

**Early Drinking Onset: A Study of Prevalence and Determinants Among 13-
years Old Adolescents in Norway**

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Abstract

Early drinking onset is associated with different psychosocial adjustment problems among adolescents. The aim of this study was to assess determinants associated with early drinking and to identify factors predicting early drinking onset among adolescents. The study included 1550 eighth-graders with a mean age of 13.5 years from 41 schools. A total of 24% (boys 29%, girls 19%) had ever drunk alcohol, while 14% had drunk some alcohol the last 30 days. Further, early drinking was associated with gender, religion, school performance, smoking and bullying in the bivariate tests. Predictors of early drinking onset were identified by generalized linear mixed models with two multivariable models created. First model included social and environmental variables. Entering intentions, expectancies, attitudes and norms into the multivariable analysis resulted in a significant improvement of the model fit constituting 86% in the second model. The percentage correctly classified of those who had been drinking was 56% in the second model which was two times higher compared to the first model. Gender, religion and smoking were emerged as significant predictors of drinking in both models.

Key words: Adolescents, early drinking onset, prevalence, prevention, risk factors

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Prevention of alcohol use among adolescents has been studied for a long time (Dvies & Stacey, 1971). Nonetheless, while risk and protective factors for alcohol use are known and well described elsewhere (Plant & Miller, 2001), drinking among adolescents still remains a major social and health problem, representing a burden to both the individual and society (Babor, Caetano, & Casswell, 2010). Recent studies have demonstrated that alcohol use among adolescents in Europe, with some exceptions, has been relatively unchanged in most countries over the past years (Heron et al., 2012), whereas the level of heavy episodic drinking has shown a small but continuous increase over the last 12 years (Hibell, Guttormsson, Ahlström et al., 2009).

Studies have also revealed that patterns of alcohol use vary between countries, for example adolescents in the Nordic countries and the UK typically drink more, but on fewer occasions than adolescents in the Mediterranean countries, who drink more frequently, but fewer units of alcohol each time (Hibell et al., 2009). According to The European School Survey Project on Alcohol and Other Drugs (ESPAD, 2011), Norwegian adolescents represent the group with lowest alcohol consumption among the 15- to 16-year olds in Europe (Hibell et al., 2012), and the trend of decreasing alcohol use among adolescents in Norway has been stable since 1999. As concerns gender differences in drinking, the ESPAD study has shown that European boys drink one-third more than girls. Norwegian girls, however, from 1995 to 2011 demonstrated a dramatic increase in alcohol use compared to previous years (Hibell et al., 2012).

It has long been acknowledged that early onset of alcohol use is associated with more severe problems resulting from alcohol use such as dependence, alcohol related disorders (Dawson, Goldstein, Chou, Ruan, & Grant, 2008), suicide (Garlow, 2002), violence and injuries (Gruber, Di Clemente, Anderson, & Lodico, 1996) and low academic performance (Kuntsche et al., 2012). The definition of early drinking is still unclear and controversial regarding the cut-off age for when drinking can be referred to as early; this varies from age 12 or younger (De Genna et al., 2009) to age 15 or younger (Humphrey & Friedman, 1986). While studies do not agree on whether it is alcohol use in childhood or in early adolescence that represent greater risk, in general they concur that early alcohol use predicts later problematic drinking. Traditionally, biological and genetic factors have been considered the major determinants for alcohol use in a bio-medical context (Cloninger, Svrakic, & Przybeck, 1993). In addition, a broader framework has emerged emphasizing the importance of socio-economic, environmental factors (SES, religion, family, school and friends) (Burnside, Baer, McLaughlin, & Pokorny, 1986) and such factors as alcohol attitudes, expectancies, intentions and norms (Aas, 1993; Ho, Poorisat, Neo, & Detenber, 2013) in drinking among adolescents. Of special interest is the predictive validity of factors related to early drinking onset, and some studies has defined early onset of drinking by age 14. In particular, earlier age of alcohol initiation was found to be predicted by ethnicity, a larger degree of parental drinking, poorer performance at school and having more friends who drink (Hawkins, Graham, Maguin, Abbott, Hill, & Catalano, 1997), behavior problems (Clark, Parker, & Lynch, 1999), smoking (Klein, 2006) and male gender (Rose, Dick, Viken, Pulkkinen, & Kaprio, 2001). Conduct problems, together with attention problems are associated with alcohol use.

Symptoms of anxiety and depression are related to girls alcohol drinking, and among both girls and boys alcohol intoxication predicted frequent drinking and illegal drug use (Strandheim, Bratberg, Holmen, Coombes, & Bentzen, 2011). In addition, results from other studies indicate at some shift in predictability regarding drinking which is related to age or development (Zucker, 2006; Masten, Faden, Zucker, & Spear, 2013). For example, expectancies about the effects of alcohol and intent to use alcohol have age-related shifting. Dunn and Goldman (1996; 1998) have demonstrated that negative expectancies decrease while positive expectancies increase during later middle childhood and early adolescence. As for intention to drink there is an increase with age during elementary school (Donovan, Leech, Zucker, & Loveland, 2004). Specifically, the planning of prevention efforts should be based on research on risk and protective factors associated with early drinking onset. Previous studies conducted in Norway on alcohol use among adolescents were either mostly limited to ages 15-16 years (Vedøy & Skretting, 2009; Strandheim et al., 2010; Øia, 2012) or they were conducted more than 10 years ago (Kloep, Hendry, Ingebrigtsen, Glendinning, & Espnes, 2001). Presumably, our study of drinking among young adolescents can provide better understanding of the role of possible relationships between various individual and environmental factors with early drinking onset. Knowledge on such relationships might be of relevance both for detecting adolescents at risk for early drinking and for preventive matters. The aims of the present study were, a) to estimate the prevalence of early drinking among Norwegian adolescents, b) to identify factors correlated with early drinking, and c) to test models for predicting early drinking onset.

