-users throughout the period from youth to adulthood. The use of cannabis, the level of alcohol consumption and probability of experiencing alcohol related problems decrease as the cohorts grow older. Alcohol related problems are still associated with the level of involvement with cannabis: those with a current or previous involvement with cannabis report more alcohol related problems. Taking into account the decreasing trend of alcohol related problems with age we find that becoming a parent and/ or getting married reduces the risk of experiencing such problems. **KEYWORDS** alcohol, alcohol related problems, cannabis, life course, maturing out

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Introduction

The transition from youth to adulthood implies changes in the consumption of drugs and alcohol. Leaving the parental home is associated with higher levels of consumption of both drugs and alcohol (Bachman, Johnston, Schulenberg, O'Malley, & Wadsworth, 1997; Hammer, 1991; Hammer, 1992) whereas committing to adult social roles through marriage and

parenthood is associated with a decrease in alcohol consumption and, for many, quitting to use drugs (Schulenberg et al., 2005). This process has been termed “maturing out” (Lee, Chassin, & Villalta, 2011; Millertutzauer, Leonard, & Windle, 1991; Power & Estauth, 1990).

The process of “maturing out” is dependent on, among a range of other things,

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social circumstances and stress related to parenthood (Richman, Rospenda, & Kelley, 1995) and the initial patterns of alcohol, drug use and alcohol-related problem behaviour. Studies focusing on problem drinking has found that young adults show continuity of drinking patterns and continued experience of problem behaviours through the transition from youth to adulthood (Oesterle, Hill, Hawkins, & Abbott, 2008). It has been suggested that some young adults continue to drink and do drugs as a response to a failure in adopting to the role of greater conventionality in adulthood, or that the consumption is part of the cause to this failure (Bennett, McCrady, Johnson, & Pandina, 1999; Oesterle et al., 2008).

The majority of youth cease to use drugs when entering adulthood (Schulenberg et al., 2005), whereas people continue to drink even as they grow older. “Maturing out” thus may have different meanings concerning the consumption of drugs and alcohol respectively. People report using drugs in order to get intoxicated, whereas the reasons given for alcohol consumption are more differentiated. Alcohol is legal, and a symbolic sign of adulthood, whereas cannabis is illegal in most countries and traditionally a marker of youth and opposition (Sandberg, 2010, 2013; Sandberg & Pedersen, 2010). Cannabis users describe themselves as part of a culture where social norms of intoxication are accepted and many use alcohol and cannabis simultaneously (Sandberg, 2013).

It is argued that cognitive expectancies of alcohol consumption and the use of drugs offer a template for future use. Several studies reveal similar mechanisms underlying both alcohol and cannabis ex-

pectancies and that simultaneous use of alcohol and cannabis predicts increased negative consequences concerning mental health and well-being (Barnwell & Earleywine, 2006). This may be of particular importance in a context of a prolonged transition phase from youth to adulthood. Hayford & Furstenberg (2008) argue that although the achievement of adult roles is being pushed to older ages (Buchmann & Kriesi, 2011), with a prolonged period of the life course in many western countries with few formal or family obligations (Arnett, 2000; Arnett, 2005; Bynner, 2005; Setterstein & Ray, 2010), this stretching of the transition to adulthood is not reflected in the observed patterns of alcohol and drug use across the life course.

Due to lack of longitudinal microdata containing both information on the use of alcohol and drugs and information on indicators of adult roles, few studies have had the opportunity to explore issues related to “maturing out” and observe the processes and development in alcohol consumption, drug use and alcohol-related problems in relation to indicators of adult roles and responsibilities from youth to adulthood empirically. This leads us to pose the following research questions:

To what degree is the use of cannabis associated with alcohol consumption during the transition from youth to adulthood?

To what degree is involvement with cannabis related to alcohol-related problems during the transition from youth to adulthood?

How are markers of adulthood, like marriage and parenthood, related to alcohol-related problems during the transition from young adulthood to adulthood?