Method

Participants

The data for the present study were collected as part of a larger project “W8 [wait]” investigating the effect of a school-based alcohol prevention program used in junior high schools in Norway (www.w8.uit.no) (Kyrrestad Strøm et al. 2014).

Principals from 41 (2020 pupils) of the 91 invited schools (4356 pupils) agreed to participate in the study. This resulted in a baseline sample of 1574 8th graders (77.9% out of 2020) who answered the internet-based questionnaire. Only subjects with complete data were included in the analysis which yielded 1550 pupils. Mean age was 13.5 ($SD = 0.7$), 50.6% were girls and 49.4% were boys. Concerning adolescent alcohol drinking we used questions about their alcohol experience. Risk factors we studied were drinking peers, gender, smoking and bullying. We also included question whether the adolescent’s parents have been talking about alcohol at home since parental permissiveness to drinking has been shown as a risk factor (Kosterman, Hawkins, Guo, Catalano & Abbott, 2000). These factors are based on theoretical approaches from problem behavior theory, social context theory and theory of socialization (Donovan, 2004).

Measures

Background variables and situation at school

The adolescents were asked about their gender, age, school grades and religion. Family situation was assessed by asking how many adults he/she lived with using the response categories “two parents/adults” (1), “one parent/adult” (2) and “others” (3). Family economy was assessed by asking about their family’s economical situation and response categories ranging from “very bad” (1) to “very good” (5). Adolescents’ social

life and school performance was assessed by questions such as; “How many close friends do you have” and “How do you rate your skills at school”.

One question whether the adolescents have bullied others and one question whether they have been bullied by others, originally used in the Olweus bullying program (Olweus, 2005), were also included, with response categories from “not at all” (1), “rarely” (2), “2-3 times a month” (3), “weekly” (4), “several times a week” (5).

Alcohol use variables

Several measures were used to assess alcohol use in the study. First, the respondents were asked “Have you ever had at least one glass of alcohol?” Individuals who answered positively were asked a series of follow-up questions about alcohol use and attitudes.

Frequency of monthly alcohol use was measured by a question adopted from Aas and Klepp (1992) “How often have you been drinking alcohol the past three months?” with five response categories “not at all” (0), “1-2 times in past 3 months” (1), “once a month” (2), “2-3 times a month” (3), “at least once a week ” (4).

Alcohol inebriation was measured for the period of the past three months asking “How many times did you drink so much alcohol that you felt inebriated”. Originally responses ranged from “once” (0) to “11 or more times” (7). The categories were recoded to no times (0), 1-2 times (1) and more than 2 times (2).

Drinking behavior among close friends and/or siblings was assessed by asking whether the pupil had close friends and/or siblings who drink alcohol. The response alternatives were “no close friends/siblings who drink” (1), “have close friends/siblings who drink” (2) and “don't know” (3).

Parents' talking to child about harm of alcohol was assessed by a single question, "Did your parents/caregivers talk to you in the last 3 months about harm from using alcohol or other drugs?" with response alternatives "yes" (1) and "no" (2).

Alcohol expectancies were assessed with the Global Positive and Social Positive scales from the modified Norwegian version (Aas, 1993; Christiansen, Goldman, & Inn, 1982; Christiansen & Goldman, 1983). The adolescents were asked five questions to indicate alcohol expectancy on a 7-point scale, with items such as: "many alcoholic drinks taste good" and "parties become more fun when alcoholic beverages are consumed there" The response categories ranged from "strongly disagree" (1) to "strongly agree" (7). Cronbach's α was 0.75.

Social norm scale included four questions: "Would your friends like or dislike you if you drink at least one glass of alcohol?", "Would your parents/guardians like or dislike you if you drink at least one glass of alcohol?" with answers ranging from "dislike it very much" (0) to "like it very much" (4). Two more questions were used: "How old do you think girls and boys should be before they can drink at least one glass of alcohol?" Cronbach's α 0.71 was acceptable (DeVellis, 2003) for the social norms scale which had been previously used in the "Young in Norway 2002" study.

Attitudes to alcohol consumption measured to what degree adolescents found it acceptable for same aged peers to drink alcohol. Alcohol-related attitudes were a sum of five questions from Conner and Norman (2005) where lower scores represent more negative attitudes towards alcohol use. A sample question included was, "Do you find it acceptable that an 8th grader drinks a glass of alcohol without any adults present?" The

response categories ranged from “no, totally wrong” (1) to “yes, it’s ok” (7). Cronbach’s α for the *Attitude* scale was 0.86.

Intentions to drink were assessed by two questions on how likely it would be for the adolescents to drink the next three months, and to become inebriated. The response categories ranged from “quite unlikely (1), to quite likely (5). Spearman-Brown reliability (Eisinga, Grotenhuis & Pelzer, 2012) estimate for the two items are 0.66.

Procedure

Each participating school was responsible for distributing a written consent form and information about the study to the parents. Written consent was requested from both the adolescents and their parents. Pupil data were collected in class using online questionnaires. The study was approved by the Regional Committee for Medical Research Ethics.

Statistical analyses

To assess the association between drinking experience (yes/no) and various predictors, generalized linear mixed modeling was employed, using a logit link function. Both bivariate and multivariable analyses were run. To assess the predictive value of studied variables on early drinking, the percentage of correctly classified subjects was reported, using a predicted probability of 0.5 as a classification cut-off. Two multivariable models were created. The first model included demographic variables and adolescent behavior characteristics. The second model also included alcohol related intentions, expectations, attitudes and norm variables. Multivariate analyses in the second

model were adjusted for all variables included in the first model. Data were analyzed using the Statistical Package for Social Sciences (SPSS-21.0).

Results

Sample characteristics

Among the demographic characteristics, 50,6% were girls, and a total of 82.6% of the adolescents reported living in a household with two parents/guardians and 17.4% with one parent/guardian. The family economical situation was reported as good or very good by 79.8% of the respondents, 19.1% as moderately good and only 1.1% of the sample reported about bad or very bad economic situations. The adolescents were asked about what religion their family were closest linked to. They answered (67.6%) Christianity, 9.9% Islamic and 3.3% who reported other religions such as Buddhism and Hinduism, while 19.2% of the pupils reported that their family were non-religious A total of 97% of the adolescents reported to have two or more close friends.

Self-reports showed that 24% had drunk at least one glass of alcohol. Significantly more boys (29%) than girls (19%) reported ever having been drinking ($\chi^2 = 20.8$; $df = 1$; $p < .001$). The proportion of boys versus girls who reported drinking more than one drink in the past three-month period was also larger (10.7% versus 7.9%) ($\chi^2 = 30.5$; $df = 7$; $p < .001$). A smaller proportion of girls compared to boys had alcohol-using friends (29% versus 36%) ($\chi^2 = 6.1$; $df = 2$; $p < .05$), whereas when being asked about having older or same age drinking siblings, more girls than boys replied positively (32% versus 26%) ($\chi^2 = 17.2$; $df = 3$; $p < .01$) (Table 1).

- Insert *Table 1* here -

Bivariate analysis

The relationships between drinking experience and studied variables are presented in Table 2. The variables that showed the strongest and significant associations with drinking were male gender ($OR = 1.8$, 95% CI 1.4-2.3), religion ($OR = 0.3$, 95% CI 0.1-0.5) with Christianity as a reference, worse than average performance at school ($OR = 3.9$, 95% CI 1.9-7.9), smoking ($OR = 13.0$, 95% CI 8.2-20.7), bullied others ($OR = 2.0$, 95% CI 1.5-2.8), global ($OR = 1.5$, 95% CI 1.3-1.6) and social ($OR = 2.0$, 95% CI 1.8-2.2) positive expectancies towards drinking, positive attitudes towards drinking ($OR = 2.5$, 95% CI 2.2-2.8), intentions to drink ($OR = 1.9$, 95% CI 1.7-2.1) and social norms towards drinking ($OR = 3.2$, 95% CI 2.8-3.7).

Multivariable analysis

As shown in the Table 2, when all variables were entered in a multivariable model at first level (first model), the amount of correctly classified subjects was found to be 82.2%. The first model classified correctly only 29.1% of those having been drinking alcohol at least once. Variables found significantly to predict drinking were gender ($OR = 1.6$, 95% CI 1.2-2.1), religion ($OR = 0.1$, 95% CI 0.1-0.3) worse than average performance at school ($OR = 2.4$, 95% CI 1.0-5.8), smoking ($OR = 13.7$, 95% CI 8.1-23.0) and having bullied others ($OR = 1.9$, 95% CI 1.3-2.8).

Adding to the predictor set psychosocial variables such as intentions to drink, expectancies, attitudes and norms towards drinking to the multivariable model at the second level, resulted in a significant improvement in the model fit and increased the percentage of correctly classified subjects to 86.3% overall. The second model correctly classified 56.2% of those having been drinking alcohol at least once. Gender, religion and

smoking were still found significantly associated with drinking, as well with social positive expectancies towards drinking (OR = 1.4, 95% CI 1.1-1.8), global positive expectancies (OR = 0.8, 95% CI 0.6-1.0), positive attitudes towards drinking (OR = 1.4, 95% CI 1.2-1.7), intentions to drink (OR = 1.2, 95% CI 1.0-1.4) and social norms about drinking (OR = 2.1, 95% CI 1.7-2.5).

Discussion

The study aimed to estimate the prevalence of early drinking among Norwegian adolescents. In total, 24% percent of the participants reported having ever been drinking at least a glass of alcohol. Results are similar to those found by Donovan and Molina among American adolescents (2011) where 25% percent reported having had a drink at the same age. The estimated prevalence of early-onset drinking among 13-year olds in our study could potentially be of concern to health authorities in light of the documented association between age of first drink and negative outcomes later in life. Nonetheless, such a cause-effect relationship was recently questioned by Kuntsche and colleagues (2013). In particular, it was suggested that other aspects of drinking, such as early drunkenness, may be more important for health and social consequences (Kuntsche et al., 2013; Rossow & Kuntsche 2013).