Methods

The research questions were investigated using survey data from the “Work, Lifestyle and Health” survey. This is a longitudinal panel survey following a representative sample of 1997 individuals from the cohorts born between 1965 and 1968 in Norway (Mørk, 1989). The survey was introduced in 1985, with follow-ups in 1987, 1989, 1993, 2003 and 2010. From 1987 the survey included information on consumption of drugs and alcohol. For our purpose, the time window for observation thus spans the period from 1987 to 2010, allowing us to track individual life trajectories from the ages 19–22 to 42–46. In order to secure a sufficient sample of young people at risk, the panel was stratified based on the individual’s primary occupation in 1985: young people who were still completing their education had the lowest probability of being included in the sample (0.25, $N = 801$), whereas those who were employed had a higher probability (0.70, $N = 800$) and those who were neither working nor completing their education had the highest probability of inclusion (1.00, $N = 394$). The analyses in this article use a dataset weighted with the inverse sampling probability.

Statistics Norway was responsible for the data collection. The response rates throughout the study have been relatively high: 85 percent of the sample participated in the survey in 1985, 80 percent in 1987, 74 percent in 1989, 73 percent in 1993, 70 percent in 2003 and 53 percent in 2010 (Holmøy, 2011; Wedde & Holmøy, 2003).

Several different measures were applied in the analyses. A description of the different measures appears below.

Alcohol consumption was reported on

each of the observations in 1993, 2003 and 2010. The measure is based on a combination of self-reported consumption of beer, wine and liqueur during the last instance of drinking and self-reported information about frequency of drinking. This information is recalculated into an equivalent measure of pure alcohol in litres consumed per year. This is in accordance with procedures used in public statistics in Norway (Horverak & Bye, 2007).

Cannabis use is reported in each of the surveys from 1987 and onwards. The measure is based on a question of whether and how often the respondents used cannabis within the last 12 months. To capture also those who have been smoking cannabis between the surveys and in particular those who have never used cannabis, we supplement with information from a question at each follow-up on whether they have ever used cannabis.

Alcohol-related problems were measured by 7 questions according to DSM-III. All respondents were asked in 1993, 2003 and 2010 whether they ever had experienced the following problems during the last six months (Yes/No): Troubles to stop drinking, worried about your own drinking, did not manage to get up in the morning because of drinking, did not manage to go to work because of drinking, drunk driving, criticised by others close to you because of your drinking and people close to you worry about your drinking.

Involvement with cannabis was constructed using a combination of self-reported use of cannabis, self-reported use of cannabis within the last 12 months, information about friends’ use and whether the respondents had been offered cannabis within the last 12 months on each follow-

up from 1987 to 2010 (Hyggen, 2012). Respondents who had never used cannabis were sorted into the “abstaining” category (n = 591). The abstainers who reported having friends who used cannabis or who had been offered cannabis were placed in the “exposed” category (n = 495). Respondents who reported having smoked cannabis within the last 12 months on only one of the follow-ups in 1987, 1989, 1993, 2003 or 2010 were placed in the “experimented group” (n = 313). Respondents who reported smoking on two or more of the follow-ups are placed in the “involved” category (n = 63). For the multivariate analyses self-reported use of cannabis within the last 12 months prior to the observations in 1993, 2003 and 2010 was used.

We use marriage and parenthood as indicators of adult roles and responsibilities. Information on marriage and parenthood is based on survey-questions from all the follow-ups on whether the respondents are married (or cohabiting with a partner) or live with or have responsibility for children in the household.

Mental health was measured by ten items on the Hopkins Symptoms Checklist (HSCL-10) (Derogatis, R.S. Lipman, Uhlenhuth, & Covi, 1974) for anxiety and depression in 1993, 2003 and 2010. The items used in the index are: fear or anxiousness, fatigue or faintness, nervousness or uneasiness, cry easily, blame myself, sudden fear for no particular reason, insomnia, feeling of hopelessness regarding the future, feeling that everything is a strain, and worry a lot. A principal component analysis of the ten questions indicates a one-dimensional solution. We used a mean score of the ten items. The answers are scored from 1 = not

troubled (by this problem) to 4 = troubled very much (Chronbach’s alpha HSCL-10, 1993 = 0.88, 2010 = 0.91).