Some regularity in drinking habits among the studied 13-years old adolescents was indicated among 4.1% of boys and 2.7% of girls who reported drinking with a frequency of three or more times during the past three months. These are similar to those reported in a recent WHO study among young people (Currie et al., 2012), where

percentage of weekly drinking among 13-years old adolescents in Norway was reported to 3.0% of girls and 5.0% of boys.

In our study 2.1% of the total sample reported having been inebriated. In a study by Strandheim and colleagues (2010) comprising 8983 of 13-19-year old Norwegian high school students, it was found that 6.2% in the 13-15 years group reported having been inebriated by alcohol at least once. Lower figures for intoxication estimated in our study are most probably due to our sample's lower average age of 13.5 years.

Among the assessed socio-economic variables in the present study, only religion was significantly associated with adolescents' early drinking. Our findings were different from previous studies in other countries, where an association between socio-economic variables such as family economy, family situation and early drinking had been documented (Melotti et al., 2013). One reason might be that these studies were based on samples with lower socio-economic level than our study sample. The fact that Norway is a country with less pronounced differences concerning socio-economic status, especially poverty level, than in other countries, might explain the difference in associations. Concerning the measures of socio-economic status used in our study they could have been improved by looking at material wealth since that is related to families' resources to participate in activities in the society. Another important measure of socio-economic status is parental occupation since that is correlated to a stable income (Vereecken, Incley, Subramanian, Hublet, & Maes, 2005).

The finding of a strong association between early drinking onset and gender and religion was not new and in line with a number of prospective studies focusing on social determinants of early drinking (Amundsen, Rossow, & Skurtveit, 2005; Amundsen,

2012). An interesting finding was that smoking yielded the strongest association with early drinking onset. Presumably this is of importance regarding the role of smoking prevention in breaking the chain of events which might influence initiation of drinking. On the other hand, the underlying mechanisms of such a relationship are not clear since we did not study whether smoking causes drinking or vice versa, or whether there are common antecedents of both such as peer pressure or individual risk factors such as stress, anxiety and depression which we didn't measure in our study. One can also argue that the effect of smoking prevention on onset of drinking will yield limited results due to the fact that relatively few have started smoking at the age of 13 years.

No associations between early drinking onset and adolescent's communication with parents about the harmful effect of alcohol emerged in our study. On the other hand, parental alcohol-specific rules were related to postponement of drinking debut among adolescents at different ages (Van der Vorst, Engels, Meeus, & Deković, 2006). A meta-analysis found programs with family interventions effective in reducing alcohol initiation and frequency of alcohol use among adolescents (Smit, Verdurmen, Monshouwern, & Smit, 2008).

According to the results of the study, a considerable increase in the proportion of correctly classified early drinkers occurred after entering the psychosocial variables such as expectancies, attitudes, intentions and norms into the model (increasing from 29.1% to 56.2%). Findings support the use of programs oriented towards psychosocial variables and expand previous research about a consistent relationship between early drinking and the role of adolescent's expectancies, attitudes, norms and intentions (Aas, 1993; Ho, Poorisat, Neo, & Detenber, 2013) in order to prevent drinking.

In spite of numerous socio-economic and behavioral variables included in the study, many of them failed to show significant relationships to early drinking onset after having been included in model 1. Our findings generate knowledge of factors associated with drinking onset that might be interesting for the Norwegian authorities when planning preventive efforts in schools. These efforts should involve identification of adolescents that have several risk factors including early onset of drinking and providing targeted interventions for these groups.

One potential limitation of this study is its cross-sectional design compromising conclusions regarding the causal role of studied variables for early drinking onset. Secondly, the reliability of the questionnaire might have been affected by the study participants not fully understanding the meaning of some key questions used in the questionnaire regarding alcohol and drunkenness. On the other hand, several studies on test-retest reliability of self-reported alcohol consumption have supported the reliability of adolescents' self-reports assessing on their drinking (Aas, Leigh, Anderssen, & Jakobsen, 1998). Further limitations related to the study might be the construct validity of some scales. The expectancies and attitudes scales are not correlated to other concepts within the same theme. Qualitative information from the adolescents might also give additional information.

Finally, other factors related to onset of early drinking, such as parental drinking (Baumrind, 1985; Sondhi & Turner, 2011) and the child's conduct problems (Campbell *et al.*, 2000; Kaplow, Curran, & Dodge, 2002; Masten *et al.*, 2008) were not considered in the present study. More comprehensive studies with the current limitations taken into account should provide a better overview on determinants and predictors of early

Running head: ADOLESCENT DRINKING

drinking onset. Studies using methods such as structural equation modeling and growth curve modeling makes the possibility to increase the knowledge of transitions in adolescents development, especially from regular to problematic drinking.