The analytical strategy in this article is both descriptive; exploiting the unique longitudinal panel data to explore simple associations between the use of cannabis, the level of alcohol consumption and alcohol-related problems across a large period of the life course, and more analytical; exploiting the panel structure to investigate how alcohol-related problems are associated with indicators of adult roles and responsibilities and the use of cannabis.

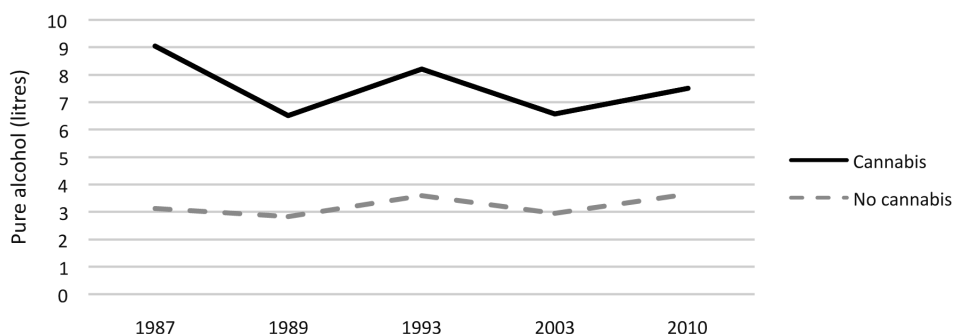
To investigate the possible association between indicators of adult roles and responsibilities, smoking cannabis and alcohol-related problems a general specification of the panel regression model was applied:

$$\text{Alcohol-related problems}_{it} = \alpha_{it} + \beta Z_{it} + \beta X_{it} + \mu_i + \varepsilon_{it}$$

Alcohol-related problems_{it} is a continuous variable measuring number of alcohol-related problems for individual *i* at time *t*. *Z_{it}* represents the main variables of interest in the analysis. These variables are the indicators of adulthood; binary variables indicating marriage/cohabitation and parenthood and a binary variable representing whether or not the individual had been smoking cannabis within the last 12 months. *X_{it}* is a vector of control variables including self-reported mental health, the log of alcohol consumption in litres of pure alcohol, and year of observation. *μ_i* is an unobserved time invariant disturbance term and *ε_{it}* is an unobserved time variant random disturbance term.

Using a Breusch and Pagan Lagrangian

Figure 1. Ever used cannabis and mean level of alcohol consumption in litres of pure alcohol 1987 – 2010.



multiplier test for random effects, we rejected the null-hypothesis that variances across entities is zero and conclude that a random effects model is preferred over the standard pooled GLS strategy.

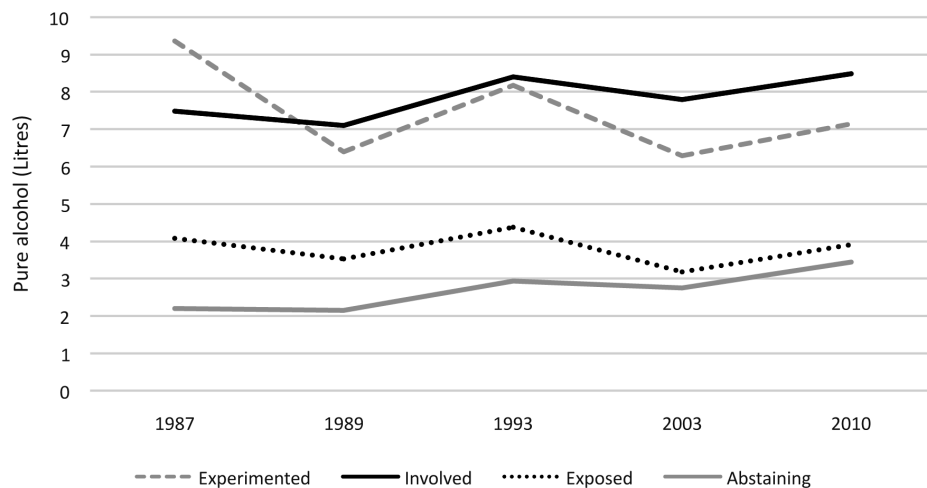
A random effects model assumes that all fixed unobserved individual characteristics μ_i are uncorrelated with the Z_{it} or X_{it} . This correlation is problematic if μ_i is correlated with Z_{it} because then the main coefficients of interest would be biased. The main worry is that people with unobserved alcohol-related problems-enhancing characteristics may be more likely to smoke cannabis, less likely to get married or become a parent, implying a positive correlation between Z_{it} and μ_i and therefore the coefficient β Z_{it} would become upwards biased. Applying the Hausman test (Hausman, 1978) on a fixed effects model (within-group regression) and a random effects model, the null-hypothesis of systematic differences in coefficients was dismissed. This means that the random effects model is not applicable and that we must use the fixed effect regression using only the within-group variation.

Results

First we explored the relationship between cannabis use and alcohol consumption over time. 23 percent of the cohorts have tried or used cannabis at some stage during the period from youth to adulthood. The peak observation is from 1989, where 5 percent of the cohort report having used cannabis during the last 12 months. There is a steady decline in cannabis use as they grow older. In 2010 1,7 percent report having smoked cannabis during the last 12 months. Figure 1 shows mean alcohol consumption in litres of pure alcohol by whether the respondents had ever used cannabis.

The figure shows that cannabis users consumed three times as much alcohol at ages 19 to 22 years as non-users. Alcohol consumption is still twice as high among current or previous users of cannabis at ages 42 – 46. Even if the overall trend is towards reduced alcohol consumption and cessation to use drugs, the underlying pattern is complex. There is, for example, a marked decrease in the consumption of beer from about 4,50 liters pure alcohol equivalents to 3,00 liters during the peri-

Figure 2. Level of alcohol consumption (litres of pure alcohol) 1987 – 2010 for categories of cannabis involvement.



od. The consumption of wine tripled from 0,60 to 1,80 liters during the same period.

Second we look at the level of involvement with cannabis and level of alcohol consumption during the period from youth to adulthood. Figure 2 shows mean alcohol consumption for groups of individuals who were categorized as abstaining, exposed, having experimented or being, or having been, involved with cannabis.

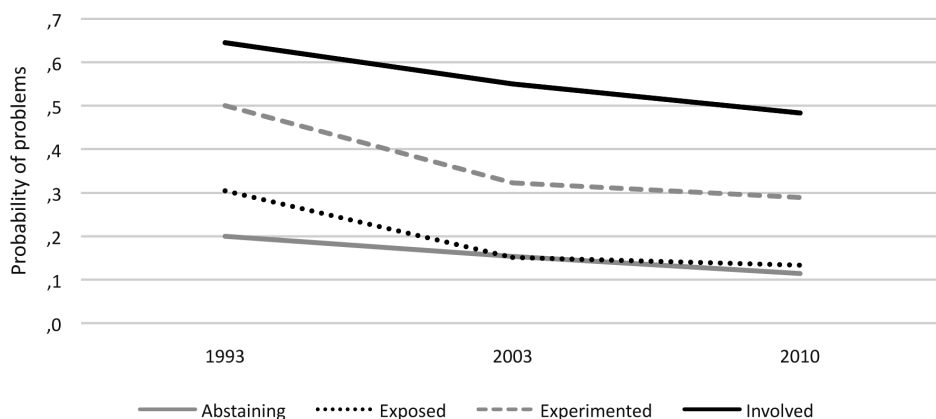
The figure shows that those who had only been exposed to cannabis through social networks or friends had twice as high levels of alcohol consumption as abstainers at age 19 - 22. Moreover, those who are categorised as only having experimented with the drug had a consumption level of alcohol more than twice as high as abstainers even at ages 42–46. The differences in alcohol consumption in 1987 were all statistically significant between the different categories based on involvement with cannabis. The gap in level of alcohol consumption between the exposed and those

abstaining are gradually closing over time and is not statistically significant in 2010, whereas the involved group have a significantly higher level of consumption than all the other groups in 2010.