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References

- Aas, H. (1993). Adaptation of the Alcohol Expectancy Questionnaire (AEQ-A): a short version for use among 13-year-olds in Norway. *Scandinavian Journal of Psychology, 34*, 107–118.
- Aas, H. & Klepp, K.I. (1992). Adolescents' alcohol use related to perceived norms. *Scandinavian Journal of Psychology, 33*, 315–325.
- Aas, H. N., Leigh, B. C., Anderssen, N., & Jakobsen, R. (1998). Two-year longitudinal study of alcohol expectancies and drinking among Norwegian adolescents. *Addiction, 93*, 373–384. doi: 10.1046/j.1360-0443.1998.9333736.x
- Amundsen, E. J. (2012). Low level of alcohol drinking among two generations of non-Western immigrants in Oslo: a multi-ethnic comparison. *BMC Public Health, 12*, 535. doi: 10.1186/1471-2458-12-535
- Amundsen, E. J., Rossow, I., & Skurtveit, S. (2005). Drinking pattern among adolescents with immigrant and Norwegian backgrounds: a two-way influence? *Addiction, 100*, 1453–1463.
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Rossow, I. (2010). *Alcohol: No Ordinary Commodity – Research and Public Policy* (2nd ed.). Oxford: Oxford University Press.
- Baumrind, D. (1985). Familial antecedents of adolescent drug use: a developmental perspective. *NIDA Research Monograph, 56*, 13–44.
- Burnside, M. A., Baer, P. E., McLaughlin, R.J., & Pokorny, A. D. (1986). Alcohol use by adolescents in disrupted families. *Alcoholism: Clinical and Experimental Research, 10*, 274–278.

- Campbell, S. B., Shaw, D. S., & Gilliom, M. (2000). Early externalizing behavior problems: toddlers and preschoolers at risk for later maladjustment. *Development and Psychopathology, 12*, 467–488.
- Christiansen, B. A. & Goldman, M. S. (1983). Alcohol-related expectancies versus demographic/background variables in the prediction of adolescent drinking. *Journal of Consulting and Clinical Psychology, 51*, 249–257. doi: 10.1037/0022-006X.51.2.249
- Christiansen, B. A., Goldman, M. S., & Inn, A. (1982). Development of alcohol-related expectancies in adolescents: separating pharmacological from social-learning influences. *Journal of Consulting and Clinical Psychology, 50*, 336–344.
- Clark, D. B., Parker, A. M., & Lynch, K. G. (1999). Psychopathology and substance-related problems during early adolescence: A survival analysis. *Journal of Clinical Child Psychology, 28*, 333–341.
- Clark, D. B., Lynch, K. G., Donovan, J. E., & Block, G. D. (2001). Health problems in adolescents with alcohol use disorders: self-report, liver injury, and physical examination findings and correlates. *Alcoholism: Clinical and Experimental Research, 25*, 1350–1359. doi: 10.1111/j.1530-0277.2001.tb02358
- Cloninger, C. R., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry, 50*, 975–990.
- Conner, M., & Norman, P. (2005). (Eds.) *Predicting Health Behaviour*. London: Open University Press.
- Currie, C., Zanotii, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., Barnekow, V. (Eds.). (2012). *Social determinants of health and well-being among young*

people. Health behaviour in school-aged children (HBSC) study: international report from the 2009/2010 survey. Copenhagen: WHO Regional Office for Europe.

Dawson, D. B., Goldstein, R. B., Chou, C. P., Ruan, W. J., & Grant, B. F. (2008). Age at first drink and the first incidence of adult-onset DSM-IV alcohol use disorders.

Alcoholism: Clinical and Experimental Research, 12, 2149–2160.

De Genna, N. M., Cornelius, M. D., & Donovan, J. E. (2009). Risk factors for young adult substance use among women who were teenage mothers. *Addictive Behaviors, 34*, 463–470. doi: 10.1016/j.addbeh.2008.12.014

Behaviors, 34, 463–470. doi: 10.1016/j.addbeh.2008.12.014

DeVellis, R. F. (2003). *Scale development: Theory and applications* (2nd ed.). Thousand Oaks, CA: Sage.

Donovan, J. E., Leech, S. L., Zucker, R. A., & Loveland, C. J. (2004). Really underage drinkers: alcohol use among elementary students. *Alcoholism, Clinical and Experimental Research, 28*, 341– 349.

Experimental Research, 28, 341– 349.

Donovan, J. E., & Molina, B. S. (2011). Childhood risk factors for early-onset drinking.

Journal of Studies on Alcohol and Drugs, 72, 741–751.

Dunn, M. E., & Goldman, M. S. (1996). Empirical modeling of an alcohol expectancy memory network in elementary school children as a function of grade.

Experimental and Clinical Psychopharmacology, 4, 209– 217. doi: 10.1037/1064-1297.4.2.209

Dunn, M. E., & Goldman, M. S. (1998). Age and drinking related differences in the memory organization of alcohol expectancies in 3rd, 6th, 9th, and 12th grade

- children. *Journal of Consulting and Clinical Psychology*, 66, 579– 585.
doi:10.1037/0022-006X.66.3.579
- Dvies, J., & Stacey, B. (1971). Alcohol and health education in schools. *Health Bulletin (Edinburgh)*, 29, 50–53.
- Eisinga, R., Grotenhuis, M., & Pelzer, B. (2012). The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? *Int. Journal of Public Health*, 58, 637-642. DOI 10.1007/s00038-012-0416-3
- Ellickson, S. L., Tucker, J. S., Klein, D. J., & McGuigan, K. A. (2001). Prospective risk factors for alcohol misuse in late adolescence. *Journal of Studies on Alcohol*, 62, 773–782.
- Garlow, S. J. (2002). Age, gender, and ethnicity differences in patterns of cocaine and ethanol use preceding suicide. *American Journal of Psychiatry*, 159, 615–619.
- Gruber, E., DiClemente, R.J., Anderson, M.M. & Lodico, M. (1996). Early drinking onset and its association with alcohol use and problem behavior in late adolescence. *Preventive Medicine*, 25, 293–300.
- Hawkins, J. D., Graham, J. W., Maguin, E., Abbott, R., Hill, K. G, & Catalano, R. F. (1997). Exploring the effects of age of alcohol use initiation and psychosocial risk factors on subsequent alcohol misuse. *Journal of Studies on Alcohol*, 58, 280–290.
- Heron, J., Macleod, J., Munafò, M. R., Melotti, R., Lewis, G., Tilling, K., & Hickman, M. (2012). Patterns of alcohol use in early adolescence predict problem use at age 16. *Alcohol and Alcoholism*, 47, 169–177. doi: 10.1093/alcalc/agr156