Figure 3 shows the probability of drinking problems across time in relation to varying degrees of involvement with, and exposure to, cannabis

From the figure, we see that there is a general decline in reported drinking problems as the cohort grows older. We also observe that the groups categorized as being only exposed to, or abstaining from cannabis, converge in terms of probability of drinking problems throughout the period. For those who experimented, the average level of drinking problems has decreased more rapidly than for the other groups. A Bonferroni test concludes that there are statistically significant differences in probability of drinking problems between the involved and the other groups also in 2010 (see appendix).

Figure 3. Probability of alcohol-related problems 1993–2010 for categories of cannabis involvement.



We use static linear regression models for panel data to investigate the possible relation between alcohol-related problems, indicators of adult roles and responsibilities and smoking cannabis, adjusting for controls on alcohol consumption, mental health and the declining trend in alcohol-related problems as the cohorts grow older. A pooled logistic regression with clustered standard errors is included for comparison.

Even controlling for the descending trend in self-reported alcohol-related problems in the panel across time, by including dummies for years of observation, we find that indicators of adulthood and responsibility is associated with a reduced probability for having experienced problems related to alcohol during the last 12 months. We also find that changes in alcohol consumption in the period is associated with the probability of problems

Table 1. Probability of alcohol-related problems last 12 months 1993, 2003 and 2010. Logistic regression models: Pooled logistic regression with clustered standard errors and fixed effects model (n=1546, observations = 3439).

	Pooled regression	Fixed effects
Married/ cohabiting (1=yes)	-0,064 ***	-0,076 ***
Parenthood (1=yes)	-0,057 ***	-0,142 ***
Cannabis last 12 months	0,174 ***	0,018
Alcohol consumption (log)	0,118 ***	0,059 ***
Mental health	0,107 ***	0,009
Constant	-0,481 ***	0,051
R ²	0,14	0,062
rho		0,5

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

related to alcohol, but that changes in the level of mental health problems is not associated with changes in the probability of alcohol-related problems. Changes in the use of cannabis is not statistically significant. About half the variation in the probability of experiencing drinking problems explained by the model is related to individual unobserved characteristics ($\rho = 0.50$).

Discussion

When in their late teens and early twenties, young Norwegians who use or have used cannabis drink significantly more than those who abstain from using cannabis. As they move through the life course towards - and into - adulthood the cohorts reduce their total level of alcohol consumption and the gap between users and non-users of cannabis is reduced. We observe tendencies towards “maturing out” of drinking and an evident “maturing out” of using cannabis. But those who use or have used cannabis still maintain a level of alcohol consumption more than twice as high as the abstainers. It is also the case that involvement with cannabis is related to probability of alcohol-related problems during the transition from young adulthood into adulthood. Even if there is a general decline in the probability of experiencing problems related to drinking, we found that the more involved users of cannabis report higher probabilities across the life course. The differences between the different groups are relatively stable over the 17-year period that we have had the possibility to observe through the data. Exploiting the panel structure in the data, we analyzed how changes in indicators of adulthood and changes in the use

of cannabis influenced the probability of problems related to drinking. We found evidence for an association between both becoming involved with a partner through marriage and cohabitation and taking on parental responsibilities through parenthood and the probability of reporting problematic drinking. Those who during the period from ages 25–28 to 42 – 46 became involved with a partner and/ or became a parent report significantly lower levels of problems related to drinking. These findings are clearly supportive of the “maturing” out hypothesis and in accordance with previous research (Lee et al., 2011; Schulenberg et al., 2005).