Hibell, B., Guttormsson, U., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., &

Kraus, L. (2009). *The 2007 ESPAD report. Substance use among students in 35 European countries*. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs.

Hibell, B., Guttormsson, U., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., &

Kraus, L. (2012). *The 2011 ESPAD report. Substance use among students in 36 European countries*. Luxembourg: Publication Office of the European Union.

Ho, S.S., Poorisat, T., Neo, R.L, & Detenber, B.H. (2013). Examining how presumed media influence affects social norms and adolescents' attitudes and drinking behavior intentions in rural Thailand. *Journal of Health Communication*.

doi:10.1080/10810730.2013.811329

Humphrey, J. A., & Friedman, J. (1986). The onset of drinking and intoxication among university students. *Journal of Studies on Alcohol*, 47, 455–458.

Kaplow, J. B., Curran, P. J., & Dodge, K. A. (2002). Child, parent, and peer predictors of early-onset substance use: a multisite longitudinal study. *Journal of Abnormal Child Psychology*, 30, 199–216.

Kloep, M., Hendry, L. B., Ingebrigtsen, J. E., Glendinning, A., & Espnes, G. A. (2001).

Young people in 'drinking' societies? Norwegian, Scottish and Swedish adolescents' perceptions of alcohol use. *Health Education Research*, 16, 279–291.

doi: 10.1093/her/16.3.279

Klein, J. D. (2006). Adolescents and smoking: the first puff may be the worst *Canadian*

Medical Association journal, 175, 262– 263. doi: 10.1503/cmaj.060737

Kuntsche, E., Rossow, I., Simons-Morton, B., Bogt, T. T., Kokkevi, A., & Godeau, E.

(2013). Not early drinking but early drunkenness is a risk factor for problem behaviors among adolescents from 38 European and North-American countries.

Alcoholism, Clinical and Experimental Research, *37*, 308–314. doi:

10.1111/j.1530-0277.2012.01895.x

Kosterman, R., Hawkins, D., Guo, J., Catalano, R. & Abbott, R.D. (2000). The dynamics

of Alcohol and Marijuana Initiation: Patterns and Predictors of first use in

Adolescence. *American Journal of Public Health*, *90*, 360-6.

Kyrrestad Strøm, H., Adolfsen, F., Handegård, B, H., Natvig, H., Eisemann, M.,

Martinussen, M., & Kuposov, R. (2014). Preventing alcohol use with a universal

school-based intervention: Results from an Effectiveness study. Manuscript

submitted for publication.

Masten, A. S., Faden, V. B. Zucker, R. A., & Spear, L. P. (2008). Underage drinking: a

developmental framework. *Pediatrics*, *121*, 235–251. doi: 10.1542/peds.2007-

2243A

Melotti, R., Lewis, G., Hickman, M., Heron, J., Araya, R., & Macleod, J. (2013). Early

life socio-economic position and later alcohol use: birth cohort study. *Addiction*,

108, 516–525. doi: 10.1111/add.12018

Olweus, D. (2005). A useful evaluation design and effects of the Olweus Bullying

Prevention Program. *Psychology, Crime & Law*, *11*, 389–402.

Plant, M., & Miller, P. (2001). Young people and alcohol: an international insight.

Alcohol and Alcoholism, *36*, 513-515. doi: 10.1093/alcalc/36.6.513

- Rose, R. J., Dick, D. M., Viken, R. J., Pulkkinen, L., & Kaprio J. (2001). Drinking or Abstaining at Age 14? A Genetic Epidemiological Study. *Alcoholism, Clinical and Experimental Research*, 25, 1594–1604.
- Rossow, I., & Kuntsche, E. (2013). Early onset of drinking and risk of heavy drinking in young adulthood – a 13-year prospective study. *Alcoholism: Clinical and Experiment Research*, 37, 297–304. doi: 10.1111/j.1530-0277.2012.01924.x
- Sartor, C. E., Lynskey, M. T., Bucholz, K. K., Madden, P. A. F., Martin, N. G., & Heath, A. C. (2009). Timing of first alcohol use and alcohol dependence: Evidence of common genetic influences. *Addiction*, 104, 1512–1518. doi: 10.1111/j.1360-0443.2009.02648.x
- Strandheim, A., Bratberg, G. H., Holmen, T. L., Coombes, L., & Bentzen, N. (2011). The influence of behavioural and health problems on alcohol and drug use in late adolescence - a follow up study of 2 399 young Norwegians. *Child and Adolescent Psychiatry and Mental Health*, 5, 5–17. doi:10.1186/1753-2000-5-17
- Strandheim, A., Holmen, T. L., Coombes, L., & Bentzen, N. (2010). Alcohol use and physical health in adolescence: a general population survey of 8,983 young people in North-Trøndelag, Norway (the Young-HUNT study). *Substance Use and Misuse*, 45, 253–265. doi: 10.3109/10826080903080680
- Smit, E., Verdurmen, J., Monshouwer, K., & Smit, F. (2008). Family interventions and their effect on adolescent alcohol use in general populations; a meta-analysis of randomized controlled trials. *Drug and Alcohol Dependence*, 97, 195–206.
- Sondhi, A. & Turner, C. (2011). *The influence of family and friends on young people's drinking*. New-York: Joseph Rowntree Foundation.