The findings are also supportive of research showing that patterns of drinking in terms of level of consumption and alcohol-related problems are associated with the use of other substances like cannabis. Our interpretation is that this has not to do with polydrug use, but the influences of a culture of intoxication that have been reported in social groups that use cannabis. Social norms are created and enforced in social networks implying that a high consumption of alcohol is not a result of cannabis use as such. It may rather be a consequence of belonging to a social environment that enforces social norms of intoxication. This interpretation is strengthened by the observation that involvement with cannabis imply a higher level of alcohol and alcohol-related problems, also for those who had only been exposed to, but never had used cannabis themselves, and for those who had only experimented with the drug at a limited number of occasions. Interestingly, those who had only experimented with cannabis had nearly as high consumption of alcohol in adulthood as

those who had used cannabis more regularly. This interpretation is strengthened by the results from the multivariate analyses where we find that changes in whether or not an individual have used cannabis during the year prior to the observation does not affect the probability of experiencing alcohol-related problems. The results thus may imply a socialization of social norms of intoxication grounded in a cannabis using environment in youth and young adulthood that continue to have an impact in adulthood.

The strengths of the results presented in this article are related to the unique data applied; both the length of the observation period and the available detailed data and the structure of the dataset. We have had the opportunity to observe individuals over a large period of their lifecourse and thus are able to present findings covering most of the process from youth to adulthood with regard to development in the use of drugs and alcohol – and its relation to indicators of adulthood only visible as individuals grow younger. The panel structure has also given us a distinct advantage concerning the opportunity to look at how changes in indicators of adulthood and changes in alcohol and drug consumption affects problematic drinking. This strength is evident when we take the results from the ordinary regression into account. The latter type of analytical strategy will only give us information on the probability for

groups with different characteristics to experience problems related to drinking, not how changes in an individual's life situation affects this probability. There are also obvious limitations with our study. As in most longitudinal studies there is a certain amount of attrition and drop-out from the study, and this attrition and drop-out is rarely random. This attrition becomes problematic if it is skewed and related to any of the variables of interest in the analyses. In our case we know that there is a higher attrition among previous users of cannabis. The initial sampling strategy, oversampling youth known to be at risk, has reduced this to a certain degree. Still, this means that our results should be used with some caution. A higher drop-out among those most at risk means that we are under-reporting alcohol consumption and problematic drinking. Another limitation is the length between observations. This means that we cannot imply causality even if we observe associations between the factors of interest.

Declaration of interest None.

Christer Hyggen, PhD

Norwegian Social Research (NOVA), Oslo;
Akershus University College of Applied Sciences
E-mail: christer.hyggen@nova.hioa.no

Torild Hammer, PhD

Norwegian Social Research (NOVA), Oslo;
Akershus University College of Applied Sciences
E-mail: torild.hammer@nova.hioa.no

APPENDIX

Table a.1. Bonferroni test of significant differences in mean level of probability for alcohol-related problems 2010.

(I) cinv	(J) cinv	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Abstaining	Exposed	-0,01919	0,02687	1	-0,0902	0,0519
	Experimented	-,17487*	0,0333	0	-0,2629	-0,0868
	Involved	-,36919*	0,0507	0	-0,5032	-0,2352
Exposed	Abstaining	0,01919	0,02687	1	-0,0519	0,0902
	Experimented	-,15568*	0,03413	0	-0,2459	-0,0655
	Involved	-,35000*	0,05125	0	-0,4855	-0,2145
Experimented	Abstaining	,17487*	0,0333	0	0,0868	0,2629
	Exposed	,15568*	0,03413	0	0,0655	0,2459
	Involved	-,19432*	0,05489	0,003	-0,3394	-0,0492
Involved	Abstaining	,36919*	0,0507	0	0,2352	0,5032
	Exposed	,35000*	0,05125	0	0,2145	0,4855
	Experimented	,19432*	0,05489	0,003	0,0492	0,3394

*. The mean difference is significant at the 0.05 level.

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