- Van der Vorst, H., Engels, R. C., Meeus, W., & Deković, M. (2006). The impact of alcohol-specific rules, parental norms about early drinking and parental alcohol use on adolescents' drinking behaviour. *Journal of Child and Psychology Psychiatry, 47*, 1299–1306.
- Vedøy, F. T., & Skretting, A. (2009). *Ungdom og rusmidler: resultater fra spørreskjemaundersøkelser 1968 – 2008* [Adolescents and drugs: Survey results 1968-2008]. SIRUS report 5. Oslo: The Norwegian Institute for Alcohol and Drug Research.
- Vereecken, C.L., Incley, J., Subramanian, S.V. Hublet, A., & Maes, L. (2005). The relative influence of individual and contextual socio-economic status on consumption of fruit and soft drinks among adolescents in Europe. *European Journal of Public Health, 15*, 224-232. doi:10.1093/eurpub/cki005
- Vieira, D. L., Ribeiro, M., & Laranjeira, R. (2007). Evidence of association between early alcohol use and risk of later problems. *Brazilian Journal of Psychiatry, 29*, 222–227.
- Zucker, R. A. (2006). Alcohol use and the alcohol use disorders: a developmental-biopsychosocial formulation covering the life course. In D. Cicchetti & D.J. Cohen (Eds.), *Developmental Psychopathology: Risk, Disorder, and Adaptation* (pp. 620– 656). New York: Wiley.
- Øia, T. (2012). *Ung i Oslo 2012, nøkkeltall* [Young in Oslo 2012, key figures]. Oslo: NOVA - Norwegian Social Research.

Table 1

Alcohol Use for Boys, Girls and the Total Sample and test of significance

| Questions | Boys N (%) | Girls N (%) | Total N (%) | p |
|---|---------------|----------------|----------------|--------|
| Have you ever been drinking at least 1 small glass of alcohol | | | | |
| No | 545 (71) | 636 (81) | 1181 (76) | .001** |
| Yes | 222 (29) | 150 (19) | 372 (24) | |
| How often have you been drinking alcohol the last three months | | | | |
| Not at all | 685 (89) | 724 (92) | 1409 (91) | .001** |
| 1-2 times in last 3 months | 51 (6.6) | 41 (5.2) | 92 (6) | |
| Once a month | 9 (1.2) | 14 (1.8) | 23 (1.5) | |
| 2-3 times per month | 12 (1.6) | 5 (0.6) | 17 (1.1) | |
| At least once a week | 10 (1.3) | 2 (0.3) | 12 (0.8) | |
| If you think of the last 3 months, how many times did you drink so much that you clearly have felt inebriated? | | | | |
| 0 times | 744 (97.3) | 770 (97.8) | 1514 (98) | .001** |
| 1-2 times | 11 (1.4) | 11 (1.4) | 22 (1.2) | |
| More than 2 times | 9 (1.3) | 5 (0.8) | 14 (0.8) | |
| Drinking friends | | | | |
| No | 269 (50) | 355 (56) | 624 (53.7) | .05* |
| Yes | 190 (36) | 182 (29) | 372 (32) | |
| Don't know | 74 (14) | 92 (15) | 166 (14.3) | |
| If you have older/same age siblings, do they drink alcohol | | | | |
| No older siblings | 217 (29) | 240 (31) | 457 (30) | .001** |
| Don't know | 202 (27) | 199 (25) | 401 (26) | |
| No | 139 (18) | 92 (12) | 231 (15) | |
| Yes | 198 (26) | 253 (32) | 451 (29) | |

*p < .05. ** < .005

Table 2. Associations between Alcohol Use and Studied Variables

| Variable | N | Never tried alcohol n (%) | Have tried alcohol n (%) | Bivariate | | | Multivariable | | |
|---|------|------------------------------|-----------------------------|-----------|---------|----------|---------------|---------|----------|
| | | | | F | OR | 95% CI | F | OR | 95% CI |
| Background variables | | | | | | | | | |
| Gender | | | | 22.0*** | | | 9.3** | | |
| Girls | 785 | 637 (81) | 148 (19) | | Ref | | | Ref | |
| Boys | 765 | 553 (71) | 223 (29) | | 1.8*** | 1.4-2.3 | | 1.6** | 1.2-2.1 |
| Religion | | | | 9.2*** | | | 8.7*** | | |
| Christianity | 1059 | 799 (75) | 260 (25) | | Ref | | | Ref | |
| Islam | 152 | 141 (93) | 11 (7) | | 0.3*** | 0.1-0.5 | | 0.1*** | 0.1-0.3 |
| Other | 52 | 45 (87) | 7 (13) | | 0.5 | 0.2-1.1 | | 0.4 | 0.2-1.1 |
| None | 298 | 205 (69) | 93 (31) | | 1.4* | 1.0-1.9 | | 1.2 | 0.8-1.7 |
| Family situation | | | | 1.2 | | | 1.0 | | |
| Two parents | 1265 | 978 (77) | 287 (23) | | Ref | | | Ref | |
| One parent | 266 | 196 (74) | 70 (26) | | 1.2 | 0.9-1.6 | | 1.2 | 0.8-1.7 |
| Family economy | | | | 1.3 | | | 0.8 | | |
| Very good | 307 | 241 (79) | 66 (21) | | Ref | | | Ref | |
| Good | 930 | 713 (77) | 217 (23) | | 1.1 | 0.8-1.5 | | 1.3 | 0.9-1.9 |
| Moderate | 296 | 217 (73) | 79 (27) | | 1.3 | 0.9-2.0 | | 1.1 | 0.7-1.8 |
| Bad/Very bad | 17 | 11 (65) | 6 (35) | | 2.2 | 0.7-6.3 | | 1.5 | 0.4-5.5 |
| School, friends, parents | | | | | | | | | |
| School performance | | | | 7.2** | | | 2.0 | | |
| Better | 582 | 462 (79) | 120 (21) | | Ref | | | Ref | |
| Moderate | 938 | 706 (75) | 232 (25) | | 1.2 | 0.9-1.6 | | 1.1 | 0.8-1.4 |
| Worse | 37 | 18 (49) | 19 (51) | | 3.9*** | 1.9-7.9 | | 2.4* | 1.0-5.8 |
| Amount of close friends | | | | 1.3 | | | 1.6 | | |
| More than 3 | 1193 | 903 (76) | 290 (24) | | Ref | | | Ref | |
| 2-3 | 325 | 256 (79) | 69 (21) | | 0.8 | 0.6-1.1 | | 0.8 | 0.5-1.1 |
| 1 | 28 | 18 (64) | 10 (36) | | 1.6 | 0.7-3.7 | | 1.4 | 0.5-3.9 |
| No close friends | 14 | 12 (86) | 2 (14) | | 0.4 | 0.1-1.9 | | 0.2 | 0.01-1.8 |
| Parents talking with child about harm of alcohol | | | | 2.7 | | | 1.5 | | |
| Yes | 706 | 555 (79) | 151 (21) | | Ref | | | Ref | |
| No | 845 | 626 (74) | 219 (26) | | 1.2 | 0.96-1.6 | | 1.2 | 0.9-1.6 |
| Smoking, bullying | | | | | | | | | |
| Smoking | | | | 117.0*** | | | 97.8*** | | |
| No | 1446 | 1161 (80) | 285 (20) | | Ref | | | Ref | |
| Yes | 115 | 29 (25) | 86 (75) | | 13.0*** | 8.2-20.7 | | 13.7*** | 8.1-23.0 |
| Have been bullied at school | | | | 1.0 | | | 0.5 | | |
| Never | 1170 | 906 (77) | 264 (23) | | Ref | | | Ref | |
| Seldom | 275 | 206 (75) | 69 (25) | | 1.1 | 0.8-1.6 | | 0.8 | 0.5-1.2 |
| 2-3 times/month | 55 | 41 (75) | 14 (25) | | 1.1 | 0.5-2.0 | | 0.8 | 0.4-1.7 |
| Several times/ week | 36 | 24 (67) | 12 (33) | | 1.9 | 0.9-3.9 | | 1.1 | 0.4-2.9 |
| Have bullied others at school | | | | 11.1*** | | | 4.0** | | |
| Never | 1263 | 1006 (80) | 256 (20) | | Ref | | | Ref | |
| Seldom | 226 | 149 (66) | 77 (34) | | 2.0*** | 1.5-2.8 | | 1.9* | 1.3-2.8 |
| 2-3 times/month | 22 | 11 (50) | 11 (50) | | 3.7** | 1.5-9.0 | | 2.4 | 0.8-6.6 |
| Several times /week | 21 | 7 (39) | 11 (61) | | 5.0** | 1.8-13.5 | | 2.2 | 0.6-7.7 |

Running head: ADOLESCENT DRINKING

| Variable | Bivariate | | | Multivariable | | |
|---|-----------|-----------|---------|---------------|-----------|---------|
| | <i>F</i> | <i>OR</i> | 95 % CI | <i>F</i> | <i>OR</i> | 95 % CI |
| <i>Attitudes, norms and intention</i> | | | | | | |
| Global positive expectations towards drinking | 61.2*** | 1.5 | 1.3-1.6 | 4.8* | 0.8 | 0.6-1.0 |
| Social positive expectations towards drinking | 158.3*** | 2.0 | 1.8-2.2 | 8.0** | 1.4 | 1.1-1.8 |
| Positive attitudes towards drinking | 255.5*** | 2.5 | 2.2-2.8 | 20.7*** | 1.4 | 1.2-1.7 |
| Intentions to drink | 121.4*** | 1.9 | 1.7-2.1 | 6.3* | 1.2 | 1.0-1.4 |
| Social norms | 254.4*** | 3.2 | 2.8-3.7 | 63.7*** | 2.1 | 1.7-2.5 |

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